

# Glastonbury Abbey

archaeological investigations 1904–79

*'Fate ... led me to ... the hot-bed of Glastonbury, where myth and fact had become inextricably entangled'*

Philip Rahtz, 1921–2011 (*Living Archaeology* 2001, 88)

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# Preface and acknowledgements

The Glastonbury Abbey Archaeological Archive Project was a collaborative venture between the University of Reading and Glastonbury Abbey. It spanned eight years from planning to completion and drew upon the records of archaeological excavations which took place at the abbey over seventy-five years (1904–79). We are grateful to the English Heritage Archive (formerly National Monuments Record) for giving us access to the archive of C A Raleigh Radford.

The project involved a team of thirty-one specialists (listed on page ii), all of whom we warmly acknowledge, including two colleagues who did not live to see their work in print, namely Geoff Egan (d 2010) and Paul Courtney (d 2013). We particularly wish to thank our illustrator, Liz Gardner, who has been integral to the project and to its successful completion. Special acknowledgement is due to Philip Rahtz (d 2011) and to Lorna Watts, both of whom supported the project from its inception and generously shared their knowledge of the archaeology of Glastonbury and its environs, and to Linda Witherill, who participated in Radford's excavations and generously funded the publication of this monograph.

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# Summary

Glastonbury Abbey was renowned in the Middle Ages as the reputed burial place of the legendary King Arthur and the site of the earliest Christian church in Britain, believed to have been founded by Joseph of Arimathea in the first century. This ancient church (*vetusta ecclesia*) was destroyed by fire in 1184. The medieval Lady Chapel was rapidly erected on the same site and became an associative relic of the ancient community of saints. The famous Glastonbury origins story was first recounted by William of Malmesbury around 1129–30. The myth was embellished by subsequent generations – including the addition of the Arthurian connection in 1191 – with the aim of establishing Glastonbury as pre-eminent among English monasteries and attracting pilgrims and funds to the abbey. The monks were spectacularly successful in crafting the Glastonbury legends: the abbey was the second richest monastery in England at the close of the Middle Ages. Glastonbury's myths continued to evolve in the centuries following the monastery's dissolution in 1539. Today the site of the abbey ruins draws a large range of visitors, including heritage tourists, students of history and spiritual seekers of diverse beliefs.

The site of Glastonbury Abbey was purchased in 1907 on behalf of the Church of England, and thirty-six seasons of archaeological excavation took place up to 1979 in association with the Somerset Archaeological and Natural History Society and the Society of Antiquaries of London. There were eight different directors, including some iconic figures in the history of monastic archaeology, namely Sir William St John Hope, Sir Charles Peers, Sir Alfred Clapham and Dr Courtenay Arthur Raleigh Radford. Frederick Bligh Bond, the abbey's first director of excavations, employed psychic experiments and dowsing in his archaeological methods and is regarded as a pioneering figure of the New Age movement, with which Glastonbury remains associated today.

The results of the antiquarian excavations were never reported in full: only interim statements were published in the form of yearly reports or summaries. The most significant excavations were those undertaken by Raleigh Radford in the 1950s and '60s and summarised in an interim publication in 1981. Radford reported only evidence dating to the early phases of the site, including a 'British' cemetery of cist burials, which he believed pre-dated the monastery, a series of early churches and a boundary ditch dating to the Mid Saxon period, a pre-

Conquest cloister and glass furnaces, which he dated to the tenth century and linked to the rebuilding of the monastery by St Dunstan. Radford also claimed to have found the shared grave of Arthur and Guinevere, which was allegedly excavated by the monks in 1191.

This volume reports on the results of the Glastonbury Abbey Archaeological Archive Project, a collaboration between the University of Reading and the Trustees of Glastonbury Abbey, funded principally by the Arts and Humanities Research Council. The project has reassessed and reinterpreted all known archaeological records from the 1904–79 excavations and made the complete dataset available to the public through a digital archive hosted by the Archaeology Data Service (<http://dx.doi.org/10.5284/1022585>). The scope of the project has included the full analysis of the archaeological collections of Glastonbury Abbey by thirty-one leading specialists, including chemical and compositional analysis of glass and metal and petrological analysis of pottery and tile, and a comprehensive geophysical survey conducted by GSB Prospection Ltd. For the first time, it has been possible to achieve a framework of independent dating based on reassessment of the finds and radiocarbon dating of surviving organic material from the 1950s excavations.

The principal aim of the Glastonbury Abbey Archaeological Project was to set aside previous assumptions based on the historical and legendary traditions and to provide a rigorous reassessment of the archive of antiquarian excavations. This research has revealed that some of the best known archaeological 'facts' about Glastonbury are themselves myths perpetuated by the abbey's excavators. Reassessment of the archive has revealed new evidence for occupation pre-dating the first Christian settlement at Glastonbury. The lithic assemblage indicates early Mesolithic and early Neolithic presence in the area, and there is a significant assemblage of Iron Age pottery. Material culture confirms the presence of Roman occupation in the vicinity, with tiles from a substantial building reused in Saxon glass furnaces. Important evidence has come to light for post-Roman occupation of the abbey site, comprising a timber structure and trodden floor associated with imported Late Roman Amphora 1 (dated *c* 450–550).

Excavations in the 1920s revealed three phases of a Saxon stone church with a detached burial crypt to the east; the crypt was incorporated into the church in the

second phase and a tower was built over it in the third phase. Glastonbury exhibits the axial layout of churches that is characteristic of Anglo-Saxon monasteries. From the seventh to eighth centuries, there were three churches on the same alignment: the *vetusta ecclesia*, and, to the east, the church of St Peter and St Paul and the detached crypt. The dating of the five Saxon glass furnaces has been reassessed in conjunction with Bayesian analysis of radiocarbon dates from wood charcoal samples: the glass-working is likely to represent a single episode of production in the late seventh or early eighth century, connected with construction of the first stone church on the site, c 700. Compositional analysis of the Saxon glass and associated metal-working debris has confirmed that glass-working at Glastonbury incorporated recycled Roman materials.

Several details of Radford's interpretation of the early monastery are challenged by reassessment of the archive, including the existence of a pre-Christian 'British' cemetery and the discovery of Arthur's grave. The pottery assemblage includes the largest collection of Anglo-Saxon ceramics from the county of Somerset, recovered from stratified contexts beneath the Norman cloister, including five glazed vessels in Winchester ware. There were free-standing stone buildings to the south of the church at Glastonbury in the Late Saxon period but there is no evidence for Radford's Late Saxon cloister, an assertion that has been widely accepted as confirmation of the influence of Dunstan and the importance of Glastonbury in reforming the character of English monasticism in the tenth century.

Radford's interim reports provide very little detail for the Norman and later medieval monastery. Re-examination of the records has confirmed stratified evidence for the Norman and later medieval monastic ranges and revealed the sequence for the replacement of the Saxon and Norman buildings. There was substantial reconstruction of the church and claustral buildings after a devastating fire in 1184. It is estimated that the Great Church was largely complete and roofed by c 1230. Major rebuilding took place in the fourteenth century, with Walter of Monington remodelling the east end (1342–75).

Glastonbury is highly unusual in the apparent absence of a west range to the monastic cloister, perhaps resulting from the evolution of the abbot's range in the south-western corner of the inner court. The excavated evidence confirms that the abbot's hall complex was completely remodelled from the early fourteenth century, providing a spacious and luxurious court c 70m square for the abbot and his guests. The new complex comprised a grand hall

and porch which provided a waiting room for visitors, accommodation for the abbot and his guests, a chapel, kitchen and service range and walled garden. Evidence for the Dissolution includes iconoclasm targeted on sculpted images, salvaging activities and evidence possibly associated with the short-lived community of Protestant refugees who occupied the site of the former abbey in 1552–3. Post-medieval occupation in the precinct is represented by high-status material culture associated with the reuse of the former abbot's lodging as a mansion up to the seventeenth century.

The monastic character of the medieval finds assemblage is evidenced especially in objects linked with music and literacy and the large number of items for personal devotion that were owned by monks or secular guests and pilgrims. The pottery assemblage of over 8,000 fragments includes glazed tablewares imported from northern France and locally made products particularly from Bristol. In the high medieval period, the status of the abbey is reflected in the presence of Spanish lustrewares and Italian maiolicas. Material excavated from the abbot's hall was dominated by jugs, reflecting an emphasis on the serving of drink to high-ranking guests. The assemblage of 7,000 ceramic tiles represents a wide range of motifs. Chemical analysis of the clay used in the fabric shows that the majority were made at kilns close to Glastonbury. The assemblage of over 2,000 fragments of medieval stained glass includes durable blue glass, confirmed by compositional analysis to have a mixed soda potash composition. It is likely to date from the twelfth century and confirms that Glastonbury's early glazing schemes were of the highest quality, comparing favourably with those at York, Winchester, Chartres and St-Denis.

Study of the worked stone assemblage reveals the lavish cloister constructed by Abbot Henry of Blois c 1150: the fifty-one fragments of blue lias carving are amongst the finest examples of Romanesque sculpture produced in England. The assemblage of nearly 1,500 fragments of Gothic sculpture confirms large-scale building activity following the fire of 1184, with major work undertaken from the 1180s into the 1250s. There are some stylistic affinities with Wells, and the figural carvings from the north transept and Galilee demonstrate the outstanding quality of the Early English abbey church. There are many conservative or retrospective elements evident in the architecture of Glastonbury Abbey; this tendency seems to have been deliberate and strategic, aimed at demonstrating the antiquity of Glastonbury and its pre-eminent place in monastic history.

Reassessment of the archive of excavations has

identified a number of new questions for future research. The presence of LRA1 pottery confirms occupation at Glastonbury in the fifth or sixth century, but there is no evidence yet to suggest whether this was a religious community or a high-status secular settlement engaged in long-distance trade. The relationship of the monastery to earlier settlement patterns deserves further consideration: for example, it is possible that the monastic *vallum* incorporates a defensive bank and ditch *pre-dating* the monastery. A striking feature of the finds assemblage is

the lack of evidence for metal objects dating to the Middle and Late Saxon periods. The paucity of evidence dating from the seventh to ninth centuries prompts the question of whether the early monastic core has actually been located. It is feasible that the main domestic buildings of the Mid Saxon monastery were situated to the north of the church, in an area yet to be examined. Fresh excavations will be required to fully understand the character, form and dating of the Anglo-Saxon monastery at Glastonbury.

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## Résumé

Glastonbury Abbey était célèbre au Moyen Âge comme l'endroit où, à ce que l'on disait, se trouvait la sépulture du légendaire roi Arthur et le site de la plus ancienne église chrétienne de Grande-Bretagne, fondée croyait-on par Joseph d'Arimathie, au I<sup>er</sup> siècle. Cette église ancienne (*vetusta ecclesia*) fut détruite par le feu en 1184. La Lady Chapel médiévale fut édifée rapidement sur le même site et devint une relique représentative de la communauté des saints ancienne. L'histoire des origines célèbres de Glastonbury fut racontée pour la première fois par William Malmesbury vers 1129–30. Ce mythe fut embelli par les générations qui suivirent, avec notamment l'ajout du lien avec Arthur en 1191, dans le but de donner à Glastonbury une place prédominante parmi les monastères anglais et d'attirer les pèlerins et les fonds vers l'abbaye. La création des légendes sur Glastonbury par les moines fut très productive: l'abbaye était le deuxième monastère le plus riche à la fin du Moyen Âge. Ces mythes continuèrent à évoluer durant les siècles qui suivirent sa dissolution en 1539. Aujourd'hui, le site de ses ruines attire un large éventail de visiteurs, y compris des touristes intéressés par le patrimoine, des étudiants en histoire et des personnes de croyances diverses en quête de spiritualité.

Le site de Glastonbury Abbey fut acheté en 1907 pour le compte de l'Église anglicane. On y organisa trente-six saisons de fouilles archéologiques jusqu'en 1979, en association avec la Somerset Archaeological and Natural History Society (Société d'archéologie et d'histoire naturelle du Somerset) et la Society of Antiquaries of London (Société des archéologues de Londres). Il y eut huit directeurs différents, y compris des personnages emblématiques de l'histoire de l'archéologie monastique, à savoir Sir William St John Hope, Sir Charles Peers, Sir Alfred Clapham et Dr Courtenay Arthur Ralegh Radford. Frederick Bligh Bond, le premier directeur des fouilles de

l'abbaye, comptait des expériences de parapsychologie et la radiesthésie parmi ses méthodes d'archéologie; il est considéré comme un des pionniers du mouvement *New Age*, avec lequel Glastonbury reste associé aujourd'hui.

Les fouilles archéologiques ne firent jamais l'objet de comptes rendus exhaustifs: on ne publia que des exposés provisoires sous la forme de rapports ou résumés annuels. Les fouilles les plus importantes furent celles entreprises par Ralegh Radford dans les années 1950 et 1960; elles furent résumées dans une publication provisoire en 1981. Radford présenta seulement les vestiges remontant aux premières phases du site, y compris un cimetière « britannique » de sépultures en cistes, à son avis antérieur au monastère, une série d'églises anciennes et un fossé de démarcation datant du milieu de la période saxonne, un cloître antérieur à la conquête des Normands et des fours à verre, d'après lui remontant au X<sup>e</sup> siècle et liés à la reconstruction du monastère par saint Dunstan. Radford affirma aussi avoir découvert la tombe d'Arthur et de Guenièvre, prétendument exhumés par les moines en 1191.

Le présent volume fait le compte rendu des résultats du Glastonbury Abbey Archaeological Archive Project, un projet de collaboration entre l'université de Reading et les Trustees of Glastonbury Abbey, dont le financement provient en majorité de l'Arts and Humanities Research Council (Conseil de la recherche sur les arts et les humanités). Ce projet a permis de réévaluer et de réinterpréter l'ensemble des archives archéologiques connues concernant les fouilles menées de 1904 à 1979 et met l'ensemble des données recueillies à la disposition du public grâce à des archives numériques hébergées par l'Archaeology Data Service (<http://dx.doi.org/10.5284/1022585>). Le projet portait sur l'analyse complète des collections archéologiques de Glastonbury Abbey par trente et un spécialistes éminents, y compris une analyse

chimique et compositionnelle du verre et du métal et une étude pétrologique des poteries et des carreaux, ainsi qu'une étude géophysique exhaustive effectuée par GSB Propection Ltd. Pour la première fois, il a été possible d'établir un cadre de datation indépendante fondé sur la réévaluation des vestiges et la datation au radiocarbone des matières organiques provenant des fouilles des années 1950 qui subsistent.

Le Glastonbury Abbey Archaeological Project avait pour principal objectif d'effectuer une réévaluation rigoureuse des archives des fouilles, en mettant de côté les hypothèses établies précédemment, fondées sur les traditions historiques et légendaires. Ces travaux ont permis de montrer que certains des « faits » archéologiques les plus connus concernant Glastonbury sont eux-mêmes des mythes perpétués par les responsables des fouilles. La réévaluation des archives a fait apparaître de nouvelles preuves d'une occupation antérieure au peuplement chrétien de Glastonbury. L'assemblage lithique indique qu'il y avait une présence humaine dans la région au début du mésolithique et du néolithique et l'on note également un assemblage important de poteries de l'âge de fer. La culture matérielle confirme la présence d'une occupation romaine dans le voisinage, concrétisée par des carreaux provenant d'un bâtiment substantiel, réutilisés dans les fours à verre saxons.

Des preuves importantes d'une occupation du site de l'abbaye après l'époque romaine ont été mises au jour, y compris une structure en bois et un sol en terre battue associés à des amphores romaines tardives importées (datant de vers 450–550).

Les fouilles menées dans les années 1920 ont mis au jour trois phases d'une église en pierre saxonne accompagnée à l'est d'une crypte de sépulture séparée; la crypte fut intégrée à l'église durant la deuxième phase, puis une tour construite au-dessus au cours de la troisième. Glastonbury présente l'agencement axial caractéristique des monastères anglo-saxons. Du VII<sup>e</sup> au VIII<sup>e</sup> siècle, il y avait trois églises sur le même alignement: la *vetusta ecclesia*, et, à l'est, l'église St Peter and St Paul ainsi que la crypte séparée. La datation des cinq fours à verre saxons a été réévaluée en conjonction avec l'analyse bayésienne des dates radiocarbone établies à partir d'échantillons de charbon de bois: la verrerie représente sans doute un épisode unique de production remontant à la fin du VII<sup>e</sup> siècle ou au début du VIII<sup>e</sup>, lié à la construction de la première église en pierre sur ce site, vers 700. L'analyse compositionnelle du verre saxon et des débris métallurgiques associés a confirmé qu'à Glastonbury le travail du verre intégrait des matériaux

romains recyclés.

Plusieurs des détails de l'interprétation de Radford concernant le premier monastère sont remis en question par la réévaluation des archives, y compris l'existence d'un cimetière « britannique » précédant l'époque chrétienne et la découverte de la tombe d'Arthur. L'assemblage de poteries réunit la plus grande collection de céramiques anglo-saxonnes du comté de Somerset. Elle provient des contextes stratifiés gisant sous le cloître normand, y compris cinq récipients vernissés en poterie de Winchester. Il y avait à Glastonbury des bâtiments en pierre indépendants situés au sud de l'église à la fin de la période saxonne. Cependant rien ne prouve l'existence, à cette époque, du cloître postulé par Radford, affirmation qui avait été largement acceptée comme confirmant l'influence de Dunstan et l'importance de Glastonbury dans la réforme du caractère du monachisme anglais au X<sup>e</sup> siècle.

Les rapports provisoires de Radford fournissent très peu de détails sur le monastère de l'époque normande et de la fin du Moyen Âge. Le réexamen des enregistrements a confirmé les vestiges stratifiés des bâtiments monastiques de ces époques et a révélé l'ordre dans lequel les bâtiments saxons et normands furent remplacés. L'église et les bâtiments du cloître furent en grande partie reconstruits après un incendie dévastateur, en 1184. On estime que la Great Church était en grande partie terminée et couverte d'un toit vers 1230. Des travaux de reconstruction majeurs eurent lieu au XIV<sup>e</sup> siècle, avec le remodelage de la partie est effectué par Walter of Monington (1342–75).

Glastonbury a pour caractéristique très inhabituelle que le cloître monastique ne comporte pas de bâtiments ouest, ce qui est peut-être la conséquence de l'évolution des bâtiments de l'abbé, dans l'angle sud-ouest de la cour intérieure. Les vestiges dégagés montrent que le complexe de la salle de l'abbé fut entièrement remodelé à partir du début du XIV<sup>e</sup> siècle, créant ainsi une cour somptueuse et spacieuse d'environ 70 mètres carrés pour l'abbé et ses invités. Le nouveau complexe comprenait une grande salle et un porche qui servait de salle d'attente aux visiteurs, des appartements réservés à l'abbé et à ses invités, une chapelle, des cuisines et des bâtiments de service, ainsi qu'un jardin clos. Parmi les traces laissées par la Dissolution, on citera les dommages causés aux images sculptées, des activités de récupération et des vestiges peut-être liés à la communauté de réfugiés protestants qui occupa brièvement le site de l'ancienne abbaye en 1552–53. L'occupation post-médiévale de l'enceinte est représentée par une culture matérielle dénotant un statut social élevé, associée à la réutilisation



de l'ancienne habitation de l'abbé comme manoir jusqu'au XVII<sup>e</sup> siècle.

Le caractère monastique de l'assemblage de vestiges médiévaux est mis en lumière en particulier dans les objets liés à la musique et aux activités de l'écrit et dans le grand nombre d'objets de dévotion personnelle qui appartenait aux moines ou aux visiteurs et pèlerins séculiers. L'assemblage de poteries, qui réunit plus de 8 000 fragments, comprend de la vaisselle vernissée importée du nord de la France et des produits faits sur place notamment à Bristol. Durant le haut Moyen Âge, le prestige de l'abbaye se reflète dans la présence de poteries lustrées espagnoles et de majoliques italiennes. Les objets découverts dans la salle de l'abbé comportaient surtout des cruches, indiquant qu'il était jugé important de servir à boire aux invités de haut rang. L'assemblage de plus de 7 000 carreaux en céramique fait apparaître un large éventail de motifs. L'analyse chimique de la glaise utilisée dans la structure montre qu'ils furent en majorité fabriqués dans des fours proches de Glastonbury. L'assemblage de plus de 2 000 fragments de vitraux médiévaux contient des tessons d'un verre bleu durable dont l'analyse compositionnelle confirme qu'il contenait un mélange de soude et de potasse. Ces vestiges datent sans doute du XII<sup>e</sup> siècle et indiquent qu'à Glastonbury, au début, les vitraux étaient de la plus haute qualité et soutenaient la comparaison avec ceux de New York, Winchester, Chartres et Saint-Denis.

L'étude des assemblages de pierres travaillées révèle le cloître somptueux construit par l'abbé Henri de Blois, vers 1150: les cinquante et un fragments de pierre de liais bleu sont parmi les plus beaux exemples de sculptures romanes produits en Angleterre. L'assemblage de près de 1 500 fragments de sculptures gothiques confirme la grande ampleur des activités de construction qui ont fait

suite à l'incendie de 1184, d'importants travaux ayant été entrepris des années 1180 aux années 1250. On détecte des ressemblances stylistiques avec Wells, et les figures sculptées du transept et du porche nord prouvent la qualité remarquable de l'abbatiale de style gothique anglais. On remarque de nombreux éléments conservateurs ou rétrospectifs dans l'architecture de Glastonbury Abbey; cette tendance, qui paraît avoir été délibérée et stratégique, visait à démontrer l'ancienneté de Glastonbury et sa place prééminente dans l'histoire monastique.

La réévaluation des archives des fouilles a permis d'identifier plusieurs thèmes futurs de recherche. La présence de poteries LRA1 confirme l'occupation de Glastonbury par les Romains au V<sup>e</sup> et au VI<sup>e</sup> siècles, mais rien ne permet encore de savoir s'il s'agissait d'une communauté religieuse ou d'un peuplement séculier à statut social élevé qui s'occupait d'échanges commerciaux de longue distance. La relation du monastère aux modes de peuplement antérieurs mérite d'être examinée dans plus de détails: il est possible par exemple que le *vallum* monastique englobe un talus défensif et un fossé en fait antérieurs au monastère. L'assemblage de vestiges découverts se caractérise de manière frappante par l'absence de traces d'objets en métal datant du milieu et de la fin de la période saxonne. Le manque de vestiges datant de la période allant du VII<sup>e</sup> au IX<sup>e</sup> siècle conduit à se demander si le centre monastique le plus ancien a en fait été localisé. Il est possible que les bâtiments domestiques principaux du monastère du milieu de l'époque saxonne aient été situés au nord de l'église, dans une zone qui n'a pas encore été examinée. De nouvelles fouilles seront nécessaires pour permettre de comprendre pleinement le caractère et la forme du monastère anglo-saxon de Glastonbury et d'en dater les éléments.

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## Zusammenfassung

Glastonbury Abbey genoss im Mittelalter als die angebliche Begräbnisstätte des sagenumwobenen Königs Arthur und als Standort der frühesten christlichen Kirche in Britannien, von der man glaubte, dass sie im ersten Jahrhundert von Josef von Arimathäa gegründet wurde, Berühmtheit. Diese alte Kirche (*vetusta ecclesia*) wurde 1184 von einem Brand zerstört. Die mittelalterliche Marienkapelle wurde schnell an derselben Stelle errichtet und wurde zu einer assoziativen Reliquie der Gemeinschaft der Heiligen. Die berühmte Geschichte der Ursprünge von Glastonbury wurde erstmals von William

of Malmesbury ca. 1129–30 erzählt. Der Mythos wurde von nachfolgenden Generationen ausgeschmückt – wozu auch der Zusatz der Beziehung zu König Arthur von 1191 gehört – mit dem Ziel, Glastonbury als vorrangig unter den englischen Klöstern darzustellen und damit Pilger und finanzielle Mittel in die Abtei zu bringen. Die Mönche waren besonders erfolgreich beim Basteln der Glastonbury-Legenden und im ausgehenden Mittelalter war die Abtei zum zweitreichsten Kloster Englands geworden. Die Mythen um Glastonbury entwickelten sich auch in den folgenden Jahrhunderten nach der Auflösung

des Klosters im Jahre 1539 weiter. Heute ziehen die Ruinen der Abtei die verschiedensten Besucher an, so z.B. Kulturtouristen, Geschichtsstudenten und spirituelle Sucher diverser Glaubensrichtungen.

Das Gelände von Glastonbury Abbey wurde 1907 im Namen der britischen Staatskirche erworben und bis zum Jahr 1979 fanden gemeinsam mit der Somerset Archaeological and Natural History Society und der Society of Antiquaries of London sechsunddreißig archäologische Grabungssaisonen statt. Zu den acht verschiedenen Leitern der Grabungen zählten einige ikonische Persönlichkeiten in der Geschichte der monastischen Archäologie wie Sir William St John Hope, Sir Charles Peers, Sir Alfred Clapham und Dr. Courtenay Arthur Ralegh Radford. Der erste Grabungsleiter, Frederick Bligh Bond, verwendete bei seinen archäologischen Methoden psychische Experimente und Pendeln. Er gilt als ein Wegbereiter der New-Age-Bewegung, mit der Glastonbury auch heute noch in Verbindung gebracht wird.

Über die Ergebnisse der antiquarischen Ausgrabungen wurde nie vollständig berichtet. Es gab lediglich Zwischenbilanzen, die in Form von Jahresberichten oder Zusammenfassungen veröffentlicht wurden. Die bedeutendsten Ausgrabungen sind jene, die in den 50-er und 60-er Jahren von Ralegh Radford durchgeführt und 1981 in einer Zwischenpublikation zusammengefasst wurden. Radford berichtete nur von Nachweisen, die auf die frühen Phasen des Standorts zurückgingen, wozu auch ein „britisches“ Gräberfeld mit Felsblockgräbern gehört, die seines Erachtens aus der Zeit vor dem Kloster stammen, sowie eine Reihe früher Kirchen und ein Grenzgraben aus der mittleren sächsischen Zeit, ein Kreuzgang aus der Zeit vor der normannischen Eroberung Englands und Glasöfen, die er dem 10. Jahrhundert zuschrieb und mit dem Neubau des Klosters durch den hl. Dunstan in Verbindung brachte. Radford behauptete auch, das gemeinsame Grab von Arthur und Guinevere gefunden zu haben, die 1191 angeblich von den Mönchen exhumiert worden waren.

Dieser Band berichtet über die Ergebnisse des Glastonbury Abbey Archaeological Archive Projekts, das gemeinsam von der Universität Reading und den Trustees von Glastonbury Abbey durchgeführt und zum Großteil vom Arts and Humanities Research Council finanziert wurde. Im Rahmen des Projekts wurden alle bekannten archäologischen Unterlagen zu den von 1904–79 durchgeführten Ausgrabungen neu bewertet und neu interpretiert und es wurde ein kompletter Datensatz hergestellt, der der Öffentlichkeit über ein digitales Archiv zugänglich ist, das vom Archaeology Data Service

(<http://dx.doi.org/10.5284/1022585>) gehostet wird. Zur Aufgabenstellung des Projekts gehörte u.a. eine umfassende Analyse der archäologischen Sammlungen von Glastonbury Abbey durch einunddreißig führende Spezialisten, die u.a. eine chemische und kompositorische Analyse von Glas und Metall und eine petrologische Analyse von Keramik und Fliesen durchführten; eine umfassende geophysikalische Vermessung wurde von GSB Propection Ltd gemacht. Es war damit erstmals möglich, ein Rahmenwerk unabhängiger Datierungen zu erhalten, das auf einer Neubewertung der Funde und der Radiokarbondatierung von organischem Material basiert, das von den Ausgrabungen in den 1950-ern erhalten ist.

Hauptziel des Glastonbury Abbey Archaeological Projekts war es, vorherige, auf den historischen und legendären Traditionen basierenden Annahmen hintanzustellen und eine rigorose Neubewertung des Archivs der antiquarischen Ausgrabungen bereitzustellen. Diese Nachforschungen haben ergeben, dass einige der bekanntesten „Fakten“ zu Glastonbury selbst Mythen sind, die von den Ausgräbern der Abtei fortgesetzt wurden. Die Neubewertung des Archivs hat einen neuen Nachweis für eine Ansiedlung erbracht, die der ersten christlichen Ansiedlung in Glastonbury zeitlich vorangeht. Die steinernen Funde weisen auf eine frühe mesolithische und neolithische Präsenz in diesem Gebiet hin und es sind auch beträchtliche Mengen von Keramikfunden aus der Eisenzeit vorhanden. Funde materialer Kultur bestätigen anhand von Fliesen von einem größeren Bauwerk, die in sächsischen Glasöfen wiederverwertet wurden, eine römische Präsenz in der Nähe. Es sind wichtige Nachweise dafür zutage getreten, dass das Gelände der Abtei auch nach den Römern besiedelt war, und zwar in Form einer Holzstruktur und eines abgetretenen Bodens, die mit importierten spätrömischen Amphoren (datiert ca. 450–550) in Verbindung gebracht werden.

Grabungen in den 1920-er Jahren enthüllten drei Phasen einer sächsischen Steinkirche mit einem getrennten Grabgewölbe gegen Osten; die Krypta wurde während der zweiten Phase der Kirche einverleibt und in der dritten Phase wurde darüber ein Turm errichtet. Glastonbury weist einen axialen Grundriss auf, der für die angelsächsischen Klöster charakteristisch ist. Vom siebten bis zum achten Jahrhundert gab es drei Kirchen auf derselben Flucht: die *vetusta ecclesia*, und gegen Osten die Kirche von St. Peter und St. Paul und die separate Krypta. Die Datierung der fünf sächsischen Glasöfen wurde in Verbindung mit einer Bayesschen Analyse der Radiokarbon-Daten von Holzkohleproben neu bewertet.

Dabei stellen die Glasarbeiten wahrscheinlich eine einzige Produktionsepisode im späten 7. oder frühen 8. Jahrhundert dar, verbunden mit dem Bau der ersten Steinkirche auf dem Gelände, ca. 700. Eine Kompositionsanalyse des sächsischen Glases und damit verbundener Metallbearbeitungsabfälle hat bestätigt, dass bei den Glasarbeiten in Glastonbury römische Materialien wiederverwertet wurden.

Mehrere Einzelheiten von Radfords Interpretation des frühen Klosters wurden bei einer Neubewertung des Archivs in Frage gestellt, einschließlich der Existenz eines vorchristlichen „britischen“ Gräberfelds und der Entdeckung von Arthurs Grab. Die Keramikfunde umfassen u.a. die größte Sammlung angelsächsischer Keramiken aus der Grafschaft Somerset, die aus geschichteten Umfeldern unter dem normannischen Kreuzgang geborgen wurden und wozu auch fünf glasierte Gefäße (Winchester Ware) gehörten. In später angelsächsischer Zeit gab es südlich von der Kirche in Glastonbury freistehende Steingebäude, es gibt jedoch keinen Nachweis für Radfords spätsächsischen Kreuzgang; diese Behauptung war weitgehend als eine Bestätigung für Dunstans Einfluss und auch für die Bedeutung anerkannt worden, die Glastonbury bei der Reformierung des Charakters des englischen Mönchtums im zehnten Jahrhundert gehabt hat.

Radfords Zwischenberichte bringen nur sehr wenige Einzelheiten zum normannischen und zum späteren mittelalterlichen Kloster. Eine erneute Prüfung der Unterlagen hat geschichtete Nachweise für die normannischen und die späteren mittelalterlichen klösterlichen Bereiche bestätigt und den Ablauf aufgedeckt, wie die sächsischen und normannischen Gebäude ersetzt wurden. Nach einem zerstörerischen Brand im Jahre 1184 wurden umfangreiche Neubauarbeiten an der Kirche und den klösterlichen Gebäuden durchgeführt. Es wird geschätzt, dass die Große Kirche um das Jahr 1230 weitgehend vervollständigt und überdacht war. Im 14. Jahrhundert fanden großangelegte Umbauarbeiten statt, bei denen Walter of Monington das östliche Ende neu gestaltete (1342–75).

Glastonbury ist aufgrund des scheinbaren Fehlens einer westlichen Baureihe am klösterlichen Kreuzgang äußerst ungewöhnlich; dies ist möglicherweise auf die Entwicklung der Gebäude des Abts zurückzuführen, bei der der südwestliche Gebäudekomplex des Abtes ab dem frühen 14. Jahrhundert völlig neugestaltet wurde und dem Abt und seinen Gästen schließlich eine rund 70 Quadratmeter große geräumige und luxuriöse Anlage bot. Der neue Gebäudekomplex umfasste eine große

Halle und einen Vorbau, in dem die Besucher warten konnten, Räumlichkeiten für den Abt und seine Gäste, eine Kapelle, eine Küche mit Dienstbereich und einen ummauerten Garten. Zu den Nachweisen für die Auflösung der englischen Klöster zählt u.a. der Ikonoklasmus auf plastische Bildwerke, Bergungsmaßnahmen und auch ein Nachweis, der möglicherweise mit der Gemeinschaft protestantischer Flüchtlinge in Verbindung gebracht werden kann, die das Gelände der ehemaligen Abtei von 1552–53 kurzfristig besetzt hatten. Die nachmittelalterliche Besetzung des Klosterbezirks wird von einer Sachkultur mit hohem Stellenwert bestätigt, die mit der Wiederverwendung der ehemaligen Unterkunft des Abtes als ein Herrenhaus bis zum 17. Jahrhundert in Verbindung gebracht wird.

Der klösterliche Charakter der mittelalterlichen Funde ist vor allem aus jenen Objekten ersichtlich, die mit Musik und Schriftkundigkeit zu tun haben, und anhand der zahlreichen für die persönliche Andacht bestimmten Gegenstände, die sich im Besitz von Mönchen oder weltlichen Gästen und Pilgern befanden. Zu den Keramikfunden von über 8.000 Fragmenten zählen glasiertes, aus Frankreich importiertes Tischgeschirr sowie lokal hergestellte Produkte vor allem aus Bristol. Im Hochmittelalter spiegelte sich der Status der Abtei vor allem in den Funden von spanischer Lüsterkeramik und italienischen Majoliken wider. Unter dem von der Halle des Abts ausgegrabenen Funden herrschten vor allem Krüge vor, woraus die Bedeutung erkenntlich ist, dass die hochgestellten Gäste mit Getränken bewirtet wurden. Die 7.000 Keramikfliesen sind mit den verschiedensten Motiven dekoriert. Eine chemische Analyse des dafür verwendeten Tons zeigt, dass der Großteil davon in Brennöfen in der Nähe von Glastonbury hergestellt wurde. Die Fundsammlung der mehr als 2.000 Fragmente von mittelalterlichem Buntglas umfasst dauerhaftes Blauglas, zu dem eine kompositorische Analyse ergab, dass es sich um eine gemischte Zusammensetzung von Natron und Pottasche handelt. Das Blauglas stammt wahrscheinlich aus dem 12. Jahrhundert und dies bestätigt, dass die frühen Verglasungen von Glastonbury von höchster Qualität waren und durchaus einem Vergleich mit York, Winchester, Chartres und Saint-Denis standhalten konnten.

Beim Studium der behauenen Steine ist ein prachtvoller Kreuzgang zutage gekommen, der um 1150 von Abt Henry de Blois erbaut wurde; die 51 Fragmente der blauen Reliefs aus Unterjuragestein zählen zu den schönsten Beispielen romanischer Bildwerke, die in England hergestellt wurden. Die Fundsammlung von nahezu 1.500 Fragmenten gotischer Skulpturen bestätigt

eine umfassende Bautätigkeit nach dem Brand von 1184, in deren Rahmen zwischen 1180 und bis nach 1250 größere Arbeiten durchgeführt wurden. Es sind stilistische Affinitäten mit der Kathedrale von Wells zu erkennen und die figuralen Schnitzereien vom nördlichen Querschiff und von Galiläa führen die hervorragende Qualität der frühenglischen Abteikirche vor Augen. In der Architektur der Glastonbury Abbey sind viele konservative und retrospektive Elemente zu erkennen; eine Tendenz, die absichtlich und strategisch zu sein scheint und die den Zweck hatte, das Altertum der Abtei und deren vorrangige Stellung in der klösterlichen Geschichte zu unterstreichen.

Bei einer Neubewertung des Ausgrabungsarchivs wurde eine Reihe von Fragen für zukünftige Nachforschungen identifiziert. Das Vorhandensein der LRA1 Keramik bestätigt, dass es in Glastonbury im 5. oder 6. Jahrhundert zwar eine Siedlung gab, dass es aber noch keinen Nachweis dafür gibt, ob es sich dabei um

eine religiöse Gemeinschaft oder um eine weltliche Siedlung mit hohem Stellenwert gehandelt hat, die mit dem Fernhandel beschäftigt war. Die Beziehung des Klosters zu früheren Siedlungsmustern bedarf weiterer Überlegungen; so ist es z.B. möglich, dass der Wall des Klosters einen Laufgraben mit Wall umfasst, die dem Kloster *zeitlich vorangehen*. Ein hervorstechendes Merkmal der Fundsammlung liegt im Fehlen von Metallgegenständen aus der mittleren und späteren angelsächsischen Zeit. Der Mangel an Nachweisen vom 7. bis ins 9. Jahrhundert führt zu der Frage, ob der frühe monastische Kern dort angesiedelt war. Es ist durchaus möglich, dass die hauptsächlich hauswirtschaftlichen Gebäude des mittelsächsischen Klosters nördlich von der Kirche gelegen waren, in einem Bereich, der noch nicht untersucht worden ist. Um den Charakter, die Form und Datierung des angelsächsischen Klosters von Glastonbury voll verstehen zu können werden neue Ausgrabungen erforderlich sein.

# Phasing and figure conventions

All remains (upstanding masonry, buried masonry, features and deposits) have been assigned to a phase where possible. Coloured fill has been used on the plans to indicate the earliest possible phase to which the remains can be assigned where the phasing is certain. The upstanding buildings have been phased in accordance with the most up-to-date analysis provided by the buildings archaeologists involved in ongoing work at the abbey (see Chapter 3). Buried masonry, features and deposits have been allocated phases based on their stratigraphic position resulting from new finds dating and their relationships with the phased upstanding remains. Lack of coloured fill means that the phasing is uncertain or unknown.

Phase 1: Roman	
Phase 2: Post-Roman	fifth to mid-seventh centuries
Phase 3: Mid Saxon	mid-seventh to ninth centuries
Phase 4: Late Saxon	tenth to early eleventh centuries
Phase 5: Saxo-Norman	early to mid-eleventh century
Phase 6: Medieval	late eleventh century
Phase 7: Medieval	early twelfth century
Phase 8: Medieval	mid- to late twelfth century
Phase 9: Medieval	late twelfth to mid-thirteenth centuries
Phase 10: Medieval	mid-thirteenth to early fourteenth centuries
Phase 11: Medieval	mid-fourteenth century
Phase 12: Medieval	late fourteenth to early fifteenth centuries
Phase 13: Medieval	mid- to late fifteenth centuries
Phase 14: Medieval	end of the fifteenth to early sixteenth centuries
Phase 15: Medieval	mid-sixteenth century
Phase 16: Post-Dissolution	mid-sixteenth to mid-eighteenth centuries
Phase 17: Modern	mid-eighteenth to twentieth centuries

## Trench outlines

**Solid line:** trench location or limit of excavation certain, plotted from original scaled plans and / or original measurements taken from the upstanding masonry and

cross-checked using a combination of measurements in the original site notebooks and sketch plans, original photographs showing the context of the trenches and from the results of geophysical survey.

**Dashed line:** trench location or limit of excavation uncertain. This may result from contradictions in the recording; for example, it might be known that a trench crossed structural remains with an established location, even though the measurements place the trench away from the remains. Uncertainty over trench location also arises where measurements were taken from fixed points that can no longer be identified. In these cases, professional judgement has been employed using a combination of all available evidence and the results of the geophysical survey.

## Building outlines

**Solid lines with coloured fill:** masonry certain, either in the form of upstanding remains or as buried masonry recorded in scaled / measured archaeological plans, cross-checked using a combination of measurements in the original site notebooks and sketch plans, original photographs showing the context of the masonry and from the results of geophysical survey.

**Dashed lines with coloured fill:** masonry uncertain; taken from buried masonry recorded in scaled / measured archaeological plans but still uncertain because of the lack of detail in the original recording. In these cases, professional judgement has been employed using a combination of all available evidence and the results of the geophysical survey.

## Archaeological features / deposits

**Solid line:** extent of feature / deposit certain, derived from original plans and sections and cross-checked against details in site notebooks and photographs.

**Dashed line:** extent or depth of feature / deposit uncertain or conjectured. This convention is mostly derived from the original drawings although some conjectural projections (particularly for wall lines) have been added during this project.



# Excavations at Glastonbury Abbey

*Roberta Gilchrist*

## 1.1 The legacy of Glastonbury Abbey

Glastonbury Abbey holds a unique place in the history of medieval monasticism and in the development of English cultural identity. The abbey possessed immense wealth and political status: it was the richest monastery in England at the end of the Saxon period and was second only to Westminster at the close of the Middle Ages. The Anglo-Saxon abbey was closely connected with the West Saxon royal house and three of its kings were buried within its grounds: Edmund I (d 946), Edgar I (d 975) and Edmund II Ironside (d 1016). Through Abbot Dunstan (909–88; abbot 940–57), Glastonbury was associated with the revival and reform of English monasticism in the tenth century. The medieval abbey achieved international fame through its legendary status as the burial place of King Arthur and Queen Guinevere (see Chapter 3). The monks announced their discovery of the graves in 1191 and thereafter promoted the secular cult of King Arthur alongside the abbey's prodigious collection of saints' relics. In 1250, the international significance of Glastonbury Abbey was reflected in its representation on Matthew Paris's map of the world. The abbey claimed to hold the relics of over 300 saints by the fourteenth century: pilgrims flocked to Somerset, drawn by the romance of King Arthur and the spiritual powerhouse of Glastonbury.

The abbey's fame was built upon its rich body of legends, a tradition of myth-making which thrives in

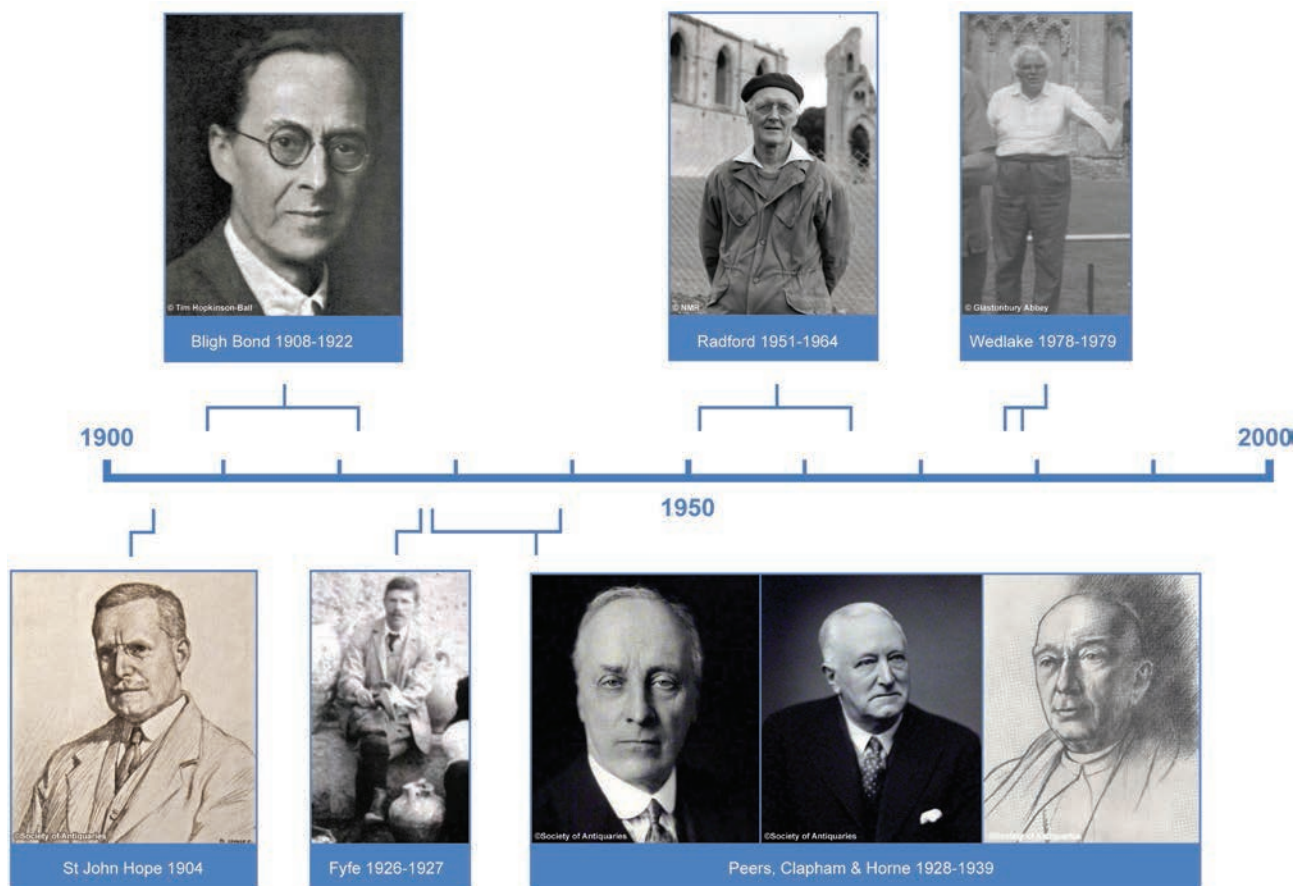
Glastonbury to this day. In addition to its reputed association with King Arthur, the abbey cultivated an origins story to proclaim its historical and spiritual pre-eminence among English monasteries. A history of the abbey was commissioned from William of Malmesbury: his *De Antiquitate Glastoniensis Ecclesie* (c 1129–30) hinted that the first church on the site had been built by the disciples of Christ (see Chapter 3). This 'old church' built of wattles (*vetusta ecclesia*) was allegedly still in existence at the time that William was writing. It was destroyed in 1184 by a devastating fire; shortly afterwards, the extant Lady Chapel was built on the site of the former church. The Lady Chapel was venerated as an associative relic of the early church at Glastonbury throughout the Middle Ages and up to the present day. Later versions of William's history embellished Glastonbury's origins story: by the fourteenth century, it was believed that the old church had been built by Christ's great-uncle, Joseph of Arimathea, and the abbey became closely associated with the cult of Joseph, even claiming that he was buried in Glastonbury.<sup>1</sup> These legends continued to evolve in the centuries following the Dissolution: in the nineteenth century, the 'Holy Legend of Glastonbury' alleged that Christ had been brought to Britain by Joseph of Arimathea in pursuit of tin. This popular West Country legend was immortalised in William Blake's poem, 'And did those feet in ancient time' (c 1808), best known in the form of Hubert Parry's anthemic hymn, *Jerusalem* (1916).<sup>2</sup>

Despite its historical and legendary importance, Glastonbury Abbey has been 'ill served' by the disciplines of history and archaeology.<sup>3</sup> Thirty-six seasons of archaeological excavation took place at the abbey in the

years 1904–79. The site was purchased in 1907 on behalf of the Church of England and excavations were carried out from 1908 under the auspices of the Somerset Archaeological and Natural History Society (SANHS); the Society of Antiquaries became involved from 1926. There were eight different directors, including some of the great figures in the history of medieval archaeology: Sir William St John Hope, Sir Charles Peers, Sir Alfred Clapham and Dr Courtenay Arthur Raleigh Radford (fig 1.1). However, the excavations were never reported in full: instead, interim statements were published as annual reports or summaries. The limited, often biased, nature of the published material has been a major stumbling block to scholarly assessment of the significance of the excavations. This volume critically reassesses the excavation archive and archaeological collections of Glastonbury Abbey and appraises their value for understanding the abbey’s place in the story of English monasticism. Essential work remains to be done on the documentary and architectural sources for the medieval abbey but this is beyond the scope of the current project.

The Anglo-Saxon history of the abbey and its estates has been fully reassessed on the basis of charter material

and evidence from Domesday Book.<sup>4</sup> In contrast, there is no comprehensive study of historical sources relating to the medieval monastery. However, the *Chronicle* of John of Glastonbury has been translated and there are several popular and synthetic volumes.<sup>5</sup> The abbey’s Arthurian connections have received far greater attention than its history and archaeology.<sup>6</sup> The relative paucity of historical scholarship on Glastonbury is perhaps explained by the ‘obvious signs of contamination’ borne by the sources.<sup>7</sup> In 1927, Armitage Robinson published the first critical study of the abbey’s legends, demonstrating how forgeries and copies of lost texts had been added subsequently to William of Malmesbury’s original work.<sup>8</sup> The abbey’s historical record was highly interpolated, growing more fantastic as successive generations pushed the origins story further back in time, until it was connected directly with the life of Christ. This was not necessarily deliberate misrepresentation: medieval people perhaps did not distinguish between legend and history in the manner of a modern historian – the story of King Arthur is a prime example of such historical myth construction.<sup>9</sup> It is perhaps more surprising that the abbey’s archaeological record is highly



**Fig 1.1** Antiquarian excavators at Glastonbury Abbey 1904–79; portraits of St John Hope, Peers, Clapham and Horne reproduced with permission of the Society of Antiquaries of London



interpolated so that, even at the end of the twentieth century, it is almost impossible to distinguish archaeological ‘facts’ about Glastonbury Abbey from fictions informed by legend and historical narrative. The current study takes a critical approach to the excavation archives of Glastonbury Abbey in an effort to disentangle the primary evidence from antiquarian embellishment.

## 1.2 The Glastonbury Abbey Archaeological Archive Project

### Previous work

In 1977, Mick Aston and Roger Leech recognised the urgent need for full publication of the excavation archive of Glastonbury Abbey. They produced the first map of Radford’s trenches from the information then available. Radford’s excavations had ceased in 1964, but his first attempt to analyse the results was not published until 1981. His interim report synthesised material excavated from 1908 to 1964 and focused on the early phases of the abbey pre-dating the great fire of 1184. Radford presented the results of the excavations in terms of an early ‘Celtic’ monastery, although he cited no archaeological evidence for a religious community earlier than the eighth century Anglo-Saxon foundation. He proposed that Glastonbury was one component of the monastic ‘city’ of the ‘Island of Avalon’ and that it was likely to be later than the monastic foundations at nearby Glastonbury Tor and Beckery, where excavations had recently located evidence dating as early as the sixth century. Excavations at the Tor yielded fourteen sherds of imported Mediterranean pottery dating to the fifth or sixth centuries; the primary grave at Beckery produced a radiocarbon date ranging broadly from the sixth to the tenth century.<sup>10</sup>

Radford’s 1981 interim report presented evidence for:

- a *vallum monasterii* (the monastic boundary ditch);
- a series of early churches;
- a monastic cemetery, comprising early cist burials, two *hypogea*, numerous timber shrines and the proposed grave of King Arthur;
- timber buildings evidenced by post-holes, including a ‘wattle’ oratory beneath the medieval cloister; and
- a pre-Conquest cloister and glass furnaces.<sup>11</sup>

Radford relied fundamentally on historical sources to

interpret and date excavated features: he made no effort to use archaeological evidence as an independent framework. He used the descriptions of buildings in two key sources as his starting point: the *Life of St Dunstan*, dated c 995; and William of Malmesbury’s history of Glastonbury of c 1129–30 (see Chapter 3).

Both the Late Saxon cloister and the glass furnaces were believed to be associated with Abbot Dunstan’s documented rebuilding of Glastonbury in the mid-tenth century. The abbot-saint is heralded as a celebrated craftsman and technological innovator as well as one of the main leaders of the English monastic reform.<sup>12</sup> This interpretation has been widely disseminated, and Glastonbury Abbey is generally attributed with the first formal cloister to have been built in England.<sup>13</sup> Although the detailed evidence for these features was not published, Glastonbury nevertheless became a ‘type’ site against which early monasteries were appraised.<sup>14</sup> The excavations at Glastonbury Abbey were tremendously important to the emerging discipline of medieval archaeology. Until the 1970s, relatively little was known of the plan and layout of Anglo-Saxon monasteries: only Glastonbury and Whitby (N Yorks) had been subject to large-scale excavation and both sites had been interpreted through the lens of Radford’s model of Celtic monasticism.<sup>15</sup>

The excavated evidence from Glastonbury was also summarised by Philip Rahtz (1921–2011) in a publication in 1993 and a revised edition written with Lorna Watts and published in 2003.<sup>16</sup> Rahtz placed the evidence of Glastonbury Abbey within the broader landscape and settlement context of the region, including the prehistoric and Roman background. As the excavator of Chalice Well, Glastonbury Tor, Beckery, Cheddar Palace and the Cannington cemetery, his archaeological knowledge of the area was unparalleled.<sup>17</sup> He was highly critical of Radford’s field methods and his attempts to link archaeology with historical or legendary figures such as Arthur, describing this approach as ‘historically misleading ... and trivial’.<sup>18</sup> Rahtz and Watts placed the historic excavations at the abbey in a coherent spatial framework and considered them in their settlement context. However, they did not examine the primary excavation records or the finds and they were therefore unable to evaluate the validity of Radford’s findings. Their discussion of the abbey’s archaeology focused exclusively on the early development of the abbey up to the twelfth century. Until the current volume, the archaeological evidence for Glastonbury Abbey in the Middle Ages has remained completely unpublished.

## 1.3 Aims and scope of the project

Failure to publish the excavations at Glastonbury was a cause of growing embarrassment to the abbey's trustees from the 1960s onwards; however, the archive was held by Raleigh Radford until his death in 1998. He was working on draft chapters for a book on Glastonbury well into his nineties but the manuscript remained incomplete at the time of his death, at the age of ninety-eight.<sup>19</sup> Upon examination, the draft manuscript does not present a critical analysis of the excavations. Instead, it is a highly interpretative, historical narrative that was structured according to his preconceived ideas about the site. It presents the historical and legendary accounts of the early Celtic monastery as purely factual and uses evidence from the excavations to describe the rebuilding of the later medieval abbey by successive abbots.<sup>20</sup> His archaeological papers were deposited at the English Heritage Archive (formerly the National Monuments Record, or NMR), in Swindon, in 1999; in the same year, the trustees commissioned an appraisal of Radford's archive to determine its scope.<sup>21</sup>

The research project on the excavation archive began to take shape in 2006, when the Trustees of Glastonbury Abbey approached Roberta Gilchrist requesting assistance. A partnership was established between Glastonbury Abbey and the University of Reading. In 2007–8, a pilot project funded by the British Academy was undertaken by Gilchrist and Green to assess the archive and to develop a methodology for its analysis (see Chapter 2).<sup>22</sup> Funding for the full project was granted by the Arts and Humanities Research Council (AHRC; 2009–13) with the Glastonbury Abbey Trustees as full project partners. Additional funding and support has been provided by the Witherill Foundation, the Society of Antiquaries, the Society for Medieval Archaeology and the Somerset Archaeological and Natural History Society.

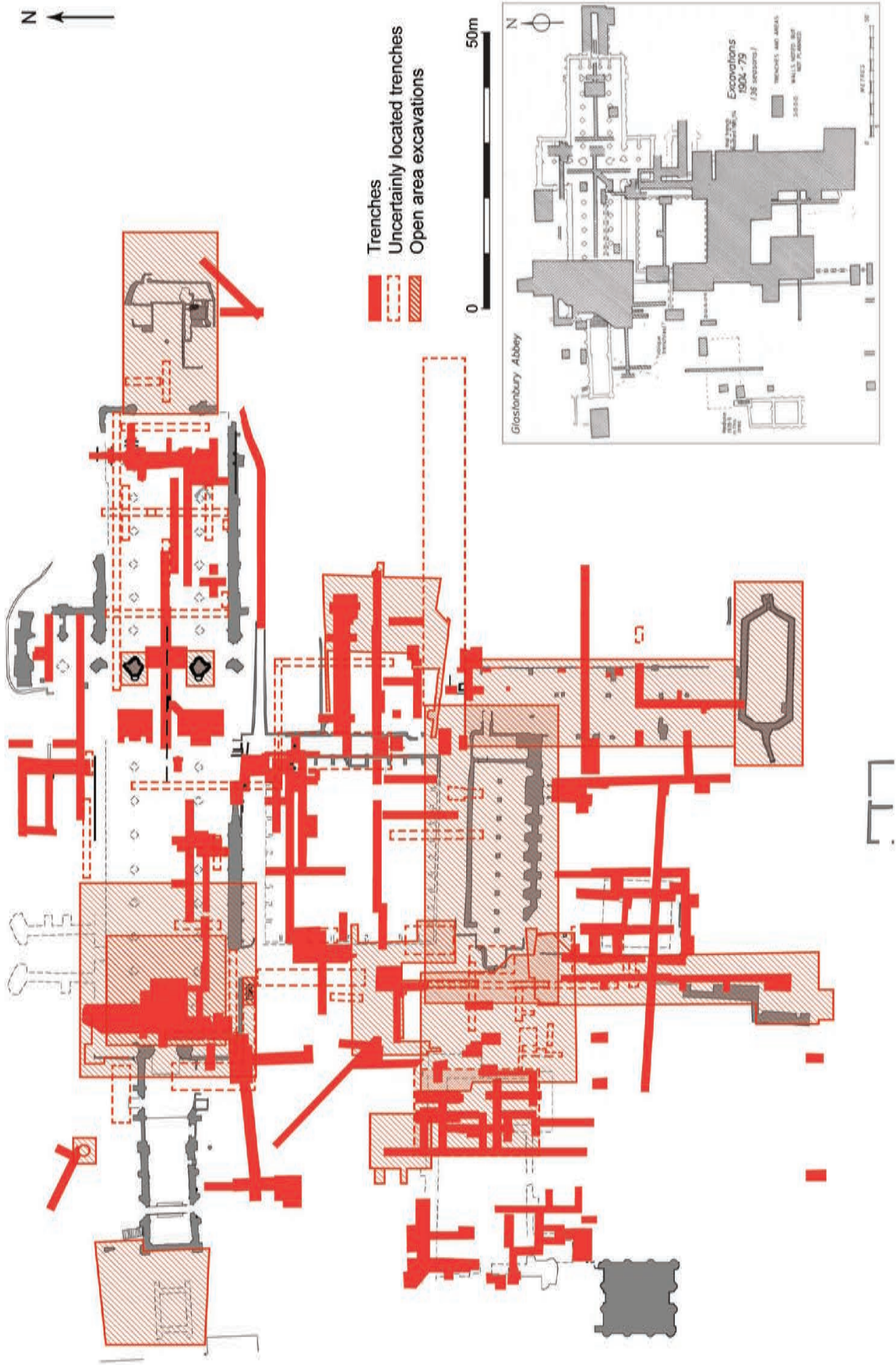
The aims of the project were to reassess and interpret all known archaeological records from the 1908–79 excavations and to provide a complete dataset for addressing the key research questions for Glastonbury Abbey. The project has also generated an integrated body of evidence for future research; this is publicly accessible through a digital archive hosted with the Archaeology Data Service.<sup>23</sup> A prerequisite for interpreting the results of the antiquarian excavations was the mapping of these investigations as far as was possible. This was attempted

in 1977 by Aston and Leech, with a simplified version published in 2003 by Rahtz and Watts. However, assessment of the primary records in the excavation archive has revealed that the trench plan is far more complex than previously understood (fig 1.2). Radford excavated approximately 103 trenches and several test-pits across the core of the monastery, taking in the church, the cloister and the claustral ranges, the cemetery and the abbot's hall. A comprehensive geophysical survey was conducted by GSB Prospection Ltd to provide crucial ground truth for the trenches and features, to establish a broader spatial context for the archaeological remains and to begin to assess the surviving deposits (see Chapter 2).

An integral element of the project was the full analysis of the archaeological collections of Glastonbury Abbey: thirty-one leading specialists have conducted the first comprehensive analysis of the artefactual material recovered from the excavations. Abbreviated reports are published in this monograph (see Chapters 7 to 9), and extended reports, method statements and full catalogues are available online.<sup>24</sup> Substantial assemblages were recovered of worked stone, window glass, vessel glass, pottery, ceramic tiles and small finds; minor assemblages were retained of animal bones, wood and charcoal, painted plaster, lead, clay pipes, metal residues and lithics. For the first time, it has been possible to achieve a framework of independent dating based on reassessment of the finds and radiocarbon dating of surviving organic material from the 1950s excavations. Full study of the excavated material has demonstrated that substantial bias has resulted from the policy of selective retention that was practised by successive excavators. Every class of material in the collection is biased towards decorative and high-status artefacts over plain and utilitarian objects associated with everyday life.

The primary aim of the project was to appraise the significance of the archive for understanding the archaeology of the Saxon and medieval monastery. In addition, a number of key research questions were identified:

- Is there evidence for occupation pre-dating the Anglo-Saxon monastery?
- What is the form and date of the early 'family' of churches?
- Does the archaeological evidence support the existence of the earliest monastic cloister in Britain?
- Can continuous occupation be demonstrated between the seventh century and the tenth century, throughout the turbulent Viking period?



**Fig 1.2** Plan showing excavations 1904–79 with inset showing previously known trench locations from Rahtz and Watts 2003, fig 41, after Aston and Leech 1977; reproduced with permission of L. Watts and M Aston (scale 1:1,000)

- What was the scale and extent of the early craft-working centre?
- What is the evidence for zoning and land-use in the early monastery and its subsequent development in the medieval abbey precinct?
- Did the emphasis placed on myth and cult activities create a distinctive layout in the medieval church and cloister?
- What is the evidence for cemeteries, shrines and tombs?
- How does the archaeology enhance our understanding of the construction, form, development and style of the medieval abbey buildings?
- How did the wealth of the abbey enable architectural or industrial innovation? Can local or national workshops of production be recognised? Can chronological fluctuations be detected that may correspond with periods of prosperity, rebuilding and the promotion of relics?
- Can the systems of water management be mapped?
- How does the archaeology further our understanding of the Dissolution process and the post-medieval use of the precinct?

Throughout the project, our analyses of the archive and collections have been informed by these research questions. We have been limited to some extent by the selective retention of material and by the antiquarian methods of excavation, particularly Radford's preference for long but narrow excavation trenches (1.2m wide) (see Chapter 2). Radford's archive was in a state of disarray when we began the pilot project in 2007; there were questions about the completeness of the archive and uncertainties about the standard of the fieldwork on which it was based. However, the quality of the archive has actually surpassed our expectations, and we were fortunate to find organic material from sealed deposits that could be used for radiocarbon dating. The archive is predominantly complete, but the records and finds were disconnected; the sections, plans, notes, photographs, sketches and finds had never been drawn together by the excavator and this required time-consuming and painstaking reconstruction.

We have nevertheless succeeded in addressing all the questions posed at the outset of the project, with one partial exception: land-use in the Saxon and medieval precinct. The antiquarian excavations focused exclusively on the central core of the monastery and the archive contained little new evidence on the archaeology of the precinct. Monastic archaeology only began to target landscape and economic questions in the 1970s, and earlier excavations, such as those at Glastonbury,

neglected the outer court areas of monastic precincts.<sup>25</sup> However, it has been possible to draw on historical sources and more recent archaeological surveys to provide an assessment of zoning and access within the precinct (see Chapter 3).

The current study is limited to the archive of antiquarian excavations up to 1979 but takes account of more recent excavations and watching briefs undertaken in advance of redevelopment in the town and precinct.<sup>26</sup> Discussion of the excavated evidence for the medieval church has also benefited from recent programmes of fabric recording on the Lady Chapel, the Great Church and St Patrick's Chapel. The abbey trustees have made all recent reports of archaeological recording in the precinct publicly available through the Archaeology Data Service.<sup>27</sup> At the time of writing, current archaeological recording in advance of conservation is revealing important new evidence for the form and chronology of the abbey's standing buildings. This volume draws on the provisional state of knowledge up to 2014.

Critical study of the archive of antiquarian excavations provides new evidence for the scale and significance of the medieval monastery, particularly the abbot's lodgings complex. Evidence for the Anglo-Saxon monastery is reappraised within the context of current knowledge of monastic archaeology (see Chapter 11). Among the most important findings are the evidence for occupation on the site dating to the fifth or sixth centuries and the redating of the glass furnaces to the late seventh century (previously believed to be tenth-century). We are sceptical of many of the claims set out in Radford's 1981 interim report: we challenge the existence of an early British cemetery, the pre-Conquest cloister and the reputed exhumation site of the grave of King Arthur. In our concluding remarks, we pose a series of new questions for future research at the site.

Glastonbury Abbey continues to be important today to diverse audiences who value the spiritual, historical and legendary resonances of the place.<sup>28</sup> A complex interplay results between the abbey's archaeological evidence and its intangible cultural heritage: the process of interpreting the abbey's archaeology therefore carries social and ethical responsibilities to living communities. In recognition of the contested nature and contemporary relevance of Glastonbury Abbey's archaeology, a parallel project was established to explore the social impact of interpreting the excavation archive. A collaborative doctoral studentship was funded by the AHRC and supervised jointly by Roberta Gilchrist at the University of Reading and Janet Bell, the Director of Glastonbury Abbey. Rhianedd Smith developed a doctoral project of

'hybrid fieldwork', which employed ethnographic and heritage techniques to consider the significance of the abbey's medieval past to contemporary stakeholders.<sup>29</sup> This research has informed a new interpretation strategy that places the abbey's archaeology within a rigorous academic framework that we hope will speak to a range of different stakeholders.<sup>30</sup> Separate publications are in preparation that will report on this research and explore aspects of the archaeology in relation to the intangible heritage of Glastonbury Abbey.

### **The structure of this volume**

The post-excavation analysis reported in this volume has been limited by the constraints of working with antiquarian records and incomplete collections. Ideally, a more integrated and thematic approach would be taken, comparable to the model developed at the Museum of London for the analysis of materials from monastic excavations.<sup>31</sup> The limitations of an archive project have led us to adopt a more traditional structure in which we analyse chronological development by area, and in which specialist analyses of finds are reported separately from stratigraphic analysis. The significance of the Saxon glass furnaces merits a dedicated chapter.

The remainder of this chapter introduces the successive campaigns of excavation at Glastonbury Abbey and the research agendas of their directors and sponsors (fig 1.3). Archaeological investigations at Glastonbury Abbey are placed within the historiographical context of monastic archaeology. Chapter 2 sets out the methodology for analysing the archive and the parameters of the database and establishes the scope and results of the geophysical survey. Chapter 3 outlines the historical and topographical context for the archaeology of Glastonbury Abbey, including a précis of the legendary associations. The layout of the monastic precinct is outlined and the architectural development of the abbey is briefly described on the basis of historical evidence and standing fabric. Chapters 4 to 6 assess the excavation records by area: the church and cemetery; the cloister; the inner court and the abbot's hall and lodging. The evidence for the Saxon glass furnaces is reassessed in Chapter 7 and the results of the analyses of the finds are set out in Chapter 8. Chapter 9 is devoted to the substantial assemblages of Romanesque and Gothic sculpture and worked stone. Chapter 10 reviews the evidence chronologically, and the concluding chapter takes a more thematic and integrated approach, assessing the findings in relation to the research questions that informed the project.

## **1.4 Glastonbury Abbey and the history of monastic archaeology**

Glastonbury holds a distinctive place in the history of medieval archaeology. Many of the iconic figures of church archaeology in the late nineteenth to mid-twentieth centuries were connected with the abbey. There is a more controversial link through the abbey's first director of excavations: Frederick Bligh Bond employed psychic experiments and dowsing in his archaeological armoury and for this he is regarded as a pioneering figure by the New Age movement.<sup>32</sup> But Glastonbury Abbey is also associated with one of the earliest documented archaeological excavations: in 1191, the monks of the abbey staged a search for the remains of King Arthur (see Chapter 3). The key textbooks on the history of both medieval archaeology and church archaeology commence with this event.<sup>33</sup> The twelfth-century excavations at Glastonbury were motivated by political and financial factors and can hardly be regarded as modern archaeology in pursuit of knowledge of the past. But perhaps they were not so very different from the contemporary quest for the remains of such celebrated individuals as Richard III.<sup>34</sup>

Antiquarian interest in Glastonbury Abbey began in the mid-seventeenth century when the first valuable records were made by Wenceslaus Hollar. In the early eighteenth century, William Stukeley produced an aerial view (ground plan) and two aspects of the ruins (see figs 3.14 and 3.15), a section through the Lady Chapel and measured drawings of the abbot's kitchen.<sup>35</sup> No excavations are recorded at Glastonbury until one hundred years later. In 1825, the site was purchased by John Fry Reeves, who built Abbey House (1829–30) on a platform immediately to the east of the ruined abbey church. The architect was the antiquary and topographical artist John Buckler (1770–1851), who constructed the new dwelling in the Tudor Gothic style to complement the abbey ruins. A parkland setting was designed for the new house and it was sited to permit a view down the length of the ruined church. Reeves commissioned the first excavations in the precinct in 1825: Richard Warner investigated the crypt of the Lady Chapel and recorded significant discoveries. Eighteen oak coffins were recovered from the crypt, containing skeletons with their skulls resting on wood shavings, probably pillows; each was accompanied by a rod of hazel or thorn placed on their right-hand sides.<sup>36</sup> These early

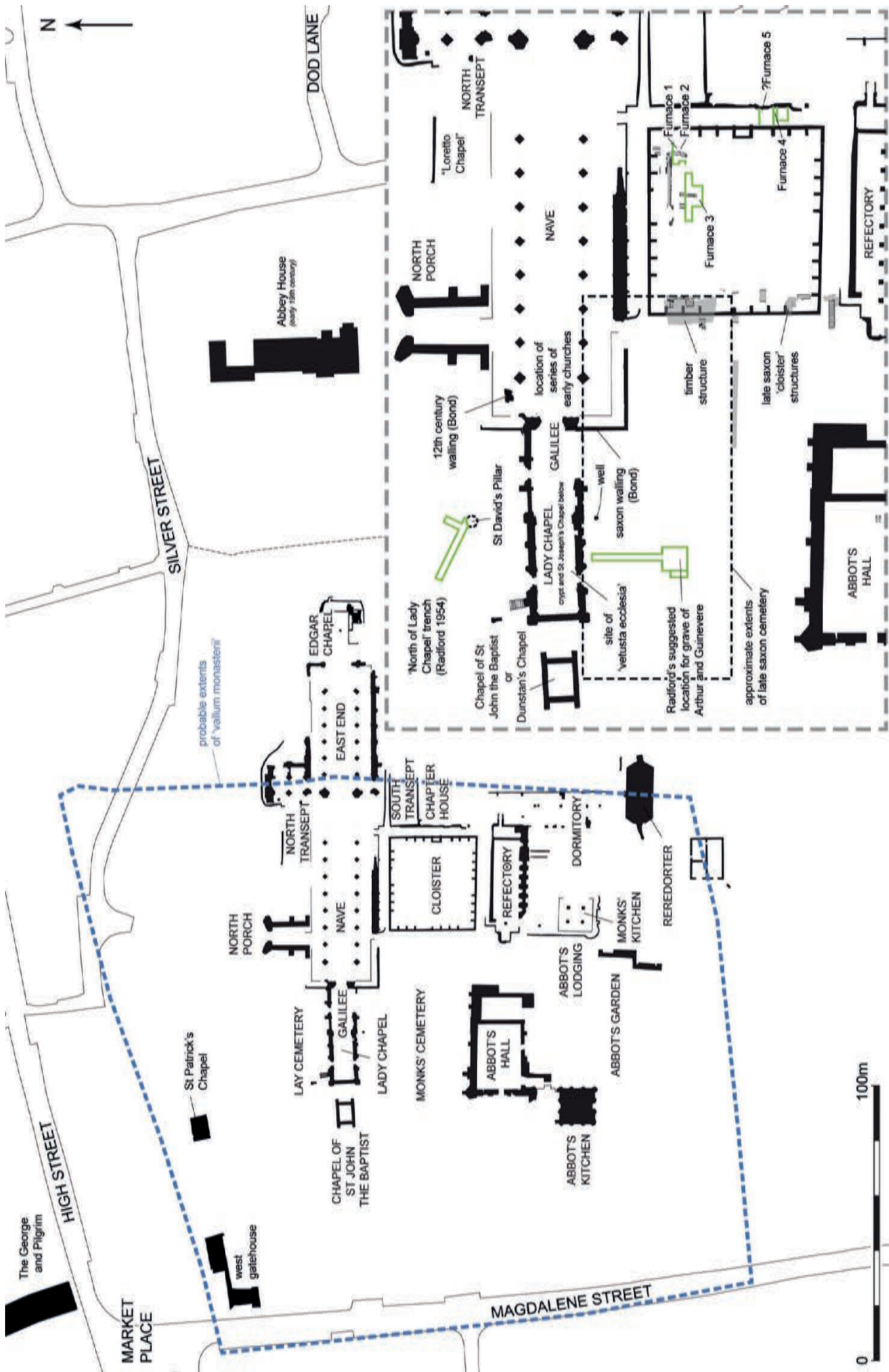


Fig 1.3 Plan of Glastonbury Abbey showing key features discussed in Chapter 1 (scale 1:2,000 and 1:500)

investigations were relatively well recorded but were typical of the antiquarian curiosity that surrounded monastic sites in the first half of the nineteenth century. Recent excavations in the abbot's kitchen (2013) have revealed that extensive excavations took place in the kitchen in the late eighteenth or early nineteenth century.<sup>37</sup> More sustained interest in the archaeology of monasteries developed through the nineteenth century, alongside the interest in Gothic architecture and the revival of medievalism in church worship.<sup>38</sup>

The first modern archaeological investigation at Glastonbury Abbey was undertaken by the Reverend Robert Willis (1800–75), Jacksonian Professor of Natural Philosophy at the University of Cambridge. His architectural history of the Lady Chapel and Great Church was read at the annual meeting of the Royal Archaeological Institute in 1865.<sup>39</sup> Willis is credited with the earliest systematic and analytical recording of cathedrals and major churches. His work integrated stratigraphic and historical evidence and is widely regarded as a landmark of church archaeology and architectural history.<sup>40</sup>

The estate of Glastonbury Abbey was purchased by James Austin in 1862, who agreed to permit excavations by Sir William St John Hope in 1904. Hope (1854–1919) was the pre-eminent monastic archaeologist of his day, but his field method comprised 'wall-chasing': the exposure of wall foundations to trace the ground plans of monastic structures (fig 1.4).<sup>41</sup> This approach destroyed archaeological stratigraphy and was not well suited to multi-period sites with complex histories. His excavations at Glastonbury aimed to uncover the Saxon origins of the abbey; mercifully, they were not sufficiently deep and encountered only robbed remains. The site was inherited by Stanley Austin in 1896, who advertised the precinct for sale in 1906. There was national interest in the sale and speculation that the ruins would be purchased either by the government for the nation or by the Catholic Church.<sup>42</sup> The sum of £30,000 was paid by Ernest Jardine, Conservative parliamentary candidate for East Somerset, acting on behalf of the Bishop of Bath and Wells. The site was subsequently opened to the public, and archaeological excavations were commissioned to inform its conservation and interpretation. Today the abbey is a Scheduled Monument (SAM 1021077) and a visitor attraction; it is run as a charity by a board of trustees with the aim of preserving the fabric of the ruins and grounds for public benefit and education.

During the early twentieth century, the formal programme of excavations focused on clearing the

grounds and retrieving the plan of the medieval buildings. Before 1908, large trees – including an apple orchard – grew in the cloisters and within the walls of the abbey church.<sup>43</sup> As clearance work progressed, the abbey site gradually extended southwards as more buildings were traced. Until Radford's appointment, the excavation directors were professionally trained as architects rather than archaeologists. The excavations undertaken in 1926–9, in conjunction with the Society of Antiquaries, were specifically targeted at the Saxon and Norman churches. The main objective of Radford's excavations of 1951–64 was elucidation of the abbey before the great fire of 1184, while Wedlake's explorations of 1978–9 focused on completing the plan of the abbot's hall and exploring adjacent areas.

## Excavation campaigns

### 1908–22: Frederick Bligh Bond

An excavation committee was formed comprising representatives of the abbey trustees and the Somerset Archaeological and Natural History Society (SANHS). Frederick Bligh Bond (1864–1945) was appointed as the first director of the formal archaeological programme, publishing his results in ten detailed reports in the SANHS *Proceedings* (1908–26). Bond was architect to the Diocese of Bath and Wells and was intensely interested in the legendary history of Glastonbury. The primary objective of the excavations was stated to be a systematic examination of the site and precincts (fig 1.5),<sup>44</sup> with workmen operating on a year-round basis and Bond visiting the site periodically. Radford praised Bond's early work at the abbey for its careful observation of architectural detail and stratigraphy below the medieval floor levels, although the published reports do not provide a comprehensive account of this work.<sup>45</sup> In particular, his detailed, stone-by-stone plan of St Dunstan's Chapel (also known as the chapel of St John the Baptist) has been recognised for being considerably ahead of its time in the quality of its archaeological recording (see Chapter 2).<sup>46</sup>

The credibility of Bond's work at Glastonbury came into question, however, once he revealed his commitment to spiritualism – the belief that the spirits of the dead can communicate with the living. In a book published in 1918 – *The Gates of Remembrance: the story of the psychological experiment which resulted in the discovery of the Edgar Chapel at Glastonbury* – he revealed that his excavations at the abbey had been an extended experiment in psychical research.<sup>47</sup> Bond's biographer states that he was not strictly speaking a

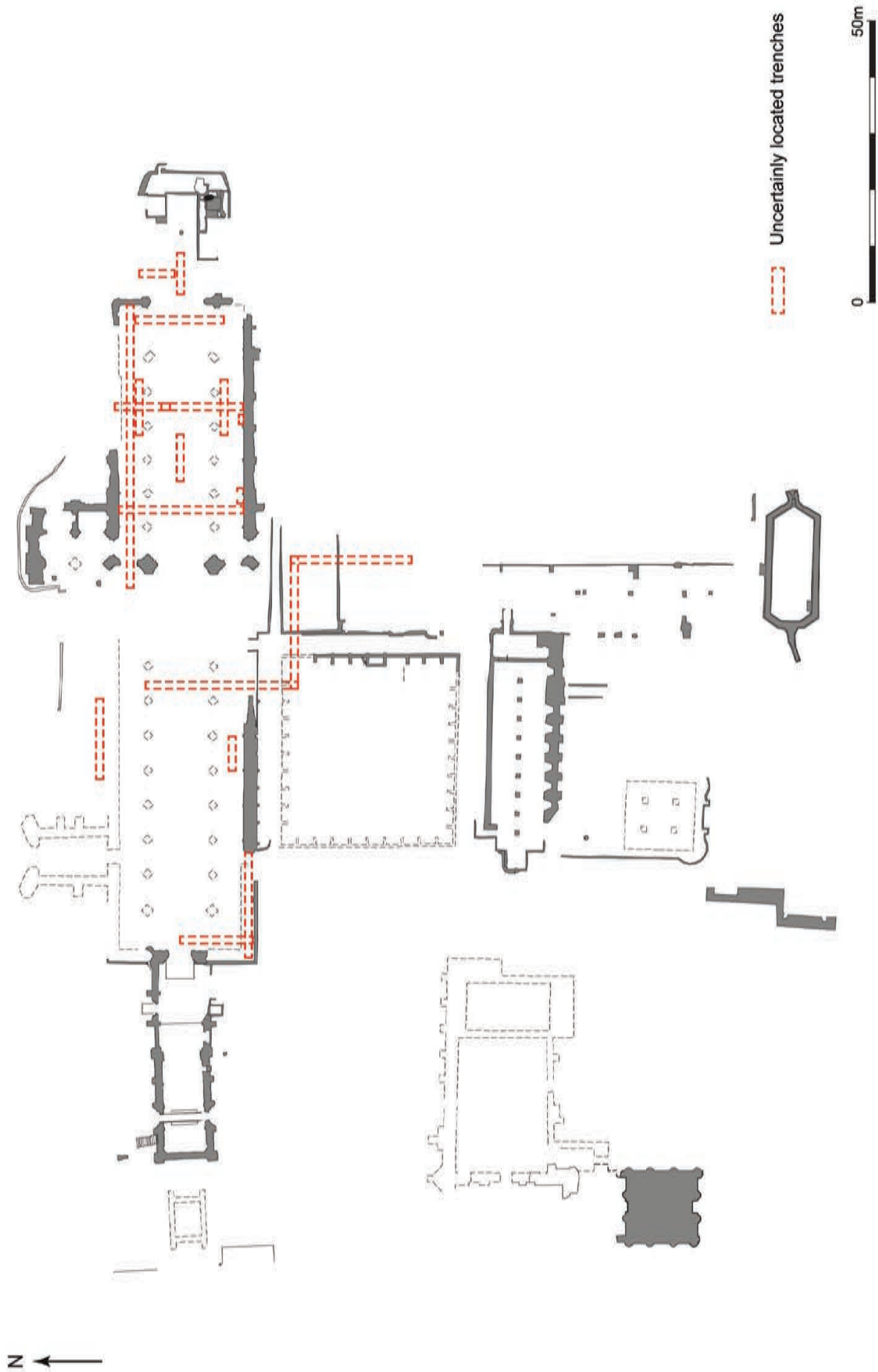


Fig 1.4 Excavation trenches by St John Hope, 1904 (scale 1:1,000)



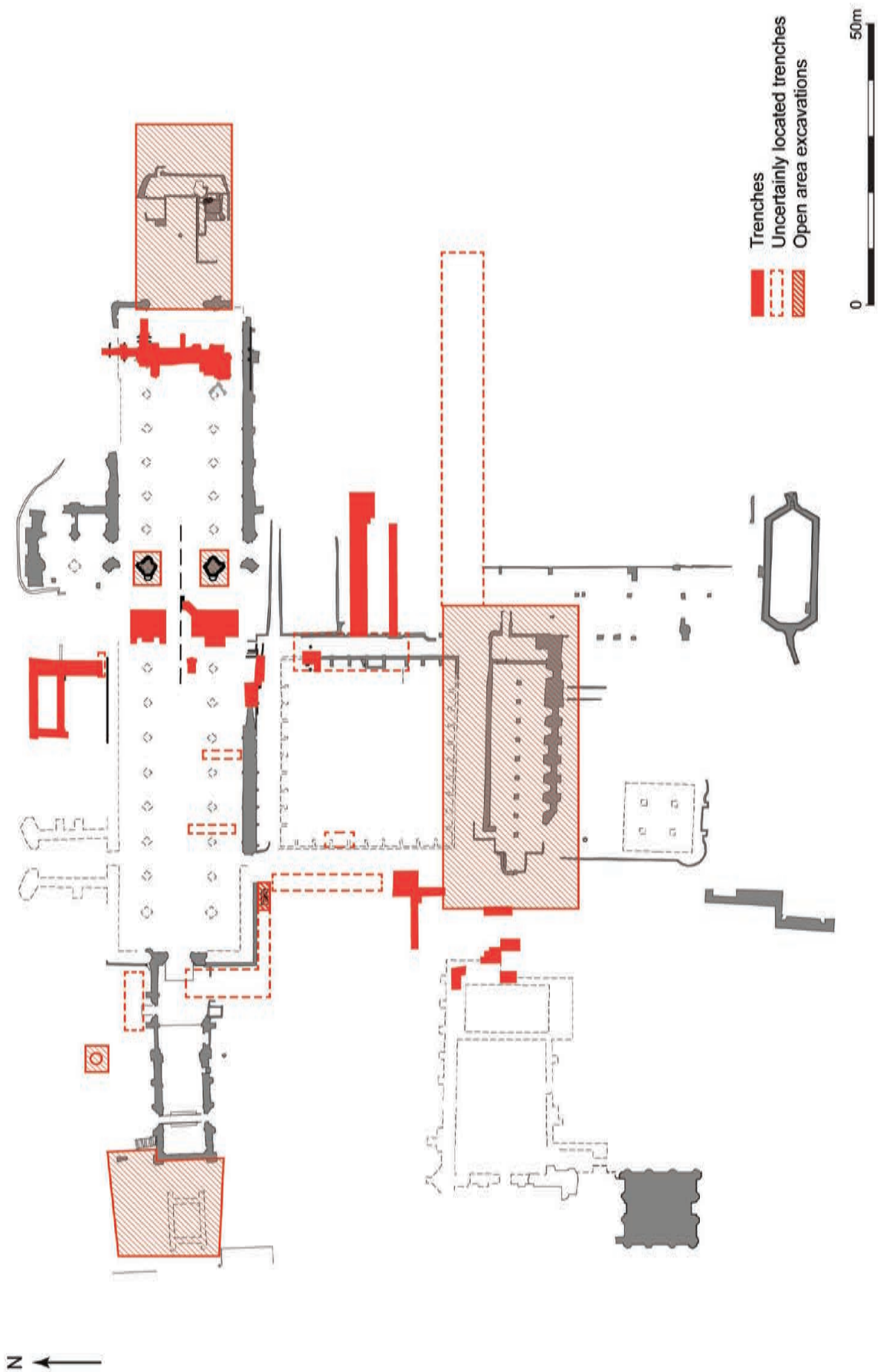


Fig 1.5 Excavation trenches by Bond, 1908–22 (scale 1:1,000)

spiritualist: Bond did not allege to be in direct contact with the dead – rather that he was able to detect traces of their memories. His theory of ‘great memoria’ proposed that ancient memories from the unconscious could be channelled through the medium of automatic writing.<sup>48</sup> He also advanced the theory of geomatria (holy numbers) and argued that the whole complex of abbey buildings was planned within a regular grid of squares, each with a side of seventy-four feet, the magic unit of the sun.<sup>49</sup> Glastonbury was the focus of Bond’s psychical research from 1907, one year before his appointment as director of excavations. Indeed, it was Bond who approached SANHS with the proposal to excavate at Glastonbury Abbey, and he indicated that he would cover his own expenses if they obtained permission to dig.<sup>50</sup>

It is clear that Bond’s psychic experiments biased his interpretations and on some occasions led to breaches in professional ethics. This is most apparent in relation to his interest in two chapels: a ‘lost chapel’ to the east of the Edgar Chapel, the eastern termination of the church; and the Loretto Chapel, which Bond claimed to have located near the north transept. Automatic writing suggested to Bond that the Edgar Chapel terminated in an apse; this feature was not confirmed by his excavations but Bond nevertheless showed an apsed chapel on his published plans of the chapel and he reconstructed the feature in the layout of the ruins on site. The Edgar Chapel became a national controversy and a great point of contention between Bond and William Caroe, the conservation architect for Glastonbury Abbey. Caroe accused Bond of fabricating evidence and eventually removed Bond’s apsidal reconstruction from the abbey ruins.

Bond’s personal belief system also led him to withhold and misappropriate archaeological evidence. When he discovered a jumbled collection of bones behind the site of the high altar, he believed that he had been informed through automatic writing that these were the remains of Abbot Whiting (d 1539), the last abbot of Glastonbury and martyr to the Dissolution. Bond chose to omit these archaeological finds from his published reports and to withhold the bones from the abbey’s archaeological collection.<sup>51</sup> The excavation committee was increasingly concerned by Bond’s actions and in 1921 appointed a co-director to work with him. They selected Sebastian Evans, nephew of Sir Arthur Evans and overseer of the excavations at St Augustine’s, Canterbury.<sup>52</sup> Bond was finally dismissed as excavation director and, in 1922, SANHS voted to discontinue their funding of excavations at the abbey.<sup>53</sup>

## 1926–8: Theodore Fyfe

Excavations resumed in 1926 with representatives from the Society of Antiquaries joining the excavation committee. The new director, Theodore Fyfe (1875–1945), had been architectural adviser to Sir Arthur Evans’s excavations at the Minoan palace at Knossos; thus two consecutive directors of excavations at Glastonbury shared direct connections with the celebrated excavator of Knossos.

Fyfe explored the Saxon and Norman churches beneath the western end of the thirteenth-century nave (fig 1.6). The initial objective was to trace the plan of Abbot Herlewin’s church and to identify the thirteenth-century nave piers. The siting of Fyfe’s excavation trenches was based on Bond’s discovery of twelfth-century walling inside the west end of the medieval nave. It was anticipated that the twelfth-century church would be ‘very fine’ on the basis of the quality of the twelfth-century blue lias carvings discovered by Bond.<sup>54</sup> Fyfe published two accounts of his work in the SANHS *Proceedings* for 1926–7. When the importance of the findings at Glastonbury was recognised, Fyfe was replaced by a team of eminent ecclesiologists.

## 1928–39: Sir Charles Peers, Sir Alfred Clapham and Dom Ethelbert Horne

From 1928, excavations were continued under the joint directorship of Sir Charles Peers (1868–1952), Sir Alfred Clapham (1883–1950) and Dom Ethelbert Horne (1858–1952), with William Wedlake appointed as sub-director overseeing five labourers. The yearly reports consisted of nine short summaries or statements in the SANHS *Proceedings* for the years 1928–38 (fig 1.7). Peers was an architect and held the position of Chief Inspector of Ancient Monuments; Clapham was an architectural historian and Commissioner of the Royal Commission on Historical Monuments. They accepted the appointment on condition that they would only visit the excavations at Glastonbury twice during every season. Horne was Prior of Downside Abbey (1929–33) and a local antiquary; he later became titular Abbot of Glastonbury and titular Cathedral Prior of Norwich.<sup>55</sup> Horne was able to visit once a week from Downside Abbey but had no direct experience of archaeological excavation.

Fyfe’s excavations of the Saxon and Norman churches were extended eastwards; work on the pre-Conquest church was concluded and a paper read to the Society of Antiquaries on 17 October 1929. Armitage Robinson put forward a criticism of some of the historical sources used

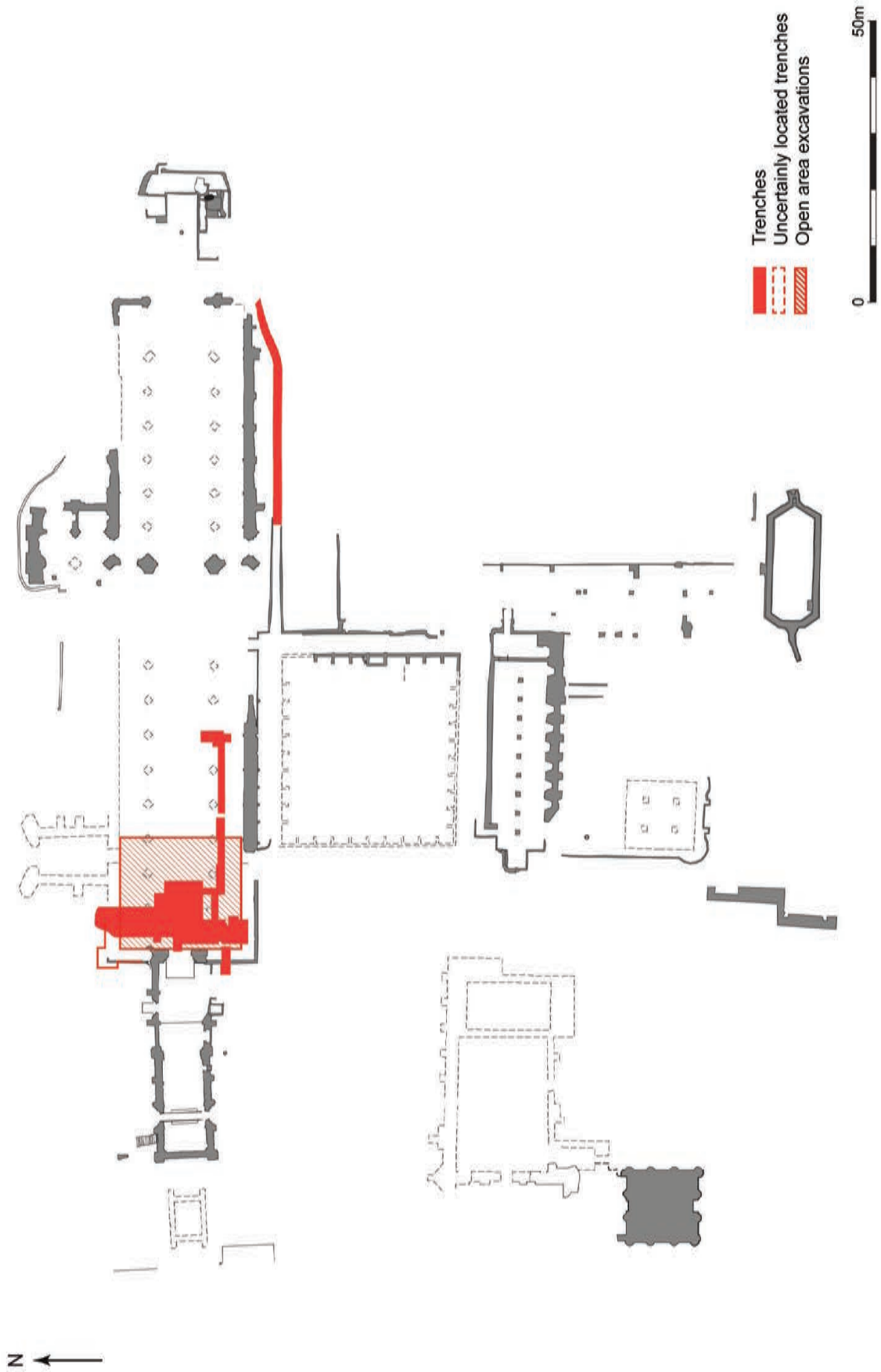


Fig 1.6 Excavation trenches by Fyfe, 1926-7 (scale 1:1,000)

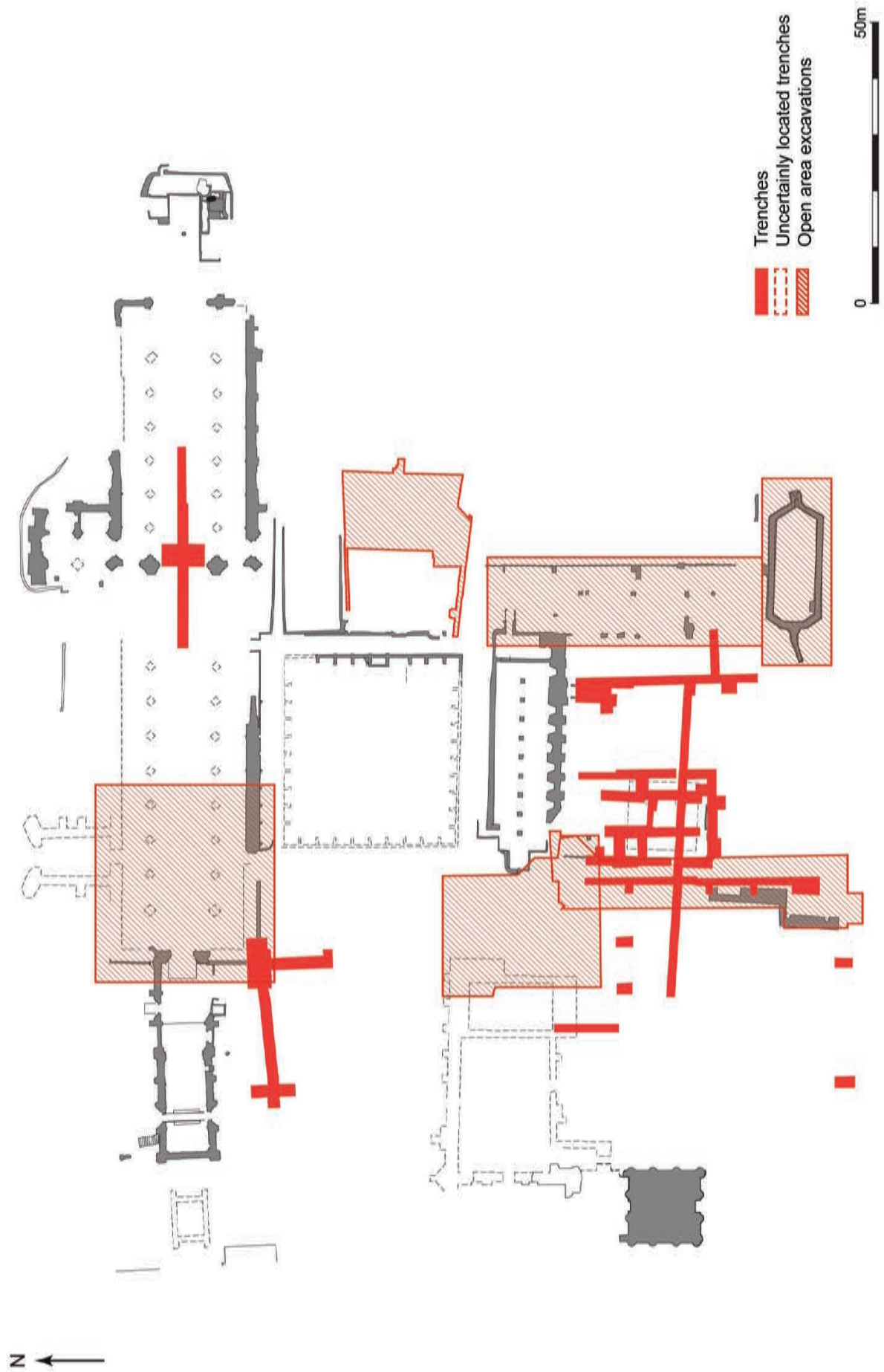


Fig 1.7 Excavation trenches by Peers, Clapham and Horne, 1928-39 (scale 1:1,000)

to interpret the archaeology and this was published alongside the archaeological report. Between 1930 and 1939, the excavations were mostly devoted to the clearance and planning of the medieval east range and the area west of the refectory.<sup>56</sup> Primarily this involved the removal of a mass of building debris and material dumped from the town and involved very little disturbance of the underlying deposits.<sup>57</sup> In 1930 an attempt was made to locate a cloister for the Saxon church,<sup>58</sup> an objective later pursued by Radford.

### 1951–64: Dr Courtenay Arthur Raleigh Radford

The Excavation Committee reconvened in 1950 and Raleigh Radford was appointed director of excavations. Radford had long-standing connections with Glastonbury: his first employment in archaeology was working under Sir Charles Peers, director of excavations at Glastonbury (1928–38), who was a close friend of Radford's father. His father also knew Bond and he had taken Radford to visit the excavations at Glastonbury when he was a boy.<sup>59</sup> Raleigh Radford had strong West Country associations and an established reputation in monastic archaeology. By the time of his appointment at Glastonbury, Radford was one of the most respected archaeologists in Britain: he dominated the development and study of church archaeology, although his interpretations are approached with scepticism today.<sup>60</sup>

Radford conducted ten seasons of excavations (fig 1.8): six short summaries were published in the *Somerset and Dorset Notes and Queries* and a longer interim report in the conference proceedings of the British Archaeological Association in 1981.<sup>61</sup> His campaign was principally aimed at the examination of the earlier periods through targeted trenching. In particular, he hoped to recover the plan of the twelfth-century church and buildings.<sup>62</sup> In the first two seasons Radford dealt with a large area between the abbot's hall and the refectory; this had been left exposed since 1939 and had not been recorded in detail, because of the outbreak of the Second World War.<sup>63</sup> The plan inherited from 1938 made little attempt to distinguish between phases, but Radford was convinced that the walls discovered by Bond in the south-western corner of the cloister related to 'Dunstan's range'. It was anticipated that further evidence of a Late Saxon cloister would be discovered during the 1951 and 1952 campaigns;<sup>64</sup> additional trenches were therefore opened across the eastern side of the cemetery and across the west cloister walk in 1954.

The excavations in 1955–6 aimed to find further evidence for the pre-1184 Norman churches. In 1955,

Radford opened trenches in the south choir aisle and found evidence for the twelfth-century east end. It was anticipated that the apsidal chapel of the twelfth-century church would be found in the north transept, and targeted trenches were excavated in 1956.<sup>65</sup> In the same year, a trench was excavated to the west of the north transept to test the validity of Bond's discovery of the Loretto Chapel. The Saxon monastic bank and ditch (*vallum monasterii*) was discovered in the north transept and a further section was investigated across the chapter house in 1957.

The impact of the deep and extensive nave excavations of 1926–9 meant that Radford's work in this area was very limited. As the plan of the Saxon church was thought to have been predominantly exposed in the 1920s, Radford focused on further exploration of the Norman churches, opening trenches in 1955, 1959 and 1962, to the south and east of the 1920s explorations. Extensions to the 1959 trench were designed to test points of detail concerning the plans of the churches built by the Norman abbots, Turstin and Herlewin.<sup>66</sup> Trenches across the claustral ranges, dug between 1955 and 1959, were intended to discover something of the Norman layout. In 1955 this resulted in the crucial discovery of the first Saxon glass furnace in the cloister garth; further trenches in 1956 and 1957 revealed additional furnaces.

In 1954 and 1962 the cemetery was examined: Radford sought evidence for Dunstan's alterations (c 940–57), as recorded by William of Malmesbury, and investigated a possible location for the legendary exhumation of Arthur and Guinevere. The 1963 excavations aimed to explore what Radford believed to be the exhumation site to discover more about the shape of the flanking pyramids and to look for fragments of a tombstone marking Arthur's grave.<sup>67</sup> The report of his 1962 excavations states that there was a 'high probability' that he had located the site of the grave from which 'Arthur' was exhumed in 1191.<sup>68</sup> By 1975, he was much more confident in his interpretation:

There is no reason to doubt the actual report of a twelfth-century exhumation. Excavation has shown that between the presumed site of the two standing crosses, a large irregular hole had been dug out and then shortly afterward refilled in the 1180s or '90s. The evidence for this precise dating is found in the occurrence in the hole of masons' chippings of Doulling stone, which was then first used at Glastonbury in rebuilding the Lady Chapel in 1184–9. The bottom of the hole had disturbed two (or possibly three) of the slab-lined graves belonging to the earliest phase of the Celtic cemetery.<sup>69</sup>

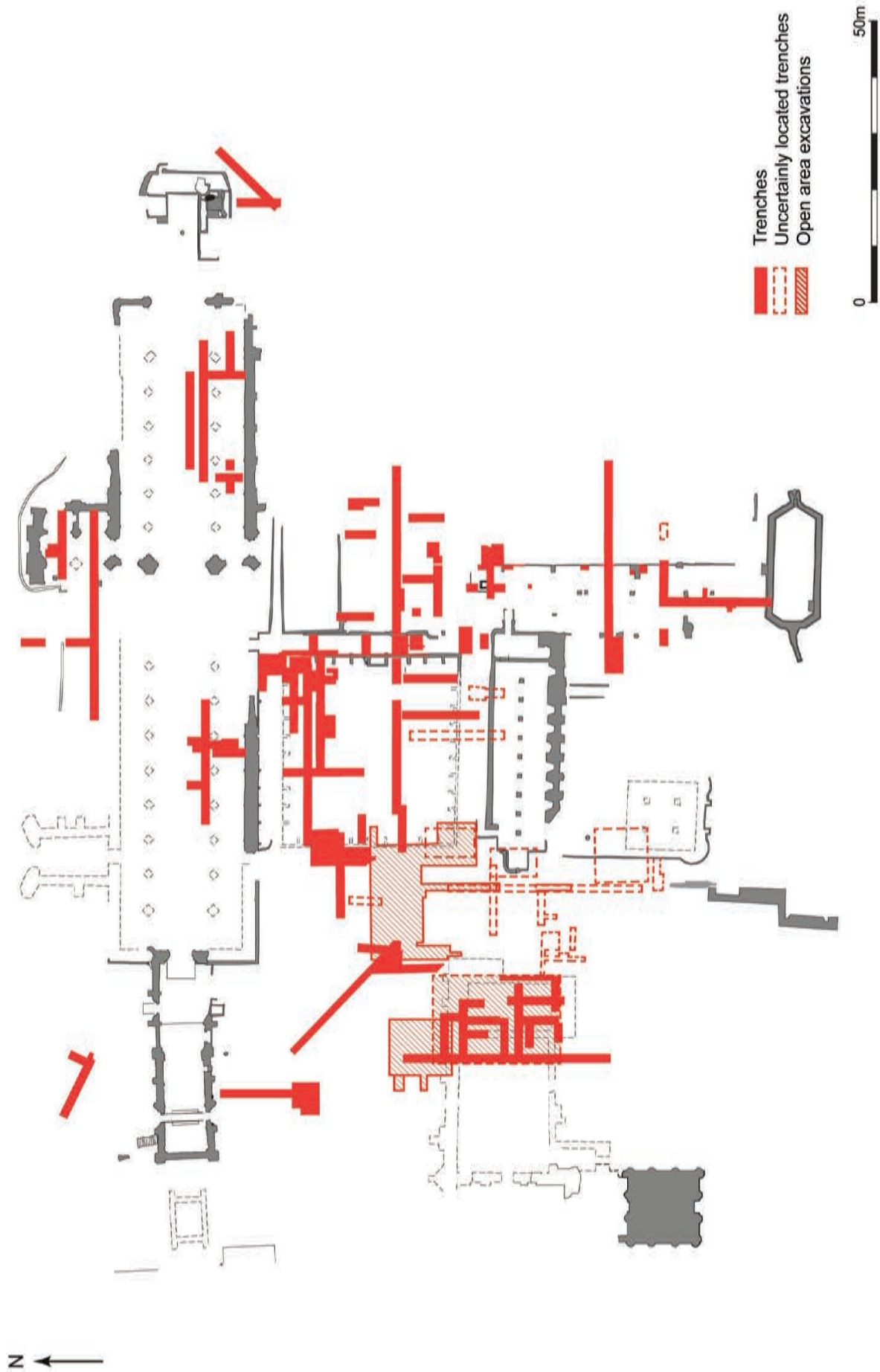


Fig 1.8 Excavation trenches by Radford, 1951-64 (scale 1:1,000)

In his interim report of 1981, this feature was described without reservation as ‘the graves identified in 1191 as those of King Arthur and Queen Guinevere.’<sup>70</sup>

In 1962–4 work was extended across the medieval abbot’s hall to search for evidence of any claustral buildings associated with Dunstan’s monastery and to clarify details of the abbot’s hall plan.<sup>71</sup> Although the intention was to complete the work in 1963, poor weather and unexpected discoveries meant a further season was necessary.<sup>72</sup> By the end of 1964, Radford concluded that sufficient work had been undertaken to outline the sequence of monastic layout from the earliest period before the Saxon conquest of Somerset in the late seventh century up to the late twelfth century.

### 1928–39 and 1978–9: William J Wedlake

Bill Wedlake (1904–89) assisted with the excavations at Glastonbury from 1928 to 1939 though, as was common at the time, he had no formal training in archaeology. During this period, he investigated some areas of major archaeological significance for which few records remain (fig 1.9); for example, he trenched around the walls of the abbot’s kitchen and dug some deeper holes within the interior. He produced an account of various works conducted in 1929–34, which were outside official excavation periods and never plotted. These included the excavation of a large cutting along the north Galilee wall, which produced very finely carved heads in white lias (1929); the foundations of a building projecting to the south from the south side of the choir, perhaps a vestry (1929); the foundations of two parallel walls running north–south to the east of the east wall of the Chapter House (1930); a foundation running north–south outside the west wall of the Lady Chapel (1930–1); and foundations to the east of the east range, including a fireplace (1933–4).<sup>73</sup> It is likely that other excavations took place for which we have no surviving records.

Wedlake later gained invaluable experience as the foreman for Sir Mortimer Wheeler’s excavations at Maiden Castle and he directed his own excavations in Somerset during the 1950s.<sup>74</sup> His interest in Glastonbury Abbey was rekindled following his retirement from the Admiralty in 1972: he directed two short seasons of excavations across the abbot’s hall and adjacent areas in 1978–9. This work was never published and much of Wedlake’s primary archive has been lost, but he wrote an unpublished account that also provides some useful insight into his earlier excavations.<sup>75</sup> The work in the 1970s was conducted at the request of the Department of the Environment with the aim of removing post-medieval

levels to recover the plan of the buildings. The excavation photographs and sections demonstrate that in fact the trenches were carried far below this depth, and went well into medieval deposits.

## 1.4 Private sponsors

While the campaigns were guided by the excavation committee, external sponsors sometimes influenced the research agenda. Bond’s 1908 report explained that the abbey trustees were required to direct all available funds towards the extensive repair programme to the ruins; his excavations were therefore largely funded by voluntary contributions made by a few of Bond’s friends.<sup>76</sup> It is unknown to what extent these friends may have influenced the siting of the excavations but there are indications that personal interests were sometimes pursued. For example, Bond reported that a circuitous trench was cut around the well-house of St Joseph’s Chapel. This was an attempt to find evidence of a purported subterranean passage which was thought to lead to the George and Pilgrim in Glastonbury High Street.<sup>77</sup>

The most persistent external influence arose from Bond’s connections with the American Society for Psychical Research in New York, where he worked from 1926 to 1935, following his estrangement from Glastonbury Abbey. Bond attracted the patronage of Colonel George van Dusen and his wife, Blanche, and cultivated their interests in Glastonbury Abbey. Blanche van Dusen encouraged him to return to England in the 1930s to resume his work at Glastonbury, his main objective at this time being to dowse for the Holy Grail. He also attracted the patronage of Sir Charles Marston (1867–1946), the wealthy chairman of Villiers Engineering and a great exponent of biblical archaeology.<sup>78</sup> The notebooks of Captain Bowen, the custodian of Glastonbury Abbey, reveal that in 1937 the abbey accepted an offer of £250 to dig in two spots where gold had supposedly been detected by dowsing: to the north of the Lady Chapel and to the south-east of the Edgar Chapel.<sup>79</sup> A plan proposing three trenches was sent to the abbey in 1939 by Blanche van Dusen and Charles Marston.<sup>80</sup> The custodian correctly deduced that Bond was behind the scheme, and the trustees recorded their grave reservations about implementing the proposals. The outbreak of the Second World War put an end to the matter; Bond died in 1945, before new investigations at the abbey resumed.

The offer of sponsorship for new excavations was repeated in 1953 by Blanche van Dusen and the daughters

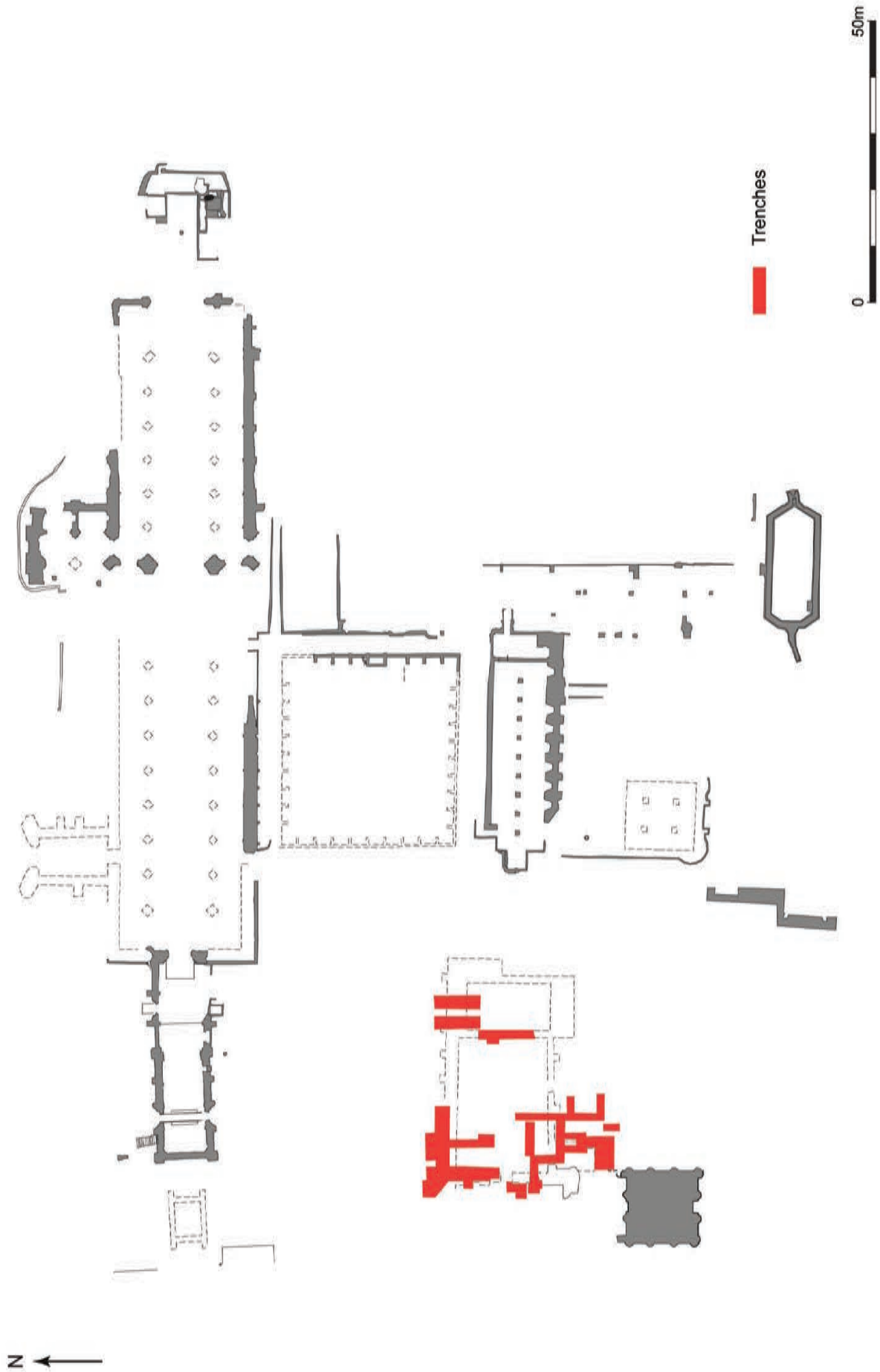


Fig 1.9 Excavation trenches by Wedlake, 1978-9 (scale 1:1,000)



of Charles Marston (Mrs van Harten and Miss Marston). Radford developed a relationship with Bond's patrons and agreed to excavate two of the three trenches that they had proposed in 1939. A letter from Radford to Mrs van Harten, dated 10 August 1954, reveals that he had the original plan redrawn and that two of the proposed trenches were excavated in 1954 ('North of Lady Chapel' and 'SE Corner of Edgar Chapel').<sup>81</sup> Both trenches were relatively shallow and neither encountered significant archaeological remains. However, Radford rejected the proposal for the third trench requested by the sponsors, which would have required deep excavations.

These patrons continued to provide financial support for Radford's excavations up to their completion in 1964;

his interim report of 1981 acknowledges 'the special debt owed to the late Mrs Blanche van Dusen' and 'the late Mrs van Harten and her sister, Miss M Marston.'<sup>82</sup> It is not clear precisely how the interests of these sponsors may have influenced Radford's research agenda. However, given that their initial attraction to Glastonbury Abbey was through Bond's psychic experiments and the quest for the Holy Grail, it is possible that Radford's search for Arthur's grave in 1962 was at least partly motivated by the interests of his external sponsors. We should, however, acknowledge that Radford himself was a romantic, captivated by sites connected to the legends of his native West Country, such as Glastonbury, Tintagel, Castle Dore and Cadbury Camelot.<sup>83</sup>

# Methodology and geophysical survey

# 2

*Cheryl Green, with a contribution from Claire Stephens*

## 2.1 The excavation archive

The antiquarian excavation archive is stored principally at Glastonbury Abbey and at the English Heritage Archive (EHA, formerly the National Monuments Record, NMR), Swindon. A small number of additional records are held by the Society of Antiquaries, London, and in the SANHS Library and Somerset Heritage Centre, Taunton. The completeness of the records from the successive campaigns of excavation varies considerably, as does the survival of the finds assemblages and contextual information for the artefacts. The first part of this chapter characterises the archive and assesses the potential for re-analysis, before discussing the challenges encountered in dealing with the respective components of the archive. The second section outlines the methodologies developed in order to process, integrate and evaluate the archive: the mapping of the excavations, the construction of the database and the use of cartographic evidence, historic maps and geophysical survey. Finally, the digital output of the project is introduced.

## 2.2 Scope

Extant material from Bond's excavations is confined to a small number of plans, photographic materials and correspondence held at the Glastonbury Abbey Gatehouse. Most of Bond's records were lost following the dispersal of his literary estate, and those retained at Glastonbury following his dismissal in 1922 were not

properly archived.<sup>1</sup> A box of Bond's plans, sections, elevations, sketches and photographs are contained within the Radford archive at the EHA, indicating that Radford had been loaned or had acquired some of Bond's records from the abbey.

In contrast, the majority of the records connected with the 1928–39 excavations of Fyfe and Peers, Clapham and Horne survive and are held at Glastonbury Abbey. These comprise directors' notes, handwritten summaries of the excavations, correspondence, plans, occasional section drawings, isometric drawings, finds drawings and photographic material. A few plans and sketches and items of personal correspondence relating to the directorship of Peers, Clapham and Horne were discovered within the EHA Radford archive – once again revealing that Radford had either borrowed or acquired records from earlier excavations.

The majority of the Radford archive is held at the EHA and is remarkably complete for most seasons. The archive includes detailed measured plans and section drawings, Radford's site notebooks, further notebooks belonging to the volunteer excavators, photographic material with a register (copies of most of the black and white photographs are held at the abbey), finds lists, trench write-ups, a corpus of draft publications and correspondence.

Most of Wedlake's records are held at the abbey but some were held privately and were lost following his death.<sup>2</sup> The extant records include plans and section drawings, finds drawings, photographic material, a levels chart and correspondence. The archive is dominated by Wedlake's write-ups of the 1928–39 and 1978–9 excavations and unfinished work towards publication, the

latter including annotations and additional work by Peter Greening, who attempted to complete publication following Wedlake's death. In common with the practice followed by Radford, the Wedlake archive included extensive material from the 1928–39 excavations, which had clearly been borrowed from the abbey.

A significant proportion of both Radford's and Wedlake's archives consists of work done in preparation for publication, including extensive commentary on the earlier excavations. The daily journals of the various abbey custodians are another important complementary source of evidence; these record the day-to-day running of the excavations and are particularly useful for the 1928–39 seasons, when the directors rarely visited the site and labourers were overseen by the custodian. The plentiful newspaper cuttings within the abbey archive provide images additional to the scant photographic record and provide insight into the discoveries that captured the public imagination, for example the extensively publicised 1962–3 search for 'Arthur's grave'.

Most of the finds from the successive campaigns are kept at Glastonbury Abbey with a small collection at the Museum of Somerset, Taunton. The curatorial database maintained by Glastonbury Abbey reveals that finds have gone missing: some were stolen many years ago while others were sent for specialist analysis and never returned. For example, some of the Saxon glass furnace material was sent to Sheffield University in the 1950s but the material could not be located when a check was made in 2009. Conversely, a box of furnace material and associated finds labelled 'Radford 1956' was discovered at the Museum of London and returned to Glastonbury Abbey in 2007. As a result of this project, a small quantity of finds discovered within the EHA archive was also transferred to the abbey. Other finds are dispersed amongst private collections and museums; one example is the blue lias capital at Salisbury Museum, now recognised as deriving from the twelfth-century cloister at Glastonbury Abbey (see Chapter 9). Accounts of finds being given away to visitors explain the report of a Glastonbury glazed tile located in Australia; indeed, medieval tiles from the abbey have recently been identified in the floor of a lavatory in the premises of a hairdresser in the town of Glastonbury.<sup>3</sup>

## 2.3 Potential

The few records available from Bond's excavations add little to his detailed published accounts. The most valuable additions are the unpublished plans, which

supplement the published literature by revealing the full extent of the first organised explorations at Glastonbury. Some new information has been incorporated and reinterpreted in the light of subsequent excavations. It has already been noted (see Chapter 1) that the quality of some of Bond's plans was above the standard of the time in which they were produced (fig 2.1).<sup>4</sup>

The most valuable element of the excavation archive for the 1920s and 1930s has been the vast quantity of unpublished photographic material and plans. Stratigraphy was not generally recorded using sections, but isometric drawings were produced of the flooring discovered beneath the west end of the Great Church (figs 2.2 and 2.3); these have been useful in reassessing the phasing of the Saxon and Norman churches (see Chapter 4). The meagre published reports for this period can be supplemented with notes by Wedlake, who recorded information that otherwise would have been lost. Radford also made personal observations of these early excavations. He twice visited Bond's excavations as a boy, and in 1928–39 he witnessed the work at least once each season and discussed the results with the directors, all three of whom were close personal friends of Radford or his father.<sup>5</sup> Unfortunately, Radford's notes were lost when his home was destroyed during a bombing raid on Exeter in 1942. However, Radford's approach to the site was influenced by these formative experiences. Attempts by Radford and Wedlake in the 1980s and '90s to synthesise the results of all the excavations reveal their subsequent reflections on what had been found in the 1920s and '30s.

The Radford archive offers the greatest potential for understanding the archaeology of Glastonbury Abbey and is therefore the central focus of this publication. Radford's archive was found to be predominantly complete, reflecting his habit of keeping everything: Professor Dame Rosemary Cramp recalls visiting Radford's home at Uffculme and observing the excavation records piled high on a Jacobean tester bed.<sup>6</sup> The completeness of the Glastonbury archive contrasts with the archive from Radford's excavations at Tintagel, of which only three site notebooks and a small number of photographs and survey drawings survived the wartime destruction of his Exeter home.<sup>7</sup>

The records from Wedlake's excavations in the abbot's hall in 1978–9 are incomplete; however, enough survives to suggest that remains were found beneath the early fourteenth-century abbot's hall. His findings contribute to the reinterpretation of Saxon remains excavated in the vicinity and provide credible evidence for the Norman abbot's hall.

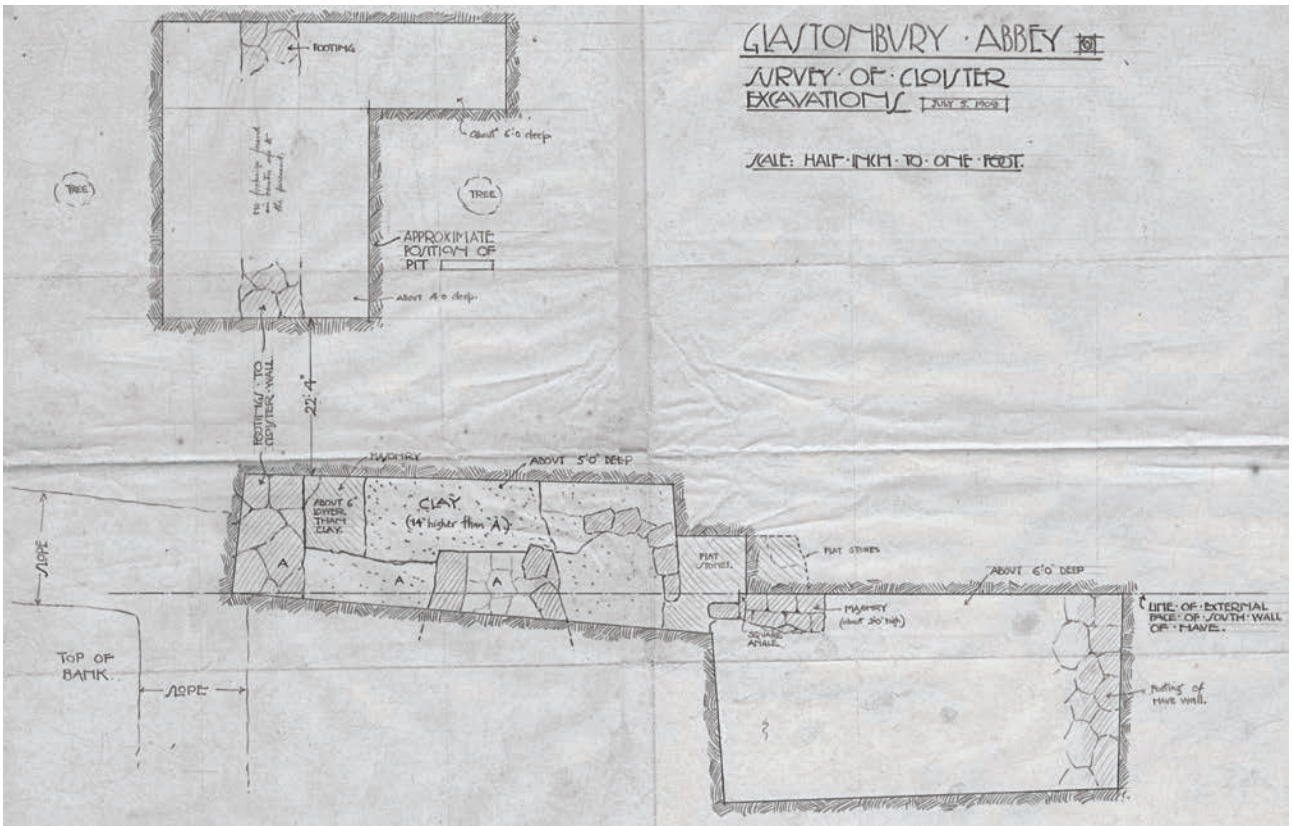


Fig 2.1 Bond's 1909 plan of the cloister excavations (© Tim Hopkinson-Ball and EHA)

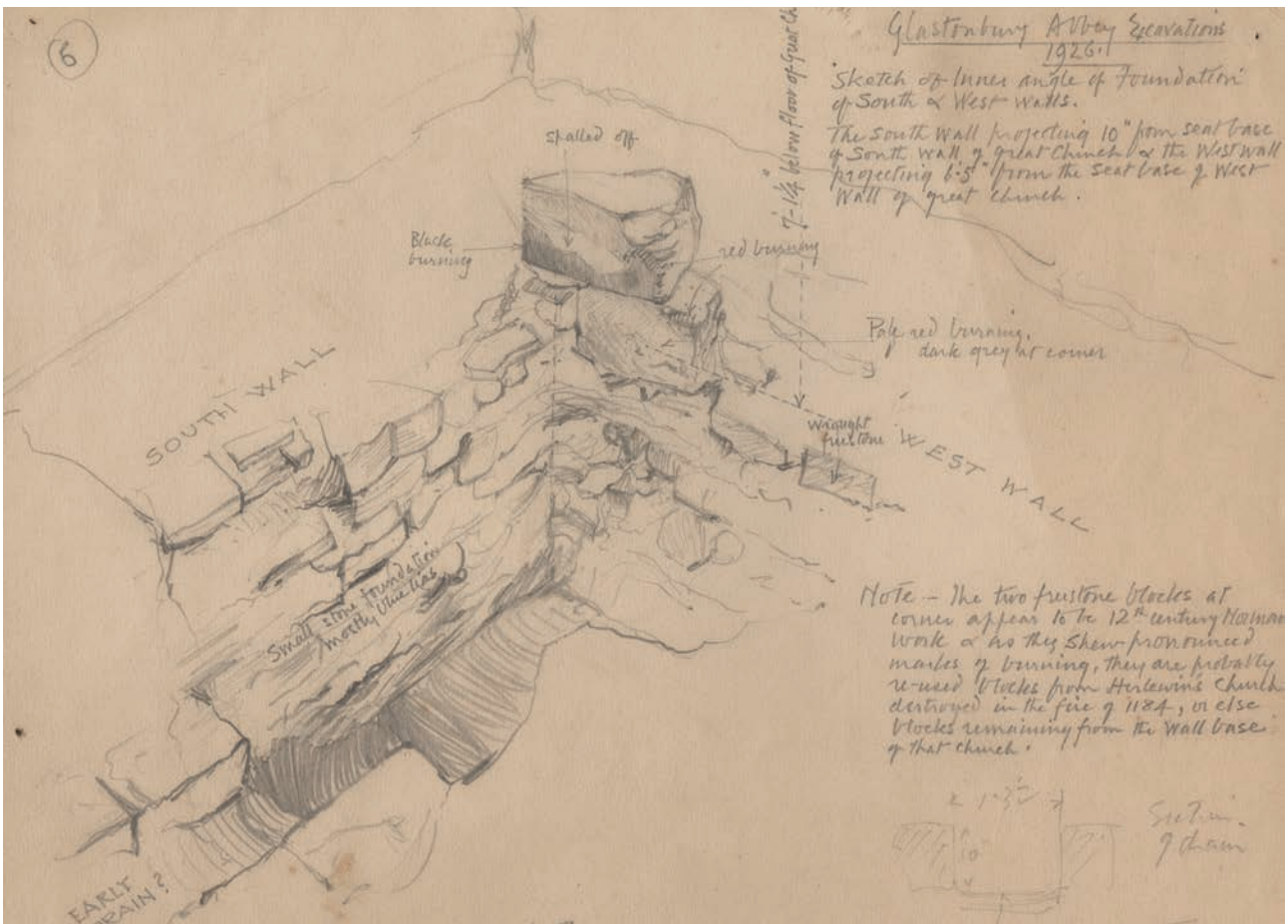


Fig 2.2 Isometric drawing, 1926 (© Glastonbury Abbey)

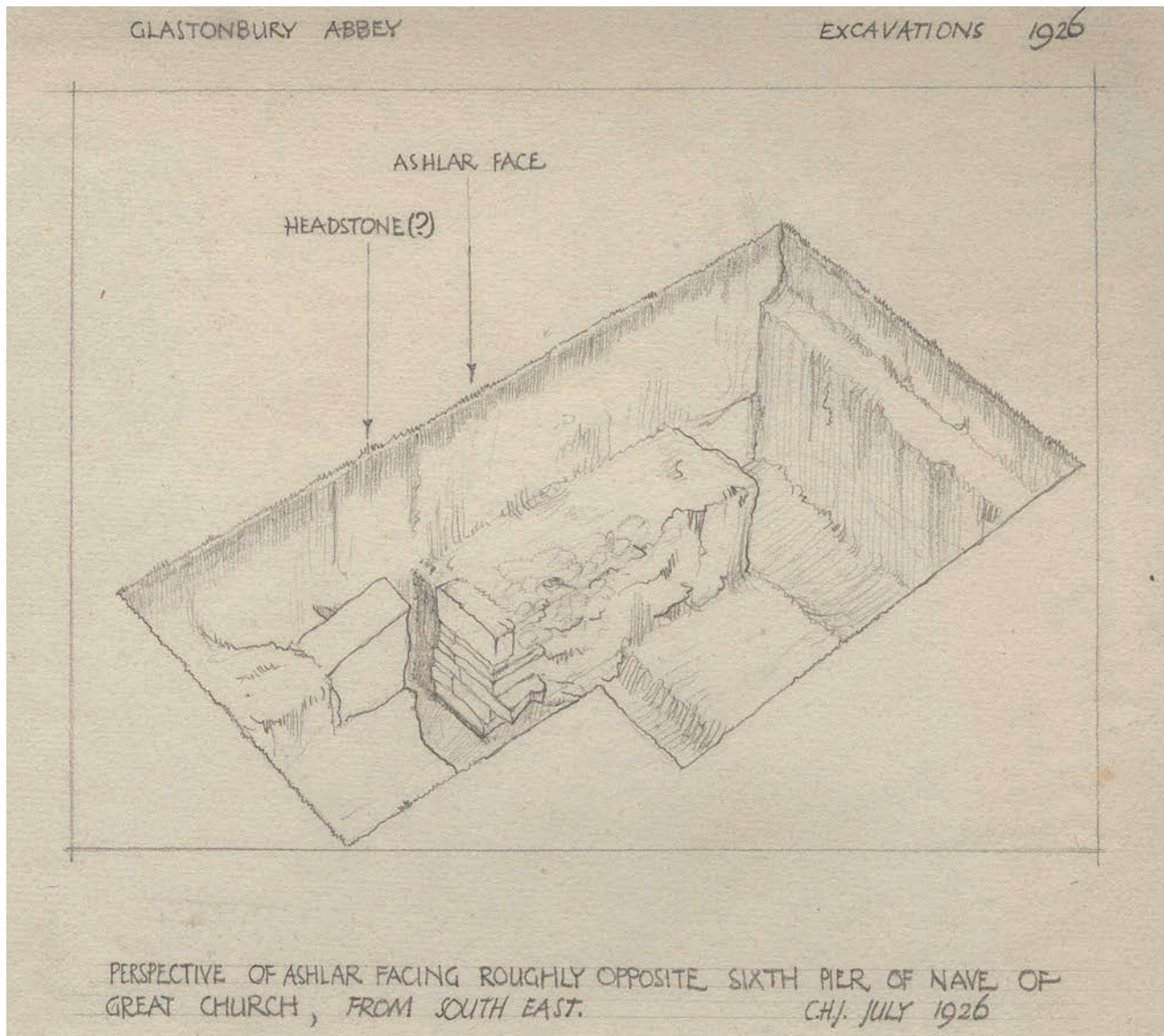


Fig 2.3 Isometric drawing, 1926 (© Glastonbury Abbey)

## 2.4 Challenges and solutions

The archives for excavation campaigns dating 1908–39 and 1978–9 are incomplete, making it impossible to integrate all of the antiquarian records and fully reassess the evidence. Radford's records are complete but present both interpretative and logistical challenges. His published interim statements have generally been accepted as factually correct without verification of the archaeological evidence. However, it is clear that Radford used archaeology to illustrate pre-determined views that were based on a historical framework, rather than using history and archaeology as separate but complementary sources of evidence.<sup>8</sup> Consequently, the primary records

are biased in their identification of particular features, and the site chronology is based directly on historical accounts such as the *Life of St Dunstan* (see Chapter 3). This project has sought to disentangle the archaeological records from Radford's opinions. His interpretations were further compromised by his preference for narrow excavation trenches (1.2m wide) and his reliance on section drawings to establish phasing. He regularly reconstructed the form and layout of buildings based on fragmentary evidence across several narrow trenches. Mapping of his evidence in concert with new geophysical survey has prompted significant reassessment of his findings.

Although the Radford archive is predominantly complete, the records and finds were disconnected. Personal correspondence and drafts for publication presented a daunting mountain of additional literature;

contradictions presented themselves particularly in the decades following the excavations when some of the assumptions were revisited. Dealing with this material has involved returning to the primary records to reconstruct the archaeological record from first principles.

The level of accuracy in Radford's recording was found to be reasonable, reflecting improvements in archaeological technique from the 1950s onwards and the development of the discipline of medieval archaeology.<sup>9</sup> The drawings from the 1951 and 1952 seasons were sketchy in nature and the accompanying notes were scarce in contrast with the more thorough recording of subsequent years. Radford's previous excavations employed workmen as diggers; at Glastonbury he recruited skilled supervisors and a loyal band of volunteer diggers, some of whom have been closely involved with this project. Radford was self-employed when he took up the post of Director of Excavations in 1951 and was able to be present on site for most of the season, in contrast with his episodic presence at Tintagel in the 1930s. His methods had improved since he had excavated at Tintagel but there was a lack of consistency in the recording, indicating an absence of established procedures on site. Particularly noteworthy are the inconsistencies in the photographic record. The site photographer would usually visit once during a season: some trenches and features are therefore well presented, while others are entirely absent, with no official photographic material whatsoever for the years 1962–4. Variations in the quality of recording are also apparent; for example, some of the section drawings and accompanying notes made by volunteers betray a lack of understanding of stratigraphy and were clearly not closely supervised.

Although Radford's excavations were dominated by the use of narrow trenches, several larger open areas were excavated in 1954, 1955 and 1964 (fig 2.4). This technique was first applied in England at the deserted medieval village of Wharram Percy (N Yorks) from 1950 and became widespread during the 1960s.<sup>10</sup> However, at Glastonbury the quality of recording of the larger open areas is inferior to that of the narrow trenches, perhaps reflecting a lack of understanding of the different recording techniques required. No section drawings were made of the baulks and there was no single-context planning; the archaeology was therefore removed without record, with the exception of planned features at the base of the trenches. The most extensive of the open-area excavations, and also the most poorly recorded, was carried out in 1964. In the absence of any plan, the precise location of these excavations has not been established, although photographs indicate that they

involved knocking-through between the 1962 and 1963 trenches. Without drawings, it is impossible to make full sense of the notes or to link the numerous finds retaining contextual information with specific archaeological deposits.

The policy for recording and retaining finds does not stand up to modern scrutiny. Radford's prime objective was to recover evidence from the period pre-dating the great fire of 1184, and contextual information was only routinely recorded for finds within these deposits. The poor quality of the records also reflects Radford's belief that he alone would be responsible for writing up the findings; important contextual information was therefore consigned to memory rather than recorded explicitly. In common with many of his contemporaries, Radford discarded many finds on site following his rapid appraisal.<sup>11</sup> It seems that he kept all material dating from early contexts and was more selective in relation to Norman and later deposits. Analysis of the excavated assemblage has shown that all classes of medieval material are dominated by decorative and high-status objects.

## 2.5 Approaches to the antiquarian records

Given the vast archive and the varied nature of the records, a pragmatic approach was required to assess the archaeological value and the level of digital recording required. This section outlines the methodologies developed for processing the paper elements of the archive, mapping the excavations and integrating the records within a database. This approach was applied to the entire excavation archive, but the higher recording standards and completeness of the Radford archive means that it has produced a more useful resource.

### Processing

The EHA archive was catalogued and accessioned during the 2007–8 pilot project and subsequently reordered by the EHA so that related elements of the archive are now stored together. Drawings, photographs, slides and lantern slides from the EHA and the abbey were scanned to create digital safety copies; the primary written material (excavation notes, registers, lists, trench write-ups and work towards publication) was either scanned or transcribed. Secondary sources, such as personal correspondence and newspaper cuttings, were more

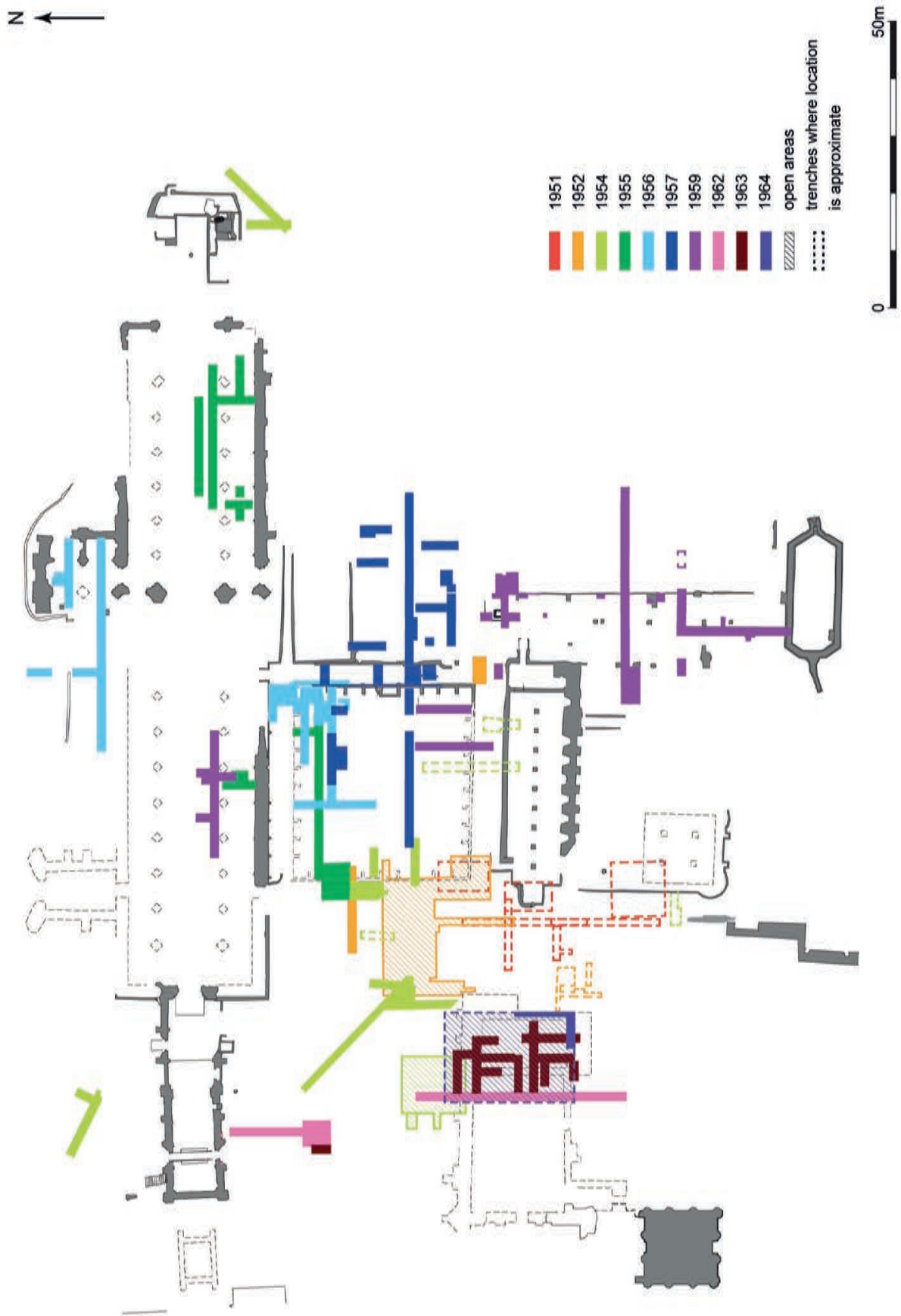


Fig 2.4 Plan of Radford's excavation trenches by year (scale 1:1,000)

variable in their archaeological content, and notes were therefore only taken where considered relevant. During this process, the records were itemised on spread sheets and sorted into digital folders representing the first step in integrating the records (in most cases) by year, area and trench. Figure 2.5 illustrates the range of records for one 1956 trench located within the cloister, originally labelled as '1956 CL2':

Radford's original trench names have been replaced by consecutive numbering for the purposes of this publication, but have been retained for the digital archive deposited with the Archaeology Data Service: Appendix 1 links the new trench numbers with Radford's original trench names, references to primary sources, new context number ranges and new section numbers. The complexity of Wedlake's excavations made it difficult to identify specific trenches although it was possible to locate the sections in plan: Appendix 2 links Wedlake's original 1978–9 section names with the new section numbers used throughout this book; it lists original illustrations and photographic references where these are identifiable to specific sections. Appendix 3 lists all the excavations from 1908 to 1939, including publication references, details of the findings where this is not discussed in the text, and (where possible) links to original and photographic references. New numbering has not been applied to these excavations as much of this work simply involved clearance. Where specific records are referenced within this publication, items from the EHA archive are prefixed with 'NMR: GLA' or a shorter assigned number prefixed with the letters 'LA' (Loaned Archive), while items from the abbey archive are prefixed with 'GLSGA' or the shorter abbey-assigned number relating to document type prefixed by 'GLA'.

## Mapping

The only record-based process undertaken outside the Integrated Archaeological Database (discussed below) was the plotting of the excavation trenches. The base mapping was taken from a recent survey of the precinct by the Downland Partnership and tied into the OS National Grid, providing the necessary spatial framework for the archaeology.<sup>12</sup> Most of the trenches were plotted from measurements taken from the original plans, either triangulated from fixed points (usually upstanding remains) or base lines. Setting-out diagrams contained within Radford's site notebooks were useful for locating or confirming the locations of trenches.

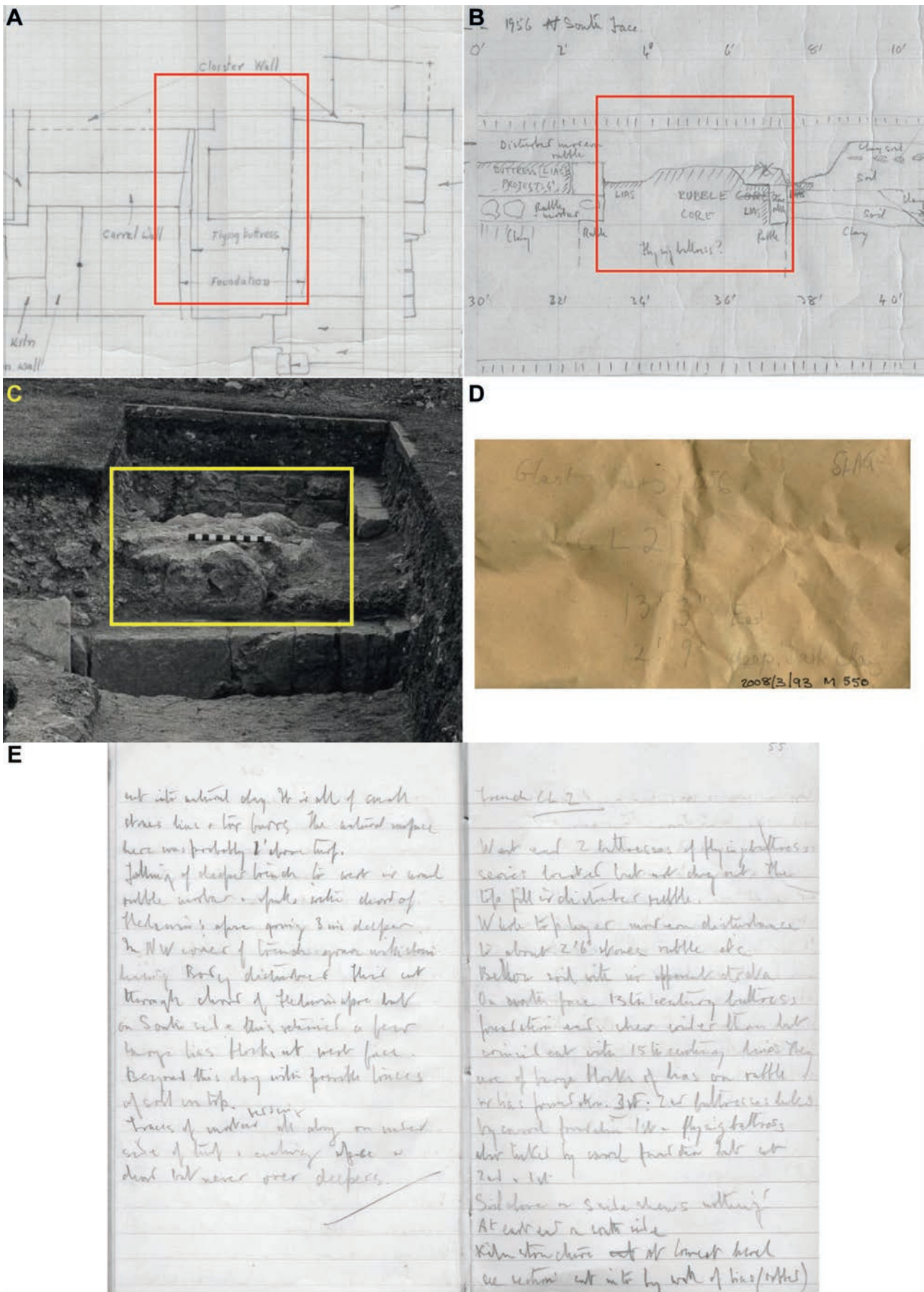
Radford stated that the locations of the trenches from excavations pre-dating 1950 were generally too vague to

facilitate cartographical delineation; overall this was found not to be true. The locations of most of the trenches mentioned in antiquarian publications and in the excavation notes have now been established, although an approximate position was only possible for some (represented by dashed lines on figure 1.2). Published plans were also useful for confirming the locations of the pre-Radford trenches, although they did not always correspond exactly with the original plans. There were also discrepancies between the plans drawn of identical areas in different years. For example, Radford noted that the 1928 plan of the Saxon church is more reliable than the 1929 plan, which differs in certain respects due to the deterioration of exposed masonry.<sup>13</sup> Where applicable, we have relied on the earliest plans of any exposed masonry.

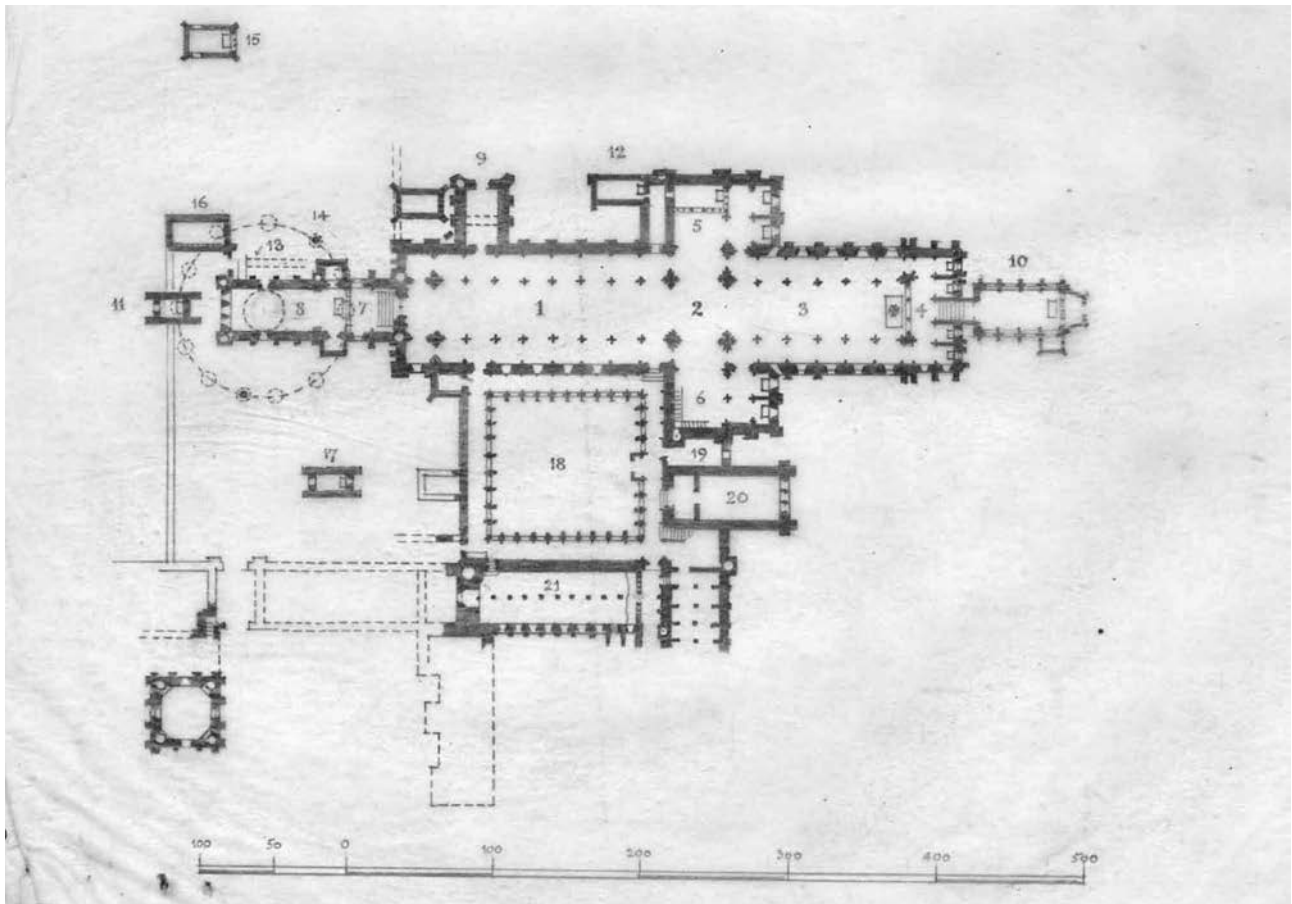
A high success rate has been achieved in mapping Radford's 103 trenches and four test-pits (fig 2.4). Most of these trenches have been precisely located; confirmation has been provided by excavation photographs and the geophysical data, which provided ground truth for several trench locations and for features recorded within trenches (see below). Only a few trenches were approximately sited and are indicated by dotted lines; in particular, the 1951–2 trenches between the abbot's hall and the refectory were affected by an inherited planning problem. The 1913 plan shows the cloister as a rectangle, despite the fact that Bond had already uncovered the east end of the refectory sub-vault and shown on plan that the angle between the cloister and the refectory was about three degrees less than a right angle (fig 2.6). The same plan also shows the Lady Chapel precisely aligned with the Great Church despite the slightly skewed orientation being clearly visible when taking a longitudinal view along the upstanding remains of both structures. The cloister discrepancy was present on the generally accepted plan of 1930 and continued through subsequent surveys.<sup>14</sup> Unfortunately, the error was not identified until 1952, by which time the trenches had been backfilled and the area landscaped. As a result, Radford noted that some buildings discovered by excavation can no longer be plotted.<sup>15</sup>

Problems with mapping the 1954 and 1959 trenches across the south cloister walk cannot be blamed on the inherited mapping problems, however. These trenches were particularly difficult to decipher; the trench names and written descriptions clearly place them in the south cloister but the plan implies they should be out to the west towards the abbot's hall area. The geophysics results could be interpreted as supporting either location and there are no photos of these trenches; they have therefore been mapped tentatively.





**Fig 2.5** Excavation records for '1956 CL2': A) Plan (© EHA); B) Section (copyright EHA); C) Photograph (© EHA); D) Finds envelope (© Glastonbury Abbey); E) Site notebook (© EHA)



**Fig 2.6** Plan of Glastonbury Abbey, Bond 1913 (© Tim Hopkinson-Ball and EHA)

The mapping discrepancy continued to cause problems for Radford and in a letter dated 9 May 1954 he requested a new survey, stating that 'at present the measurements are under control but this is not going to be the case much longer for I am advancing into the cloister this summer'. Despite his optimism, we have detected problems with the setting-out of the 1954 cemetery trenches, with resulting difficulties in correlating those trenches that were measured from the Lady Chapel and nave with those that were measured from the cloister. Where possible, excavation images have been used to check trench alignments with upstanding remains; for example, the orientation of Trench 19 across the cemetery was confirmed by a photograph showing the Lady Chapel south door in the background (see fig 4.15). The same trench was also visible on the geophysical survey along with a cist grave within the same trench. In this area, only Trench 20 could not be secured and is approximately positioned.

Only three of Radford's trenches have been impossible to pinpoint: the large open-area of 1964 (Trench 105); and two 1962 trenches in the nave (Trenches 91 and 92), known only from section drawings, one aligned

north-south and the other east-west. The original intention was to excavate a trench along the north side of the nave to establish the width of the twelfth-century church.<sup>16</sup> However, a rather enigmatic note for a sleeper wall within Trench 91 indicates that the trench was located only 1.5m north of the south transept, which places the excavation trench within the south side of the nave. The only other evidence is the presence of a modern (presumably retaining) wall recorded at the east end of Trench 91 and a label pinpointing the locations at the east end of the nave. The only clue for Trench 92 is the presence of a supposedly twelfth-century wall below a supposedly fifteenth-century wall; however, it has not been possible to identify the location of these walls.

The mapping of Wedlake's 1978-9 excavation plans was fairly straightforward. However, where drawings had been amalgamated from earlier excavations, the tracings resulted in human error on the base maps, perpetuating the pre-1950s survey errors discussed above. The plentiful excavation photographs were extremely useful in clarifying trench locations.

In practical terms, there was some distortion of the original plans and sections drawings, in particular

those drafted on brown paper, which tends to distort with age. Brown paper was a product of the economic climate of the early 1950s, when war-time paper rationing was still in force. With the drawings now scanned and digitally stored as vector images, any further distortion has been minimised. In order to amalgamate the plans it was necessary to standardise the variety of planning scales that had been used throughout the antiquarian excavations and to transfer measurements from imperial to metric.<sup>17</sup> The new master plan of the site has been digitally created at 1:50 and sections drawn at 1:20. Many of the plans and sections from Radford's excavations include levels, some of which have been reduced; however, the Newlyn datum level has changed over the course of the century and the site has been landscaped. Consequently, conversion of the levels from imperial to metric has not been undertaken.<sup>18</sup>

### Integrated Archaeological Database (IADB)

A key part of the pilot project undertaken in 2007–8 was to write up a test area in order to evaluate the quality of Radford's records and to develop an appropriate methodology for a full project: the chapter house area was selected for this purpose.<sup>19</sup> This area had also been partially excavated by Bond in 1910 and by Wedlake in 1935; it therefore provided a suitable test for

amalgamating the excavation records from different campaigns. It quickly became apparent that a database was required to process and integrate the records for the full archive. The Integrated Archaeological Database (IADB) created by Mike Rains (York Archaeological Trust) has been specifically designed to manage the data from large-scale archaeological projects. It had not been used previously for the post-excavation analysis of antiquarian excavation records and was specifically adapted for the Glastonbury Abbey project to process section drawings (as opposed to single-context plans).

Using the IADB, the primary field records were tagged by year and trench name to link evidence with specific trenches where possible. This is illustrated (fig 2.7) for Radford's '1956 CL2' (the same trench whose original records are shown in fig 2.5). The first step was to digitise the ninety section drawings and assign context numbers, which were also applied to the master plan created outside of the IADB by Liz Gardner. The majority of the excavation photographs only retained a date, and it was necessary to link the photographic material to the trenches and where possible to features. Information from the excavation notes and other written evidence was transferred to the context records to retain source information.

Approximately 5,050 finds retained enough contextual information to group them by year of excavation and trench or area from which the find was recovered,

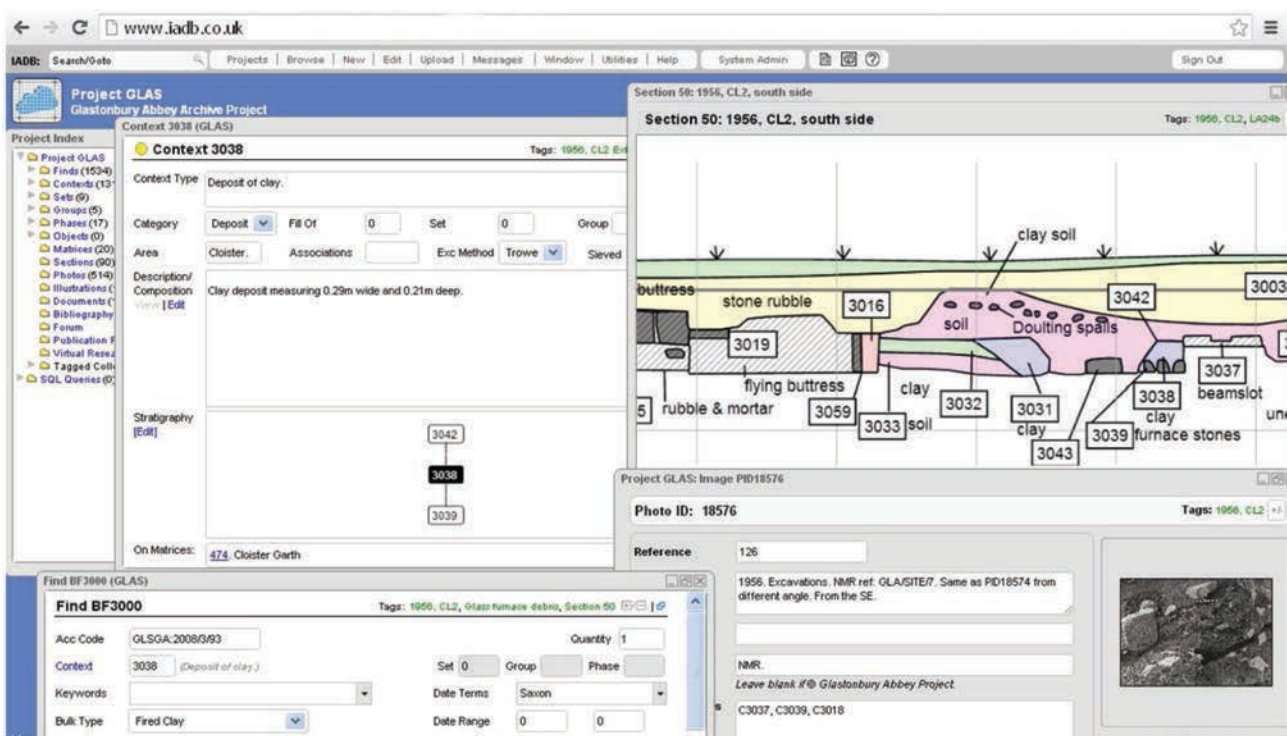


Fig 2.7 Screenshot from IADB showing linked records for '1956 CL2'

resulting in a total of c 1,530 finds records within the IADB. For Radford's excavations, context information had been recorded on brown envelopes detailing the distance from one end of the trench and the depth from the trench surface, often supplemented with a context description. As a result, it has been possible to link 2,400 finds to specific archaeological deposits, albeit with differing degrees of certainty. The new specialist finds assessments have provided a limited dating framework allowing the archaeological phasing and stratigraphy to be properly assessed. All contexts have been included on stratigraphic matrices approximately arranged by phase and divided into ten areas; however, it was not possible to deduce relationships for all contexts.

Full excavation reports were written within the IADB and form the basis of this publication. The results sections of the reports (available in the ADS archive) provide a technical stratigraphic account based on the sections, plans, photographic material, sketches and notes for each trench. As far as possible, the interpretative elements of the records have been removed, although original labels have been left on the sections primarily to retain terms of reference between the drawings and the notes. The phased 'Discussion' sections (which form the basis of Chapters 4 to 6) provide a critical appraisal of the archaeology incorporating new dating and spatial evidence from specialist finds reports, the recent geophysical survey, the parchmark survey and the earthwork survey (fig 2.8).<sup>20</sup> Interpretations recorded in original records and publications have been re-evaluated and features have been attributed to the earliest possible phase.

## 2.6 Geophysical survey

A key component of the pilot project was a geophysical survey by the University of Reading across the east range. This was undertaken as part of the trial write-up of the antiquarian excavations in the chapter house area and proved to be invaluable in placing the archaeological data into a broader spatial context, providing ground truth and verifying the geophysical results.<sup>21</sup> The survey highlighted the need for a full-scale survey of the entire precinct.

### Introduction

*Claire Stephens*

A programme of geophysical survey was undertaken within the grounds of Glastonbury Abbey by GSB

Prospection Ltd between March and September 2009. The work comprised approximately 8ha of magnetometer survey (covering all accessible parts of the grounds) and roughly 5ha each of resistance and ground-penetrating radar (GPR) survey, focusing on the core area of the monastic precinct. Magnetic survey was carried out using Bartington Grad 601-2 instruments with a sample interval of 1m by 0.25m; resistance data was collected with a Geoscan Research RM15 0.5m twin probe array with a sample interval of 1m by 1m; the GPR survey used a Noggin SmartCart<sup>plus</sup> with a 250MHz antenna, sampled at 0.5m by 0.05m.

The aim of the survey was to identify and accurately locate features relating to the abbey, responses that might represent excavation trenches and any other anomalies of possible archaeological interest within the precinct. The results were fed in to the wider project and used to assist in the digitisation, collation and mapping of the excavation archive.

The survey methodology differed from that employed by the pilot study, particularly in the case of the sampling intervals used for magnetic and resistance surveys (0.5m by 0.25m and 0.5m by 0.5m respectively in the pilot survey). The different strategy was based on considerations of logistics and data quality. In the case of the magnetic survey it was considered that an increased sample density would not significantly enhance the interpretability of the results, given the prevalence of magnetic disturbance in the data. The resistance technique is very sensitive to ground moisture changes (and therefore seasonal weather variations); this was clearly illustrated in the results from the pilot study. Given that the survey was to be carried out across three seasons, the probability of such changes was high and the reduction of spurious readings was a major consideration. The cart system employed in the pilot study enables relatively speedy data collection but the operator cannot monitor in real time any possible 'bad' data points and correct for them. Using a standard twin probe array, such monitoring can be done, but the technique is slow; to collect data at 0.5m intervals over 5ha, prohibitively so. Given that GPR is equally well suited to detecting masonry features and provides additional depth information, it was decided to devote a greater part of the project resources to this technique. In recognition of the reduced sampling density, the survey grid was aligned at 45 degrees to the archaeology to maximise the resolution of the responses.

### Data display and interpretation

The data plots presented in figures 2.9 to 2.15 represent a tiny sample of those used in the analysis, selected to give

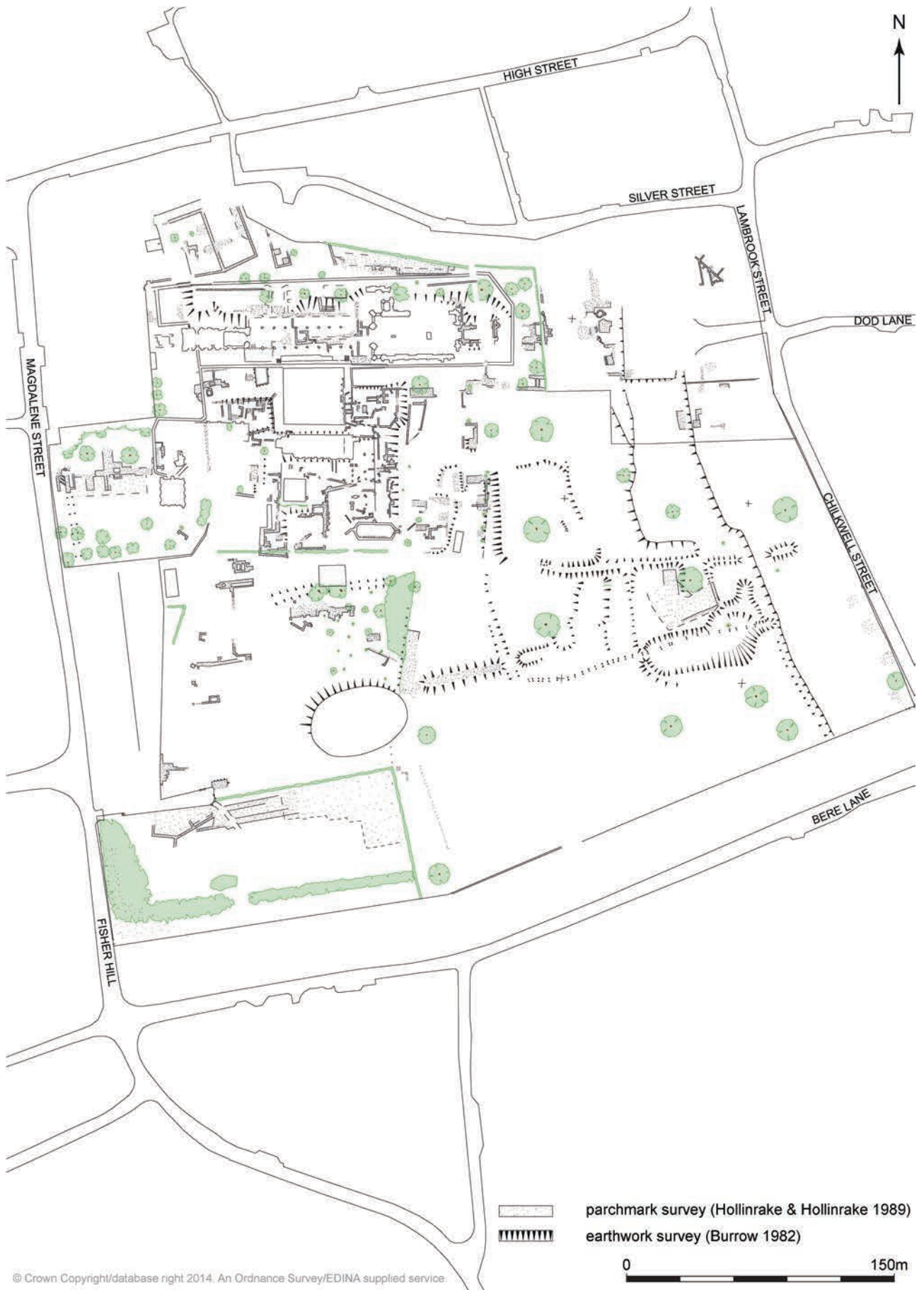


Fig 2.8 Plan showing parchmarks (after Hollinrake and Hollinrake 1989) and earthworks (after Burrow 1982) (scale 1:3,000)

an overview; these may not clearly show all the features depicted in the interpretations (figs 2.16 to 2.22). The numerous phases of building and remodelling of the abbey complex, post-Dissolution damage and modern interventions (excavation, landscaping and reconstruction) have given rise to a complex stratigraphy and a considerable amount of unstratified debris, all of which has left some trace in the geophysical record, resulting in complex datasets. The challenge in the analysis was to identify clear patterns in the results that would indicate discrete *in situ* features and to assess their likely origin.

Given the history of the site, most of the archaeological responses in the core area of the precinct probably relate to features associated with one of the many phases of abbey construction or destruction and are classified as 'possible abbey features', even if their definition is poor. However, some anomalies within the core area are classified simply as 'possible archaeology'; this reflects a reduced level of confidence in the interpretation, either due to the very indistinct or non-linear nature of the responses or a position or alignment that cannot be obviously linked to known abbey structures. All archaeological-type anomalies at the peripheries of the site are similarly classified. A number of anomalies appear to coincide with features noted on early OS mapping and others have an alignment suggesting an association with these early map features; these are all categorised as 'pre-twentieth-century features', although it is possible that some might represent earlier historic features that have been remodelled or reused. 'Uncertain origin' is applied to those responses that indicate some anthropogenic source where the precise archaeological / historical significance cannot be determined. For visual clarity, some anomalies produced by modern features and all those attributed as unstratified debris are omitted from the interpretation.

Excavation trenches can be difficult to identify with any degree of certainty in geophysical data, since the contrast between the backfilled trench material and the surrounding matrix is often comparatively low. In some cases, an abrupt break in an anomaly might indicate a trench cut; in other cases, weak trends in the data might be highlighted as coinciding with the expected position of a trench, but in very few instances have these been clearly identified as trenches.

### **Magnetic survey (figs 2.9 and 2.16)**

Within the core area of the abbey complex, the data generally display noisy background levels and numerous

widespread ferrous anomalies, both of which have severely hindered data analysis and interpretation. The ferrous anomalies have effectively masked any weaker responses, while in the areas between the most severe magnetic disturbance, it has often been difficult to define and interpret discrete responses that might be of interest, particularly those that are small and non-linear. Both historic and modern activity will have contributed to the noise but, most crucially for the interpretation, the use of iron or steel in reconstructing and securing extant building walls and in fixing the ground markings of former abbey buildings has produced extensive ferrous anomalies in precisely those areas which are of greatest interest.

Despite these problems, a few anomalies of possible interest have been identified in and around the core area of abbey buildings (in the nave, east end, cloister garth, possible infirmary site, monks' kitchen and abbot's hall). Most are positive linear responses or weak positive trends in the data. Positive anomalies are usually associated with ditches and pits, not stone walls; in this instance, however, some anomalies might represent the lines of former walls that have been robbed out and filled with magnetically enhanced material. Backfilled excavation trenches might also produce weak magnetic positive signals, depending on the nature of the backfill material. But this response could not be said to be 'characteristic'; without foreknowledge of a trench's approximate position, none of the anomalies can be definitively interpreted as such. Some of these responses have parallels in the resistance and / or GPR data which strengthen the archaeological interpretation. Little more can be said specifically about the magnetic responses, with three notable exceptions.

A positive linear anomaly has been identified immediately east of the dormitory, with possible continuations noted on the eastern edge of the chapter house and running through the east end (fig 2.16). Although poorly defined, this seems likely to represent the ditch of the *vallum monasterii*. The feature has not been detected in the resistance survey and barely in the GPR, thus the magnetic results provide the main geophysical evidence for this feature.

Two parallel negative trends, aligned east–west within the chapter house, correspond roughly with Trench 48 and might represent the edges of the trench, although the negative form of response could suggest two separate stone features.

Ordinarily, the magnetic technique is well suited to the detection of furnaces, kilns, and other industrial features, which can produce anomalies of characteristic



**Fig 2.9** Magnetic data: colour plot (© Claire Stephens, GSB Prospection)

strength and shape. In this case, however, the background noise levels associated with historic destruction and modern interventions have made it extremely difficult to identify any such typical responses with any degree of certainty. At best, some strong non-linear magnetic responses might be classed as being of 'uncertain origin', but little more can be determined from the geophysics alone.

Beyond the core of the abbey buildings, two groups of responses are highlighted as possible archaeology. At the western edge of the precinct a few linear anomalies and trends have a broadly rectilinear arrangement; however, they are very ill defined and it is doubtful these would be assigned any archaeological significance without associated evidence from the other two datasets and the parchmark survey.<sup>22</sup> Even more tentative is the interpretation of several weak and very indistinct ditch-type anomalies in the eastern half of the precinct, which overlap resistance and GPR responses but do not have any clear parallels in these datasets. A pattern of rectilinear responses at the northern edge of the precinct may be of archaeological interest (and they have corresponding resistance and GPR responses) but they are on a different alignment to the abbey complex, and comparison with early OS mapping suggests that at least some of these are associated with modern features such as paths or walls.

### **Resistance survey (figs 2.10 and 2.17)**

A broad range of resistance values was recorded across the survey area, arising from a combination of general overburden debris and seasonal moisture changes. In places these large variations have masked weaker responses, although filtering has helped to 'pull out' anomalies of interest.

Some of the strongest and most coherent responses have been recorded in the area of the Great Church and relate to the aisle sleeper walls associated with the medieval nave and east end. At the western end of the nave most of these anomalies truncate abruptly, leaving a largely 'blank' zone; this coincides with an area of extensive excavation carried out in 1926–9. At the south-western corner of this zone, ill-defined higher resistance anomalies form a rectilinear pattern that might represent remnants of walling associated with the pre-Conquest churches or possibly the twelfth-century church. Some GPR anomalies are present here, but there is little good correlation between the two datasets and it is possible that the responses are simply the product of excavation disturbance.

At the eastern end of the church and the Edgar Chapel the anomalies are weaker but still relatively well defined, suggesting either deeper or less substantial walls, drains or robbed-out foundations. Discrete, low-resistance anomalies are apparent within and around the walls of the Edgar Chapel, indicating a marked increase in soil moisture content at this location. This could reflect 'ponding' of water over an intact floor surface, moisture accumulation within a backfilled excavation trench, or the impact of modern site landscaping.

Limited detail is shown around the north transept, where surviving masonry and modern features have hindered data collection and interpretation. Similarly, the area of the Loretto Chapel has been landscaped and contains trees, the roots of which will affect the resistance results. Although some vaguely rectangular anomalies are present here, any interpretation is uncertain.

The outer walls of the south transept, chapter house and dormitory have all produced reasonably clear responses and there are some indications of internal features (pier bases, walls, drains or possible excavation trenches). East of the chapter house and dormitory, poorly defined high-resistance anomalies form rectilinear patterns suggesting possible walls or drains. The patterns are too fragmentary to enable any firm interpretation or association with the possible infirmary range. The anomalies in and around the monks' kitchen provide little additional detail to the surface layout. Immediately east of the monks' kitchen, well-defined linear anomalies aligned north–south (and with clear parallels in the GPR data) suggest substantial wall foundations.

Within the area of the cloister, most of the anomalies are ill defined and several are non-linear, suggesting a combination of small walls, drains and possible excavation disturbance.

Towards the western edge of the cloister garth a weak but relatively well-defined response aligned north–south is attributed to the supposed eastern wall of the Saxon cemetery. Anomalies possibly representing the southern and western walls are noted but the designation is more cautious since they do not precisely follow the extrapolated line of the feature and interpretation is further complicated by the presence of a boundary feature (probably a path or wall, though the mapping is not clear) indicated on early OS mapping. Within the area of the cemetery several small high-resistance responses may represent burial slabs or chambers. Breaks in the linear anomalies might be due to Trench 19; evidence from the GPR data supports this.

Comparatively few anomalies of likely significance have been identified in the area of the abbot's range.





**Fig 2.10** Resistance data (filtered): greyscale plot (© Claire Stephens, GSB Prospection)

Arguably, the clearest responses relate to the southern end of the abbot's lodging at the south-eastern corner of the garden, and a few linear / rectilinear anomalies classified as possible archaeology may relate to the garden itself.

At the western edges of the precinct, a broadly rectangular arrangement of high-resistance anomalies may be of interest, possibly indicating banks or the remains of a range of buildings, although there is no detail of individual wall lines and the GPR anomalies at this location are not especially convincing. To an extent, archaeological significance has been assigned on the basis of parchmark evidence suggesting features in this area.

A number of high-resistance anomalies are present in the south-eastern corner of the survey. Clearly anthropogenic in origin, they may be of archaeological interest, suggesting possible building footings and drainage. Their relationship to the monastic complex cannot be determined.

### **GPR survey (figs 2.11 to 2.15 and 2.18 to 2.22)**

Even with the extra detail and depth information afforded by GPR, the rich history of the site results in a degree of ambiguity in the origin or antiquity of the recorded responses. For example, many apparent services (drains, culverts, pipes and cable runs) have been detected, some complete, some partial, but often it has been difficult to determine whether these features are relatively modern installations or historic elements of the site. Furthermore, around most of the mature trees, anomalies have been recorded associated with not only the root mass but also over-ground reflections from the trunks.

Most of the archaeological responses in the GPR occur in the timeslices between 0m and 1.5m (approximate depth); some responses are visible at 1.5–2.0m and very few are noted below 2.0m. As with the resistance data many of the more dominant GPR responses relate to the later phases of the abbey buildings and show a good correlation with the resistance results (eg the main walls and some internal features of the church, transepts, chapter house, dormitory and monks' kitchen).

In several areas, the GPR has provided additional information or clearer responses. North of the nave, linear responses are present in the area currently marked as the site of the Loretto Chapel. Further to the west, linear responses suggest a small building immediately adjacent to the Lady Chapel. Clear wall lines are present in the area of the abbot's lodging and extending south from the extant abbot's kitchen. A number of responses

are present in and around the location of the abbot's hall. Some are thought to relate to various phases of the hall, while others may represent earlier ranges of buildings, located to the north, east and south of the hall.

In common with the resistance data, the east wall of the Saxon cemetery is clearly evident, but the southern and western walls have not been identified conclusively. Locating the western wall has been complicated by the presence of possible early modern features (shown on the OS map) in the vicinity.

The GPR survey has been of limited help in confirming the presence of a possible infirmary range to the east of the chapter house and dormitory. While some ill-defined rectilinear anomalies are noted, none have clear parallels in the resistance data and any one of these could indicate drains rather than building foundations. Similarly inconclusive are the results from the western edge of the site where the anomalies, although arranged in a rectangular pattern, do not suggest substantial building foundations with stone footings. The pattern of response across the easternmost part of the survey area is difficult to interpret. Many of the responses suggest a combination of landscaping and drainage, of uncertain date, with a few rectilinear anomalies only tentatively interpreted as possible walls and compacted ground.

Despite the additional detail and depth information, the excavation trenches have not been clearly identified except where the responses from features are cut off. For example, the truncation of wall lines and a 'blank' zone at the west end of the nave, or distinct breaks in linear features in the area of the cemetery which confirm the location of Trench 19.

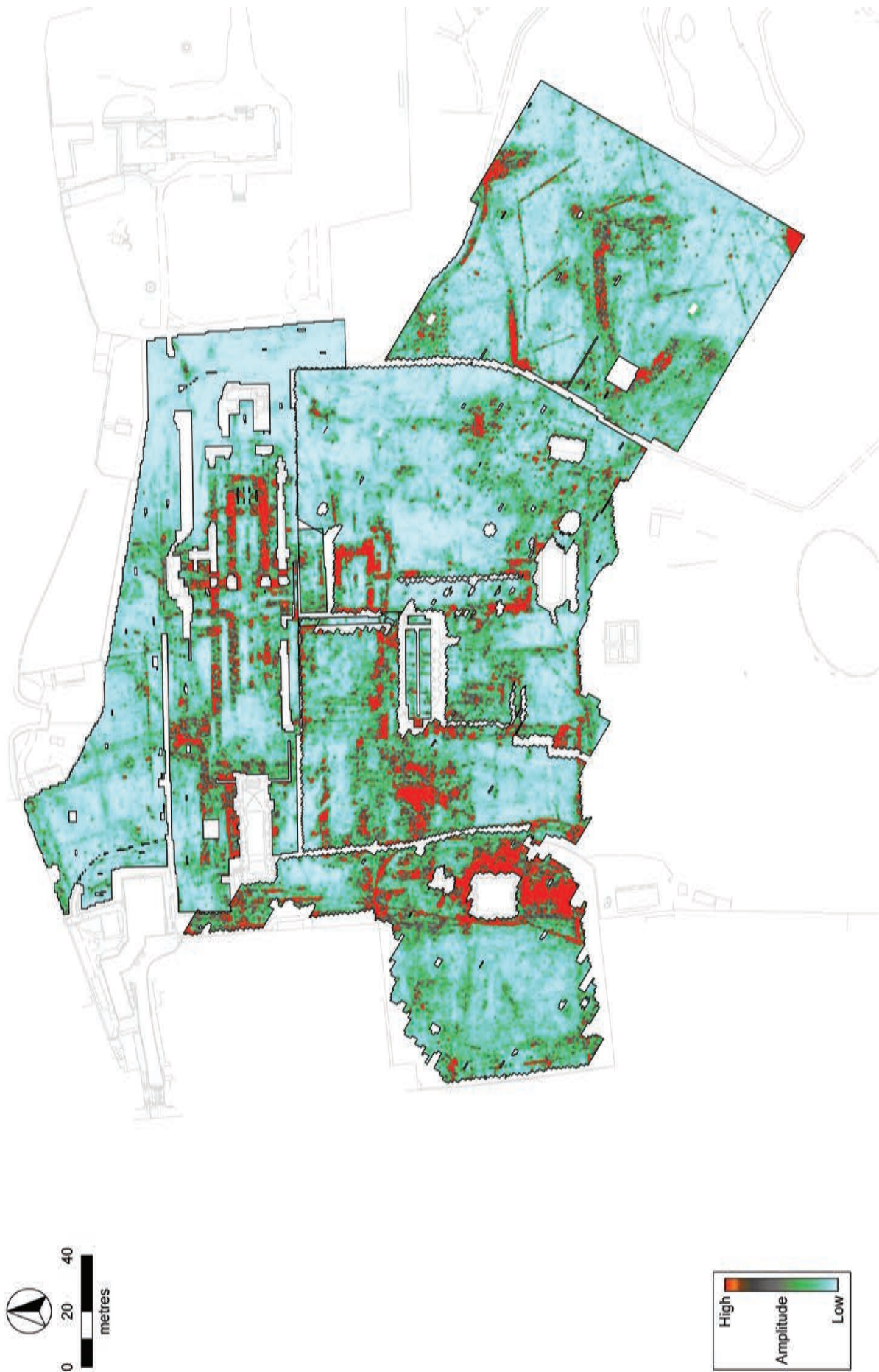
The vallum ditch is not apparent in the timeslices, but has been noted in the radargrams, especially in the area of the north transept, as a pronounced dip in the overlying masonry responses.

### **Conclusions**

The geophysical survey has successfully identified numerous responses associated with remains of abbey structures and assisted in ground-truthing features first identified through excavation. Although many of the responses appear to be associated with the later building phases, this is arguably to be expected since these foundations have not been subjected to removal or remodelling. The interpretation is an ongoing process and, once the known excavated features have been accounted for, weaker responses of possible interest can be examined more closely and perhaps used as the starting point for further investigation of the site.



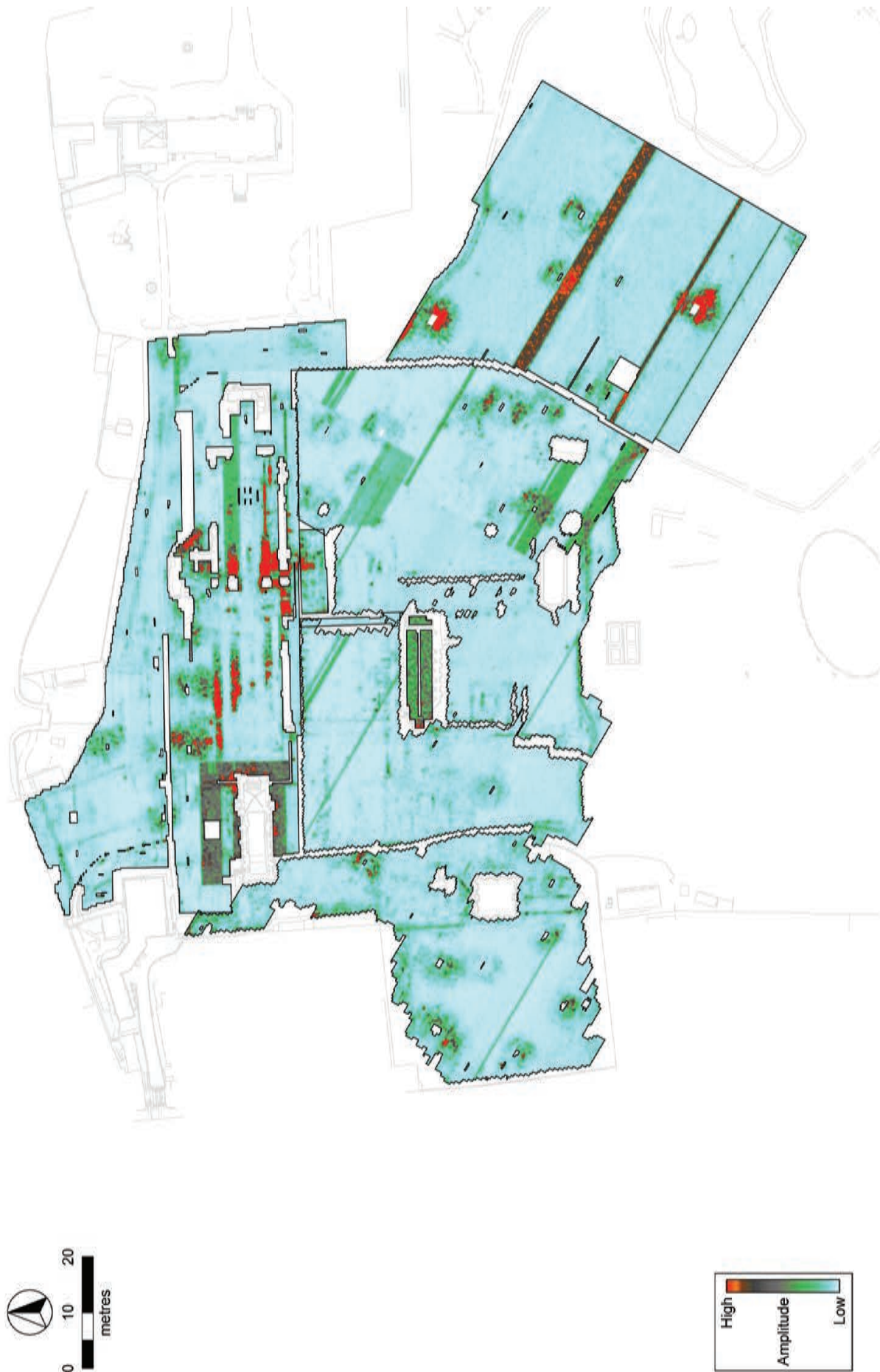
**Fig 2.11** GPR data (migrated and filtered): timeslice 0.0m-0.5m (© Claire Stephens, GSB Prospection)



**Fig 2.12** GPR data (migrated and filtered): timeslice 0.5m–1.0m (© Claire Stephens, GSB Prospection)



**Fig 2.13** GPR data (migrated and filtered): timeslice 1.0m–1.5m (© Claire Stephens, GSB Prospection)



**Fig 2.14** GPR data (migrated and filtered): timeslice 1.5m-2.0m (© Claire Stephens, GSB Prospection)



Fig 2.15 GPR data (migrated and filtered): timeslice 2.0m-2.5m (© Claire Stephens, GSB Prospection)



**Fig 2.16** Magnetic data: interpretation (© Claire Stephens, GSB Prospection)





Fig 2.17 Resistance data: interpretation (© Claire Stephens, GSB Propection)



**Fig 2.18** GPR data: interpretation, timeslice 0.0m–0.5m (© Claire Stephens, GSB Prospection)



**Fig 2.19** GPR data: interpretation, timeslice 0.5m–1.0m (© Claire Stephens, GSB Prospection)



Fig 2.20 GPR data: interpretation, timeslice 1.0m–1.5m (© Claire Stephens, GSB Prospection)



**Fig 2.21** GPR data: interpretation, timeslice 1.5m–2.0m (© Claire Stephens, GSB Prospection)



Fig 2.22 GPR data: interpretation, timeslice 2.0m-2.5m (© Claire Stephens, GSB Prospection)

Of the three techniques applied in the investigations, it is suggested that the GPR survey has proved the most useful in identifying structural remains and magnetic survey the least useful. The limitations of the latter are due to the nature of the deposits (stonework being weakly or non-magnetic) producing generally weak anomalies, combined with severe magnetic disturbance (from both historic and modern sources) obscuring these weak responses.

The historic ground disturbance associated with the various phases of destruction and rebuilding has impacted on the effectiveness of the GPR survey in detecting features at great depth. In particular, the deliberate covering of the site to provide a level surface for later building phases has increased the attenuation (or weakening) of the signal at depth, resulting in poor anomaly resolution.

## 2.7 Finds assemblages

The pilot project identified a team to undertake specialist analysis of the finds assemblages held at the abbey. The Saxon glass furnace material is analysed in Chapter 7 in conjunction with the associated archaeological records. Chapter 8 covers the prehistoric material (lithics and pottery), Roman material (pottery, tile and small finds) and the early medieval to post-medieval assemblages, which include pottery, tile, small finds, glass vessels, metal-working residues, window glass, painted plaster, clay pipes, faunal remains, charcoal and wood. Additional reports available online discuss window came and wax seal impressions. Chapter 9 focuses on the architectural stone, encompassing the post-1184 Romanesque and Gothic worked stone from the abbey.

Chapters 7 to 9 present abbreviated reports on the finds assemblages; extended reports, method statements and full catalogues are available online.<sup>23</sup> Targeted scientific analysis was applied to selected items to identify the composition and provenance of the materials and the area of production and to aid dating. Methods employed included chemical and petrological analysis of the pottery and tile, X-rays of small finds, electron-probe microanalysis (EPMA) and isotope analysis of the Saxon glass furnace material, SEM analysis of the window glass, XRF and XRD analysis of the metal-working residues and selected small finds, and radiocarbon dating of charcoal.

As discussed above, there is limited contextual information for the finds and not all material from precise contexts (or otherwise) was retained. The level of specialist analysis for each group was determined by its

potential value to address the research questions. Some categories were analysed as a whole even though there was limited or no contextual information. For example, study of the ceramic tiles and pottery has revealed the sources of supply at different times in the abbey's life, reflecting the varying fortunes of the abbey, marketing patterns and technological and artistic innovation. Other categories of finds contribute value only when linked to an identifiable context, either as a dating tool (such as the charcoal submitted for radiocarbon dating), or as an indicator of spatial zoning (for example the faunal material). Some assemblages have been useful for both purposes – in particular the pottery, which represents the greatest proportion of finds within the pre-1184 contexts.

The finds reports use the numbering system employed for the Modes Database, the abbey's curatorial record. The abbey accession numbers are prefixed with GLSGA, followed by year of accession to the Modes system (not the excavation year) and a consecutive number; many of these numbers have been extended as a result of reanalysis during this project. The shorter abbey-assigned numbers relate to material type and have been adopted for most of the specialist reports; some of these numbers have also been extended during the project. Some of the specialist reports use the IADB numbering where pre-existing cataloguing of the assemblage was insufficient; standard modern prefixes are used to distinguish the different kinds of find type, such as bulk finds and small finds.

## 2.8 The digital archive

An objective of the research project was to safeguard the antiquarian records and make digital copies that would be accessible for future research. The Glastonbury Abbey Conservation Plan recommends that the records and finds are physically reunited in one repository.<sup>24</sup> At present this is not practically viable; however, a centralised digital archive has been achieved, bringing together the dispersed records for the first time. The records and full results of the project are maintained by the Archaeology Data Service (ADS) which is also home to more recent surveys and archaeological recording at Glastonbury Abbey.<sup>25</sup> The purpose of the Glastonbury Abbey antiquarian excavation resource is thus twofold: it serves as an archive and as a research tool.

The catalogues constructed during the project serve as a starting point for future researchers, providing a detailed list of all relevant records including location, unique number, description and how the record was used

for the current project. The unique number comprises an accession number, assigned number or original number designated during the antiquarian excavations; an IADB number is also given where relevant. Not all the items within the catalogue are included in the ADS archive; for example, where documents represent work in progress by Wedlake and Radford, only the latest copies are included. Secondary sources such as letters warranted only a listing in the catalogue but some notes have been included.

All the primary sources used within the IADB have been transferred to the ADS, maintaining the tagging system that links the records together. These consist of scans of original sections, plans and photographs, documents comprising transcriptions of excavation notes (incorporating sketches and newly assigned context numbers) and the better-quality write-ups or work drafted for publication by Radford and Wedlake. Material

created within the IADB included the digitised section drawings and trench plans, context records, finds records, photographic records, matrices, site phasing, transcriptions of antiquarian site notebooks and other relevant accounts, new full excavation reports and the associated bibliography. The original plans were not used within the IADB as they were dealt with separately (see above) and are included within the ADS archive.

Another important aspect of the online archive was to accommodate work that could not be included in the monograph. Primarily this comprises the detailed introductions and results for each area of excavation (the discussion and conclusion sections have been absorbed within this monograph and are not replicated in the ADS archive). In addition, the ADS makes available full catalogues and unabridged specialist reports and the full results of scientific analysis, appendices and tables.



# A sense of place: history, buildings and landscape

*Roberta Gilchrist*

## 3.1 Introduction

...there was an island belonging to the crown, the Old English name for which was Glastonbury. It spread wide its curving shores, surrounded as it was by waters in which fish abounded and by river swamps. It was well suited to the many requirements of human need, and, what is most important, it was given over to the holy service of God.<sup>5</sup>

Monastic archaeology has traditionally focused on describing the physical development of the religious precinct and its buildings, prioritising economic themes in interpreting their evolution.<sup>1</sup> Recent studies have advocated a more holistic understanding of monastic *place*: the relationship of the monastic community to their environment and concepts such as social memory and tradition as reflected in ritual behaviours in the landscape.<sup>2</sup> Significant local narratives were also attached to monastic landscapes, with some achieving 'biographies of place' which became embedded in community identities.<sup>3</sup> This more holistic approach is essential to the study of Glastonbury Abbey, where the distinctive perception of place gave rise to legendary traditions and informed the use of material culture.

The monastery was an active agent in shaping its physical and cultural environment: for spiritual, political and economic reasons, the monks created their own 'origins story' which was embellished by successive generations and continues to resonate today. The monastic community placed tremendous importance on

its religious heritage, for example promoting social memory through the use of archaic architectural style and the reuse of materials (see Chapter 11). The physical character of the abbey was designed to convey antiquity, to sustain continuity and to forge a collective identity for the monastery.<sup>4</sup>

## 3.2 Topography and settlement history

### Geology and topography

Glastonbury Abbey (NGR 350100, 138800) is situated on the lower western slope of a peninsula that protrudes into the Somerset Levels to the south west, known traditionally as the 'Isle of Avalon' (fig 3.1). The town and abbey lie below 35m above Ordnance Datum on clay and limestone, surrounded by three hills formed by outcrops of lias clay and silt (Windmill Hill, Stone Down Hill and Tor Hill).<sup>6</sup> The most prominent of these hills is better known as Glastonbury Tor, a distinctive pinnacle (158m) capped with hard sandstone, which is visible for up to 40km in all directions (fig 3.2). The summit of the Tor is crowned by the tower of the ruined chapel of St Michael and this feature dominates the surrounding flat lands. It has been argued that a sacred landscape had emerged around Glastonbury by the sixth century or earlier, attracted by the symbolic potency of the Tor rising from this watery landscape, combined with the ample economic resources of the surrounding wetlands.<sup>7</sup>

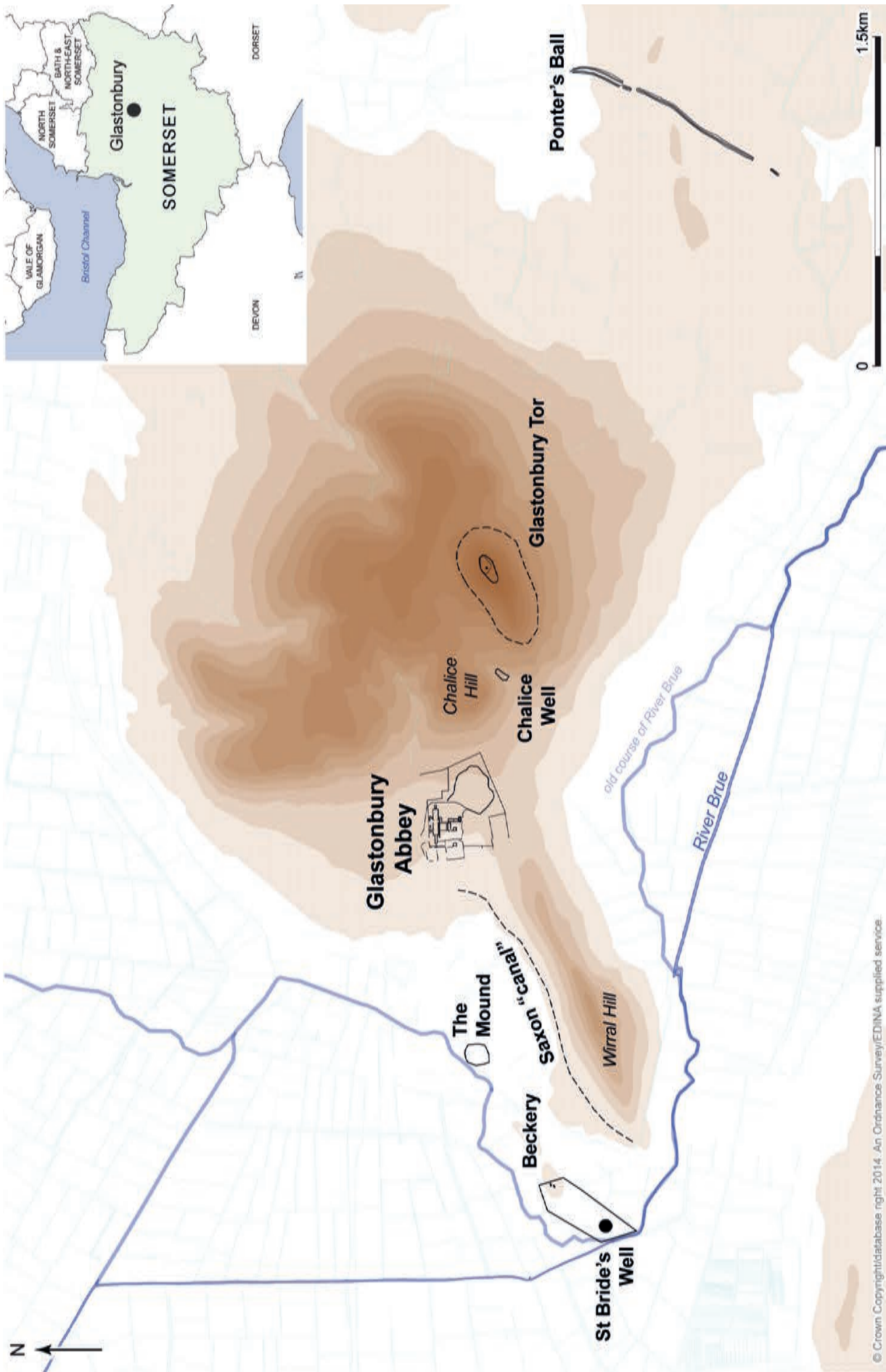


Fig 3.1 Location of Glastonbury Abbey, archaeological setting and topography (scale 1:25,000)



**Fig 3.2** Glastonbury Tor from the south west (© Mick Sharp)

The earliest topographical description of Glastonbury is contained in the *Life of St Dunstan*, written c 995 by a monk known only as 'B', but drawing on his earlier memories of the community from around the mid-tenth century. The passage quoted above confirms that the early monastery was perceived as an island prior to the draining of the surrounding levels. Islands located within this wetland environment were valued for both their spiritual and economic significance. Peninsulas and islands were regarded as particularly suitable locations for the siting of Anglo-Saxon monasteries: the natural topography provided a sense of isolation while at the same time situating the monastery within a prime farming zone and affording good communication and mobility by water. The 'island' metaphor was also symbolically charged, enhancing the sense of 'boundedness' that was fundamental to the monastic ideal of enclosure that originated with desert monasticism.<sup>8</sup> The distinctive landscape of Glastonbury may have acquired sacred status before the Conversion period: the pagan Anglo-Saxons perceived wetlands as gateways to other worlds, while seasonal islands and marshes possessed spiritual value as places of assembly, territorial boundaries and crossing places.<sup>9</sup>

The Anglo-Saxon monastery was active in reshaping the wetland environment: there is archaeological evidence for a 1.75km canal running from the River Brue to the market place to the west of the precinct in Glastonbury; radiocarbon dates suggest this may have been constructed in the ninth or tenth centuries.<sup>10</sup> The medieval abbey managed the watery landscape for great economic benefit: wetlands were drained for use as meadow pasture when agriculture expanded during the twelfth and thirteenth centuries; rivers were canalised for navigation, flood prevention and powering mills; and unclaimed land was utilised as a source of fish, wildfowl, reeds and alder wood.<sup>11</sup>

Urban settlement appears to have coalesced around the market place established to the north west of the abbey by the early thirteenth century, from which streets developed to the east, south, west and north.<sup>12</sup> Domesday Book makes no mention of a town at Glastonbury, and the extent and character of pre-Conquest occupation is not yet clear. It appears that a small Late Saxon settlement was located outside the north-west gate of the abbey: the evidence comprises sherds of Late Saxon pottery from ditches and the remains of timber structures found during excavations close to the terminus of the Saxon canal and monastic ditch.<sup>13</sup> Anglo-Saxon minsters generally stimulated early urban development but Glastonbury is an exception to this rule: the monastery

directed its energies towards amassing extensive rural estates rather than encouraging urban growth.<sup>14</sup> The precinct came to occupy a central position within the medieval town, with ribbon settlement developing along streets at the north-west, north-east and south-east corners of the precinct (fig 3.3), so that the precinct today is bounded by Magdalene Street to the west and Silver Street to the north, with High Street running parallel to the precinct on the north, Chilkwell Street to the east and Bere Lane to the south.

The natural topography within the precinct rises gradually towards the north and east, although extensive terracing and landscaping are evident. The geology comprises Langport Member Blue Lias Formation and Charmouth Formation undifferentiated Jurassic sedimentary mudstone under seasonally wet, slightly acid, loams and clays with impeded drainage and moderate fertility.<sup>15</sup>

## Settlement history

The place name 'Glastonbury' dates before c 1000 and combines both Celtic and Saxon elements. The suffix 'bury' (*byrig*) may refer either to a fortified place or to a monastic enclosure. The origins of the prefix 'glaston' are unknown, but it is first used in charters from the late seventh century; subsequent traditions explained the origins of the name as being connected with a man named *Glasteing*. The earliest Welsh form dates from the late twelfth century: 'Yneswytrin' means island of glass (*vitrea*) or woad.<sup>16</sup>

Important prehistoric remains have been preserved by the extensive peat deposits to the west of the town but little prehistoric archaeology has been recorded to date on the Glastonbury peninsula and Tor.<sup>17</sup> The neck of the natural peninsula into Glastonbury is crossed by Ponter's Ball, a substantial bank with residues of a ditch on its east side (fig 3.1). A section excavated in 1909 by Arthur Bulleid revealed Iron Age pottery deep in the ditch and medieval pottery below the turf and in the original ground surface below the crest of the bank. The part of the bank examined thus appears to be medieval but there are also indications of Iron Age construction.<sup>18</sup> The southern slopes of Wirral Hill, to the south west of the abbey, have produced Roman building material and were home to an abbey vineyard and park in the medieval period.<sup>19</sup> The vineyard was well documented in the thirteenth century: its likely location is Barrow Hill, where earthwork terraces are still extant.<sup>20</sup> An earthwork known as The Mound, approximately 1km to the west of the abbey, yielded archaeological material spanning the

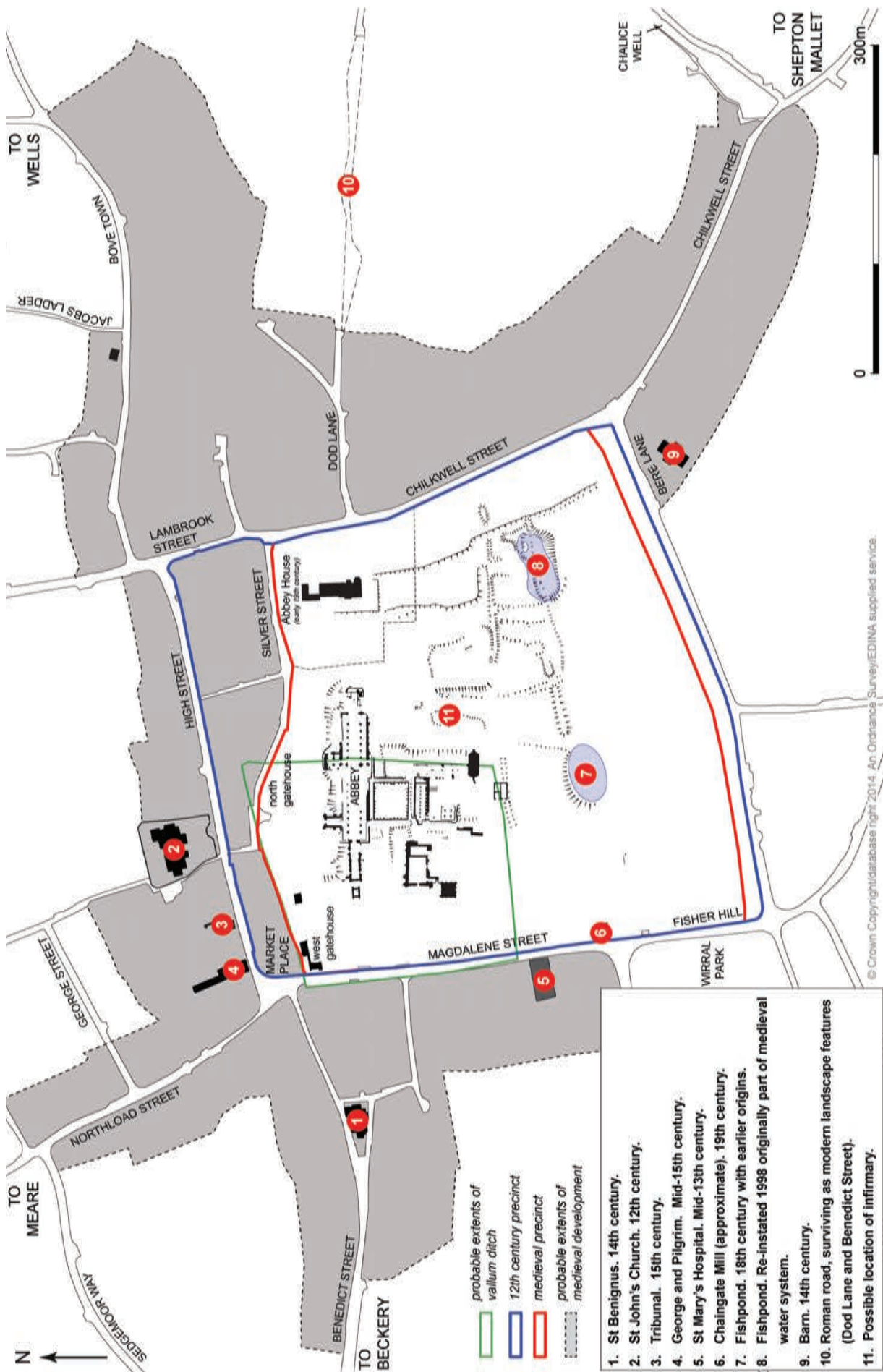


Fig 3.3 Setting of Glastonbury Abbey with precinct extents and relevant heritage assets (scale 1:5,000)

prehistoric to medieval periods; this included Bii ware (LRA1), dating to the mid-fifth to sixth centuries, and two iron-smelting furnaces dating to the tenth to twelfth centuries.<sup>21</sup> Some 2km to the south west is Beckery, one of the 'daughter-houses' of the abbey, established in the Mid Saxon period on the edge of the Glastonbury peninsula.

Within the immediate landscape of Glastonbury Abbey is Chalice Well, a natural warm spring that has attracted visitors since the prehistoric period.<sup>22</sup> During the nineteenth century, the spring acquired the status of a holy well used by Joseph of Arimathea to wash the Holy Grail; however, the evocative name 'chalice well' does not derive from an association with the vessels of the Passion, but rather from the more prosaic 'chalk well'.<sup>23</sup> Chalice Well was important to the medieval abbey as the principal source of its water supply: excavations by Philip Rahtz recorded a late twelfth-century well-house that protected the source, from which wooden pipes carried water to the abbey precinct by gravity for a distance of 300m.

Mick Aston proposed that the 'island' of Glastonbury was part of a network of islands in the Somerset marshes that hosted eremitic monasteries of the early British church. There were hermitages at Glastonbury Tor and Beckery and possibly on the islands of Meare, Godney and Marchey; in addition fourteen possible pre-Conquest hermitage sites have been identified in the Somerset Levels.<sup>24</sup> Those at Glastonbury Tor and Beckery were excavated by Philip Rahtz and provide important comparanda for the excavations at Glastonbury. Excavations at Glastonbury Tor took place in 1964–6, revealing timber buildings set on platforms cut into the rock. Early medieval deposits survived on the sides of the summit, dated to the fifth to sixth centuries by sherds of Bii or LRA1 ware amphorae, imported from the Mediterranean. Two graves of unknown date were recorded, oriented south–north rather than the customary Christian orientation of west–east. Late Saxon occupation was represented by the remains of a carved cross-base and by metal-working hearths associated with fragments of two crucibles and residues of copper-alloy slag. Rahtz emphasised the significance of the finds at the Tor as being earlier than anything found at the abbey.<sup>25</sup> Excavations took place at Beckery in 1967–8, revealing a small monastery dating to the Late Saxon period, rebuilt in later centuries. A small timber chapel was associated with a cemetery containing a minimum of sixty-three individual inhumations; all but three were adult males, indicating a monastic community.<sup>26</sup> Glastonbury's legends attribute Beckery with an Irish connection and

claim that St Bridget visited the hermitage in the fifth century and left behind personal possessions, which were displayed by the later medieval abbey as her relics, consisting of a wallet, necklace, bell and weaving implements.<sup>27</sup>

### 3.3 The Anglo-Saxon monastery: history and legends

#### Foundation and history

Key questions relating to the Anglo-Saxon monastery are the date and nature of its foundation and the impact of the Vikings on the Late Saxon religious community. Monastic life at Glastonbury appears to have flourished uninterrupted from the late seventh century until 1066, when it was the wealthiest monastery in England. Glastonbury was exceptional in weathering the Viking invasions: the survival of early charters suggests some degree of continuity throughout the tumultuous ninth century. The history of the early monastery was well documented by William of Malmesbury – a monk of St Albans Abbey and a highly reputable medieval historian – in *De Antiquitate Glastoniensis Ecclesie* (c 1129–30).<sup>28</sup> However, there are no early documents surviving to corroborate his account, and elaborate myths (discussed below) have been fabricated to account for the monastery's origins.<sup>29</sup> The precise circumstances surrounding the commissioning of William of Malmesbury's history are unknown, but the hand of Abbot Henry of Blois may be assumed (1126–71), given that *De Antiquitate* was dedicated to him. Henry commissioned the ambitious rebuilding of the abbey's physical infrastructure and it is likely that he sought a new history to provide ideological underpinning.<sup>30</sup>

Recent reassessment of the archive of Anglo-Saxon charters has provided important new insight in to the early monastery.<sup>31</sup> A collection of sixty-one charters is extant, principally royal diplomas: thirty-nine date to the tenth century, seven to the ninth century, fifteen to the seventh or eighth century and one is an eleventh-century forgery. Susan Kelly has judged the charters to be largely authentic, although many survive only as fourteenth-century copies. An early list of charters, the *Liber Terrarum*, suggests that over one hundred more Anglo-Saxon charters may once have existed. The veracity of the list is uncertain and the archive is a formidable challenge

to interpretation. Kelly suggests that, by the tenth or eleventh century, the Glastonbury archive was already being manipulated to construct a mythical past for the monastery.

The earliest historical evidence for the monastery at Glastonbury dates from the last three decades of the seventh century, with extant (and lost) charters granted by the West Saxon kings Cenwealh (641–72), Centwine (676–85) and Ine (688–726). The early monastery briefly regarded Centwine as its founder, until he was marginalised by the impetus to demonstrate ancient Christian origins. The evidence for earlier benefactions by Cenwealh is insecure and the actual role of Centwine remains uncertain. However, it is clear that King Ine played a major role; indeed, he was credited as the founder of Glastonbury in William of Malmesbury's earlier works, *Gesta Pontificum* (1125) and *Gesta Regum* (1125–6).<sup>32</sup> When William wrote his history of Glastonbury in 1129–30, he attributed an instrumental role to King Ine, including construction of the great church dedicated to Saints Peter and Paul, located to the east of the *vetusta ecclesia*.

Kelly observes that the timing of royal interest in Glastonbury coincided with the consolidation of West Saxon rule in the formerly British areas of Devon, Somerset and north Wiltshire.<sup>33</sup> The medieval community believed that the monastery had descended from British and Irish antecedents; an alternative scenario is that Glastonbury was founded by West Saxon kings and bishops who appropriated the assets of British religious communities and used them to endow a flagship Saxon monastery.<sup>34</sup> During the reign of King Æthelheard (726–40), the abbey benefited from substantial endowments of land.<sup>35</sup> William of Malmesbury was able to construct a clear picture of successive abbots and land acquisition in the eighth century but his sources for the ninth century were less secure. The charter evidence confirms the presence of a religious community at Glastonbury during the ninth century, but it is doubtful that regular monastic life was sustained throughout this period. It is perhaps more likely that a secular minster was in place, an establishment of secular priests who may not have lived communally. Indeed, the earliest life of St Dunstan suggests that there were no monastic buildings present when Dunstan became Abbot of Glastonbury in 940.<sup>36</sup>

Aspects of the tenth-century monastery can be gleaned from the earliest *Life of St Dunstan*, written by the monk known as 'B', who was educated at Glastonbury and had personal experience of the monastery and its abbot.<sup>37</sup> B describes Glastonbury as *regia insula*, a royal vill or island, and records the presence of a colony of Irish

scholars (*peregrini*, see below); Kelly postulates that it may have served as a school for young noblemen, operating under royal patronage.<sup>38</sup> Glastonbury in the tenth century was evidently a place of learning and possibly of manuscript production: a composite manuscript associated with Glastonbury includes annotations by Dunstan and an illuminated frontispiece shows Dunstan prostrate before Christ.<sup>39</sup> Glastonbury flourished under Abbot Dunstan, who substantially rebuilt and reformed the monastery. He 'first surrounded the cloisters on every side with solid monastery buildings' and enclosed the monks' cemetery with a stone wall.<sup>40</sup> He was also a great statesman who had a profound influence on the court: his example inspired a massive transfer of land resources from the secular aristocracy which fuelled the tenth-century monastic reform.<sup>41</sup>

Royal favour towards Glastonbury is confirmed by the choice of the monastery as the burial place of King Edmund I (d 946), King Edgar I (d 975) and King Edmund II (Ironside; d 1016). At the time of the Norman Conquest the abbey held 416 hides in Somerset, 259 in Wiltshire, 58 in Dorset, 40 in Berkshire, 20 in Gloucestershire, 6 in Devon and 1 in Hampshire. The home manor of Glastonbury was assessed at Domesday as twelve hides, and is said never to have paid tax. The medieval abbey claimed that this 'Twelve Hides' was a privileged jurisdiction connected with the abbey's early endowment. There is no surviving evidence to substantiate this claim, but it was nevertheless upheld by Henry I in 1121 and Henry III in 1217.<sup>42</sup>

## Glastonbury legends

### The origins story: an apostolic foundation

The earliest record of Glastonbury's origins myth is contained in B's late tenth-century *Life of St Dunstan*, which credited the building of the ancient church (*vetusta ecclesia*) to divine agency: 'for it was in this island that, by God's guidance, the first novices of the catholic law discovered an ancient church, not built or dedicated to the memory of man.'<sup>43</sup> The narrative was further developed by William of Malmesbury in 1129–30. His primary motivation when writing *De Antiquitate* was to prove the great antiquity and unbroken history of the monastery at Glastonbury. At the end of the eleventh century, Osbern of Canterbury had claimed that St Dunstan had been the first Abbot of Glastonbury. It was imperative to the reputation and prestige of the monastery to demonstrate its early origins.<sup>44</sup> William of Malmesbury asserted that the monastery had been founded before the arrival of the

Anglo-Saxons in Somerset and even hinted that Glastonbury originated in an apostolic foundation.

He claimed that the ancient church had been built in the second century by missionaries sent by Pope Eleutherius in AD 166 and cautiously noted the story that it may have been founded earlier by the disciples of Christ. He provided an eye-witness account of the ancient 'brushwood' church that they had allegedly constructed:

The church at Glastonbury ... is the oldest of all those that I know of in England and hence the epithet applied to it. In it are preserved the bodily remains of many saints, and there is no part of the church that is without the ashes of the blessed. The stone-paved floor, the sides of the altar, the very altar itself, above and within, are filled with relics close-packed. Deservedly indeed is the repository of so many saints said to be a heavenly shrine on earth.<sup>45</sup>

He claimed that the walls of the wattle church had been strengthened by Paulinus (c 625) using a layer of boards covered from the top down with lead.<sup>46</sup> The salient point in William of Malmesbury's account is that a church of some antiquity existed on the site in the early twelfth century and that it was preserved as a relic of the early monastery and its founders. This old church, *vetusta ecclesia*, was destroyed by fire in 1184. The medieval Lady Chapel was rapidly erected on the same site and became an associative relic of the ancient community of saints.

By the mid-fourteenth century, the legend attributed the foundation of the old church to Joseph of Arimathea. According to the Gospels, Joseph was the man who had donated his own tomb for the body of Christ following the Crucifixion. The Glastonbury legend claimed that Joseph had been sent to Britain from Gaul by Christ's disciple, St Philip, together with twelve of his followers. A specific foundation date is stated for the old church as AD 63, and the dedication is noted as being in honour of the Virgin.<sup>47</sup> By directly linking the foundation of the monastery with the life of Christ, the monks of Glastonbury assured their success in attracting revenue from patrons and pilgrims; they also established the abbey's premier status as the earliest Christian foundation in Britain. It was relatively common for Benedictine monasteries to embellish their histories in order to claim religious and political authority, but Glastonbury excelled in this strategy above all others.<sup>48</sup> Many Benedictine abbeys crafted institutional histories that stressed the antiquity of the monastery and its connection with early saints.<sup>49</sup> However, Glastonbury was audacious in claiming both that its foundation was divinely inspired and that it

was directly linked to the life of Christ.

The origins story has shaped the history and character of Glastonbury Abbey, creating a 'biography of place' that connects local inheritance to biblical traditions. It has also impacted on archaeological interpretation: despite the absence of any physical evidence for the existence of the *vetusta ecclesia*, each successive interpretation has assumed the location and significance of the old church. Early excavators accepted the legend uncritically: Bligh Bond, for example, sought evidence in the 1940s to corroborate the story of Joseph of Arimathea and the foundation in the first century AD of an apostolic church at Glastonbury.<sup>50</sup>

### A Celtic precursor

The medieval community promoted an Irish heritage and believed that both St Patrick and St Bridget had visited the early monastery. Celtic saints figured strongly in the medieval abbey's calendars of feasts and lists of relics: they claimed to have the bones of St Patrick, St Benignus and St Indract, as well as personal objects associated with Bridget (discussed above). The medieval monks traced ancestral connections to these early Celtic saints in order to lend authority to their origins story. These traditions were invented in the tenth century or later, but there is strong evidence for the presence of an Irish community at Glastonbury around the tenth century.<sup>51</sup> B's *Life of St Dunstan* states that: 'Irish pilgrims [*peregrini*], like men of other races, felt special affection for Glastonbury, not least out of their desire to honour the elder St Patrick, who is said to have died there happily in the Lord.'<sup>52</sup> Glastonbury's claims to Celtic origins have directly affected the interpretation of its archaeology.

Raleigh Radford acknowledged that his excavations at the abbey had discovered no evidence for a religious community at Glastonbury earlier than the eighth century. Despite this absence of evidence, he postulated a Christian community at Glastonbury 'in Celtic times' and considered the abbey as one part of the 'holy city' of the island of Avalon. Radford's 'radical stance' proposed that Glastonbury was a pagan holy place of the ancient Celts.<sup>53</sup> He offered three pieces of evidence for this theory: he argued that the earthwork Ponter's Ball (discussed above) was not a defensive feature but rather a Celtic religious sanctuary; he cited the association of Glastonbury with St Patrick and St Indract and assumed that these connections must have originated before the foundation of the Anglo-Saxon monastery; finally, he claimed that the earliest excavated evidence at Glastonbury was similar in form to Irish monasteries.<sup>54</sup> As noted above, the dating



of Ponter's Ball is inconclusive and the association of Glastonbury with Irish saints is likely to have originated in the tenth century. The earliest structural evidence excavated at Glastonbury is the sequence of Saxon churches, which are firmly in the tradition of axially aligned 'families' of churches that are distinctive to Anglo-Saxon monasteries in England (see Chapters 4, 10 and 11).<sup>55</sup>

## 3.4 The medieval abbey

### Sources and outline history

William of Malmesbury gives an account of the history of the abbey up to c 1130, which is supplemented by the evidence of charters and papal bulls.<sup>56</sup> The abbey's Great Chartulary survives as a fourteenth-century manuscript and was transcribed and published by Dom Aelred Watkin.<sup>57</sup> The later narrative sources are Adam of Damerham's *Historia de Rebus Gestis Glastoniensibus*, an account of the abbey from 1126 to 1290, and the mid-fourteenth-century *Cronica sive Antiquitates Glastoniensis Ecclesie*, the chronicle of John of Glastonbury (c 1340–2).<sup>58</sup> A list of abbots and a summary chronology based on these has been published by Carley.<sup>59</sup>

The transition from Anglo-Saxon monastery to Norman abbey was a painful one: the last Anglo-Saxon abbot, Æthelnoth, was taken hostage by William the Conqueror in 1067 and then deposed by Archbishop Lanfranc in 1079. Turstin (1078–96), the first Norman abbot, imposed changes in liturgy and lifestyle that were stubbornly resisted by the monks; this culminated in a bloody battle in the abbey church, in which at least two monks were killed and fourteen wounded. The apogée of the Norman monastery came under its powerful fourth abbot, Henry of Blois (1126–71), grandson of William I, nephew of Henry I and brother of King Stephen. Henry's long abbacy secured Glastonbury's prestige: he consolidated the estate, donated books and relics, commissioned *De Antiquitate* and was a prodigious patron of architecture. Disaster struck shortly after his death when, in 1184, a major fire razed the church, claustral buildings and monastic offices. Immediate rebuilding began with the support of Henry II, but ceased with his death in 1189. During the abbacy of Henry of Sully (1189–93), the entrepreneurial monks raised funds by taking their relics on national tour and promoting the legend of King Arthur's burial at Glastonbury (discussed below).

The fame attracted by Arthur's exhumation in 1191

brought some unwanted attention: for a period of twenty-five years, Glastonbury Abbey was annexed to the Diocese of Bath and remodelled as a cathedral priory. Savaric de Bohun, Bishop of Bath, declared himself Abbot of Glastonbury in 1193 with the support of the king and pope. The monks chose to elect their own abbot and Savaric retaliated by excommunicating them. The dispute continued after Savaric's death in 1205 and a compromise was eventually reached in 1218–19 with Jocelin of Wells, Bishop of Bath and Glastonbury. Ten Glastonbury manors were annexed by the bishop and transferred to Wells, exacerbating the jealous rivalry that existed between the two monasteries. The period between the mid-thirteenth and the fifteenth centuries was a comparatively settled one for the abbey and the town, with continued expansion of the estates.<sup>60</sup> The history of the abbey in the later Middle Ages has been described in outline by Carley, and the chronology of the main monastic buildings is presented in summary below.<sup>61</sup>

The notorious story of the abbey's dissolution produced a monastic martyr and achieved its own legendary status. Glastonbury was one of the last monasteries to be dissolved: its enormous wealth, valued in 1535 at £3,301 17s 4d, promised a glittering prize for Henry VIII. Abbot Richard Whiting (1525–39) was arrested on a fabricated charge of treason in 1539 and found guilty of 'robbery' from his own church. He was hanged and quartered on Glastonbury Tor, together with two of his monks: John Thorne, the treasurer, and Roger Wilfrid, one of the youngest members of the community. Whiting was attached to a hurdle at the abbey gate and dragged through the town and up the Tor, where it was said that he 'took his death patiently'. His head was placed over the great gate of the abbey and the four quarters of his body were displayed at Wells, Ilchester, Bridgwater and near Bath.<sup>62</sup> The brutal treatment of Glastonbury's last abbot entered folk memory and continues to haunt local imaginations today. It is an excellent example of how monastic landscapes become linked with local narratives and community identities. Glastonbury's Dissolution story prompts local sentiments connected to mortality and loss, contributing to a distinctive 'biography of place'.<sup>63</sup>

### Population and social composition

There were seventy-two monks at Glastonbury in 1172, just over eighty in the early fourteenth century and around fifty from the time of the Black Death up to the Dissolution.<sup>64</sup> There were two other religious groups living in the monastic precinct: the residents of an

almshouse in the north-west corner of the precinct and the college of secular priests attached to the Lady Chapel. There were two successive charitable foundations on the same site. An early hospital dedicated to St John the Baptist was maintained by the almoner of the abbey to care for poor and infirm persons; by 1246, this hospital had moved outside the precinct.<sup>65</sup> Abbot Richard Beere (1493–1524) refounded the hospital in 1512 as an almshouse with a chapel for seven to ten poor widows. It was stipulated that the widows could not practise midwifery or any other occupation; this prohibition was presumably intended to limit the numbers of secular women visiting the precinct.<sup>66</sup> Abbot Adam of Sodbury (1323–34) established the chaplains of the Galilee in 1332: four priests were attached to the Lady Chapel and given a garden and house adjacent. There were also permanent secular residents: the abbey supported three royal corrodians, pensioners who were nominated by the king.<sup>67</sup> Secular servants, including a laundress, a tailor and a barber, were employed in the precinct but were not necessarily resident.<sup>68</sup>

## Saints and legends

### The burial place of King Arthur

The legendary association of King Arthur with Glastonbury Abbey continues to enjoy international currency today. The connection was not promoted until the late twelfth century but it was subsequently integrated in to the abbey's foundation story. The origins of a possible historical figure of Arthur in the fifth or sixth centuries are still debated, but the literary figure took shape in the twelfth and thirteenth centuries, following Geoffrey of Monmouth's *Historia Regum Britanniae* (c 1136).<sup>69</sup> This pseudo-history of the kings of Britain set the scene for Glastonbury's Arthurian legend: it claimed that, after being mortally wounded, Arthur was carried to the Isle of Avalon to die; the precise circumstances of his death and his burial place were unknown.

The monks of Glastonbury claimed the discovery of Arthur's remains in 1191, staging the spectacle of exhumation recorded by Gerald of Wales:

Now the body of King Arthur ... was found in our own days at Glastonbury, deep down in the earth and encoffined in a hollow oak between two stone pyramids ... In the grave was a cross of lead, placed under a stone ... I have felt the letters engraved thereon ... They run as follows: 'Here lies buried the renowned King Arthur, with Guinevere, his second wife, in the isle of Avalon' ... two parts of the tomb, to wit, the head, were allotted to

the bones of the man, while the remaining third towards the foot contained the bones of a woman ... there was found a yellow tress of woman's hair still retaining its colour and freshness; but when a certain monk snatched it and lifted it with greedy hand, it straightaway all of it fell into dust ... the bones of Arthur ... were so huge that his shank-bone, when placed against the tallest man in the place, reached a good three inches above his knee ... the eye-socket was a good palm in width ... there were ten wounds or more, all of which were scarred over, save one larger than the rest, which had made a great hole.<sup>70</sup>

Gerald went on to explain that Henry II had informed the monks where to dig, having received the information himself from 'an ancient Welsh bard'. Adam of Damerham later reported that the exhumation site was concealed by curtains. The control of visual access would have increased the element of mystery, but also smacks of deceit.<sup>71</sup>

The lead cross supposedly found in the grave survived up to the seventeenth century and was published in the 1607 edition of *Britannia* by the antiquary William Camden (fig 3.4). It has been suggested that the style of the lettering is tenth-century and that the object may represent a twelfth-century forgery of an earlier artefact.<sup>72</sup> Mortuary crosses of similar form have been recorded in excavated graves dating to the eleventh century at St Augustines, Canterbury, suggesting that the monks copied a relatively recent burial practice.<sup>73</sup> The two stone 'pyramids' (fig 3.5) were first described by William of Malmesbury, who noted their great age and stated that they bore carved figures and names; modern scholars consider them to have been Late Saxon cross-shafts.<sup>74</sup>

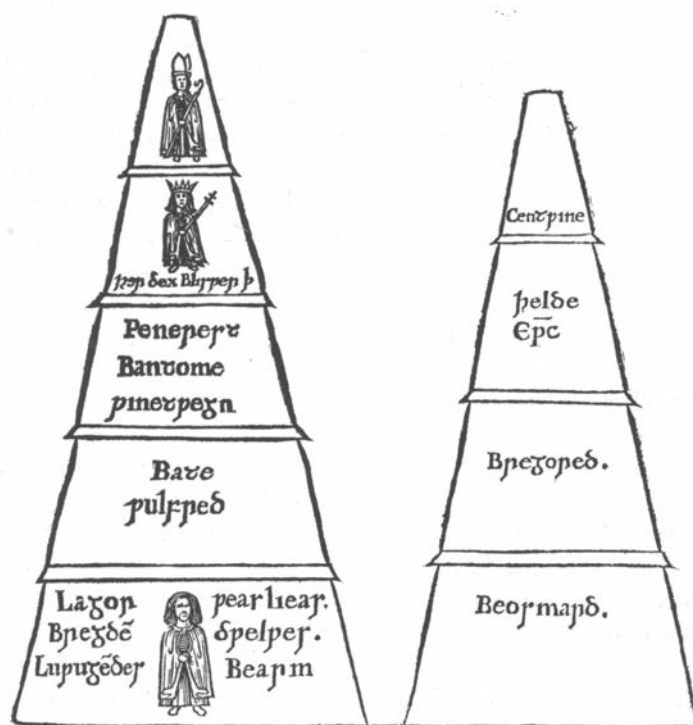
Antonia Gransden assessed different versions of the exhumation story and concluded that the monks deliberately buried two skeletons and then staged the find 'for the credulous public'.<sup>75</sup> The discovery of Arthur's grave at Glastonbury was potentially beneficial to both the abbey and the reigning Plantagenets. The monks needed to attract funds and patronage to rebuild the abbey after the disastrous fire of 1184 and the subsequent death of Henry II (d 1189), their royal patron. At this time, Glastonbury had no major relics to attract pilgrims and certainly could not compete with Canterbury and the allure of Thomas of Becket, following his martyrdom in 1170. It is possible that Henry II encouraged the monks to promote Glastonbury as a rival to Canterbury, to distract from his complicity in the murder of Becket and to create an alternative cult based on royal and secular associations.<sup>76</sup> There were other political motives: the



**Fig 3.4** Lead cross, now lost, allegedly found in 'Arthur's grave' (Camden 1607)

reigning monarchs were struggling to consolidate their empire across Britain and parts of France; locating Arthur's bones on English soil appropriated a Celtic legend to their cause.<sup>77</sup> The new king, Richard I, was cousin of Abbot Henry of Sully, who initiated the exhumation, and appointed him Abbot of Glastonbury. In 1190, King Richard made his nephew Arthur heir to the throne; if he had been crowned, royal patronage for Glastonbury would have been secured.

Following the exhumation in 1191, the remains of Arthur and Guinevere were translated to a tomb in the abbey church. Both Adam of Damerham and John of Glastonbury confirm that this was located 'in the choir, before the high altar'.<sup>78</sup> This location is highly significant: the tomb of Arthur was placed in the most sacred space at the heart of the monastery, one reserved for burials of founders and patrons of the highest status. Julian Luxford argues that Arthur was perceived by the medieval monastery as 'a founder in the extended sense of the term used in the later Middle Ages'.<sup>79</sup> The tomb was relocated on two, or possibly three, occasions; detailed accounts survive of ceremonies that took place in 1278 and 1368. Leland states that Arthur was first entombed near the altar of St Stephen, possibly located in a chapel next to the treasury on the south side of the church. Luxford



**Fig 3.5** Late Saxon 'pyramids'; Henry Spelman's seventeenth-century reconstruction based on William of Malmesbury's description

suggests that the tomb may have been placed in the chapel temporarily, while the presbytery was being rebuilt following the fire of 1184 and up to its reconsecration in 1213. From the early thirteenth century, the tomb of Arthur was located in the prime liturgical space of the choir.<sup>80</sup>

Philip Lindley has offered a possible reconstruction of the appearance of the tomb based on Leland's brief description, together with evidence in the Glastonbury chronicles and comparable examples of funerary monuments. It is assumed that the tomb was destroyed at the Dissolution, shortly after Leland's description was made; its demolition was undocumented and no surviving fragments are known. The tomb was of black marble with four lions at its base (two at the head and two at the foot), a crucifix at the head (west) and an image of Arthur carved in relief at the foot (east). There were inscriptions at the east for Guinevere, at the west for Arthur; also on the west was an inscription to Abbot Henry of Sully. The tomb enclosed separate containers for the remains of Arthur at the head (west) and Guinevere at the foot (east). The tomb was placed centrally before the high altar with the tombs of the Saxon kings relocated to create a royal Saxon mausoleum in the presbytery: Edmund the Elder was to the north and Edmund Ironside to the south.<sup>81</sup>

Lindley argues convincingly that the tomb described

by Leland in the 1530s was the original monument constructed before 1200. The inscription to Abbot Henry of Sully (d 1195) supports this argument: Sully left Glastonbury in 1193 to become Bishop of Worcester; a later tomb would surely have downplayed his role in Arthur's entombment. The choice of material was also significant: black stone, such as Purbeck or Tournai marble, was selected for tombs in the twelfth century and was especially associated with the circle of Henry of Blois.<sup>82</sup> Lindley reconstructs the monument as a sculpted tomb-chest with a gabled lid, elevated and supported by lions. Tomb-chests were unusual in England at the end of the twelfth century, making Arthur's tomb one of a small number of English monuments modelled on classical sarcophagi.<sup>83</sup> The form and material were deliberately selected to place Arthur within the lineage of ancient Saxon kings.

The remains of Arthur and Guinevere were exhumed in 1278 during a visit by Edward I and Queen Eleanor, attended by the Archbishop of Canterbury and a large court retinue. This event drew upon Edward's particular interest in the Arthurian legend and in objects that strengthened his sovereignty. John of Glastonbury describes how, on opening the tomb of Arthur, King Edward 'found there in two separate chests, decorated with their portraits and arms, the king's bones, of wonderful size, and those of Queen Guenevere, which were of great beauty'. The bones were wrapped in palls and replaced in the chests for reburial by Edward and Eleanor the next day: 'They marked them with their seals and directed the tomb to be placed speedily before the high altar, while the heads and knee-joints of both were kept out for the people's devotion'.<sup>84</sup> It is not clear whether the tomb was actually moved in 1278 or merely opened for royal inspection. Lindley observes that Edward deployed Arthur's remains as material evidence for a historical tradition that would support his own aggressively expansionist ambitions.<sup>85</sup>

The tomb was moved in 1368 following the lavish rebuilding of the eastern arm of the church that was begun under Abbot John of Taunton (1274–91) and completed by Abbot Walter of Monington (1342–75). Luxford demonstrates that Monington showed a personal interest in Arthurian iconography and argues that Arthur's tomb was integral to Monington's architectural scheme for the east end of the church. A sixteenth-century copy survives of a document that describes the translation of 1368; this records that the tomb was moved 'from the lower part of the choir [to a position closer] towards the high altar'.<sup>86</sup> The tomb remained in this position until it was observed by Leland in the 1530s.

Monington's own tomb was located in the choir, gaining intercessional benefit from the mausoleum that he had created for the legendary king.<sup>87</sup>

In summary, the association between Arthur and Glastonbury appears to have been invented by twelfth-century monks in a shrewd bid to garner royal favour and pilgrimage income. Modern historians have dismissed the evidence as fictitious and motivated by economic and political expedience.<sup>88</sup> However, the Arthur story played a critical role in strengthening Glastonbury's claim to unrivalled Christian antiquity. It may be more appropriate to consider the 'discovery' as the equivalent of the relatively common practice of forging documents to underpin or exaggerate some aspect of the heritage of a monastic community.<sup>89</sup> While the credibility of the connection is easily challenged, the tomb of Arthur and Guinevere took pride of place in the choir of the Great Church for over 300 years and the legendary king was regarded as a founder. In the later Middle Ages, Arthurian objects were displayed alongside saints' relics on a tomb to the north of the high altar.<sup>90</sup> When Leland visited in the 1530s, he took the tomb to be material evidence that verified the existence of King Arthur and his legend.<sup>91</sup>

King Arthur has been integral to the intangible heritage of Glastonbury since the late twelfth century: the Arthur story is central to Glastonbury's 'biography of place' and creates a sense of local ownership of the mythical king. The Arthurian legend has also influenced the research agenda of modern excavations at the abbey: in 1962, Raleigh Radford staged his own search for the exhumation site that had been announced by the monks in 1191 (see Chapters 4, 10 and 11).

## Pilgrimage and the cult of relics

The medieval abbey keenly promoted its relics and devised innovative means of advertising its Christian heritage to pilgrims. By the fourteenth century, Glastonbury claimed to hold the relics of 300 saints; particular prominence was devoted to early British saints in its relic lists.<sup>92</sup> St Dunstan, Abbot of Glastonbury (940–57) before becoming Archbishop of Canterbury, was also celebrated. His relics included artefacts attributed to his craftsmanship: he is said to have made 'altarcloths, crosses, thuribles, phials, chasubles and other vestments of his workmanship'.<sup>93</sup> Objects attributed to Dunstan survived in the thirteenth century at Glastonbury and possibly into the later Middle Ages.<sup>94</sup> Both Glastonbury and Canterbury claimed to hold Dunstan's physical remains, and the two monasteries dedicated shrines to

him. Glastonbury allegedly rediscovered his bones after the fire of 1184 and immediately constructed a shrine that was further embellished by three successive abbots.<sup>95</sup> Tussles over the relics of patronal saints were not uncommon: for example, the relics of Ripon's St Wilfrid were translated to Canterbury after *c* 950, but later archbishops of York claimed that his relics still resided at Ripon.<sup>96</sup>

It has been suggested that, following the fire of 1184, veneration of the Virgin Mary eclipsed devotion to the panoply of other saints at Glastonbury. Hopkinson-Ball argues that the cult of Our Lady rose to prominence when a statue of the Virgin and Child miraculously survived the burning of the *vetusta ecclesia*. An interpolated passage in William of Malmesbury's *De Antiquitate* describes how the statue was damaged by the conflagration: 'yet because of the fire heat blisters, like those on a living man, arose on its face and remained visible for a long time to all who looked, testifying to a divine miracle.'<sup>97</sup> That the Chapel of Our Lady, built at the site of the destroyed ancient church, became the focal point for pilgrimage and special devotion to the Virgin is confirmed by finds from the excavations (see Chapter 8).

William of Malmesbury described 'streams of people flowing along all the roads' leading to Glastonbury in the early twelfth century.<sup>98</sup> The density of guests and pilgrim traffic demanded extensive investment in facilities for their hospitality; for example Abbot Selwood (1456–93) built the George and Pilgrim Inn, a pilgrims' hospice, to the north west of the precinct (fig 3.3).<sup>99</sup> Glastonbury's role as a cult centre contributed to the development of distinctive zones in the precinct: an area between the north and west gates was dedicated to hospitality and charity (see below and fig 3.11). The visitor experience was managed through early methods of signage and display. A tablet known as *Magna Tabula*, which still survives in the Bodleian Library, set out the abbey's story from the foundation in AD 63 to the refurbishment of the abbey by Abbot Chinnock in 1382. Believed to date to Chinnock's abbacy (1375–1420), the *Tabula* is a hollow wooden box containing two hinged wooden leaves onto which parchment is pasted; smoke stains indicate that it may have been displayed inside the church, perhaps attached to a pillar.<sup>100</sup>

A brass plaque on a pillar, known as St David's Pillar, gave a summary of the origins story in Latin. The plaque is not mentioned in medieval sources and was first recorded in the seventeenth century. The content of the description draws on fourteenth-century sources and the style of the script is likely to date to the early sixteenth century.

The 31st year after the Passion of the Lord twelve saints, among whom Joseph of Arimathea was the first, came here. They built in this place that church, the first in this realm, which Christ in honour of his Mother, and the place for their burial, presently dedicated. St David, Archbishop of Menevia [ie Wales], rested here.<sup>101</sup>

Lindley notes that the plaque is likely to be contemporary with Abbot Beere's creation of the Chapel of St Joseph of Arimathea in the crypt of the Lady Chapel and attributes it to him.<sup>102</sup>

### Joseph of Arimathea

The cult of Joseph of Arimathea was not fully developed at Glastonbury until the later Middle Ages, when the biblical association became more politically advantageous. In the fifteenth century, representation at international Church councils was based on the antiquity and precedence of ecclesiastical foundations. The significance of an apostolic foundation was therefore magnified and material evidence was sought for the connection to Joseph of Arimathea.<sup>103</sup> In 1419, the monks were planning to announce the discovery at Glastonbury of the graves of Joseph and his followers, but they later retracted their claim.<sup>104</sup>

Abbot Beere (1493–1524) was active in promoting Joseph to sainthood as Britain's own apostle. He constructed a crypt chapel dedicated to Joseph beneath the east end of the Lady Chapel; and the almswomen in the hospital founded by Beere wore black livery embroidered with the 'arms' of Arimathea.<sup>105</sup> Glastonbury's legend of 'the holy thorn' developed in post-medieval centuries: it claims that when Joseph of Arimathea reached Glastonbury, he stopped to rest and placed his staff in the ground, where it took root and grew into a thorn tree that blossoms twice a year, at Christmas and in May.<sup>106</sup> The thorn found at Glastonbury is a form of the common hawthorn, *Crataegus monogyna* 'Biflora', which does indeed flower twice a year, in winter and late spring.<sup>107</sup>

### Historical evidence for building campaigns

The chronology of the abbey's buildings can be gleaned principally from the narratives by Adam of Damerham and John of Glastonbury (1126–1291 and up to *c* 1340, respectively).<sup>108</sup> Construction during the abbacy of Walter of Monington (1342–75) is particularly well

documented by sources appended to a copy of John of Glastonbury's *Chronicle*.<sup>109</sup> Leland's *Itinerary*, dating to the 1530s, records tombs in the church and attributes building work to successive abbots.

The controversial first Norman abbot, Turstin (1078–96), began the process of renewing the Anglo-Saxon monastery by building a church. This structure was quickly replaced by his successor, Abbot Herlewin (1100–18), who deemed the first Norman church to be insufficient in scale and grandeur. John of Glastonbury states that Henry of Blois (1126–71) found the monastery in poor repair and set about major rebuilding. Henry 'raised from their foundations the bell-tower, chapter house, cloister, *lavatorium*, refectory, dormitory, the infirmary with its chapel, a beautiful and spacious palace, an attractive gate of dressed stone, a great brewery and stables for many horses.'<sup>110</sup> There is no record of Henry of Blois having carried out work on the church, suggesting that it may have been completed by his time.

Adam of Damerham recorded the devastation of the great fire in 1184: the church and other buildings were 'reduced to a heap of ashes', with the exception of the bell-tower built by Henry of Blois and a chamber and chapel constructed by Abbot Robert (1173–80).<sup>111</sup> King Henry II appointed his chamberlain, Ralph Fitzstephen, *in loco abbatis* (1184–9), to oversee the rebuilding. It was during this period that the precinct was adjusted to form the nucleus of a new medieval town (fig 3.3).<sup>112</sup> Rebuilding work continued during the period in which the abbey was annexed by Savaric de Bohun (1193–1219): archaeological analysis of the standing fabric (discussed below) has assigned dates of c 1200 for the choir and c 1213 for the crossing.<sup>113</sup>

John of Glastonbury records that Michael of Amesbury (1235–52) constructed 'about a hundred buildings from their foundations, within and outside the monastery', including work on the choir and transepts.<sup>114</sup> John of Taunton (1274–91) began rebuilding the church and constructed a new gate to the precinct; Geoffrey Fromond (1303–22) completed the central tower of the church.<sup>115</sup> Adam of Sodbury (1323–34) 'vaulted the largest proportion of the nave of the church and decorated it with splendid paintings. He built the large and excellent clock for processions and public displays' and he began 'the great hall in the abbey'.<sup>116</sup> John of Breynton (1334–42) 'feliculously completed the abbot's great hall, which had been begun and built as far as the tops of the windows, at the expense of a thousand pounds. He left the abbot's chapel to his successor in a finished state: it had been begun and the timber and glass prepared for it. He raised from its foundation a long

chamber next to the abbot's chamber and adorned it with the circuit of a wall to protect it.'<sup>117</sup>

The patronage of Walter of Monington (1342–75) has been the subject of detailed study by Julian Luxford. Monington spent over £1,100 in building projects, including lavish reconstruction of the eastern arm of the church; he lengthened the central vessel by forty feet, built a new eastern ambulatory, paved the whole with *precioso marmore* and installed a sculpted reredos behind the high altar.<sup>118</sup> Recent analysis of the abbot's register has revealed a contract for the choir roof, confirming that the walls of the central vessel had been completed by 1364.<sup>119</sup> Monington also rebuilt parts of the infirmary (see below), part of the abbot's chapel, a walkway between the abbot's chamber and the cloister, the porch of the abbot's hall, and the conventual kitchen, meat-store and grain-store.<sup>120</sup>

Abbot Chinnock (1375–1420) rebuilt the cloisters, the dormitory and the refectory.<sup>121</sup> His successor, Nicholas Frome (1420–56), completed the chapter house, and rebuilt the misericord (the meat-kitchen attached to the infirmary) and the great chamber of the abbot's lodging. He also constructed the embattled wall that surrounds the abbey's precinct.<sup>122</sup>

Abbot Richard Beere (1493–1524) was an energetic builder and promoted the cult of St Joseph of Arimathea through construction of the crypt chapel beneath the Lady Chapel. He was also responsible for the addition of the Loretto Chapel to the north side of the church, the chapel of the Holy Sepulchre in the south part of the nave, and the Edgar Chapel at the east end of the church.<sup>123</sup> Beere also intervened to address the condition of the crossing tower and added supporting piers with inverted arches, possibly resembling the scissor arches at Wells Cathedral, in addition to flying buttresses at the east end of the choir. He had new accommodation constructed for the chaplains of the Galilee and almshouses for poor widows built near the north gate (discussed above). Leland also attributes to Beere the building of the king's lodging by the great chamber (discussed below).<sup>124</sup> The Edgar Chapel was completed under the final abbot, Richard Whiting (1525–39); its completion made Glastonbury the longest ecclesiastical building in England.<sup>125</sup>

### **Current knowledge of the standing buildings**

The surviving architectural remains of Glastonbury Abbey comprise the ruins of the Lady Chapel and the Great Church and three structures that retain their roofs: the abbot's kitchen, St Patrick's Chapel and the Magdalene Street gatehouse.

The monastic ruins are particularly challenging for visitors to read in the absence of claustral remains and because of the unusual siting of the Lady Chapel to the west of the Great Church (fig 3.6). A major programme of building conservation and archaeological recording has been carried out in recent years and is still in progress at the time of writing. The preliminary results of this work challenge the traditional dating for the construction and development of the Lady Chapel, the Great Church and the abbot's kitchen, which is based on studies by Willis and Bond carried out in the nineteenth and early twentieth centuries.<sup>126</sup> The summary below gives a brief account of the major buildings, their appearance and chronology, together with interim reports of new findings (see Chapter 9 and the online archive reports for further discussion).<sup>127</sup>

### The Lady Chapel

The Lady Chapel is the visual focal point of the precinct today and was the spiritual heart of the abbey in the Middle Ages. It was built on the site of the old timber church, following the fire of 1184, and was consecrated in 1186. Its walls survive to full height: it is a rectangular building with high angle-turrets. It was designed as a detached structure of four bays but was later connected to

the Great Church by a Galilee; the chapel is Romanesque in its proportions but is a hybrid of Romanesque and Gothic style. The round-headed windows have chevron decoration while the exterior walls below the windows are decorated with intersecting blind arcading of round-headed arches with chevrons. The turrets are decorated with intersecting blind arcading. The opposing north and south doors have round-headed arches beneath gables, embellished with five orders of rich floral and figural carving. The iconography of the door carvings represents the Life of the Virgin on the north side and an unfinished cycle of the Creation on the south side.

The interior of the chapel was decorated with round-headed blind arcading ornamented with stiff-leaf carving and chevrons (fig 3.7). Fragments of sumptuous paintwork survive on the upper parts of the internal wall-faces.<sup>128</sup> The original scheme covered the whole of the interior, but the surviving evidence is concentrated in a band in the lower register of intersecting arches. Foliage scrolls, stars, the sun and moon were depicted in a rich tapestry of ochre, red, blue, green, white and gold leaf. Holes placed at regular intervals in the upper spandrels of the arcade indicate the positions of armatures that held some form of light-weight ornamental fixture – perhaps metal sunbursts or stars, such as the lead examples discussed by Courtney *et al* later in this volume (see



**Fig 3.6** The Lady Chapel, Galilee and Great Church, looking east-north-east (© Cheryl Green)



**Fig 3.7** The Lady Chapel, looking west (© Cheryl Green)

Chapter 8: Small finds). It has been suggested that the form and decoration of the Lady Chapel may have been deliberately archaic in order to recall the earlier timber church, the *vetusta ecclesia*. It was perhaps modelled to evoke the shape of contemporary reliquaries and decorated to resemble their richly jewelled and enamelled surfaces.<sup>129</sup>

Archaeological analysis of the standing fabric by Jerry Sampson has proposed that the east wall of the chapel was originally lit by three single-light openings; one early window head was reused for the arched recess in the adjacent well-chamber. He proposes that the chapel was provided with quadripartite vaults.<sup>130</sup>

### The Lady Chapel crypt

A chapel dedicated to St Joseph was inserted through the floor of the Lady Chapel in the later Middle Ages. The precise date is unknown but the work is generally attributed to Abbot Richard Beere (1493–1524). The crypt was formed by removing the soil inside the foundations of the Lady Chapel and digging further down into the natural clay. A masonry lining was inserted to the level of the crypt floor and the walls served as a

revetment against the natural clay. The associated well of St Joseph was located to the south. It was approached by a flight of steps near the south-east corner of the Lady Chapel and from a passage within the crypt. The route for medieval pilgrims took them from the crypt to the well via a stone passage; the stair is a secondary medieval feature, later in date than the passage. The crypt was cleared in 1825 (see Chapter 1) and the well to the south of the crypt was excavated by Philip Rahtz in 1991–2, to a depth of 1.5m.<sup>131</sup> Rahtz argued that the well may already have existed when the Lady Chapel was built in the late twelfth century.

Archaeological evaluation took place in 2013 of the floor of the crypt, in advance of new work.<sup>132</sup> Four trenches were excavated by Stewart Brown: the trenches were located at the base of the north, west and south walls of the crypt and in the area of the well-house to the south of the Lady Chapel (built in 1825). Two empty graves were recorded in the western part of the crypt, both of which were stone-lined and stone-flagged; these appear to correspond with the robbed lead coffins reported by Stukeley in 1724.<sup>133</sup> Post-medieval disturbance has caused extensive damage in the crypt but it was possible to identify two medieval floor levels.



## The Galilee

The three-bay Galilee provided processional access from the Lady Chapel to the west end of the church through a pair of centrally placed doorways. Archaeological analysis of the standing fabric by Jerry Sampson has confirmed that the Galilee is contemporary with the west front of the Great Church.<sup>134</sup> The west front and Galilee share the same masons' marks, and the stone coursing of the two buildings is integrated. On the basis of masons' marks common to both Glastonbury and Wells, Sampson proposes a date for the west front and Galilee of c 1210–30, and more likely towards the end of this period. The east wall of the Lady Chapel appears to have remained *in situ* for approximately a century, before an arch was created between the two buildings. Sampson argues that the arch dates from the revaulting of the Galilee in the fourteenth century.

Recent analysis by Sampson has shown that the thirteenth-century buttresses of the Galilee were each designed to accommodate two tiers of life-size figure sculptures. A total of twenty-four figures was apparently envisaged, compared with the 300 figures on the west front of Wells Cathedral. Both buildings employed a fine white lias stone for detailed carving: the exquisite heads and drapery fragments from the excavations at Glastonbury are likely to have come from a screen or some other major furnishing in the Galilee (see Chapter 9). The scheme of wall-painting in the Galilee was modest, comprising white plaster with red lining to mimic ashlar; excavated fragments of painted wall-plaster showed similar treatment (see Chapter 8: *Ex situ* painted wall-plaster).

The crypt beneath the two western bays of the Galilee was probably excavated at the end of the fifteenth century, before the creation of the crypt in the Lady Chapel. These two eastern bays are likely to have formed the chapel of St Joseph of Arimathea, located just beyond the pilgrims' path to the well-chamber. The excavation of the crypt necessitated the raising of the interior floor level and the blocking of the axial doors in the chapel above.

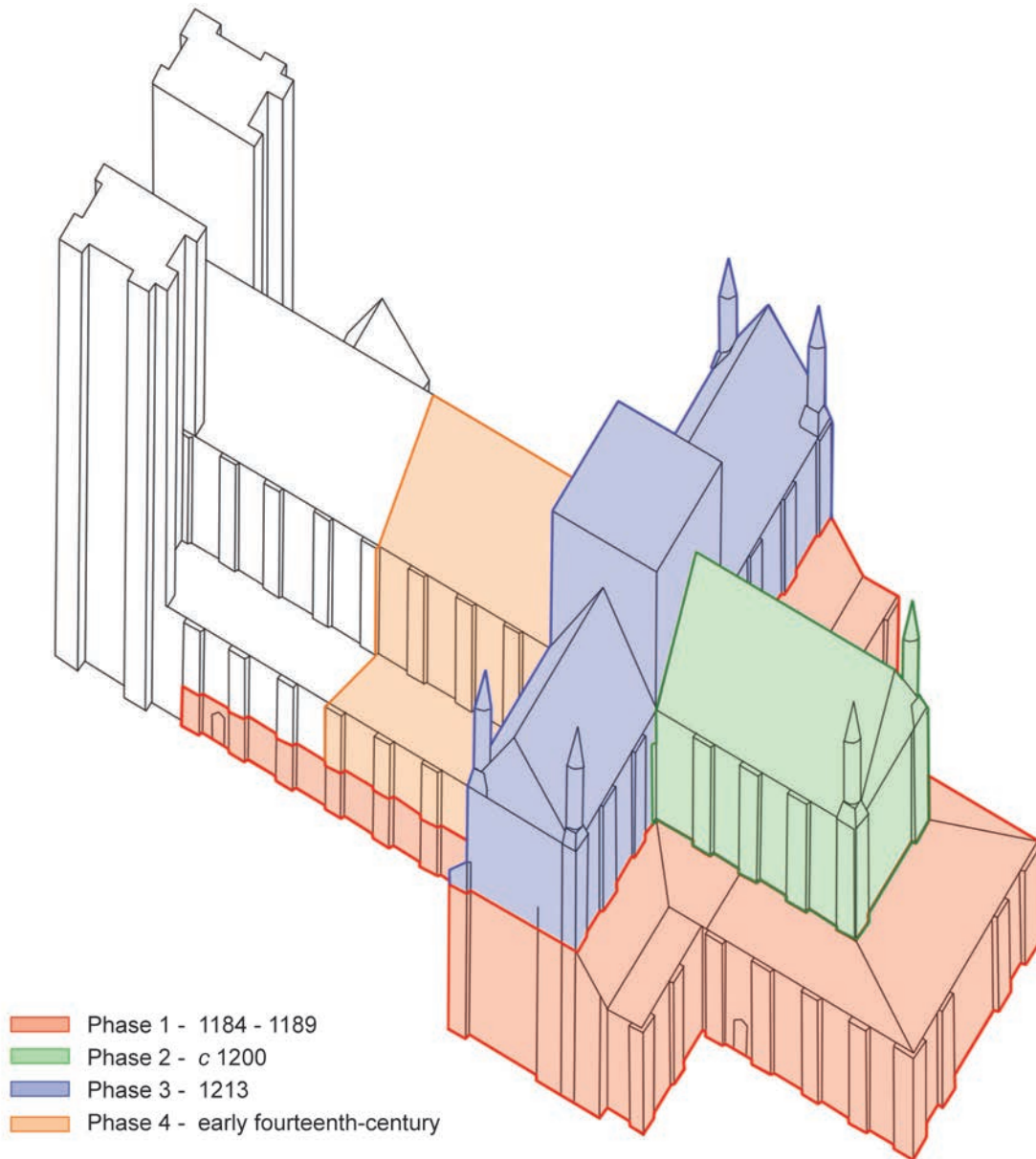
## The Great Church

The ruins of the church include fragments of the crossing and part of the walling of the choir aisles and north transept. To the west of the crossing, only one part of the south aisle nave survives, which also formed part of the north wall of the cloister (fig 3.6). The plan of the church was cruciform with a square east end and later additions, including the Galilee – built in the early thirteenth century to connect the nave with the Lady Chapel – and

the Edgar Chapel at the east end, added in the early sixteenth century (fig 3.8). Construction began soon after the fire of 1184: the Early English church had a nave of nine or ten bays with an eastern arm of four bays; the transepts were of three bays with aisles on their eastern side and chapels of two bays to the east. It is estimated that the Great Church was largely complete and roofed by c 1230 (see Chapter 9). Major rebuilding took place in the fourteenth century, with Walter of Monington remodelling the east end (1342–75),<sup>135</sup> which was extended by two bays and an eastern ambulatory constructed; the clerestory windows were greatly enlarged and a facing of blind Perpendicular tracery was added to the wall surfaces. It has been speculated that the new eastern arm was capped by a monumental fan vault.<sup>136</sup> The remodelled building is judged to have been an important example of early Perpendicular style, comparable in appearance to the east end at Gloucester.<sup>137</sup> Recent analysis emphasises the similarities with Wells and proposes that the nearby cathedral was more important than Gloucester as a model for Glastonbury (see Chapter 9).

Detailed archaeological recording has been carried out by Jerry Sampson on the two piers that supported the eastern side of the central tower, and the substantial length of the south wall of the nave.<sup>138</sup> Sampson argues that rapid progress was made in the early years of the building campaign; the lower parts of the aisle wall were built by 1189, providing the abutment for the cloister, and the crossing and eastern arm had been completed by this date to the top of the triforium (fig 3.8). Dundry stone was used for a very short period from the first season of construction (c 1184) up to the hiatus in construction that occurred c 1189. This stone was used in the Lady Chapel, choir aisles and triforium, but disappears from the fabric at approximately the height of the springing of the choir high vaults. The choir clerestory was probably completed by c 1200, when the four bays of the choir were brought into use by the monastic community. A number of building breaks indicate that subsequent work progressed in stages with subtle changes between the phases.

The upper part of the south nave aisle was not constructed until the second decade of the thirteenth century. Only the four eastern aisle bays of the nave were completed, and this truncated church served the monastic community until the later thirteenth century. The nave was vaulted throughout in the early fourteenth century. A new free-standing cloister was constructed under Abbot Chinnock (1375–1420) with the wall-shafts pinned to the nave wall and the wall-plates fixed with mortar; it is likely



**Fig 3.8** Axonometric drawing indicating the phasing of the church (© Jerry Sampson)

that the flying buttresses bridging the north walk were added as part of this programme of reconstruction.

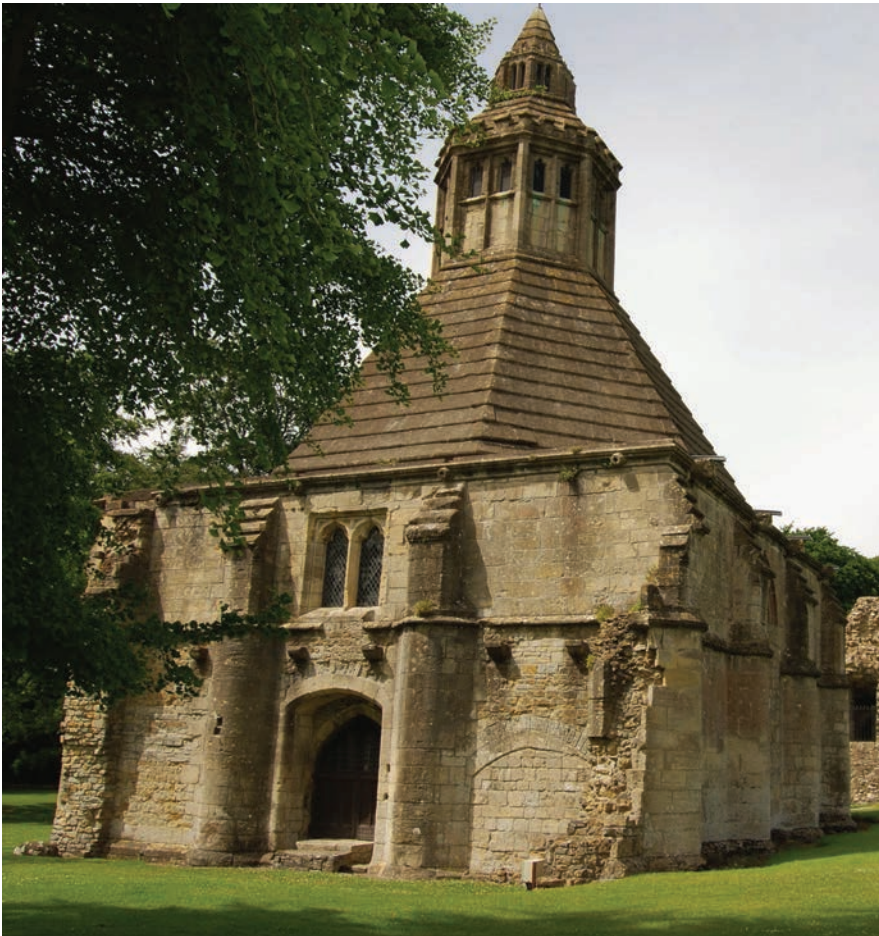
Traces of the fourteenth-century *pulpitum* associated with Monington were identified on the north and south elevations of the crossing pier with traces of the rood beam above. The scars left by the insertion of Abbot Beere's scissor arches were recorded beneath the side arches of the crossing.

### The abbot's kitchen, the gatehouse and St Patrick's Chapel

The abbot's kitchen is located to the south west of the abbey ruins; it owes its survival to post-medieval reuse. It is a detached square structure capped by a stone

pyramidal roof and tiered lantern (fig 3.9). The interior of the kitchen appears octagonal, with four massive fireplaces set across the angle of the four corners, each serving a specialist culinary use. The kitchen, which served the abbot's household and his high-ranking guests, has achieved iconic status because of its unusual form: it was the model for the first chemistry laboratory at the University of Oxford, known as the Abbot's Kitchen, built in 1860, and for the dairy at St Michael's Mount (Cornwall), probably built in the 1870s.

The kitchen has been dated to the mid-fourteenth century in the past, but a date in the 1320s or 1330s now looks likely, based on masons' marks that can be linked to documented campaigns at Wells Cathedral.<sup>139</sup> This fits with the earliest documentary reference to an abbot's



**Fig 3.9** The abbot's kitchen, looking north west (© Cheryl Green)

kitchen, during the abbacy of Adam of Sodbury (1323–34).<sup>140</sup> There is evidence in the fabric to show that it was originally incorporated into a high wall surrounding the abbot's house, with a wall-walk along the top of the wall.<sup>141</sup>

The gatehouse is currently occupied by the abbey offices and is not open to the public; it dates from the early sixteenth century and was remodelled in 1639, according to a date on the front of the building with the initials 'TB' for Thomas Brooke, lesee of the abbey from c 1623–43.

St Patrick's Chapel remains a consecrated place of worship: it is open to the public and hosts a weekly mass. The chapel is a small rectangular building of limestone construction with gable ends and a barrel-vault. Previously it was attributed to Abbot Beere, and assumed to have been built in 1512 to serve the almshouses in the north-west corner of the precinct. Archaeological recording by Stewart Brown in 2008–9 demonstrated that two of the chapel walls pre-dated the foundation of the almshouses, however, and that the chapel incorporates fabric from four different medieval phases; it may originally have formed part of a lodging block or almonry dating from the thirteenth or fourteenth centuries.<sup>142</sup>

### The monastic precinct

The antiquarian excavations focused on the ritual core of the monastery and contribute relatively little new evidence for the wider precinct. However, further insight is provided by standing remains and documentary sources in combination with more recent archaeological interventions. It is possible to trace the boundaries and layout of the precinct and to identify distinctive zones to which access was controlled. The precinct of Glastonbury Abbey is an example of a monastic 'designed landscape' which was shaped physically and ideologically by the monastic community. The *Chronicle* depicts the setting of the abbey as an 'island of apples' (the Arthurian Isle of Avalon), drawing on classical and biblical archetypes to convey a landscape of spiritual harmony and agricultural plenty.<sup>143</sup>

### Layout

The layout and boundaries of the medieval precinct can be reconstructed from a combination of historical, topographical and archaeological evidence (figs 3.10 and 3.11). Most of the east wall of the precinct survives and

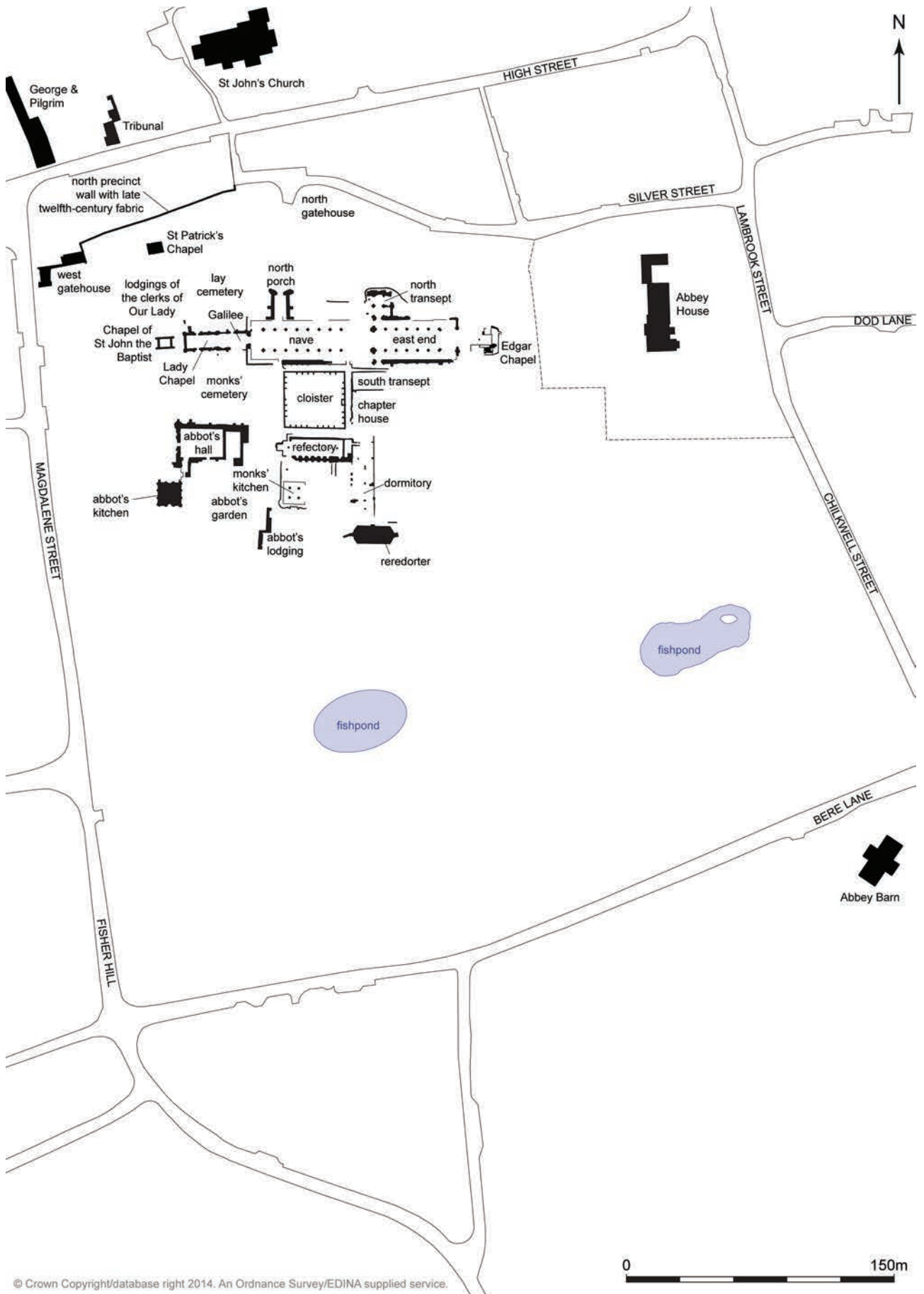
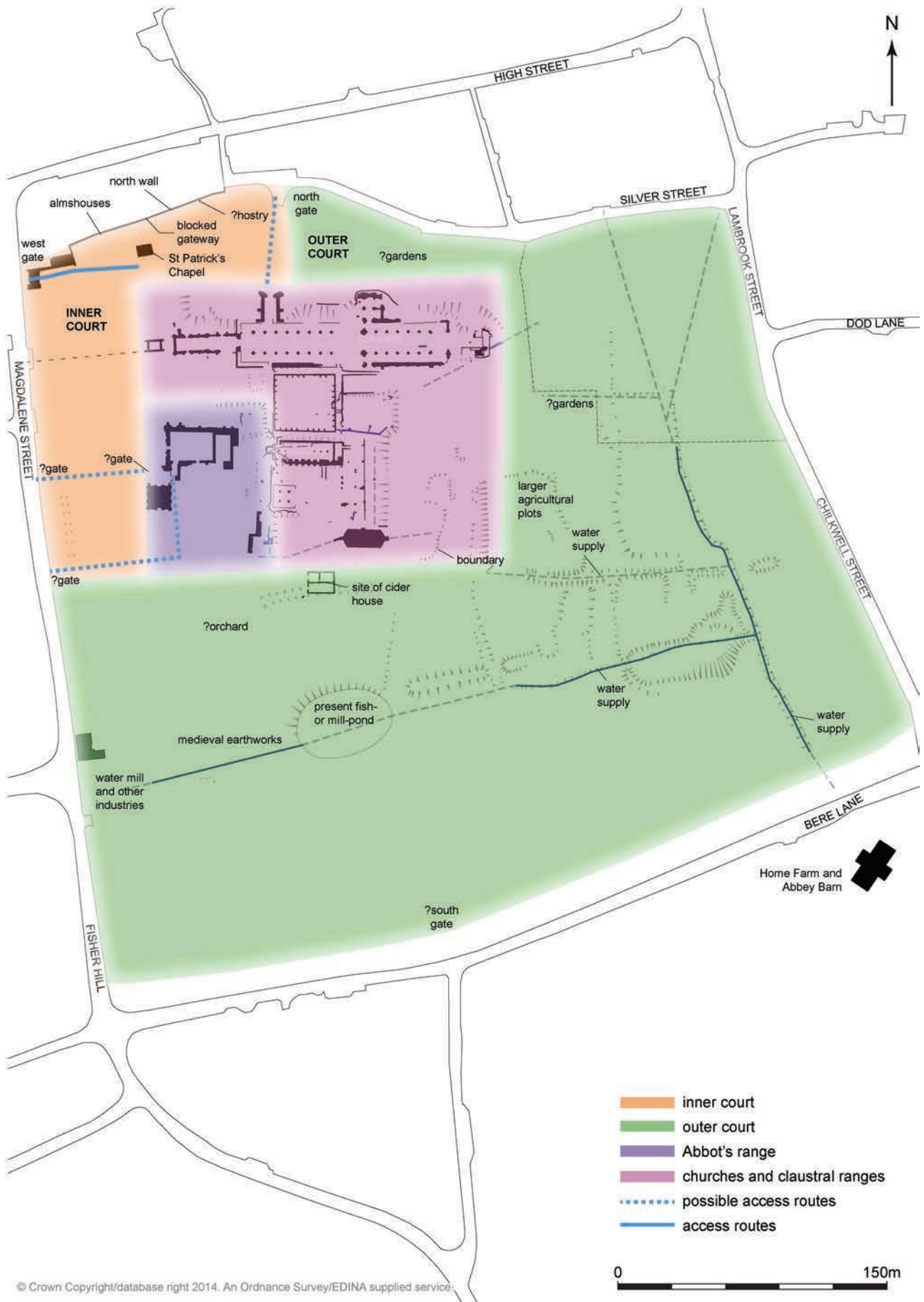


Fig 3.10 Plan of Glastonbury Abbey showing key features (scale 1:3,000)



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Fig 3.11 Plan of Glastonbury Abbey showing zones and key features of inner court and outer court (scale 1:3,000)

parts of the remaining three sides are extant; the west wall is shown in an engraving by Hollar dating to the mid-seventeenth century. The following summary draws on an earthwork survey by Ian Burrow, a parchmark survey by Charlie and Nancy Hollinrake, topographical analysis by Warwick Rodwell and various archaeological watching briefs and surveys.<sup>144</sup> The shape and size of the precinct of Glastonbury Abbey was largely established by the early twelfth century: conjectural plans show the boundary running alongside Magdalene Street and Fisher Hill to the west, Bere Lane to the south, Chilkwell Street and Lambrook Street to the east and the High Street to the north.<sup>145</sup> If we accept this reconstruction, the precinct boundaries enclosed an area measuring c 18ha (fig 3.3).

The precinct contracted slightly, to c 16ha, following the great fire of 1184, allowing tenements to be constructed along Magdalene Street, Bere Lane and High Street, where town properties are first mentioned in written records in 1240 (fig 3.3).<sup>146</sup> This is confirmed by the survival of fabric within the north precinct wall dating to the late twelfth or early thirteenth centuries.<sup>147</sup> Further east, the northern boundary is thought to have followed the dog-leg of Silver Street.<sup>148</sup> The southern boundary did not extend as far as Bere Lane; properties occupied the space between this lane and the precinct, evidenced by a photograph held at Glastonbury Abbey showing a substantial section of medieval walling prior to demolition in 1910.<sup>149</sup> Overall, the medieval extent of the precinct remains predominantly intact, with the surviving remnants of walling confirming that the entire precinct was enclosed by a stone wall. This was largely built from 1420 by Abbot Frome, although, as noted above, parts of the north wall retain twelfth-century fabric.

## Zoning

In common with other Benedictine abbeys, the abbey church and adjoining cloister formed the central core of the precinct, and these were surrounded by overlapping zones extending outwards to the edge of the precinct (fig 3.10).<sup>150</sup> As well as containing service buildings for the monastery, the inner court at Glastonbury was dominated by the roles of hospitality and charity that were essential to a major pilgrimage centre. The outer court and home farm provided the agricultural and industrial functions required to support the monastic community. These discrete zones were separated by physical boundaries that were also regulated by social and religious prohibitions that controlled access; nevertheless, there was a certain degree of permeability and movement of people between these zones.<sup>151</sup> Glastonbury's status as a cult centre may

have required flexibility in accommodating the large numbers of secular pilgrims who visited the precinct. For example, the outer court area may have provided 'soft space' for seasonal pilgrim camps for the overflow of visitors, as has been suggested at Bromholm (Norfolk).<sup>152</sup>

By focusing on the central core of the abbey, the antiquarian excavations located many of the important religious and domestic buildings (fig 3.11). These can be grouped into four sub-zones: the church and cemetery; the Lady Chapel and the college of the chaplains of the Galilee; the cloister; and the abbot's range. Excavations undertaken between 1987 and 1993 focused on the area occupied by the chaplains of the Galilee: in the fourteenth century, their living accommodation comprised a building range flanked by an alleyway to the west and fronting on to a cobbled and walled yard. The range was demolished by 1475 and replaced by new buildings.<sup>153</sup>

The locations of several important features listed in Dugdale's *Monasticon*, compiled around the time of the Dissolution – namely the infirmary, the hostry and the king's lodging – had not been established previously. Based on comparison with other English monasteries, the infirmary is likely to have been located to the east of the cloister.<sup>154</sup> Confirmation of its location can be found in the *Ostensa*, a document that details the work of Abbot Walter of Monington (1342–75). It records that Monington rebuilt the infirmary cloister, together with a chamber for entertaining visitors, located near the treasury. The treasury was located on the south side of the church, probably in the south transept. Monington also rebuilt the misericord from its foundations and a small chamber next to it 'for the private relaxation of the brethren'.<sup>155</sup> The misericord was a special dining chamber attached to the infirmary, which provided an enriched meat diet for monks who were elderly, infirm or recently phlebotomised.<sup>156</sup> Stukeley's views and plans show exposed foundations to the east of the cloister stretching as far as the east end of the church; these may represent remains of the infirmary complex.<sup>157</sup> A few fragments of masonry, discovered in 1910 near a drain at the south-east corner of the chapter house, were also attributed by Bond to the infirmary.<sup>158</sup> Wedlake reported that excavations in 1933–4 uncovered foundations to the east of the east range, including a fireplace, perhaps again corresponding with the location of the infirmary.<sup>159</sup> Geophysical survey undertaken in 2008 showed a number of features directly to the south east of the chapter house, including a linear structure that may be connected with the infirmary.<sup>160</sup>

The domestic and administrative offices were usually located in an inner court adjacent to the church and

cloister (fig 3.10). This space may have accommodated some of the service buildings recorded at the Dissolution, including the bakehouse, brewhouse and stabling. At Glastonbury the inner court was dedicated principally to hospitality: it was sited directly to the west of the Great Church and the abbot's hall (fig 3.12). Known as the 'Broad Court', this space served as a reception point for the large numbers of guests and pilgrims visiting the abbey. It is also likely to have served an important commercial function: it was common for cathedrals and major abbeys to establish a commercial zone to the west of the church with shops selling souvenirs and catering to pilgrims.<sup>161</sup> The only surviving section of the Broad Court wall is located in the north-west corner. A large part of the inner court now lies beneath Magdalene Street car park and the properties along Magdalene Street; a

large square, flat area remains to the west of the abbot's kitchen, however. Geophysical survey shows this area surrounded by linear spreads of building rubble or compacted earth and some rectilinear signals. The results are very similar to the outlines recorded by the parchmark survey and strongly indicate the presence of ranges around a square courtyard. This includes two linear signals across the north side which may relate to a possible thoroughfare linking the Magdalene Street gate and the gate to the north of the abbot's kitchen.

A zone dedicated to charity developed in the north-west corner of the precinct, between the west gate and the north gate: this housed the almshouse for poor widows and possibly the hostry for the accommodation of guests. A massive structure is indicated along one stretch of the extant north precinct wall (fig 3.13), to the west of the



**Fig 3.12** The south-west corner of the abbot's hall showing the porch and staircase looking south-south-west (© Cheryl Green)



**Fig 3.13** The north precinct wall with evidence for a massive building, looking north west (© John Allan)

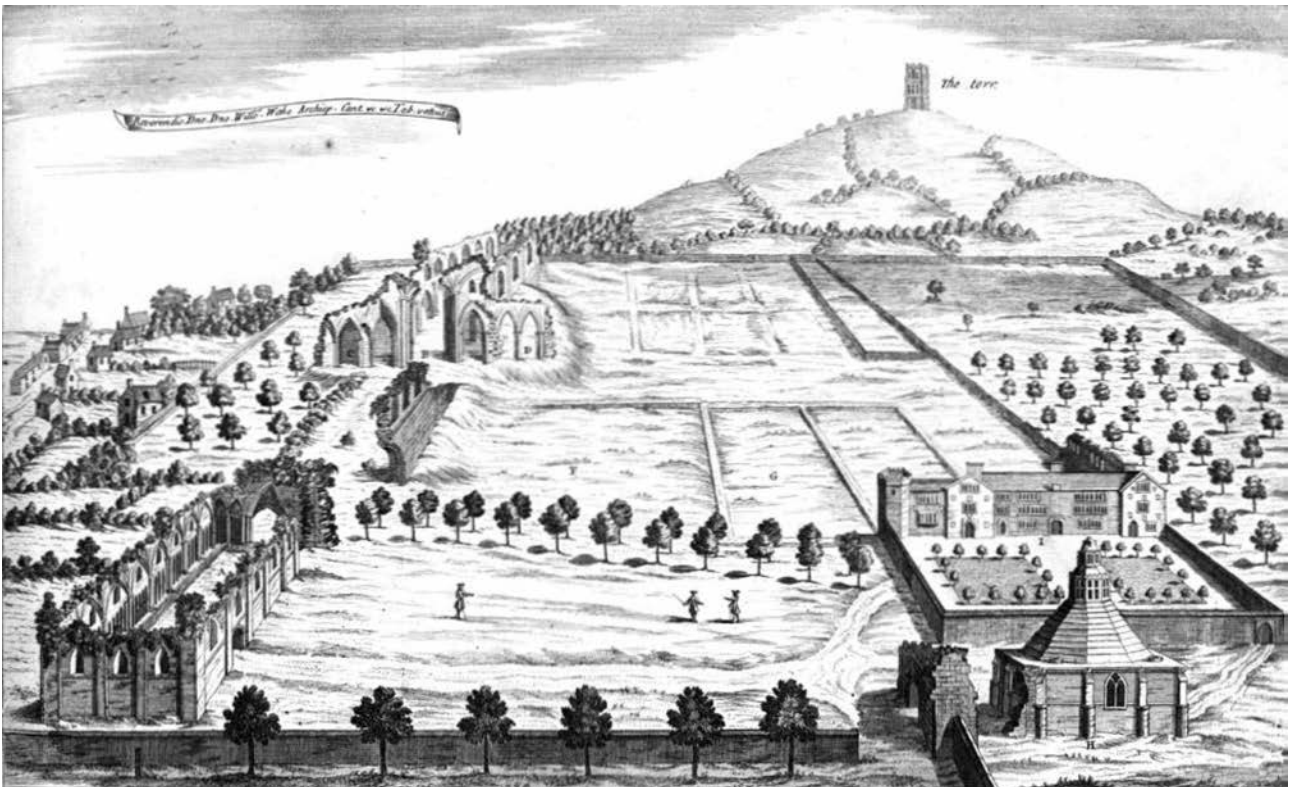
former north gate, measuring approximately 90m in length and 6m in height and occupying twenty-six bays (two stretches of thirteen bays each). A two-storey structure is indicated by rows of timber slots that would have supported the floor and roof. An approximate date for the structure has been suggested on the basis of materials and mortar type: it is constructed of poor-quality Tor burr stone that was used in the abbey from the Saxon period up to the thirteenth century; it employs the yellow mortar that is characteristic of work at Glastonbury dating to the twelfth or thirteenth centuries.<sup>162</sup> If the remains along the north precinct wall represent a single structure, it would have been one of the largest precinct buildings in Europe. It may have comprised a series of conjoined structures with related functions: for example, a hostry for receiving and accommodating guests; essential stabling for guests' horses; a hospice for sick pilgrims; and an almonry for dispensing food to the poor. The dating and enormous scale of the complex suggests a link with Henry of Blois and the extravagant hospitality that was expected of a prelate.

The outer court, dedicated to agricultural and industrial functions lay to the south and east of the religious zone and inner court. This is likely to have been separated from the inner precinct by a series of walls or

other boundaries; the geophysics suggest an intermittent wall running along the north side of the church, possibly a boundary between the outer and the inner courts. Antiquarian drawings and early maps depict walls, which may have divided the precinct into zones: there is a long wall on Stukeley's views that ran eastwards from the southern end of the abbot's lodging (figs 3.14 and 3.15).<sup>163</sup> This broadly equates to a boundary shown on the earthwork survey and the geophysical survey, with the resistance survey showing a short stretch of possible walling extending eastwards from the south-east corner of the abbot's lodging (see fig 3.12).

The outer court was occupied by gardens, orchards, ponds, pasture and agricultural buildings, such as the cider house, which still existed in 1935 to the south of the main monastic buildings (fig 3.16). The millhouse may have been situated near the nineteenth-century Chaingate Flour Mills, demolished in 1979.<sup>164</sup> Excavations in 1979 and 1980 suggest that there was a mill in this area in the Anglo-Saxon period, with evidence for mill ponds of pre-Conquest and twelfth-century date. These were overlain by an earthwork of later medieval date thought to relate to realignment of the ponds (fig 3.11).<sup>165</sup> Other buildings documented at the Dissolution include a stilling house and dairy house.





**Fig 3.14** Stukeley 1724 eastern aspect; reproduced with permission of Glastonbury Antiquarian Society



**Fig 3.15** Stukeley 1724 southern aspect; reproduced with permission of Glastonbury Antiquarian Society

The cash account of an abbey gardener surviving from the 1330s documents an orchard, vineyard, herb garden, vegetable plots, flower beds and pasture.<sup>166</sup> Small garden plots may have been sited against the north precinct wall, providing a warm sheltered south-facing area for growing fruit and vegetables (fig 3.11).

Archaeological monitoring to the south east of the church found evidence for gardens, confirming observations made during the earthwork survey.<sup>167</sup> Larger plots, perhaps for a vineyard, vegetables and pasture, may have been located in the south-eastern and eastern areas of the precinct where there was more space.



**Fig 3.16** 1935 photograph showing the refectory and dormitory undercrofts, reredorter and the cider house, looking south (© Glastonbury Abbey)

The earthworks in the eastern part of the outer court comprise banks, hollows, silted-up ditches, scarps and terraces. The parchmark survey revealed a plethora of previously unknown sub-surface features including buildings, courtyards, metalling and dumps of stony material. These surveys are now supplemented by the geophysical survey (see Chapter 2), which provides an additional source of evidence. A number of rectilinear and linear features showed up in the eastern and southern areas relating to water channels, boundaries and parts of enclosures or terraces. This correlates with the use of these zones for agriculture and water management, channelling water from the south-eastern corner for agricultural, milling, liturgical and domestic use. Many of the earthworks in the southern area were associated with the fishpond or mill-pond complex, and to the west further earthworks led to the mill area. The north-eastern part of the outer court (now within the grounds of Abbey House) has not been excavated, although the earthwork and parchmark surveys show three features aligned approximately north to south that are thought to be related to water management (see below and figs 2.6, 3.11 and 11.3) and to some of the other sub-surface features.

The abbey's home farm was located immediately to the south east of the outer court, outside the walled

precinct, in a situation comparable to the home farms at the Benedictine abbeys of Eynsham, Evesham, Ely and Abbotsbury. The only medieval survival is the barn, a stone building of seven bays, a particularly large structure in a region dominated by non-arable agriculture. The construction and ornamental details are of exceptional quality, befitting its status and location close to the abbey.<sup>168</sup> Some of the timbers of the roof structure have been dendro-dated to 1342–60.<sup>169</sup> The abbey also built substantial barns on its rural properties: fourteenth-century examples survive at Pilton, West Pennard and Doulling.

### Access

The walled precinct was controlled by a series of major gatehouses and minor gateways. These barriers were intended to control secular access to the precinct and to prevent the monks from visiting the town. During his Visitation in 1408, Archbishop Arundel ordered that no brother was to go outside the monastery, especially to places frequented by women, without special licence from the abbot.<sup>170</sup>

There were at least two major gatehouses: the extant west gatehouse on Magdalene Street, which dates from

the early sixteenth century; and a north gatehouse, described as the 'great gate' *c* 1255 and recorded as being on the High Street.<sup>171</sup> Excavations in this area in 1978 uncovered the foundations of the medieval north precinct wall and one side of the entrance-way of the north gatehouse.<sup>172</sup> The geophysical evidence supports the presence of a path leading from the north gatehouse through the inner court and leading to the north porch of the Great Church (see Chapter 2). The western side of the possible pathway is represented by the eastern side of a large rectilinear signal with ill-defined walls at a depth of 1m to 1.5m. The presence of the path suggests that the north gatehouse provided the main access for the laity visiting the church and Lady Chapel. A third gatehouse may have existed in the south precinct wall: an eighteenth-century map of the 'Corporation town of Glastonbury' shows a slight kink in Bere Lane, which perhaps indicates a south gate.<sup>173</sup>

A sequence of gateways controlled access to the Broad Court and ingress to the abbot's complex: high-ranking guests to the abbot's hall were filtered from pilgrims and other visitors to the abbey. A minor west gate was documented before *c* 1313 and a lower gate was noted in 1322.<sup>174</sup> Carter's plan of the precinct in 1784 shows a gate leading off Magdalene Street to the south of the west gatehouse, while Stukeley's drawings show a further connecting gate to the east on the north side of the abbot's kitchen (figs 3.14 and 3.15).<sup>175</sup> It is possible that an additional gate further south on Magdalene Street may have provided an access route across the south side of the inner court, circumnavigating the abbot's kitchen and leading to the south porch of the abbot's hall (see Chapters 6 and 10). The geophysical survey perhaps suggests these routes, but alternatively these signals can be interpreted as relating to buildings or ranges (as discussed above).

## Water management

The monastic water supply and drainage systems have received little attention at Glastonbury and yet they were a determining factor in the siting of precinct boundaries and buildings.<sup>176</sup> The following account draws from the Glastonbury Abbey Conservation Plan (2004), using evidence from historic maps and from antiquarian and modern archaeological investigations. Two external sources of water supplied the abbey precinct: the Launder or Lambrook Stream once flowed directly into the north-east corner of the medieval precinct from its source high up the north slope of Chalice Hill, while the Chalice Well spring entered the south-east corner of the precinct from

its source on the south slope of Chalice Hill (fig 3.11).<sup>177</sup> With the expansion of the abbey, the increased demand for water probably required both sources to be connected as a dual supply.<sup>178</sup>

It has been suggested that the Launder Stream followed the line of the north wall of the late medieval precinct supplying the town; however, a branch may have supplied the precinct.<sup>179</sup> This branch is thought to have entered the north-east corner of the precinct (now occupied by Abbey House), flowing south west to a conjectured junction with the supply from the Chalice Well spring. The only archaeological evidence consists of a large stone drain noted in the twentieth century running from Abbey House to the abbey. The Chalice Well supply must have been utilised for the Saxon abbey. Indeed, a Saxon date has been proposed for the millponds excavated adjacent to Chaingate Mill.<sup>180</sup> The Chalice Well supply must have entered the precinct at a high enough level to service the abbey buildings: the 1799 Davidge Map shows a water-course entering the precinct near the eastern end of the south precinct wall.<sup>181</sup>

The Chalice Well supply crossed the eastern side of the precinct running south-south-east to north-north-west, shown on the 1628 Senior map as a rectangular area of water and artificial banking to the east of the claustral buildings and as a continuous stream across the precinct on the 1799 Davidge map. The 1821 survey map shows that the water-course had been truncated at the southern end, while the 1844 tithe map only shows the northern end of the water-course on the western side of Abbey House and does not appear on early Ordnance Survey maps, indicating that the water-course was then no longer visible.<sup>182</sup> There have been several recent interventions, including construction of the new upper pond in 1998,<sup>183</sup> identified as part of the abbey's complex water systems associated with earth embankments.<sup>184</sup>

From the main supply across the eastern side of the precinct, there were at least three or four diversions downhill to the monastic buildings to the west. A major water-course ran across the southern side of the precinct evidenced by the remains of a ditch recorded during the 1982 earthwork survey. This crossed the site of the modern upper pond and the lower modern fish or mill pond. The 1989 parchmark and 1982 earthwork surveys confirm a substantial ditch and bank running west from the lower pond (fig 2.8);<sup>185</sup> the 1628 Senior map and the 1844 tithe map show a water-filled outflow channel in this position heading towards Magdalene Street, where two possible Saxon ponds have been excavated. The 1844 tithe shows the channel ending in a long narrow pond with another pond to the north possibly associated with

the second precinct outfall, which discharges today from a pipe that passes through the garden wall of Abbey Grange (the pipe is initialed and dated TP 1714).<sup>186</sup> In 1948 the abbey custodian referred to a deep-set stone drain in the vicinity of the Lady Chapel, which continued under St Dunstan's car park and across the abbot's kitchen field.<sup>187</sup> This drain was further investigated in 2013: it runs from the crypt of the Lady Chapel and under its west wall; Warner recorded the discovery and refurbishment of a medieval drain at the west end of the crypt in 1825.<sup>188</sup> The crypt floor lies close to the water table and a drain would have thus been essential to its use.

### 3.5 The post-medieval use of the precinct

The abbey's Dissolution story and subsequent post-medieval development are unusual in a number of respects. Following the dramatic execution of Abbot Whiting in 1539, the abbey was dissolved and its assets were dispersed. The abbey and its demesnes were treated as separate units and the precinct was retained by Henry VIII until his death in 1547. In contrast with the frenzy of salvage that took place at other former monasteries, the buildings of Glastonbury Abbey remained intact for a decade or more after the Dissolution. In July 1547, the site and demesne were granted to Edward Seymour, Duke of Somerset, with 'a house and site, church, steeple and cloister and circuite, with all buildings etc therein and all lead on the church, site and buildings thereon'.<sup>189</sup> Elsewhere, the process of dissolution usually involved demolition followed by the salvage of materials or the conversion of a former monastery into domestic architecture.<sup>190</sup> It was common practice to target the sacred and corporate spaces of a monastery, such as the church and chapter house, for early destruction, in order to prevent their reoccupation by former monks. We may speculate that Glastonbury Abbey was left intact by the king in order to serve as an example, the architectural equivalent to the quartered and decapitated remains of the last abbot.

The Duke of Somerset engaged the former abbey site in a Protestant social experiment: he established a colony of 230 Walloon worsted weavers, French-speaking Protestant refugees from Flanders. The weavers constructed houses within the precinct and their leader, Valerand Poulain, occupied the abbot's lodging. In March 1552, the community comprised forty-four families and

six widows; only six houses were completely built and another twenty-two lacked doors and windows.<sup>191</sup> A survey of the abbot's kitchen in 2013 revealed evidence for a substantial two-storeyed building with a pair of gables built against the south wall of the kitchen. This correlates with the geophysical survey evidence for a foundation running south from the middle of the south wall of the kitchen. Evidence was also recorded for a gabled building added to the north side of the abbot's kitchen.<sup>192</sup> A document records two dye-houses on the south side of the monastery where the monastic brewhouse and bakehouse had been, with two acres to the north of the monastery set aside for gardens.<sup>193</sup> The Walloon community fled from Glastonbury to Frankfurt following the accession of the Catholic Queen Mary in 1553. A number of small finds dating to the sixteenth century have their closest parallels in the Low Countries and could potentially be associated with the short-lived Walloon community (see Chapter 8). However, the Low Countries were a common source for everyday objects used by people in the south west of England, so these finds may not indicate specific links to the Walloons.

During Mary's brief reign, four of the former monks petitioned for restoration of the monastery. Instead, the precinct passed through a series of owners during the late sixteenth and seventeenth centuries, and, though there is limited documentary evidence for anyone residing at the site, there is a surprising amount of excavated material of late sixteenth-century date, including pottery, glass and jettons (see Chapter 8). Carley proposes that the monastic ruins themselves remained standing as a kind of *memento mori*, a poignant reminder of Glastonbury's past glories.<sup>194</sup> In 1554 the tenant, Peter Wolf, was given a lease on houses and a barn including a house called the Galley within the precinct, near the Great Hall.<sup>195</sup> This may relate to the building known as the abbot's lodging, which stood until about 1720 and was described by William Camden in 1653 with reference to spacious cellars, indicating an undercroft.<sup>196</sup>

The earliest surviving map was made some time between 1609 and 1628 by William Senior and shows the precinct divided into eight parcels of land.<sup>197</sup> A single building is marked – perhaps representing the Lady Chapel – with two water-courses shown crossing the southern and eastern sides of the precinct and a pond in the approximate location of the Chaingate Mill. Engravings by Wenceslaus Hollar, dating to the mid-seventeenth century, show the abbot's kitchen and abbot's lodging with walled garden.<sup>198</sup> In 1712, Eyston described the ruinous house on the eastern side of the abbot's

walled garden as the abbot's lodging.<sup>199</sup> William Stukeley visited the site in 1723, shortly after the abbot's lodging had been demolished by Thomas Prew and its materials used to build a house in Magdalene Street.<sup>200</sup> Stukeley made use of earlier drawings and descriptions in his depictions of the abbot's lodging, which show an octagonal turret at the north-west corner and two projections to the west elevation (fig 3.14). The walled garden is surrounded by a path and contains two rectangular grassed areas surrounded by trees and separated by a wide central avenue, also evident on his 1723 plan. A doorway is shown at the southern end of the west wall of the garden indicating access between the garden and abbot's kitchen.

Hollar, Eyston and Stukeley all referred to the same structure as the 'abbot's lodging'. However, this term does not appear on the inventory of buildings listed at the time of the Dissolution. The abbot's residence is simply referred to as the 'abbot's chamber', a modest description for the grand, three-storey residence that is documented in this position in the eighteenth century. The 'king's lodging' is the only building listed on the Dissolution inventory that would be consistent with the grandeur indicated by Stukeley's sketches and Eyston's description. In 1497, King Henry VII spent one night in the newly finished king's quarters as the greatly honoured guest of Abbot Beere (1493–1524); according to Leland, this was situated by the 'abbot's great chamber' built by Abbot Frome (1420–56).<sup>201</sup> It is not clear whether the 'abbot's great chamber' refers to a chamber within the abbot's hall or a separate structure. However, the style of the house on the eastern side of the abbot's garden is more consistent with a late fifteenth-century date. It is feasible that it may have originated as the king's quarters and was later used as the abbot's residence (see Chapter 10).

Stukeley recorded that local people considered it unlucky to quarry stone from the former abbey, although this was still taking place into the eighteenth century. Some of the smaller buildings were easily put to other uses and retained their roofs, notably the west gatehouse and the abbot's kitchen, which was used as a Quaker meeting house in 1677. The almshouses also remained in use after the Dissolution for their original purpose. Stukeley noted that the Lady Chapel had been provided

with a timber and thatch roof so that it could be used as a stable.<sup>202</sup> The Lady Chapel had been the spiritual core of the Catholic monastery and embodied the legendary traditions of the ancient foundation. It is striking that the Lady Chapel was allowed to survive relatively intact: does this imply some reluctance to erase the memory of Glastonbury's *vetusta ecclesia*? It endured even the destruction wrought by John Down, mayor of Glastonbury, who at the end of the eighteenth century used gunpowder to dislodge the stones of the ruins and turn the site into a quarry.<sup>203</sup>

In the 1790s, the ground adjoining the abbey ruins was cleared, levelled and converted into pasturage with many loads of stone used as hardcore for new highways.<sup>204</sup> The Davidge map of 1799 is the first plan to show an orchard to the south and west of the cloister and to the west and north west of the church.<sup>205</sup> It also shows that the precinct had been further subdivided by this time, with ten numbered plots evident. The 1821 map by H B Guy shows a similar arrangement: the land to the north of the church had been further subdivided into narrow plots, and the abbot's kitchen is shown within its own plot. The 1821 map also represents the water-courses or ditches depicted on the Senior map.<sup>206</sup>

In 1825 John Fry Reeves built Abbey House at the eastern end of the precinct, overlooking the abbey ruins (fig 3.3). The ruined Lady Chapel attracted new attention as a garden feature: in 1825 soil was cleared from the crypt and the structure was reinforced, presumably to make it safe for visitors.<sup>207</sup> The 1844 tithe map indicates some alterations to the plot boundaries within the precinct, including the boundary on the north side of the church. It also records the lower fishpond and the orchard, which occupied the area between the church and the fishpond. The 1886 OS map indicates that the planting and landscaping begun by Reeves was continued by James Austin, the new owner. He was responsible for instigating the preservation of the abbey ruins and opening the site to the public on a weekly basis in the summer months; he also facilitated the first excavations by St John Hope (see Chapter 1). In the early twentieth century there were still many trees across most of the abbey site, with an orchard encroaching upon the refectory and cloister.

# The cemetery and church

Cheryl Green and Roberta Gilchrist

## 4.1 Summary

Radford reported that his excavations in the cemetery revealed evidence for the legendary 1191 exhumation site of Arthur and Guinevere, the locations of two ancient stone 'pyramids' near Arthur's grave, a sunken burial chamber (described as a 'hypogeum' and said to resemble that found to the east of the first-phase Mid Saxon church in 1927) and 'early' (pre-Dunstan) cist burials (fig 4.1).

Analysis of the excavation archive challenges the identification of the exhumed 'grave' and redates the cist burials as later than the mid-tenth century (therefore post-Dunstan). There is more convincing archaeological evidence for Dunstan's remodelling of the cemetery: the raised cemetery platform was created from a deep layer of redeposited clay that pre-dates the Norman period, and there is evidence for both a southern retaining wall and an eastern wall within the later medieval cloister garth (see Plan 1). The north wall that is claimed to have been found in the lay cemetery can only be broadly dated to the monastic occupation.

Previously unpublished material on burial practice throughout the Late Saxon and medieval periods is presented below (and discussed in Chapter 11). Evidence for continuity, alterations and additions to the cemetery boundaries is considered, particularly in relation to St Michael's Chapel, constructed within the south cemetery wall. Radford envisaged a thirteenth-century phase for the chapel, for which there is only circumstantial evidence.

The archaeological evidence for the Saxon church is synthesised from the published reports of the late 1920s,

with additional material incorporated from the original records and from later accounts by Wedlake and Radford. The identification of three different mortar types supports the existence of at least three construction phases. However, the details of the published reconstructions are challenged. Peers *et al* showed three phases of the Saxon church in relation to the *vetusta ecclesia*, with a wall running eastwards from the eastern tower.<sup>1</sup> Radford's more extensive reconstructions show the church in *c* 720, *c* 760 and *c* 1000.<sup>2</sup> A more recent composite plan of the Saxon churches is presented, based on the 1929 reconstruction;<sup>3</sup> an additional wall extending eastwards from the north-east porticus is shown, although the elaborate eastern arm envisaged by Radford is not reproduced. Rahtz and Watts published plans based on the original excavation records but omitted discussion of the primary evidence.<sup>4</sup> The excavated evidence is now critically assessed particularly in relation to dating.

To the east of the Saxon church, the monastic enclosure ditch extended through the transepts and choir (fig 4.2); the evidence is presented here, although the best section was obtained in the chapter house (see Chapter 5). Of particular interest are the measures taken by the twelfth- and thirteenth-century builders to stabilise the ditch fill as the church was extended eastwards. Radford claimed evidence for a Roman well at the base of the ditch but this is unconvincing.

Radford published reconstructions of the church in the late eleventh- and early to mid-twelfth century.<sup>5</sup> The remains are insufficient to support these elaborate reconstructions, particularly for the late eleventh century (see Plan 2); however, stratigraphic evidence of external

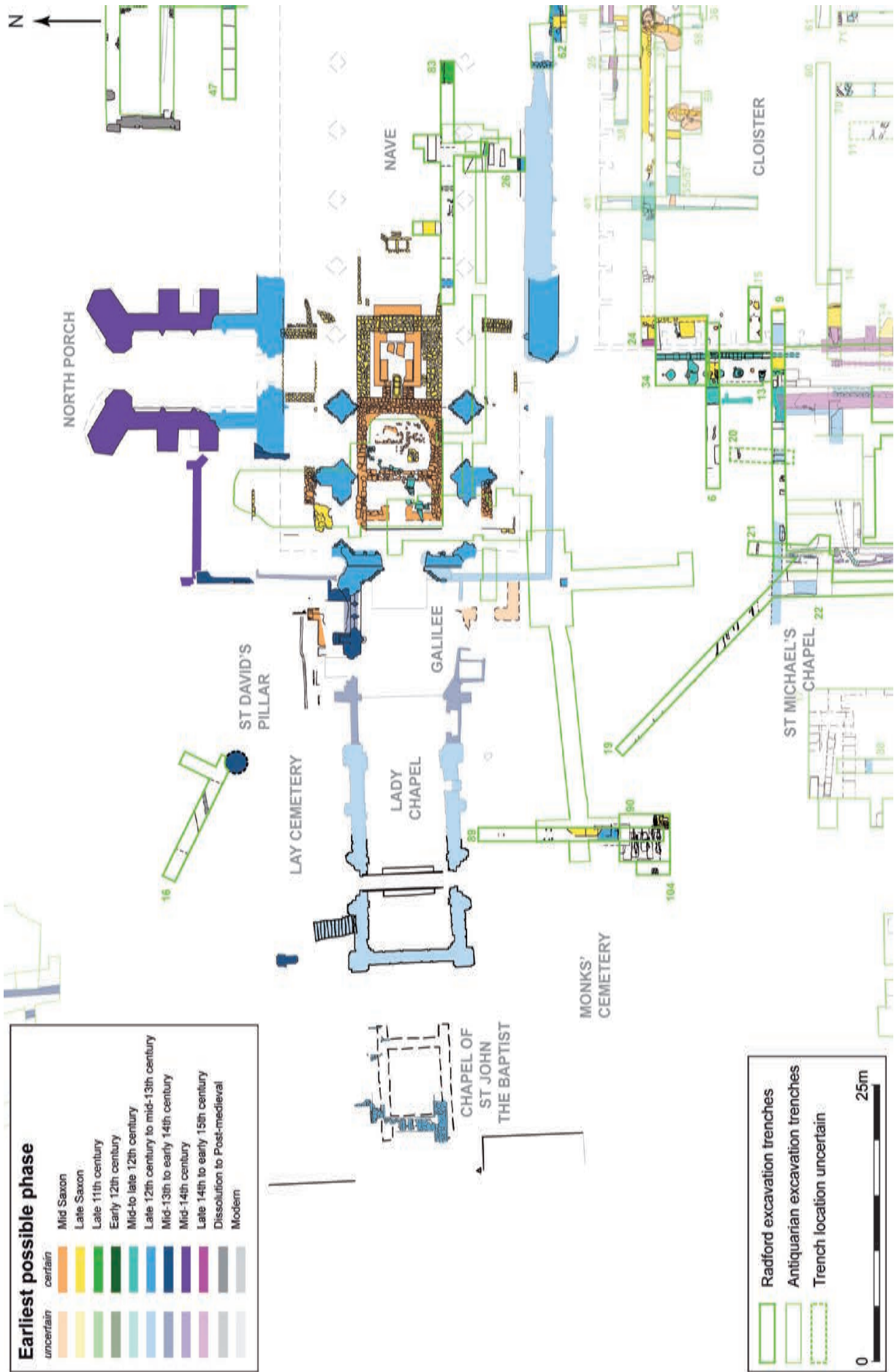


Fig 4.1 Plan of phased archaeology across the cemeteries and the western ends of the churches (scale 1:500)

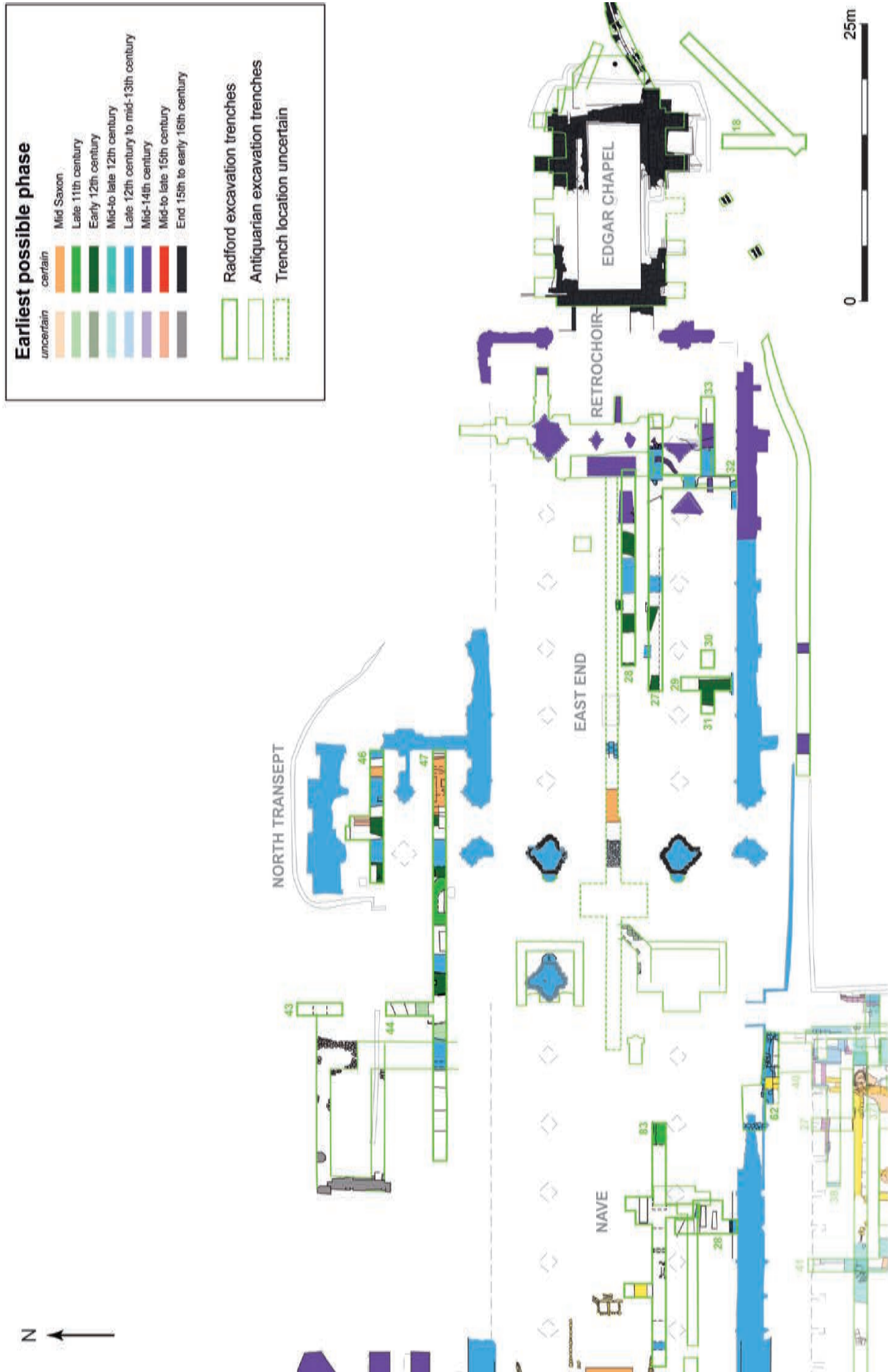


Fig 4.2 Plan of phased archaeology across the eastern ends of the churches (scale 1:500)



walls and internal arrangements are datable and confirms the presence of apsidal chapels. The evidence mostly relates to the twelfth-century phase (see Plan 3), which is discussed in relation to the late twelfth- to mid-thirteenth-century nave, with the walls of the latter built immediately alongside and to the east of the earlier walls. Unpublished archaeological evidence has emerged of fourteenth- and fifteenth-century alterations, liturgical arrangements and burials as an important and hitherto unrecognised aspect of Radford's excavations (see Plan 4). Finally, archaeological evidence is presented for episodes of rebuilding, enhancement and post-Dissolution destruction (see Plan 5).

## 4.2 The lay cemetery

### Late Saxon (Phase 4)

An 'early cemetery' horizon was recorded by Bond at a depth of 2.74m, with Radford's Trench 16 suspended at a similar depth (fig 4.3) as part of a deliberate policy of avoiding burials (see below).<sup>6</sup> The northern edge of a rough foundation [C:1007] was recorded at a distance of 13.88m from the north wall of the Lady Chapel and parallel to it (figs 4.1 and 4.3). It was suggested that this may have been the north wall of the Saxon cemetery; in a letter to Woods in 1993, Radford located this outer wall 9.14m north of the Lady Chapel.<sup>7</sup> However, Woods's report also states that 'St David's Pillar', at the southern end of Radford's trench, was located 12.19m north of the Lady Chapel, when the correct measurement is 9m. With only one excavation sited in the lay cemetery, we must conclude that Radford was alluding to the foundation [C:1007] as the outer cemetery wall, enclosing an area approximately half the width of the Late Saxon monks' cemetery. The two courses of exposed foundation were constructed of lias, in common with other walls attributed to the Saxon period; however, hard mortar was recorded as distinct from the soft bonding material noted elsewhere. The foundation is dated to the monastic period on the basis of the shared orientation with the Lady Chapel and the presence of an overlying soil layer [C:1006] that pre-dates the Dissolution demolition layers. However, it is not possible to date these remains firmly as Saxon.

### Mid-thirteenth to early fourteenth centuries (Phase 10)

Eighteen oak coffin burials were discovered immediately west of the Lady Chapel north door in 1825, during

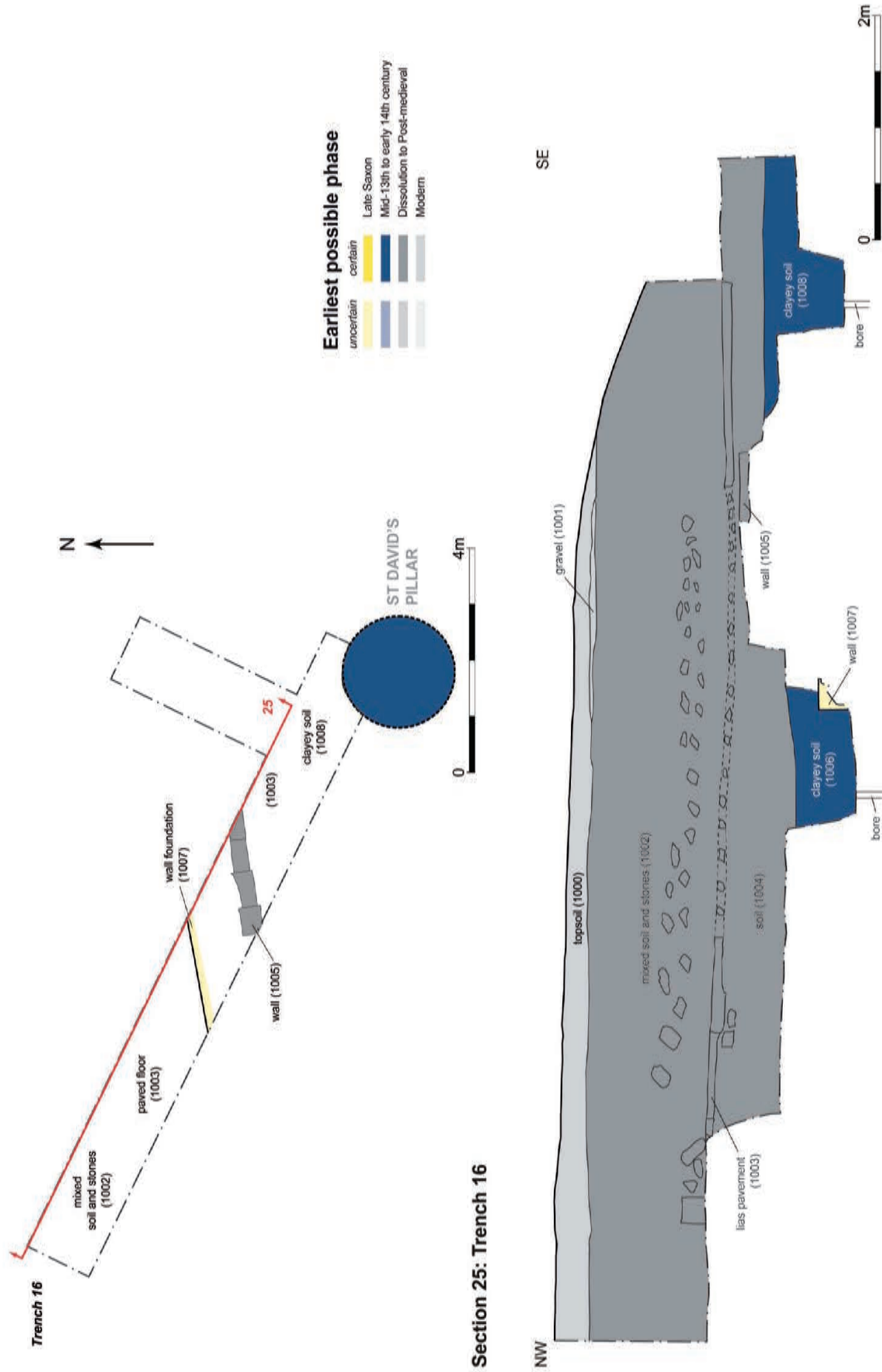
replacement of the medieval stairs that provided access to the Lady Chapel crypt, constructed between 1493 and 1524 by Abbot Beere.<sup>8</sup> Three burials beneath the medieval steps indicate that the group pre-dated the construction of the crypt. The head and shoulders of each skeleton rested on a bundle of wood shavings and a rod of thorn or hazel was beneath and to the right side of each skeleton. In 1724 William Stukeley stated that many lead coffins were plundered from the flooded crypt to melt down for making cisterns; the crypt was finally cleared and stabilised in 1825.<sup>9</sup>

Bond thought he had found the remains of 'St David's Pillar', the structure which bore the brass plaque that recounted the Glastonbury origins story (see Chapter 3).<sup>10</sup> Bond believed that the pillar marked the position of one of the pyramids that coincided with the eastward extension of the *vetusta ecclesia* (figs 4.1, 4.3 and 4.4).<sup>11</sup> He assumed that the pillar dated to the sixth century, and was perplexed to discover that mouldings recovered from the circular structure indicated a fourteenth-century date. The plaque itself is now regarded as probably of early sixteenth-century date.<sup>12</sup> Radford also dug at the site of the pillar at the request of the van Dusens, the American sponsors of Bond's excavations (see Chapter 1).<sup>13</sup> The area was situated at the southern limit of Radford's Trench 16 (fig 4.3): only the disturbance surrounding the platform was noted and no further evidence regarding the feature was retrieved.

A foundation 1.52m in width was found by Bond running westwards for 9.14m from the north-east corner of the Lady Chapel (fig 4.5).<sup>14</sup> Bond suggested this was a pre-1184 protective stone enclosure for the *vetusta ecclesia*, but in his 1993 letter to Woods, Radford clearly identifies this as the inner retaining wall for the lay cemetery, the shared alignment with the Great Church proving a post-1184 date (fig 4.1).<sup>15</sup> A dark clayey soil [C:1006] [C:1008] exposed in two sondages in Trench 16 was thought to represent the late medieval garden of the chaplains of the Galilee (fig 4.3). This is a reasonable hypothesis, given the proximity of the fourteenth-century lodgings of the Clerks of Our Lady, rebuilt by Abbot Beere. Excavated between 1987 and 1993, this structure provides a *terminus ante quem* for the reduction of the tenth-century terrace of the lay cemetery.

### Post-Dissolution (Phase 16)

In Trench 16, the dismantling of buildings is reflected in demolition material and roof tile fragments within a soil





**Fig 4.4** 'St David's Pillar' excavations (1921 photograph: © Tim Hopkinson-Ball and EHA)

layer [C:1004] (fig 4.3). This was overlain by an intact blue lias pavement [C:1003] at a depth of 1.22m below the turf. Radford thought this was associated with a shallow post-Dissolution blue lias wall [C:1005] aligned east–west across the trench, although the section appears to show the pavement overlying the wall. Pottery dated to the seventeenth century was found lying on the pavement [C:1003]; a record of irregular piles of stone debris above the pavement is suggestive of a breakers' yard (see Plan 5).<sup>16</sup>

## 4.3 The monks' cemetery

### Mid Saxon (Phase 3)

#### Graves

The exposure of graves was deliberately avoided by Radford, and only a few were sufficiently excavated to facilitate basic recording. Radford's first report on the ancient cemetery presents two series of oriented graves. The earliest series was dug into the natural clay at a depth of 2.13–2.44m below the modern turf and sealed by the



**Fig 4.5** Wall to the north of the Lady Chapel, looking south-east-east (1921 photograph: © Tim Hopkinson-Ball and EHA)

clay supposedly deposited by Dunstan to raise the height of the cemetery by over 1m.<sup>17</sup> Of all Radford's cemetery trenches, only Trench 89 was excavated to a sufficient depth (maximum 2.13m) to have reached the earliest series, yet no graves were recorded at this level (figs 4.6 and 4.7). A skeleton labelled 'lower skeleton old' was located in the disturbed clay [C:5914] beneath 'Dunstan's clay' [C:5910]; although this was only 1.55m below the trench surface, stratigraphically it could pre-date 'Dunstan's clay' [C:1356]. Radford described a low-level grave [C:1366] at a depth of 1.67m below the surface of Trench 21, c 0.56–0.85m deeper than two other skeletons (fig 4.8). This was not deep enough to tally with the published depths of the earliest series but, more critically, the skeleton was located within 'Dunstan's clay' and was therefore later.

An extensive layer of disturbed clay with bone [C:5921] in Trench 89 inclined variably from 0.91 to 1.22m below the surface. Although shallower than the purported depth of the earliest series of graves, it underlay 'Dunstan's clay' [C:5917], and is likely to have belonged to a pre-tenth-century cemetery phase (fig 4.6). The layer contained a Bath stone cross-base section, a stone type used at Glastonbury in the Saxon period and employed briefly following the Norman Conquest (see Chapter 9). A single sherd of pottery dated post-1250 was recovered from the clay with bone [C:5921], but this may have been introduced via a later grave.

Radford's 1981 interim report identifies the graves in Trench 19 (see below) as closely packed early cist graves associated with the British monastery (fig 4.15);<sup>18</sup> yet, both the scale bar in the photograph and the section show that they are c 1.22m above the purported depth of the earliest series of graves. A contradiction in the 1981 report between the photograph and the text is circumnavigated by the absence of any depths. The same publication maintains that the cist graves had been dug through Dunstan's clay, contradicting a pre-Dunstan date for these burials.<sup>19</sup>

### Stone crosses or 'pyramids'

In 1962 Radford attempted to locate the site of the legendary 1191 exhumation of Arthur and Guinevere, together with the two ancient stone 'pyramids' said to have flanked the grave. The 'pyramids' are likely to have been the remains of earlier memorials in the churchyard, such as high crosses (see Chapter 3). Trench 89 was marked out based on two medieval descriptions: the apparent eye-witness account of the twelfth-century exhumation written by *Giraldus Cambrensis* (Gerald of

Wales), and a later description of the grave-site by William of Worcester (1480). Gerald described Arthur's grave as sited between the two stone pyramids and William of Worcester placed it south of the second window from the east end of the Lady Chapel.<sup>20</sup> It was suggested that one of the pyramids may have been erected above the remains that had been interpreted by Radford as a burial chamber;<sup>21</sup> there is no archaeological evidence to support this. A 'robbed socket' [C:6003] to the west in Trench 104 was recorded as a possible location for the other pyramid (fig 4.7); however, this is more likely to have represented a grave marker (see below).

## Late Saxon (Phase 4)

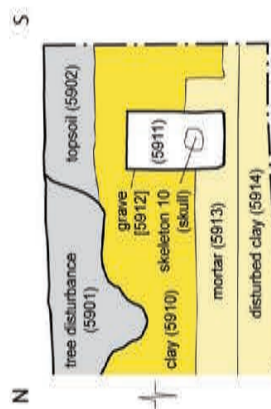
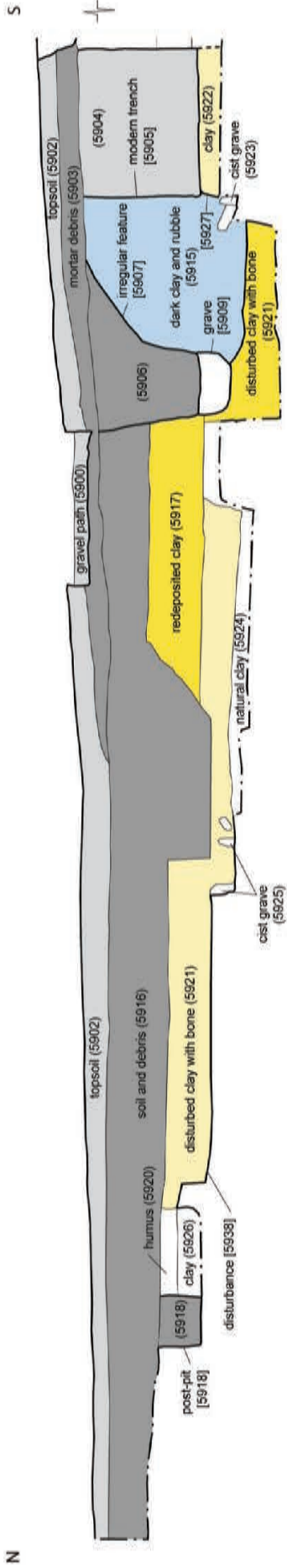
### Cemetery boundaries

The south cemetery wall was identified as a shallow robbed foundation, traced for c 17m west of the outer wall of the thirteenth-century west cloister walk.<sup>22</sup> The post-Dissolution robber trench [C:1353] was recorded in two sections (Trenches 20 and 21) across the southern limit of the cemetery (figs 4.8 and 4.9 and Plan 2). This boundary was thought to have originated in the Late Saxon period based on a shared alignment with the Lady Chapel and Saxon churches. This interpretation seems plausible, particularly as no further cemetery deposits were recorded to the south. The clay [C:1356] identified as 'Dunstan's clay' (see below) was located immediately north of the robber trench [C:1353] and there is no evidence for another retaining wall further north.

### Cemetery platform

A deep clayey soil sealed the first series of graves; this was dug through by the second series and the pit identified by Radford as the legendary 1191 exhumation site of Arthur and Guinevere.<sup>23</sup> It was on this basis that the deep layer of redeposited clay recorded across the cemetery was attributed to Dunstan's documented raising of the cemetery. This comprised a deep clay layer with fragmented bones [C:1459] in Trench 19 (fig 4.10), a 'loose and yellowish' clay [C:5917] and possibly clay [C:5910] at the southern end of Trench 89 (fig 4.6). Later activity probably accounts for the absence of the clay further north, although the cemetery platform presumably levelled off to meet the rising ground surface near the Lady Chapel. Radford reported that the ground to the north of the south cemetery wall had been raised with a bank of clay more than 1m high: this indicates that the deep clay [C:1356] to the north of the south cemetery

**Section 72: Trench 89**

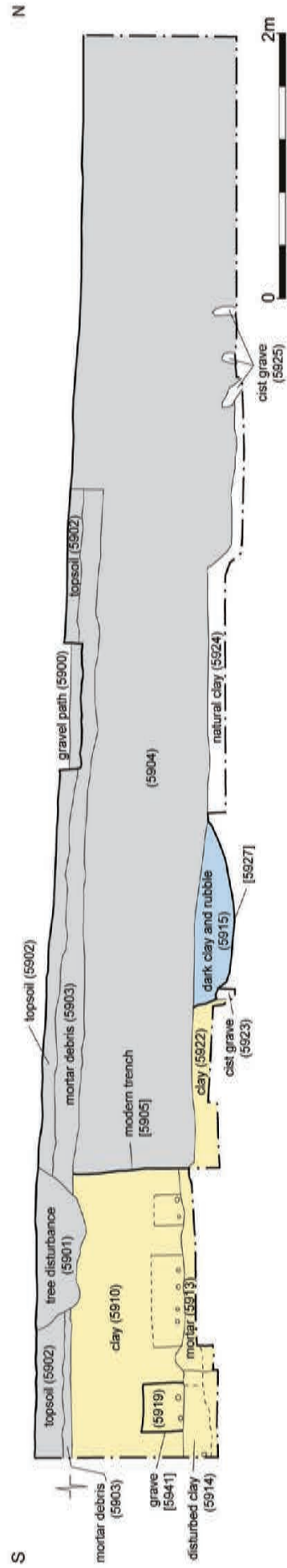


**Earliest possible phase**

- uncertain
- Late Saxon
- Late 12th century to mid-13th century
- Dissolution to Post-medieval
- Modern



**Section 73: Trench 89**



**Fig 4.6** Sections of Trench 89 (scale 1:60)

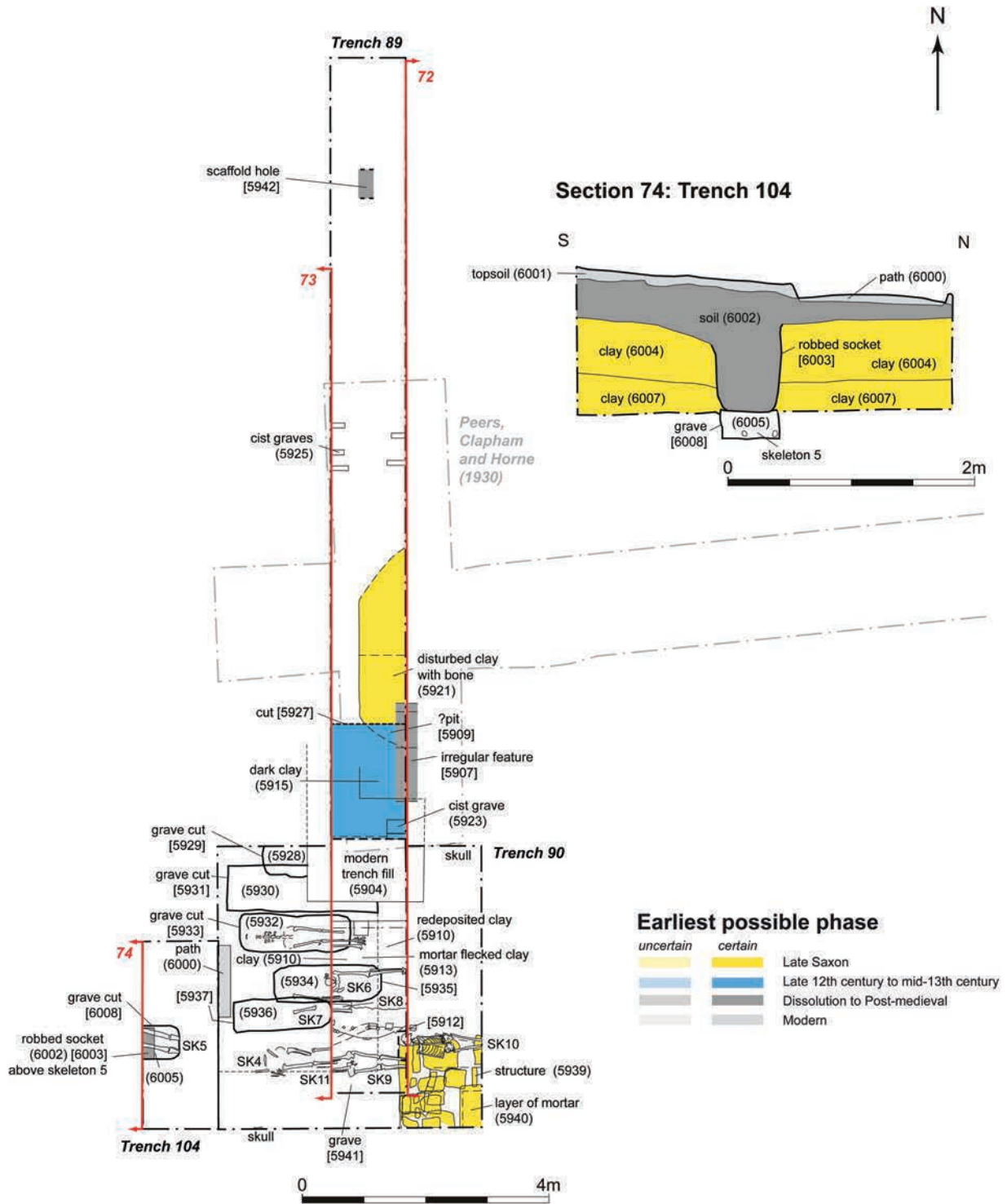


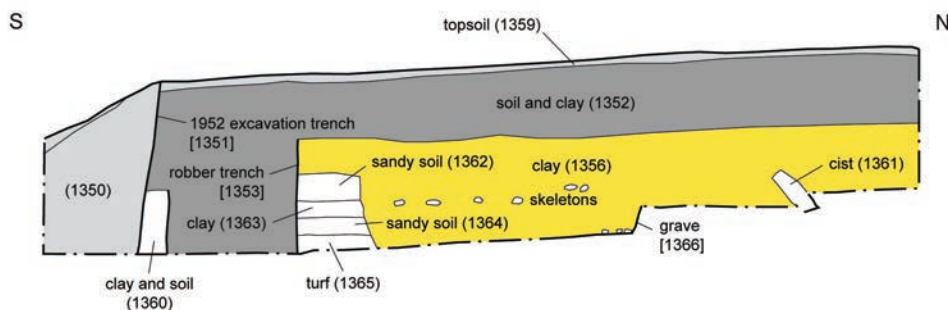
Fig 4.7 Plan of Trenches 89, 90 and 104; section of Trench 104 (scale 1:100 and 1:50)

wall robber trench [C:1353] was linked to ‘Dunstan’s clay’ (fig 4.8).<sup>24</sup> Medieval grave disturbance probably accounts for the thirteenth- to sixteenth-century pottery recovered from one of these deposits [C:5910]. Otherwise, the absence of pottery in these clay layers appears to support a tenth-century date, given that the Glastonbury area of Somerset was aceramic before c 930.<sup>25</sup>

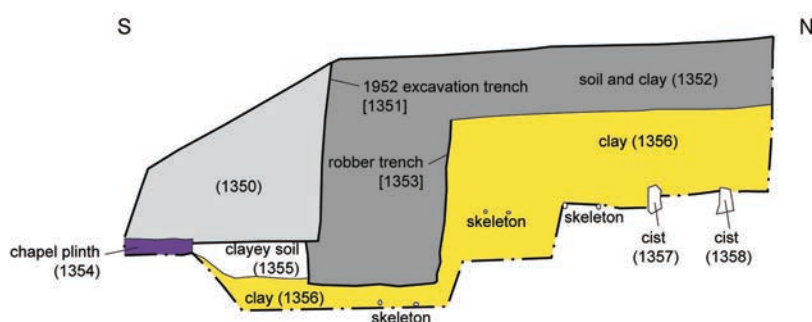
### Burial chamber

Radford states that two early Christian *hypogea* were found within the cemetery.<sup>26</sup> A rectangular crypt was found c 1m east of the earliest stone church (figs 4.1, 4.11, 4.12, 4.13 and 4.14).<sup>27</sup> The eastern halves of the walls had been cut away, and it was suggested this may have been

## Section 26: Trench 20



## Section 27: Trench 21



## Earliest possible phase

uncertain	certain	
		Mid Saxon
		Mid-14th century
		Dissolution to Post-medieval
		Modern

0 2m

Fig 4.8 Sections of Trenches 20 and 21 (scale 1:50)

to accommodate human remains, indicating the crypt was at some point used as a burial chamber (see below).<sup>28</sup> In the monks' cemetery, the north-west corner of a structure [C:5939] was recorded in Trench 89, comprising a north and west wall both measuring  $\approx 0.85\text{m}$  wide and which appeared to contain a rectangular mortar layer [C:5940] (figs 4.6 and 4.7). This feature corresponds with poorly defined walling imaged in the resistance survey (see fig 2.17).

The interpretation of this feature as another subterranean burial chamber was based on its reported similarity to the 1928 discovery, although there is no elaboration in the archaeological record regarding any shared characteristics. The stratigraphic location of the structure beneath 'Dunstan's clay' [C:5910] was used as further evidence for a pre-Dunstan date.<sup>29</sup> However, the disturbed clay [C:5914] beneath the structure yielded a sherd of incised Saxon pottery (noted as being sealed by the mortar floor or wall) and a further sherd of Saxon pottery. Any Saxon pottery post-dates 950 (see Chapter 8) and, although the sherds may be intrusive, their presence

throws doubt on a pre-Dunstan date for the disturbed clay [C:5914] and consequently for the structure. It was also stated that the graves beside the structure illustrate the early Christian custom of burial *ad sanctos*.<sup>30</sup> This relationship is not supported by the plan evidence, which shows one burial [F:SK10] overlying the north wall of the structure and the lower legs of another skeleton [F:SK9] coinciding with the west wall. Further, these burials are more likely to be medieval in date (see below) than Saxon.

### Saxo-Norman to mid-sixteenth century (Phases 5–15)

The 'second series' of graves cut through 'Dunstan's clay' and was thought to have comprised two types: earlier burials in cist graves and later burials in wooden coffins. However, Radford noted that all the graves were at a constant depth of 0.91m below the modern turf; with a known modern ground reduction of  $\approx 0.3\text{m}$ , it was estimated that the graves were cut from at least 1.22–1.52m above the natural clay.<sup>31</sup> Indeed, with the





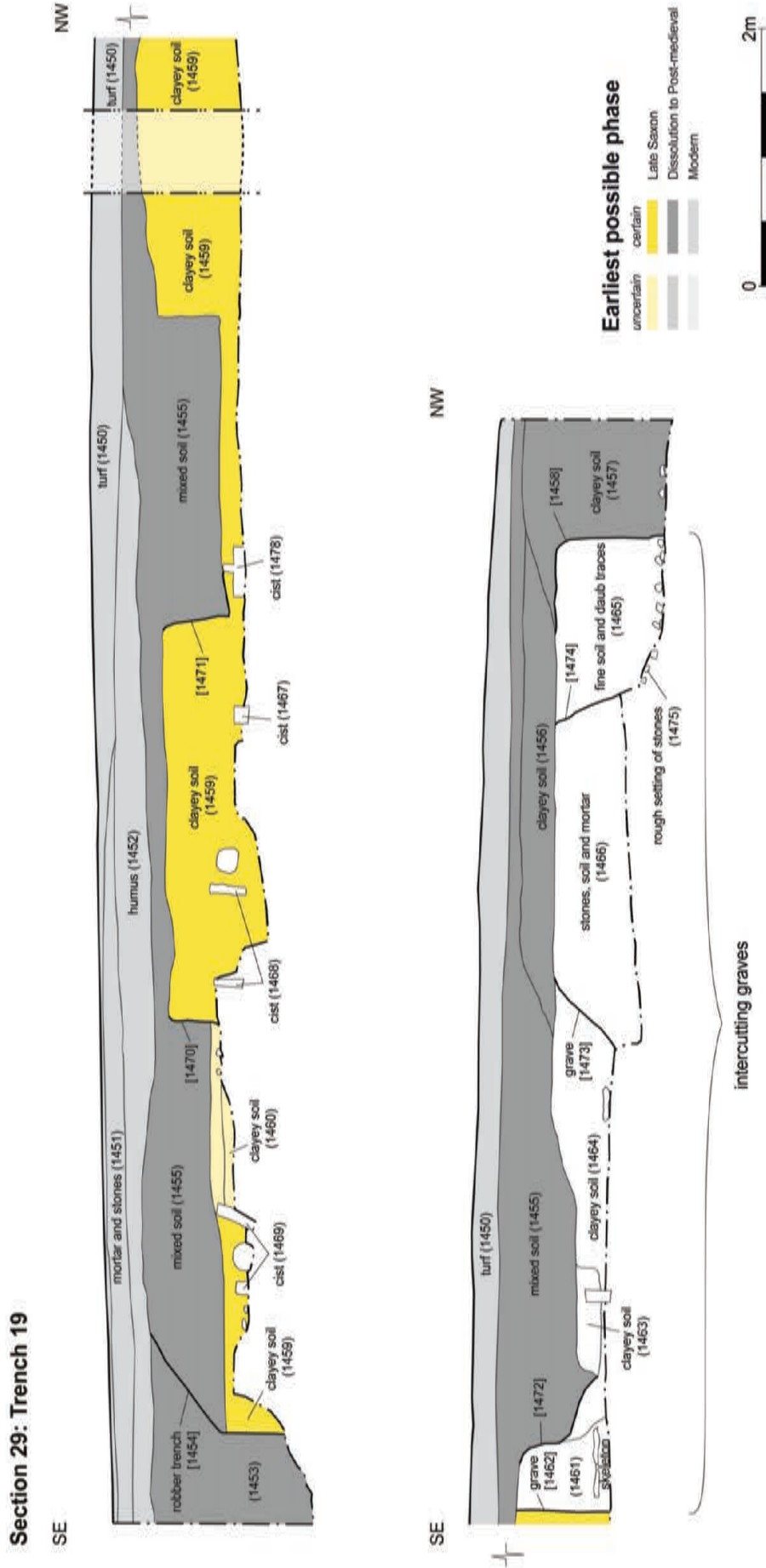


Fig 4.10 Section of Trench 19 (scale 1:50)



**Fig 4.11** Burial chamber and earlier walls beyond, looking west (1929 photograph © Glastonbury Abbey)



**Fig 4.12** Burial chamber, looking north (1929 photograph © Glastonbury Abbey)



**Fig 4.13** Burial chamber, looking south west (1929 photograph © Glastonbury Abbey)



**Fig 4.14** East end of burial chamber, looking east (1929 photograph © Glastonbury Abbey)

exception of two cist graves in Trench 89 (see below), neither the cist graves nor those in wooden coffins penetrated the natural clay, implying that they probably all post-date Dunstan's raising of the cemetery; there is no evidence to support Radford's assumption that the cist graves relate to earlier burial practice.

Radford's published accounts deliver no further information on the medieval graves in the monks' cemetery beyond the use of wooden coffins. However, there is significant evidence of medieval burial practice within the archive, including multiple and intercutting graves, double interments, translated remains and a pillow burial. Very few grave goods were recorded; this paucity of evidence may reflect the fact that none of the burials were fully excavated.

### Cist graves

Between eleven and thirteen cist graves were recorded in the southern, central and eastern areas of the monks' cemetery. The first [C:560] was discovered in Trench 6 within 'Dunstan's clay' [C:559] [C:563] at a depth of c 0.9m. This contained a disturbed skeleton [F:SK16]; the section only shows a layer of bones, although the notes state that the larger bones were distinguishable (figs 4.9 and 5.3). The four cist graves [C:1467] [C:1468] [C:1469] [C:1478] in Trench 19 were recorded at c 0.76–0.91m below the surface of 'Dunstan's clay' [C:1459] (figs 4.9, 4.10 and 4.15). Radford noted the difficulty in identifying grave cuts, which explains why only one insertion [C:1462] is evident. Located at the base of the trench, the cist graves were roughly parallel, except the northernmost grave [C:1478], which was aligned more precisely east–west. The cists were constructed of upright stones embedded in 'Dunstan's clay' with no trace of the cover stones. The southern side of one cist grave [C:1469] probably formed the northern side of another, indicating a double interment, also highlighted by Radford.<sup>32</sup> A narrow east–west aligned high-resistance feature on the geophysical survey corresponds with the same grave. Part of the south side of the northernmost grave [C:1478] comprised two stones flanking a thin stone, indicating an element of improvisation when it came to burial practice (fig 4.15). A rough setting of stones [C:1475] possibly indicates the presence of an earlier cemetery structure or cist grave, and an upright stone within deposit 1464 may belong to a cist grave.

An undisturbed skeleton [F:SK19] was found in one of these cist graves [C:1469], the east side of the trench crossing the lower part of the femur. The ulna and radius were folded across the stomach, the left arm higher than

the right (fig 4.16); however, there are no other records of this burial.

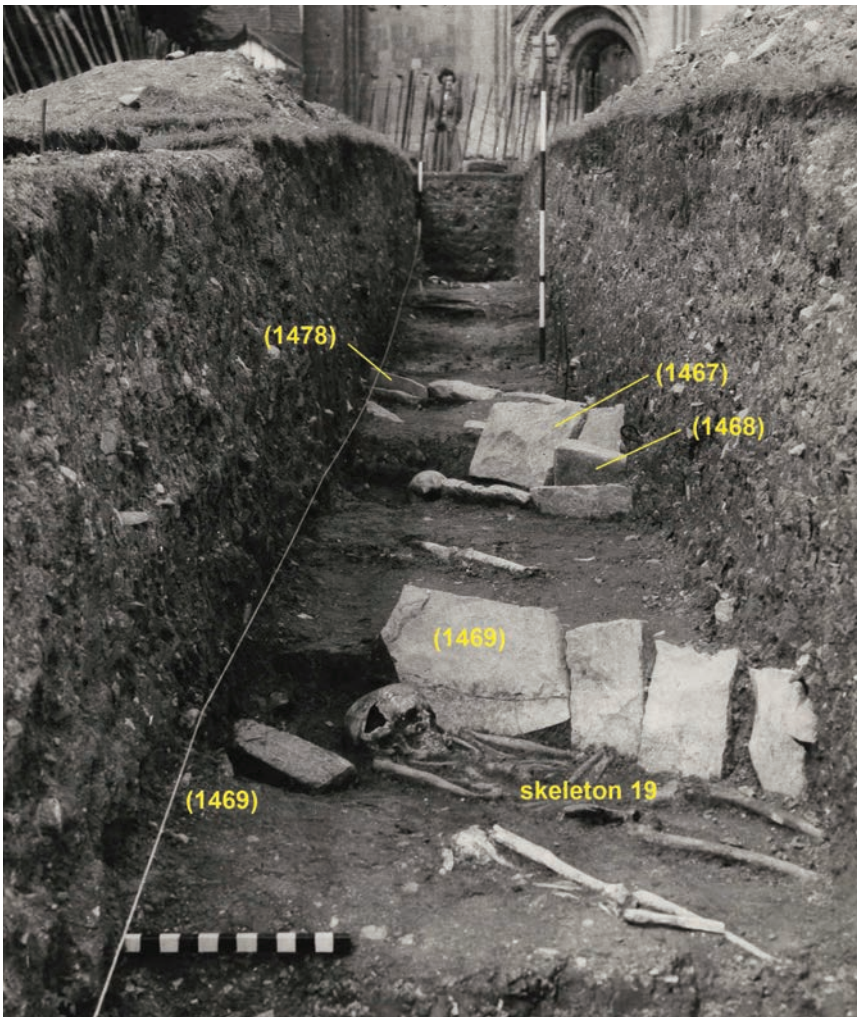
Near the southern boundary of the cemetery, in Trenches 20 and 21, the remains of two cist graves [C:1361] and [C:1358] [C:1357] were aligned approximately east–west at a depth of c 0.9m below the surface of the trenches (figs 4.8 and 4.9). The latter may be imaged as a high-resistance feature on the resistivity survey (see fig 2.17). As with the cist graves in Trench 19, the upright slabs were embedded in 'Dunstan's clay' [C:1356] but were also recorded as being covered by the same deep, continuous layer containing numerous skeletons, although no grave cuts were identifiable.

In Trench 89 two cist graves were located beneath the level of 'Dunstan's clay', however the depth indicates that they also belonged to the later grave series (figs 4.6 and 4.7) and they were noted as resembling those found in Trenches 19, 20 and 21.<sup>33</sup> The southernmost grave [C:5923] was at a depth of 1.68–1.83m below the surface of the trench. A sherd of post-1250 pottery appears to have been recovered from the grave fill [C:5922], although there is some uncertainty surrounding the context. Further north, a cist grave [C:5925] was recorded at a depth of 1.22–1.37m, the arrangement of the slabs perhaps indicating two or three graves.

### Other graves

The only grave recorded in a stone coffin outside the church was Bond's 1908 discovery to the west of the nave and post-dating it.<sup>34</sup> Forty or forty-one other graves were recorded by Radford in the southern, central and eastern areas of the monks' cemetery. Wooden coffins were evident for only five of these burials; skeletons were not recorded for five or six graves; three skeletons were recorded within graves and one set of remains had been translated. Grave cuts could not be identified for the majority (twenty-seven) of the skeletons.

A grave [C:579] recorded in plan in Trench 6 had traces of a wooden coffin visible as a grey rectangle (fig 4.9). The undisturbed skeletal remains [F:SK15] were not exposed, perhaps because the south side of the trench crossed the remains. In Trench 19, graves with wooden coffins were recorded cutting through 'Dunstan's clay' [C:1459] and disturbing the cist graves (fig 4.10). The skeletons were at depths of c 0.9–1.37m below the surface of the trench and, as the same clay was used for the backfill, only three cuts were identifiable. Graves 1462 and 1458 both contained skeletons and had traces of wooden coffins (with a *terminus post quem* of 1250–1500). The latter cut through another grave [C:1474] with traces of a



**Fig 4.15** Cist graves, looking north west  
(1954 photograph: © EHA)



**Fig 4.16** Skeleton in cist grave (1954  
photograph: © EHA)

wooden coffin and a rough setting of stones [C:1475] on the south side of the skeleton (see above). The fifth wooden coffin is indicated by coffin nails recovered from grave [C:5911] [C:5912] (see below).

Grave 1474 cut through a deep layer of stone, soil and mortar [C:1466]; Radford immediately linked this deposit to the legendary 1191 exhumation site of Arthur and Guinevere, before discovering what he thought was a more convincing location in 1962 (see below). The southern side of this deposit appears to have been cut by a wide feature [C:1473] filled by another grave horizon [C:1464] containing a skeleton [C:1474]. A regular hollow in this horizon containing clayey soil [C:1463] may represent the base of a later grave.

In addition to the skeletons located within graves, Trench 19 recorded scattered bones and the presence of a further five intact skeletons (fig 4.10). One of these skeletons [F:SK14] was described in detail, perhaps because of an ashy layer discovered beneath the skull and fragments of the collapsed coffin lid beneath the left radius and ulna. Although the skeleton was misaligned, the angle of the femur suggests it belonged to another individual. Distribution of the ash beneath the skull is suggestive of an ash-filled pillow, in contrast to an ash burial, in which the coffin is lined with hearth ash rakings before the corpse is placed inside.<sup>35</sup> Evidence for pillows was also found in the eighteen wooden coffins excavated by Warner in 1825 to the north of the Lady Chapel.

Five sets of skeletal remains were recorded in Trenches 20 and 21, between 0.9m and 1.06m below the surface, with a further set of skeletal remains at a depth of 1.12m (fig 4.8). In Trenches 89 and 90 a minimum of thirteen graves / individuals were represented (fig 4.7), with most of the burials intercutting. Only two of these were recorded in any detail. A skeleton [F:SK10] with coffin nails discovered within a grave [C:5911] [C:5912] (figs 4.6 and 4.7) appears to have been complete, although the smaller bones were recorded as missing and the lower parts of the legs disappeared into the eastern baulk and overlay the eastern wall of the funerary structure [C:5939] (see above). A skeleton [F:SK11] within a grave [C:5919] [C:5941] comprised a skull and miscellaneous bones (fig 4.6) with coffin nails, indicating that the remains had been collected and placed in a small box. A further skeleton [F:SK3] appears to have been associated with a grave [C:5933]. A very large grave with a precise, rectangular shape [C:5931] is suggestive of multiple burials. Skulls were recorded in both the northern baulk and in the southern baulk of the south extension, while the west section showed a further three skeletons at the base of 'Dunstan's clay' [C:5910], 1.3m below the surface

of the trench. These probably relate to skeletons shown in plan [F:SK3] [F:SK6] [F:SK8], which shows these burials and several of the others in more detail. A further three graves – [C: 5929] [C:5935] and [C:5936] – and three sets of skeletal remains – [F:SK4] [F:SK7] and [F:SK9] – were recorded.

In Trench 9 a grave [C:682] [C:683] containing a skeleton [F:SK1] coincides with the southern side of the south cemetery wall robber trench [C:1353] in Trench 19 (fig 4.9). This is the only evidence that the south cemetery wall might have moved slightly northwards. However, the mapping is insecure for this area and there is no further evidence to suggest that the position of the Late Saxon southern boundary of the monks' cemetery was altered (see above).

### 'Arthur's grave'

In Trench 89, an irregular pit [C:5927] backfilled with dark clay and rubble [C:5915] was located between the funerary structure [C:5939] and the robber trench [C:5907] said to represent one of the 'pyramids' (see below). The pit [C:5927] matches Radford's description of the feature he identified as the AD 1191 exhumation site of Arthur and Guinevere. Radford dated the disturbance to 1184–9 on the basis that the fill contained a large number of Doultling stone chippings. Believing this material was not widely used at Glastonbury until after the 1184 fire, Radford argued that the chippings related to post-fire rebuilding. However, Doultling stone comprises the bulk of the stone collections for all periods and the standing remains (see Chapter 9); it has also been identified amongst Anglo-Saxon carvings dating from the eighth to eleventh centuries.<sup>36</sup> Radford argued that the cemetery would only have been used for stone dressing in the post-fire period, and was probably related to the construction of the Lady Chapel in 1186.<sup>37</sup> The pit [C:5927] cut through the extensive 1184 fire layer, with the backfill containing large quantities of burnt material.<sup>38</sup> Although this indicates a post-fire date, Radford's interpretation of this feature is clearly based on his reading of the historical evidence.

### Monuments

In 1921 a search was made for one of the 'pyramids'. At a point 9.75m from the south door of the Lady Chapel, Bond discovered traces that he thought might represent a 'pyramid' or large stone cross.<sup>39</sup> To the east, an irregular feature [C:5907] in Trench 89 was sealed beneath post-Dissolution mortar debris [C:5903] (fig 4.6) and

purportedly contained fifteenth-century pottery. Radford associated this feature with the post-Dissolution removal of one of the stone 'pyramids', although there is no archaeological evidence to support the theory.<sup>40</sup>

Nearby, Trench 104 recorded a feature with vertical edges [C:6003] (fig 4.7): interpreted as a 'robbed socket', Radford argued that because it could not be traced below the original ground surface it must have been contemporary with the deposition of 'Dunstan's clay' [C:6007] [C:6004] and was therefore set around c 950. On this basis, it was identified as the hole from which the other early 'pyramid' was 'dragged'. The feature probably represents a robbed grave marker for the burial [C:6005] beneath.

### Post-Dissolution (Phase 16)

Extensive destruction layers and evidence of robbing activity was recorded beneath the topsoil (Plan 5). For example, in Trench 19 a robber trench [C:1454] (probably for the north wall of St Michael's Chapel) cut through an extensive mixed soil layer [C:1455] containing fragments of building material, stones and debris (fig 4.10). This suggests that significant demolition work took place while buildings were still extant. In the same trench, three wide features [C:1470] [C:1471] [C:1472] cut into 'Dunstan's clay' [C:1459] were backfilled by a demolition layer [C:1455], suggesting the removal of funerary monuments in the centre of the cemetery.

## 4.4 St Michael's Chapel

Following Bond's discovery of St Michael's Chapel (fig 4.1), Radford undertook further explorations of the eastern end of the structure, during which two phases of masonry were recognised. The earliest was a stone-walled crypt with stone paving slabs and some surviving Tor burr foundations from the chapel walls, said to resemble those of thirteenth-century buildings on the site.<sup>41</sup> Radford suggested that the large quantity of human remains stacked in the crypt were probably translated from the nave during the mid-thirteenth-century building work. The later building phase surrounding the crypt was attributed to Abbot Chinnock's reconstruction work of around c 1382, represented by a fourteenth- or fifteenth-century moulded plinth surviving at the base of the east wall. The floor of the chapel was level with the cemetery platform while the crypt was coterminous with the original lower ground surface shared by the abbot's range to the south.<sup>42</sup>

### Late twelfth to mid-thirteenth centuries (Phase 9)

In Trench 22, the foundations [C:1321] of the southern and eastern sides of St Michael's Chapel crypt were set in a clay matrix, in contrast to the yellowish mortar used for the later chapel walls (figs 4.9 and 4.17). Although predominantly robbed [C:1306] [C:1326] (fig 4.18), an inner face of vaulting stones set in mortar indicates that the room was vaulted. The dating is based entirely on the similarity of the build to other supposed thirteenth-century foundations.

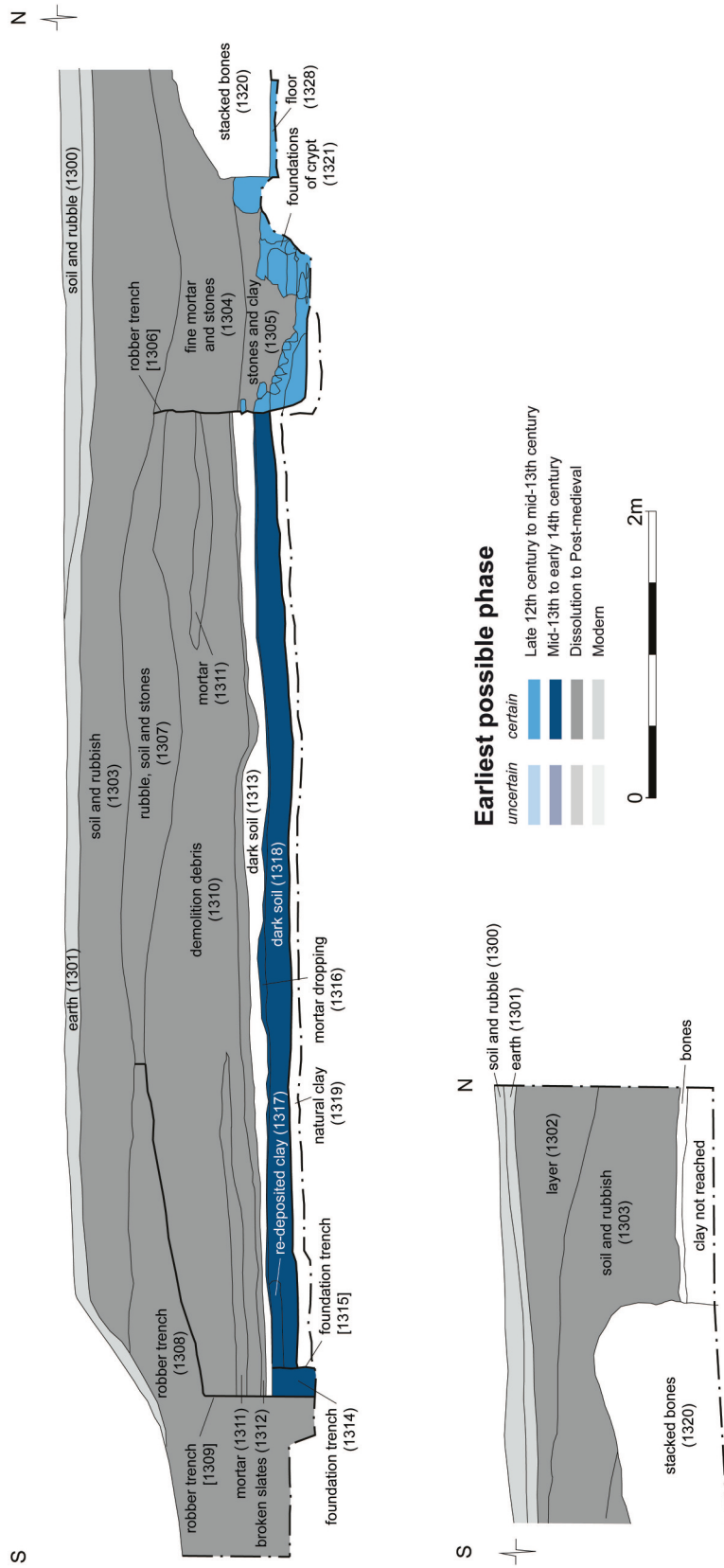
The section bisected a large stack of bones [C:1320] contained within the crypt [C:1321] and overlying two paving slabs [C:1328] on the north side of the south wall (figs 4.17 and 4.19). Although disturbed by later robbery, the remains had been arranged with the long bones in the centre and the smaller bones and skulls to the north and south. There was no dating evidence to confirm Radford's assumption that the bones were moved here in the thirteenth century.

### Late fourteenth to early fifteenth centuries (Phase 12)

Remnants of the south foundation [C:465] in Trench 7 comprised roughly dressed or undressed Tor burrs and lias set in a yellowish mortar (figs 4.9, 6.13 and 6.14). The east wall was represented by three stones recorded in plan, coinciding with remains of the external eastern moulded plinth [C:1323] crossing Trenches 9 and 22 (fig 4.9) and in section [C:1354] (fig 4.8). Approximately 0.45m to the west, and at the same depth of c 1m below the trench surface, was a further line of five upright slabs [C:1322] (fig 4.18) forming the inner line of the east wall.

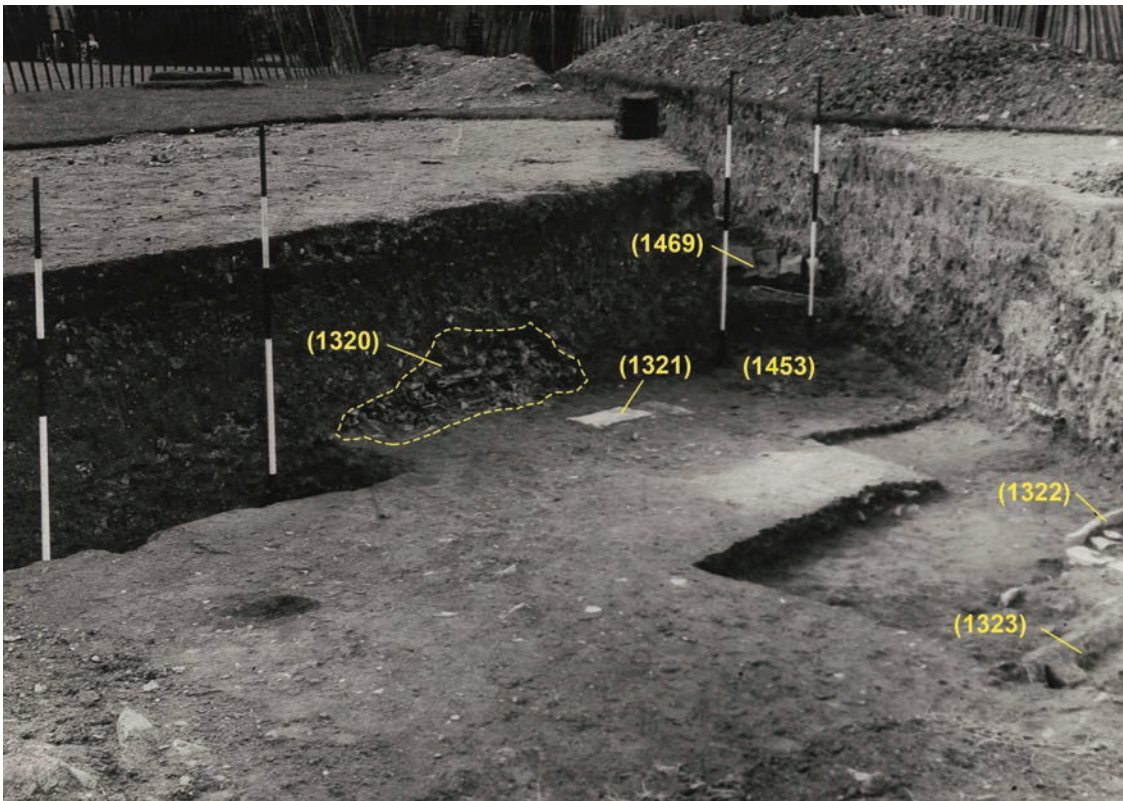
The south cemetery wall appears to have formed the north wall of St Michael's Chapel, probably represented by the robber trench [C:1453] [C:1454] in Trench 19 immediately north of the crypt (figs 4.10 and 4.18). However, the level of the eastern plinth [C:1323] shows that the chapel foundations must have been significantly deeper than those for the south cemetery wall, known only from a robber trench [C:1353] (fig 4.8). Indeed, Radford commented that the foundation trench for the south cemetery wall is unlikely to have supported a high wall. Unfortunately, there is no indication from the archaeological records as to whether the foundations were deeper in the area of St Michael's Chapel. A mortar layer [C:458] within the chapel footprint in Trench 7 (see figs 6.13 and 6.14), together with a possible floor horizon [C:664] in Trench 9 (see fig 5.25), may represent the crypt floor.

**Section 28: Trench 22**



**Fig 4.17** Section of Trench 22 (scale 1:50)





**Fig 4.18** St Michael's Chapel and crypt, looking north west (1954 photograph: © EHA)



**Fig 4.19** St Michael's Chapel crypt, looking west (1954 photograph: © EHA)

### Post-Dissolution (Phase 16)

The crypt [C:1321] of St Michael's Chapel was extensively robbed [C:1306] [C:1326] (figs 4.9 and 4.17). The upper fill [C:1304] contained mortar which was softer, finer and browner than that from the abbot's hall robber trenches, reflecting the different construction dates of the two buildings. The robber trench [C:1306] cut through an extensive rubble layer [C:1307] to the south of St Michael's Chapel revealing a sequence of demolition that probably relates to the dismantling of the chapel before the crypt. Although the stacked bones [C:1320] contained within the crypt had been disturbed, the arrangement of the bones was preserved indicating minimal interference.

The remnants of St Michael's Chapel were covered by a deep layer of mortar, stone and debris [C:663] in Trench 9 (see fig 5.25); a deep layer of soil [C:457] containing some stones and mortar spalls in Trench 7 (see fig 6.14); and a soil and rubbish layer [C:1303] with an additional levelling deposit [C:1302] at the northern end of Trench 22 (fig 4.17).

## 4.5 The Saxon church nave

The Saxon church was uncovered beneath the medieval nave between 1926 and 1929 (figs 4.1 and 4.20), the base of the foundations being up to 3.56m below the modern turf.

### Mid Saxon (Phase 3)

Radford proposed that the earliest Saxon church comprised three inter-connecting compartments: the eastern end of the nave, a presbytery reserved for the clergy, and the western end of the chancel (see Plan 1 and fig 10.3), which Radford believed had an apsidal east end.<sup>43</sup> In plan, several pieces of masonry may represent the interior south-eastern face of this supposed apse. The side walls of these compartments ran inside the sleeper walls of both the twelfth-century and the late twelfth- to early thirteenth-century arcades (figs 4.21 and 4.22); the west wall of the twelfth-century nave cut through the western



**Fig 4.20** Saxon church excavations, looking west (1929 photograph: © Glastonbury Abbey)



**Fig 4.21** 1926 photograph: remains at west end of nave, looking north (1926 photograph: © Glastonbury Abbey)



**Fig 4.22** Flooring and walls, looking west (1926 photograph: © Glastonbury Abbey)

compartment and therefore confirms a pre-Norman date. The walls comprised shallow courses of limestone measuring 0.71m thick and rendered with lime mortar containing ground brick.<sup>44</sup> Walls of similar character found to the north and south of the central compartment were interpreted as the outer walls of lateral chambers flanking the porticus (figs 4.1 and 10.3). A plaster floor containing ground brick (III on original photographs; fig 4.21), described as *opus signinum*, was associated with a cross-strip of paving thought to represent a central opening between the central and eastern chambers (fig 4.1).<sup>45</sup>

The remains were attributed to the earliest documented stone church built by King Ine (688–726) on the basis that *opus signinum* flooring had been identified at seventh- and eighth-century Kentish churches.<sup>46</sup> On stratigraphic grounds, the subsequent discovery of two further Saxon phases (see below) supports a pre-tenth-century date. Radiocarbon dating of the glass furnaces (see Table 1) has revealed that window glass was being produced in the late seventh century, and is likely to be directly associated with the refounding of the monastery by King Ine. Although there is no direct evidence linking Fyfe's discoveries to Ine's church, no other pre-Dunstan stone structures have been identified.

A partially subterranean stone crypt was discovered on the same alignment to the east (fig 4.1). Radford thought this was one of two early Christian *hypogea* (figs 4.11, 4.12 and 4.13); the other within the monks' cemetery is now reinterpreted as a funerary structure (see above). The thin walls of the crypt were dressed on both sides, perhaps evidence of an effort to keep water out. A flight of steps was thought to have provided access from the west, although there is no physical proof to support this. A sloping entrance at the west end of the crypt had a base stone containing two iron dowels, indicating the presence of a doorway.<sup>47</sup> A blue lias slab with a circular aperture in the east wall of the chamber (fig 4.14) provided light or visual access, indicating that the chamber was separate from the church before being enclosed by the later extensions (see below). The eastern halves of the walls had been cut away, and it was suggested this may have been to accommodate human remains.<sup>48</sup> Together with the viewing aperture, this suggests that the crypt was at some point used as a mausoleum or relic chamber.

The second-phase remains were distinguished by the use of purplish or mauve mortar (see Plan 1 and fig 10.4). This was interpreted as the remodelling and extension of the eastern termination to form a square end; a western porticus and atrium were also added. This is shown on

Radford's 1981 figure 3 as the reconstructed chancel of the second-phase church. Further east was another rectangular room with walling of greater depth surrounding the subterranean crypt; the space between was filled with stone rubble, possibly forming a pavement bedding layer.<sup>49</sup> Although the mortar was said to be different, the rectangular room was also attributed to the second phase. The excavation plans show only the east wall immediately to the east of the earlier crypt; no further foundations were identified to the east. In addition, two walls connected the reconstructed chancel with the crypt, flanking the western entrance to the crypt and perhaps implying an entrance.

Excavations to the west of the medieval church disclosed masonry that was interpreted as the north-west corner of a porticus (see Plan 1 and fig 10.4). Consequently, the foundations discovered by Bond in 1911 to the south of the Galilee were reinterpreted as an opposing porticus.<sup>50</sup> Radford thus described the remains as consisting of two asymmetrical porticus flanking the western end of the Saxon nave, probably terminating beneath the medieval Galilee.<sup>51</sup> Evidence of a further wall extending westwards from the remains was interpreted as the north-west porticus;<sup>52</sup> this was later reinterpreted as evidence for an atrium connecting the nave and the old church.<sup>53</sup> However, the original excavation plans show no masonry and only suggest the outline of a short foundation trench. The small stretch of masonry to the north west of the Saxon church may relate to the second phase, based on the mortar employed, and there is no convincing evidence to support Radford's atrium theory.

A number of excavated fragments of sculpture may have come from the Saxon church; these include a late eighth-century sculpture with a border of fret patterns and two eighth- or ninth-century sculptures with animal ornament that were mentioned in the published report.<sup>54</sup>

#### **Late Saxon (Phase 4)**

The crypt was surrounded by thick walls (see Plan 1 and figs 10.4 and 10.5); these were said to have replaced the second-phase rectangular enclosure around the crypt, although the east wall of the second phase was located immediately on the eastern side of the third-phase east wall. The thick walls were interpreted as the tower of Dunstan's eastern extension, with evidence of flanking porticus.<sup>55</sup> Wedlake and Radford corrected an inaccuracy in the 1929 published plan in relation to the position of the north porticus east wall, which is 1.2m west of the tower east wall and the south porticus.<sup>56</sup>



**Fig 4.23** Coffin with cover stone removed, looking east (1929 photograph: © Glastonbury Abbey)



**Fig 4.24** Stone coffin, looking east (1928 photograph: © Glastonbury Abbey)



**Fig 4.25** Emptied stone coffin, looking north-west-west (1928 photograph: © Glastonbury Abbey)



**Fig 4.26** Walls to the east of the tower, looking north (1929 photograph: © Glastonbury Abbey)

A large stone coffin had been placed at the entrance to the crypt (fig 4.1), sealed with rough slabs (figs 4.23, 4.24 and 4.25). When the slabs were removed, the coffin was found to contain a collection of human remains comprising skulls placed at the west end, long bones at both ends and smaller bones in the centre.<sup>57</sup> The remains were removed from the coffin and examination revealed the presence of up to seventeen individuals; it was suggested Dunstan's eastward extension to the church (see below) probably disturbed human remains and that these were collected and placed in the coffin.<sup>58</sup>

Radford argued for an aisled eastern arm located to the east of the tower, based on Wedlake's recollections, unpublished archaeological plans and William of Malmesbury's description of Dunstan's lengthening of the earlier Saxon church.<sup>59</sup> He drew attention to a wall running eastwards from the north porticus east wall for 1.5m, to traces of another wall running east from the north wall of the tower (fig 4.1) and to four stones with small holes in the surface located to the east of the south wall of the tower, which he conjectured carried a metal screen (fig 4.26 and 10.5). Although this feature was shown on the published excavation plan, it was not discussed; Radford believed that the stones indicated the position of the south arcade of an aisled eastern arm.<sup>60</sup> In Trench 83, Radford recorded a 'light' robbed foundation

trench [C:5320] aligned east–west to the east of the stones with holes (see fig 10.5). The clay fill [C:5319] was sealed beneath the early to mid-twelfth-century floor [C:5315] and was interpreted as further evidence of a presbytery south arcade. Located to the west of the supposed western limit of the eleventh-century church (see below), this pre-twelfth-century feature probably relates to the Late Saxon period.

The dimensions that Radford extracted from these minimal remains led to a comparison with Cluny II (dated from 948) and his elaborate reconstruction of the third-phase eastern arm attributed to Dunstan.<sup>61</sup> There is no archaeological evidence for the eastern sanctuary as envisaged by Radford. An important feature was omitted from the original published plans: an empty stone-lined receptacle centrally placed to the east of the Saxon church (figs 4.1 and 4.27). Radford located this in the centre of his postulated aisled sanctuary;<sup>62</sup> however, this feature can only be dated as pre-1184 and may relate instead to the twelfth-century church.

### Late eleventh century (Phase 6)

At the eastern end of Trench 83 were the remains of a foundation [C:5310] comprising fairly small lias stones and Tor burrs set in soft yellow mortar (figs 4.28 and



**Fig 4.27** Stone-lined receptacle, looking north (1929 photograph: © Glastonbury Abbey)

4.29). This was interpreted by Radford as the west wall and adjoining south-west pier of Turstin's late eleventh-century church (Plan 2).<sup>63</sup> The foundation was covered by the twelfth-century mortar bedding [C:5309] and the south side was cut by the robber trench [C:2307] for the late twelfth- to mid-thirteenth-century south arcade sleeper trench. Located eastwards of the known extent of the Saxon church, an eleventh-century date seems likely. In plan, the foundation is aligned north-south with an eastward return, which may represent a wall and attached pier as envisaged by Radford.

### Early twelfth century and mid- to late twelfth century (Phases 7 and 8)

The discovery of Tor burr foundations beneath the post-fire foundations suggested that the twelfth-century north porch was in the same relative position as the later structure.<sup>64</sup> The western foundation of the Romanesque nave (fig 4.30), previously observed by Bond,<sup>65</sup> was slightly east of the west wall of the later nave (Plan 3).<sup>66</sup>

The 1927 excavations recorded blue lias paving stones 1.9m below the thirteenth-century paving (Plan 3; fig 4.1; identified as 'II' in fig 4.21), bedded on a 0.3m make-up layer containing fragments of painted wall-plaster.<sup>67</sup> Fragments of large thick red tiles were at the same level as the blue lias paving (visible on the north side of paving 'II' in fig 4.22). The underlying make-up layer covered the Saxon foundations and red plaster floor; therefore, the blue lias paving and red tiles were stratigraphically dated to the Romanesque church. The white incised decoration is consistent with a Norman date; however, this attribution is made only from the description of the red tiles, which are no longer present within the abbey collections. These tiles were thought to have formed a central tiled strip about 1.83m wide within the nave. Fragments of another *in situ* paved floor were located at a slightly higher level to the east (fig 4.22). Significantly, these tiles were noted as being fire-blackened and with molten lead in their joints, providing possible evidence of the 1184 fire.<sup>68</sup>

The two levels of paving were originally thought to represent the two Romanesque churches. Instead, Radford suggested that there were two levels of early to mid-twelfth-century paving, the lower level perhaps representing a western vestibule. The existence of a partition wall would perhaps have protected the postulated vestibule from the fire, explaining the lack of fire evidence at the lower level.<sup>69</sup>

In Trench 26 the mortar bedding for the twelfth-century pavement was recorded as a shallow bed of soft

yellowish mortar [C:2312] in the south aisle (fig 4.31), c 1.5m below the surface of the late twelfth- to mid-thirteenth-century mortar bedding [C:2308] (fig 4.28). In Trench 83 within the central aisle, brown mortar bedding [C:5315] overlay the natural clay and was covered by a clay make-up [C:5308] at a depth of c 1.0m below the turf. Two flat stones [C:5314] were located at the same level and to the west of the mortar bedding [C:5315], while to the east the mortar bedding [C:5309] was 0.15m higher, covering the earlier foundation [C:5310] (see above).

One segment of an early to mid-twelfth-century sleeper wall [C:5318] appeared to survive immediately to the north of the post-fire south arcade (fig 4.29). The stones were *in situ* beneath a later disturbed skeleton [F:SK12], and the outline of a wooden coffin survived in places. Perhaps the burial was encountered and avoided during post-Dissolution robbery, preserving the earlier structural remains beneath. Within the south nave there was evidence that the twelfth-century foundation remained beneath: below the fifth course the character of the fabric changed to uncoursed lias rubble (fig 4.32).

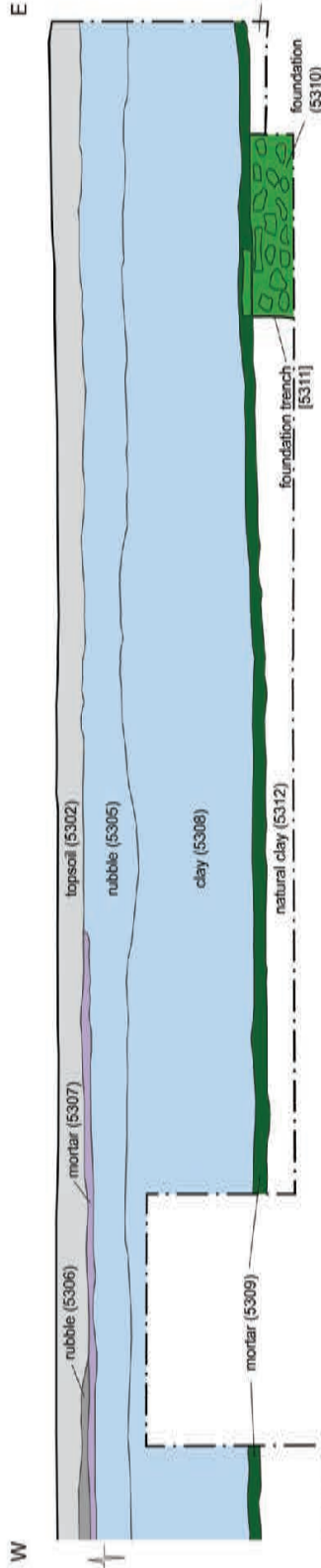
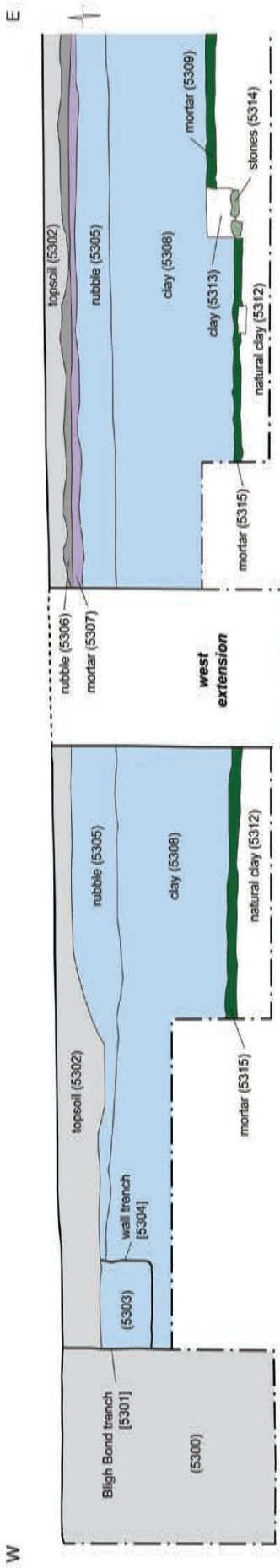
### Late twelfth to mid-thirteenth centuries (Phase 9)

A deep layer of redeposited clay separated the pre- and post-fire pavements. In the south aisle this comprised upper [C:2309] and lower [C:2310] layers abutting the foundation [C:2303] of the south nave wall (fig 4.28). Two layers were also noted within the clay make-up [C:5308] in the central aisle. Radford noted that the absence of a working surface between the clay layers indicated two stages in a single levelling-up operation, following the construction of the nave south wall. This is confirmed by the presence of three offsets in the foundation [C:2303] and the lack of a vertical foundation cut, indicating that it was built free. The foundation was constructed of roughly coursed reused ashlar and mouldings (fig 4.31).

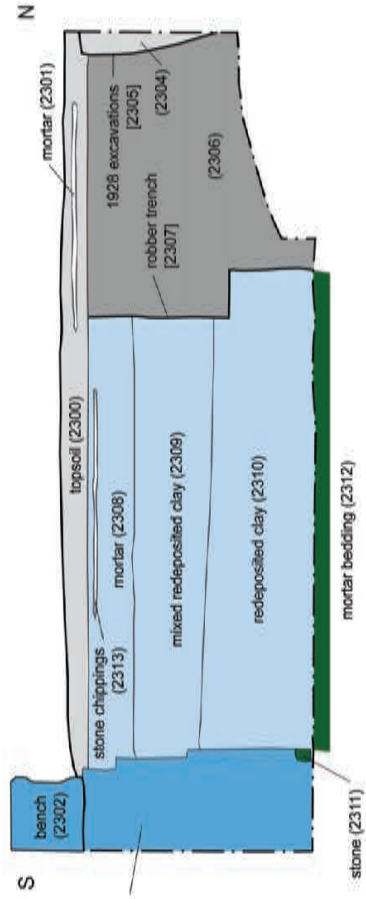
In the south aisle, a 0.3m deep layer of cream mortar bedding [C:2308] covered the clay make-up and lay directly beneath the modern topsoil [C:2300], almost level with the base of the bench [C:2302] (fig 4.31). Within the mortar was a layer of stone chippings [C:2313], which Radford thought might indicate the level of an earlier stone pavement.

In the central aisle, a rubble foundation [C:5305] overlay the clay make-up [C:5308] (figs 4.28 and 4.32) and was thought to represent the foundation of the late twelfth- to mid-thirteenth-century choir stalls. These

Section 63: Trench 83



Section 21: Trench 26



Earliest possible phase



Fig 4.28 Sections of Trenches 26 and 83 (scale 1:50)



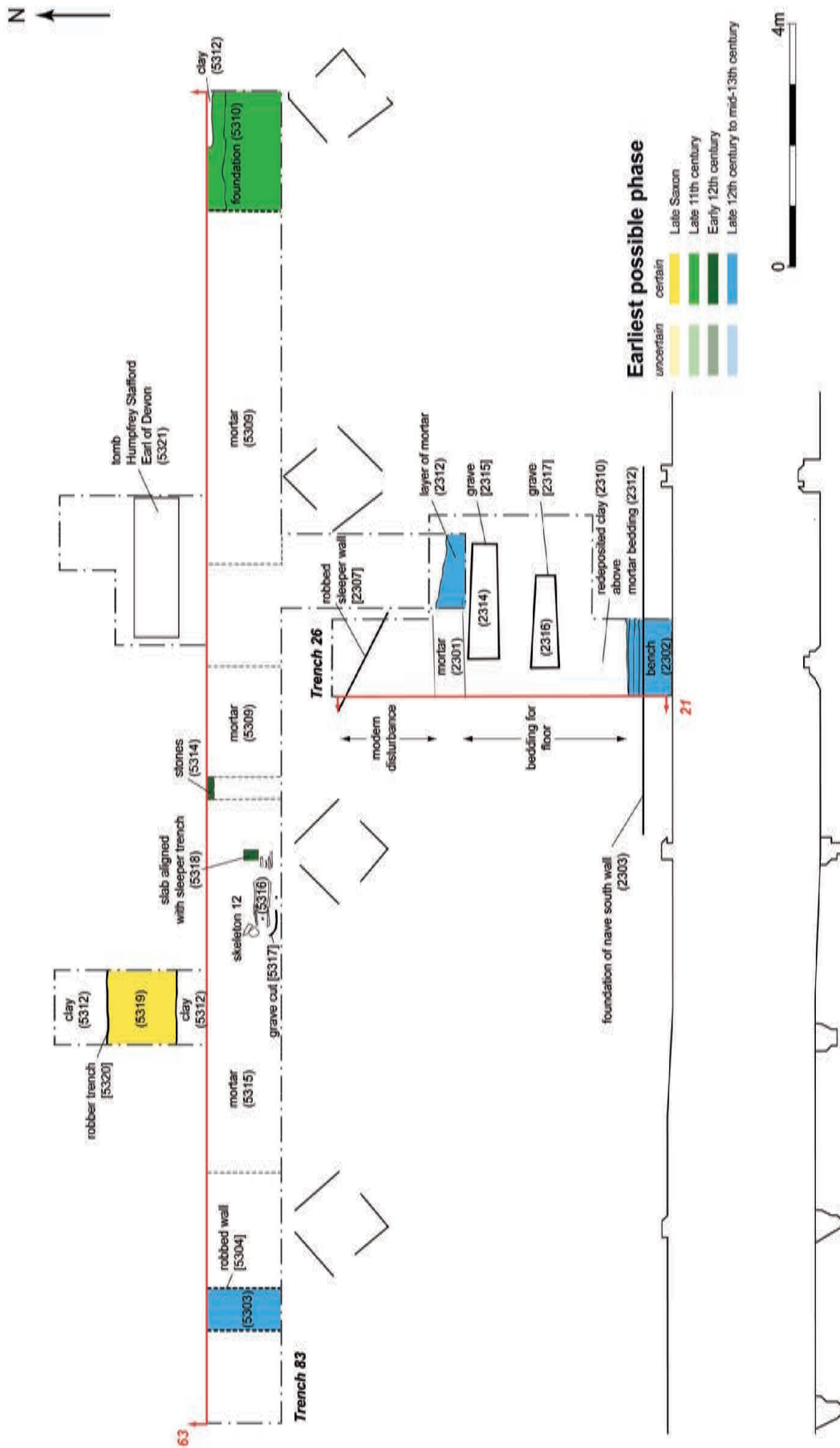


Fig 4.29 Plan of Trenches 26 and 83 (scale 1:100)

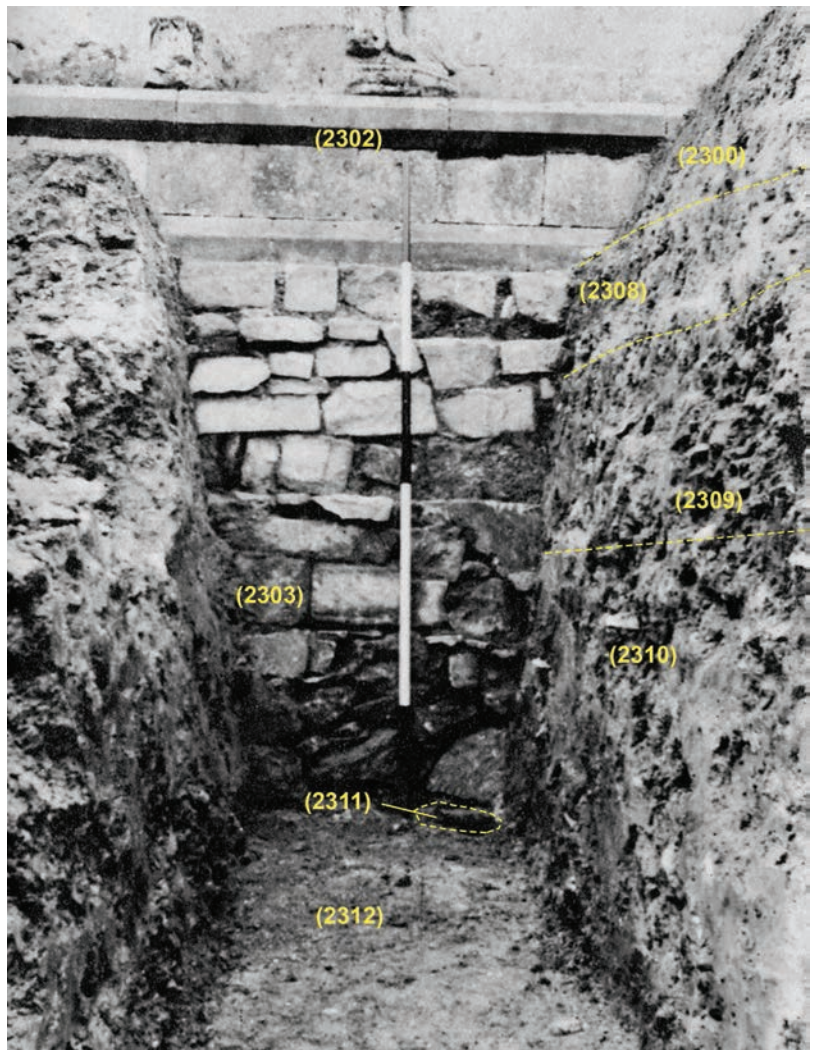


**Fig 4.30** South-west corner of nave, looking north west (1926 photograph: © Glastonbury Abbey)

features were cut by a small robbed feature [C:5303] [C:5304], suggested as representing a *pulpitum* or screen forming the west end of the monks' choir. According to Radford, this indicated a length of 30.48m for the choir stalls.<sup>70</sup> Stratigraphically, the rubble foundation [C:5305] was covered by a pink mortar bedding [C:5307], indicating the presence of shallow structures beneath the later floor. Although more precise dating evidence is lacking, this may relate to the choir that was later moved eastwards as part of Monington's alterations (see below).

### **Mid-thirteenth to early fourteenth centuries (Phase 10)**

In the south aisle, two adjacent burials within wooden coffins cut through the late twelfth- to mid-thirteenth-century mortar bedding [C:2308] (fig 4.29). These graves were thought to be contemporary; the northern burial [C:2314] [C:2315] contained a male skeleton aged forty to fifty at death. The southern burial [C:2316] [C:2317] was



**Fig 4.31** Nave and south aisle foundations (possibly two phases), looking south (1955 photograph: © EHA)



**Fig 4.32** Nave trench, looking west (1959 photograph: © EHA)

a smaller grave and contained a skeleton described as a child of about twelve or thirteen years of age. Tile from the southern grave provides a *terminus post quem* of 1280. A further disturbed burial [C:5316] [C:5317] [F:SK12] was recorded on the south side of the central aisle above the twelfth-century sleeper wall (see above).

The rubble foundation [C:5305], possibly relating to the late twelfth- to mid-thirteenth-century monks' choir stalls (see above), was covered by a soft and slightly pinkish mortar layer [C:5307] that was observed throughout much of this section (figs 4.28 and 4.32). This may represent the installation of a new pavement following Monington's translation of the choir stalls to the east end in the mid-fourteenth century.

### Mid-fourteenth century (Phase 11)

A stone-lined tomb [C:5321] was excavated on the north side of the south arcade: this was labelled as Humphrey Stafford, first Earl of Devon, who was executed at Bridgwater in 1469 and buried at Glastonbury Abbey (fig 4.29).<sup>71</sup> According to Leland, Stafford was buried in a tomb in the sixth bay of the nave and slightly to the north of the south aisle under the arcade, corresponding exactly with Radford's discovery. The tomb was solidly built of coursed ashlar and rubble; remnants of mortar visible from the photographic record indicate that it was lined (fig 4.33). The burial was thoroughly disturbed (fig 4.34): the ribs and pelvis were missing, the head was rolled to



**Fig 4.33** Stone-lined tomb in nave, looking north west (1959 photograph: © EHA)



one side and the lower jaw was under the skull. Finds recovered from the grave fill included one sherd of post-1450 pottery (P1243), broadly corresponding with the date of Stafford's death.

### **Post-Dissolution (Phase 16)**

The nave arcades had been thoroughly robbed: the north side of the robber trench for the south arcade sleeper wall [C:2306] [C:2307] cut through all the earlier features and layers (figs 4.29 and 4.32).

## **4.6 The church transepts**

### **Roman (Phase 1)**

A rough setting of stones [C:3754] was located at the base and possibly cut by the *vallum monasterii* [C:3756] in Trench 47 (fig 4.35). Radford suggested that a vertical cut in the clay (not drawn) might indicate the presence of a wood-lined well, and that the stones were associated with its construction or maintenance. The

**Fig 4.34** Skeleton in stone-lined tomb, looking west (1959 photograph: © EHA)

evidence for a well is unconvincing: a late Roman sherd and 'samian ware' (not identifiable in the assemblage) were recovered from the clay silt [C:3753] but were probably residual.

### Mid Saxon (Phase 3)

The *vallum monasterii* [C:3522] [C:3756] ran from north to south through the eastern chapels (figs 4.35, 4.36 and 4.37). In Trench 47 the ditch was largely cleared, although the full depth was not established because of the risk of destabilising the upstanding remains. The clay silt [C:3753] above the stone setting [C:3754] and beneath the later stone 'raft' [C:3752] (see below) contained residual Roman pottery and a piece of painted Saxon wall-plaster. The masonry [C:3752] within the ditch was shown as a well-defined wall on the GPR survey at a depth of 1.5–2.0m. The only potential remnant of the western bank was the redeposited clay layer [C:3717] above the natural ground surface and beneath a plaster line [C:3716] associated with the late eleventh-century phase (see below).

In Trench 46 the ditch was not investigated below the base of the excavation trench (fig 4.36). The upper part of the eastern cut [C:3522] and the upper clay fill [C:3521] contained large undressed blocks of Tor burr rubble set in a very poor mortar with spalls. This was thought to have been backfilled prior to the construction of the post-fire church (see below); the western side of the ditch had been truncated by later activity.

### Late eleventh century (Phase 6)

The north side of Trench 47 ran along the centre of a robbed apse feature [C:3737] (Plan 2; figs 4.35 and 4.37). Interpreted as the north side of a small apsidal chapel, the curve of the apse was cut by a sleeper wall associated with the early twelfth-century phase [C:3733]. The plan shows the spring of the apsidal termination and the start of the sleeper wall for the apse chord. The latter is clearly visible with some *in situ* masonry [C:3788], which appears to have been cut by the robber trench [C:3737]; during excavation this was removed back to the north wall of the excavation trench (figs 4.38 and 4.39). A double grave [C:3772] appeared to have been positioned within the north side of the supposed late eleventh-century apse (fig 4.37); however, with no details of stratigraphic relationships, the grave could be later.

The tightly packed, robbed foundation [C:3736] [C:3737] ascribed to the late eleventh-century church, was sealed by make-up layers [C:3735] [C:3734]

associated with the early twelfth-century floor (see below) (fig 4.35).<sup>72</sup> Below the level of these make-up layers was a plaster line [C:3716] above the possible bank deposit [C:3717] (see above). The plaster line was not evident to the east of the robber trench and is most likely to have been associated with the late eleventh-century rather than the early twelfth-century transept. Between the eastern end of the apse and the *vallum* was a stone and mortar layer [C:3743] cut by a twelfth-century feature [C:3777]. Radford suggested it might represent an external path between the east end of the transept and the *vallum*.

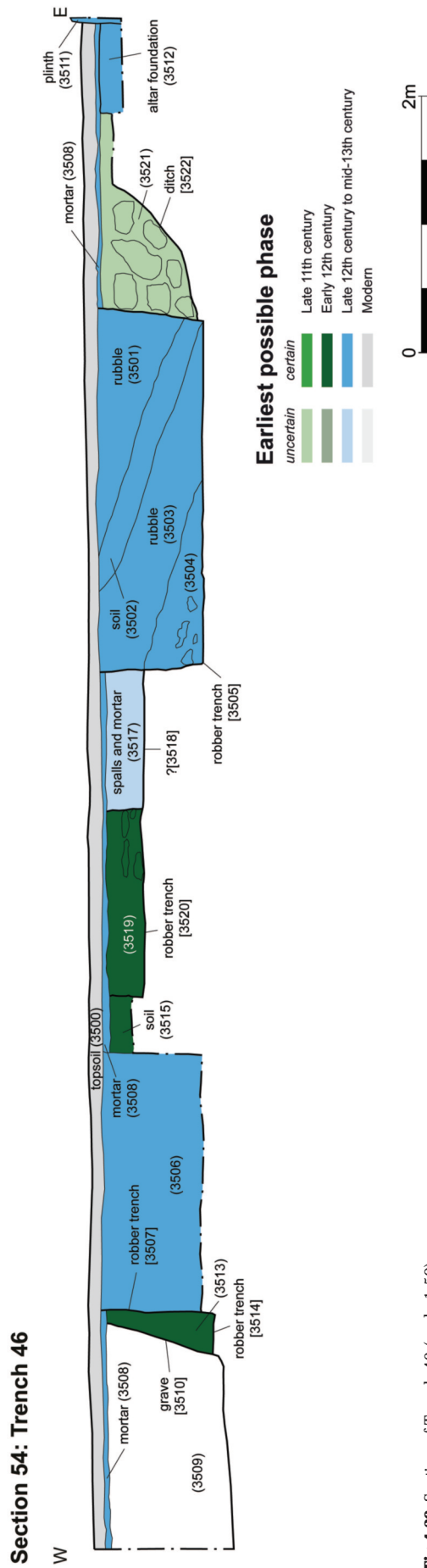
Approximately 2.5m west of the early twelfth-century west wall [C:3712] was a further robber trench [C:3787] (figs 4.35 and 4.37), shown on the GPR survey as the westernmost of two parallel and well-defined walls at a depth of 0.5–1.5m (figs 2.12 and 2.13). Radford tentatively suggested that this represented the west wall of the late eleventh-century church, primarily on the basis that the fill [C:3786] was similar to that of the robbed apse [C:3736]. The eastern return was very tentatively located in Trench 44 [C:3781]; the soil fill [C:3780] had very little rubble and stone in contrast to the later robber trenches.

### Early twelfth century (Phase 7)

The north and south walls of the twelfth-century transepts were in the same relative position as the thirteenth-century walls; however, the twelfth-century west wall and the west arcade were located immediately west of the thirteenth-century walls (Plan 3).<sup>73</sup> In Trench 47 the eastern side of the robber trench for the early twelfth-century west wall [C:3712] was cut by the robber trench [C:3714] for the thirteenth-century west wall (figs 4.35 and 4.37). The former had a fill of dark soil and stones [C:3711], in contrast to the yellow fill [C:3713] with rubble and mortar within the later robber trench.

Further east, a sleeper wall ran north–south through both north transept excavation trenches; in Trench 47 the robber trench [C:3733] represented the early twelfth-century western arcade while the robber trench [C:3517] in Trench 46 represented the north apse chord. Again, both were cut on their eastern sides by the robber trenches for the thirteenth-century arcade sleeper wall [C:3707] [C:3507]. The twelfth-century sleeper wall of the western arcade retained some *in situ* masonry [C:3740] at the base of the foundation trench [C:3761], although predominantly robbed [C:3733] and backfilled with rubble and mortar [C:3732]. This appears to have been depicted on the GPR survey as a well-defined wall at a depth of 0.5–1.0m.





**Fig 4.36** Section of Trench 46 (scale 1:50)

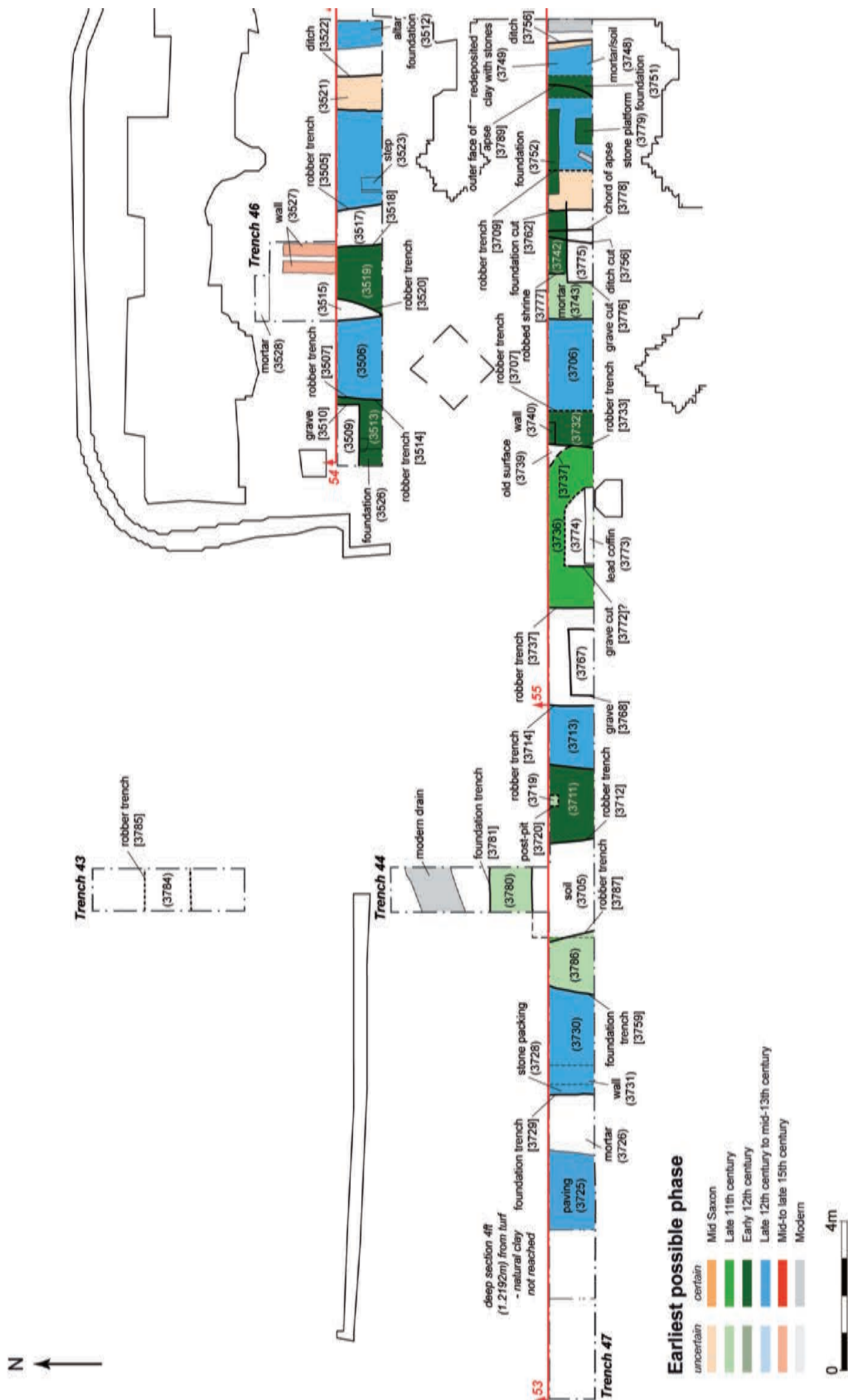


Fig 4.37 Plan of Trenches 43, 44, 46 and 47 (scale 1:150)





**Fig 4.38** North side of ?apsidal chapel (with Radford and Poyntz-Wright), looking west (1956 photograph: © Peter Poyntz-Wright)



**Fig 4.39** North side of ?apsidal chapel (with Radford and Poyntz-Wright), looking west (1956 photograph: © Peter Poyntz-Wright)

In Trench 46 the north apse chord also retained some masonry comprising two large lias blocks [C:3526] from the west face, although it had been largely robbed [C:3513] [C:3514]. It was cut on the west side by a later grave [C:3510] and on the east side by the thirteenth-century robber trench [C:3507] (figs 4.36 and 4.37). The apsidal termination of the early twelfth-century outer chapel was also apparent. The mortar and spalls fill [C:3519] of the robber trench [C:3520] was covered by the later mortar bedding [C:3508] which also sealed a compacted layer of spalls and mortar [C:3517]. The latter was immediately east of the early twelfth-century north transept and may have been associated with construction or demolition.

In Trench 47, the spall and mortar layer [C:3735] and the yellow clay with mortar, stones and spalls [C:3734] above the earlier robbed apse [C:3736] were probably make-up layers for the twelfth-century floor (fig 4.35). A rectangular feature [C:3777], with some *in situ* masonry [C:3742], was located on the threshold to the inner apsidal chapel (fig 4.37); although sealed beneath the thirteenth-century floor, there is no evidence to support the initial identification of Herlewin's shrine.

Above the Saxon ditch, masonry [C:3752] had been

constructed at a depth of 1.5m below the modern turf. This appears to have acted as a platform providing a solid base for the early twelfth-century apse, possibly associated with a further stone platform [C:3779] shown in plan on the south side of the trench. A foundation [C:3751] is shown cutting [C:3783] into the eastern edge of the ditch, recorded in plan as the outer face of the apse. The ditch was backfilled with a 'rammed fill' of redeposited clay [C:3750] [C:3749].

### Late twelfth to early thirteenth centuries (Phase 9)

Robber trenches were recorded for the west wall [C:3714] (aligned with the west wall of the south transept), for the sleeper wall of the western arcade [C:3707] [C:3507] and for the sleeper wall between the extant eastern chapel arches [C:3505] [C:3709] (figs 4.35 and 4.37). The western edge of the foundation cut [C:3762] for the latter was recorded in plan, but appears to have been obscured in section by the robbed shrine [C:3777]. All three robber trenches were depicted on the GPR survey as well-defined walls at a depth of 0.5–1.0m. The mortar bedding [C:3710] [C:3508] for the thirteenth-century

pavement was cut by the robber trenches but was otherwise traced, together with the underlying clay make-up [C:3715], at one level throughout most of the north transept.

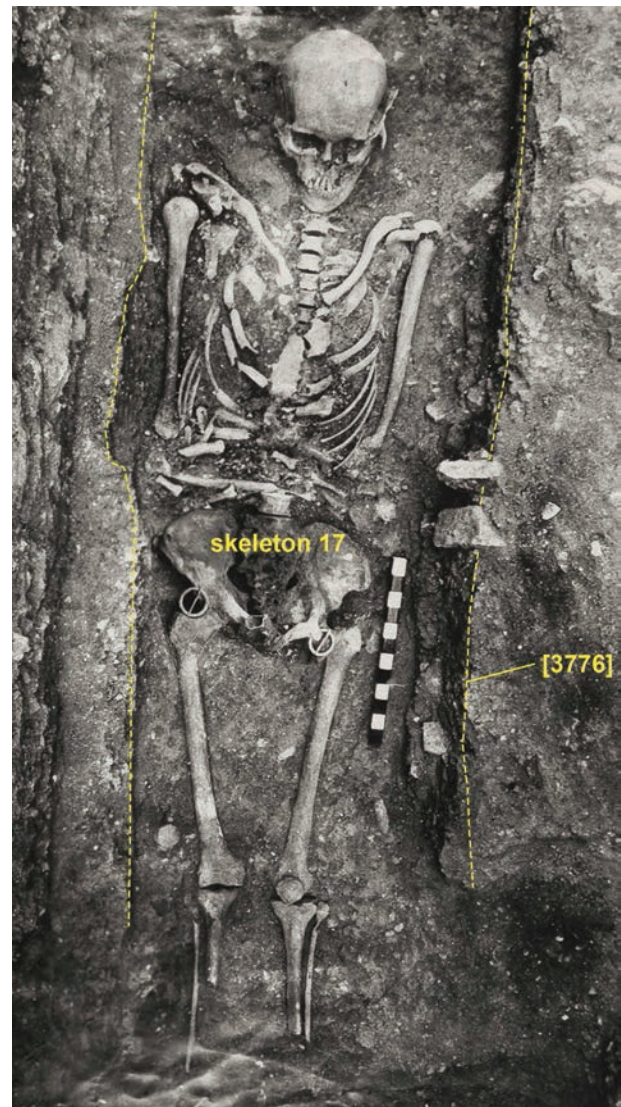
There is some evidence for internal arrangements within the north transept. Bond recorded a small area of *in situ* glazed tile, interpreted as a threshold for a space such as a chantry chapel; a rough foundation aligned with the tiling suggested an interior screen wall.<sup>74</sup> In Trench 47, a layer of mortar [C:3757] and a further layer of mortar and soil [C:3748] may indicate the position of the altar within St Thomas's Chapel. In Trench 46, the altar foundation [C:3512] butted against the eastern wall (fig 4.36). This was constructed above the natural clay and was overlain by the thirteenth-century mortar bedding [C:3508]. A step [C:3523] beneath the arch of the eastern chapel may represent the chapel threshold (fig 4.37).

To the west of the north transept, Bond uncovered foundations that he initially suggested represented a western aisle to the north transept. Following his discovery of the 'Loretto Chapel' (see below), he reinterpreted these foundations as a covered 'cloister' leading to the chapel. The foundations correspond with remains recorded by Radford, comprising a wall [C:3731] extending northwards from the nave and the western side of a construction cut [C:3729] packed with stones [C:3728]. The eastern side had been largely robbed [C:3759] and backfilled with rubble, mortar and spalls [C:3730]. Depicted on the GPR survey as the easternmost of two parallel and well-defined possible walls at a depth of 0.5–1.0m (fig 2.12), these remains explain why Radford favoured the interpretation of a western aisle. Deep truncation from Bond's excavation trench [C:3702] prevents a clear understanding of the relationship of this wall with the features to the west. However, the stone packing [C:3728] was certainly below a later grave fill [C:3723] located to the west of the transept; the grave overlay paving [C:3725] with a *terminus post quem* of 1220–30, dated by a gilded stone boss in the centre of the paving.

Several other graves were recorded within the north transept, all aligned along the central axis of the eastern chapels. In Trench 47 the easternmost grave [F:SK17] [C:3775] [C:3776], located in front of the eastern chapel, was identified by Radford as that of Abbot Seffrid (d 1150–1). The male skeleton was found with two buckles (B64 and B65) on the hip bones (fig 4.40) and the lower legs were cut by the thirteenth-century sleeper wall [C:3762]. Although Seffrid was thought to have been buried in Chichester Cathedral, Radford argued that

Seffrid's remains were interred at Glastonbury; this information was never published, and the 1956 report simply states that the burial was twelfth-century and most likely that of an abbot.<sup>75</sup> New analysis of the twin *breche* buckles provides a post-1270 date for the remains, revealing that the robber trench cut the legs rather than the original construction trench [C:3762].

In the 1530s, Leland recorded the epitaphs of three abbots' tombs in the north transept. In the same order that he presented them, these are Abbot Taunton (1274–91), Abbot Amesbury (1235–52) and Abbot Petherton (1261–74). His description accords with an account prior to 1291 by Adam of Damerham who specifically recorded the tombs of Amesbury and, on his 'left', Petherton before the altar of the blessed St Thomas. This indicates that the late thirteenth-century tomb arrangement had survived through to the Dissolution, providing good evidence for



**Fig 4.40** Burial shown with buckles, looking west (1956 photograph: © EHA)

the stability of the north transept and its chapels from the 1230s to the 1530s. It also suggests that the tomb found at the east end of Trench 47 [C:3775] may correlate with one of these abbots, although the twin *breche* buckles found within the tomb are dated to post-1270 and would suggest a secular burial.

A double grave [C:3772] with the remains of a lead coffin appeared to be contained within the late eleventh-century apse, although the shared alignment with the other graves perhaps suggests a later date (figs 4.35 and 4.37). Further west beneath an area of *in situ* tile [C:3782] was another grave [C:3767] [C:3768] (possibly shown in fig 4.41). A disturbed single grave recorded in the north-west corner of Trench 46 [C:3509] [C:3510] cut through the chord of the early twelfth-century apse (figs 4.36 and 4.37). This grave had a stone lining and was sealed by the thirteenth-century mortar bedding, although a later insertion is possible.

### End of the fifteenth to early sixteenth centuries (Phase 14)

To the west of the north transept, Bond found what appears to have been a small rectangular structure interpreted as Abbot Beere's Loretto Chapel, described by Leland as joining the north side of the body of the church (Plan 4; fig 4.2).<sup>76</sup> The only closely datable find from Bond's excavations comprised a fifteenth- or sixteenth-century window mullion.<sup>77</sup> Radford's Trenches 43 and 44 were located to the east of the remains planned by Bond; no further archaeological evidence is therefore available. However, an alternative location for the chapel has been suggested (initially by Radford) within the northern bay of the north transept, comprising a substantial, stone-cage chantry chapel in existence by 1530.<sup>78</sup> Two parallel stones [C:3527] aligned north–south and possibly supporting a screen may provide the archaeological evidence for this chapel (fig 4.37).

### Post-Dissolution (Phase 16)

The robber trench for the thirteenth-century west arcade sleeper wall contained a loose fill [C:3706] [C:3506] of stones, mortar, spalls and soil (figs 4.35 and 4.36). The robber trenches for the other thirteenth-century foundations were backfilled with loose rubble [C:3708] [C:3701], [C:3702], [C:3703] [C:3704]. At the western end of Trench 47 a deep layer of soil with some rubble [C:3703] beneath the topsoil [C:3700] and above a buried topsoil [C:3704] was probably associated with post-Dissolution activity.



**Fig 4.41** Grave in south trench, looking west (1956 photograph: © EHA)

## 4.7 The east end of the church

### Early twelfth century (Phase 7)

Seven features were recorded in 1955 that pre-dated the redeposited clay make-up for the late twelfth- to early thirteenth-century pavement (Plan 3; fig 4.2). The features comprised evidence for an apse termination, two pier bases, a possible sleeper wall trench, a tomb and possible altar foundation and a foundation. The stratigraphic relationships, and the fact that most of these features were clearly unrelated to the late twelfth- to early thirteenth-century plan, led Radford to suggest that they were most

likely associated with the early twelfth-century east end.

The most distinctive diagnostic feature within the south choir trenches was an apsidal wall (figs 4.42 and 4.43). In Trench 28 this survived as a fairly substantial foundation [C:2559] comprising large stones set in a coarse, cream-coloured mortar. The west side of the foundation had a distinct curve while the outer east side was indistinct due to later truncation. The upper part of the foundation [C:2559] had been robbed [C:2575] and the mortar and rubble fill [C:2558] overlay the remains of the foundation [C:2559]. To the south in Trench 27, the apse was cut by a late twelfth- to early thirteenth-century robber trench [C:2455].<sup>79</sup>

In Trench 29, evidence for a further exterior wall comprised a foundation [C:2368] aligned north–south and cut by a late twelfth- to early thirteenth-century robber trench [C:2353] and south choir foundation [C:2364] (fig 4.43). This substantial foundation [C:2368] first became visible as loose stones and mortar above *in situ* masonry, with the western edge indicating an alignment slightly to the east of north–south.

Radford states that these foundations had been entirely robbed and the trench backfilled with rubble, mortar and soil; in saying this, he contradicted his excavation notes, which say the base of this foundation was not reached at a depth of 1.47m.<sup>80</sup> This wide foundation was thought to indicate a small apse set in the square east end to the south aisle.

In Trench 27 a robbed pier base [C:2460] was backfilled with earth and rubble [C:2458] (fig 4.42). The pier base [C:2460] was crossed by the north side of the excavation trench and was approximately aligned with an empty tomb [C:2568] to the north in Trench 28 (see below). However, a dashed line on the excavation plan depicts the northern limit of the pier, and Radford was certain that he had found two separate features as opposed to a single wall. Interpreted as the respond of the arch spanning the chord of the twelfth-century apse, the pier extended southwards into the excavation trench where it was cut by the robber trench [C:2353] for the late twelfth- to early thirteenth-century arcade sleeper wall.<sup>81</sup>

A further robbed ‘pier’ base [C:2462] in Trench 27 was also cut by the robbed arcade wall [C:2353] and was similarly filled with small stone rubble and mortar with a few stones set towards the base [C:2461]. This was thought to represent the southern respond of the western aisle of the sanctuary. The feature was located away from the north face of the trench and was annotated on the section (figs 4.43 and 4.44). Consequently, the relationships shown in section are inaccurate and the feature was also sealed by the redeposited clay [C:2463]

and not the late twelfth- to early thirteenth-century mortar [C:2457].

A robbed foundation [C:2571] with remnants of a stone and mortar base [C:2565] projected 0.15m into Trench 28 (figs 4.42 and 4.43).<sup>82</sup> This was interpreted as the twelfth-century altar on the basis that it was sealed by the redeposited clay and that it coincided with the supposed location of the late twelfth- to early thirteenth-century altar. To the west of the altar was a robbed tomb [C:2568] filled with clay [C:2567]; the stratigraphic location beneath the redeposited clay is suggestive of a twelfth-century date. The edge of a robbed feature [C:2572] [C:2573] was initially thought to represent the location of the Norman high altar. However, the feature was approximately aligned with the east side of the threshold into the early twelfth-century sanctuary and is perhaps the eastern edge of the robbed sleeper wall beneath the arch.

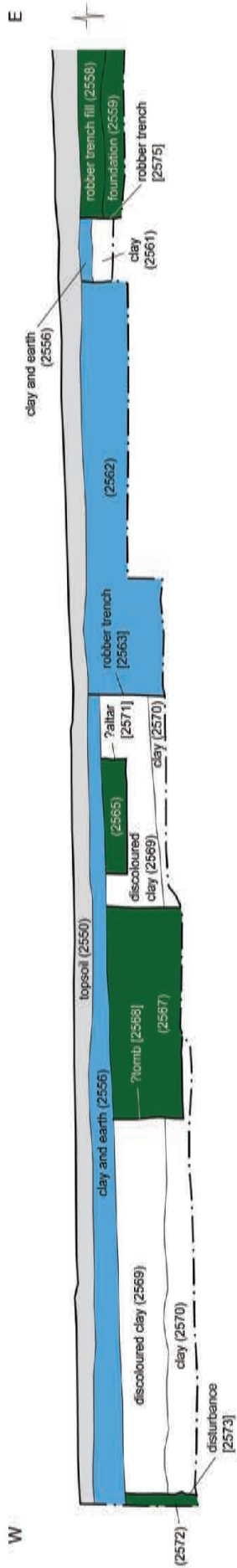
All the features in Trenches 27 and 28 seem to have been cut from the level of the discoloured clay [C:2465] [C:2569] thought to represent the original ground surface (figs 4.42 and 4.44); all but the possible altar foundation [C:2571] cut into the natural clay beneath. The surface of the discoloured clay [C:2465] [C:2569] sloped down from east to west and from north to south; a twelfth-century make-up layer would therefore have been required to create a level floor. However, Radford noted the high level of the twelfth-century floor horizon at approximately the same level or just below the modern turf; this accounts for there being no evidence for any twelfth-century paving or, indeed, for the 1184 fire.

### **Late twelfth to mid-thirteenth centuries (Phase 9)**

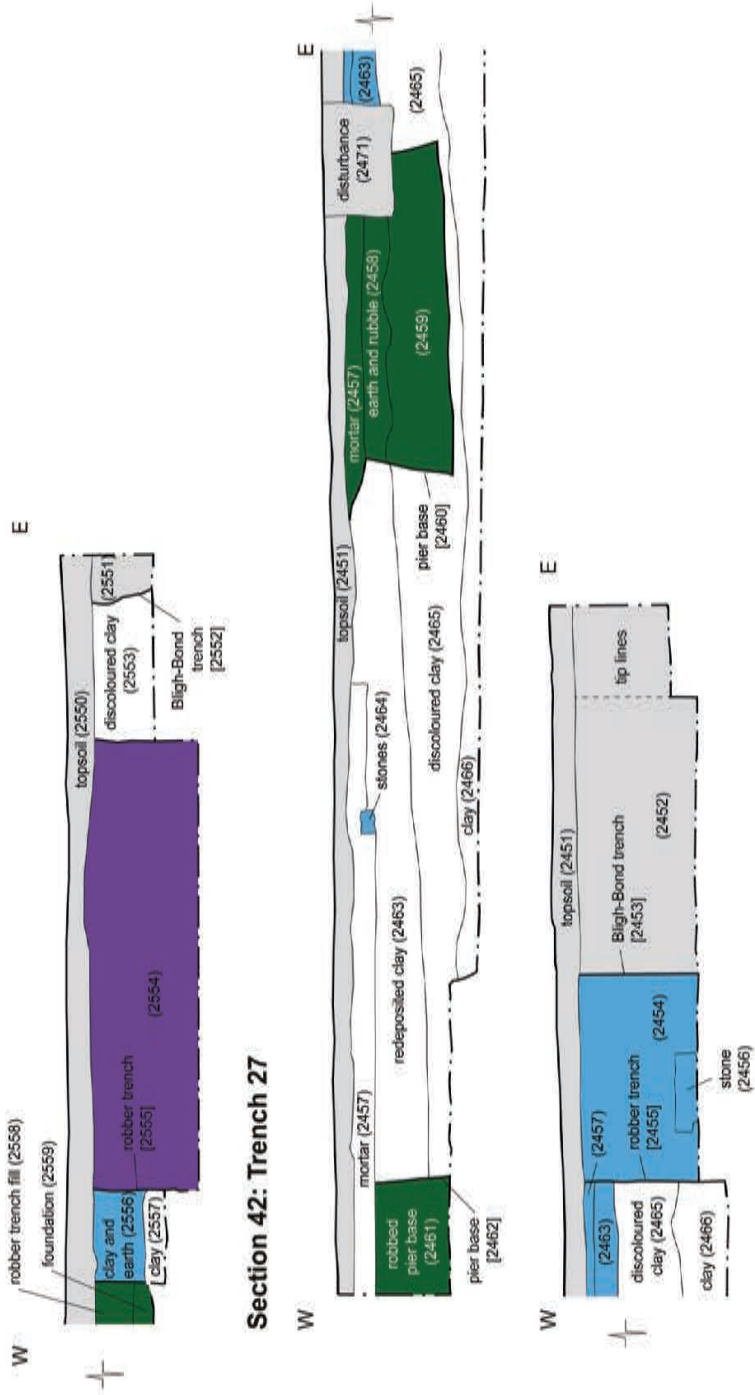
The foundations of the south choir wall were exposed at the southern ends of Trenches 29 and 32 with the bench [C:2363] remaining *in situ* (fig 4.43). In Trench 29, the underlying foundation [C:2364] had undergone extensive modern repair with original fabric from 0.45m below the modern turf. In Trench 32, the foundation had a ragged termination in the centre of the trench (the bench also terminated at this point) aligned with the robber trench [C:2468] [C:2403] for the original east end prior to Monington's extension (see below).

Following the demolition and robbery of the early twelfth-century east end, a layer of redeposited clay and soil [C:2463] [C:2556] [C:2370] [C:2366] [C:2360] covered the old surface of the discoloured natural clay [C:2465] or natural clay [C:2372] [C:2365] (figs 4.42 and 4.44). The layer became deeper towards the south and

**Section 44: Trench 28**



**Section 42: Trench 27**



**Earliest possible phase**



**Fig 4.42** Sections of Trenches 27 and 28 (scale 1:50)

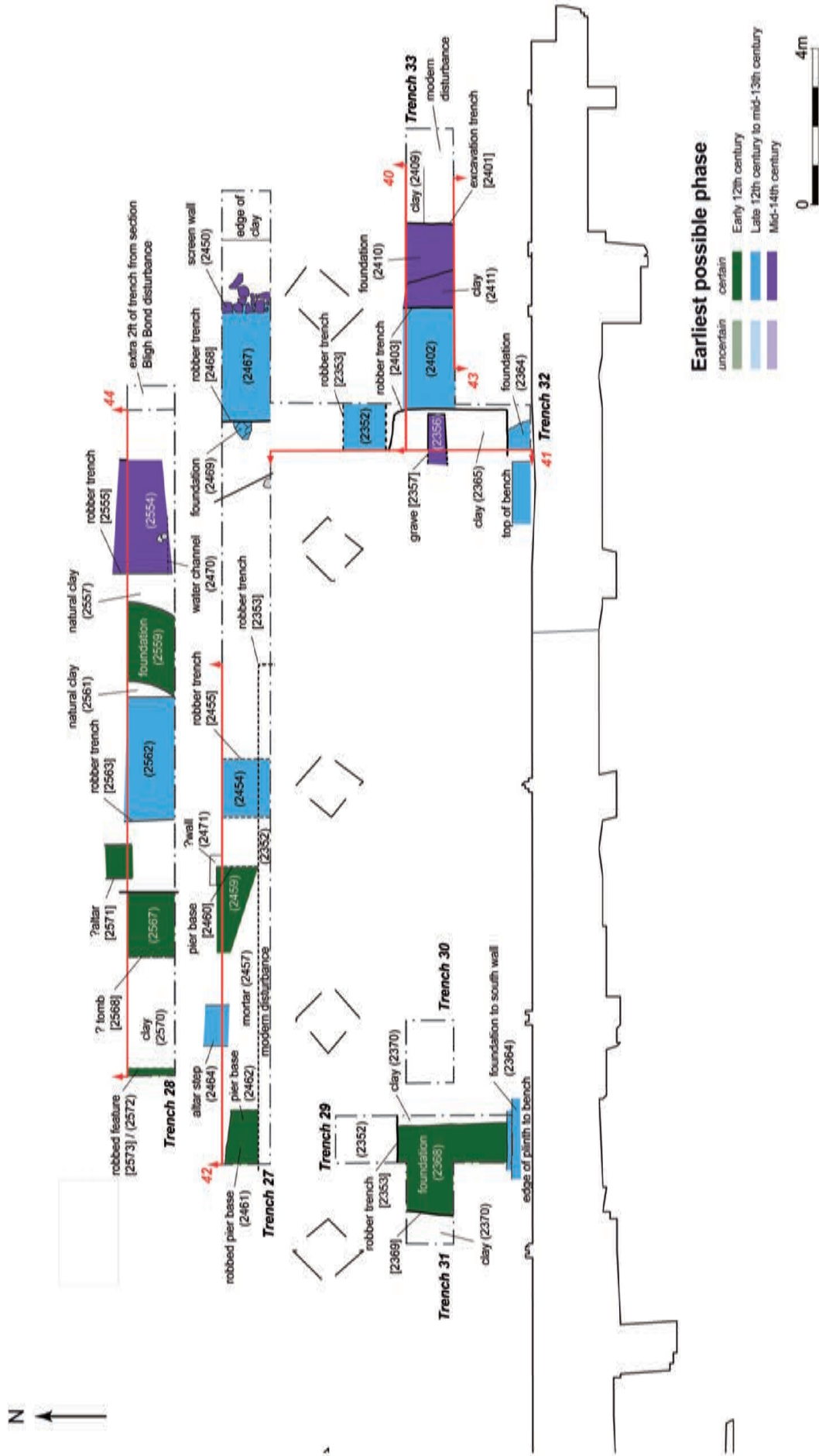


Fig 4.43 Plan of Trenches 27, 28, 29, 30, 31, 32 and 33 (scale 1:150)

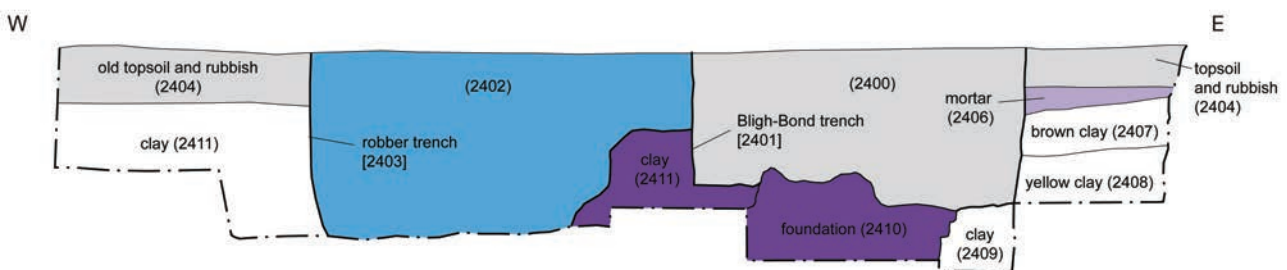
west compensating for the natural rise in topography towards the east. As with the nave, this redeposited clay contained Roman pottery. The clay layer in the choir was considerably thinner (only *c* 0.35m deep) and the choir construction trenches may have been sufficient to produce this make-up layer, in which case the Roman pottery could have come from the immediate vicinity. The record of a samian sherd found in the black clay under the supposedly natural clay [C:2365] suggests this was redeposited. A fragment of glazed medieval floor tile dated *c* 1272–80 was recovered from the redeposited clay [C:2463], perhaps indicating episodes of repair or reflooring.

The upper fills [C:2458] [C:2558] of the robbed twelfth-century piers were at the same level as the redeposited clay (figs 4.42 and 4.44), which is described as being 'piled up' against the rubble. These fills were harder and more compact than the clay and appear to have been laid simultaneously, probably to prevent the pavement slumping into the robbed features. Sagging of the surviving mortar bed [C:2457] above the pier in Trench 27 [C:2460] shows this was unsuccessful.

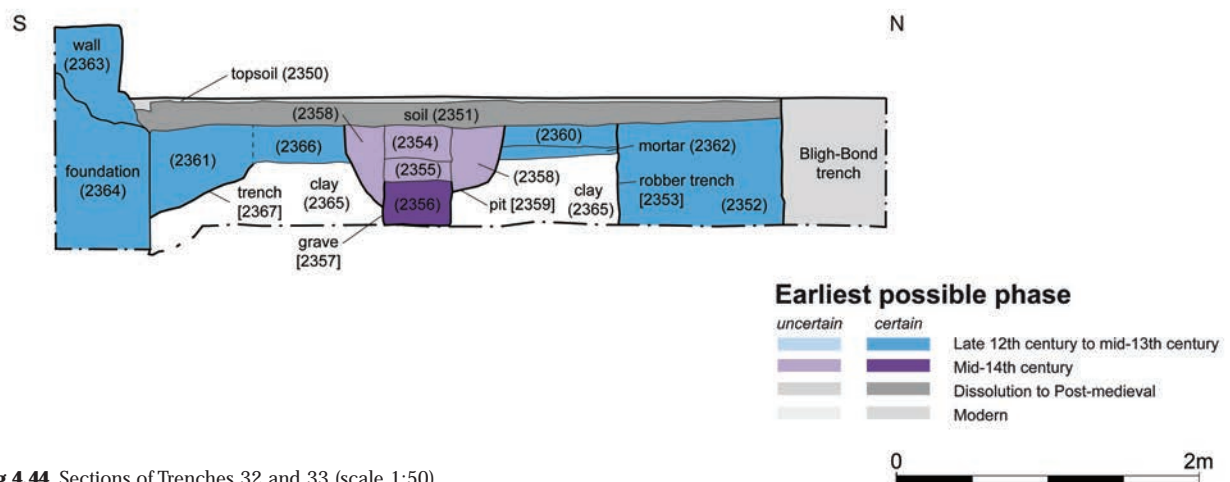
The mortar bedding [C:2457] was recorded throughout most of Trench 27 (fig 4.42). A rise in the base of the mortar was noted opposite the third pier from the crossing, with small bedded stones [C:2464] possibly marking the location of a step and labelled as an altar step for the high altar to the east. Although the location of the altar here would account for a break in the mortar, a note states that in Trench 28 the late twelfth- to early thirteenth-century high altar does not appear as expected. Following Monington's mid-fourteenth-century east extension, the high altar was moved eastwards (see below).

Only a short stretch [C:2574] of mortar bedding was noted in the Trench 28 section above the redeposited clay make-up [C:2556] (fig 4.42). A small area of mortar [C:2371] was recorded above the redeposited clay [C:2370] in Trench 29, although the area was disturbed as a result of modern underpinning of the south choir wall. The level of this mortar revealed that the late twelfth- to early thirteenth-century pavement was located only 0.05–0.07m below the bench plinth and the modern turf. In Trench 32 a mortar layer [C:2362] was recorded between the natural clay [C:2365] below and the

**Section 40: Trench 33**



**Section 41: Trench 32**



**Fig 4.44** Sections of Trenches 32 and 33 (scale 1:50)

redeposited clay [C:2360] above (fig 4.44). On the basis of its description as 'discoloured' and its stratigraphic level beneath the late twelfth- to early thirteenth-century floor horizon, this was thought to be a mortar mixing layer rather than a bedding layer.

In Trench 27, the original east end of the choir, prior to Abbot Monington's mid-fourteenth-century extension, is represented by a wide north–south robber trench [C:2468] on the west side of a wall labelled as Monington's reredos [C:2450] (fig 4.42). Part of the western face of the wall [C:2469] remained *in situ*, and the fill [C:2467] of the robber trench comprised packed clay with spalls and traces of spalls and mortar. This careful repacking of the construction trench is indicative of medieval – as distinct from post-Dissolution – robbery and probably relates to the fourteenth-century removal of the original eastern end of the church. This robber trench continued southwards and was recorded in plan on the east side of Trench 32 and within Trench 33 [C:2403] (figs 4.43). The fill was different in composition to that recorded further north, comprising loosely packed stones, small rubble, mortar and some soil [C:2402] more typical of later robbery. The eastern sides of both trenches are aligned with the sixth pier east from the crossing which is also thought to have formed the eastern limit of the late twelfth- to early thirteenth-century choir.

Further west, aligned with the fourth pier east from the crossing, was a further wide north–south robber trench thought to represent the sleeper wall for the late twelfth- to early thirteenth-century high east gable wall (or choir).<sup>83</sup> The labelling in Trench 28 [C:2563] is in agreement with this interpretation (fig 4.42); however, in Trench 27 the robber trench [C:2455], with one *in situ* stone [C:2456] in the base, was labelled as the fourteenth-century sacristy (fig 4.44). The eastern side of this robber trench [C:2455] was truncated by an earlier excavation trench [C:2453], so the width could not be established. However, the western side is aligned with the robber trench [C:2563] to the north and is therefore more likely to be a continuation of the late twelfth- to early thirteenth-century sleeper wall rather than a fourteenth-century sacristy, which would be highly unlikely in this location. The fills of both trenches are described as loose mortar and spalls [C:2562] [C:2454] typical of modern robbery, implying that the sleeper walls were encountered and chased during the robbery of the arcade sleeper walls. This may also explain the difference in the backfills [C:2467] [C:2402] of the robbed late twelfth- to early thirteenth-century east choir wall. In Trench 27, this trench [C:2455] could be seen cutting through the robbed foundation of the twelfth-century apse [C:2559].

## Mid-fourteenth century (Phase 11)

There are several features relating to Monington's mid-fourteenth-century eastern choir extension. In Trench 28 was a layer of discoloured clay [C:2553] which was described as being 'behind' (that is to the east of) the high altar and therefore marking the passage between the altar and Monington's reredos (figs 4.42 and 4.43). Radford envisaged the high altar and reredos standing forward from the east end of the enlarged choir (between the fifth piers from the west) with a narrow sacristy behind the altar.<sup>84</sup> The evidence for this comprised a wide robber trench [C:2555] cutting through discoloured clay [C:2553] to the east and redeposited clay and soil [C:2555] to the west, backfilled with loose mortar and spalls [C:2554]. This location places the fourteenth-century high altar c 0.9m west of the site proposed by Bond.

Towards the east end of Trench 27 was a line of masonry thought to have been the remains of Monington's reredos [C:2450], on the eastern side of the supposed robbed late twelfth- to early thirteenth-century east end [C:2468] (fig 4.42). The foundation appears to have continued in Trench 33 [C:2410] on the same alignment and exposed to a depth of 1.45m (fig 4.43). Although labelled in section as thirteenth-century, this foundation is separated from the late twelfth- to early thirteenth-century east end by a band of clay [C:2411] and therefore, as Radford later states, is associated with Abbot Monington's extension. Only in this trench was there mortar bedding that might be specifically associated with the fourteenth-century phase (fig 4.44). This solid mortar layer [C:2406] was directly beneath the old topsoil [C:2404] (ie pre-Bond) and overlay the natural brown clay [C:2407]. The absence of a clay make-up layer in the area of Monington's extension is noteworthy.

In the centre of Trench 32, opposite the centre of the window in bay six, was a probable pit [C:2359] cutting through the redeposited clay make-up [C:2366] [C:2360] and overlain by the post-Dissolution disturbed soil [C:2351] (fig 4.44). This may have been a scaffold-hole associated with the construction of the later vaulting, with the scaffolding perhaps extending through or resting on the window sill. Cut into this pit was a supposed grave [C:2357], although a skeleton was not reached. The upper fill [C:2354] overlay a mortar layer [C:2355], which sealed the lower fill [C:2356] of the grave, described as being typical of the other grave fills on the site. In plan the grave was trapezoid, tapering towards the east and extending from the west side of the trench. The loose fill of the pit [C:2358] (reddish soil with red and black specks, stones and rubbish) contrasted with the tightly



packed upper fill [C:2354] of the grave; it also contained broken fragments of tile, plaster and painted plaster (described as both pink and maroon on white).

Bond located the high altar in 1915, noting a water-channel running diagonally from near the south-west corner of the altar dais to the south aisle wall, where a large cavity once existed. The cavity may indicate the presence of a stone conduit bringing water to the altar.<sup>85</sup>

### **End of the fifteenth to early sixteenth centuries and mid-sixteenth century (Phases 14 and 15)**

Bond's excavations in 1908–9 confirmed that the east end terminated in five chapels rather than the four-chapel arrangement suggested by St John Hope in 1904. To the east of the central chapel were robber trenches confirming that the central chapel originally projected by about 3.66m, as depicted on Willis's plan,<sup>86</sup> and locating the Edgar Chapel at the eastern end of the church (Plan 4).<sup>87</sup> The level of the foundations indicated that the chapel floor was *c.* 2.44m above the choir floor.

### **Post-Dissolution (Phase 16)**

Post-Dissolution robbery was evident in Trenches 27, 28 and 29 relating to the following features: the south arcade sleeper wall [C:2353], the southern part of the late twelfth- to early thirteenth-century sleeper wall for the east high gable [C:2455], the southern part of the late twelfth- to early thirteenth-century east wall [C:2403], Monington's reredos [C:2450] and the fourteenth-century reredos and high altar [C:2555]. The loose fill [C:2352] of the south arcade sleeper wall yielded a small fragment of pottery probably of *c.* 1800 (not retained), which suggests a late episode of robbery. This raises the question of how walls dating to the twelfth or thirteenth century, and removed during Monington's extension work, could have been subject to modern robbery. There is some evidence of fourteenth-century robbery, as would be expected, but it appears that some earlier foundations remained *in situ* and were later encountered and chased during the robbery of the arcades.

# The cloister

*Cheryl Green and Roberta Gilchrist, with a contribution from Peter Marshall*

## 5.1 Summary

The medieval cloister and surrounding ranges were extensively excavated, revealing beneath them the earliest *in situ* evidence for occupation on the site (fig 5.1). The excavations of 1954–9 discovered a series of post-pits, early glass-working furnaces and three fragmentary burials below the medieval cloister (Plan 1). The post-pits were thought to represent the foundations of a timber building (or buildings) comprising wooden uprights with a wattle and daub infill and interpreted as a small chapel within the ancient cemetery; this evidence was taken as confirmation of the Glastonbury tradition that the *vetusta ecclesia* was built of wattles.<sup>1</sup> The 1981 interim report described a number of small buildings within the cemetery and stated that the best plan was recovered from the cloister.<sup>2</sup> Later published plans show two post-built structures beneath the west cloister walk, a larger post-pit building and a ‘wattle oratory’ to the north.<sup>3</sup> However, the original excavation plans bear little resemblance to any of the published plans, showing a fairly irregular pattern of post-pits more suggestive of one or more large post-built structures. Pottery recovered from an occupation layer associated with this structure was originally identified as imported Mediterranean amphorae (Bii ware) dating to the post-Roman period.<sup>4</sup> This pottery is now confirmed as Late Roman Amphora 1 (LRA1) imported from the Mediterranean, reaffirming Radford’s original identification of this as high-status ware indicative of fifth- or sixth-century occupation (see Chapter 11 for a discussion). Radford argued that the

glass furnaces dated to the tenth century and were associated with major works undertaken by Abbot Dunstan. Bayesian analysis of radiocarbon-dated material from the furnaces has shown that they were in operation in the late seventh to eighth centuries (Tables 1 and 2).

Between 1954 and 1957 the excavations recorded structures pre-dating the twelfth-century cloister (Plan 1). Along the western side of the cloister garth, evidence of a wall was interpreted as the Late Saxon eastern cemetery wall associated with Abbot Dunstan’s documented remodelling (*c* 940–57+); this extended southwards from the south side of the porticus of the Saxon church, with a purported east range continuing southwards.<sup>5</sup> Radford’s dating was based on two premises: his observation that the ‘east range’ was in ruins prior to the construction of the cloister of Henry of Blois; and its similarity with the fabric of the Late Saxon phase of the church that had been exposed in the 1920s.<sup>6</sup> Possible structures were recorded further east, above the glass furnaces, although the plans are incomplete. Stratigraphically, these features all pre-date the twelfth century; however, the evidence does not support Radford and Wedlake’s proposal that they represent an east range forming one side of a cloister.

The refectory, dormitory, chapter house and, possibly, the cloister are thought to have been begun by Abbot Herlewin (1100–18) and completed by Abbot Henry of Blois (1126–71) (Plan 3).<sup>7</sup> Radford’s excavations within the cloister, chapter house and dormitory (1959) recorded detailed evidence of this range, but the results were summarised in a single paragraph in the 1981 interim report and no drawings were ever published.<sup>8</sup> Radford’s assessment of the evidence in terms of dating and layout

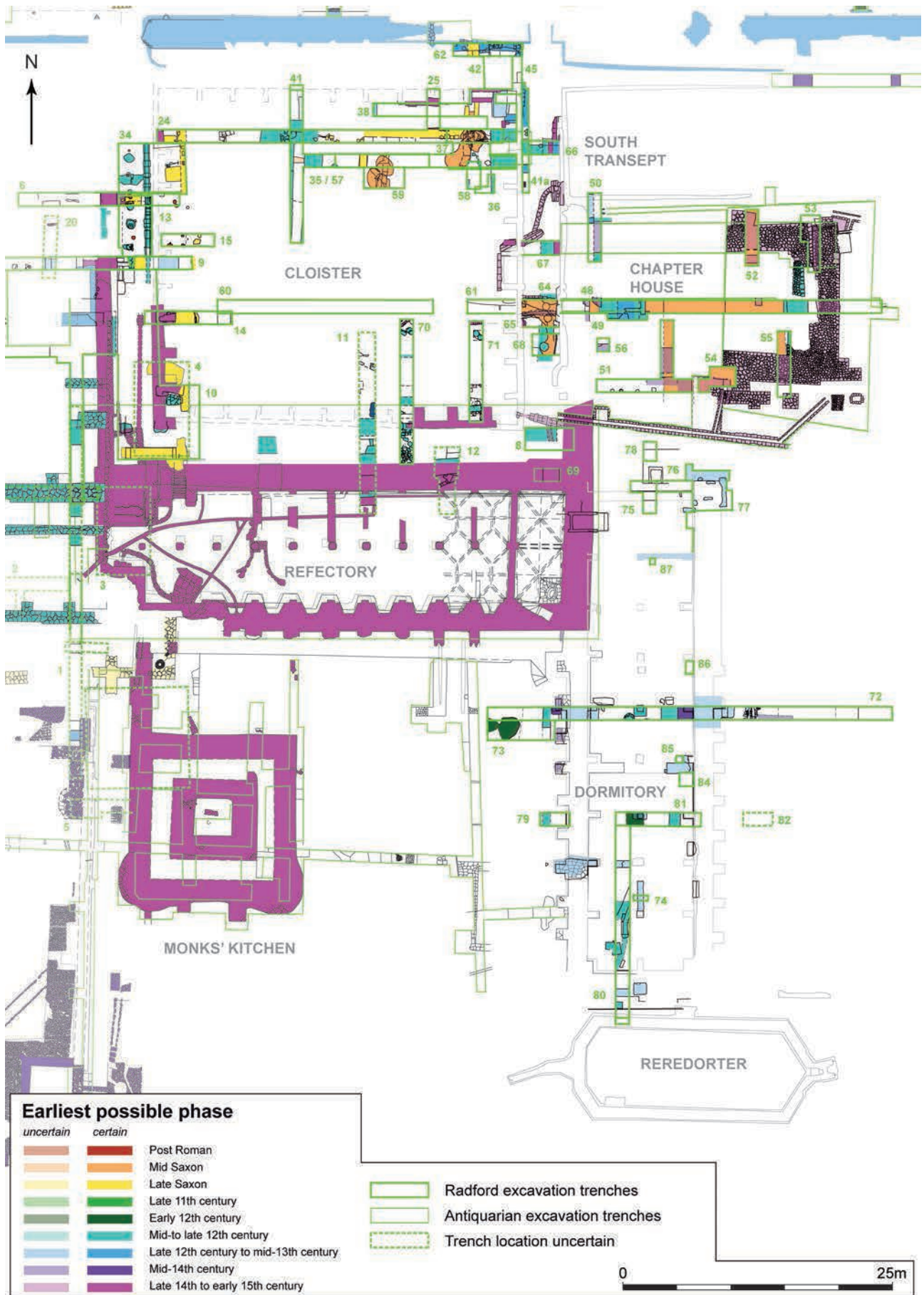


Fig 5.1 Plan of phased archaeology across the cloister (scale 1:500)

are sustained here, together with discoveries from earlier explorations by Bond and Wedlake. The twelfth-century buildings were located on the immediate west side of the later buildings, a pattern also evident in the north transept, and the archaeological records also provide indications of the internal arrangements. It is argued that Radford's proposal of a detached bell-tower within the cloister garth is unlikely; a conduit house perhaps offers a more plausible interpretation.

The extent of the 1184 fire is outlined, followed by a discussion of the archaeological evidence for episodes of repair, rebuilding and enhancement; the evidence is evaluated in connection with historical evidence for building programmes such as the cloisters, rebuilt by Abbot Chinnock (1375–1420) in the early fifteenth century (see Chapter 9). The cloister garth was used as a building yard during the post-fire rebuilding programme, and the west cloister walk was not rebuilt until some point during the thirteenth century. The level of the west, north and south cloister walks was raised and the layout of the cloister and other buildings of the east range were adjusted slightly eastwards during the rebuilding programme, corresponding to a shift in the church plan. The fifteenth-century rebuilding of the cloister is evident together with indications of possible carrel walls. There is also new evidence for water management: the possible twelfth-century conduit house continued in use and further drains and water-courses were developed. Radford's search for the monastic library produced no convincing results; on the basis of comparison with other sites, the library is likely to have been situated in the east cloister range.<sup>9</sup> Evidence for internal arrangements and the later medieval remodelling of the dormitory, chapter house, refectory and monks' kitchen is also discussed, along with the remains that Bond identified unconvincingly as the infirmary. The final part of this chapter evaluates the extent of post-Dissolution destruction (Plan 5).

## 5.2 Cloisters

### Post-Roman to Mid Saxon (Phases 2 and 3)

#### Post-pits

A series of small post-pits was recorded beneath the medieval west cloister walk and on the western side of the cloister garden, supposedly forming two lines running east to west and spaced at *c* 1.2m intervals.<sup>10</sup> These were thought to represent a building measuring 4m wide and between 5.5m and 7.5m long, although the west end had been destroyed by a later foundation

trench.<sup>11</sup> The location of this structure is indicated on a published sketch plan between the fifth and sixth buttresses of the later cloister<sup>12</sup> and was subsequently illustrated as two neat rows of post-pits.<sup>13</sup>

Reanalysis of the records indicates six post-pits located between the fifth and seventh buttresses [C:1425], [C:1426], [C:1428], [C:583], [C:2072] = [C:573], [C:2080] (figs 5.2, 5.3, 5.4 and 5.5). Contrary to Radford's published account, there are large gaps between most of these features, with more regular spacing only evident at the eastern end. Slightly further north was a group of four post-pits between the seventh and ninth buttresses [C:2045], [C:2058], [C:2064], [C:2068] (fig 5.2); the surface of one post-pit [C:2045] was at the same level as a mortar floor which may be associated (fig 5.6). The post-pits were recorded at a depth of between *c* 0.8m and *c* 1.0m below the topsoil. Dating was based on their location within the ancient cemetery, thought to pre-date Dunstan's Late Saxon remodelling. A date earlier than the middle of the twelfth century is certain: four of the post-pits [C:2080], [C:2064], [C:2068], [C:2072] = [C:573] were sealed beneath the intact mid-twelfth-century mortar bedding [C:565] for the west cloister paving (fig 5.3), together with a series of large twelfth-century post-pits (see below).

Of critical importance is the location of one of the post-pits [C:2058] in the base of the wall trench that is interpreted as Dunstan's east cemetery wall [C:2055] (fig 5.2). Two of the post-pits [C:573] [C:583] were sealed by a clay layer [C:577] located between the later inner cloister wall and the east cemetery wall (fig 5.3); this may represent a residue of Dunstan's documented raising of the cemetery, along with a layer of clay with bones [C:589] and another clay layer [C:570] beneath the mid-twelfth-century cloister walk. Two post-pits [C:1425] [C:1426] in Trench 15 were recorded beneath supposed Late Saxon deposits; however, the section drawing makes no sense stratigraphically and is therefore not reproduced here.<sup>14</sup>

More convincing evidence for a pre-tenth-century date comes from artefacts recovered from two features sealed beneath the west cloister walk. One post-pit [C:2079] [2080] contained Iron Age pottery, animal bone, plaster, ironwork and charcoal with a radiocarbon determination of AD 710–870 at the lowest probability (at 1 sigma) and AD 680–890 at the highest probability (at 2 sigma) (see Table 1). The lack of tenth-century pottery from these small post-pits contrasts with the large quantity recovered from the series of large twelfth-century post-pits, indicating they are unrelated. One post-pit [C:572] [C:573] excavated in 1952 has been tentatively linked to

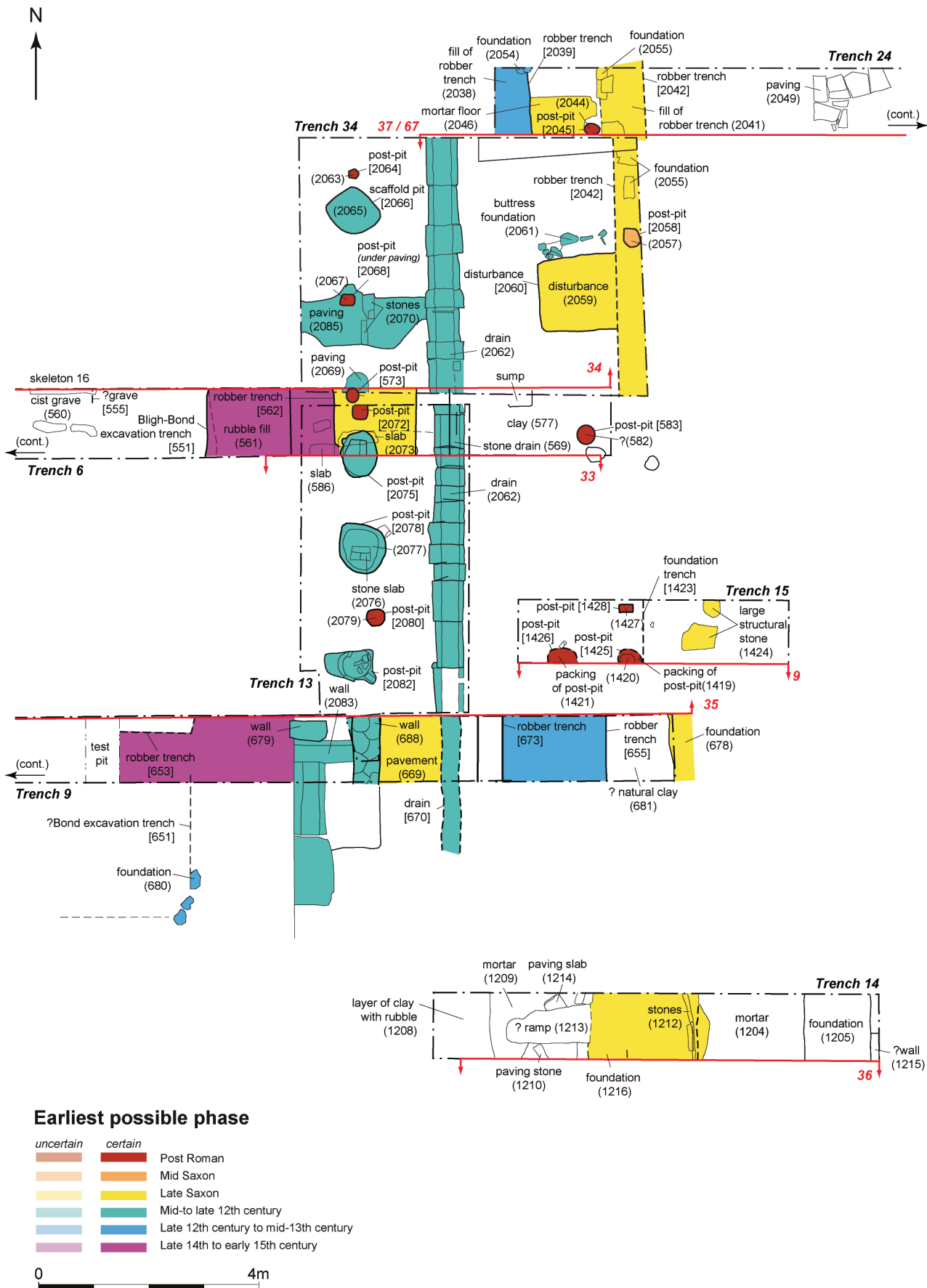
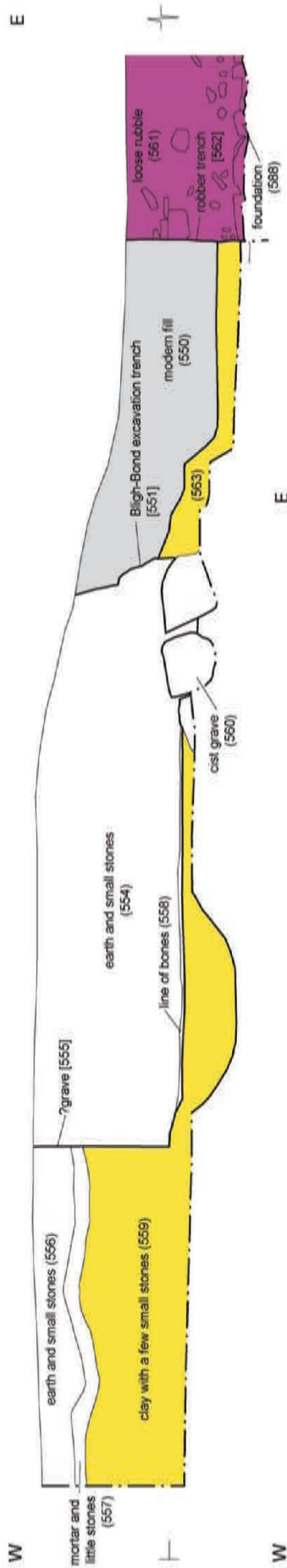
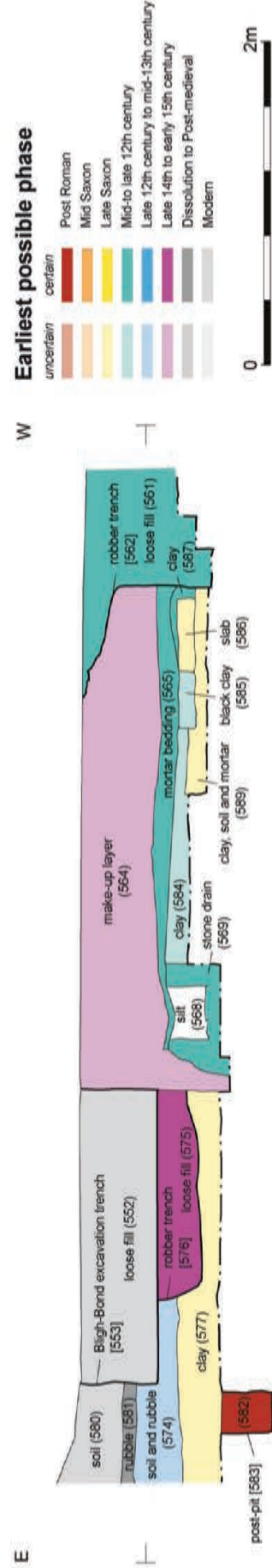


Fig 5.2 Plan of Trenches 6, 9, 13, 14, 15, 24 and 34 (scale 1:100)

**Section 34: Trench 6**



**Section 33: Trench 6**



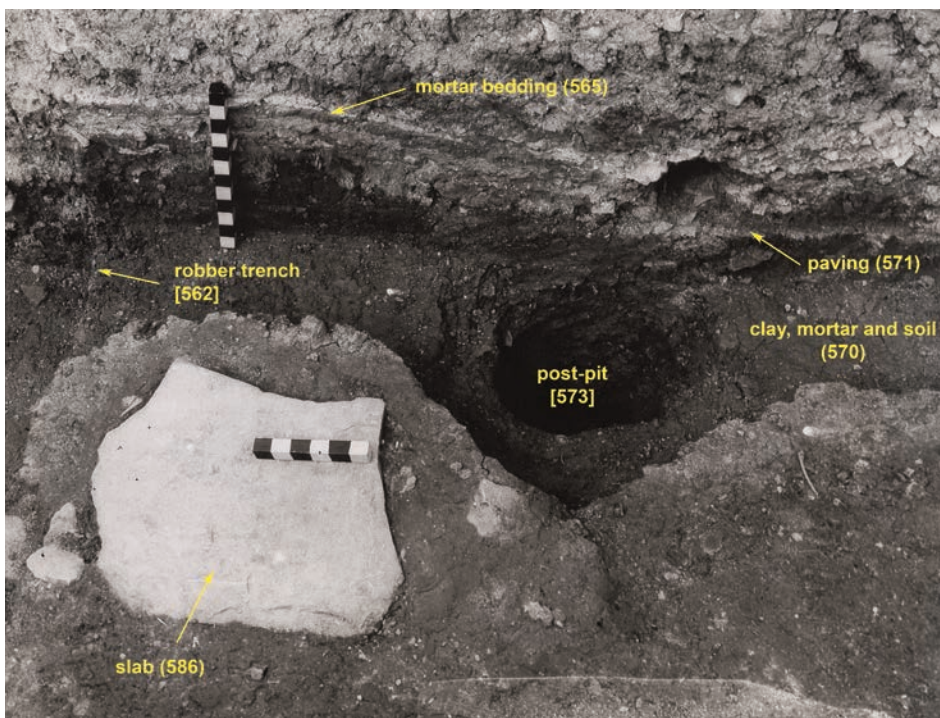
**Earliest possible phase**



**Fig 5.3** Sections of Trench 6 (scale 1:40)

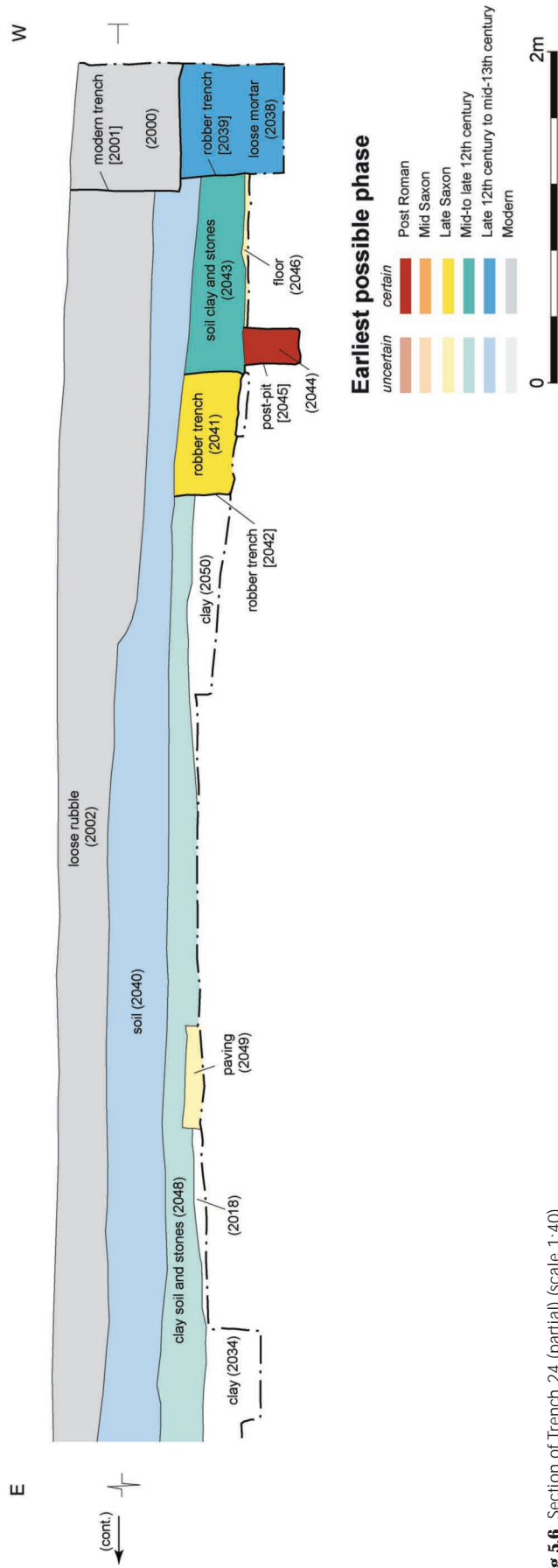


**Fig 5.4** Post-pits beneath mortar in Trench 13, looking north (1954 photograph: © EHA)



**Fig 5.5** Post-pit beneath twelfth-century paving in Trench 6, looking north (1952 photograph: © EHA)

**Section 37: Trench 24 (partial)**



**Fig 5.6** Section of Trench 24 (partial) (scale 1:40)



**Table 1** Radiocarbon dates

Sample	Year	Glass furnace	Bulk find	Harden no.	GLSGA no.	$\delta^{13}\text{C}$ relative to VPDB	Range at 1 sigma (68.2%)	Range at 2 sigma (95.4%)	SUERC code
1	1955	1	BF2024	27	2008/20/1	-25.0 ‰ assumed	613–865 AD	689–882 AD	37151
2	1955	1	BF2034	37	2008/3/28/2	-24.8 ‰	660–770 AD	650–780 AD	34515
3	1955	1	BF2055	9	2008/3/34/1	-26.0 ‰	640–70 AD	605–85 AD	34517
4	1956	1/2	BF3001	Unknown	1998/3/170	-25.9 ‰	678–767 AD	661–773 AD	37150
5	1956	1/2	BF3137	Unknown	1998/3/116	-26.8 ‰	675–770 AD	662–778 AD	37149
N/A	1954	N/A	BF113	N/A	1991/146/1	-27.1 ‰	710–870 AD	680–890 AD	34516
N/A	1959	NA	BF5201	N/A	1993/81	-25.8 ‰	1040–1160 AD	1020–1190 AD	34518

finds, including two pottery sherds dated 1100–1250 and a single pottery sherd dated 1250–1450. The pottery dating is at odds with the contextual information on the original finds envelopes which state that they came from a post-pit under a Saxon floor (now redated as mid-twelfth century [C:571]). This inconsistency is perhaps explained by a letter from Radford dated 22 February 1960, in which he responds to the trustees' request that all archaeological finds be returned to the abbey.<sup>15</sup> Radford insisted on retaining finds until they had been properly bagged, since in 1955 the abbey had separated the pottery of 1951 and 1952 from the original packaging. It can be concluded therefore that the medieval pottery did not come from the post-pit and that the envelope had been labelled incorrectly.

The same finds debacle of 1951–2 explains why fourteen sherds of post-Roman imported pottery (LRA1), which are now thought to come from an undisturbed post-Roman context, were found in an envelope inscribed '1951 mid-twelfth-century mortar bedding'. The site notebook states that these sherds were recovered from a 'roughly trodden floor', which was not identified in the section drawings but was located several centimetres above the natural clay surface and was supposedly associated with the post-pits described above. Reassessment of these sherds indicates that they represent only a few vessels, and the lack of abrasion indicates an undisturbed post-Roman, rather than a twelfth-century, context (see Chapter 8: Pottery).

The association of late fifth- to sixth-century pottery with the trodden floor indicates this could be the earliest building yet identified by excavation, although the radiocarbon date suggests a destruction date between the late eighth and ninth centuries. A date earlier than the tenth century is also supported by the lack of tenth-century pottery and the location of one of the post-pits beneath the supposed Late Saxon east cemetery wall. The

post-pits may indicate a building with minimum dimensions of c 5m by c 10m. Radford also proposed that the discovery of Roman and sub-Roman pottery within thirteenth-century make-up layers suggests further buildings of this type may have been disturbed by the digging of thirteenth-century foundation trenches.<sup>16</sup>

### Glass furnaces

Three areas with glass furnaces were excavated during the course of the 1955–7 excavations. Glass-working had been unrecognised on site previously, although a trial trench excavated by Bond in the vicinity recovered two fragments of 'ware' with a 'crystalline glaze of brilliant blue-green tint'.<sup>17</sup> The British Museum identified the wares as glazed pottery possibly of Egyptian or Syrian origin. In the light of Radford's excavations, they may be identified as crucibles associated with Saxon glass-working. Areas A and B are located within the cloister garth (fig 5.7) and Area C in the east cloister walk (fig 5.18). The floors of the furnaces were preserved and are recorded as having been dug into the 'stiff yellow' natural clay; there were traces of three successive floors observed in one place.<sup>18</sup> The typology of the glass was believed at the time to suggest a ninth- or tenth-century date, although this was subsequently reassessed as resembling eighth-century glass.<sup>19</sup> Radford based his dating of the furnaces on a circular argument regarding their relationship to the *vallum monasterii*.<sup>20</sup> He stated that the furnaces cut through the bank of the *vallum*; however, the most easterly furnace (in Area C) was located c 15m west of the *vallum* ditch and c 10m west of the bank. A ninth- or tenth-century date was also inferred from the supposed pre-Conquest structures above the furnaces (see below).<sup>21</sup>

The pottery from the furnace floors and structures was originally thought to support a tenth-century date,

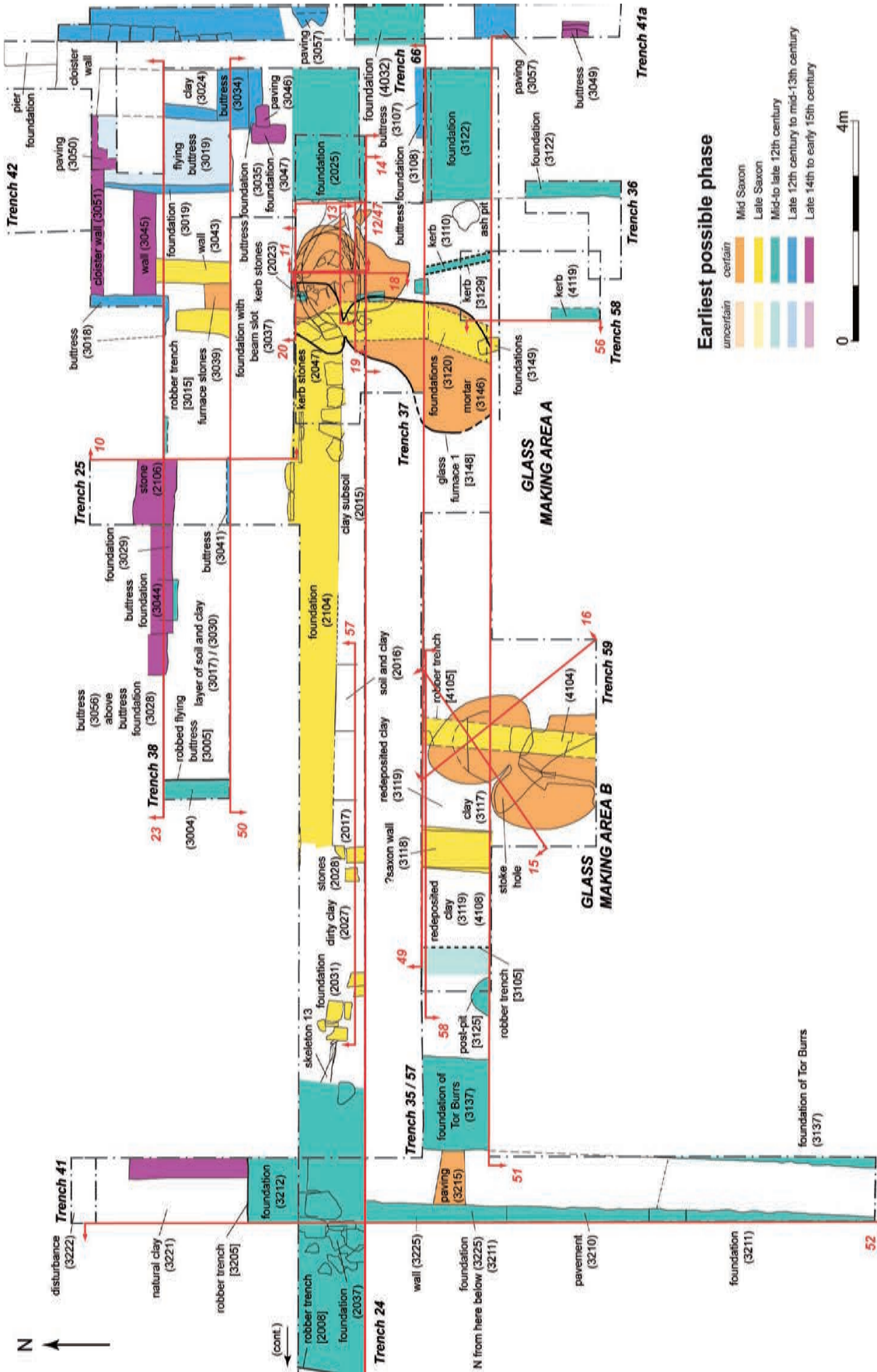


Fig 5.7 Plan of Trenches 24, 25, 35, 36, 37, 38, 41, 42, 57, 58, 59 and 66 (scale 1:100)

but the Glastonbury area of Somerset was aceramic before c 930 (see Chapter 8: Pottery). All this pottery has now been redated as Roman, with reused Roman tile employed for the furnace superstructures. Detailed analysis of the stratigraphy above the furnaces reveals that the abundant Late Saxon pottery was all derived from debris layers rather than the furnaces themselves (see Chapter 7). These sherds were either overlying or located outside the furnaces and may have been introduced during the demolition of the structures and subsequent levelling of the cloister garth. Five charcoal samples from the glass furnaces were submitted to the Scottish Universities Environmental Research Centre for radiocarbon dating (Table 1) and are discussed below.

Furnace 1 (see fig 7.1) was horseshoe shaped in plan and almost completely contained within Trench 24. An entrance was aligned towards south-west-west, with the stokehole stones [C:2053] and part of the outer kerb [C:2047] remaining *in situ* (see fig 7.2). The south section (fig 5.8) crossed the southern edge of the furnace wall, with one of the entrance stones [C:2053] and outer kerb [C:2047] visible in the base of the section. Above the stones and the natural clay [C:2024], to the east, were debris layers of tile, ash and clay [C:2021] [C:2020] [C:2019], which appear to have been located south of the furnace. The natural clay [C:2024] probably formed the eastern side of the furnace, as indicated by the presence of three small pieces of glass waste in this deposit at the edge of the furnace. The hollow of the furnace was backfilled with stones, clay, soil and rubbish, including loose fragments of tile and pieces of burnt clay with a domed, smooth surface and irregular outer surface. This backfill was consolidated prior to the insertion of the twelfth-century cloister kerb [C:2023] (see below), which cut through the dark layers at the base of the trench and the outer edge of the furnace (fig 5.8). Radford records that the outer wall of the furnace was almost entirely removed but that the burnt surface within the centre of the furnace was left *in situ*, although fragments of Roman tile remained embedded around the furnace edge (see fig 7.3).

In 1956 a second glass furnace was discovered in Trench 35 to the south of Furnace 1, extending south-westwards from the entrance to Furnace 1 (see fig 7.2). The north section (fig 5.9) was not sufficiently deep to reach the furnace deposits; however, the south section (fig 5.10) crossed the southern edge. This showed the robber trench [C:3150] for the supposed Late Saxon building (see below) cutting through a soil and clay layer [C:3142] with redeposited furnace material providing a *terminus post quem* of 950 (see below). This overlay a

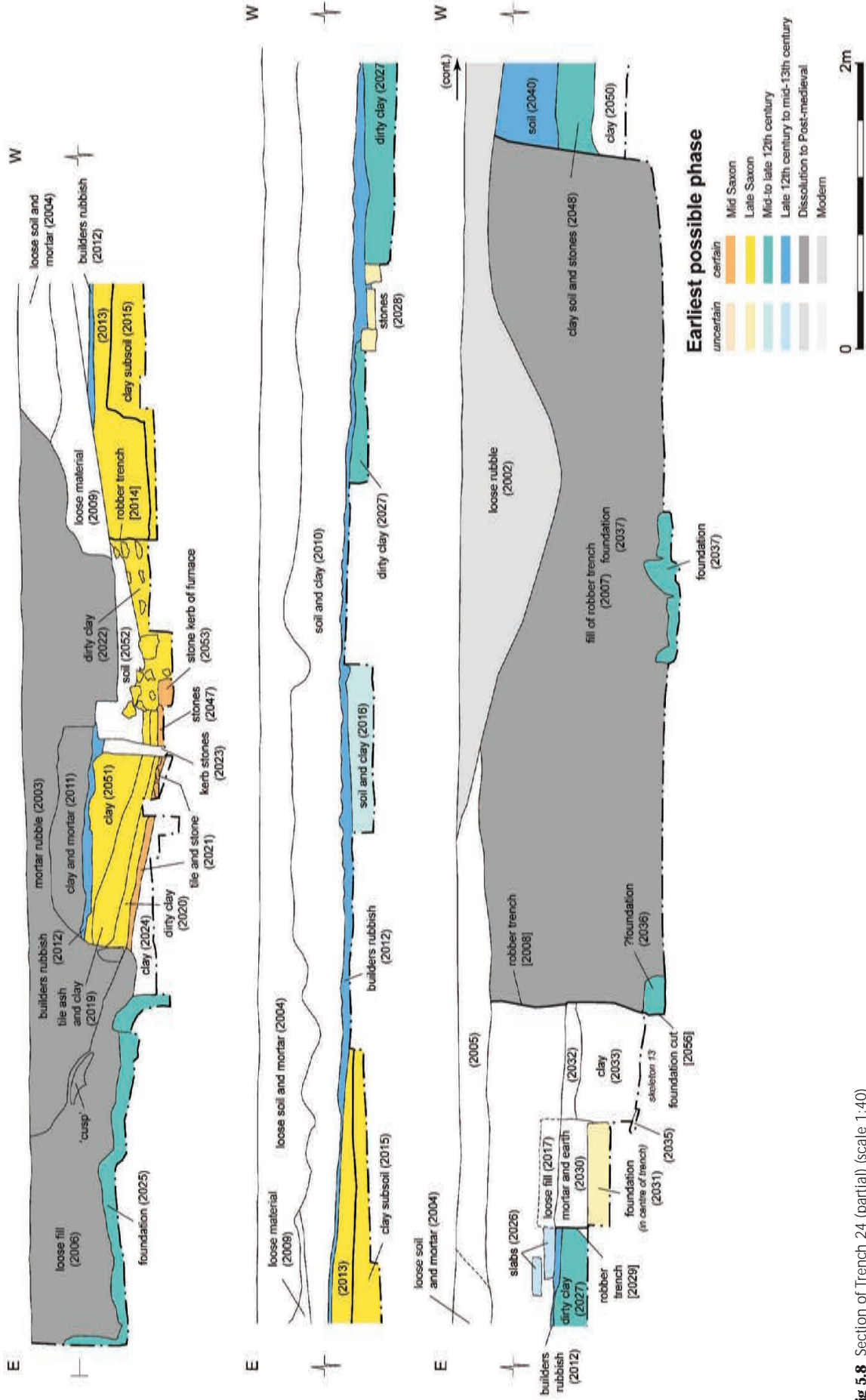
burnt clay layer [C:3145] (labelled ‘?decayed daub’) with abundant glass furnace debris comprising fired clay (including four pieces that fitted together), glass cullet / waste, a small fragment of a glass crucible and a piece of glass reticella rod (see Chapter 7 and Chapter 8: Slag and metal residue samples). The burnt clay covered the mortar floor [C:3146] of the furnace which contained fired clay and a sherd of Iron Age pottery, with two fragments of copper sheeting and 6g of fuel ash slag. The mortar sloped upwards from east to west and was described as being cut [C:3148] into the subsoil [C:3144]. In the centre of the trench, to the east of Furnaces 1 and 2, was an ash pit [C:3152] measuring c 0.52m in diameter. No further details are known about this feature with the exception of a note by Donald Harden stating that, during the clearance of the ash pit, it was proven to be beneath the twelfth-century foundation [C:3122].

The remains of Furnace 3 were discovered c 5m west of Furnace 1 and 2 (fig 5.7), first evident as a small circular pit filled with clay [C:3139] overlapping a layer of soil and debris [C:3140]. The clay lined a hollow with gently sloping sides, noted as a ‘hard dished floor’ (figs 5.11 and 5.12). Both the soil and debris [C:3140] and the furnace layer [C:3139] covered a clay layer [C:3117], cut to the west by the supposed Late Saxon wall foundation [C:3118] (fig 5.13).

Trench 35 was reopened (Trench 57) and extended in 1957 (Trench 59) to explore the furnace fully (fig 5.14). In plan, the furnace resembled a figure of eight with a stokehole in the southern half (figs 5.7 and 7.6). In section (fig 5.15), the furnace was sealed by a clay deposit [C:4110] with a *terminus post quem* of 950. This had been cut by a robber trench [C:4105] for another supposed Late Saxon wall [C:4122] exposed to the south of the furnace (fig 5.13). The upper deposit of the furnace comprised a thin layer of reddened clay [C:4111], overlying an ash layer [C:4113] of the same thickness. This covered the primary furnace deposit [C:4113] of clay with red furnace material and ash (fig 5.15) measuring 0.25m deep and yielding one sherd of Roman pottery and two fragments of copper-alloy sheeting. There were no certain remains of glass or other waste, although the assemblage does include a Roman flue tile (T162) thought to have been reused in a glass furnace structure and a piece of clear glass (G66) found over the furnace.

Structural evidence for a further glass furnace comprised a row of stones [C:3039] in the base of Trench 38 (fig 5.7). As with Furnace 1, this feature and the overlying clay [C:3038] were cut by a wall trench [C:3042] containing the remains of a supposed Late Saxon wall [C:3043] (see below). With the northern edge of Furnace

**Section 37: Trench 24 (partial)**



**Fig 5.8** Section of Trench 24 (partial) (scale 1:40)

Section 49: Trench 35

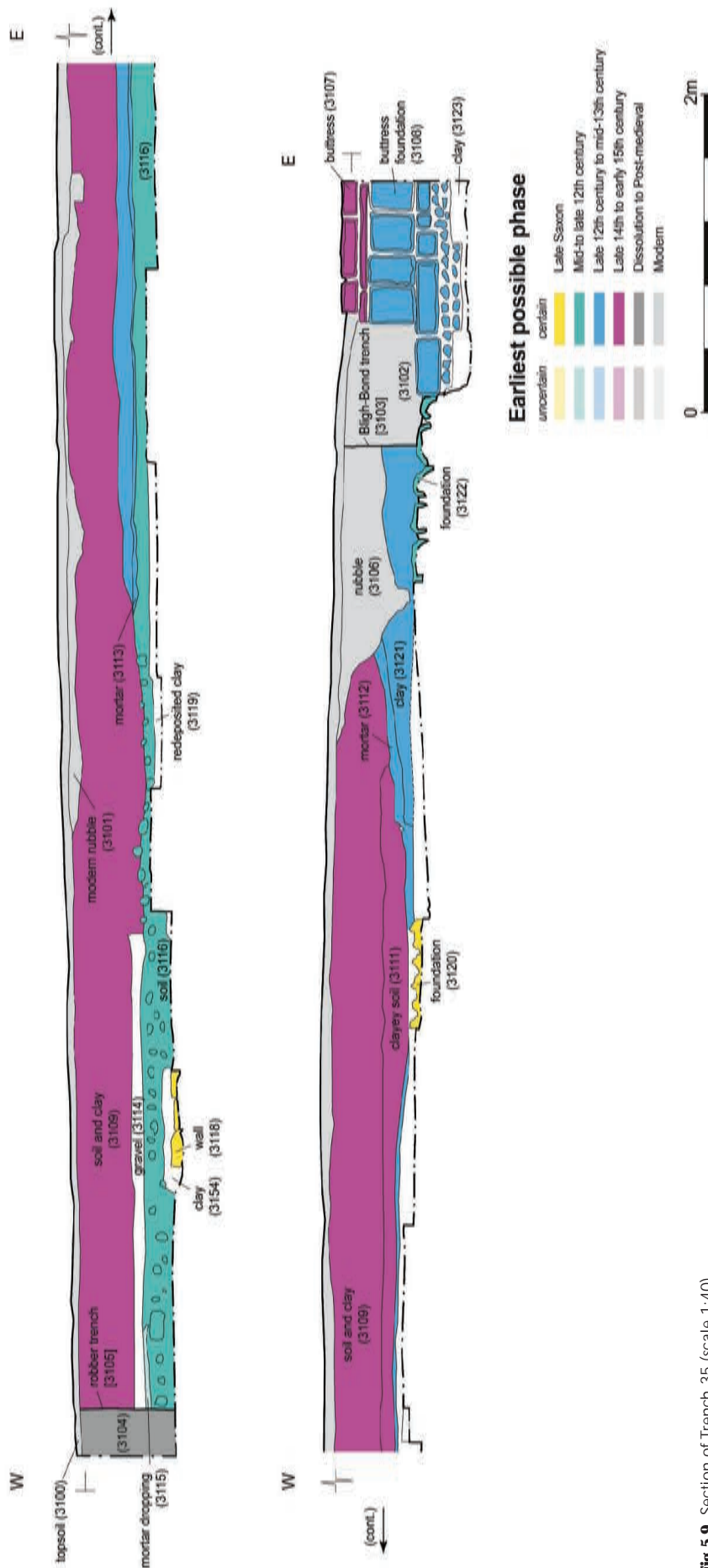


Fig 5.9 Section of Trench 35 (scale 1:40)

Section 51: Trench 35

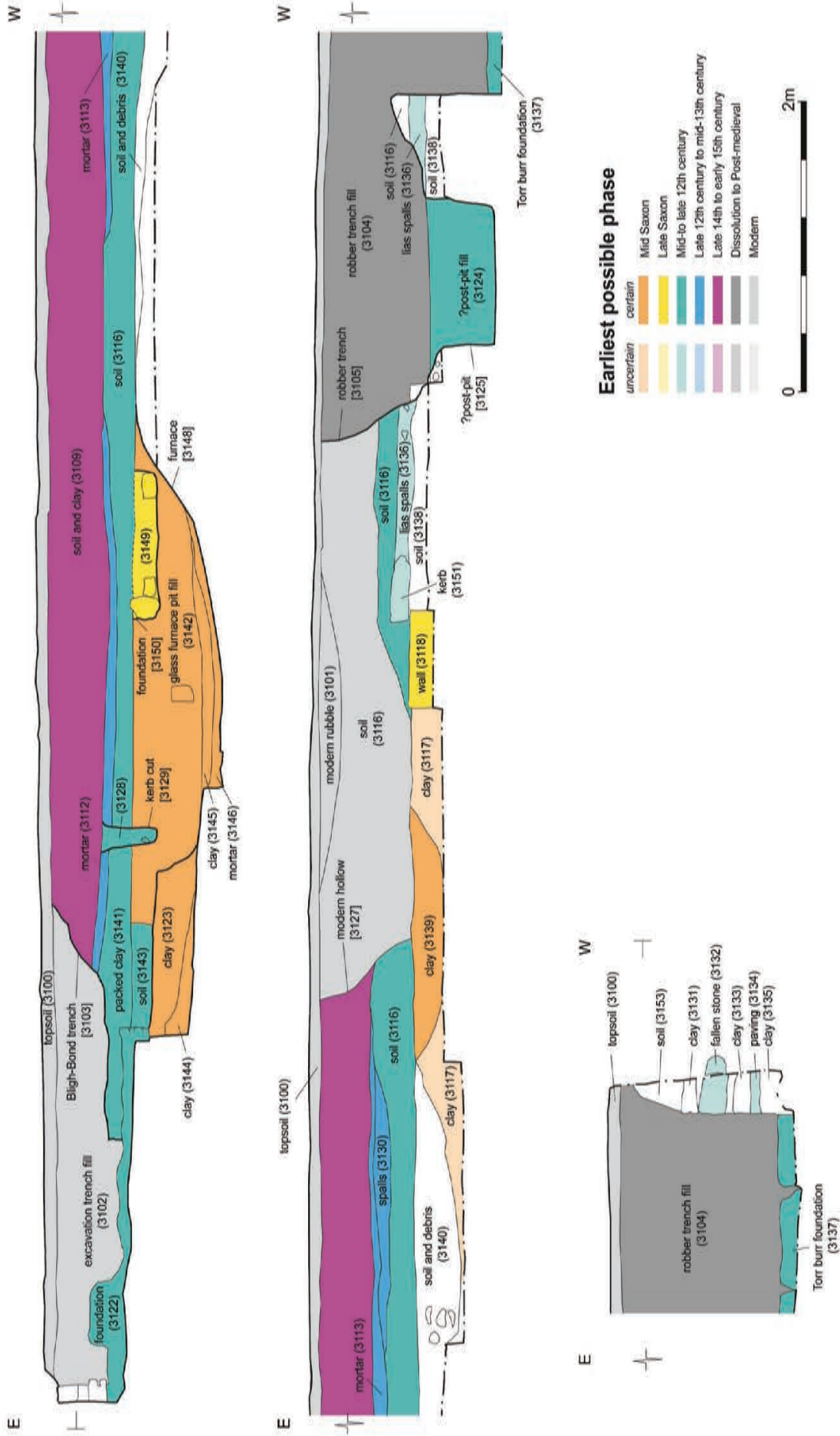
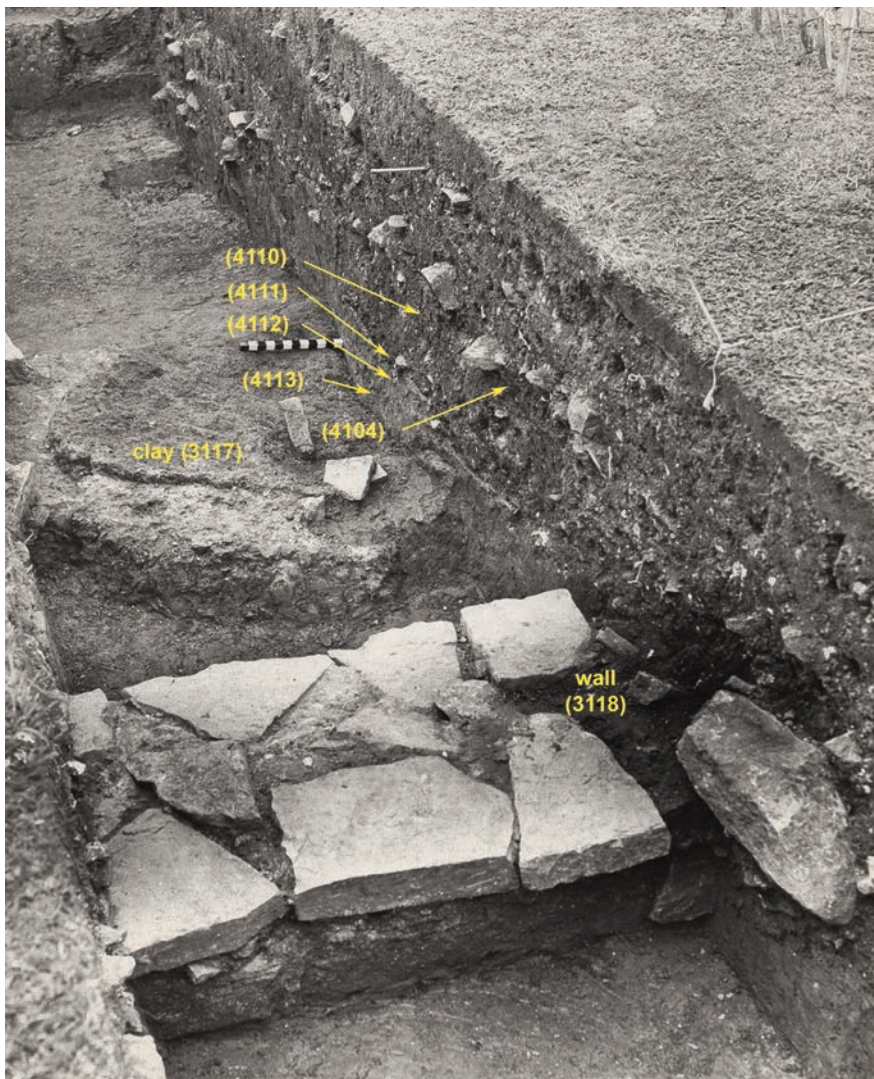


Fig 5.10 Section of Trench 35 (scale 1:40)



**Fig 5.11** Furnace 3 and Saxon wall in Trench 57, looking south-south-east (1957 photograph: © EHA)



**Fig 5.12** Furnace 3 in Trench 57, looking south west (1957 photograph: ©EHA)



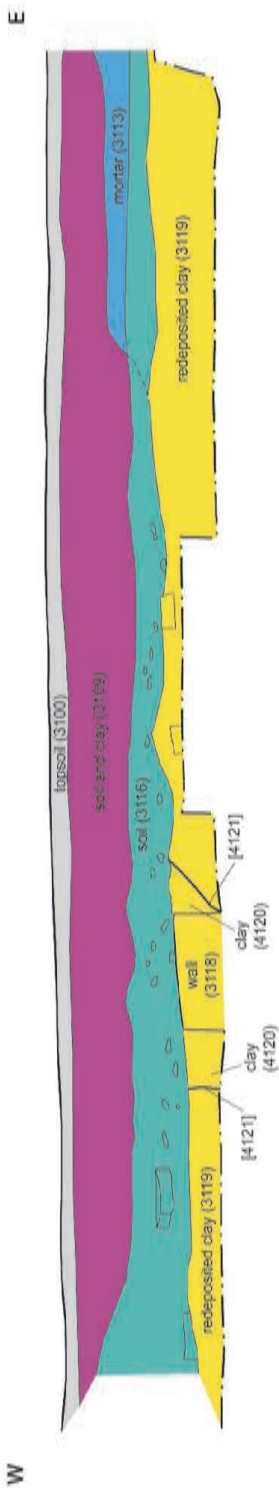
**Fig 5.13** Furnace 3 and Saxon walls in Trenches 57 and 59, looking south-east-east (1957 photograph: © EHA)



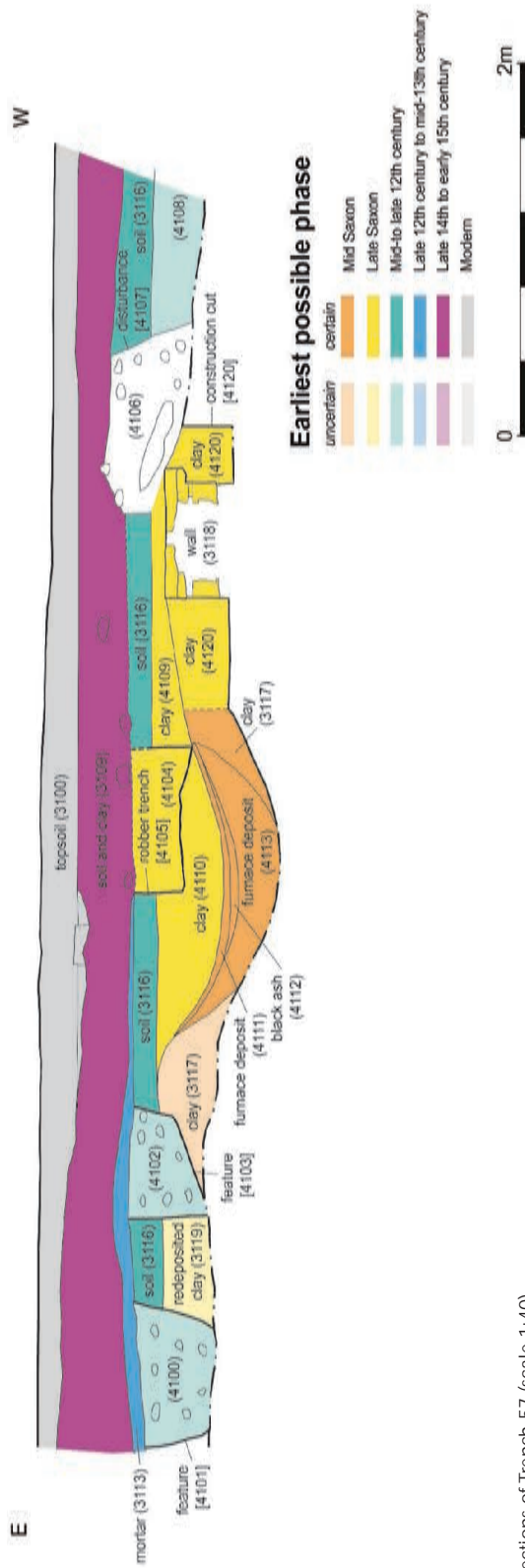
**Fig 5.14** Excavation of Furnace 3 in Trenches 57 and 59 (Donald Harden wearing a beret), looking west (1957 photograph: © EHA)



**Section 57: Trench 57**

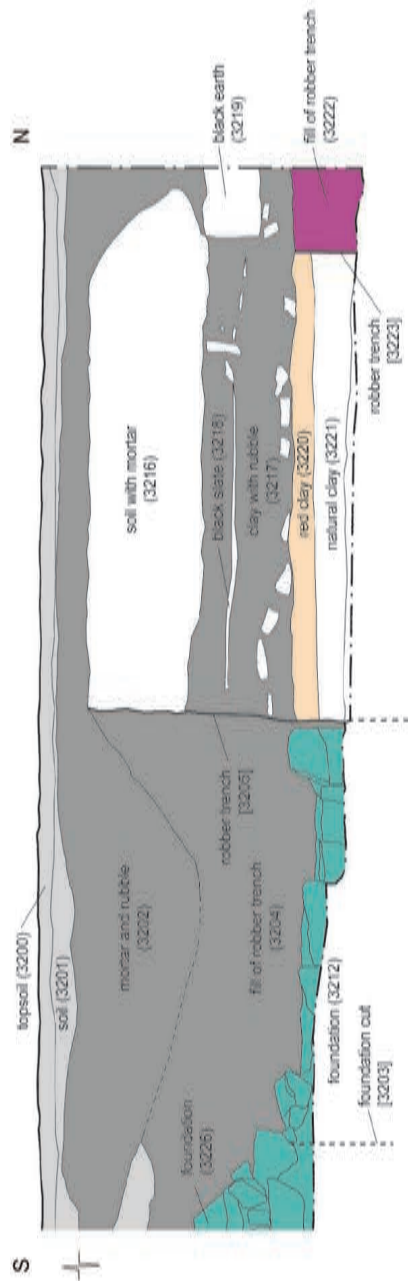
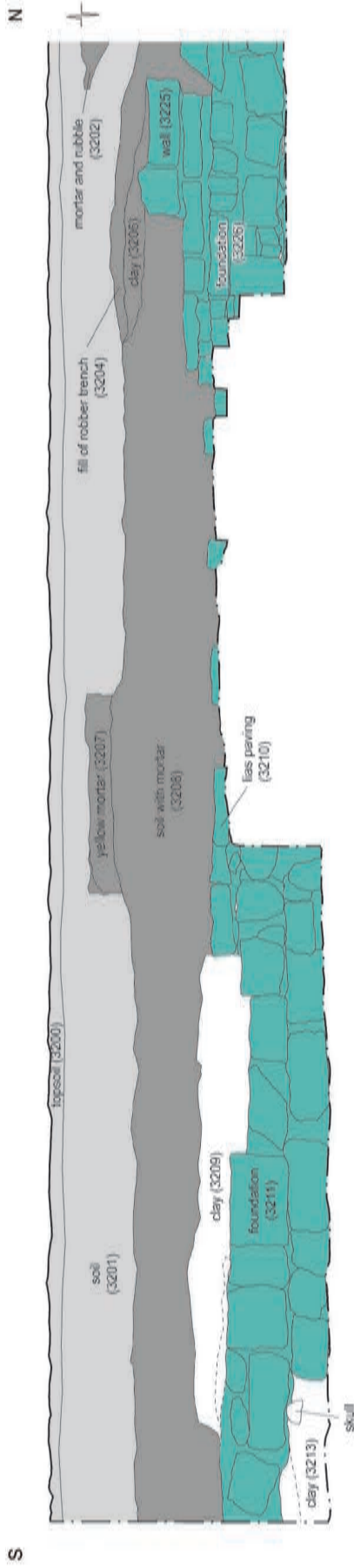


**Section 58: Trench 57**



**Fig 5.15** Sections of Trench 57 (scale 1:40)

**Section 52: Trench 41**



**Earliest possible phase**



**Fig 5.16** Section of Trench 41 (scale 1:40)

1 established 1.18m to the south, it seems unlikely that these stones [C:3039] relate to the same furnace.

Artefactual evidence for glass-working within the same trench consisted of a flue vent fragment from the supposed twelfth-century make-up [C:3030] and a very slender square sectioned glass rod from the dark clay [C:3040] at the base of the trench. The stones [C:3039] were overlain by a small deposit of clay [C:3038] containing one fragment of fired clay and two small fragments of blue Saxon glass.

In Trench 41 the robber trench [C:3222] for the inner wall of the medieval north cloister walk cut through a layer of clay [C:3220] with red patches above the natural clay [C:3221] (fig 5.16). The possible presence of slag (not retained) and 'rust-red' clay patches indicated some industrial activity; however, this was not investigated owing to time constraints and weather conditions. To the south, beneath the clay make-up [C:3214] for a possible twelfth-century structure, was a 'low-level' paved area [C:3215] comprising small slabs of lias. Radford noted the similarity of this area to the mortar floor of Furnace 3 located c 6.8m to the east and suggested it may have been associated with industrial activity. A decision was made by Harden and Radford to leave the possible additional glass-working remains in Trenches 36, 38 and 41, although no such evidence is contained within the records for Trench 36. Radford concluded that further traces of Saxon industrial activity found in the cloister had been disturbed in the medieval period and yielded little information.<sup>22</sup>

In the south-east corner of the cloister, a pavement [C:762] was recorded in Trench 8 beneath a large foundation [C:760] thought to belong to Herlewin's

(1101–18) east range (fig 5.17). Any paving of this date within the east cloister was considered likely to have been associated with the nearby glass production. However, with the exception of some furnace debris within a soil layer [C:5518] at the northern end of Trench 71, there is no further evidence.

Glass furnace deposits were recorded in the east cloister walk (Area C) in both the north section of Trench 64 and the south section of Trench 65, with additional deposits in Trench 68 immediately to the south (fig 5.18). Originally thought to represent the remains of one furnace (Furnace 4), re-examination of the records now suggests the presence of an additional furnace (Furnace 5). Although it is uncertain whether all these deposits relate to *in situ* furnaces, the extent of the associated layers is demonstrated across an area measuring 5m wide from north to south. The sequences in the two sections are quite different and are described separately.

The Trench 64 section showed a layer of dark clay [C:4062] with burnt red clay and embedded fragments of furnace material above what appears to have been natural clay [C:4072] (fig 5.18). The similarities between the two deposits led Radford to suggest that the dark clay [C:4062] may have been *in situ* natural clay levelled to create a flat surface for the furnace. A shallow, concave bowl was cut [C:4090] into the natural clay [C:4072] and lined with burnt clay [C:4071]. The hollow was filled with a layer of furnace debris [C:4075] comprising soil with small fragments of burnt clay and ash measuring 0.09m thick. This was overlain by a similar but much deeper fill of small stones with fragments of burnt clay and ash [C:4070], cut by the twelfth-century east cloister wall (represented by a robber trench [C:4069]).

### Section 8: Trench 8

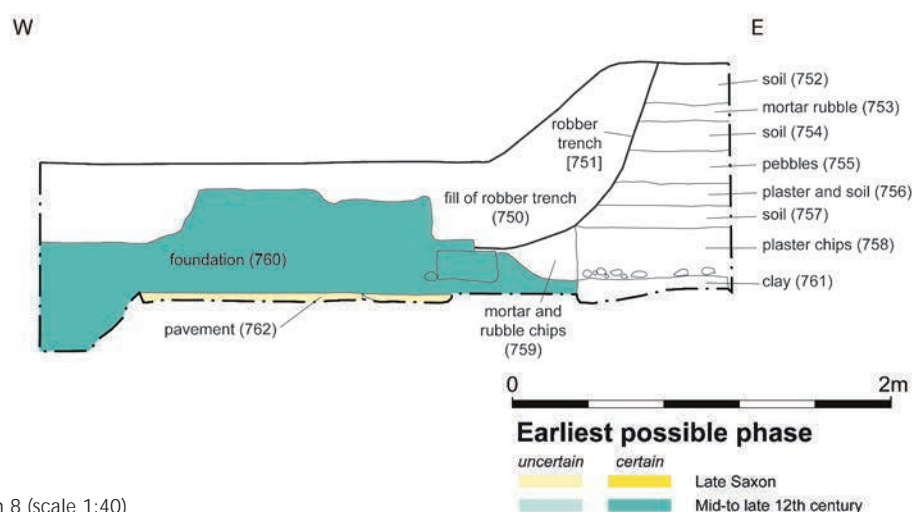
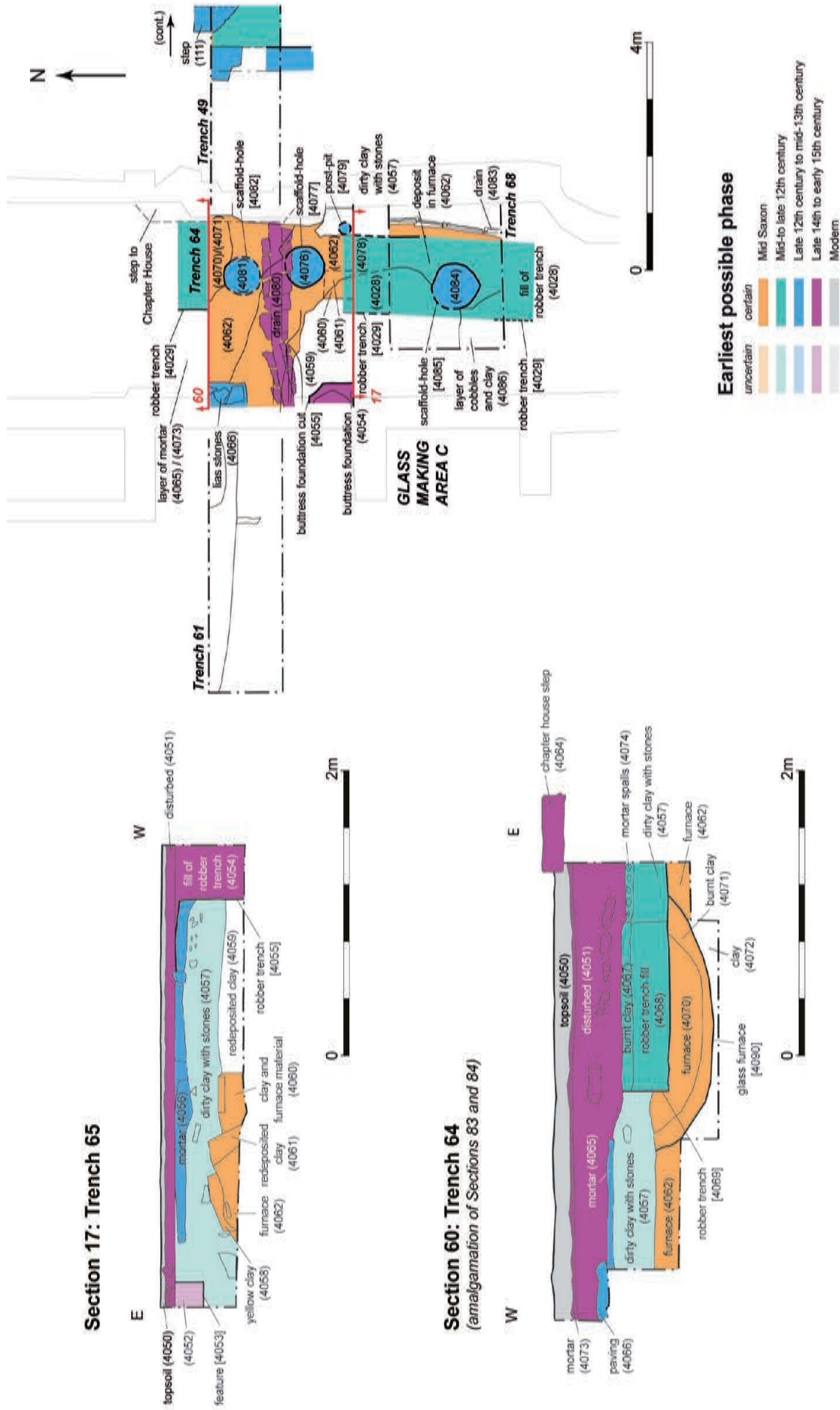


Fig 5.17 Section of Trench 8 (scale 1:40)



**Fig 5.18** Plan of Trenches 49, 61, 64 and 68 and sections of Trenches 64 and 65 (scale 1:100 and 1:40)

In Trenches 64 and 65 the furnace layers were sealed by a deep layer of dirty clay [C:4057] with stones, debris, clay and daub fragments (fig 5.18). Abundant glass-working material was recovered from this clay, some of which was described as coming from the surface of the glass furnace. The notes describe a cobbled surface originally labelled (3) above the deep clay [C:4057]: a number of finds associated with glass-working came from the cobbled surface, in addition to one pottery sherd, dated post-950, and 74g of iron-smithing slag. The dirty clay layer [C:4057] was cut by the robber trench [C:4069] for the twelfth-century east cloister wall (see below). The cobbled surface (3) must have overlain the sub-cobbled surface originally labelled (4) above the furnace floor, which contained fired clay and one fragment of reused Roman tile.

In Trench 65, the earliest furnace deposit was the dark clay [C:4062] with burnt red clay (fig 5.19) and embedded fragments of furnace material and glass fragments including fired clay fused to a Roman tile. This was covered by yellow mortar [C:4058] containing one fragment of glass slag and redeposited blue clay [C:4061]. The western side of this deposit was covered by a layer of dirty clay [C:4060] with furnace material. To the west of

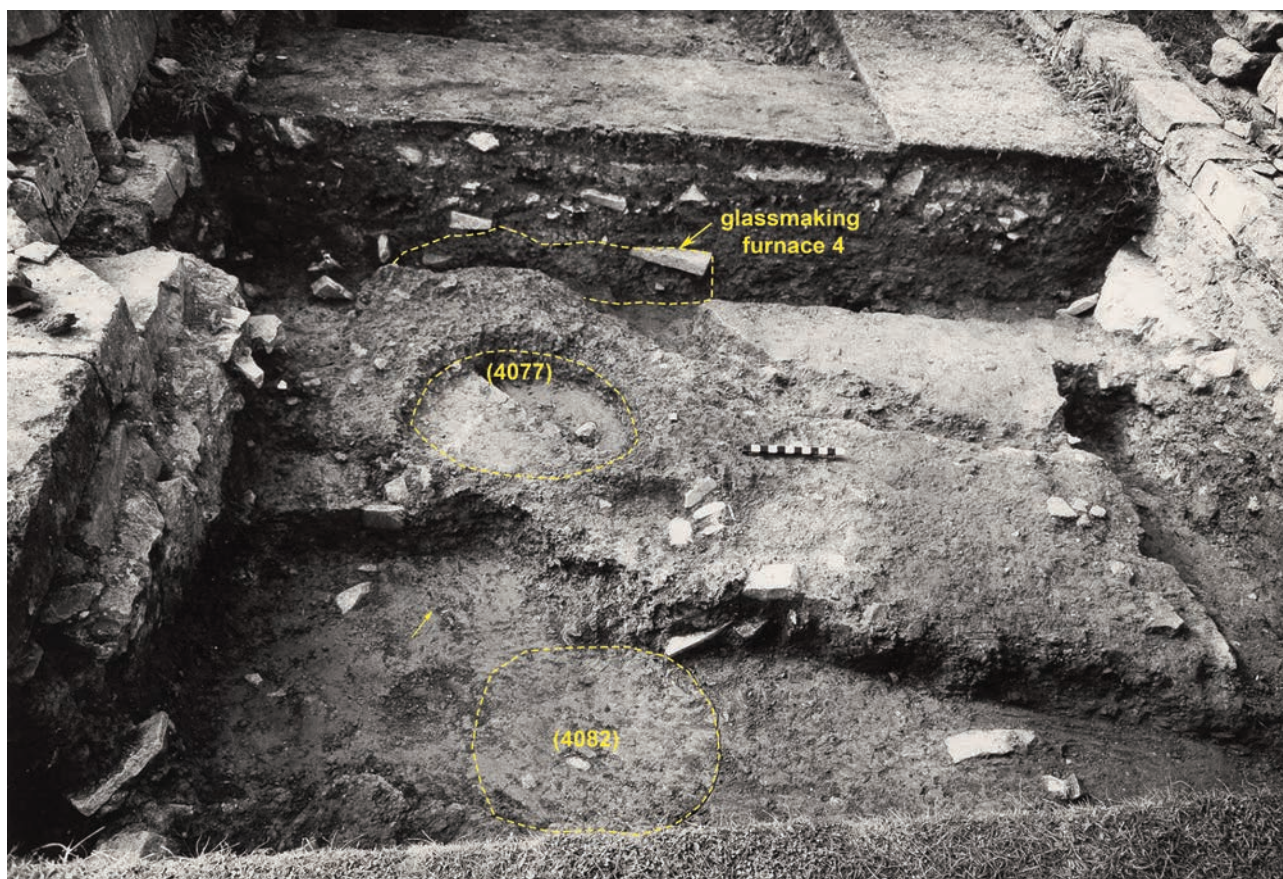
this was a further layer of redeposited blue clay [C:4059] containing a glass moil and a fragment of furnace structure with glass slag.

Located immediately south within Trench 68, a layer of cobbles [C:4086] in the south-west corner was noted as overlying both red clay and a furnace spread (fig 5.15). In the north east a furnace deposit [C:4062] extended northwards into Trench 65 and appears to have contained glass and crucible fragments.

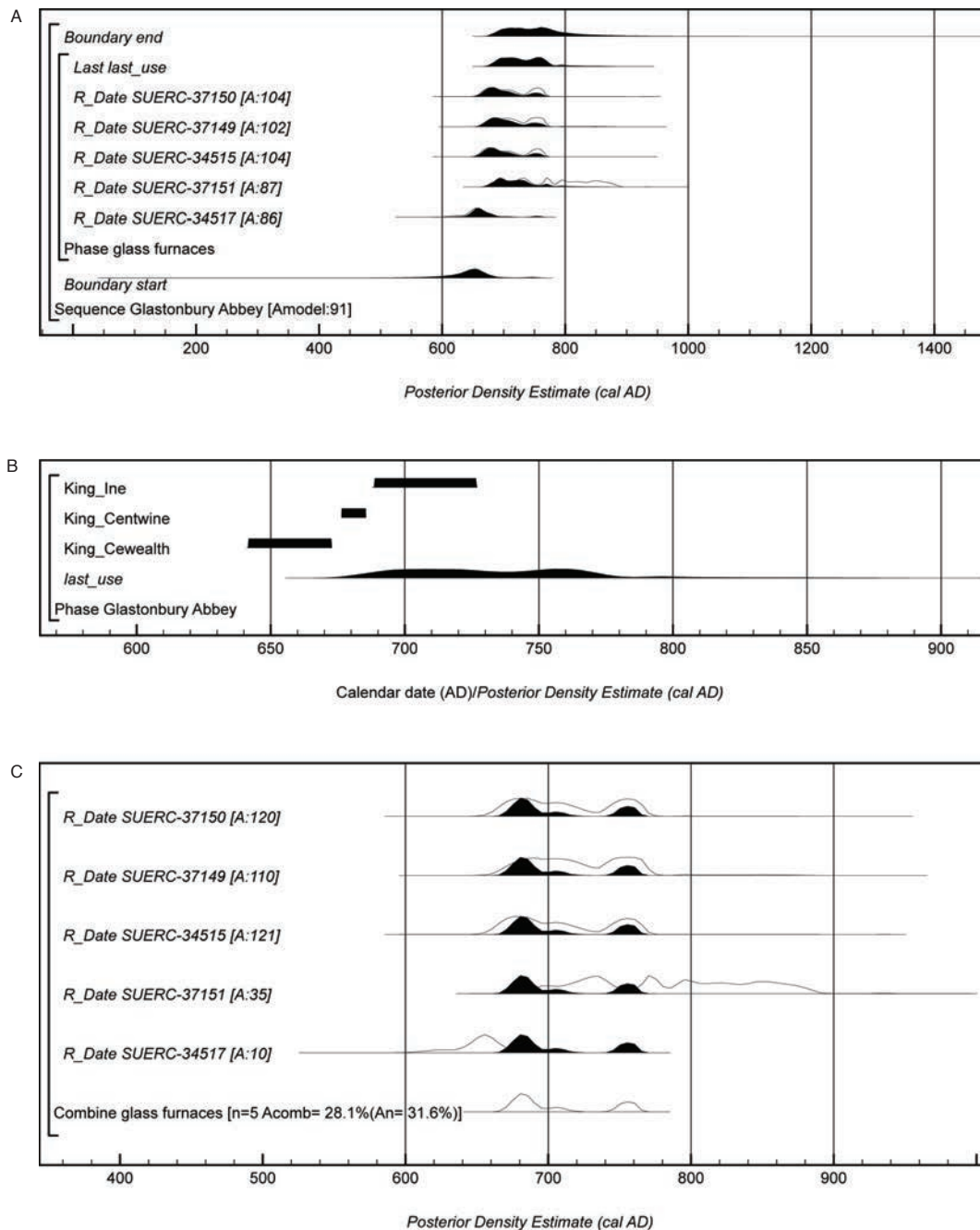
## The radiocarbon results for the glass furnaces

### *Peter Marshall*

Five charcoal samples were dated at the Scottish Universities Environmental Research Centre (SUERC).<sup>23</sup> The results (Table 2) are conventional radiocarbon ages and are quoted in accordance with the Trondheim convention.<sup>24</sup> The calibrations of these results relate the radiocarbon measurements directly to the calendrical time scale and are given in Table 2 and in outline in figure 5.20. All have been calculated using the datasets published by Reimer *et al* (2013) and the computer program OxCal v4.2.<sup>25</sup> The ranges in Table 2 have been



**Fig 5.19** Trenches 64 and 65, looking south (1957 photograph: © EHA)



**Fig 5.20** (A) Probability distributions of dates from glass-working activity at Glastonbury Abbey: each distribution represents the relative probability that an event occurs at a particular time. For each of the radiocarbon dates two distributions have been plotted: one in outline, which is the result of simple calibration, and a solid one, which is based on the chronological model used; (B) Summary of the main historical and archaeological dates relating to Glastonbury Abbey. The last-use distribution derived from the model shown in (A) provides the best estimate for glass-working at Glastonbury Abbey; (C) Combination of radiocarbon dates from Glastonbury Abbey using the OxCal Combine function (diagrams: P Marshall)

calculated according to the maximum intercept method; the probability distributions shown in figure 5.20 are derived from the probability method.<sup>26</sup>

Methodological approach and results

A Bayesian approach has been adopted for the interpretation of the chronology of the glass furnaces.<sup>27</sup> The simple calibrated dates are accurate estimates of the

dates of the samples; the Bayesian approach estimates the dates of the archaeological events represented by those samples. In the case of glass production at Glastonbury Abbey, it is the chronology of the furnaces that is under consideration, not the dates of the samples themselves. The dates of this activity can be estimated by using the absolute dating information from the radiocarbon dates combined with archaeological information about the

**Table 2** Analysis of radiocarbon results

Laboratory no.	Sample no.	Year	Glass furnace	Bulk find	Harden no.	GLSGA no.	Material (charcoal)	$\delta^{13}\text{C}$ (‰)	Calibrated date range (95% confidence) – cal AD	Posterior Density Estimate (95% probability) – cal AD
SUERC-37151	1	1955	1	BF2024	27	2008/20/1	Maloideae	-25.0*	680–890	665–810
SUERC-34515	2	1955	1	BF2034	37	2008/3/28/2	<i>Corylus avellana</i>	-24.8	650–770	655–725 (80%) or 740–770 (15%)
SUERC-34517	3	1955	1	BF2055	9	2008/3/34/1	<i>Salix/Populus</i>	-26.0	610–680	625–710 (91%) or 745–765 (4%)
SUERC-37150	4	1956	1/2	BF3001	Unknown	1998/3/170	Maloideae roundwood	-25.9	650–770	660–770
SUERC-37149	5	1956	1/2	BF3137	Unknown	1998/3/116	<i>Prunus</i> sp. roundwood	-26.8	660–780	665–770

\*assumed value

relationships between the samples.

The technique used to combine these different types of information explicitly is a form of Markov Chain Monte Carlo sampling and has been applied using the program OxCal v4.2.<sup>28</sup> It should be emphasised that the posterior density estimates produced by this modelling are not absolute. They are interpretative estimates, which can and will change as further data become available and as other researchers choose to model the existing data from different perspectives. The algorithm used in the model described below can be derived from the structures shown in figure 5.20.

The first stage in sample selection was to identify short-lived material, which was demonstrably not residual in the context from which it was recovered. The taphonomic relationship between a sample and its context is the most hazardous link in this process, since the mechanisms by which a sample came to be in its context are a matter of interpretative decision rather than certain knowledge. All samples consisted of short-lived single entities that are interpreted as deriving from kindling for the furnaces. The five samples all derive from the glass furnaces that were excavated in 1955–7. The furnaces were heavily truncated and poorly recorded, although reassessment of the stratigraphy has allowed a potential sequence to be suggested (see Chapter 7).

In summary, SUERC-34515 and SUERC-37151 derive from the demolition layer of ash and clay above Furnace 1 and are securely stratified; SUERC-34517 is from the floor and filling of Furnace 1 and is securely stratified; SUERC-37150 is from the floor of a furnace – it is not absolutely clear from the notes whether this was from Furnace 1 or 2; SUERC-37149 is from a layer within and under a furnace – again, it is not absolutely clear from the

notes whether this was from Furnace 1 or 2.

The five radiocarbon determinations are statistically consistent at 99% confidence ( $T' = 12.0$  v = 4;  $T'(1\%) = 13.3$ ),<sup>29</sup> and could therefore all be of the same actual age. It is likely that the furnaces were used for a relatively short period of time as part of the construction of the first stone buildings on the site, with experimental archaeology showing that this type of melting furnace reaches high temperatures and is likely to collapse after three weeks of constant use (see Chapter 7). Given the evidence for an extremely short phase of industrial activity and the relatively poorly understood stratigraphic relationship between the samples, the chronology is conservative in that it simply assumes the samples all derive from a discrete period of glass-working. The model does not assume that any stratigraphic relationship between the samples exists.

The model shown in figure 5.20 is based on the assumption that the glass furnaces were in use for a continuous period of time.<sup>30</sup> The model shows good agreement ( $A_{\text{model}} = 91$ ) between the radiocarbon dates and prior information (in this case the hypothesis that the charcoal samples from the furnaces come from a single phase of activity). The model provides an estimate for the last use of the furnaces of cal AD 670–810 (95% probability; last use) and probably cal AD 690–770 (68% probability). Further analysis (fig 5.20) shows there is a 47% probability that the last dated glass-making activity took place during the reign of the West Saxon king Ine (AD 688–726).

## Discussion

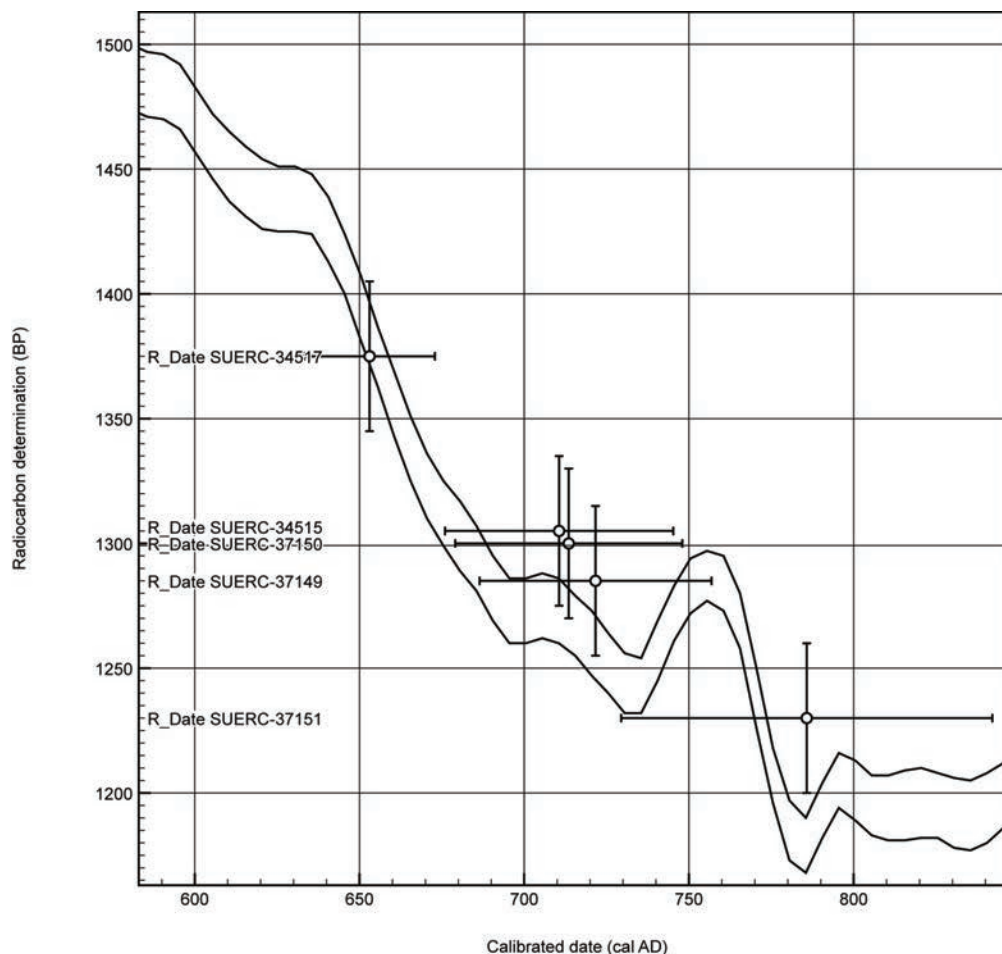
The five radiocarbon results pass a chi-square test supporting the proposal that the glass-making was a

short-lived 'single-event'. Analysis was therefore undertaken to see if the radiocarbon dates could be combined to produce a more precise estimate for the date of this activity. Figure 5.20 shows the results of analysis that combines the radiocarbon dates following calibration. These results, however, show that the radiocarbon dates are not in agreement, although they fall only just below the acceptable threshold, with all the samples being of the same date ( $A_{\text{comb}}=28.1$  ( $A_n=31.6$ );  $n=5$ ). This is likely to be due to the problematic shape of the radiocarbon calibration curve in the late seventh to early eighth centuries (fig 5.21), reflected by the bimodality in figure 5.20 and the possibility of some very small age-at-death offset between the charcoal samples and the use of the furnaces.

Although not conclusive, analysis of the radiocarbon dates suggests that the glass-making furnaces at Glastonbury were contemporary with the construction of the first stone church in the late seventh century. They were in operation during the time of King Ine (AD 688–726), who is credited with a major role in founding or refounding the monastery (see Chapter 3).

## Burials

Burials were discovered near the centre of the medieval cloister that were thought to pre-date Dunstan's enclosure of the cemetery. The human remains comprised a disturbed skull within the construction trench of a supposed twelfth-century foundation [C:3211] (fig 5.16). Approximately 9m to the north-north-east, in Trench 24, another early burial [F:SK13] was discovered, of which only two articulated legs were drawn (fig 5.11), overlain by a foundation [C:2031] (fig 5.4). A sketch plan shows one of the foundation stones labelled as 'Dunstan's stone' overlying the feet of the skeleton, although the basis for this attribution is not given. Another possible grave [C:1213] was recorded in Trench 14 beneath a mortar mixing floor [C:1209] (fig 5.2) with a *terminus post quem* of 1250, but there are no further details. A pre-tenth-century date may be suggested on the basis that the burials are located to the east of the supposed eastern boundary of the Late Saxon cemetery [C:2041] [C:2042] (see below). The burials are unlikely to be contemporary with the nearby glass



**Fig 5.21** Radiocarbon results from Glastonbury Abbey plotted on the IntCal13 calibration curve (Reimer *et al* 2013) (diagram: P Marshall)



furnaces: it was customary to separate industrial and mortuary zones in Anglo-Saxon monasteries.

## Late Saxon (Phase 4)

### Glass furnace debris

There were several layers or deposits associated with the demolition of Furnace 1 from which most of the glass-working finds were recovered; the original excavation records referred to these layers as tile / ash / clay. In section these are shown as three thin layers directly overlying the furnace floor and sloping gently down from east to west (fig 5.8). The lowest layer [C:2021] of tile and stone is described by some of the finds context labels as a burnt layer. This contained abundant material from the glass furnaces plus some faunal remains (domestic goose, duck, domestic fowl, ?domestic fowl / pheasant) and some Roman tile. This was overlain by a dirty clay layer [C:2020] containing Roman tile and glass furnace material. The uppermost layer, consisting of tile, ash and dark clay [C:2019], contained pottery dating after *c* 950 and a large quantity of redeposited glass furnace material. Immediately west of Furnace 1 was a dirty clay and stone layer [C:2022] with twenty pottery sherds dating after *c* 950 overlying the entrance stone or outer kerb [C:2053]. The finds within this deposit were mostly found just outside the furnace or in the furnace mouth and comprised fragments of the glass furnace structure and items related to glass-working.

The foundation trench [C:3150] for a supposed Late Saxon structure [C:3149] cut through a deep deposit of soil, debris and contaminated clay [C:3142] with tip lines sloping downwards from east to west (fig 5.10). With a *terminus post quem* of 950 provided by pottery, this was situated on the southern edge and to the east of Furnaces 1 and 2 and contained five fragments of associated glass. Both deposits containing the redeposited furnace material [C:2022] and [C:3142] probably represent disturbance of the furnaces and consolidation prior to construction of the possible Late Saxon building (see below).

### Structures

The glass furnaces in Area A (fig 5.7) were truncated by a building attributed to the time of Dunstan, which was removed before the twelfth-century garden was laid out.<sup>31</sup> Evidence for this building comprised a narrow robber trench [C:2014] (fig 5.8) in Trench 24, with a few mortared stones [C:3120] [C:3149] and one large lias slab surviving to the south in Trench 35 (figs 5.9 and 5.10). This evidence indicates a wall aligned approximately

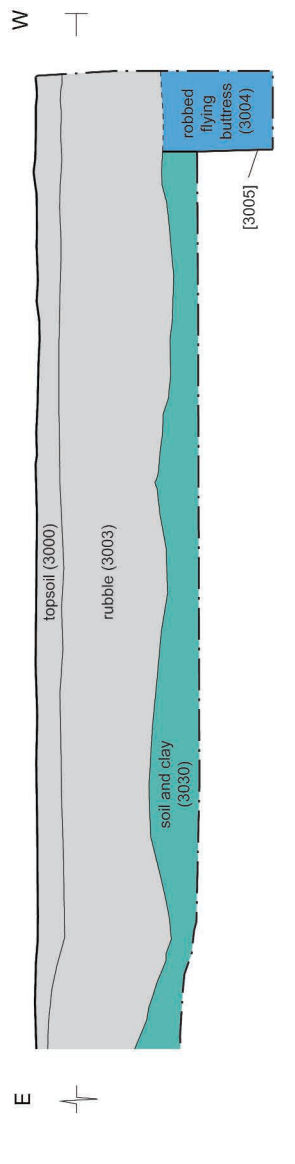
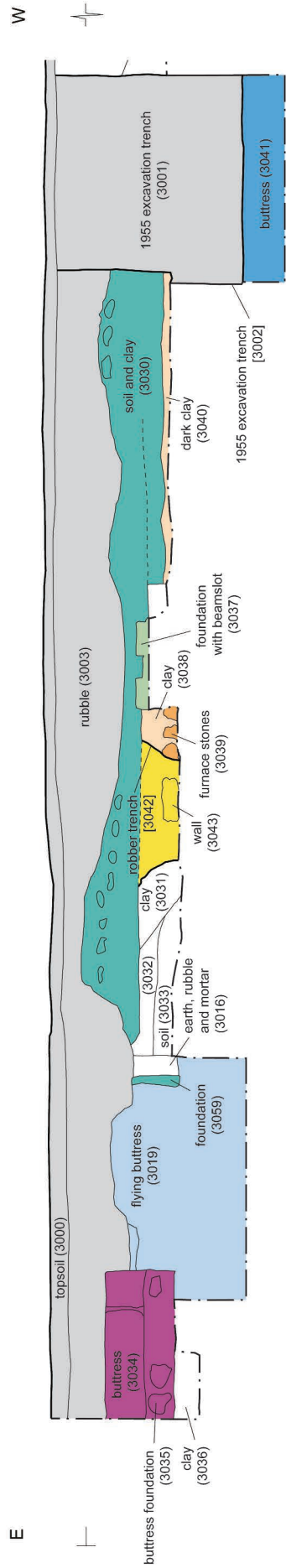
north–south, with the wall trench [C:3150] and robber trench [C:2014] cutting through the clay subsoil [C:2015]. Several sherds of pottery from this subsoil [C:2015] date from 950, which therefore also provide the earliest possible construction date for the wall.

The intermittent remains of foundations [C:2104] were observed in Trench 24 running westwards from the wall described above for a distance of *c* 9m (fig 5.7), possibly representing a north wall for the same structure; this appears to have been broadly captured on the GPR survey at a depth of 0.5–1.0m. At the western end of this foundation, there appears to be evidence for a wall running south represented by three thin lias slabs [C:2028] along the base of the section in Trench 24 (fig 5.8); Radford stated that this was similar to the other foundations associated with this structure. It was also approximately aligned with a substantial foundation [C:3118] to the south in Trench 35, sealed beneath the twelfth-century garden soil [C:3116] (figs 5.7, 5.10, 5.11, 5.12 and 5.13). A construction cut [C:4121] for this wall [C:3118] was backfilled with clay [C:4120] (fig 5.15) and produced a single pottery sherd dated to after 950. This appeared to cut through a layer of redeposited clay [C:3119], also with a *terminus post quem* of 950, consistent with the post-950 date suggested for the postulated structure.

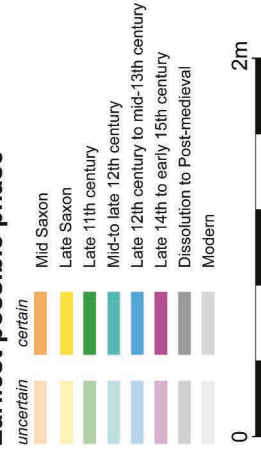
In Trench 57, a robber trench [C:4104] [C:4105] was recorded *c* 1.49m east of the foundation [C:3118], aligned with an *in situ* wall [C:4122] in Trench 59 (figs 5.13 and 5.15). The robber trench cut the post-950 clay [C:4110], sealing Furnace 3 and a clay deposit [C:4109] covering the foundation [C:3118]. The fill [C:4104] had a *terminus post quem* of 950, although the robber trench is shown cutting through the twelfth-century cloister soil [C:3116]. Nevertheless, the wall shares the same slightly oblique angle as the other Late Saxon foundations and robber trenches (fig 5.7) and is therefore unlikely to relate to the twelfth-century phase. The fabric of what appears to be blue lias set in a clay matrix is similar to the foundation [C:3118] to the west, although it is considerably narrower (measuring only *c* 0.31m wide). It is also stratigraphically and physically later, indicating the presence of two Late Saxon building phases.

Remnants of a further wall [C:3043] constructed of lias rubble was recorded in Trench 38, *c* 0.78m east of the postulated Late Saxon building (fig 5.22). This wall was predominantly robbed [C:3042], but is thought to have cut through the edge of a stone setting [C:3039] originally identified as a glass furnace (see above). This was sealed beneath the supposed twelfth-century make-up layer [C:3030] and may indicate the presence of another Late

**Section 50: Trench 38**



**Earliest possible phase**



**Fig 5.22** Section of Trench 38 (scale 1:40)

Saxon building or wall. Indeed, the rubble wall [C:3043] was aligned with a north–south aligned wall [C:3052] measuring 0.59m wide and located 4.13m to the north in Trench 45. The same wall was recorded as a robber trench [C:4003] [C:4004] in Trench 62 (fig 5.23), possibly containing a minute fragment of turquoise glass from the nearby glass-working. The robber trench [C:4004] cut through a clay layer [C:4007] thought to represent the Saxon level. A further wall [C:3053] in Trench 45 located 0.9m to the east was too close to be related; however, both were cut through by the deep foundation [C:3054] of the supposed twelfth-century nave south aisle (see below).

A beam-slot foundation was located 0.45m to the west in Trench 38 [C:3037], apparently cut by a thirteenth-century buttress foundation [C:3018] (figs 5.7 and 5.22). Originally the beam-slot was linked to Turstin's cloister but there is no evidence to support this phasing; however, the stratigraphic position beneath the supposed twelfth-

century cloister make-up [C:3030] suggests a pre-twelfth-century date. Finally, towards the western side of the cloister garth in Trench 24 an area of paving slabs [C:2049] was sealed beneath a supposed twelfth-century debris layer [C:2048], suggesting an earlier date for the paving (figs 5.2).

A wall aligned approximately north–south was traced intermittently for over 60m along the western side of the cloister garth almost as far as the monks' kitchen, with two cross-walls to the north of the later refectory (fig 5.1).<sup>32</sup> This was interpreted by Radford as the eastern range of a Late Saxon cloister (see Chapters 10 and 11). Only one of the cross-walls [C:901] was recorded in plan in Trench 4, with broad offsets on both the north and south sides; this corresponds with the masonry interpreted by Bond as the foundation for a *lavatorium*.<sup>33</sup> According to a published sketch plan, the other cross-wall was located on the northern side of the southern buttress

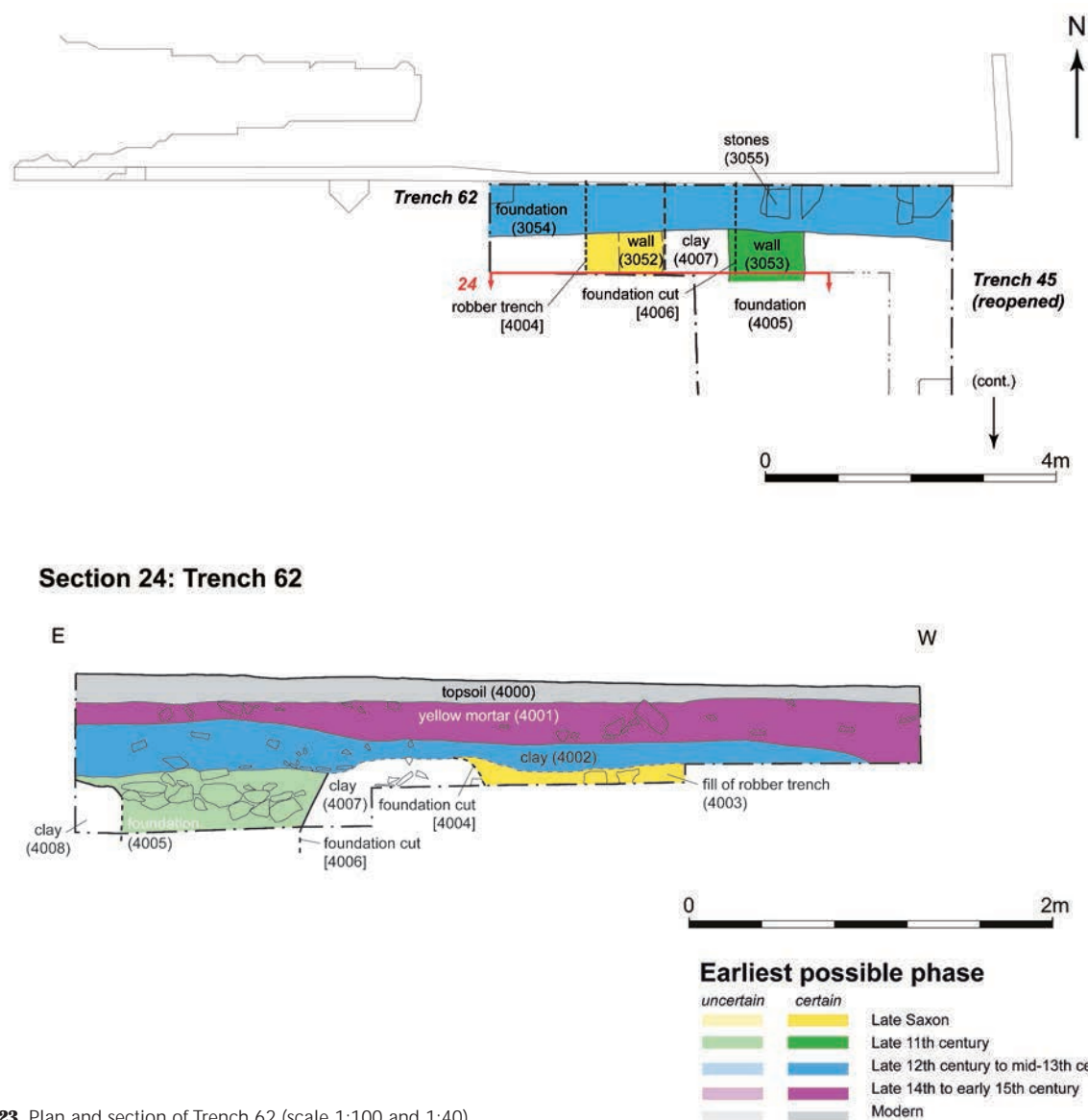


Fig 5.23 Plan and section of Trench 62 (scale 1:100 and 1:40)

of the west cloister walk.<sup>34</sup> This was not recorded by Radford, although it is represented on his published sketch plan and approximately corresponds to an 'early wall' found by Bond (see Appendices). A continuation of this wall may be indicated by a well-defined possible wall depicted on the GPR survey at a depth of 0.5–1.0m and clearly shown on the resistance survey, although the feature could also relate to the drains recorded to the south and east (see fig 2.12). The east wall [C:900] was located in the south-west angle of the later cloister garden, as indicated by the slight eastern offset (fig 5.24).

The walls of the purported Saxon range were recorded as being constructed of Tor burrs set in a hard dark cream mortar, although the published accounts note that a yellow mortar was used for the Saxon work.<sup>35</sup> The excavation notes state that the east wall of the hypothesised east range was cut by a late eleventh- or twelfth-century drain [C:904] in Trench 4 (fig 5.24); this is unclear from the plan but may relate to the mid-twelfth-century drain beneath the west cloister walk. Indeed, the caption for the published version of the photograph in figure 5.24 states the wall is tenth-century with twelfth-century bedding piled against it.<sup>36</sup> The notes correspond, stating that a deposit of coarse plaster [C:903] was located on the east side of the east wall [C:900], resting on the edge of the

drain cover stones (fig 5.24). These various strands are difficult to decipher, but we may conclude that the walling was earlier than the mid-twelfth-century drain and subsequent plaster deposits and was probably unrelated to the mid-twelfth-century plan.

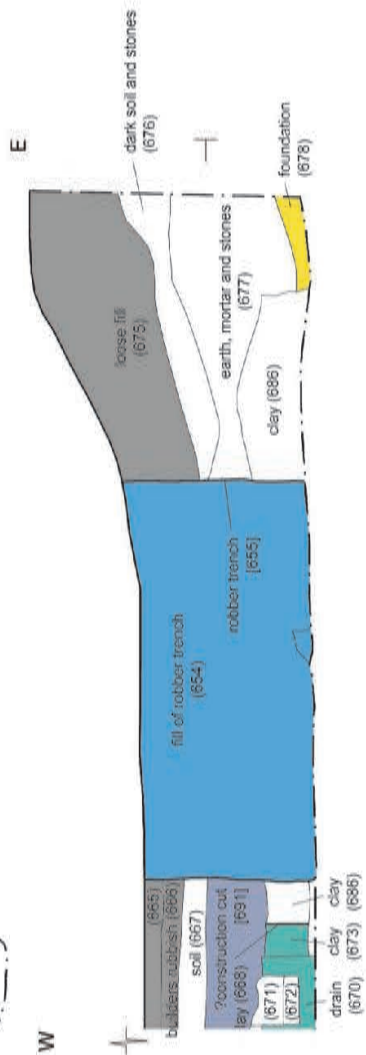
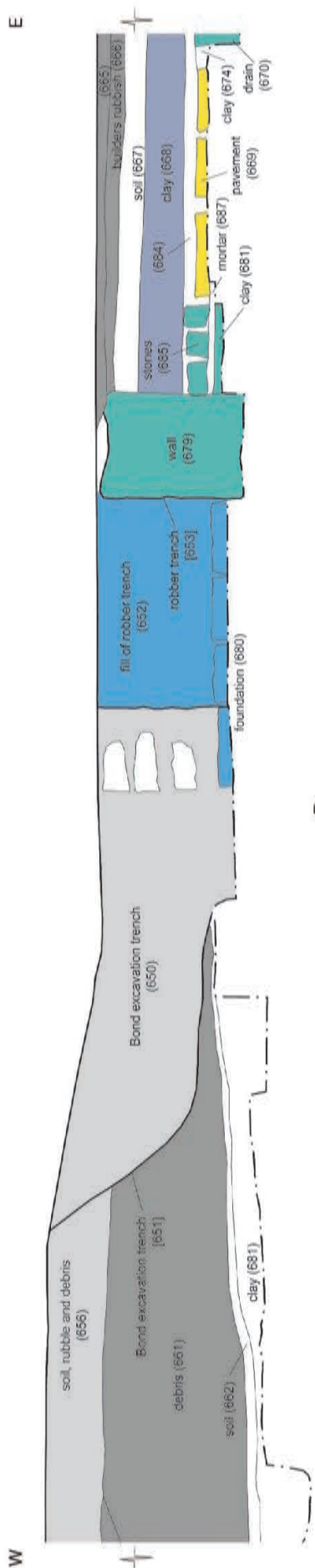
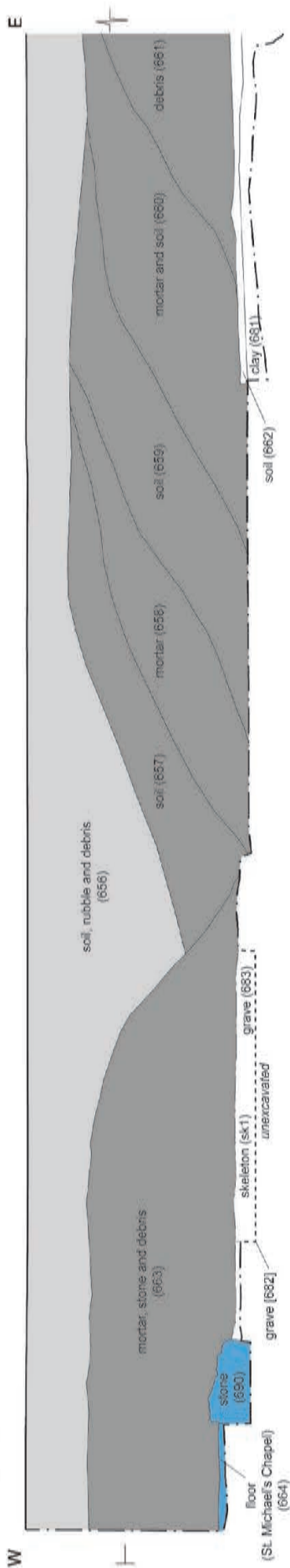
Further north, several mortar and make-up layers recorded in Trench 15 were originally associated with the Late Saxon structure and thought to represent floor horizons. These comprised three deposits of mortar ([C:1413], a pink mortar layer [C:1414] and a yellow mortar layer [C:1415]). Pottery dated 950–1100 was recovered from the underlying clay [C:1417], while pottery dated 1100–1250 was found in the overlying layer [C:1407]. However, the section drawing makes no sense stratigraphically and the dating is therefore unreliable.<sup>37</sup>

It is possible that the east wall [C:900] recorded in Trench 4 continued northwards, represented by approximately aligned robber trenches with some *in situ* stones or foundations. A robber trench [C:1211] was recorded in Trench 14 with several possible stones [C:1212] at a depth of c 1.5m (fig 5.2). The latter were approximately aligned with a foundation [C:678] in Trench 9 at a depth of c 1.3m (fig 5.25). The depth of both these features indicates a pre-twelfth-century date, although the latter was described as having grey mortar



**Fig 5.24** ?Saxon wall with plaster deposit in Trench 4, looking west (1951 photograph: © EHA)

Section 35: Trench 9



Earliest possible phase

- uncertain: certain
- Late Saxon
- Mid-to late 12th century
- Late 12th century to mid-13th century
- Dissolution to Post-medieval
- Modern



Fig 5.25 Section of Trench 9 (scale 1:40)

as opposed to the yellow mortar which Radford normally attributed to remains of Saxon date. Immediately to the north in Trench 15 was a probable robbed foundation [C:1410], with two large stones [C:1424] remaining in the base at a depth of 1.38m. The GPR survey shows ill-defined features that are probably walls at a depth of 1.0–1.5m (see fig 2.13); unfortunately, the responses do not provide any clue to the relationship between the pre-twelfth-century structural remains described above and the possible east cemetery wall [C:2042] to the north.

A robber trench [C:2041] [C:2042] with some *in situ* masonry [C:2055] was recorded in the north-west corner of the cloister garth in Trench 24 (figs 5.2 and 5.6). This cut through a layer [C:2043] [C:2048] dated by pottery to 1130, indicating the wall was extant until this date. This was identified as the east wall of Dunstan's cemetery, and a Saxon date seems likely on the basis that the wall shares the same slightly skewed alignment as the Saxon church.

The east cemetery wall is clearly shown on the resistance survey along most of the western side of the medieval cloister garth, disappearing just before the second cloister buttress from the south (see fig 2.17).

An excavation photograph of the west cloister walk appears to show a continuation of the Norman drain [C:569] cutting through earlier paving, located at a slightly lower level than the top of the drain (fig 5.26). The caption for the published version of figure 5.26 identifies this as tenth-century paving below mid-twelfth-century mortar bedding.<sup>38</sup> Additional paving [C:586] is shown further west, below the alleged mid-twelfth-century bedding horizon [C:565] (figs 5.2, 5.3, 5.5 and 5.26). The assumption appears to have been that the paving related to the Late Saxon structures (thought by Radford to be an east range). However, the western area of paving in Trench 6 is certainly within the Late Saxon monks' cemetery and may be a cemetery feature.



**Fig 5.26** ?Saxon paving above post-pit with drain in Trench 6, looking west (1952 photograph: © EHA)

A further cemetery feature may be indicated by a disturbance [C:2059] [C:2060] on the western side of the robber trench [C:2042] for Dunstan's east cemetery wall in Trench 34 (fig 5.2). Although badly disturbed, it was interpreted as a square structure exceeding 1.82m in each direction and surrounded by paving, although any slabs had been displaced by the twelfth-century mortar bedding [C:2086]. This was identified as a robbed, pre-Dunstan cross-base on the basis that it was 'set on the natural clay' and therefore pre-dated Dunstan's raising of the ground level of the cemetery. Although the fill of the foundation trench is linked to pottery from the Iron Age and two sherds dated 450–550, it also contained pottery dated 950–1350. The location on the western side of Dunstan's east cemetery wall suggests it was contemporary and was removed prior to the construction of the mid-twelfth-century cloister, if not before.

### Late eleventh century (Phase 6)

Beneath the eastern end of the north cloister walk was a wall [C:3053] measuring 1.02m wide and aligned north–south. This was visible in the base of Trench 45 (fig 5.27) and was recorded as a partially robbed foundation [C:4005] when the trench was reopened

(Trench 62) in the following year (fig 5.23). The wall comprised small to medium-sized stones within a construction cut [C:4006] measuring 1.38m wide, and this was cut by the supposed foundation [C:3054] of the twelfth-century nave south aisle; on this basis, it was linked to Abbot Turstin. The wall was located *c.* 1.9m west of the west wall that Radford linked to Turstin's south transept and within the footprint of the north-east corner of the twelfth-century cloister walk.<sup>39</sup> It is possible that this small segment represents a step leading up to the east cloister walk, which was at a higher level than the south and west cloister walks (and possibly the north cloister walk; see below). Further evidence is required to confirm this, particularly as the dating of the supposed twelfth-century foundation is in doubt (see below). Bond's 1909 excavation plan (unpublished) shows a wall aligned with the inner wall of the east cloister walk, with what appears to be earlier masonry on the western side. This corresponds approximately with the conjectured west wall of Turstin's south transept, as shown on Radford's eleventh-century plan; in the absence of any evidence in his own trenches, Bond's evidence may have formed the basis of the siting.<sup>40</sup>

A thin band of mortar droppings (no context) from which extremely decayed fragments of window glass



**Fig 5.27** Foundation, paving and ?wall in Trench 45, looking north-east-east (1956 photograph: © EHA)

(G69) (G72) were recovered, appears to have sealed the robber trench [C:4004] for the possible Saxon wall (see above). This may relate to late eleventh- or twelfth-century building work.

### Early twelfth century and mid- to late twelfth century (Phases 7 and 8)

Fragments of blue lias sculpture recovered during the excavations pinpoint the likely date of the cloister's construction to the mid-twelfth century and probably not before 1147 (see Chapter 9 and Plan 3).

### Cloister walks

Along the northern side of the cloister garden in Trench 38 was evidence for three twelfth-century buttresses located between the later buttresses (figs 5.7 and 5.28). At the western end of the trench was a layer of earth and clay [C:3012], cut to the west by the robber trench [C:3005] for a later flying buttress (see below). The next buttress foundation [C:3044] to the east appears to have been encased in a later wall [C:3029] (see below). The eastern buttress was thought to have been represented by a further robber trench [C:3015] backfilled with mixed clay and blue lias spalls [C:3014]. This robber trench cut through a dark clay layer [C:3017] with a possible *terminus post quem* of 950, yet the section shows this covering a later buttress [C:3118] located 1.8m to the east. As the dark clay layer [C:3017] cannot be simultaneously earlier *and* later than the buttresses, this must reflect a mistake in the recording of the section. The dark clay layer [C:3017] was also recorded [C:3030] in the south section of the same trench (fig 5.22): the upper part contained Doulling spalls which are elsewhere associated with the use of the cloister as a masons' yard during the thirteenth century.

Evidence of the inside wall of the twelfth-century east cloister walk was consistently recorded against the western side of the later cloister walk. The surface of a Tor burr foundation [C:2025] was revealed 2.38m west of the later cloister walk (figs 5.7 and 5.8), aligned with a heavily robbed foundation to the south [C:3122] (figs 5.7, 5.9 and 5.10). Imaged on the resistance survey and the GPR survey at a depth of 0.5–1.0m (see figs 2.17 and 2.19), the foundation continued southwards and possibly northwards [C:3059] (figs 5.22 and 5.28) beneath the later medieval north cloister wall, where it was described as having a rubble core faced with large blocks of blue lias (fig 5.29).

In the west cloister it was impossible to distinguish

the robbed twelfth-century walls from the later post-Dissolution robber trenches; however, some possible twelfth-century masonry was identified. A substantial section of walling [C:679] just below the modern ground surface (figs 5.2 and 5.25) was located immediately east of the robber trench [C:653] for the later cloister west wall. A further wall [C:688] aligned north–south is shown to the east with a possible east–west aligned wall [C:2083] between the two walls [C:679] and [C:688] (fig 5.2). Beneath the thirteenth-century inner cloister wall, an earlier buttress foundation [C:2061] was recorded between the later buttresses in Trench 34 (fig 5.2). This is perhaps confirmed by the GPR survey which shows a well-defined possible wall at a depth of 0.5–1.0m (see fig 2.19). This suggests a different bay arrangement to the later cloister.

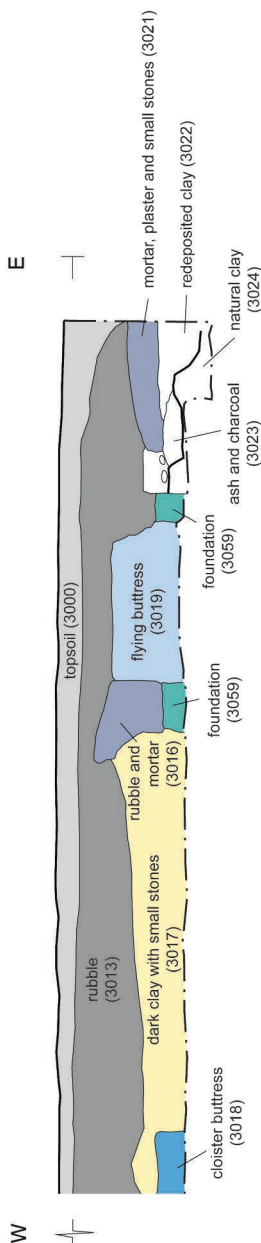
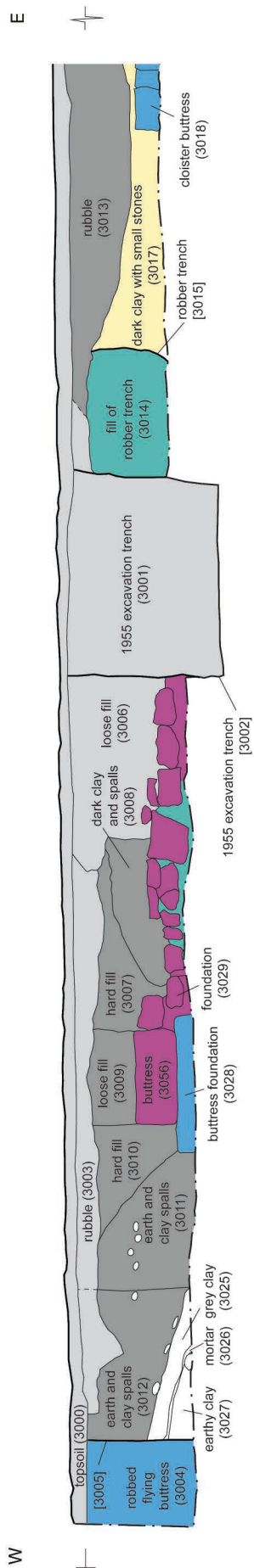
A large drain [C:569] [C:670] [C:2062] ran north–south along the eastern side of the west cloister walk (figs 5.2, 5.3, 5.4, 5.25, 5.30 and 5.31), located 0.91m below the thirteenth-century mortar bedding and cutting through earlier deposits and features. This was attributed to the mid-twelfth-century cloister: the top of the stone-lined drain was at the same level as the mortar bedding [C:2086] for the mid-twelfth-century paving [C:2085] [C:2069], which would have covered the drain (figs 5.30 and 5.31).<sup>41</sup> Finds recovered from the silt within the drain demonstrate that it remained open until at least 1250. The drain is positioned *c* 0.5m further east than the drain recorded by Bond;<sup>42</sup> this may reflect either a slight inaccuracy in the planning or a small dog-leg in the drain.

The paving [C:2085] of the mid-twelfth-century west cloister walk had been predominantly robbed. The mortar bedding beneath [C:565] [C:689] [C:2086] is described as covering the entire west cloister walk; with a *terminus post quem* of 1100, this is consistent with a mid-twelfth-century date.

Four large post-pits were sealed beneath the intact mid-twelfth-century mortar bedding [C:2065] [C:2066], [C:2074] [C:2075], [C:2077] [C:2078] and [C:2081] [C:2082] (figs 5.2 and 5.4). These were aligned north–south just inside the outer wall of the twelfth-century west cloister walk, as indicated by the position of the west wall [C:679]. The upper fill of one hole contained a coin of Edward the Confessor.<sup>43</sup> Three of the post-pits (which were also called 'bone-pits' due to the large quantity of animal bone they contained) yielded datable finds: Iron Age pottery, one sherd of post-Roman imported pottery (LRA1) dated to 450–550, pottery dated 950–1100 [C:2082], pottery dated 1100–1250 [C:2065] and plaster and tile. A fragment of a blue lias capital was



**Section 23: Trench 38**



**Fig 5.28** Section of Trench 38 (scale 1:40)



**Fig 5.29** North-east corner of cloister in Trenches 38 and 40, looking north (1956 photograph: © EHA)



**Fig 5.30** Drain, post-pits, mortar bedding and paving in Trench 13, looking south-south-east (1954 photograph: © EHA)



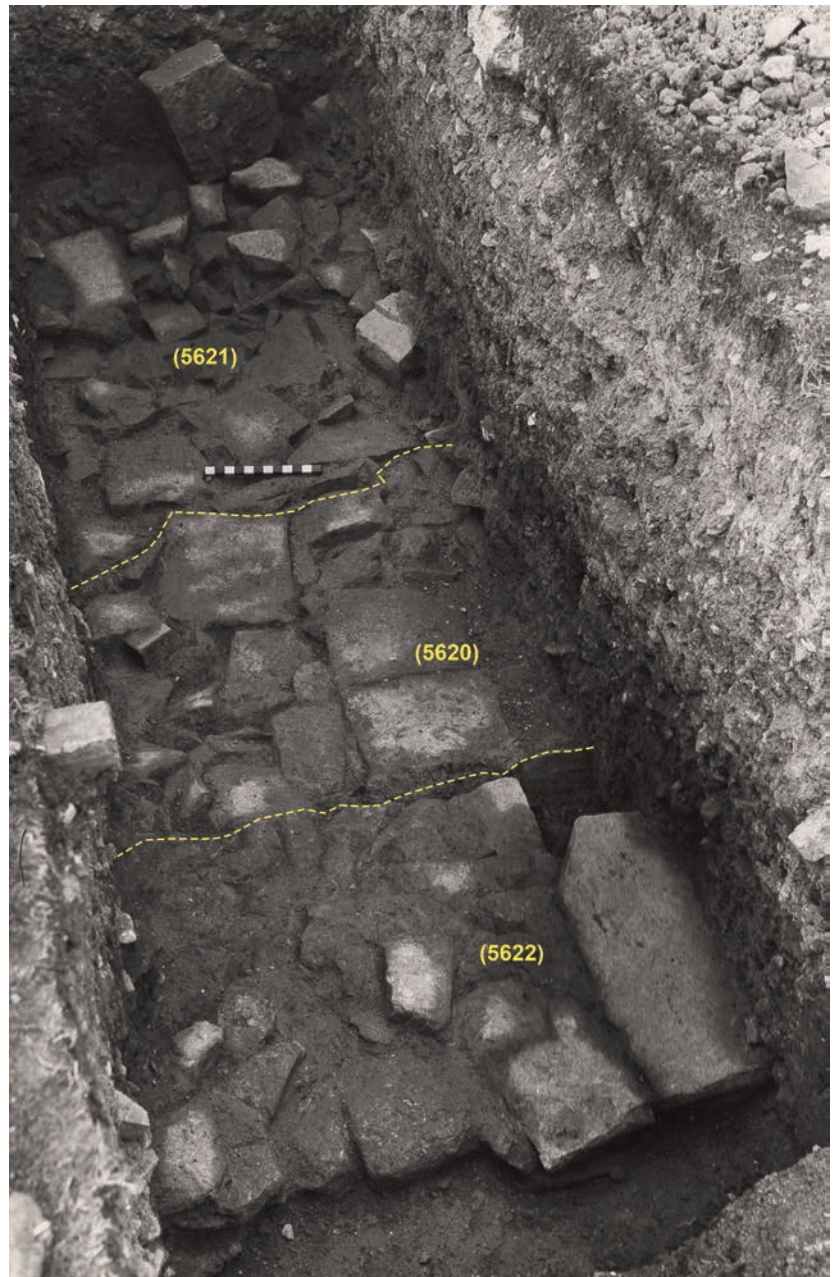
**Fig 5.31** Drain and paving above mortar bed in Trench 13, looking south west (1954 photograph: © EHA)

also recovered from one of the pits [C:2077]; although too small to be securely dated, the context indicates it may have been a discarded fragment from the construction of the mid-twelfth-century cloister. The dimensions, nature and alignment of the post-pits indicate they are part of the same series and on the basis of the finds evidence date to *c* 1140. Radford proposed that they were scaffold-pits for the construction of the mid-twelfth-century cloister of Henry de Blois, and the dating supports this theory.

It is important to address briefly the confusion in the archaeological record between the Saxon and the Norman layers. The published record is clear that all the post-pits were sealed beneath the mid-twelfth-century mortar bedding. However, the finds from one post-pit [C:2077] were all described as being below the Saxon floor level. Contextual information for a number of finds suggests the presence of a Saxon floor. For example, pottery dated 950–1100 was from ‘under Saxon shale floor’ and pottery dated 1100–1250 was from ‘under Saxon floor’. This new dating undermines the Saxon date for these layers, which have consequently been reinterpreted as twelfth-century. Finally, the three or four (unexcavated) wooden coffins lying side-by-side in the west cloister walk were described as being sealed by solid mortar. This was interpreted as being at the same level as the Norman

bedding, suggesting they may relate to the twelfth-century phase.

Evidence for the twelfth-century north refectory wall and coterminous south cloister walk were identified within the south cloister area. A foundation excavated by Bond in 1910–11 (see Appendix 3) has now been interpreted as the north wall of the twelfth-century refectory, based on Radford’s excavations and the new geophysical survey. Labelled on the 1959 plan as a ‘twelfth-century frater wall’, a tumbled wall [C:5621] (figs 5.32 and 5.33) and robber trench [C:2152] [C:2153] (fig 5.34) may represent this wall. A further robber trench [C:2181] [C:2182] may be associated, although the difficulties should be acknowledged in securely placing Trenches 11 and 12 across the south cloister walk (both 1954). The paving [C:2151] to the south of the possible refectory robber trench [C:2152] [C:2153] was thought to have been associated with the twelfth-century refectory (see fig 5.34), the trench location implying that the later north refectory wall was constructed above. Overall, the evidence supports Radford’s suggestion that the twelfth-century north refectory wall was located along the south walk of the later cloister.<sup>44</sup> Indeed, Bond’s 1910 plan shows the full width of the later refectory walls: when this is overlain onto Radford’s excavations, the north side of the robber trench [C:2153] for the supposed twelfth-



**Fig 5.32** Walls and paving in Trench 70, looking south (1959 photograph: © EHA)

century wall is located 1.21m north of the later wall.

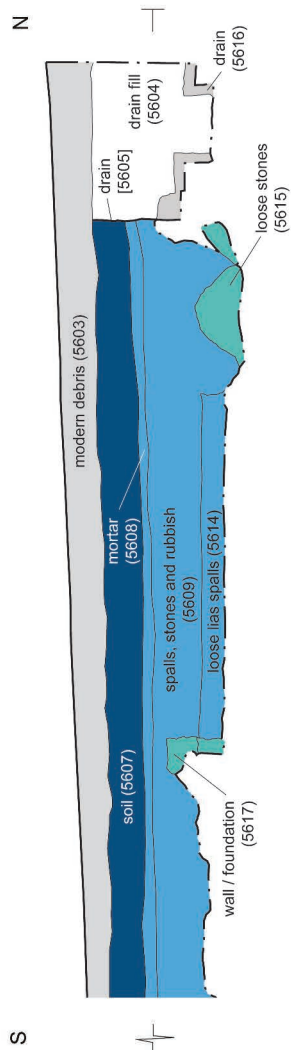
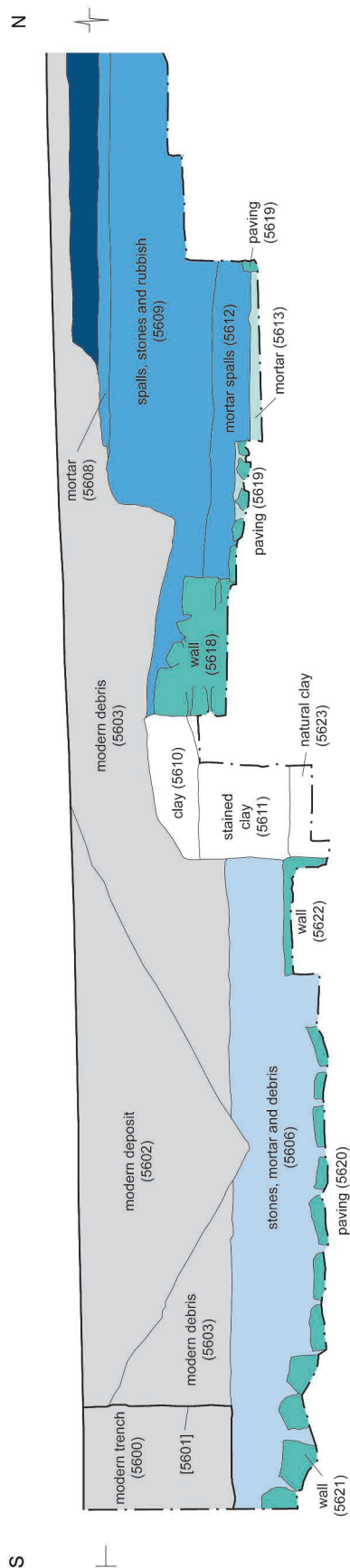
The inner wall of the twelfth-century north cloister walk is represented by a robber trench [C:2155] [C:2156] and by a wall [C:5622] (figs 5.33 and 5.34). The southern edge of the robber trench [C:2156] is not well defined in plan; however, the northern edge was cut or overlain by the later inner cloister wall.

To the north of the twelfth-century north refectory wall was an area of paving [C:5620] labelled as twelfth-century (figs 5.32, 5.33 and 5.34); the same paving was also possibly identified to the west [C:2154] (fig 5.34). Radford's yearly report states that the twelfth-century walk was 2.13m wide, which is 0.3m wider than the paving shown on the excavation plan for Trench 70 and

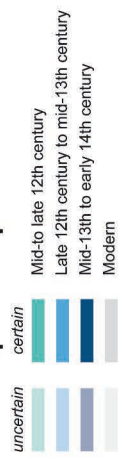
considerably wider than the paving in Trench 11.<sup>45</sup> If the paving is a remnant of the twelfth-century south cloister walk, this would mean that the possible refectory paving [C:2151] [C:2080] and the cloister paving [C:2154] were at the same level. The twelfth-century north refectory wall and south cloister paving appear to be clearly depicted on the GPR survey as a well-defined (although not continuous) wall at a depth of 0.5–1.0m and as ill-defined possible walls in the timeslices between 1.0m and 2.0m (see figs 2.20 and 2.21).

Remains of a possible *lavatorium* were found in the southern side of the cloister garth, described as an elaborate, free-standing twelfth-century octagonal *lavatorium* with a covered paved walk surrounding a

**Section 62: Trench 70**



**Earliest possible phase**



**Fig 5.33** Section of Trench 70 (scale 1:40)



Fig 5.34 Plan of Trenches 11, 12, 70 and 71 (scale 1:100)

central basin. Tentative evidence for this feature comprised remnants of a south wall [C:5618], a north wall [C:5617], a paved walk [C:5619] and mortar bed [C:5613] surrounding a central circular basin (figs 5.33 and 5.34). The paving [C:5619] appears to have been shown on the GPR survey as an ill-defined wall (and part of a broader group of responses) at a depth of 0.5–1m, and the wall and paving were broadly depicted as an ill-defined wall at a depth of 1.0–1.5m (see figs 2.19 and 2.20); these depths correspond with the section (fig 5.33). The excavation records do not support the detailed published account, particularly as the north wall [C:5617] was separated from the rest of the remains by an excavation baulk left *in situ* to protect the supposed basin. However, the stratigraphy appears to support a pre-thirteenth-century date: a mortar mixing layer post-dating the fire of 1184 [C:5608] sealed a deep rubble layer [C:5609], which in turn covered the remains along with various deposits associated with demolition, including rubble [C:5609], mortar spalls [C:5612] [C:5614] and tumbled blocks [C:5615].

Near the eastern side of the cloister garth, three scaffold-holes were recorded: two grouped together [C:5514] [C:5526] near the northern end of the trench and one slightly to the south [C:5516] (fig 5.34). The section shows two of these scaffold-holes cutting through a layer [C:5518] containing redeposited glass furnace material presumably from the disturbed furnaces in the east cloister walk.<sup>46</sup> The scaffold-holes were associated with the twelfth-century construction phase of the cloister: they were dug from the supposed twelfth-century level [C:5517] (with a *terminus post quem* of 950) and overlain by a later levelling layer [C:5512].

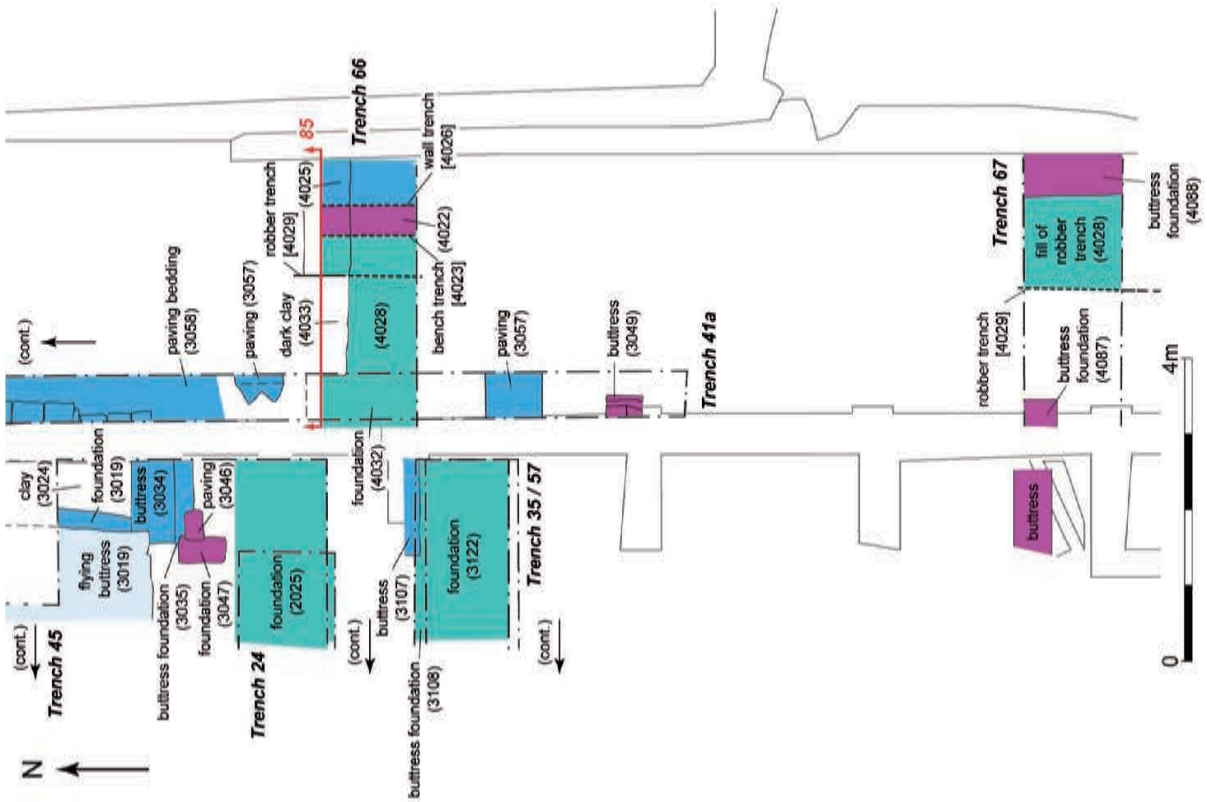
Towards the eastern end of the north cloister walk, a deep foundation was recorded running east–west close to the outer wall of the walk, within the northern half of Trench 45 [C:3054] (figs 5.23 and 5.27), although the 1957 reopening (Trench 62) shows this to have been predominantly robbed [C:4009] [C:4010]. This projected 0.67m southwards of the nave south aisle and was thought to relate to the twelfth-century church. The overlying paving slabs [C:3055] were recorded at intervals against the south side of the nave, corresponding to an area of ‘flat stones’ shown on Bond’s 1909 excavation plan (unpublished). Radford interpreted these slabs as the remnants of the twelfth-century cloister paving: the excavation notes state that they were overlain by the thirteenth-century paving with the fifteenth-century paving of the north cloister walk above. The only find was a possible Saxo-Norman bone point (M85) sealed beneath the twelfth-century paving [C:3055], which

appears to support Radford’s original phasing. However, the orientation of the twelfth-century nave south wall differed slightly from the thirteenth-century alignment, suggesting that the earlier foundation would not have extended so far south. This perhaps suggests a thirteenth-century date for these features.

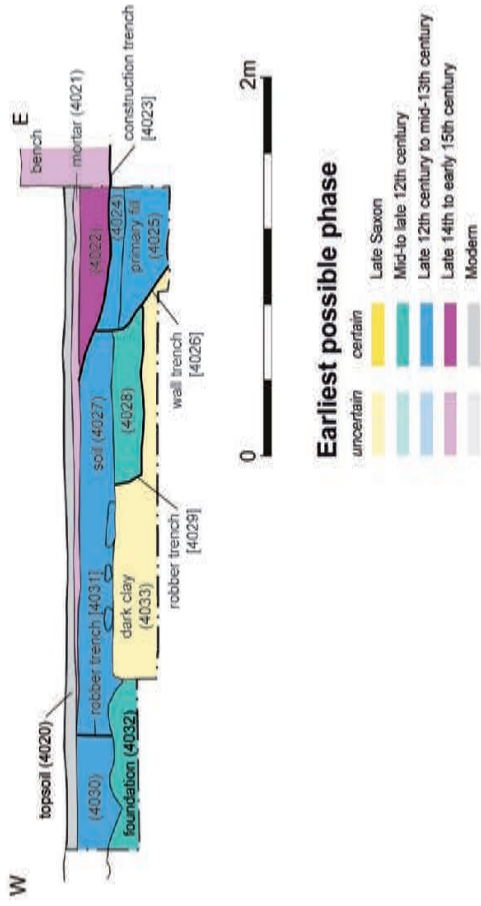
The east wall of the twelfth-century east cloister walk was recorded as a robber trench [C:4029] [C:4069] running a few degrees clockwise of north–south along the later medieval east cloister walk (figs 5.18 and 5.35). In Trench 66 this cut into a dark clay layer [C:4033], which appeared to contain one sherd of pottery dated to after 950, with the backfill [C:4028] containing a large quantity of mortar debris and spalls, including Doulling spalls from stone dressing. This indicates that the foundation was robbed and backfilled during construction work; this may relate to the proposed use of the cloister as a builders’ yard during the thirteenth century, although Doulling stone was the predominant building material used throughout the abbey’s history. According to the postulated layout of the twelfth-century church, the north-east corner of this trench [C:4029] was located within the south-west angle of Herlewin’s south transept.<sup>47</sup> Radford referred to the west wall of Herlewin’s south transept being found in the east walk of the thirteenth-century cloister;<sup>48</sup> this is probably based on Bond’s identification of facing stones slightly to the north.<sup>49</sup> At the western end of the trench and also cutting through the dark clay [C:4033] was a foundation [C:4032] of small Tor burrs set in soft yellow mortar (fig 5.35). An eastern return [C:4028] [C:4029] along the southern side of the trench is aligned with the supposed south-west corner of Herlewin’s south transept, suggesting a partition in the east cloister walk.

In Trench 64, the robber trench [C:4069] for the east wall of the east cloister walk had a primary fill [C:4068] sealed by a thin layer of broken fragments of burnt clay [C:4067] observed as being very similar to the underlying redeposited glass furnace material [C:4070] (fig 5.18). A layer of mortar spalls [C:4074] on the eastern side of the robber trench may have been associated with either the construction or the demolition of this wall. To the south this continued as a partially robbed foundation [C:760] (fig 5.17) and as a robber trench [C:5550] [C:5551] aligned with the twelfth-century west dormitory wall [C:5242] to the south (figs 5.1 and 5.36).

Two scaffold-holes [C:4082] [C:4077] (fig 5.19) may have been associated with a small post-pit [C:4079] to the south east and a further scaffold-hole [C:4085] to the south (fig 5.18). All three scaffold-holes were of similar dimensions and approximately aligned, cutting through



**Section 85: Trench 66**

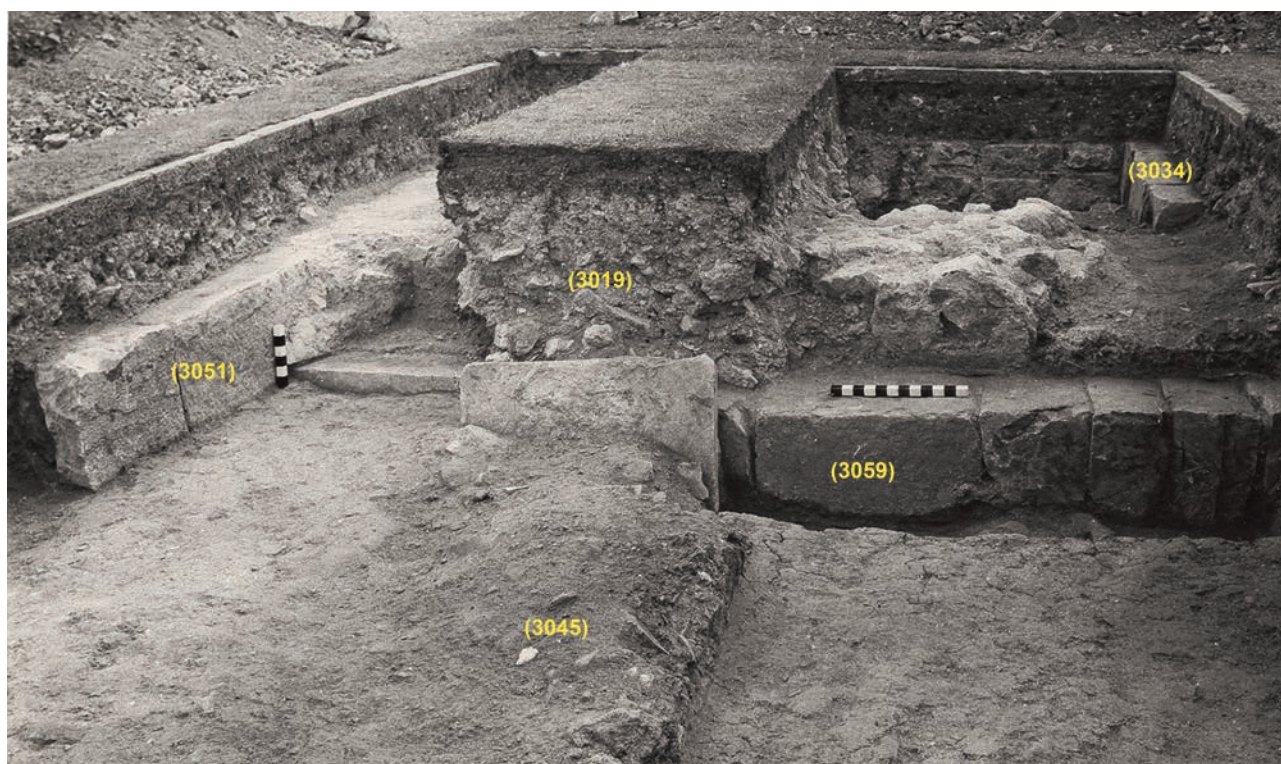


**Earliest possible phase**

uncertain	certain	
[Yellow box]	[Yellow box]	Late Saxon
[Light blue box]	[Light blue box]	Mid-to late 12th century
[Dark blue box]	[Dark blue box]	Late 12th century to mid-13th century
[Purple box]	[Purple box]	Late 14th to early 15th century
[Grey box]	[Grey box]	Modern

**Fig 5.35** Plan of Trenches 24, 35/57, 41, 45, 66 and 67 and section of Trench 66 (scale 1:100 and 1:40)





**Fig 5.36** North-east corner of cloister in Trenches 38 and 39, looking east (1956 photograph: © EHA)

the dirty clay layer [C:4057] which post-dated the furnaces and pre-dated the twelfth-century phase. Located along the line of the twelfth-century east wall, the scaffold-holes and possibly the post-pit were associated with twelfth-century construction work.

### Garden features

A series of kerb stones set on edge were found running parallel and c 3.65m west of the twelfth-century cloister walks.<sup>50</sup> These upright slabs were sealed beneath the thirteenth-century cloister soil and were interpreted as twelfth-century garden features. The kerb [C:2023] was inserted through the debris layers associated with Furnace 1 and the outer kerb [C:2047] of the furnace (figs 5.8 and 7.3). The kerb continued [C:3110] southwards (fig 5.7), although it had been removed [C:3128] [C:3129] in the south section (fig 5.10), and further south again [C:4119], where it was embedded in the natural clay [C:4116] (figs 5.7 and 5.37). Radford noted that an upright oblique slab [C:2103] recorded in section further west (5.37) was similar to the kerb stones recorded to the east.

The soil deposits on either side of the kerb contained pottery dating from 950, overlain by the supposed thirteenth-century construction deposit [C:2012] [C:3112] (see below). On the eastern side of the kerb, the

soil [C:2051] [C:3141] was described as a hard trodden layer between the kerb and the cloister.<sup>51</sup> This is confirmed by context information for one of the finds which identifies it as the 'clay make-up of path' (figs 5.4 and 5.10). In contrast, the soil to the west of the kerb [C:2052] [C:3116] was described as cultivated. The evidence appears to be consistent with Radford's interpretation of a twelfth-century cloister garden defined by a kerb, with a path to the east and a garden to the west.

The twelfth-century garden soil continued westwards beneath the later construction deposits [C:2012] [C:3112] [C:3113] [C:3115] (see below). In Trench 35, layer [C:3116] had a consistent *terminus post quem* of 950 indicated by the pottery; it also contained a pair of single-sheet tweezers with a broadly medieval date. This layer [C:2013] [C:3116] also filled the robber trench [C:2014] [C:3150] for the postulated Late Saxon building (see above), although the presence of late thirteenth-century tile fragments within the fill [C:2013] indicates later disturbance. In Trench 24, the twelfth-century horizon continued westwards intermittently [C:2027] at the base of the trench and also had a consistent *terminus post quem* of 950.

The twelfth-century garden soil could not be traced on the western side of the large robber trench that was possibly associated with a large structure within the cloister garth (see below). However, an extensive layer of

clay, soil, stones and mortar debris [C:2048] appears to have been contemporary with the robber trench [C:2042] for Dunstan's east cemetery wall (figs 5.2 and 5.6). The fill [C:2041] of this robber trench had a *terminus post quem* of 1100, suggesting that the robbery and debris layer [C:2048] both date to the twelfth century.

### ?Conduit house

A large robber trench [C:2008] [C:3105] was located immediately west of the centre of the medieval cloister, measuring *c* 6m wide and backfilled with stones, rubbish, clay and soil [C:2007] [C:3104] (figs 5.8 and 5.10) with a *terminus post quem* of 1470 (see below). It was suggested by Radford that this might represent the demolition of Henry of Blois's bell-tower, which, according to Adam of Damerham, survived the 1184 fire. There are two major problems with this interpretation: first, the tradition of free-standing masonry bell-towers began in the thirteenth century;<sup>52</sup> secondly, most known examples are located at public access points on the periphery of monastic and cathedral precincts.<sup>53</sup> The plan was incomplete and difficult to trace within Radford's narrow excavation trenches. Nevertheless, the substantial remains within Trenches 24, 35 and 41 warrant a description, and an alternative interpretation is put forward here.

The north wall of the structure is represented by a

single surviving course of a 2.16m wide, east–west foundation [C:2036] [C:2037] [C:3212] and construction cut [C:2056] (figs 5.6, 5.7, 5.10 and 5.16), from which twelve sherds of pottery dated 950–1100 appear to have been recovered. To the south was a slightly narrower foundation [C:3137] measuring 1.8m wide (fig 5.10) and continuing southwards at a slightly oblique angle along the eastern side of Trench 41 (fig 5.7). Radford suggested this represented the east side of the structure, although the relationship between the foundations was not established.

The east–west foundation [C:3212] cut [C:3203] through an earlier wall [C:3225] and foundation [C:3226] to the south, running along the western side of the section (fig 5.16). The walling [C:3225] measured 1.85m wide and comprised two *in situ* ashlar blocks and three courses of lias (5.38) above a foundation [C:3226] of roughly coursed Tor burrs. At the same level as the lowest wall course [C:3225] were remnants of lias paving slabs [C:3210] extending southwards intermittently over a distance of 3.45m. These overlay a clay bedding layer [C:3214] and overlapped the northern end of a two-course foundation [C:3211] that ran along the western side of the trench. The presence of a dotted line on the plan suggests this foundation ran from east to west.

On the western side of the east foundation [C:3137] was a series of deposits possibly associated with the structure, including a fallen stone [C:3132] and paving [C:3134] [C:3210] (figs 5.10, 5.16 and 5.38). A possible

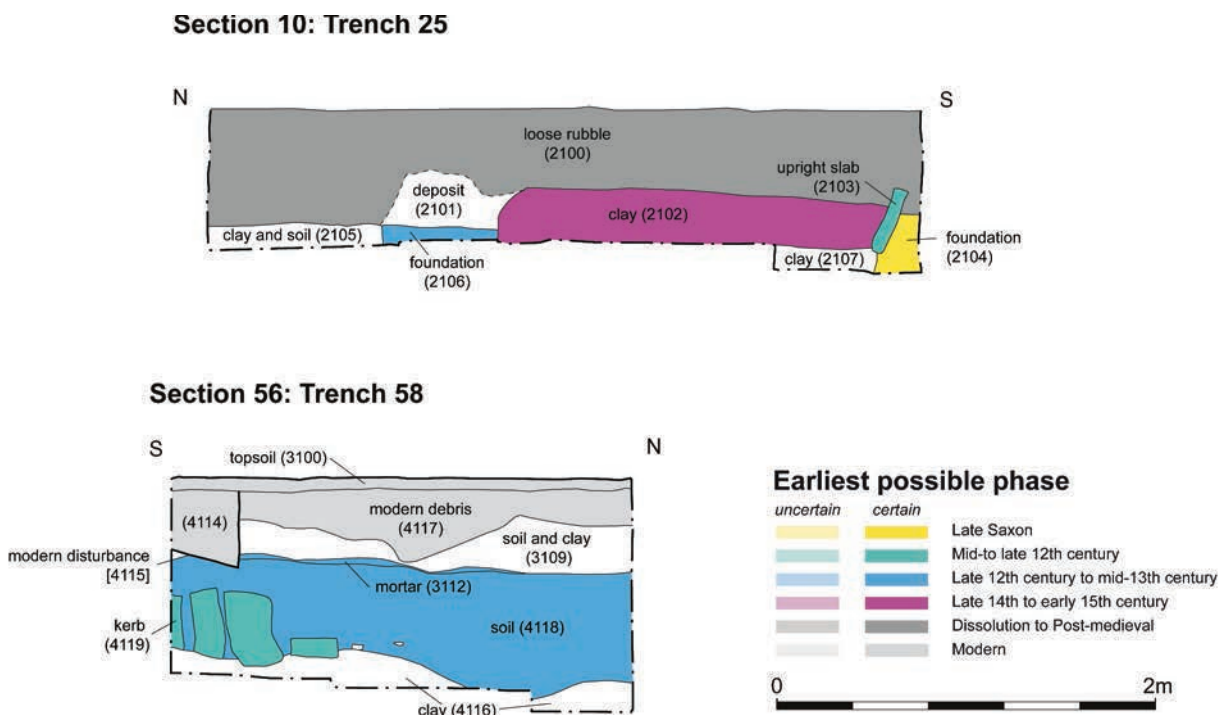


Fig 5.37 Sections of Trenches 25 and 58 (scale 1:40)

post-hole [C:3124] [C:3125] and a layer of lias spalls [C:3136] on the eastern side of the robber trench [C:3105], below the twelfth-century garden soil [C:3116], may have been associated with the construction of this building (fig 5.10).

A twelfth-century date is possible for the Tor burr foundations [C:3211] [C:3226] [C:3212] [C:3137], the lias wall [C:3225] above the foundations [C:3226] and the lias paving [C:3210] [C:3134]. The fabric was observed as being similar to the twelfth-century east cloister foundation (ie Tor burrs in yellow mortar); however, stratigraphic relationships with the cloister deposits have been predominantly lost as a result of extensive post-Dissolution robbery. The remains either represent two phases of the same structure or two different structures. The later building or second phase survived until the Dissolution, as proven by the date of the robber trench [C:2007] for the north foundation (see below). The ephemeral nature of the evidence permits only a very tentative suggestion, but one possible interpretation is that the remains are those of a conduit house that was used as a central point for collecting water and redistributing it to other parts of the site.

### **Late twelfth to mid-thirteenth centuries (Phase 9)**

In the north-east corner of the cloister garth was a small deposit of ash and charcoal [C:3023] (fig 5.28), which supposedly contained a fragment of green-glazed pottery (not identified in the assemblage). This may relate to the 1184 fire as it lay within the twelfth-century cloister walk and was covered by a possible make-up layer [C:3022] for the later medieval cloister garden. The latter comprised dark redeposited clay containing seventy-one sherds of pottery dated 950–1100, plus one sherd dated to the fifteenth to sixteenth centuries.

Evidence of the thirteenth-century buttresses supporting the inner walls of the north cloister walk was identified within the footprint of the later buttresses. Against the north wall a buttress foundation [C:3028] underpinned a later buttress [C:3056] labelled as fifteenth-century; a further foundation [C:3018] to the east may be contemporary based on its spacing (figs 5.7 and 5.28). Against the east cloister walk was a foundation [C:3035] beneath a later buttress [C:3034] and a flying buttress [C:3019] (figs 5.7 and 5.22). To the south, the lower two courses of a buttress foundation [C:3108] were offset to the west by 0.46m (figs 5.7 and 5.9), possibly indicating the remains of the thirteenth-century foundation. This abutted the eastern edge of the twelfth-

century foundation [C:3122] of the inner wall of the east cloister walk.

Several deposits and features within the cloister garth may result from stone dressing and building work. A thin layer of mortar and Doultong stone chippings was recorded throughout much of the cloister garden [C:2012] [C:3112] [C:3113], overlying the twelfth-century garden deposits and features, and the latter overlying a spalls layer [C:3130] (fig 5.10). Two sherds of pottery from [C:3112] indicate a *terminus post quem* of 1100; however, two sherds from [C:2012] indicate a *terminus post quem* of 1250. An even later date is suggested by two sherds of pottery dated to after 1450 within a clay deposit [C:2016] beneath the construction deposit [C:2012], although these are probably intrusive. At the western end of Trench 35, on the eastern side of robber trench [C:3105] (see above), was a layer of mortar droppings [C:3115] below a gravel layer [C:3114] (fig 5.9). Although these two layers may have been associated with the construction of the large central earlier structure (the possible conduit house), they are at a similar level to the other mortar layers. Notes indicate that the mortar layer [C:3112] containing Doultong spalls was also present immediately south (fig 5.37). However, the mortar covered a 'redeposited humus' or clay layer [C:4118] identified by finds as a kitchen midden with a *terminus post quem* of c 1272. The majority of these extensive construction deposits probably relate to the use of the cloister garth as a builders' yard following the 1184 fire, as suggested by Radford.

At the eastern end of Trench 24 was a deep layer of loose 'fill' [C:2006] above the supposed twelfth-century Tor burr foundation [C:2025] (fig 5.6). This contained five sherds of pottery dated 950–1100; a note on the pottery indicates this was the make-up layer of the thirteenth-century cloister, although this cannot relate to the whole deposit as the section shows the surface at the same level as the post-Dissolution demolition layers. Two offset stones [C:2026] above the construction layer [C:2012] may represent a garden feature, such as a small step. A 'loose fill' [C:2017] to the west may have also been associated, perhaps representing the robbery of a further stone. This is a very tentative interpretation but it perhaps indicates the level of the thirteenth-century cloister garden.

### **Late twelfth to mid-thirteenth century and mid-thirteenth to early fourteenth centuries (Phases 9 and 10)**

Within the west cloister walk, pottery dated 1200–1300 was recovered from hollows within the surface of the

mid-twelfth-century paving [C:2085], suggesting that the cloister walk was perhaps cleared of debris and remained in use following the fire. A soil and rubble layer [C:574] [C:2040] appears to have been a make-up deposit for the cloister garden, cut by the robber trench [C:576] [C:2039] for the inner cloister wall (figs 5.3 and 5.6).

In the south cloister area, traces of burning are mentioned in Trench 69 overlain by a yellow mortar (not identified) continuing from the east cloister walk and possibly associated with later construction work. Other deposits associated with post-fire rebuilding include the demolition layers [C:5612] [C:5614] sealing the possible twelfth-century *lavatorium* and covered by a mortar mixing floor [C:5608] (fig 5.33). At the southern end of the same trench a deep layer of stones, mortar and debris [C:5606] covered the remains of the twelfth-century cloister walk. Within the cloister garth, the mortar [C:5608] was overlain by a soil layer [C:5607] [C:5512] with a *terminus post quem* of 1250 which may represent the cloister garden soil; an extensive soil layer [C:5512] containing pottery of the same date sealed the earlier post-holes to the east.<sup>54</sup> The only surviving structural remains for this phase comprised a thirteenth-century buttress foundation [C:5508] below a fifteenth-century buttress foundation [C:5507] (fig 5.34). The former is depicted on the GPR survey as a well-defined wall at a depth of 0.5–1.0m in keeping with the depth shown in section (fig 2.19).<sup>55</sup>

In the north cloister walk, the excavation notes for Trench 62 describe two large lias slabs [C:4011] keyed in to the ashlar of the thirteenth-century nave south aisle wall and therefore representing thirteenth-century cloister walk paving. Two earlier robber trenches [C:4003] [C:4005] (see above) were sealed by a deep layer of grey clay [C:4002] with yellow streaks (indicative of deep clay) and containing traces of the glass furnaces (fig 5.23). This was sealed by the fifteenth-century mortar bedding [C:4001] (see below) and interpreted as upcast from the excavation of the thirteenth-century nave foundation trenches, mixed with some redeposited glass furnace material.

Remnants of the thirteenth-century paving [C:3057] with mortar under-bedding [C:3058] were recorded in plan in the east cloister walk, running along the western edge of the medieval cloister (fig 5.35). Further south, the thirteenth-century paving was represented as three lias stones [C:4066] above a layer of mortar bedding [C:4065], with the latter also recorded [C:4056] further south again (fig 5.18).

At the eastern end of Trench 24, Radford describes the early fifteenth-century cloister arcade wall set directly

above an earlier foundation. A fragment of cusped window tracery supposedly post-dating c 1300 was thought to be contemporary with the wall; the tracery appears to be represented in section (fig 5.8). The outer wall foundations of the east cloister walk had previously been found to be complete with a heavy stone wall at the eastern end of the south cloister walk interpreted as a dividing wall.<sup>56</sup> This is shown in plan as conjectural and therefore is not replicated.<sup>57</sup>

Evidence for four flying buttresses was recorded at approximately equal intervals along the northern edge of the cloister garth, all aligned with the bay divisions of the nave. These were probably constructed to support the vaulting erected in the nave in the mid-thirteenth century. This included a foundation [C:2106] [C:3041] (figs 5.22 and 5.37) containing a number of medieval pottery fragments (not retained) pre-dating c 1300. The robber trench [C:3005] for a further flying buttress was located c 4.62m to the west, with the western edge of another flying buttress [C:3224] identified in Trench 41 to the west. Approximately 4.96m to the east of the first flying buttress [C:3041] was a foundation [C:3019] of another flying buttress which was thought to have been reconstructed from an earlier and wider twelfth-century foundation [C:3059] (5.39 and 5.40). In plan, the flying buttress [C:3019] is shown extending beneath the early fifteenth-century north cloister wall [C:3051]; however, this is not evident from the photographic record which appears to show the buttress terminating to the south of this wall.

### Late fourteenth to early fifteenth centuries (Phase 12)

Throughout the cloister garden was an extensive layer of soil and clay [C:2010] [C:2040] [C:2102] [C:2105] [C:3109], directly below the post-Dissolution layers (see below) and overlying the thirteenth-century construction deposit (see above). A small number of pottery sherds from this layer provide a *terminus post quem* of 1450, indicating that some building work took place following Abbot Chinnock's rebuilding of the cloister. Part of the make-up layer [C:3109] included redeposited glass furnace material [C:3111] from Furnace 1 and 2 located below (fig 5.9).

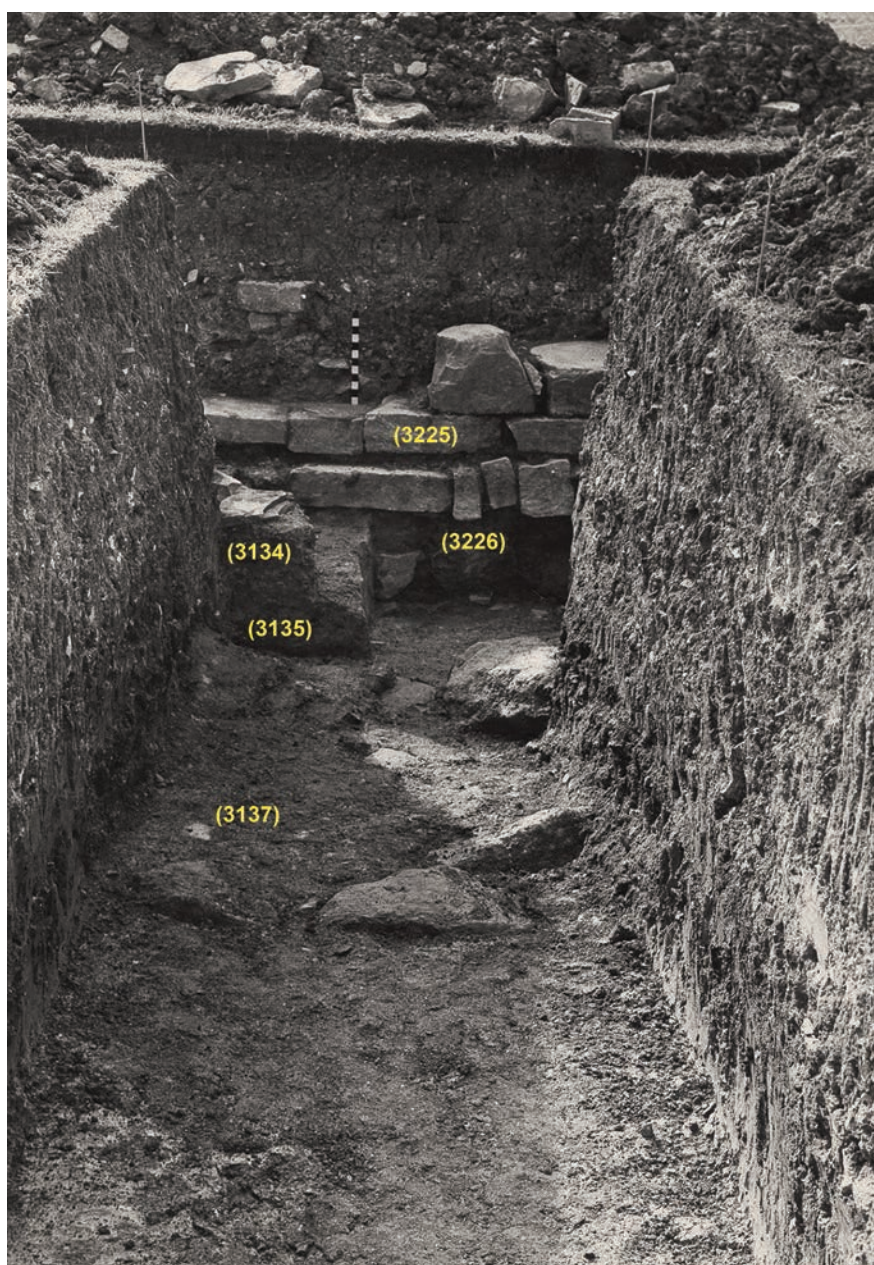
In the north cloister walk, the location of the earlier, middle flying buttress [C:3041] corresponds to the location of the second fifteenth-century buttress from the east (fig 5.22). To the west, the width of the robbed flying buttress [C:3005] overlaps the fourth buttress from the east (fig 5.19). The third buttress [C:3056] from the east

was constructed of large blocks of lias above what was thought to be a slightly wider thirteenth-century buttress foundation [C:3028] (see above). The location of the first buttress from the east is also indicated on the section drawing although only the thirteenth-century foundation [C:3018] is shown (see above).

Against the east cloister walk a buttress [C:3107] was constructed above the possible thirteenth-century buttress foundation [C:3108] (see above) (figs 5.7 and 5.9). The first buttress [C:3034] from the north was above a wider, possibly thirteenth-century foundation [C:3035] and was beneath a narrow wall [C:3047] aligned north–south (figs 5.7 and 5.29). This may represent a carrel wall [C:3047], with a small area of paving [C:3046] labelled as fifteenth-century to the east. Against the north

cloister walk, a further carrel wall is indicated by the presence of a narrow wall [C:3045] aligned east–west running between the flying buttress [C:3019] and the first buttress from the east (represented by foundation [C:3018]) (figs 5.7 and 5.38). This may have been associated with a small area of paving [C:3050] against the north cloister walk. A further carrel wall [C:3029] possibly connected the second and third [C:3056] buttresses from the east, enclosing an earlier twelfth-century buttress foundation [C:3044]. Although relationships are uncertain from the records, this provides a glimpse into the potential arrangements within the north-east corner of the cloister in the early fifteenth century.

In the west cloister walk, a deep layer of make-up



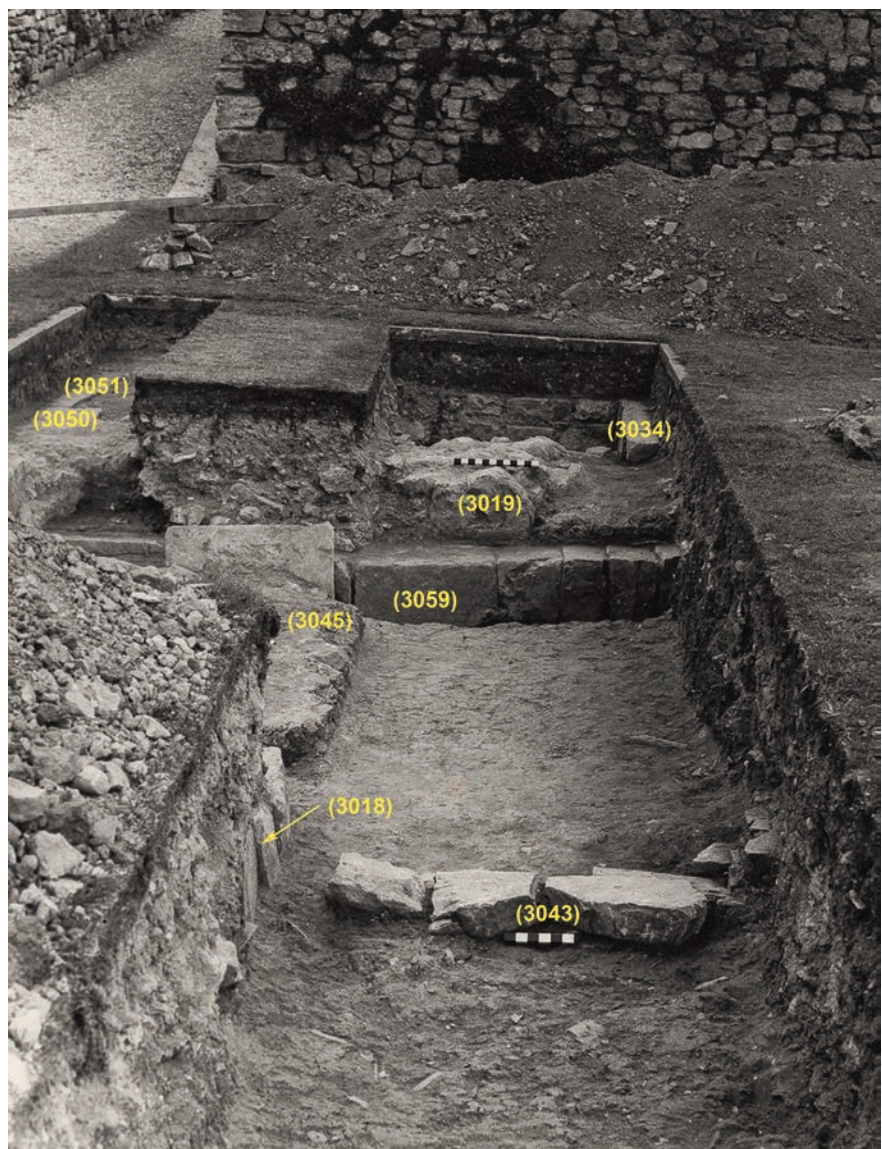
**Fig 5.38** Structural remains in Trenches 35 and 41, looking west (1956 photograph: © EHA)

[C:564] [C:668] overlay the mid-twelfth-century paving and bedding, dated by Radford to the fourteenth century. The west wall of the later cloister shared the same alignment as the mid-twelfth-century outer wall, the former represented by robber trenches [C:561] [C:562] and [C:652] [C:653] both with *in situ* masonry [C:588] [C:680] in the base (figs 5.2 and 5.3). The inner wall was on the same alignment as the earlier wall and is represented by robber trenches [C:2038] [C:2039] and [C:575] [C:576], the former with two foundation stones [C:2054] *in situ*. A further robber trench [C:654] [C:655] was labelled as a cloister buttress either dating to *c* 1200 or the fourteenth century.

As already mentioned, the north wall of the refectory was located south of its twelfth-century predecessor. The exact course of the wall is shown on a Bond plan<sup>58</sup> although the robber trench is not recorded in Trench 11, the only trench to extend far enough south. However, at

the southern end of this trench is a wall / foundation [C:2150] (fig 5.34) which may be a remnant of the north refectory wall; as mentioned above, problems with accurately placing this trench render a precise interpretation impossible. Using Bond's plan, the south cloister walk was of the same internal width of *c* 3m as the contemporary east and west cloister walks.

Along the southern side of the cloister garth was a small area of paving [C:2157] which may have been associated with a carrel wall. In the south-eastern corner of the cloister garth were foundations that Radford suggested were associated with the fifteenth-century library step foundations [C:5510] (fig 5.34), although the basis of this interpretation is not made explicit. An inventory made in 1247–8 of the books held in the library indicates that some works were saved from the 1184 fire, including virtually all the books of Henry of Blois, and that the abbey was rebuilding its collection. It is possible



**Fig 5.39** North-east corner of cloister in Trenches 38 and 39, looking east (1956 photograph: © EHA)

that the inventory was made during reorganisation, possibly relating to the completion of the new east cloister where the library may have been housed.<sup>59</sup>

A number of internal buttresses or responds were recorded in the east cloister walk (figs 5.18 and 5.35) including responds [C:3049] [C:4055]; robber trenches for the outer wall [C:4053]; and foundations of buttresses or responds [C:4087] [C:4088] on either sides of the inner wall. Structural remains shown on Bond's 1909–10 excavation plan (not published) represent the bench against the west side of the south transept wall, and Radford recorded an associated robber trench [C:4023].

In Trench 62 a deep, undulating layer of yellow mortar [C:4001] covered the thirteenth-century clay make-up [C:4002] (fig 5.23). This was interpreted as the fifteenth-century mortar bedding for the north cloister walk. The more interesting finds from this layer included a cast copper-alloy ring with attached hook (possibly used to hang tapestries / curtains), a bead of black Whitby jet and one fragment of floor tile with white slip and green glaze decoration. Later disturbance was observed, which probably accounts for the presence of one sherd of pottery dated after 1500 and one eighteenth-century sherd. The fifteenth-century mortar bedding was also recorded in the east cloister walk [C:4021] [C:4073] (figs 5.18 and 5.35), the latter contemporary with the base of the chapter house step [C:4064] to the east, directly beneath the modern topsoil [C:4020]. This covered the mortar and spalls fill [C:4022] of a construction trench [C:4023] for the *in situ* fifteenth-century bench. The make-up layer [C:4027] for the mortar bedding [C:4021] contained two fragments of blue glass, including a complete triangular window piece and three pottery sherds dated 950–1100. Bond recorded that the east cloister pavement was represented by a light brown mortar or a thin layer of stone with numerous fragments of glazed tile of 'remarkable variety' in the overlying debris.<sup>60</sup> A thin layer of dirt above the mortar bed was covered by broken remnants of window glass overlain by a rubble layer containing numerous fifteenth-century architectural fragments.<sup>61</sup>

A stone-lined drain [C:4080] crossed the centre of Trench 64 from east to west before turning towards the south-south-west, into the cloister garth (fig 5.18). This was a wide and solid structure very close to the surface of the trench and therefore likely to relate to the late cloister phase. A further stone-lined drain recorded by Bond on his 1909–10 excavation plan appears to have followed the northern edge of the trench, although this did not appear in publication and Radford makes no mention of it. Located 0.75m to the north of Radford's drain [C:4080]

they are unlikely to represent the same feature. Further north in the east cloister walk, the same Bond plan shows a further stone-lined drain opposite the south-west corner of the south transept, curving south-westwards towards a diagonal stone-lined drain. The latter exited through the inner wall of the east cloister walk before turning southwards around a small room projecting into the cloister garth. This appears to be shown on the magnetic survey. Finally, Bond's 1909–10 plan also shows a stone-lined drain crossing the southern end of the east cloister walk.

### Post-Dissolution (Phase 16)

An exceptionally large robber trench [C:2008] [C:3105] [C:3205] was recorded just west of the centre of the cloister garth (figs 5.7, 5.8, 5.10 and 5.16). It is suggested above that the foundations and paving surviving beneath the robbery may relate to a conduit house. The pottery provides a *terminus post quem* of 1470 for the robber fill [C:2007] [C:3104] [C:3204], supporting post-Dissolution demolition.

Post-Dissolution robber trenches are represented by loose fills containing mortar debris and stones. The presence of these features outline the plan of the cloister walks, the walls of which had been thoroughly robbed with only a small quantity of *in situ* masonry. For the north cloister walk these comprised robber trenches for the buttresses against the inner wall (see above) and a robber trench [C:3222] [C:3223] for the inner wall of the north cloister walk (figs 5.7 and 5.16). In the west cloister area, a 'modern' trench [C:2001] was located directly above another robber trench [C:2039], and cutting through the uppermost layer of demolition material and rubble [C:2002] (fig 5.6); this may either be associated with the robbing of the later cloister inner wall or an excavation trench following the robber trench beneath [C:2039]. Finds recorded to the east of the mid-twelfth-century drain [C:2062] in the vicinity of the inner cloister wall probably relate to post-Dissolution robbery; these include a jetton dated 1553–84 (M487) at a depth of 1.27m and a Doulling moulding (S968).

Beneath the topsoil, the uppermost layers across the cloister garth comprised spreads of post-Dissolution debris and modern levelling [C:2004] [C:2005] [C:2002] [C:3101] [C:3003] [C:3013] [C:3201] [C:3202] [C:3207] [C:3216], including a layer of crushed slate [C:3218] probably associated with demolition. In the west cloister area there are also several layers that are probably associated with post-Dissolution dismantling, including 'builders' rubbish' [C:666] within the cloister walk, a loose

layer [C:675] [C:2002], a deep layer of dark soil with mortar and stones [C:1402] and a possible demolition layer [C:581] beneath the topsoil both within the cloister garden.

In the southern area of the cloister garth was a late drain [C:5616] and a row of neatly laid stones [C:5505] with an east–west alignment covered by a layer of mortar [C:5503] (figs 5.23 and 5.35). This was beneath the topsoil and may represent a late or perhaps even a modern garden feature.

## 5.3 Chapter house

### Mid Saxon (Phase 3)

The monastic enclosure bank and ditch [C:143] crossed the chapter house from north to south (figs 5.40 and 5.41), the ditch alignment correlating with a response on the magnetic survey. The eastern side of the ditch should run through the western side of Trench 55; although Radford noted that no attempt was made to define it, the dark clay [C:712] and light clay [C:713] beneath may relate to the ditch fill. Radford stated that Trench 52 lay entirely over the ditch, suggesting that the dark clay [C:413] in the base of the trench was the redeposited clay fill.

The deep section in Trench 48 shows the ditch [C:143], measuring 2.21m deep, cutting through a series of natural clays, with the sequence reversed in the bank material on the western (inner) side of the ditch; the dark clay [C:142] was at the base, the iron-flecked clay [C:141] above, followed by a larger quantity of light clay [C:140]. The upper layer of dark clay [C:134] at the rear of the bank may have been the result of recutting, perhaps due to slippage; this is evident on both sides of the ditch, although it was only noted by Radford for the east slope.

Only one ditch fill [C:139] was recorded, measuring 2.13m deep. A series of fills would be expected and their absence may be explained by a lack of detail in the recording. Only a single, poor-quality photograph of the section survives; this was taken at an oblique angle making it impossible to identify a sequence. The records highlight two discrete and deliberate dumps of material within the fill: an area of black, wet, clayey mud with animal bones and wood fragments, and 200g of fuel ash slag / vitrified clay from the base of the ditch. The backfill was roughly level, implying deliberate levelling prior to construction of the twelfth-century chapter house.

Radford thought that the clay and soil layer [C:133] on the western side of the bank represented gradual

erosion during a period when there was little activity in the vicinity (fig 5.40). In Trench 51 the toe of the bank was identified at 9.45m from the east cloister walk, c 0.3m to the west of the line through Trench 48. This probably relates to a small section of dark clay [C:305] which appears to have been cut by what Radford described as a pre-Conquest feature [C:308] filled by disturbed clay [C:304] (fig 5.42). These two layers [C:304] [C:305] were overlain by a clay layer [C:303], which is probably the dumped clay described at the back of the bank containing debris and some larger lias stones and probably the same as the clay and soil layer [C:133] in Trench 48.

A flat-bottomed cut [C:130] in the deep natural clay [C:129] at the western end of Trench 48 was cut by the foundation of the later chapter house [C:117] (fig 5.41). The excavation notes describe a glass furnace lining in the same approximate location: the overlying make-up layers [C:121] [C:126] contained two fragments of glass furnace debris. Although glass furnace Area C is in the immediate vicinity, the lack of detailed records makes it impossible to evaluate this interpretation.

### Mid- to late twelfth century (Phase 8)

Evidence of ground works prior to the construction of the chapter house includes make-up layers [C:121] [C:126] offsetting the natural ground slope (fig 5.41). The upper part of the soil and clay layer [C:133] to the west of the bank (above a line of stones) is different in character from the lower part of the deposit. This could be the clayey soil deposit described in the hollow behind the bank, containing debris, loose stones and rubbish used as backfilling including the remains of large beams and planks. Radford thought these planks were from scaffolding used during the construction of the earlier chapter house, with an entry on the finds register recording a blackened wooden board embedded vertically in the undisturbed clay [C:144].

The structural remains of the earlier chapter house consisted of the east wall foundation [C:138] with a dais foundation [C:137] on the western side and evidence of a vestibule structure towards the western end of the chapter house (figs 5.40 and 5.41). The latter consisted of two steps [C:122] at right angles to each other, with further step foundations to the south [C:153] and to the west [C:152]. The step [C:122] corresponds with an ill-defined wall shown on the resistance survey, which is aligned with a possible short projection from the north wall depicted on the GPR survey at a depth of 0.5–1.0m (fig 2.19). The east wall foundation [C:138] aligns with a foundation cut [C:711] to the south, with some surviving



Section 78: Trench 48

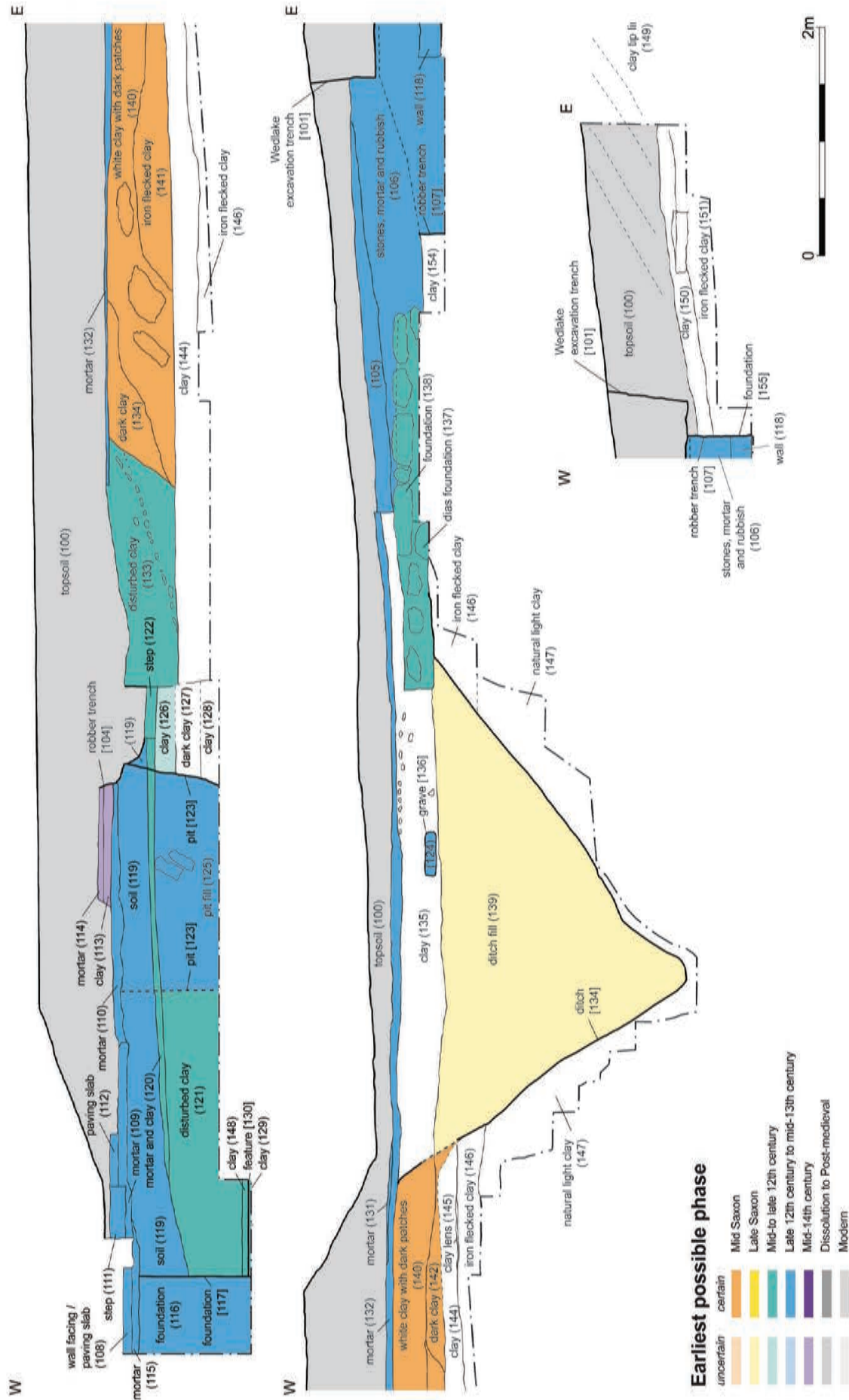


Fig 5.40 Section of Trench 48 (scale 1:50)

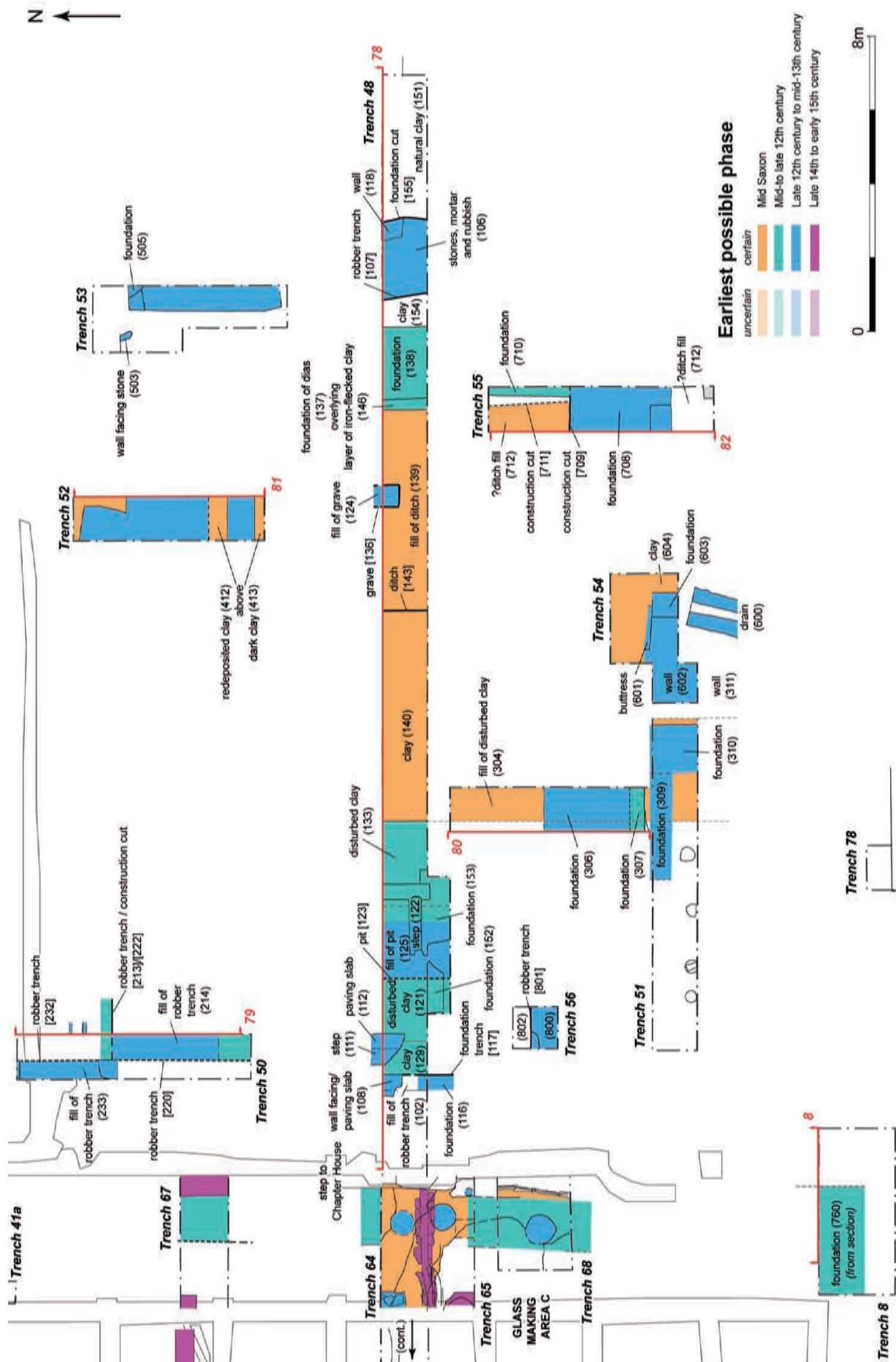


Fig 5.41 Plan of Trenches 48, 50, 51, 52, 53, 54, 55 and 56 (scale 1:150)

Tor burrs set in yellow mortar [C:710] and cut by the later foundation trench [C:709] for the south wall. Both foundations [C:138] [C:711] are aligned with the wall that Bond interpreted as a cross-wall as shown on Wedlake's 1935 plan (fig 5.43). This detailed stone-by-stone plan of the eastern end is at least partly conjectural: an elevated photograph of the excavations shows very little surviving masonry and the excavation notes (GLA: A500) confirm this.

Two irregular cuts [C:222] [C:213] and foundations were located to the north of, and at a higher level than, the robber trench [C:220] for the north wall (figs 5.41 and 5.42). This indicates that the earlier north wall was located slightly northwards of the later structure, although this would make the foundations rather shallow in relation to the floor level of the earlier chapter house. The earlier foundations [C:307] for the south chapter house wall consisted of Tor burrs set in a soft, fine orange-yellow mortar.

The lower mortar bedding [C:120] in Trench 48 was associated with the earlier chapter house, extending westwards from the steps [C:122] (fig 5.40). These remains clearly pre-dated the fire of 1184, with considerable burnt material at the surface of the mortar [C:120]. To the east of the step [C:122] the floor surface was higher, as shown by the mortar bedding [C:132] above the truncated Saxon deposits. Indeed, Radford suggested the existence of two steps in the dip to the east of the *in situ* step [C:122].<sup>62</sup> A twelfth-century date is supported by the fact that the higher level of mortar bedding [C:132] covered the dais [C:137] and overlapped the foundation [C:138]. It was suggested that a grave [C:136]/[C:124] discovered beneath the supposed early chapter house was that of Abbot Vigor who died in 1223 (see below).<sup>63</sup> The sagging in the overlying mortar bedding [C:132] was interpreted as a repair to the floor, possibly made after the insertion of the grave. Alternatively, the mortar layer [C:132] may relate to the later chapter house. Indeed, Radford's original site notes state that this is a later floor of fine yellow mortar still covered in places with a fine very white mortar with an admixture of calcitised stone, described as Dundry, used for aggregate. Nevertheless, the earlier mortar surface would have been at a similar level, showing that the floor was higher at the eastern end of the chapter house.

The make-up layer [C:119] overlying the twelfth-century mortar bedding [C:120] contained much redeposited burnt material near the base, including some discarded building stones, mortar debris and a sherd of post-950 pottery (fig 5.42). The foundations [C:152] [C:153] for the step [C:122] were adjacent to an area

containing burnt wood and showing considerable signs of burning. On the south side of the north wall and just within the area of the chapter house, a burnt layer [C:230] was recorded above the natural clay [C:231] and was cut by a later robber trench [C:232]. Further evidence of the 1184 fire was recorded in the area of the slype to the north of the north wall; this included a burnt layer [C:205] at the northern end of the trench and a sequence of alternating burnt and clay layers [C:227] [C:226] [C:225] [C:224] and [C:223] closer to the north wall.

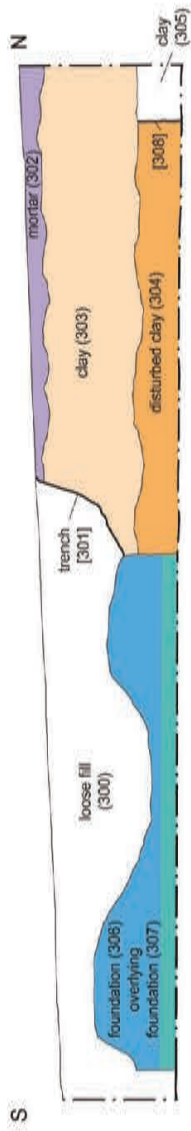
### Late twelfth to mid-thirteenth centuries (Phase 9)

On the south side of the chapter house north wall, the burnt fire layer [C:230] was covered by 'brown clay' [C:212], which may have been the make-up for the later chapter house floor (fig 5.42). Above the clay fill [C:413] of the Saxon ditch was a redeposited dark clay layer [C:412] with iron flecks, which was thought to have derived from the foundation trench of the south transept (fig 5.42). In the centre of the chapter house, in addition to the post-fire make-up layer [C:119], other evidence of activity between the two building phases includes a pit [C:123] filled with discarded building stones and mortar debris [C:125], dated by three sherds of pottery to post-950 (figs 5.40 and 5.41). The pit post-dated the mortar bedding [C:120] of the earlier chapter house and was sealed beneath the mortar bedding [C:109] [C:110] of the later chapter house. However, this feature corresponds to Bond's vestibule wall, suggesting that this may be a robber trench for a cross-wall;<sup>64</sup> located to the west of the steps [C:122], this might have been a low partition wall carrying steps between the twelfth-century vestibule and the chapter house.

The western wall of the later chapter house was evident from a foundation cut [C:117] with some intact foundations [C:116] (figs 5.40 and 5.41). The section drawing shows the robber trench fill [C:102] sealed by a mortar layer [C:115] below a slab [C:108]. The notes indicate that the 'paving' slab [C:108] overlay the foundations [C:116]; however, the section write-up suggests it is a small fragment of facing on the east side of the chapter house west wall. The slab was located opposite the western entrance to the chapter house and probably formed part of the threshold. An ashlar quoin [C:210] of the south-east corner of the angle buttress of the south transept was found *in situ*, despite being at the end of the robber trench [C:232] [C:233] (fig 5.41).

The eastern end of the chapter house was thoroughly explored by Wedlake in 1935, but some remains were

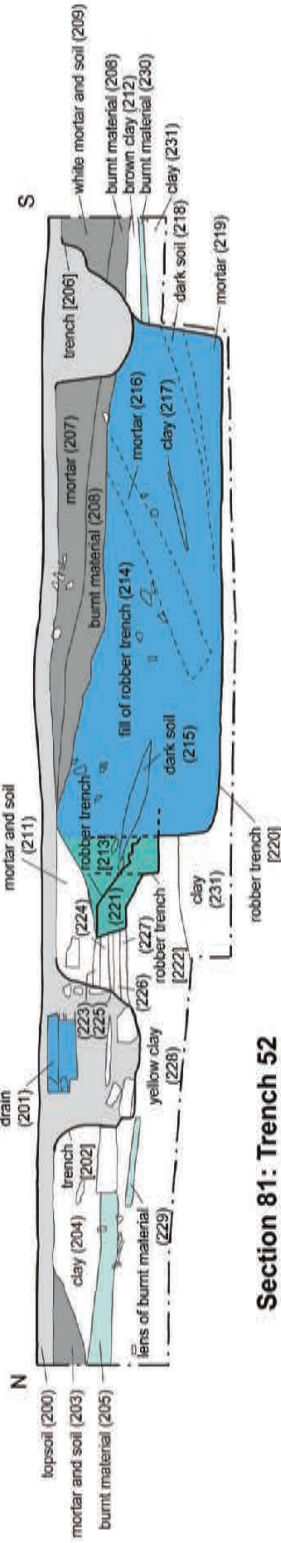
**Section 80: Trench 51**



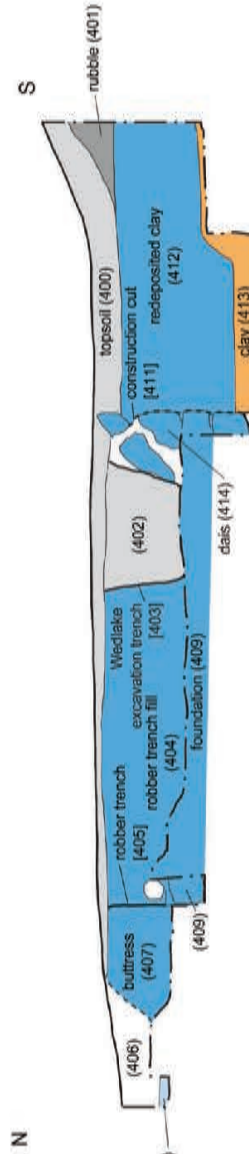
**Earliest possible phase**



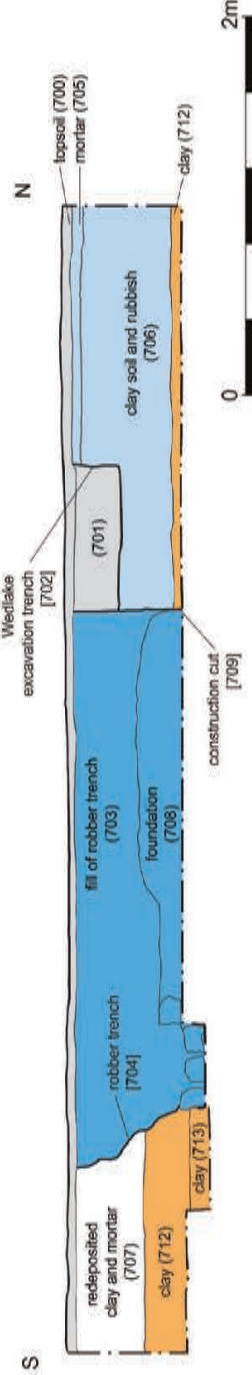
**Section 79: Trench 50**



**Section 81: Trench 52**



**Section 82: Trench 55**



**Fig 5.42** Sections of Trenches 50, 51, 52 and 55 (scale 1:40)

recorded subsequently by Radford (fig 5.43; no context numbers were assigned during the 1935 excavations). The eastern wall of the later chapter house was represented by a foundation cut [C:155], one lias block [C:118] and a robber trench [C:502]. Two Tor burrs [C:505] within a foundation cut [C:504] relate to the north wall (fig 5.41), together with a single *in situ* facing stone of lias ashlar [C:503] adjacent to the north face of the north wall foundation trench [C:504].

Further west, the north wall foundation [C:409] is represented by some Tor burrs, the dais retaining wall [C:414] and a foundation cut [C:411], either for the retaining wall or the foundation (figs 5.41 and 5.42). The dais to the south of this wall had gone but it was represented by a raised area [C:410]. An external buttress [C:407] is shown in plan against the north wall of the chapter house, corresponding to the 1935 plan. A spread of mortar [C:408] was at the level of the base of the buttress foundation [C:407]; however, the mortar spread was also within the area of the slype and may relate to this corridor.

The surviving foundations [C:708] of the south wall include some lias set in a whiter mortar than that used for the earlier foundation [C:710] (see above) (figs 5.41 and 5.42). Similarly, further west the later foundations [C:306] overlay earlier foundations [C:307] and consisted of a layer of stones set in a hard creamy white mortar (fig 5.42). To the south of these foundations was a further north-south orientated foundation [C:309], although there are no details of relationships (fig 5.42). Slightly to the east was a further, more substantial north-south foundation [C:310] [C:603] and wall [C:311] [C:602]; these relate to the east wall of the dormitory vestibule. Radford stated that Trench 54 had been badly robbed; however, in addition to the remains already mentioned there appears to have been an internal buttress for the chapter house. Radford's original site notes describe the east wall of the dormitory vestibule [C:602] as abutting the south wall of the chapter house. Although both the buttress and the wall were constructed of Tor burrs, the mortars were yellow and white respectively, suggesting different construction episodes. Redeposited clay [C:604] [C:707] on the south side of the south wall foundation probably derived from the foundation trench. Within the chapter house was a deep make-up layer [C:706] from which a fragment of lead came was retrieved.

At the western end of the chapter house, the mortar bedding [C:109] [C:110] for the paving lay beneath a step [C:111] – perhaps the dais – and an adjacent slab [C:112], possibly a remnant of the pavement (fig 5.40). The black clay layer described during the excavation of a sondage

between the slab [C:108] and step [C:111] may have been the fill of a narrow drain. As discussed above, the mortar bedding [C:132] observed throughout much of the trench is likely to belong to the later chapter house. To the south, mortar bedding [C:705] associated with the later chapter house phase overlay the make-up layer [C:706] (fig 5.42). Further west, the horizon of the chapter house pavement is described as lying between two layers [C:302] and [C:303], although Radford states that the level of the pavement could not be ascertained due to later disturbance (fig 5.42). The mortar layer [C:302] was at approximately the same level as the later chapter house mortar bedding [C:109] [C:110], although labelled in section as 'modern mortar'.

The small grave attributed to Abbot Vigor (d 1223) contained jumbled and incomplete skeletal remains. The size of the grave and the condition of the bones suggest that the remains were 'translated' – deliberately removed from their original resting place and reburied in a reverential manner (fig 5.42).<sup>65</sup> In addition to four coffin nails, the grave [C:136] [C:124] contained two important finds that have since been lost. These comprised a crozier and a bowl-shaped piece of lead, thought to have been part of a chalice. The number of burials containing lead chalices peaked in the thirteenth to fourteenth centuries; this corresponds with the early thirteenth-century death of Abbot Vigor, who is known to have been buried in the chapter house.<sup>66</sup>

A drain [C:600] ran southwards from the chapter house (fig 5.41); aligned north-north-east to south-south-west, this fed into the east-west water-course. Both the drain and water-course were discovered and partially planned by Bond in 1910, although the precise placing of these features differs slightly from the 1935 and 1957 plans.

### **Mid-fourteenth century and late fourteenth to early fifteenth centuries (Phases 11 and 12)**

Alterations to the floor level within the chapter house may be indicated by a double layer of mortar bedding [C:110] [C:114] separated by a thin clay layer [C:113]. Patches of this double layer were apparently found elsewhere in Trench 48, although not recorded.

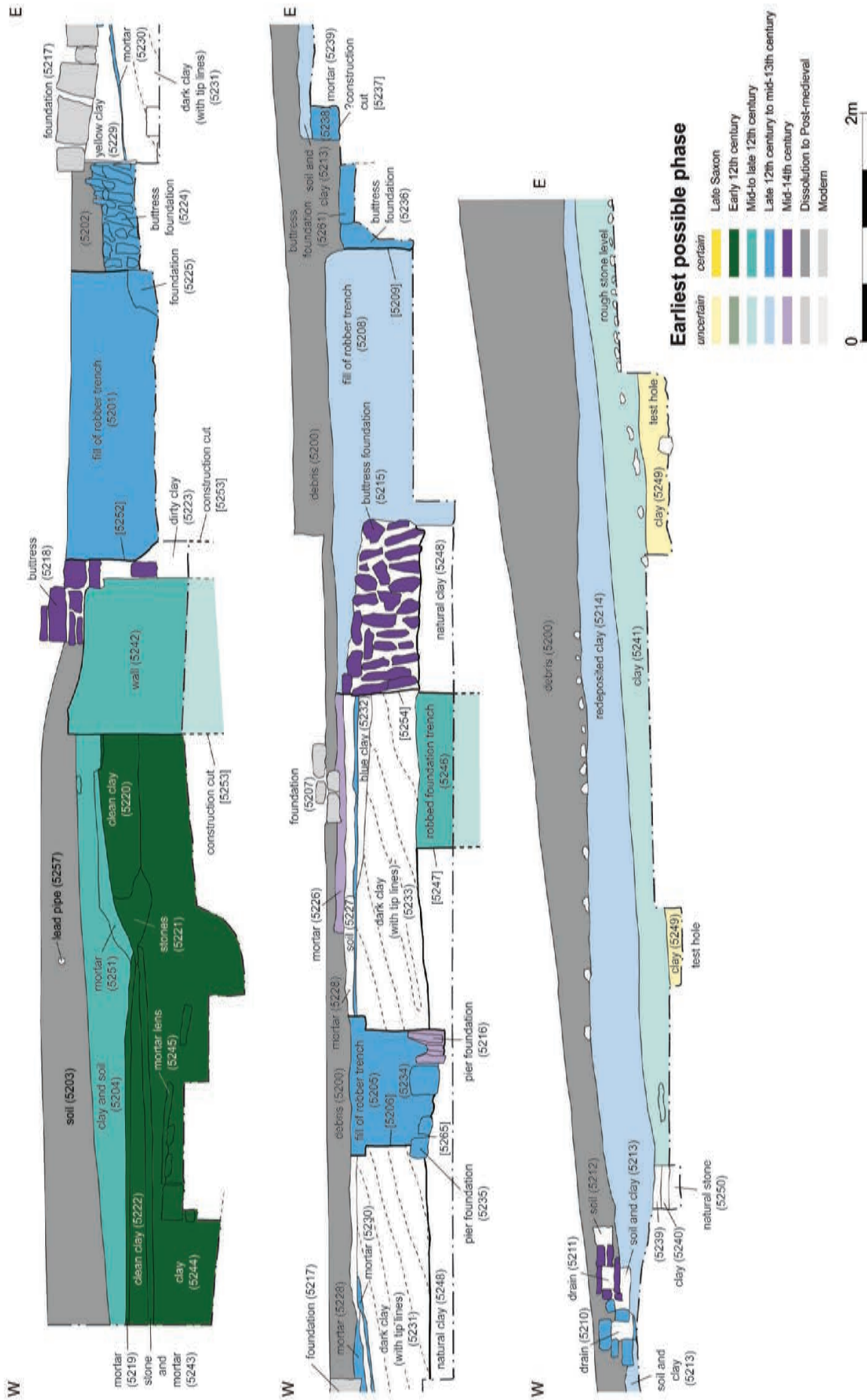
### **Post-Dissolution (Phase 16)**

The west wall [C:103], the east wall [C:502] [C:107] and the north wall [C:220] [C:405] of the later chapter house had been predominantly robbed, the latter backfilled with tips and spreads. The northern edge of the robber



Fig 5.43 Plan of Wedlake's 1935 chapter house excavations (scale 1:150)

**Section 65: Trench 72**



**Fig 5.44** Section of Trench 72 (scale 1:50)



**Fig 5.45** Chapter house excavations looking south (1935 photograph: © Glastonbury Abbey)

trench [C:801] for the south wall of the chapter house was located west of the *in situ* foundation [C:306]. A series of deposits [C:203] [C:204] [C:211] [C:208] [C:207] [C:209] and a rubble layer [C:401] were the result of post-Dissolution destruction.

A rough, stone-lined drain [C:201] was planned during Wedlake's excavations immediately north of the north-east corner of the chapter house (figs 5.41 and 5.43). This was supposedly removed from above the foundation of the doorway leading into the slype and probably relates to the post-Dissolution phase.

### Modern (Phase 17)

Most damage and disturbance in the chapter house area was caused by early twentieth-century excavations. Bond's 1910 explorations were mostly confined to wall-chasing, as identified in Radford's trenches. His longitudinal trench was later crossed by Trench 48 and does not appear to have been deep enough to have reached the steps [C:122].<sup>67</sup> Wedlake's excavations of 1935 had the largest impact on the remains, exposing the eastern foundations of both phases of the chapter house

(fig 5.43); however, in Trench 55 the archaeology on either side of the walls does not appear to have been penetrated. The spoil [C:100] was spread across the area to the west with clay tip lines [C:149] to the east (fig 5.40). Beneath further layers [C:105] [C:106] relating to the backfilling of these excavations, Norman pottery sherds (no longer identifiable in the assemblage) were found on top of the twelfth-century east wall [C:138], presumably left from the 1935 excavations (fig 5.45).

## 5.4 The dormitory

### Late eleventh and early twelfth centuries (Phases 6 and 7)

Furnace deposits were recorded in Trenches 72 and 73 to the west of the west wall [C:5242] of the mid-twelfth-century dormitory (fig 5.46). The natural clay [C:5248] was thought to represent the original ground surface, as indicated by the presence of iron staining to a depth of c 0.2m. It was overlain by a deep layer of dirty clay [C:5244] containing one sherd of pottery dated after 950,





**Fig 5.46** Trenches 72 and 73, looking west (1959 photograph: © EHA)

a possibly medieval copper-alloy balance arm and ten nail fragments (fig 5.37). Within the dirty clay was a mortar lens [C:5245] that might equate with one of the furnace floors; it was overlain by a stone floor [C:5243] with some mortar inclining slightly from west to east. In section this was labelled as a furnace floor, situated at a similar depth (*c* 0.91m) to the furnace deposits shown in the extension trench (fig 5.47).

The possible furnace floor [C:5243] was covered by a deposit of fairly clean clay [C:5222], with a deeper deposit of the same material [C:5220] directly overlying the dirty clay [C:5244] nearer the dormitory. This appeared to have been cut to the east by the construction trench [C:5253]

for the mid-twelfth-century west dormitory wall [C:5242], providing a *terminus ante quem* of *c* 1150. A stone deposit [C:5221] was noted as filling a small trench labelled as a sleeper beam in section and described in the notes as probably representing a wooden sill beam. This may have been associated with the superstructure of a furnace.

The plan (fig 5.48) shows two furnace deposits comprising a large area of industrial material [C:5256], labelled as 'lower industrial floor', and a smaller area labelled as burnt clay [C:5255] extending into the western baulk (fig 5.47). Radford's notes describe irregular pits and hollows cut into the natural clay [C:5248], indicating a complex of industrial activity. The furnace features were



**Fig 5.47** Industrial surfaces in Trench 73, looking south (1959 photograph: © EHA)

supposedly filled with the dirty clay [C:5244] identified in section and traces of lias structures (fig 5.47).

Within the area of the dormitory, further possible furnace floors were recorded beneath the redeposited clay [C:5006] underlying the mid-twelfth-century deposits (fig 5.49). The furnace floors comprised a thin upper layer of red burnt clay [C:5007], above a layer of red burnt and grey clay [C:5008], overlying a lower layer of red burnt and grey clay [C:5009].

Radford dated the furnaces as contemporary with the supposedly Late Saxon glass furnaces, on the basis of perceived similarities between the remains and the presence of pre-Conquest artefacts. However, the charcoal and ash layer [C:5263], probably located in the south-west corner of the trench (fig 5.47), has produced a radiocarbon determination of AD 1040–1160 at the lowest probability (at 1 sigma) and AD 1020–1190 at the highest probability (at 2 sigma) (Table 1). The latest pottery associated with the furnace deposits has been dated to after 950 and stratigraphically the furnace deposits are earlier than the mid-twelfth-century dormitory. We must conclude therefore that this furnace complex was in use between 1020 and c 1150, significantly later than the glass furnaces. One sherd of pottery dated after 1250 and a small rotary key dating from

the late fourteenth to sixteenth centuries must be intrusive.

Very few objects were recovered to indicate the purpose of the furnaces. Trench 72 (fig 5.44) produced two residual finds: a single small fragment of blue Saxon glass from the mixed clay near the supposed industrial surface and the rim or base sherd of a glass-making crucible, with turquoise glass adhering. The charcoal and ash layer [C:5263] that produced the radiocarbon date also yielded a nail fragment with mineralised wood, while forty-three nail fragments were recovered from a black layer associated with the furnaces. A small quantity (89g) of iron smithing slag was recovered from the robbery [C:5246] of a twelfth-century wall together with a copper-alloy ingot fragment or slag (151g) (see Chapter 8: Slag and metal residue samples). A clay mould for founding was recovered from an ashy layer associated with the furnaces, and fired clay from a foundry, mould (possibly for a bell or a cauldron) was retrieved from a post-Dissolution robber trench [C:5208]. Fragments of burnt clay may have derived from the industrial activity. To the south, Trench 74 produced 566g of conglomerated iron slag and burnt stone representing iron slag and a hearth or furnace lining (see Chapter 8: Slag and metal residue samples). To the north, 110g of possible

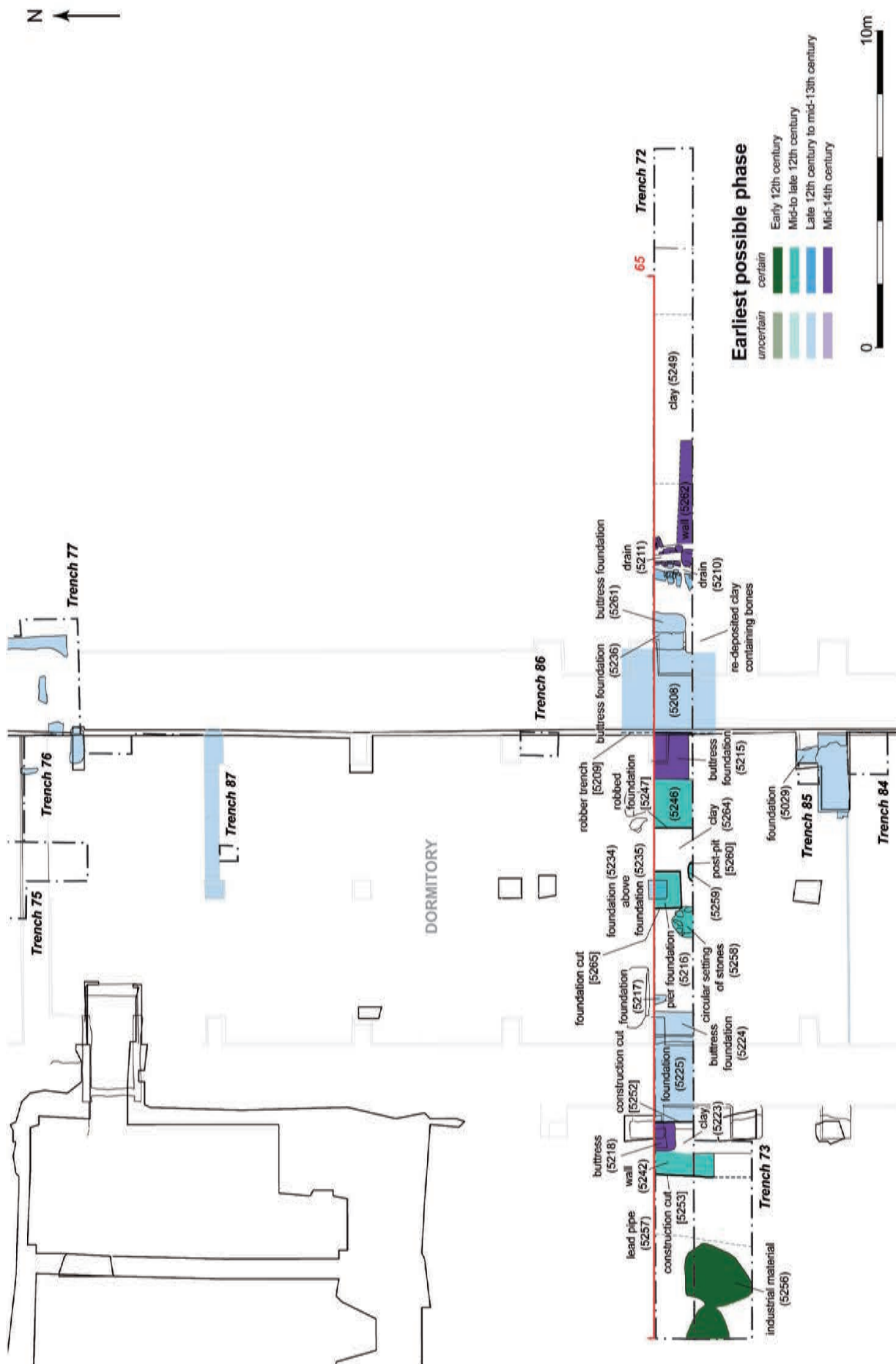


Fig 5.48 Plan of Trenches 72, 73, 75, 76, 77, 84, 85, 86 and 87 (scale 1:175)



iron smithing slag was recovered from Trench 75 and 168g of possible iron smithing slag from Trench 78. In Trench 80, a tiny glass fragment was found to the west of the furnace area and a fragment of furnace debris was recovered from a deep clay layer [C:5024] beneath the twelfth-century drain.

### Mid- to late twelfth century (Phase 8)

To the west of the dormitory, above the clean clay [C:5220] [C:5222] sealing the furnaces, was a thin level mortar layer [C:5219] and a short, undulating mortar spread [C:5251]. Both of the mortar spreads were covered by the later clay [C:5204] and may have been associated with mid-twelfth-century construction activity (fig 5.44).

Masonry associated with the mid-twelfth-century dormitory was recorded throughout the trenches. The west dormitory wall [C:5242] remained *in situ*; in Trench 72 this was located beneath a supposed fourteenth-century buttress [C:5218] on the western side of the robber trench [C:5252] for the west dormitory wall believed to date to the thirteenth century (fig 5.44). The wall [C:5242] was constructed of uncoursed lias with some Tor burrs and other stones set in soft brown mortar. The backfill [C:5223] of the construction trench [C:5253] contained two sherds of pottery dating from c 950. To the south of the later south dormitory wall foundation [C:5020] was a further foundation [C:5021] with a yellow mortar characteristic of other twelfth-century work (fig 5.49). Radford thought this represented the inner face of the twelfth-century south dormitory wall, which had been cut through longitudinally by the reredorter.

The east dormitory wall was represented by a robber trench running from north to south. In Trench 72 the robber trench [C:5247] was on the western side of the inner buttress [C:5215] of the later east dormitory wall (figs 5.44 and 5.48) and sealed beneath the thirteenth-century clay make-up [C:5233] (see below). The fragments of lias, scraps of burnt mortar and the small amount of burnt material within the clay backfill [C:5246] are consistent with a post-1184 fire date for the robbery. Other finds included a vitrified pottery sherd dated after 950 and a small quantity (89g) of iron smithing slag. In Trench 81, the robber trench [C:5005] was sealed beneath the supposed thirteenth-century mortar bedding [C:5001] (fig 5.49); the clay fill [C:5004] also contained burnt rubbish consistent with a post-fire date for the robbery.

There was some evidence for internal arrangements within the twelfth-century dormitory, including indications of construction. Two lias blocks [C:5235] at

the base of the robber trench [C:5206] for a later central pier base were labelled possibly twelfth-century (figs 5.37 and 5.48). The position of one of these stones to the west of the robber trench [C:5206] may support an earlier date. The construction trench [C:5265] for the pier foundation was cut into the natural clay [C:5248] and a post-pit [C:5260] recorded opposite in plan. Radford noted that this post-pit was traceable to 0.3m from the surface of the old clay [C:5248], perhaps suggesting it was contemporary with the possible twelfth-century remains [C:5235]. There was also a circular 'jumble of lias' stones [C:5258] recorded in plan extending from the south side of the trench; this may represent a further post-pit.

A wide robber trench [C:5023] filled with stones, rubbish and redeposited clay [C:5022] (figs 5.49 and 5.50) was aligned between the thirteenth-century pier and the west dormitory wall. However, it is significantly wider than the robbed later partition [C:5014] immediately to the north and was sealed beneath the burnt debris layer [C:5016], suggesting it may represent a twelfth-century partition.

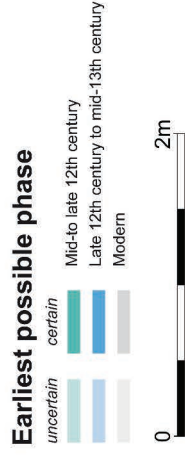
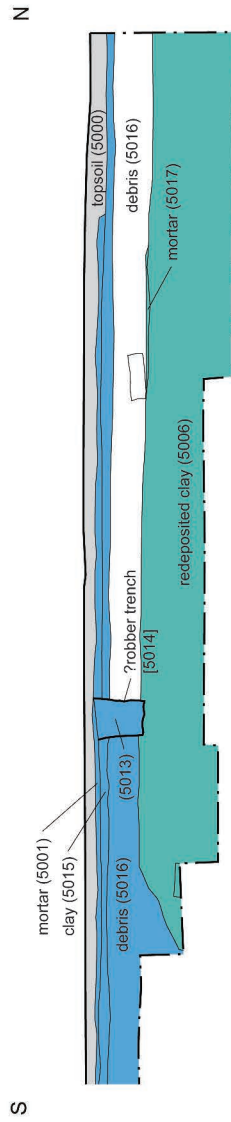
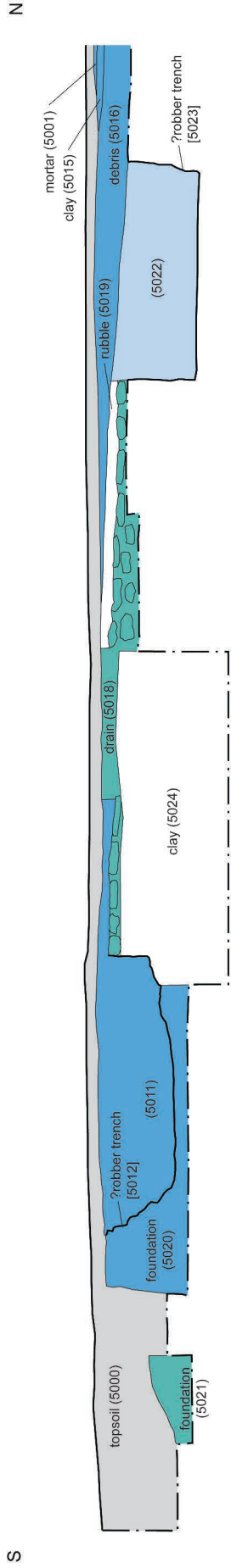
Running northwards from the robber trench [C:5012] for the south wall of the later dormitory was a substantial stone-built water channel [C:5018], approximately aligned north-north-east to south-south-west and constructed of irregular stones set in a hard white mortar. The later dormitory south wall was presumed to have cut through the supposedly twelfth-century drain [C:5018], although the direct relationship was lost due to later robbery [C:5012].

A layer of burnt debris [C:5016] associated with the 1184 fire overlay a thin remnant of white mortar bedding [C:5017] which is described as being level with the top of the supposed twelfth-century drain [C:5018]. This white mortar was also visible in much of Trench 81, although the section only shows a rubble fill [C:5003] labelled as twelfth-century, and was described as having sunk severely over the clay [C:5006] beneath.

To the east of the dormitory was a mortar layer [C:5239] seemingly cut by the construction trench [C:5237] for the later external buttress and overlain by a soil and clay layer [C:5213] and a deep layer of redeposited clay [C:5214]; this was dated by Radford to the thirteenth century (fig 5.44), although the pottery only provides a *terminus post quem* of 950. It seems likely that the mortar was associated with the twelfth-century phase as originally concluded, as the mortar [C:5239] was at the same level as a deep clay layer [C:5241] with a line of stones at the base thought to represent an old surface.

The deep clay [C:5241] covered a soft grey clay [C:5249] with a *terminus post quem* of 950 provided by

**Section 64: Trench 80**



**Fig 5.50** Section of Trench 80 (scale 1:50)

three sherds of pottery; this deposit was exposed in two test-pits in the trench base. Radford suggested this may be the wet ditch fill of the monastic enclosure bank and ditch, although the test-holes were located immediately east of the alignment recorded through the chapter house and the course of the ditch as depicted on the magnetic survey.

### Late twelfth to mid-thirteenth centuries (Phase 9)

A small fragment of a Tor burr foundation [C:5225] survived at the base of the robber trench [C:5252] for the west dormitory wall (figs 5.37 and 5.48). Immediately to the east was a 'pitched lias foundation' associated with the internal buttress [C:5224]; twenty-six sherds of pottery provided a *terminus post quem* of 1100. On the eastern side of the robber trench [C:5209] for the east dormitory wall, remnants of the external buttress remained *in situ*. In section this comprised a Tor burr [C:5236] and a lias

slab [C:5261] within a rubble-filled [C:5238] construction trench [C:5237]; this appears to be confirmed by the notes, which describe coursed stones bonded with thick hard white mortar [C:5236] and topped by a 0.2m course of lias [C:5261]. The foundations [C:5020] of the south dormitory wall were *in situ* beneath the post-Dissolution robber trench [C:5012] (fig 5.49 and 5.50). The north-east angle of the dormitory and buttress, with fragments of the masonry possibly shown in plan, were noted in Trench 77 but not recorded.

The central piers running north-south through the dormitory undercroft were recorded. In Trench 72 the pier had been largely robbed [C:5205] [C:5206], but Radford identified three possible phases of masonry in the base (fig 5.44). The possible twelfth-century stones [C:5235] are discussed above. In the centre of the robber trench base was one large Tor burr [C:5234] labelled as thirteenth-century, with three lias blocks [C:5216] on its eastern side labelled as fourteenth-century, although there



**Fig 5.51** ?Robbed central pier in Trench 72, looking east (1959 photograph: © EHA)

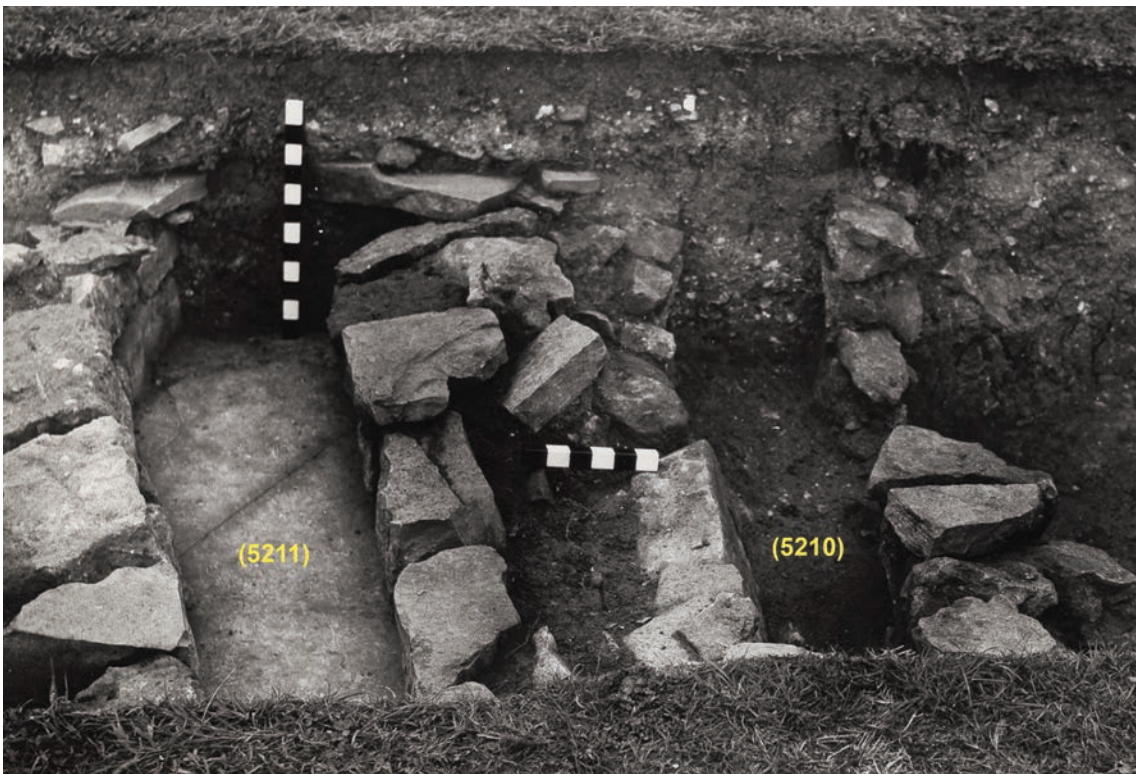
is no evidence to support this date (figs 5.44 and 5.48). In plan, the foundation was square and projected from the north side of the trench by 0.81m (possibly shown in figs 5.48 and 5.51). The foundation [C:5026] and square base [C:5025] of the fifth central pier from the south were recorded in plan (fig 5.49).

Evidence for internal arrangements was recorded in four places. The base of a well-constructed partition wall [C:5027], aligned north–south and measuring 0.54m wide, extended northwards from the southern central pier of the dormitory undercroft for a distance of 2.73m (fig 5.49). A small robber trench [C:5013] [C:5014] between the central pier and the west wall may represent a partition between the second and third bays from the south (figs 5.49 and 5.50). Mortar bedding [C:5001] above the robber trench indicates that the partition was removed while the dormitory was still in use. The eastern end of a further cross-wall foundation was recorded in Trench 85, on the south side and flush with the fourth internal buttress from the south (fig 5.48). The south side of this foundation was shown in plan continuing across the full width of the dormitory, indicating the presence of a partition on the south side of the central pier between the fourth and fifth bays from the south. A fourth partition is shown in plan across the eastern side of the dormitory between the eighth and ninth bays from the south.

Remnants of the thirteenth-century mortar bedding

[C:5228] survived above a deep layer of dark clay [C:5231] [C:5233] with tip lines (fig 5.44). Near the western edge of the dormitory was evidence of subsidence: the mortar layer [C:5228] covered yellow clay [C:5229], which overlay a thin band of white mortar [C:5230] sloping upwards from west to east. Radford described this as the twelfth-century mortar bedding sagging under the late foundations [C:5217] and overlying the earlier industrial disturbance. Stratigraphically this is impossible, as the dark clay [C:5233] sealed the robber trench [C:5246] [C:5247] for the twelfth-century east dormitory wall. The sloping mortar layer [C:5230] and overlying make-up [C:5229] is more likely therefore to represent sagging of the thirteenth-century bedding layer. A further mortar layer [C:5001] overlay a thin clay make-up [C:5015] in Trench 80 (fig 5.50), and another mortar bedding layer [C:5002] in Trench 81 (fig 5.49) sloped gradually downwards from east to west. This indicates that the lower mortar bedding [C:5002] had slumped and that the upper mortar bedding [C:5001] was a repair.

Two drains were recorded 1.52m east of the dormitory (figs 5.52 and 5.53), both with blue lias cover stones. These appear to have been detected on the GPR survey at a depth of 0.0–1.0m (figs 2.18 and 2.19). Although the earlier north–south aligned drain [C:5210] had been disturbed by the construction of the later drain



**Fig 5.52** Two drains to E of dormitory Trench 72, looking south (1959 photograph: © EHA)





**Fig 5.53** Two drains and rubble wall Trench 72, looking east (1959 photograph: © EHA)

[C:5211] (see below) to the east, the construction is visibly less robust and the side walls were composed of smaller rubble pieces. The construction trench had a *terminus post quem* of 1250 provided by three sherds of pottery, and a further eleven sherds (P1262) dated to the fourteenth to fifteenth centuries were recovered from one of the drains.

### Mid-fourteenth century (Phase 11)

To the west of the robbed west dormitory wall [C:5252] was an upstanding outer buttress [C:5218] constructed of lias and labelled as fourteenth-century (figs 5.44 and 5.48). This had been constructed above the remains of the twelfth-century west dormitory wall [C:5242]. An inner buttress foundation [C:5215], labelled as fourteenth-century, was located on the western side of the robber trench [C:5209] for the thirteenth-century east dormitory wall, constructed of large lias slabs and one large Romanesque blue lias block. The lower courses were pitched on edge and driven in to the clay [C:5248] while the upper courses were laid flat. A layer of mortar bedding [C:5226] is a remnant of an upper bedding layer possibly associated with the mid-fourteenth-century phase (fig 5.44).

On the eastern side of the supposed thirteenth-century drain [C:5210] was a stone-lined drain [C:5211]

aligned north–south with a slight westward curve near the southern section (figs 5.52 and 5.53). Although Radford suggested that this may have been post-Dissolution, the solid construction and the location of the drain beneath the post-Dissolution or modern debris layer [C:5000] indicates a medieval date, probably representing improvements to the water supply. As noted above, a further eleven sherds (P1262) dating from the fourteenth to fifteenth centuries came from one of the two drains. A rubble wall [C:5262] extended eastwards from the drains cutting through the post mid-thirteenth-century drain [C:5210]. The rough nature of the wall led Radford to believe this was a post-Dissolution garden wall; however, the remains were beneath the post-Reformation or modern debris layer [C:5000], perhaps indicating a medieval date (fig 5.53). The section drawing shows that the trench was excavated beyond the level shown in the photograph; this may have revealed further evidence in support of a post-Dissolution date.

### Post-Dissolution (Phase 16)

Robber trenches were identified for the west dormitory wall [C:5252], the south dormitory wall [C:5012], the east dormitory wall [C:5209] and the central pier of the dormitory undercroft [C:5206] (figs 5.37, 5.48 and 5.50). The backfills were similarly described as loose earth with

much mortar [C:5251] [C:5205], rubble fill [C:5011] or loose fill [C:5208]. The backfill of the robbed west dormitory wall [C:5202] possibly indicates two phases of robbery, and contained a possible copper-alloy box lid.

The post-Dissolution or modern debris layers [C:5200] [C:5000] extended within and to the east of the remains of the dormitory. To the west of the dormitory was a deep destruction level [C:5203] beneath the topsoil.

A post-Dissolution or modern lead pipe [C:5257] ran through this layer from north-north-east to south-south-west. Two post-Dissolution or modern walls were identified within the dormitory area. A rough foundation [C:5207] of unmortared stones is suggestive of a modern boundary (fig 5.44). A further foundation [C:5217] was located to the west, comprising one course of squared stones.

## 6

# The inner court and precinct

*Cheryl Green and Roberta Gilchrist*

This chapter critically examines the evidence for the proposed Late Saxon cloister, considers the character of the twelfth- and fourteenth-century abbots' halls and assesses post-Dissolution activity, particularly in relation to documented occupation of the abbot's hall by a community of Walloon worsted weavers, Protestant refugees from Flanders afforded refuge at the former abbey site by the Duke of Somerset.

Radford proposed that he had identified the east range of 'Dunstan's cloister' in 1951–4 (see Chapter 5) and found traces of the south and west ranges beneath the later abbot's range. He observed shared characteristics in the masonry of the alleged ranges of the Saxon cloister and the third phase of the Saxon church attributed to Abbot Dunstan. These remains were not closely datable on archaeological grounds (see Chapter 4) and the observed similarities were based upon the personal recollections of Wedlake and Radford across several decades. The remains beneath the abbot's hall can only be dated on stratigraphic evidence as earlier than the fourteenth century. There is good stratigraphic evidence that the stone structures beneath the west cloister walk (see Chapter 5) and to the south of the refectory are earlier than the twelfth century. However, the archaeological evidence is insufficient to reconstruct a full cloister as envisaged by Radford and Wedlake. It is suggested here that several free-standing structures dating from the period between the tenth and the late eleventh centuries were located across the later west cloister and abbot's range areas.

Radford suggested the existence of a twelfth-century abbot's hall to the west of the refectory, based on explorations by Bond and the excavations conducted in

1939. He attributed this to Henry of Blois (1126–71), although Robert of Winchester (1173–80) is also documented as having built a chamber and chapel that may have formed part of the twelfth-century abbot's hall.<sup>1</sup> Wedlake produced a multi-phase stone-by-stone plan of the area, including two short stretches of walling recorded in 1978–9. This discovery informed the alternative theory that the twelfth-century hall was located beneath the fourteenth-century hall. These remains were identified as part of the 'palace' of Henry of Blois that was documented by John of Glastonbury, together with the building to the west of the refectory and less substantial structures to the north of the abbot's hall. While there is insufficient evidence to support this theory, there was a substantial twelfth-century building to the west of the refectory, and stratigraphic evidence confirms a twelfth-century date for the walls discovered in 1978–9 beneath the abbot's hall.

Radford suggested the presence of a thirteenth-century hall based on just a few features earlier than the fourteenth century; this interpretation is no longer upheld. In contrast, reanalysis of the archaeological evidence for the later medieval abbot's range has led to significant progress in understanding the abbot's complex. Several sixteenth-century finds from the abbot's hall could possibly relate to the Walloon occupation of the precinct (see Chapter 8: Small finds), and some of the post-Dissolution occupation levels within the building footprint may relate to this same episode. Radford associated several features with Monmouth's documented encampment; however, the short-lived occupation would have left only ephemeral traces which cannot be proven archaeologically.

## Late Saxon (Phase 4)

### Structural remains

The 1938–9 excavations discovered narrow foundations in blue lias, and Wedlake noted their resemblance to those of the Saxon church excavated in 1926–9. Located immediately north of Trench 5, Radford later interpreted these foundations as the southern end of an ‘east range’ and the eastern end of a ‘south range’ (fig 6.1). The ‘east range’ was thought to continue northwards beneath the later refectory and cloister (see Chapter 5); Radford addressed the misalignment in the walling on either side of the refectory by suggesting that the room to the north was 1.5m wider, but there is no proof that the structures were connected.<sup>2</sup>

To the north of the refectory, the remains were stratified beneath the twelfth-century west cloister walk. Those to the south appear to relate to the pre-twelfth-century layout; however, a small sandstone water-basin was found in 1938–9 within the south-east angle of a room to the north of Trench 5 (fig 6.1) in association with a quantity of black medieval cooking pots and remains of fish and animal bones. There are no surviving archaeological records and the pottery could not be located within the finds assemblages; this deposit would strengthen Wedlake’s suggestion that the building functioned as a kitchen into the twelfth century.

Radford recorded an ‘early’ wall in Trench 5 (which had been left open since 1939), with associated paving to the south, extending westwards beneath a later retaining wall (fig 6.2). The caption for the published photograph states this is a tenth-century wall to the south of the refectory, and the remains appear to equate with the eastern end of the ‘south range’.<sup>3</sup> The unpublished excavation plan of the same area depicts extant masonry showing the junction of two rooms (fig 6.1). The intersection between the two connecting rooms is clearly defined on the GPR survey at a depth of 1.0–1.5m (see fig 2.20), confirming that deposits survive and may be investigated further. A foundation photographed in 1951 was labelled ‘Excavation of Dunstan’s monastery’ (fig 6.3); however, it has not been possible to link the photographed remains with any planned features.

Structural remains within the south area of the early fourteenth-century abbot’s great hall were tentatively linked to ‘Dunstan’s cloister’ (Trench 88). These comprised two parallel, east–west walls / foundations [C:5819] [C:5827] of similar dimensions, with a layer of mortar between them [C:5818] (figs 6.4 and 6.5). The remains were said to resemble the structures previously identified by Radford as an east range (see Chapter 5),

although the 1962 discoveries could only be dated stratigraphically to the early fourteenth century. It is likely that the published account, describing a series of rooms forming a possible ‘west range’ running north–south, with thin plastered walls and floors of cream-coloured mortar, refers to these remains.<sup>4</sup> The 1978 excavations disclosed what was believed to be a more convincing location. As a consequence, the parallel walls / foundations [C:5819] [C:5827] were tentatively linked to a ‘south range’, although they are considerably further north than the previously published location.<sup>5</sup> The 1981 publication is vague about the location of the 1962 discoveries, stating that the parallel walls were on the south side of the abbot’s hall. With no updated plans of the supposed Late Saxon cloister published since 1955, the discrepancy in alignment between the two parts of the supposed south range has become evident only now.

During the 1978 excavations two short narrow fragments of blue lias masonry were discovered encased within the west wall foundations of the early fourteenth-century abbot’s hall. One to two courses of walling ran northwards from the north-west corner of the later hall; this is not shown in plan, but section drawings reveal two segments of walling at different levels (fig 6.6). An east–west wall was described as running beneath the western foundations of the later hall, shown in plan immediately south of section 100 (fig 6.7). Wedlake’s site notebook describes an inspection by Radford, during which the remains were described as resembling the two parallel walls / foundations [C:5819] [C:5827] discovered in 1962. Walling photographed at a depth of c 1.6m below the modern turf is sufficiently deep to relate to these remains (figs 6.8 and 6.9), indicating that the wall at least pre-dated the later abbot’s hall.

Radford recorded a series of blue lias walls comprising roughly squared stones set in a hard yellow mortar, either surviving as a single course of masonry or isolated stones in a shallow foundation trench, with cream-coloured mortar bedding.<sup>6</sup> Remains fitting this description included a structure beneath the south side of the early fourteenth-century abbot’s hall and two structures to the south of the refectory, which appear to intersect at their corners. The relationship between the two walls beneath the west side of the abbot’s hall was not established; therefore a further room / structure cannot be proven. Based on the observed similarities with the stratified remains beneath the west cloister walk, it is possible that these remains pre-date the twelfth century, although those beneath the abbot’s hall could only be dated on stratigraphic grounds as earlier than the fourteenth century. In summary, the evidence suggests several separate structures that could date from the Late Saxon period.

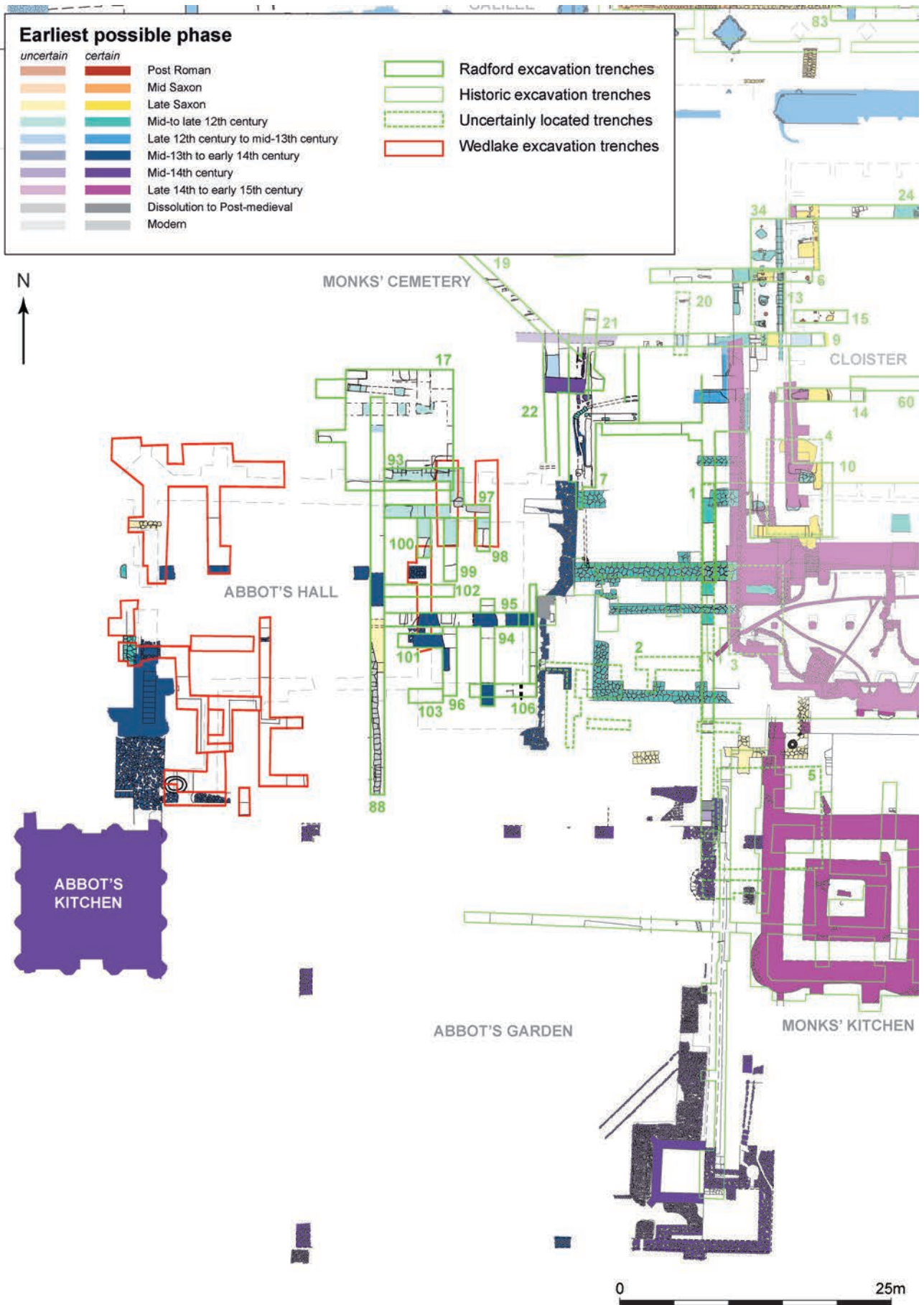


Fig 6.1 Plan of phased archaeology across the abbot's range (scale 1:500)

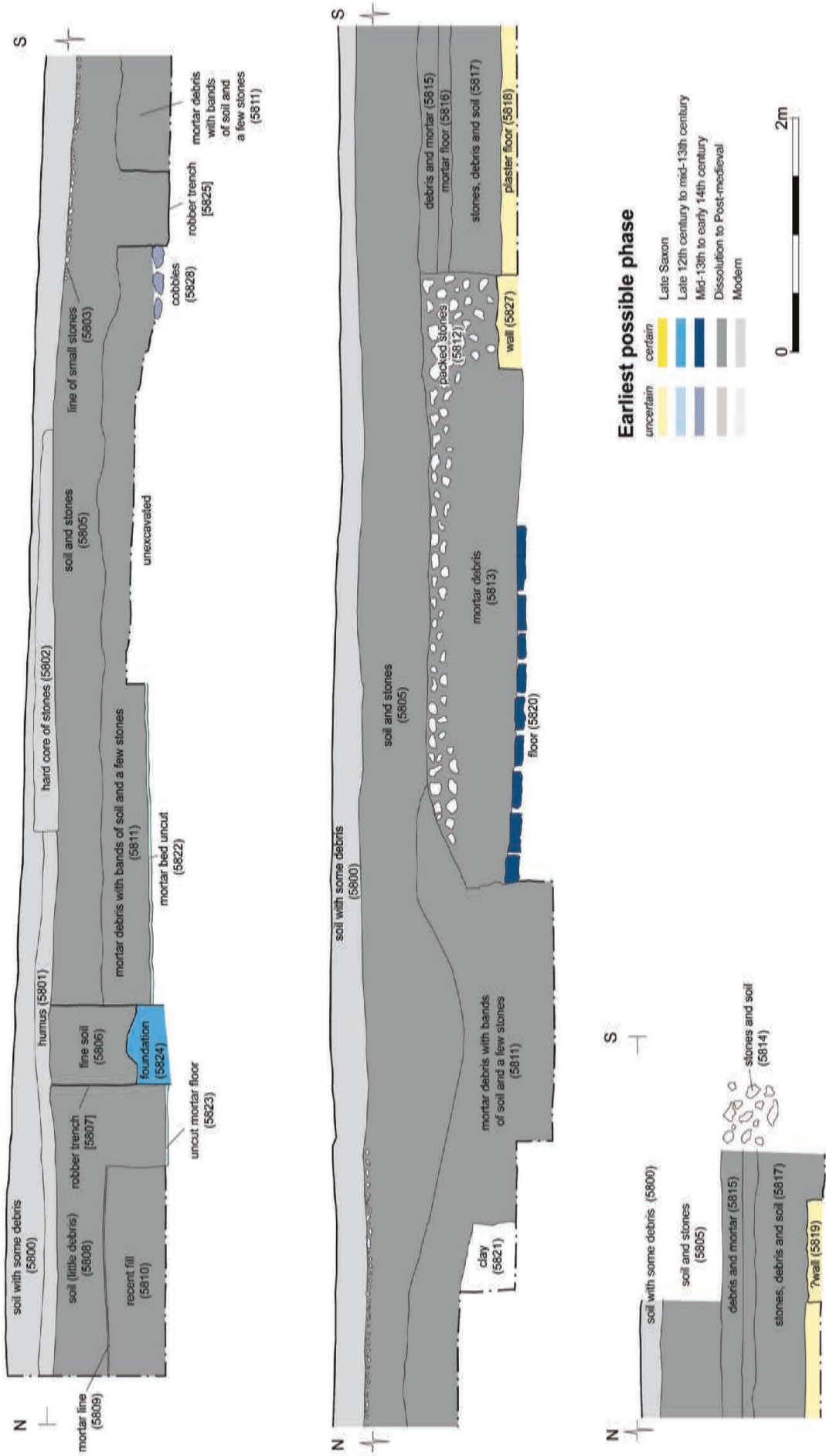


**Fig 6.2** Possible Saxon remains, looking east (1951 photograph: © EHA)



**Fig 6.3** Possible Late Saxon foundation (1951 photograph: © EHA)

**Section 71: Trench 88**



**Fig 6.4** Section of Trench 88 (scale 1:50)

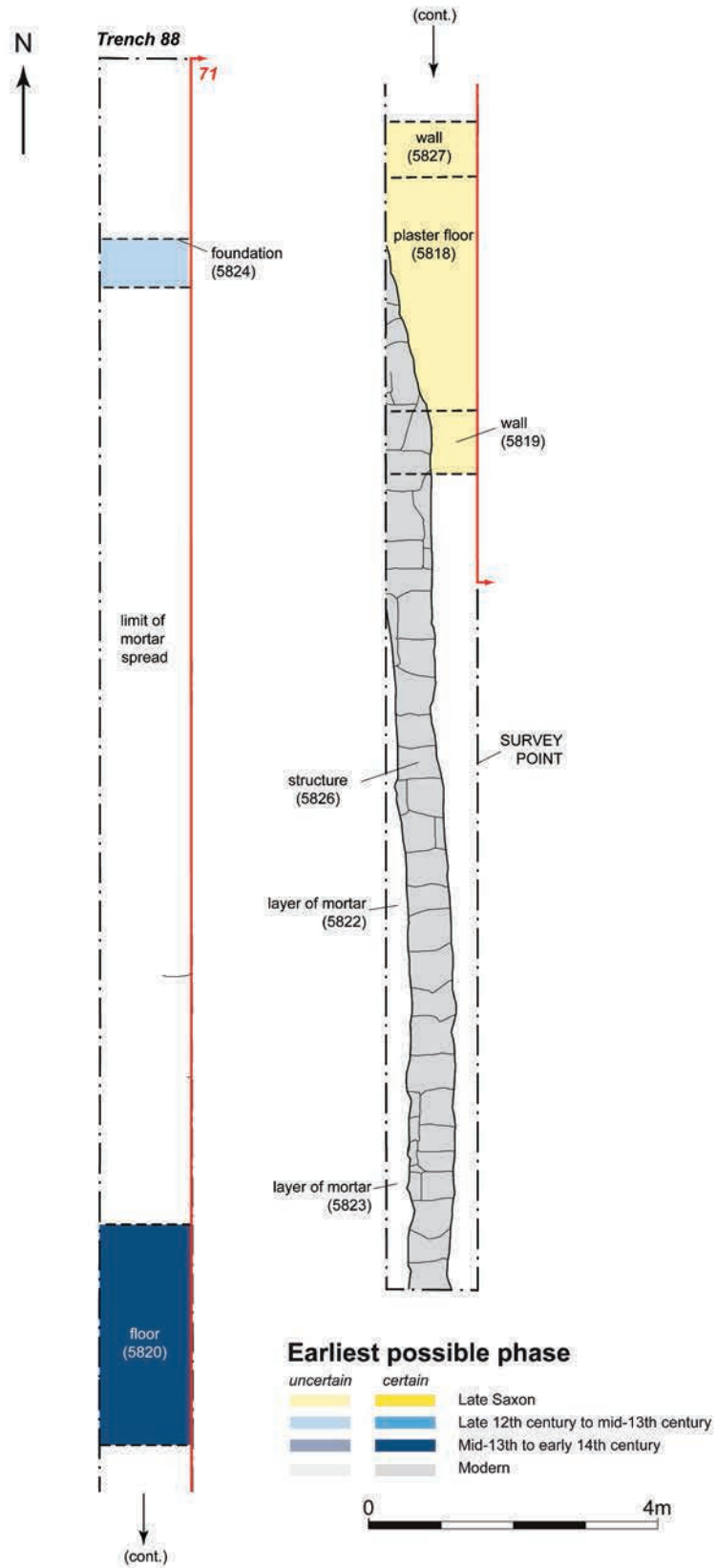
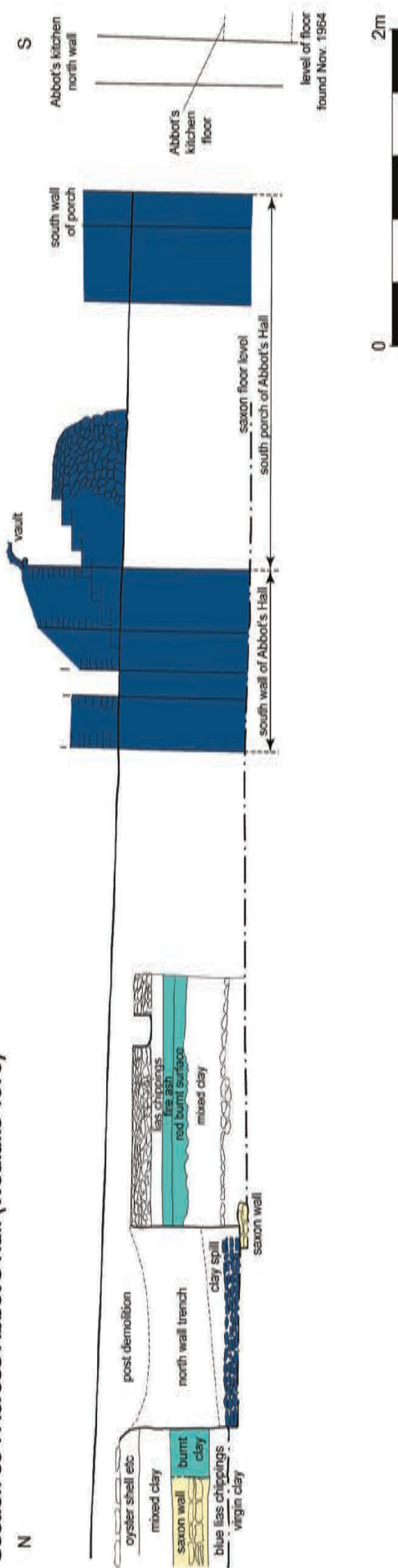


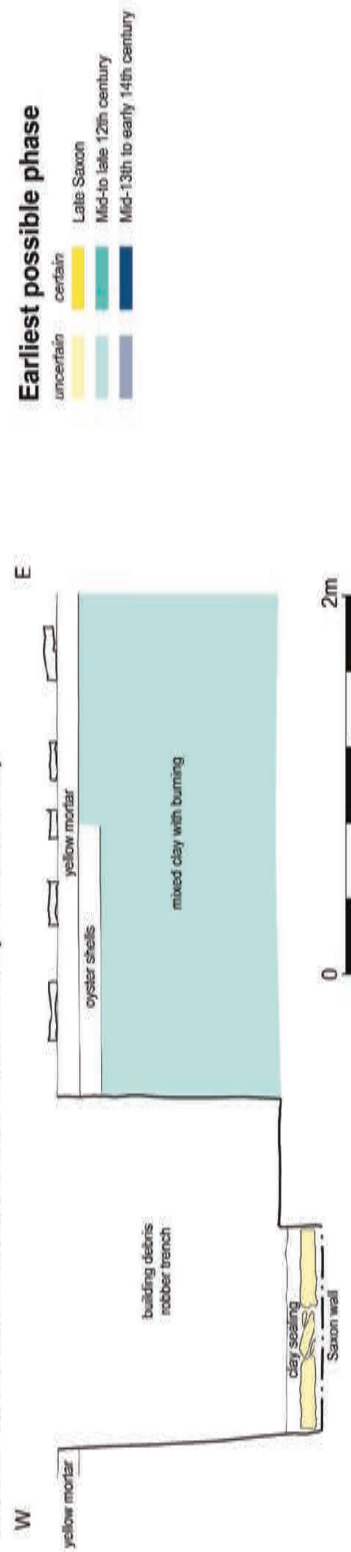
Fig 6.5 Plan of Trench 88 (scale 1:100)



Section 89 : Across Abbot's Hall (Wedlake 1979)



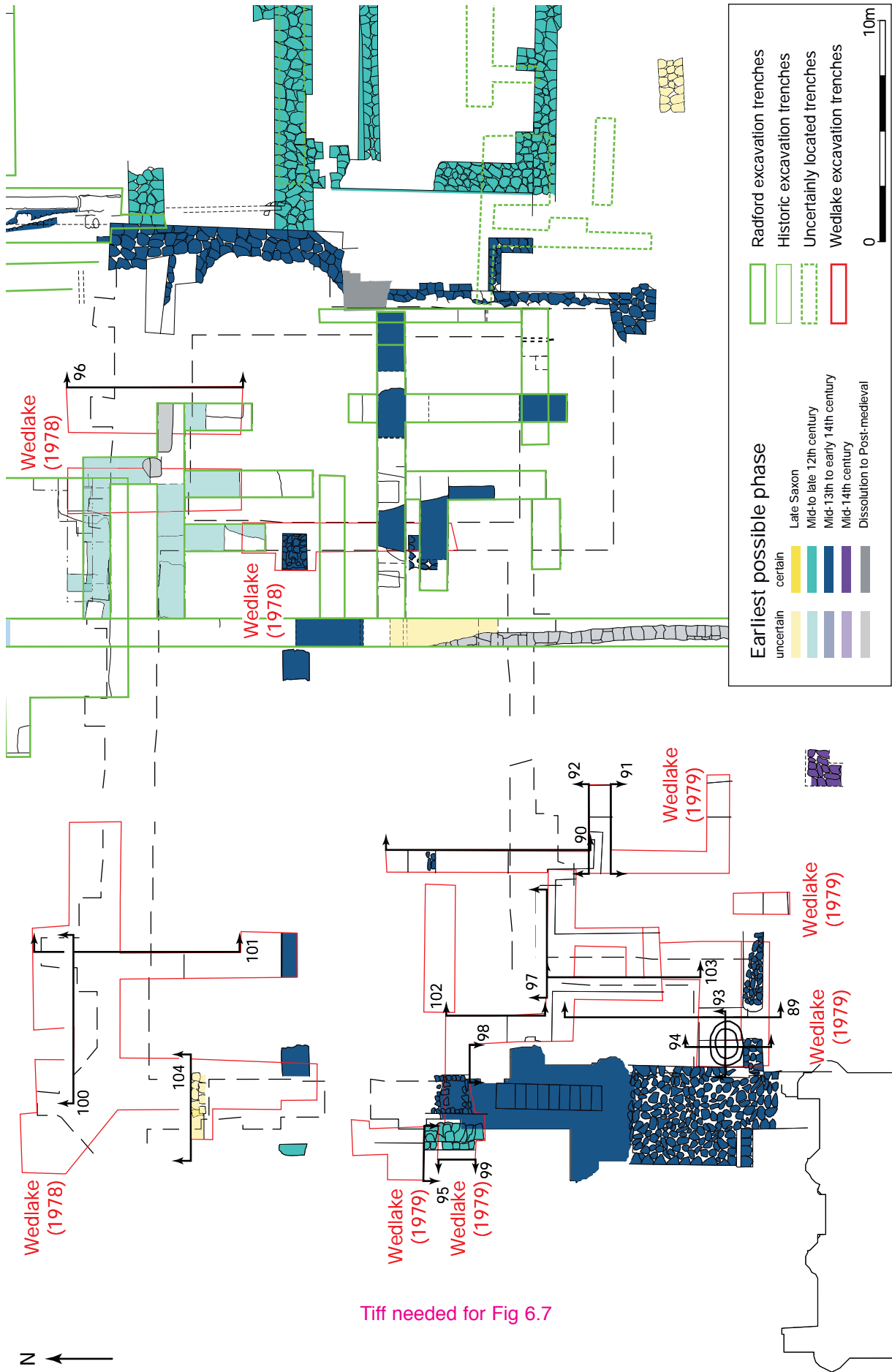
Section 100: North-West corner of Abbots Hall (Wedlake 1979)



Earliest possible phase

uncertain	yellow	Late Saxon
certain	light blue	Mid-to late 12th century
	dark blue	Mid-13th to early 14th century

Fig 6.6 1979 Trenches, Sections 89 and 100 (scale 1:40)



Tiff needed for Fig 6.7

Fig 6.7 Plan showing numbered sections for the 1978-9 trenches (scale 1:250)



**Fig 6.8** Possible Saxon walling (1979 photograph: © Glastonbury Abbey)



**Fig 6.9** Possible Saxon walling (1979 photograph: © Glastonbury Abbey)

## Mid- to late twelfth century (Phase 8)

### Structural remains

Bond recorded a wall on the eastern side of St Michael's Chapel that terminated in a large building that extended westwards from the southern end of the west cloister walk.<sup>7</sup> The structural remains in this area and to the west of the refectory were more fully exposed during the 1939 excavations; in 1951, the trench bisected walls and foundations and recorded evidence for paving between them. The 1955 publication indicates that some of these remains were thought to relate to a twelfth-century abbot's hall, which Radford suggested ran westwards from the south-west corner of the cloister. There are difficulties in mapping the 1951 trenches (1 and 2) accurately and in correlating the excavation notes with features; such an assessment would have been impossible without Wedlake's account. His plans show extensive walling that coincides approximately with the features within Radford's narrow trench, allowing the 1951 discoveries to be evaluated within a wider spatial context.

A Tor burr foundation [C:382] and ashlar wall [C:379] (figs 6.10, 6.11 and 6.12) probably relate to the north wall of a room (fig 6.1) measuring 10.01m long and 4.88m wide. The south wall is probably represented by a further Tor burr foundation [C:372] with remnants of finely

jointed Tor burrs and lias walling [C:371] retaining an offset on the south side. A Tor burr foundation with some ashlar facing [C:370], recorded *c.* 1.22m to the south, may relate to a passageway between the two rooms, which Wedlake thought had been inserted into the northern side of a larger hall. It was suggested that this chamber was used as a waiting area between the smaller room and the larger hall, with an entrance in the north-west corner providing access to the smaller room. The paving level of the postulated twelfth-century range may be represented by mortar bedding beneath an earth and debris layer [C:383] and a layer of slabs and floor debris [C:373], above a possible construction deposit of soil with small stone chippings [C:374] (fig 6.11). These deposits were located between the wall [C:379] and the foundation [C:372].

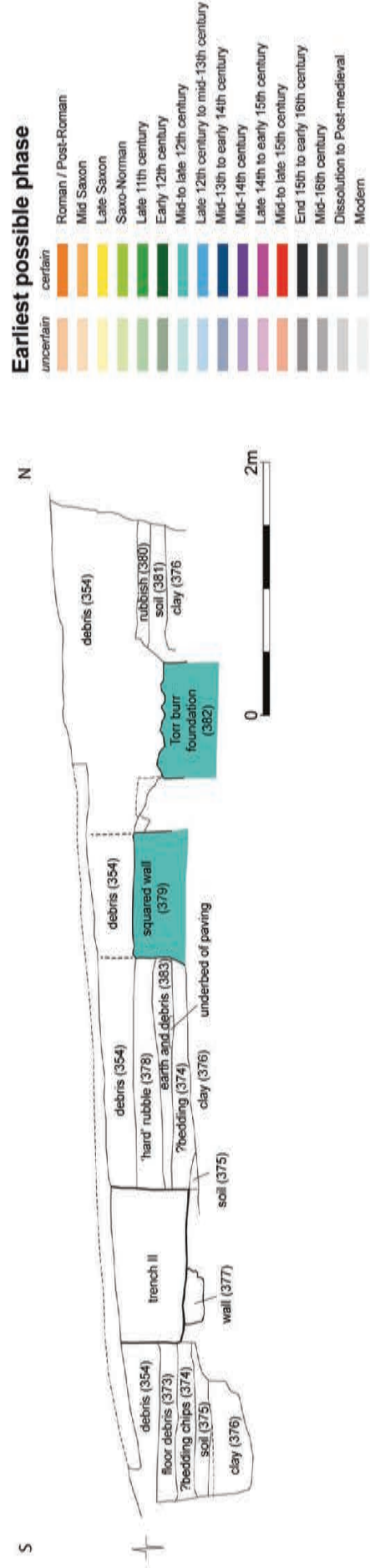
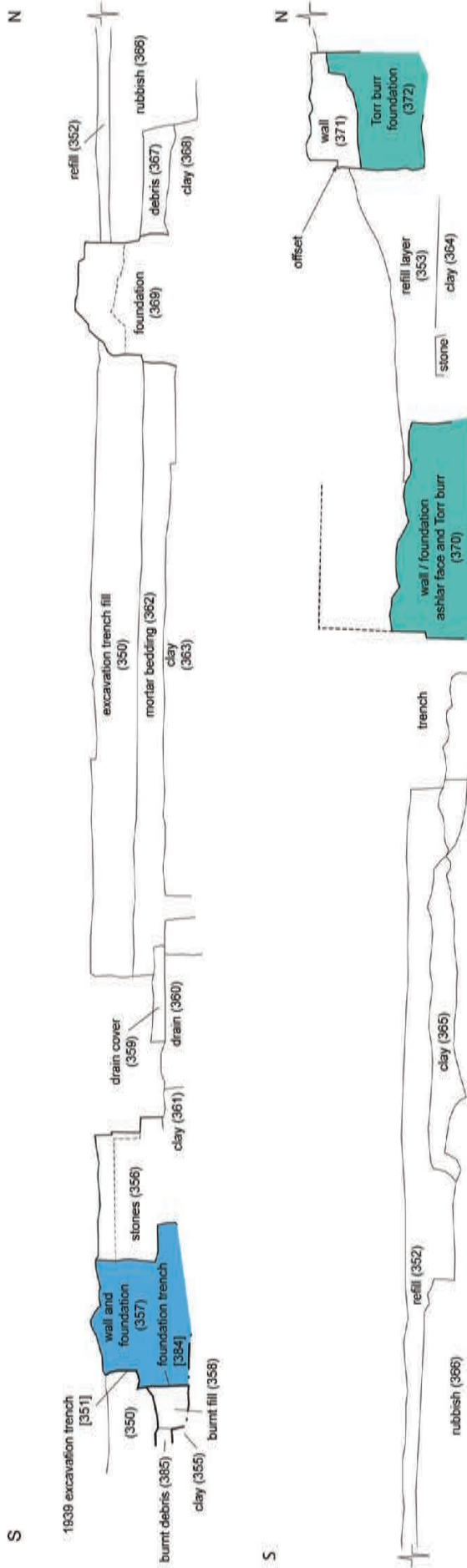
The larger hall measured 10.36m square, and the presence of internal bases for pilasters or columns against the south and west walls indicate a building of some importance. The paving and north wall of the 'early abbot's hall' were described as cutting the north wall of the later refectory. It is difficult to evaluate the evidence on the basis of limited records. However, the plan clearly shows the eastern end of the large room and passageway beneath the west end of the later refectory (fig 6.1), indicating an earlier date for the building.

To the north east of the early fourteenth-century



**Fig 6.10** ?Wall of twelfth-century abbot's range, looking north east (1952 photograph: © EHA)

**Section 30**



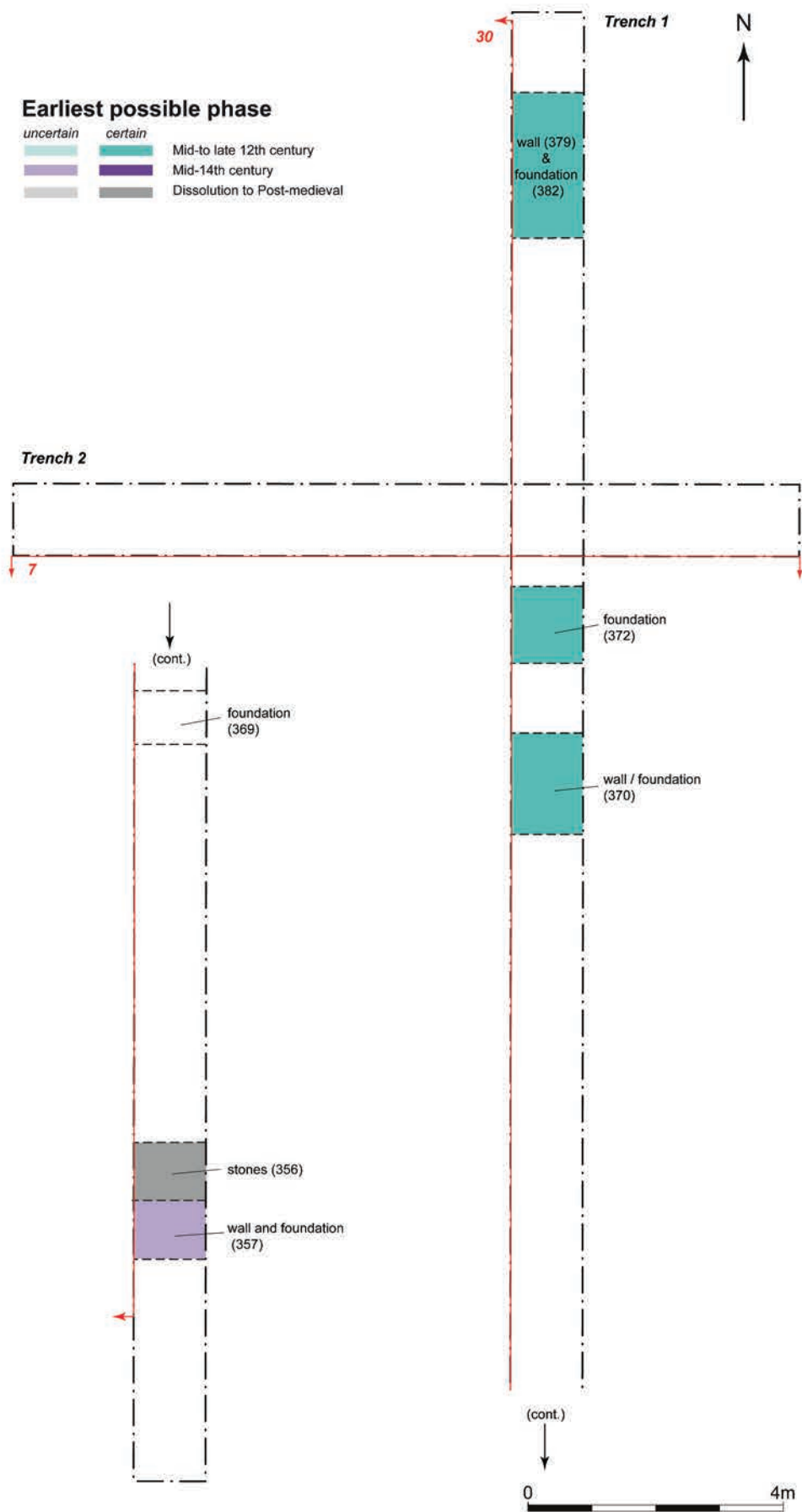


Fig 6.12 Plan of Trenches 1 and 2 (scale 1:100)

abbot's hall, an 'early' drain [C:461] entered the east side of Trench 7 before turning southwards where a later drain [C:467] had been inserted (figs 6.13 and 6.14). Radford noted that the earlier drain had been deflected around the north end of the early fourteenth-century abbot's hall, when 'Henry of Blois's hall' was already in ruins, although no rationale is provided for this interpretation. This would imply not only that the course of the drain was altered, but that masonry discovered by Bond immediately to the south may have been associated with the twelfth-century range. In addition, a plan produced by Wedlake shows a short, east–west aligned wall to the north of the small room (fig 6.1), although there are no details regarding date or character.

Radford's 1951 recording of the 1939 excavations revealed at least three walls represented by robber trenches and foundations between the early fourteenth-century abbot's hall and the cemetery (figs 6.1, 6.11 and 6.12); these may correlate with responses on the magnetic, resistance and GPR surveys. These walls may represent the features interpreted as poorly constructed twelfth-century buildings in the published account of the 1963–4 excavations;<sup>8</sup> unfortunately, there are no other records covering this area. Three graves (two of which are intercutting) were recorded in Trench 17 to the north of the possible building, immediately south of the monks' cemetery (see fig 4.9).

Wedlake's account of the 1978–9 excavations includes the substantial remains which he associated with 'Henry of Blois's palace', comprising heavy blue lias wall foundations measuring 1.22m wide beneath the west wall of the early fourteenth-century hall (fig 6.7). Only section 104 represents this walling (fig 6.15); a 1979 trench in the vicinity of sections 95 and 99 shows masonry on the western side of the abbot's hall west wall (figs 6.16 and 6.17) which may also relate to these supposed twelfth-century remains. A letter from Wedlake to Radford confirmed that a north–south wall ran immediately west and almost parallel to the fourteenth-century west wall.<sup>9</sup> The letter also states that this wall was associated with a mass of fire ash about 0.15m thick and at the same level as the mass of burnt material discovered the previous year. This appears to confirm a twelfth-century date for at least one of the walls. It was noted that the burning was less intense on the external side of the wall, where a distinct lowering of the ground was encountered. In Wedlake's opinion, the evidence indicated that a twelfth-century hall occupied the same position as the early fourteenth-century hall, with the floor level of the later hall located 0.61m above the 1184 fire debris. However, with only two small segments of the western side of the

structure apparently exposed, there is insufficient evidence to reconstruct the plan or to identify the structure as a hall.

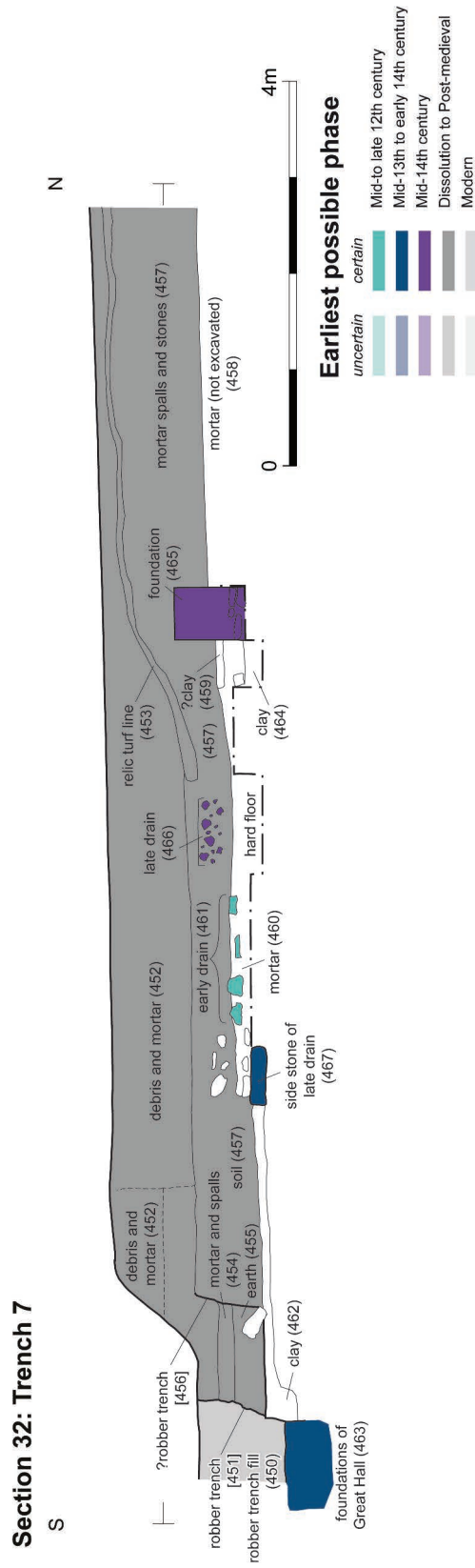
### Occupation layers

Radford described an early mortar bedding layer [C:6056] above a mortar debris layer [C:6057] to the north of the later abbot's hall (figs 6.18 and 6.19). Consistent at a depth of 1.02m deep, this was at approximately the same depth as mortar bedding layers [C:5822] [C:5823] in Trench 88 (fig 6.4). Located *c* 0.2m below the level of the late medieval surface (above soil layer [C:6053]), these were possibly associated with the twelfth-century buildings. Slightly further south, just within the early fourteenth-century abbot's hall, a mortar bedding layer [C:7060] at the base of Trench 97 was at the same depth (figs 6.18 and 6.19). The plan shows what appears to be a continuation of the same mortar layer [C:7060] into the trench connecting Trenches 93 and 97, and within Trenches 98, 99 and 100 [C:7063] [C:7064] (fig 6.19). This suggests a maximum extent for the mortar bedding of *c* 11m square, although in plan part of the layer is labelled as a mortar mixing floor [C:7063], indicative of construction. This covered a layer of packed stone and debris [C:7066] recorded in the southern half of Trench 98 (fig 6.19). Labelled in a sketch plan as cobbling, this was associated with a red mortar floor. The excavation notes record burning on the surface of the mortar bedding [C:7060] suggesting that it was *in situ* prior to the 1184 fire. However, pottery dating from 1250 was trodden into the surface, and the underlying clay make-up [C:7061] appears to have contained finds dating from 1280, with indications of a burnt debris layer [C:7062] beneath. This throws doubt upon Radford's pre-1184 date for the mortar bedding [C:7060].

A thin layer of crushed slate [C:7059] overlying part of the mortar bedding [C:7060] was thought to represent a remnant of the twelfth-century flooring, although this interpretation is affected by the uncertain dating of the mortar bedding (figs 6.18 and 6.19). Radford described thin slivers of well-bedded slate over much of the area, with parts of the floor described as having a 'churned surface' with no slate. Finds from 1964 confirm the presence of this broken slate layer.

### The 1184 fire

In 1978–9, further 'striking evidence' of the 1184 fire was visible in the construction trench of the abbot's hall west wall (figs 6.6 and 6.20). A thick layer of burnt wood and



**Fig 6.13** Section of Trench 7 (scale 1:75)



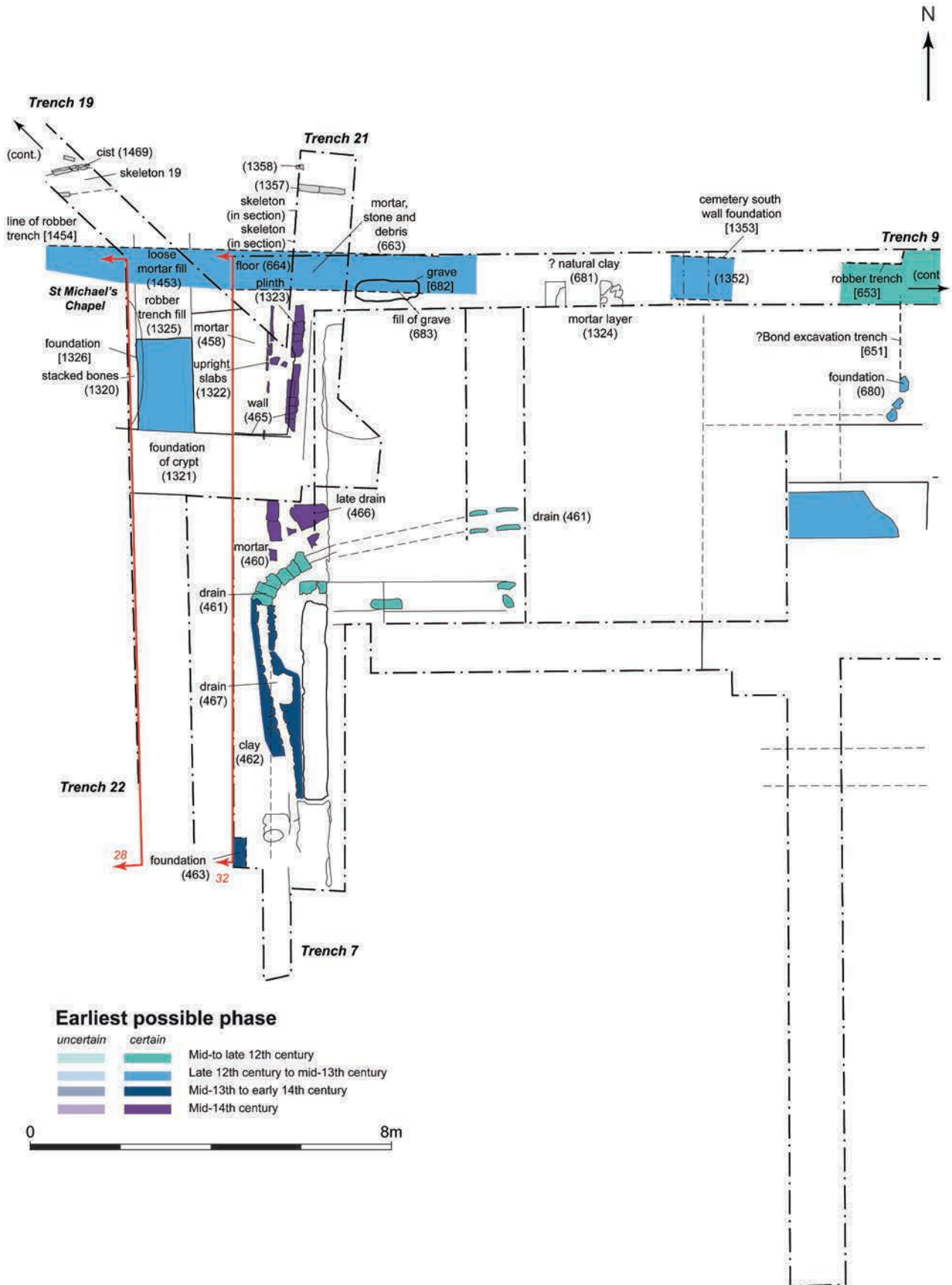
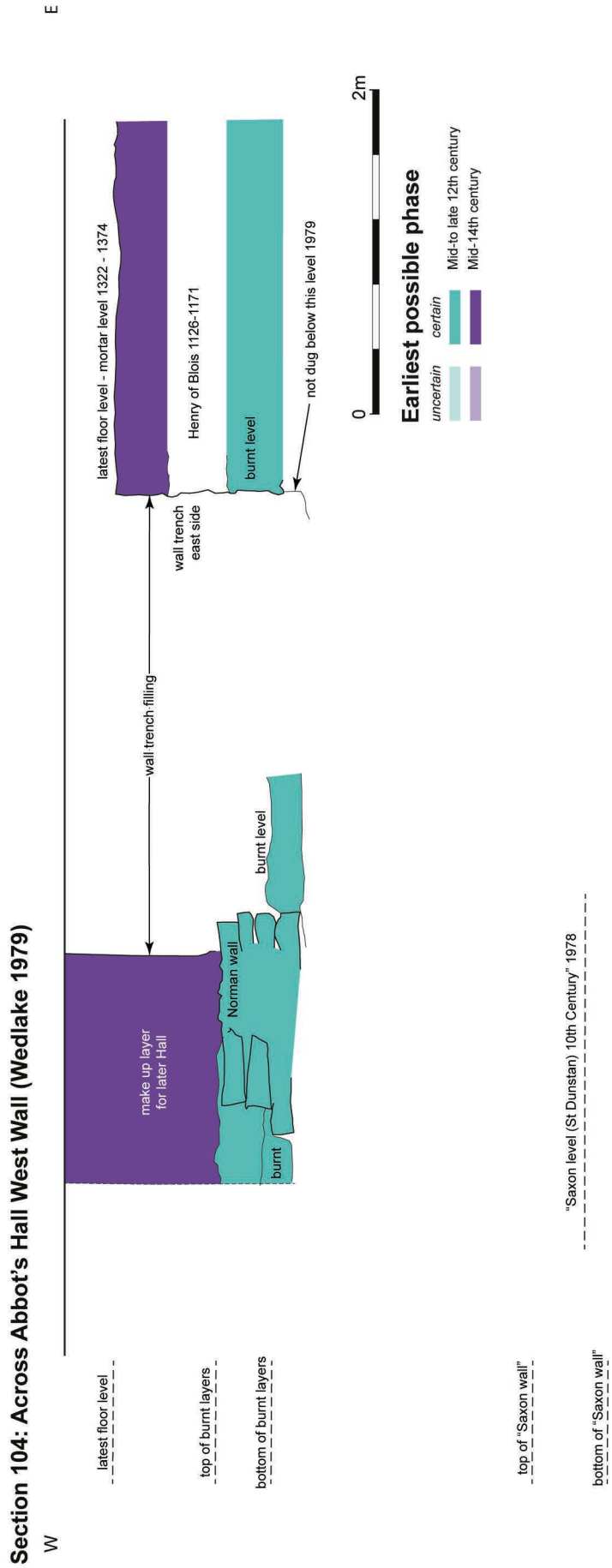


Fig 6.14 Plan of Trenches 7, 9, 19, 21 and 22 (scale 1:125)



**Fig 6.15** 1979 Trench, Section 104 (scale 1:40)

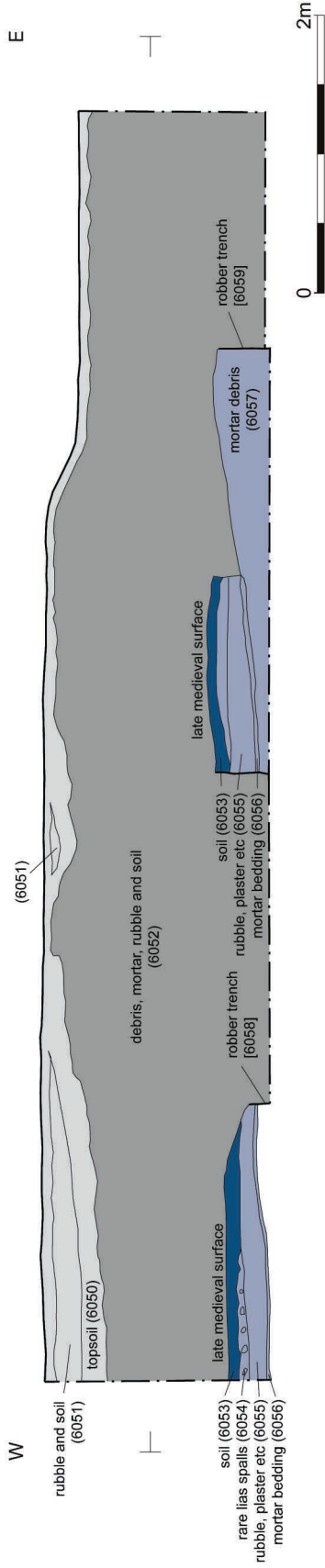


**Fig 6.16** West wall of hall with earlier wall to the west (1979 photograph: © Glastonbury Abbey)

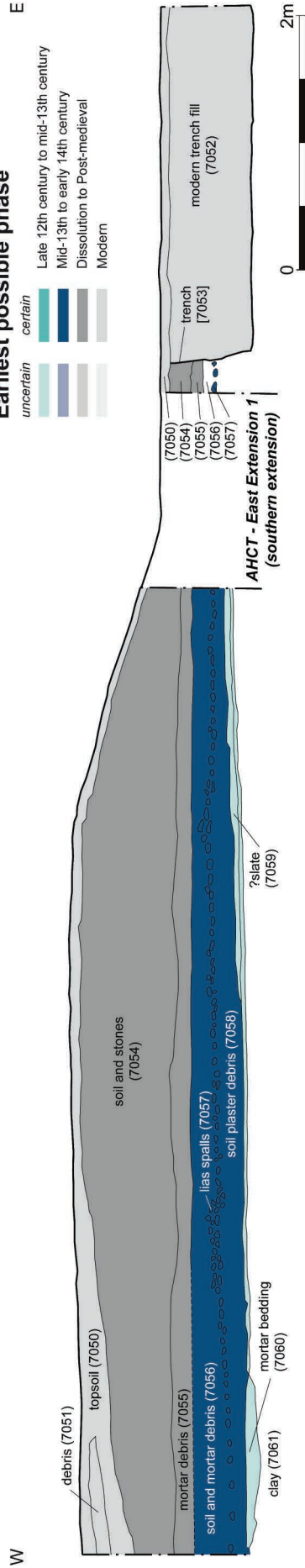


**Fig 6.17** West wall of the abbot's hall, looking south east (1979 photograph: © Glastonbury Abbey)

**Section 76: Trench 93**



**Section 77: Trench 97**



**Fig 6.18** Sections of Trenches 93 and 97 (scale 1:40)

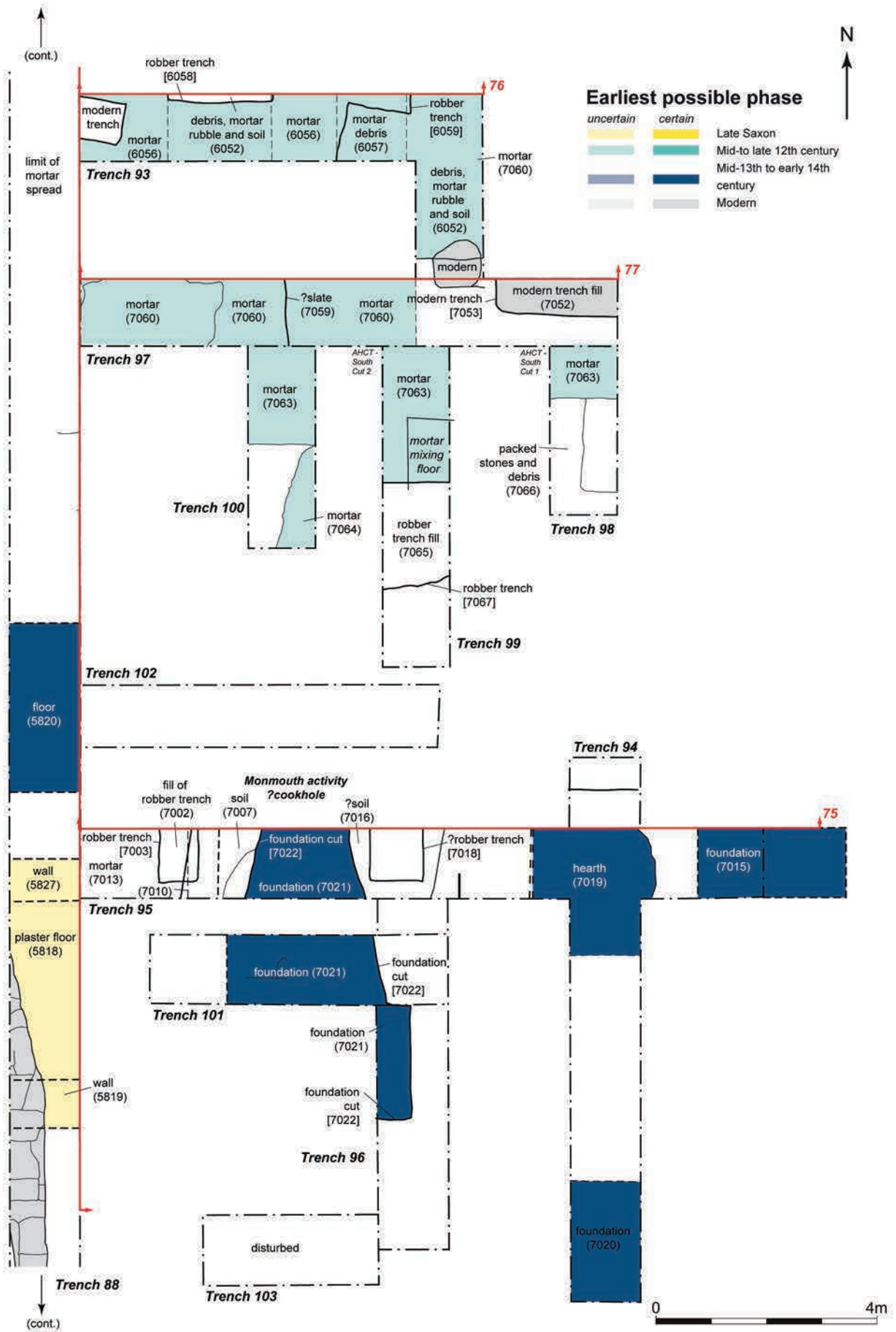
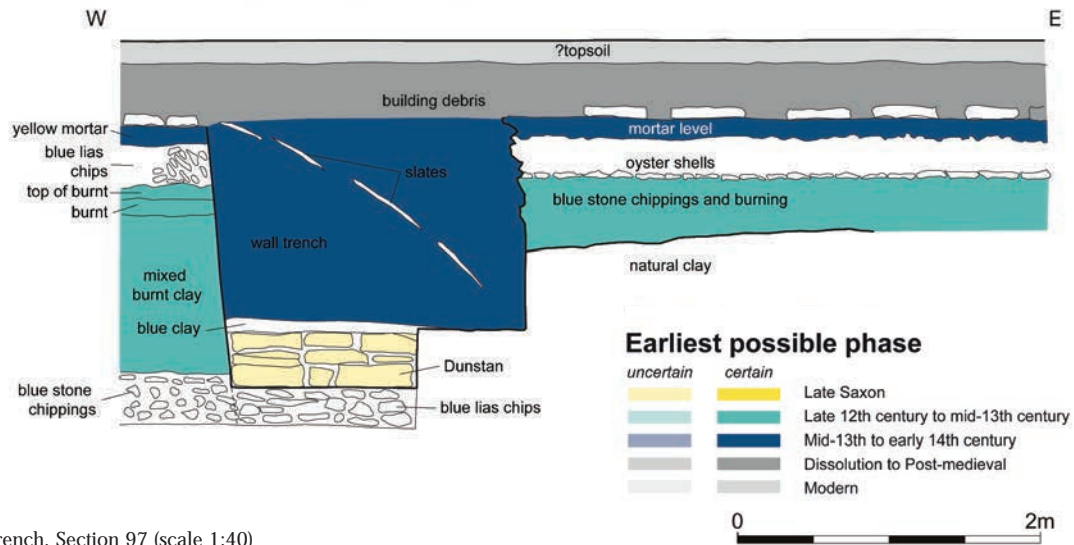


Fig 6.19 Plan of Trenches 88, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102 and 103 (scale 1:100)

**Section 97: Cutting 2 across Abbot's Hall (Wedlake 1979)**



**Fig 6.20** 1979 Trench, Section 97 (scale 1:40)

fire ash had discoloured the underlying soil to a depth of over 0.3m (possibly visible in figure 6.21). The fire horizon and overlying debris layers are represented in the majority of Wedlake's section drawings across the abbot's

hall. The extensive burnt material was taken as proof that the 1184 fire originated in the domestic buildings and that a prevailing south-west wind carried the flames across the conventual buildings to the abbey church. However, this conflicts with the absence of fire evidence from excavations in the western side of the cloister and the twelfth-century range. Adam of Damerham's *Chronicle* (1280–90) records that the bell-tower built by Henry of Blois survived the fire, together with the lodging and chapel built by his successor Robert of Winchester (1173–80).<sup>10</sup> This lodging and chapel may have formed part of a twelfth-century abbot's hall. It can be concluded only that several twelfth-century structures were discovered by both Radford and Wedlake and that these represent substantial buildings and lighter structures possibly forming part of Henry of Blois's palace or a western range to the cloister.



**Fig 6.21** Possible 1184 fire layer (1978–9 photograph: © Glastonbury Abbey)

**Late twelfth to mid-thirteenth centuries (Phase 9)**

Radford's excavation notes for 1951 state that the large Tor burr foundations above the twelfth-century 'abbot's hall' relate to a rebuild of c 1200; however, there is no further evidence to support this claim. The 1962 excavations identified another possible location: a structure measuring 4.26m wide with a stone-paved floor set on a thick mortar bed was thought to have existed beneath the early fourteenth-century abbot's hall.<sup>11</sup> It has not been possible to identify these remains within the excavation archive; indeed, Radford commented that the structure was almost entirely destroyed by the later abbot's hall and by later disturbance.<sup>12</sup> Nevertheless, an east–west

aligned foundation [C:5824] was recorded 4.3m to the north of the early fourteenth-century abbot's hall (figs 6.4 and 6.5), which included blue lias and Dundry stone. Radford related this to the supposed twelfth-century buildings; however, Dundry stone had a very limited use between 1184 and *c* 1189, providing a *terminus ante quem* for the foundation.

A 1963 trench recorded a hearth in the south section, not drawn but annotated onto the north section (fig 6.22) and clearly labelled as thirteenth-century. The stratigraphy is unclear, with rough notes and lines (not all digitised) indicating modern disturbance. The hearth [C:7019] measured 3.59m from east to west across the full width of the trench; its location near the centre of the eastern chamber of the early fourteenth-century hall suggests it could relate to the later building (fig 6.19). There is no convincing archaeological evidence to support the existence of a distinct thirteenth-century abbot's hall and the publications make no mention of it. If the twelfth-century hall survived the fire, it is perhaps feasible that this building continued to be used in some form.

## Mid-thirteenth to early fourteenth centuries (Phase 10)

### Demolition and construction

Deposits overlying the twelfth-century range [C:366] [C:367] [C:383] [C:378] [C:380] are likely to relate to medieval demolition (fig 6.10) followed by construction of the early fourteenth-century abbot's hall. A layer of mortar droppings [C:1316] located between the abbot's hall and St Michael's Chapel indicate the level of the fourteenth-century ground surface (fig 6.23). This is supported by the underlying soil layer [C:1318], with a *terminus post quem* of *c* 1300. To the north of the abbot's hall, a small deposit of lias spalls [C:6054] above a rubble and plaster layer [C:6055] both overlie a potentially earlier mortar bedding layer [C:6056] (see above) (fig 6.18). The same sequence was recorded immediately to the south within the abbot's hall, where the potentially earlier mortar bedding layer [C:7060] and possible slate flooring [C:7059] were sealed by a dense layer of soil and mortar debris [C:7058] with finds indicating a *terminus post quem* of *c* 1280 (fig 6.18). This was covered by an undulating layer of blue lias spalls [C:7057] probably associated with construction, covered by a soil and mortar debris layer [C:7056]. An irregular line of stones above this was thought to represent the medieval ground surface, although no remnants of the floor itself were recorded.

## The abbot's hall

### External walls

The plan of the abbot's hall was established primarily from the robber trenches identified during the excavations, although some *in situ* masonry and traces of construction trenches were also recorded. The eastern end of the hall was located and planned in 1939, with an elaborate buttress or turret on the south-east corner (fig 6.1). Remnants of the foundations [C:7015] of the abbot's hall east wall were recorded (figs 6.19 and 6.22) beneath the robber trench backfill [C:7005]. The foundation [C:7020] of the south wall of the abbot's hall was also evident (fig 6.19), while high levels of disturbance were recorded at the southern end of Trench 88 (fig 6.5).

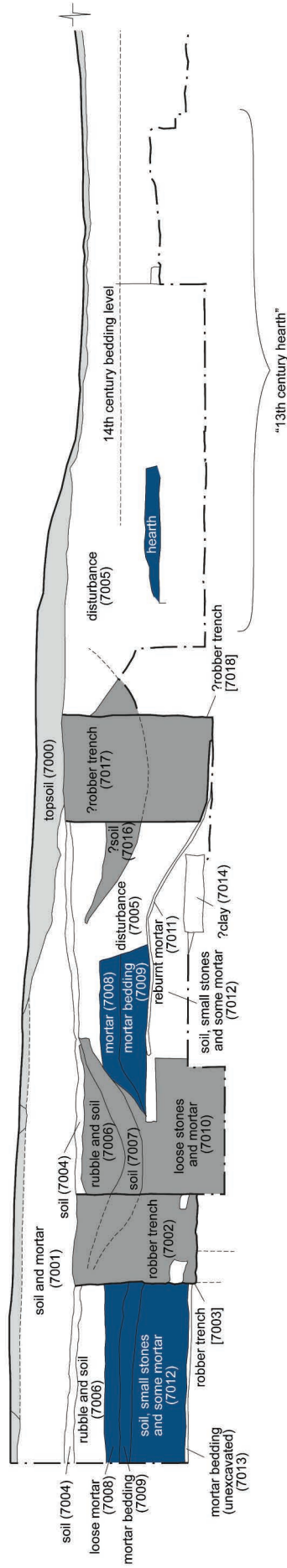
The north wall of the abbot's hall was identified in several locations. This includes the partially robbed foundation [C:463] and robber trench [C:450] [C:451] of the north-east corner (figs 6.13 and 6.14). Immediately west, *in situ* foundations for the abbot's hall north wall were noted beneath the post-Dissolution robber trench [C:1308] [C:1309], with part of the construction trench [C:1314] [C:1315] surviving on the north side (fig 6.23). The north wall also appears to be represented by a robber trench [C:5825], although the foundation would have been much wider than depicted in section (fig 6.4). The published dimensions state it was 3.05m wide and backfilled with broken rubble and mortar;<sup>13</sup> the robber trench was probably obscured by an extensive building debris layer [C:5811]. Three pieces of stonework [C:5828] below the level of the early fourteenth-century floor and on the north side of the robber trench [C:5825] may represent the foundation.

Wedlake's 1978–9 excavations uncovered more details regarding the plan (fig 6.7). The north-west corner of the hall, excavated in 1978 (fig 6.24), was thought to have had an octagonal turret with a spiral staircase. Although this is not evident on the excavation plan, the turret shape is perhaps captured in a photograph (fig 6.25). Wedlake reported that the north wall had been almost entirely robbed but had a series of four narrow buttresses measuring 1.5m wide and spaced 3.65m apart between the wide corner foundations. It should be noted that the hall is located *c* 2m further north than shown on Wedlake's plan and that the buttresses on the same plan are wider than the measurements provided in his account. The north wall foundation trench was measured at 3.35m wide, slightly wider than the measurement of 3.05m recorded by Radford in 1962. The southern wall was examined in 1979 in order to relate the south-east corner located in 1938 with the upstanding remains of

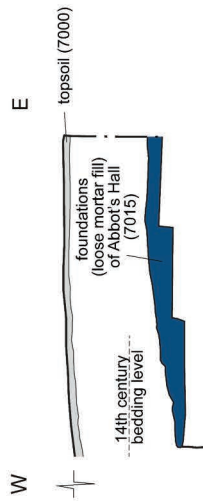
**Section 75: Trench 94**

W

E

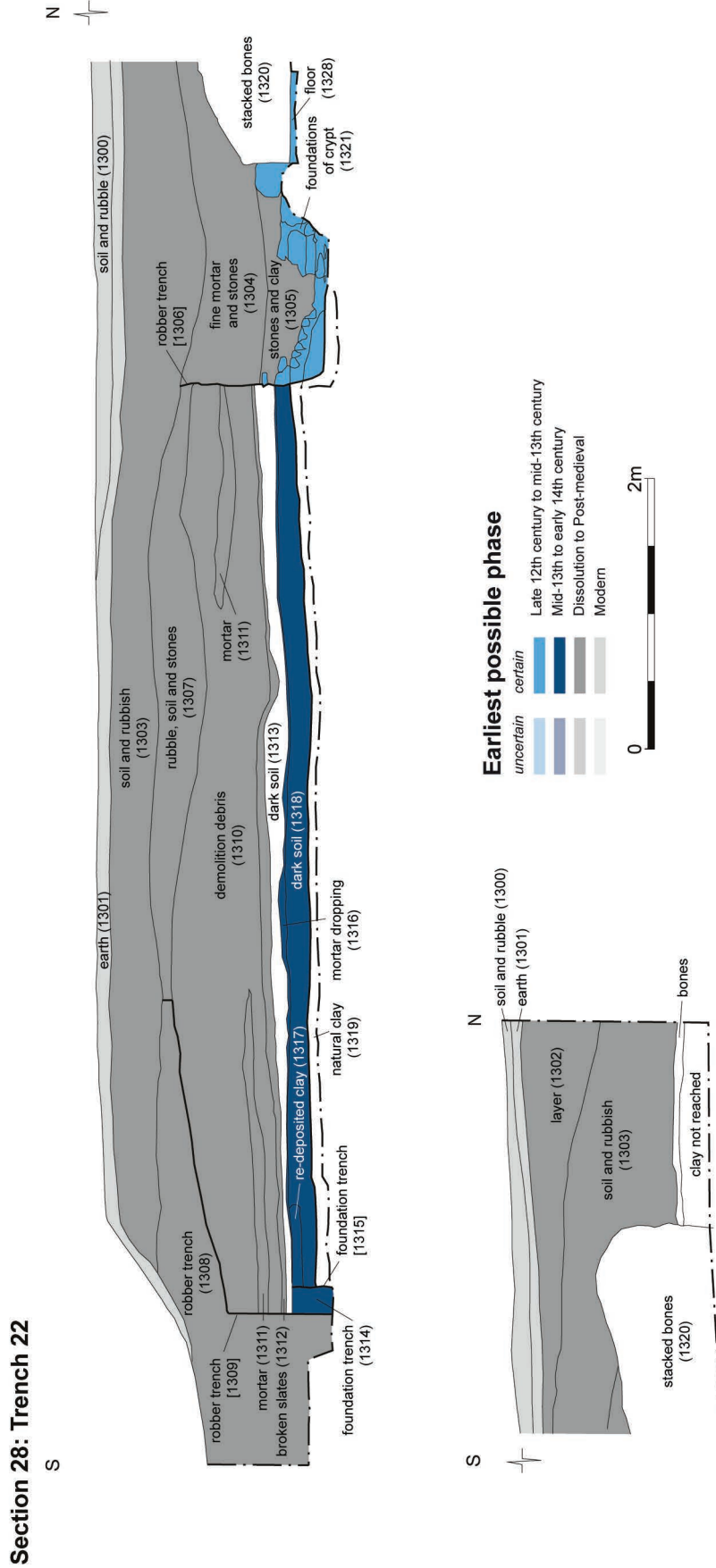


**Earliest possible phase**



**Fig 6.22** Section of Trench 94 (scale 1:50)





**Fig 6.23** Section of Trench 22 (scale 1:50)



**Fig 6.24** Excavations at the north-eastern corner of the hall, looking south-south-west (1978 photograph: © Glastonbury Abbey)

the south-west corner. A considerable part of the south wall foundation survived immediately below the overhanging masonry at the western end. The foundation continued for 3.96m to the east of the surviving respond in the west wall, but beyond that it had been extensively robbed. The buttress arrangement in the centre of the south wall was found to match that on the north wall. The western wall was predominantly robbed to the north of the upstanding remains (fig 6.17).

Radford proposed that a vaulted porch was located at the south-western corner of the great hall; this was based on the surviving fragment of vaulting on the south wall and part of the archway of a large doorway leading from the porch to the hall (fig 6.24). In 1979, at the western end of the south wall, two parallel robber trenches were traced southwards for 6.7m, before turning inwards. The substantial walls indicated by the robber trenches confirmed the existence of a massive entrance porch (figs 6.1 and 6.7) with side benches, represented by a surviving fragment against the west wall. The extant staircase at the south-west corner of the hall probably provided access to a one- or two-storey chamber above the south porch.

### Internal arrangements

The excavations revealed some details of the internal arrangements of the hall. The foundation [C:7021] of the partition between the great hall and the eastern chamber was recorded in Trenches 94 and 101 (fig 6.19). In 1978 and 1979 two small fragments of walling were found on the western side of the partition with two opposing bases against the inner face of the west wall interpreted as evidence for aisles (fig 6.7). A small carved capital of fourteenth- or fifteenth-century date was found in the vicinity and thought to have been associated with arcading for the aisles. Wedlake suggested that the hall had two arcades of four bays supporting the roof, on the basis of two pier bases that were found in the interior space and remnants of walling. It is possible that the evidence for aisles related to the twelfth-century building and that the fourteenth-century abbot's hall would have been provided with a hammer-beam roof.

In the centre of the abbot's great hall was a single course of stones [C:5820] sealed by post-Dissolution debris layers [C:5813] [C:5812]; this may represent the floor of the great hall. In Trench 94 a fourteenth-century



bedding level was annotated onto the section within the area of the eastern chamber (fig 6.22). Further west, a mortar bedding layer [C:7009] was recorded at the same level, overlying a make-up layer [C:7012] with a *terminus post quem* of c 1280.

Wedlake's excavations retrieved very few small finds; of those that were collected some probably came from the abbot's hall. Apart from several fine pieces of window arcading (fig 6.26), there was a small stone corbel in the form of an heraldic shield, bearing a black painted design held in a clenched human hand, painted flesh colour. The floor tiles were both plain and figural, including a border design now identified as an *arista* tile from Seville (see Chapter 8: Post-Roman pottery). The paving of the main hall is indicated by a number of plain brown-glazed tiles bedded in yellow mortar (see Chapter 8: Medieval floor tiles). Roofing material is evidenced by the numerous pieces of slate found alongside the walls. Other finds not specifically mentioned by Wedlake include eight fragments of late thirteenth- to early fourteenth-century

**Fig 6.25** Possible turret in the north-eastern corner of the hall, looking south (1978–9 photograph: © Glastonbury Abbey)



**Fig 6.26** Abbot's hall excavations: window tracery in the base of the trench (1978–9 photograph: © Glastonbury Abbey)

plain window glass (G36), a bronze handle, possibly from a medieval casket (B89), a bronze ring, animal bone, including part of a dog burial (M18), a bronze spur terminal (B91) and a bronze strap end (B92) (see Chapter 8: Small finds).

### West of the abbot's hall

The western wall of the south porch was formed by the wall running north–south between the abbot's hall and the north-east corner of the abbot's kitchen. The 1979 excavations confirmed that this ran continuously between the two structures; immediately to the west was a massive stone 'foundation' measuring 5.49m from north to south and 4.26m from east to west (fig 6.7). This foundation is not obvious on the GPR survey, although an ill-defined wall shown at a depth of 0.5–1.5m corresponds to the wall between the abbot's hall and kitchen (see figs 2.19 and 2.20). Ill-defined GPR responses to the north of the abbot's kitchen door were detected at depths of 0.5–1.0m and 1.0–1.5m, with two possible eastern returns at different depths. This indicates the presence of further structures in this area.

Wedlake suggested that the massive stone 'foundation' may represent a large entrance porch or passage giving visitor access to the monastery from the west. This would imply that the entrance to the porch was in the west wall, whereas the masonry shown on Wedlake's plans clearly shows a doorway in the south wall of the porch. The approach route of high-ranking visitors to the abbot's hall would have been determined by the conventions of medieval etiquette; it is inconceivable that such guests would have approached the abbot's hall by passing the service entrance of the abbot's kitchen. Visual inspection shows that the east and west elevations of the kitchen were more ornate than the plainer north and south sides, both of which had evidence for attached roofed structures. This suggests that visitors approached the abbot's hall along the eastern side of the abbot's kitchen, from which they would have viewed the abbot's garden on the right. An alternative explanation for the massive foundation is that a possible structure was located in the angle between the south porch and the south-west corner of the abbot's hall. This may have connected with the staircase at the south-western corner of the abbot's hall.

Wedlake proposed that the buttery and pantry would have stood to the west of the abbot's hall but this area was not properly excavated in 1978–9. Nevertheless, there were indications of two doors leading from the west end into the service wing. Additionally, Wedlake noted a

broken wall running westwards from the west face of the upstanding remains (fig 6.7), which presumably joined up with a similar broken wall running north from the north-west corner of the kitchen. Further north, the robber trench of the west wall of the hall indicated a similar wall also running westwards, although the location is not shown in plan. Wedlake also thought it likely that the north wall of the hall continued westwards beyond its north-west corner, although there is no evidence for this. By linking these broken walls, Wedlake conjectured that two flanking compartments existed, each measuring 9m wide, with a central compartment measuring 7.3m wide. The surviving west face of the upstanding remains displays no evidence of an external plinth: in January 1931, a small excavation made alongside this wall proved that it continued to a depth of at least 2m below the present level, with no sign of an offset. This supports the proposed existence of a range to the west of the hall, possibly with a basement or a floor level distinctly lower than the hall.

### East of the porch

The 1979 excavations found traces of a later building to the east of the south porch, in the angle with the south wall (fig 6.7). Although the complete plan was not recovered, it was said to be of approximately the same dimensions as the porch.<sup>14</sup> A white, mortared floor base and many fragments of 'bright green glazed tile, of the thin, later type' were found, some of which were *in situ* (see Chapter 8: Medieval floor tiles). The abbot's hall was separated from the monks' cemetery by a courtyard with rough cobbling, although there is no recorded archaeological evidence of this.<sup>15</sup>

### Water-courses

A 'late' stone-lined drain [C:467] recorded in Trench 7 extended southwards from an earlier stone-lined drain [C:461] (see above), both covered with mortar [C:460] (figs 6.13 and 6.14). The orientation of the 'late' drain [C:467] indicates a southwards course along the eastern side of the early fourteenth-century abbot's hall, suggesting it supplied water to flush a garderobe which may have existed in the south-east corner of the building. Wedlake's plans show a drain extending south-westwards from the refectory adjoining a drain aligned east–west; the course is lost beneath the cobbled area to the south-east of the abbot's hall. It may have joined a north–east to south–west aligned drain, extending from the south side of the twelfth-century range and passing the south-east

corner of the later abbot's hall. The east–west drain joined another drain heading southwards from the refectory, entering the northern end of the king's / abbot's lodging. In addition, short stretches of several other possible drains cross the abbot's range.

## Mid-fourteenth century (Phase 11)

### The king's / abbot's lodging

The excavations of 1938 aimed to recover the plan of the building previously believed to be the abbot's lodging and which is now thought to have originated as the king's lodging (see Chapters 3 and 11). The building was located along the eastern side of the abbot's range complex: fairly extensive remains were uncovered but the findings were never published. The structural remains were shown on Wedlake's draft publication plans but his interpretation of this evidence is now challenged.

The original excavation plans show structural remains within the eastern side of the abbot's garden, comprising mortared rubble in the north and more extensive mortared rubble in the central and southern area (fig 6.1). The archaeological remains were not continuous from north to south; however, from Stukeley's sketches (see figs 3.14 and 3.15) the building is known to have extended across the full width of the garden. The northern end of the building was aligned with the north wall of the abbot's garden and the north walls of the abbot's kitchen and the monks' kitchen. The southern end of the building was found to have been extended by 5.9m from the original south end, adjoining the south wall of the abbot's garden (fig 6.1).<sup>16</sup>

The reinterpretation of Wedlake's plan centres on the mortared stones which he thought represented exterior cobbling. However, this would allow space for only a very narrow building measuring less than 4m wide, with the rear (east) wall of the building shared in part with the west wall of the monks' kitchen and the south-west buttress of the monks' kitchen protruding into the structure. The very narrow building proposed by Wedlake is an unlikely plan for a high-status lodging; in addition, a firebreak would be expected between the monks' kitchen and a residential complex. The GPR survey shows a definite wall running north–south at a depth of 1.0–1.5m which may represent the eastern wall of the lodging (see figs 2.13 and 10.16). This would shift the building westwards, away from the monks' kitchen, and would indicate an external width of approximately 8.36m (see fig 10.15). This interpretation would reassess the mortared stones as internal cobbling within the range; alternatively, the cobbled surface may be post-medieval in

date and unrelated to the medieval structure.

Wedlake recorded finding only the southern of the two western projections shown on Stukeley's 1723 eastern aspect (see fig 3.14). The draft plan shows this extending significantly beyond what is indicated by the sketch, which shows only shallow projections and is more comparable to the new interpretation. A narrow area within the 'cobbling' was thought to indicate the location of the front entrance.<sup>17</sup> Reinterpretation of the building would place this area in the central part of the rear (east) wall, indicating a rear entrance rather than a front entrance. A foundation with a rounded corner was interpreted by Wedlake as the hexagonal turret shown on Stukeley's 1723 eastern aspect (see fig 3.14) at the north-west corner of the lodging. However, it is more likely to represent an internal stair-well based on the scale of this feature and the location in light of the new interpretation (see Chapter 11). The building was served by a garderobe or latrine flushed by a drain, which entered the lodging from the north-east corner of the garden and exited towards the main sewer of the monastic reredorter. This may relate to a drainage feature shown on the GPR survey at a depth of 0.0–0.5m (see fig 2.18). Wedlake's plan places the garderobe in the southern end of the building; however, the new interpretation would place it to the east of the southern end of the building (fig 6.1).

Cobbling and walls discovered in the area between the king's / abbot's lodging and the abbot's hall may relate to access routes between the two complexes. The western corners of the abbot's garden and fragments of the north and south walls were found during the excavations (fig 6.1).<sup>18</sup> The wall connecting the monks' kitchen and the refectory was established as being contemporary with the kitchen, creating a division between the abbot's range and the monks' ranges.

## Finds

A number of published finds from the abbot's lodging excavations may have been associated with this building, despite a lack of contextual information. These include a quantity of stained and painted glass fragments, a diamond-shaped, ornamental lead grille with central roundel retaining red stained glass, a piece of glazed foreign tile described by Wedlake as a decorated Spanish border tile coloured white, blue and brown (see Chapter 8: Spanish and Portuguese wares), large pieces of stone from coping or battlements and a large quantity of pottery, some of which was subsequently reconstructed.<sup>19</sup> In addition, several Nuremberg jettons and trade tokens were found in the cobbled surface (see Chapter 8: Small finds).

## Post-Dissolution (Phase 16)

Post-Dissolution layers recorded across the abbot's range mostly comprised deep layers of debris, although other deposits were also present. To the north of the abbot's hall, a line of mortar [C:5809] below the demolition layer [C:5808] may relate to a post-Dissolution construction phase (fig 6.4). A 'stone pack floor' [C:5812] overlying a layer of mortar debris [C:5813] was located within the abbot's hall. Immediately to the south were a series of deposits also relating to post-Dissolution activity: a debris and mortar layer [C:5815] and a mortar floor [C:5816], both with a *terminus post quem* of c 1500, above a stone, soil and debris layer [C:5817] with a *terminus post quem* of c 1400. Some of these deposits are perhaps indicative of post-Dissolution occupation of the abbot's hall. Indeed, a number of sixteenth-century objects recovered during the abbot's hall excavations may be associated with a short-lived community of Walloons (see Chapter 8: Small finds).

Sequences of demolition were evident in some excavation trenches and these appear to confirm that the abbot's hall continued to be occupied after adjacent structures were demolished. For example, a deep soil layer [C:457] containing mortar and spalls (fig 6.13) extended northwards above St Michael's Chapel and appeared to be cut by a robber trench [C:456] on the north side of the abbot's hall foundation [C:463]. This indicates that St Michael's Chapel was demolished and covered by debris prior to the demolition of the abbot's hall. A further deep layer of rubbish, mortar and debris [C:452] above the soil layer [C:457] may relate to the demolition of the hall. A late stone-lined drain [C:466] shown within a soil layer [C:457] may have been inserted during the interim period between the demolition of the two buildings.

Immediately to the west was a similar sequence: the robber trench [C:1308] [C:1309] for the abbot's hall north wall cut through a deep post-Dissolution layer [C:1310] which contained a possible ewer handle dated fourteenth- to fifteenth-century and two lenses of mortar debris [C:1311] (fig 6.23). This implies that some destruction had already occurred before the north wall of the abbot's hall was robbed. The sequence of demolition is more explicitly demonstrated by a layer of broken slates [C:1312] beneath the deep layer [C:1310]; Radford thought these had fallen from a building to the south, which must refer to the abbot's hall.

Several other robber trenches were recorded in addition to those for the outer walls of the abbot's hall and the partition between the great hall and eastern

chamber. To the north of the abbot's hall, a robber trench [C:6058] projected a short distance from the northern side of Trench 93 and was labelled as a 'late medieval wall' (figs 6.18 and 6.19). Radford describes both this and a further robber trench to the east [C:6059] as being post-Dissolution; they could relate to the north wall of the abbot's hall; alternatively they may represent a later structure. Across the centre of the hall, two possible robber trenches [C:7003] [C:7018] extend from the north side of Trench 94 and terminate in the same southerly position (figs 6.19 and 6.22). These trenches may represent a post-Dissolution structure, one cut through the post-Dissolution soil horizon [C:7004] and the other cut through the robber fill [C:7005] of the abbot's hall south wall.

Within the southern area of the abbot's hall were remains that Radford linked to Monmouth's encampment of 1685. A soil-filled hollow [C:7007], possibly a hearth above a deep deposit of loose stones and mortar [C:7010] (fig 6.22), appears to relate to a label on the section identifying the 'field kitchen'. Further east was another soil-filled hollow [C:7016], which appears to be labelled 'Monmouth cook hole' in plan, and presumably represents another possible hearth (fig 6.19). The southern quarter of Trench 88 was dominated by post-Dissolution disturbance.<sup>20</sup> Pottery dated to about 1700 was recovered from this disturbance, which Radford suggested may have been a rubbish pit associated with Monmouth's documented encampment at the abbey. With the exception of this pottery, there were no stratified finds and none of the seventeenth-century small finds can be connected to this area. A link between these features and Monmouth's camp is therefore considered to be extremely tenuous.

In 1979, the south wall of the abbot's hall porch was found to have been 'mutilated' by the construction of a kiln or furnace constructed following the demolition of the wall (fig 6.27). The feature consisted of an oval-shaped pit lined with yellow clay measuring c 3.05m from east to west, c 1.5m from north to south and c 0.6m high. Above the pit was a mass of large blocks of reused ashlar with extensive evidence of burning, interpreted as the remains of a collapsed fire box. The bank surrounding the pit consisted of a core of loose stone sealed by a band of yellow clay c 0.13m thick. The pit contained a quantity of fire ash with many fragments of copper-alloy debris, including several large pieces of bronze plate, one of which measured 0.28m long by 0.08m wide. The oval shape and fire box, combined with the presence of fire ash and smelted bronze, suggests that this was a reverberatory furnace used for melting down metal from the monastery. Associated seventeenth- and eighteenth-



**Fig 6.27** South porch and later furnace, looking south east (1979 photograph: © Glastonbury Abbey)

century pottery was mentioned in a letter from Wedlake to Radford and provides a date range for this activity.<sup>21</sup>

A stone wall [C:356] was noted as being of less solid construction and believed to correspond with a threshold shown at the end of an avenue depicted on an eighteenth-century print (fig 6.11). This presumably refers to the tree-lined avenue shown on the 1723 Stukeley plan leading northwards from the north wall of the abbot's garden (see fig 3.14). Immediately to the south of the stone wall [C:356] was a further wall or foundation [C:357] with a possible southern offset; the excavation notes indicate this was constructed of Tor burrs faced with some roughly squared stones and with traces of thick plaster on both the inner and the outer faces. Although the excavation trench is not precisely mapped, the location correlates with either the north side of the abbot's garden wall or the north-east corner of the king's / abbot's lodging. The presence of the plaster appears to support the latter attribution, although the backfill [C:358] of the construction cut [C:384] contained burnt material and an excavation note suggests this burning could be the result of post-Reformation activity.

### Modern (Phase 17)

A post-Dissolution pit at the southern end of Trench 88 was crossed by a late eighteenth-century foundation [C:5826], which gradually curved into the west side of the section (fig 6.28).<sup>22</sup> To the south of the trench, the foundation continued as an extant late eighteenth-century wall (which has since been removed).



**Fig 6.28** Late eighteenth-century wall, looking north (1962 photograph: © EHA)

# The Saxon glass furnaces

*Hugh Willmott and Kate Welham*

## 7.1 Introduction

The glass furnaces excavated at Glastonbury Abbey (1955–7) have attracted considerable scholarly attention. Despite having been uncovered over sixty years ago, they remain the most important evidence for the production of glass in Saxon England. Previous studies have addressed the character of the industrial activities at Glastonbury but this is the first analysis of all surviving finds, original plans, sections and other stratigraphic materials.

### Previous work

When it became apparent to Radford in 1955 that he had uncovered the remains of a glass furnace, he sent the finds to Donald Harden (1901–94), who was the acknowledged expert on ancient British glass at the time. Harden sent a brief interim report to Radford on 29 December 1955.<sup>1</sup> As further glass furnaces were uncovered in the following two years, it was Harden himself who led the excavations and compiled a brief catalogue of the finds.<sup>2</sup> However, Harden never published a report on the Glastonbury material, despite intermittent correspondence with Radford and others for many years after the end of excavation. Given Harden's reputation for thoroughness in publication, this is surprising; it is perhaps explained by the poor state of the paper archive and confusion over the phasing.<sup>3</sup> As late as 1980, Radford wrote to Harden saying 'As far as I am concerned the kilns are an embarrassment'.<sup>4</sup> A further complication was the loss of many of the finds after they were sent for specialist study.<sup>5</sup>

Given the significance of the site, the assemblage attracted the academic interest of other scholars. In 1989, Justine Bayley wrote to Radford requesting permission to write up the furnace excavations.<sup>6</sup> Her report was published in 2000, although she stated that 'this should not be seen as the definitive publication', as she did not have access to many of the original records or a large number of the finds.<sup>7</sup> As part of Bayley's analysis in the 1990s, Vera Evison produced a detailed discussion of the glass waste, window and vessel glass but *not* the associated furnace debris.<sup>8</sup>

### The scope of the current study

Each successive analysis of the Saxon glass has extended the preceding study, an organic approach that has led at times to a very confusing picture, especially given the rather scant recording of the original material and the subsequent loss of much of it. Consequently, this report examines all of the material afresh and discards previous catalogue numbers and nomenclature where possible (see below).

Since Bayley's study in the 1990s, a considerable amount of additional documentation has come to light, as have new finds. Bayley was reliant primarily upon a plan and a section made by Radford, a plan by Peter Hart of Furnace 1 and Harden's notebook sketches for the other furnaces. Further plans and sections drawn by Peter Hart (for Furnaces 3 and 4) have become available as well as other drawings, permitting a much more comprehensive discussion of the stratigraphy to be undertaken. As part of this reinterpretation of the site, context numbers have been assigned to each feature and stratum to allow a more



inclusive narrative. One element of the previous recording system that has been retained is the numbering of the furnaces allocated by Harden and Radford; these are established in the extant literature and are used here to avoid confusion.

This report concentrates on the most important aspects of the stratigraphic reinterpretation of the furnaces, their dating and the nature of glass-making that took place on site. A full new catalogue of all locatable finds, including accession numbers, find numbers, previous designations and context descriptions, is available as part of the online archive, together with a full summary of the material found. Since Evison's report on the window and vessel glass cannot be bettered, this is not replicated, but a more comprehensive discussion of the types of working waste is included. The material from Glastonbury Abbey is assessed in the context of a small but growing number of Saxon sites with evidence for

glass-working and appropriate continental comparanda.

Harden produced a very brief catalogue of the artefacts, assigning numbers broadly in the order that they were found.<sup>9</sup> However, he grouped different finds together under the same number; it is now apparent that there are additional finds that were not assigned catalogue numbers, and were perhaps never seen by Harden. Bayley continued to use Harden's original referencing system, but broke this down into alphabetic divisions depending on material type, whilst specifying those that were lost. Evison also used Bayley's designations in her report. Since publication of these reports in 2000, some finds thought to be lost have been found, but others reported upon then cannot now be located. Consequently, all the artefacts associated with glass-making have been fully catalogued anew in the online archive, a summary of which is presented in Table 3. Lost finds have not been included in the discussion as little meaningful information survives, although a brief list of these has been prepared and cross-referenced to older reports. Scientific analysis has been undertaken on individual glass samples employing electron-probe microanalysis and isotopic analysis; a full method statement can be consulted in the online archive.<sup>10</sup>

**Table 3** Summary of artefacts associated with glass-making

Furnace	Material	Count	Surface treatment/ colour
1/2	Tile	20	No deposits adhering
1/2	Tile	2	Glass adhering
1/2	Furnace superstructure	188 (2,525 g)	Vitrified
1/2	Furnace aperture	9	Vitrified
1/2	Crucible	29	Blue-green glass adhering
1/2	Lump glass	5	Blue-green
1/2	Lump glass	2	Mixed blue-green and turquoise
1/2	Glass spill	1	Blue-green
1/2	Glass moil	11	Blue-green
1/2	Glass pull	9	Blue-green
1/2	Glass pull	1	Emerald green
1/2	Glass pull	4	Turquoise
1/2	Glass rod	1	Turquoise and opaque white <i>reticello</i>
1/2	Cast glass slab	1	Turquoise
1/2	Uncertain	175	Blue-green
1/2	Uncertain	4	Turquoise
1/2	Uncertain	1	Olive
1/2	Vessel	33	Blue-green
1/2	Vessel	1	Emerald green
1/2	Vessel	1	Turquoise
1/2	Vessel	1	Red-purple
1/2	Window	19	Blue-green
1/2	Window	3	Amber
3	Superstructure	10 (171 g)	Fired

## 7.2 The furnaces

Harden and Bayley assigned individual numbers to some of the features interpreted as glass furnaces and these are retained for convenience in this report. However, given the high degree of stratigraphic overlap and ambiguity that exists between some of these furnaces, the evidence is discussed relative to the three areas in which it was encountered (fig 7.1).

### Glass-making Area A

The first area was identified in 1955 on the excavation of CLE-W, when Furnace 1 was uncovered and almost all the main structure fell fortuitously within the confines of the narrow trench. The following year this portion of CLE-W was re-excavated along with a new trench CL1 running parallel to the south. When it became clear that further furnace material lay within CL1, the area CL1 Ext 2 was also opened, between this trench and CLE-W. Within this extension a second feature, Furnace 2, was identified along with significant deposits underlying both the glass furnaces. The recording of this area was rather inconsistent. In 1955, three sections were drawn across Furnace 1 (Sections 12–14; fig 7.2) and a plan of the

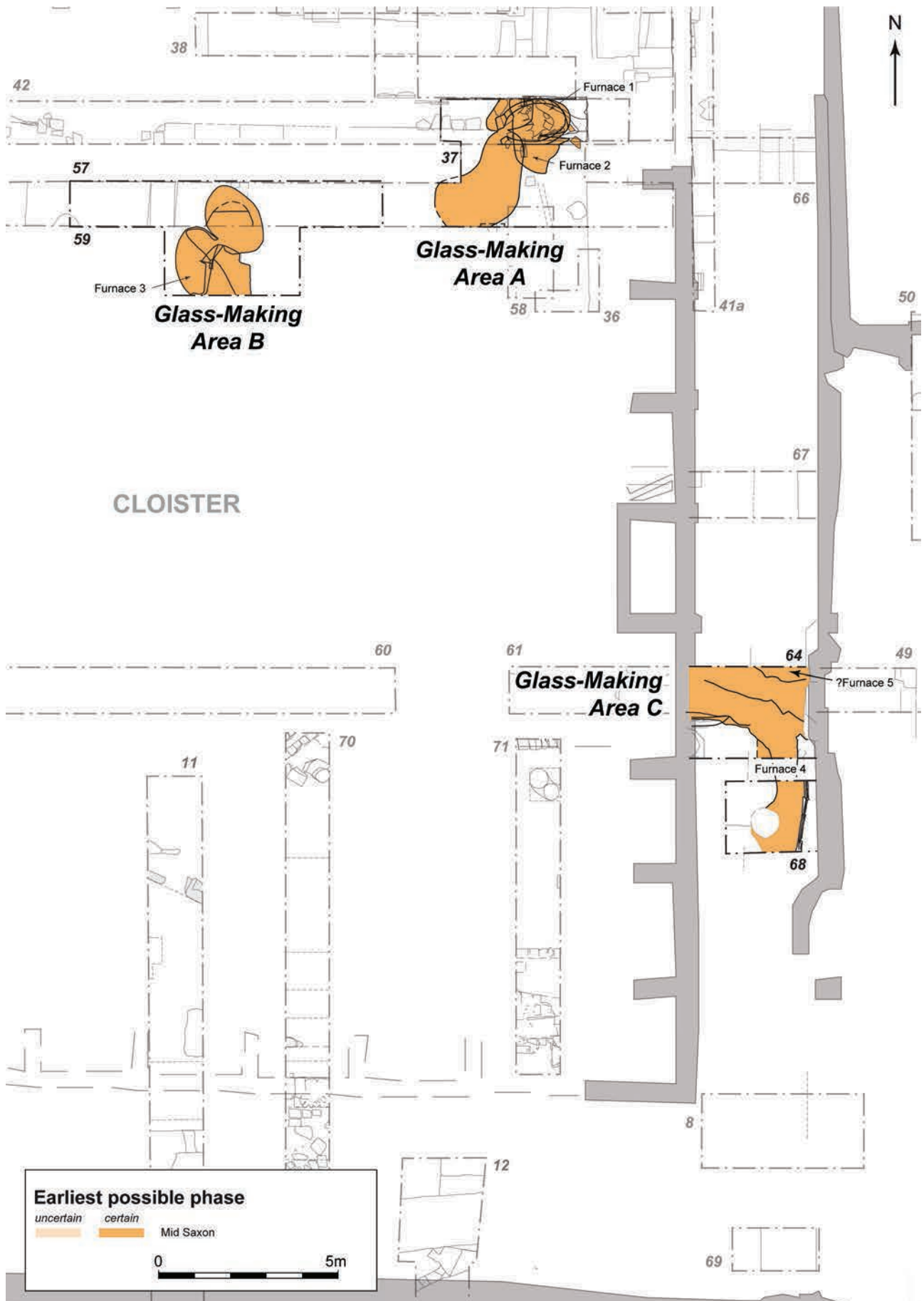
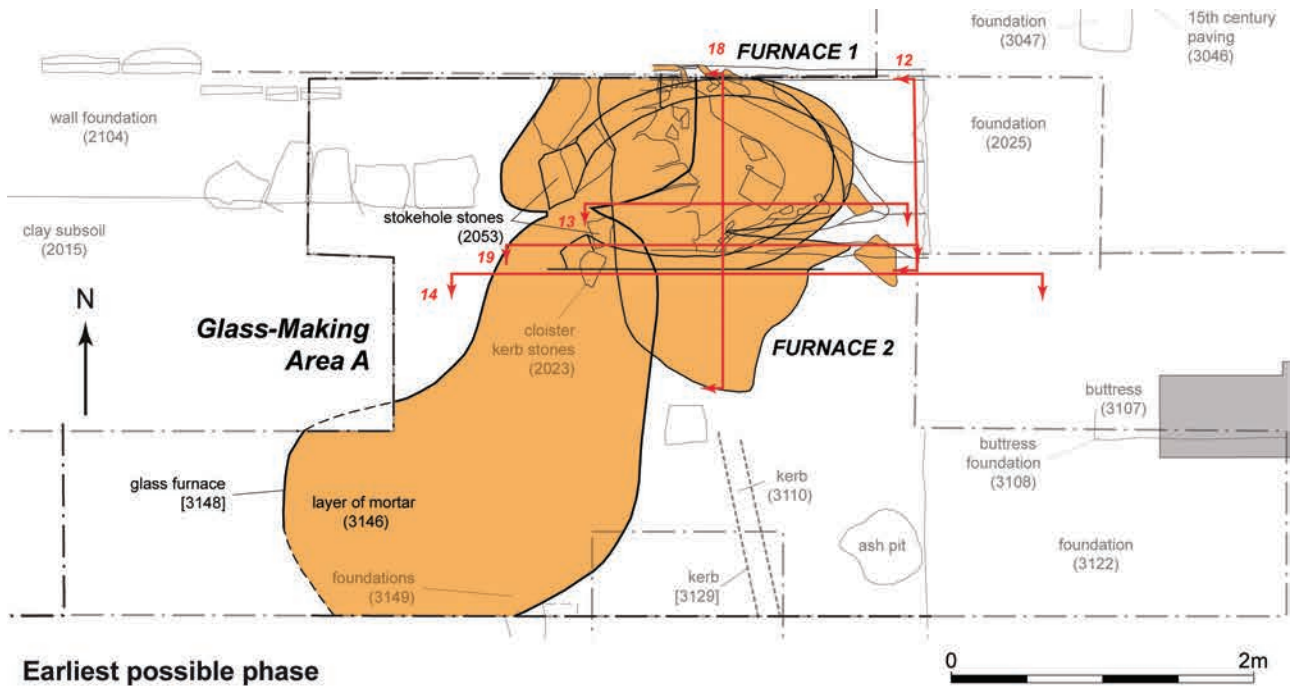
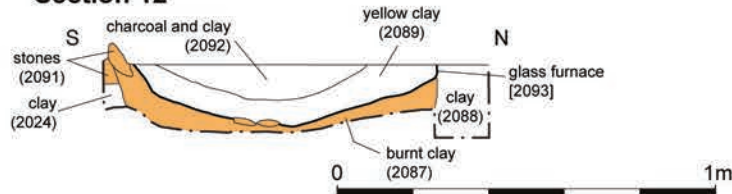


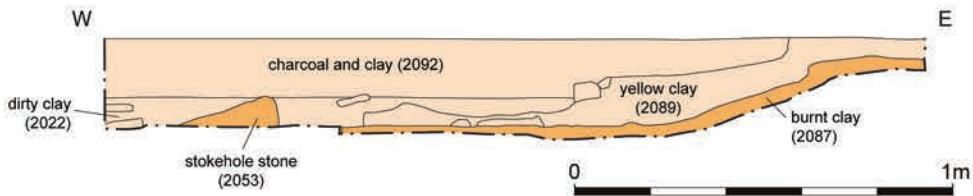
Fig 7.1 Plan of glass-making areas A, B and C (scale 1:150)



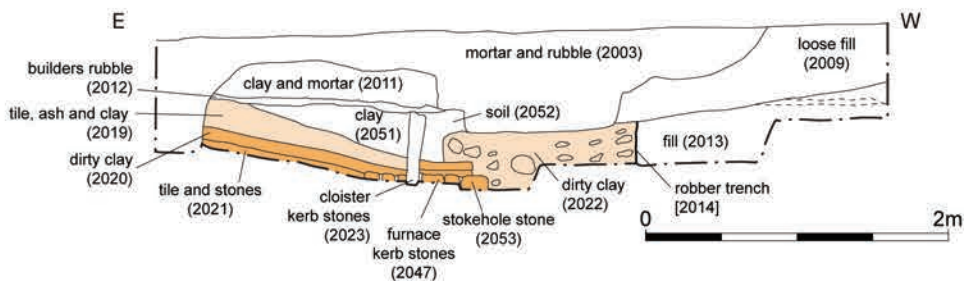
**Section 12**



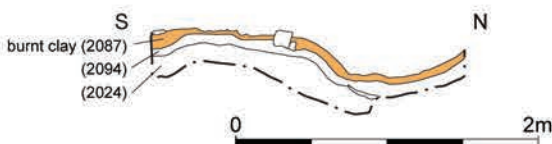
**Section 13**



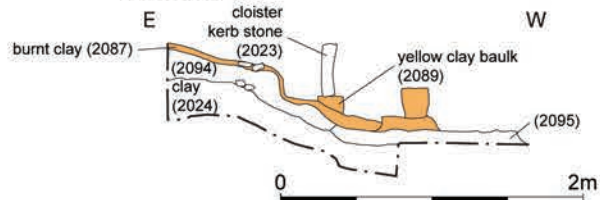
**Section 14**



**Section 18**



**Section 19**



**Fig 7.2** Detailed plan of glass-making area A (scale 1:50); Trench 24, Sections 12 (1:20), 13 (1:20) and 14 (1:50); Trench 35, Sections 18 (1:50) and 19 (1:50)

upper levels was made on the first discovery of the furnace (LA26). However, the only plan that survives of Furnace 1 was made by Harden and this is schematic at best. In 1956, further sections (18–20) were made across the re-excavated Furnace 1, the first of these also crossing Furnace 2. The quality of the section drawings is poor, especially in comparison to Section 14 drawn by Radford the previous year. Fortunately, a well-executed final phase plan (LA35) was drawn by Peter Hart of the entire area covered by the furnaces, although this only shows the outline of the two structures. Just one photograph relating to this area of glass-making survives (fig 7.3) but this is highly informative.<sup>11</sup> The excavations of 1955 seem to have stopped at the level of the furnace floor, whilst those that took place the following year were apparently dug to natural in several places, if not across the whole of the trench.

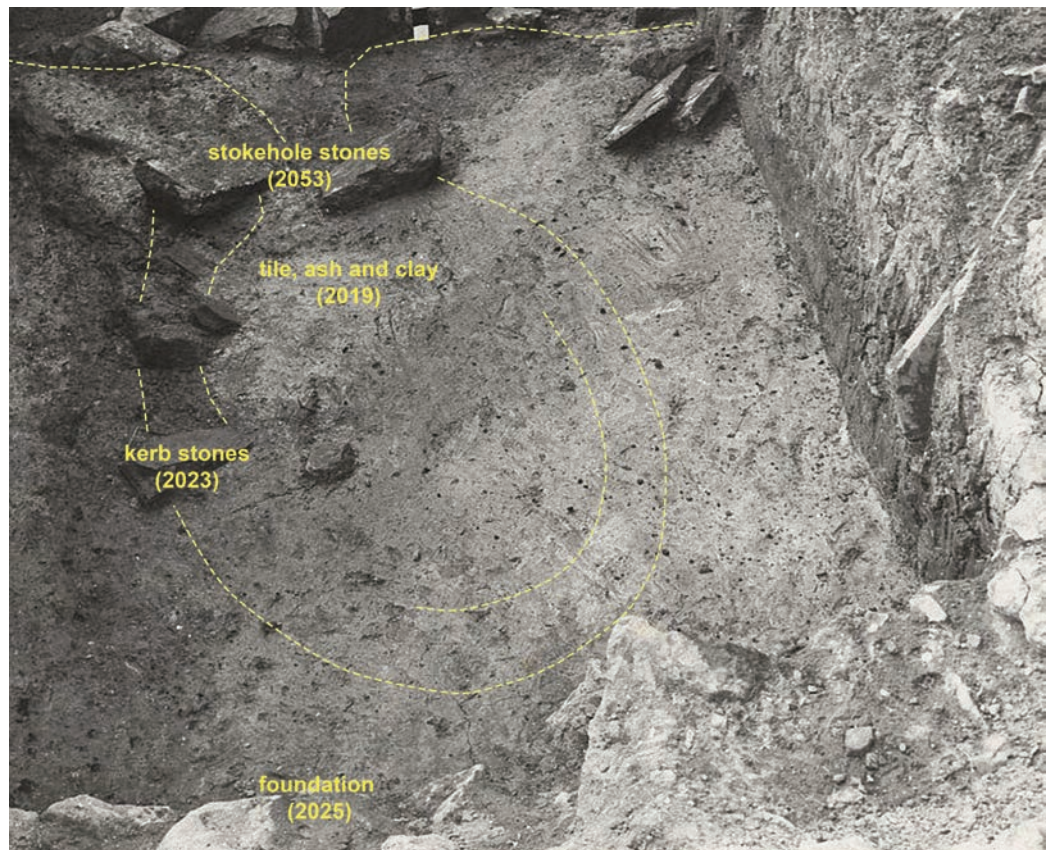
### Furnace 1

This feature is most readily recognisable from Harden's sketch plan LA27, which shows an oval furnace measuring approximately 1.8m by 1.2m externally, oriented on an east–west axis, with the stokehole to the west. Harden's plan clearly shows what he describes as a

kerb [C:2047] approximately 13cm wide, presumably the remains of the wall of the furnace (now labelled as the kerb [C:2023] and the adjacent stones [C:2047]). The stokehole was 22cm wide and flanked on either side by larger set stones [C:2053].

From Harden's contemporary descriptions, and from Sections 12–14, it is clear that the floor of the furnace was formed at least in part from a layer of reused Roman tile and clay burnt red from the heat of the furnace [C:2087] [C:2021]. This floor was not flat but rather took the form of a shallow depression 12cm deep at its central point. Above the floor was deposited a 4–6cm thick layer described variously as 'yellow' [C:2089] and 'dirty' clay [C:2020]. What this represents is uncertain, but given the absence of burning it must have been deposited after the last firing of the furnace. Above this redeposited clay was a further layer at least 11cm thick, described as 'charcoal and clay', 'clay ash' and 'tile /ash /clay' [C:2092] [C:2019]. This layer was probably formed when the dome of the furnace collapsed or was demolished; it contained a significant proportion of the glass finds, as well as the larger pieces of furnace superstructure.

The superstructure of the furnace can be reconstructed from both recorded and surviving elements. The plan made of the top of the furnace on its



**Fig 7.3** Glass-making area A, Trench 24 showing Furnace 1, looking west (1955 photograph: © EHA)

initial discovery (LA26) shows a line of tile fragments forming an arc around both the southern and northern portions of the burnt tile/ash layer that formed the centre of the furnace [C:2092] [2019]. The purpose of these tiles is clear in a photograph taken from the east, facing west: the tiles can clearly be seen, and they all are tipping into the furnace at an angle of around forty-five degrees (fig 7.3).<sup>12</sup> The tiles to the north seem to be intentionally laid on top of each other, indicating that the wall of the furnace was constructed from reused Roman tiles bonded in clay, at least at a lower level. Although a number of tiles were retained from the excavation and still survive, these are relatively uninformative. More diagnostic are two portions of fired clay aperture recovered from the top of the furnace. Too small to have been gathering holes, these were probably vents set towards the top of the furnace, used to allow gases to escape and the temperature to be regulated (fig 7.4).

## Furnace 2

The second furnace was found in 1956, immediately south of Furnace 1 in CLE Ext 2. Its outline is only known from plan LA35: it is approximately the same size and orientation as Furnace 1, although its eastern end has been disturbed. The only section drawn across Furnace 2, from south to north, is confusing (Section 18; fig 7.2). Far from showing a clear depression for a second furnace, it implies that there was actually a rise in level here, with the lowest context forming the floor of Furnace 1 continuing south and rising over the area of the supposed new furnace [C:2087]. On 17 August 1956, K Wainwright

recorded in the site notebook that more glass-making debris was found but that 'at this stage there appears to be no recognisable pattern which might betray a kiln'. Three days later, Harden took over writing the site diary and was first to record 'an oven wall apparently *in situ*'. Two days subsequently he recorded that it 'probably represented a second firing chamber ... CARR concurred' and that 'some fallen stones, S of supposed entrance to 1955 furnace probably represent the entrance to 2nd one'.<sup>13</sup>

This brief description and the outline on plan LA35 provide the only primary documentation that survives for Furnace 2, and therefore any conclusions about its form must be tentative. Indeed, it is entirely possible that there was never a furnace in this location as it certainly does not appear as a convincing feature in Section 18. An alternative explanation for what was observed is that this feature was in fact a compressed spread of kiln debris, derived originally from Furnace 1.

## The mortar floor

In 1955 excavation stopped at the floor of Furnace 1, but in the next season features were excavated to a lower level. Below the central and eastern portions of Furnaces 1 and 2, a 'grey clay' layer was encountered [C:2094] [C:2024] and this was clearly redeposited as it was noted on Section 19 that it contained 'bone and shell' (fig 7.2). To the west, and contiguous with this clay, was a clay and mortar layer [C:2095]. In plan LA35 the mortar layer forms an irregular spread primarily to the south, but also to the north where it disappears under the section. In



**Fig 7.4** A piece of furnace structure in the form of a possible 'vent', which may have been used to allow gases to escape and the temperature to be regulated (scale c 1:1) (photo: C Steele)

Sections 19 and 20, the furnace floor [C:2087] is shown directly overlying the grey clays [C:2094] [C:2095], leaving the possibility that these features might be connected. However, Radford, writing to Harden on 31 August 1956, notes that there was a layer of debris between the mortar and the furnace above and that he thought the former represented 'an earlier oven of some sort', which 'became disused and covered with debris' before the later furnaces were 'dug down on the same site and to within 2ins. of the mortar floor, thus obliterating all higher structural remains'.<sup>14</sup>

Consequently, it has to be concluded that there was no *direct* relationship between the mortar spread and the furnaces found above and any placement was probably coincidental. Radford assumed that the mortar floor represented an earlier furnace, while Harden was less convinced.<sup>15</sup> With hindsight it seems unlikely that [C:2095] formed part of an actual furnace structure as first thought, given the lack of any burning or the presence of a mortar floor at Furnace 3 (see below). However, the occurrence of glass apparently within and beneath the mortar suggests that it was at least broadly contemporaneous with the glass-making phase on the site.

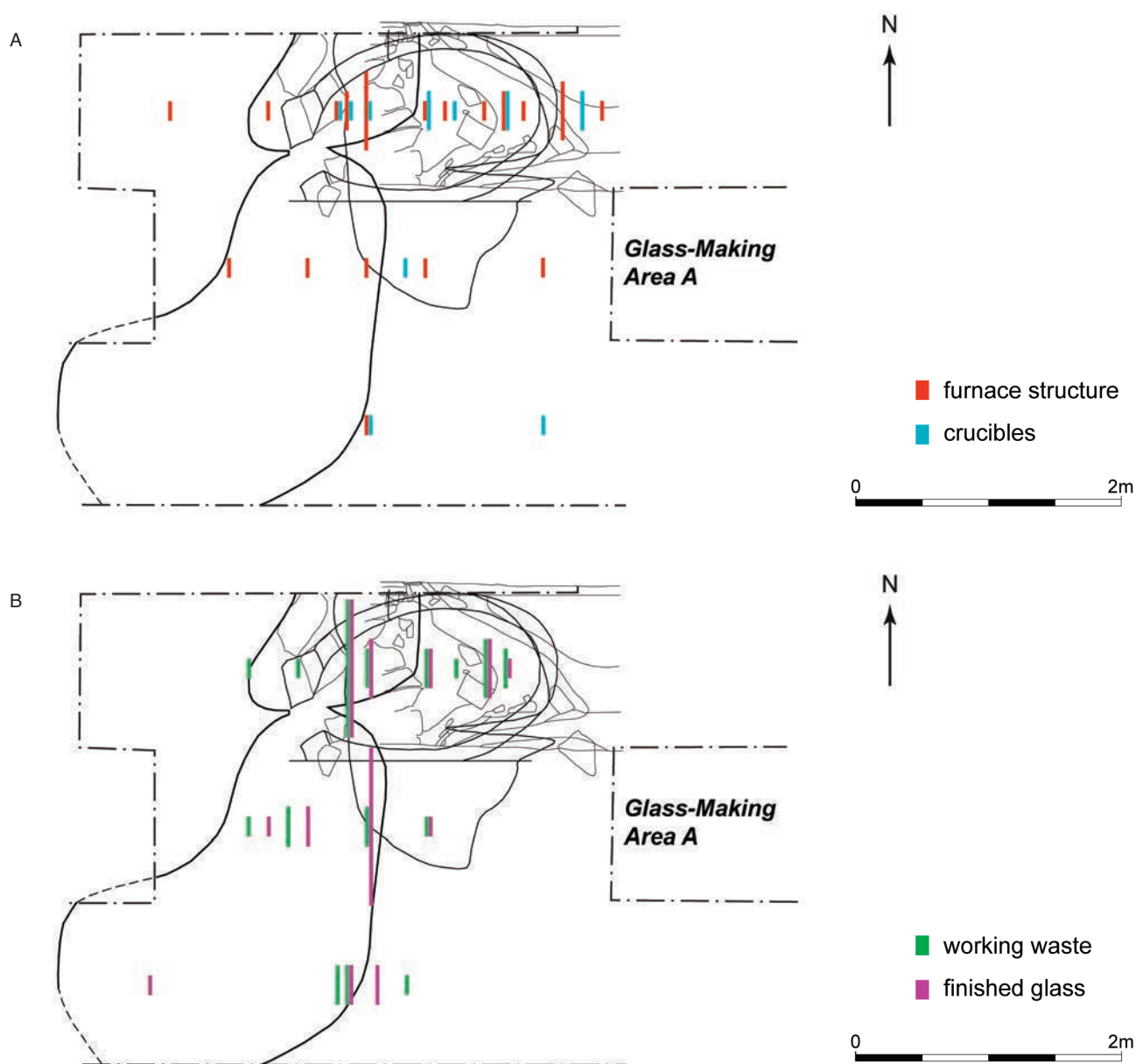
### Finds from Area A

A very significant quantity of kiln superstructure and glass-making debris was recovered from this area, although it is unfortunate that many of the more diagnostic pieces have since been lost. The material culture can be roughly divided between those finds recovered in 1955, closely related to Furnace 1, and those that were found in 1956 when the area was extended, and may relate to Furnace 2. However, artefacts found in 1956 could equally have come from the re-excavation of the lower levels of Furnace 1. Therefore, given the very close proximity of the two possible furnaces and the potential for even limited dispersal of any waste during different phases of glass-making, it is not possible to associate specific material with an individual furnace. Many of the original finds bags had detailed descriptions of their find location written on them (these are fully transcribed in the online catalogue). In most cases this included the trench itself, an easting relative to the eastern or western edge of that trench and a depth of recovery. Occasionally a northing is also given, although in most cases this is absent. This detail allows the partial reconstruction of the original find locations: two distribution maps have been produced to show the find spots of furnace material and slag (fig 7.5A) and the different coloured glasses (fig

7.5B). Given the general absence of northing data most finds are located in the middle of their respective trenches, although given that each is only 1.22m wide, a reasonable plot can still be achieved. It is clear from the distribution of the furnace structure that most was recovered from the vicinity of Furnace 1 in CLE-W, with only a very small background scatter throughout the other two trenches (fig 7.5). This too seems to confirm the suggestion that, if Furnace 2 actually existed, it must have pre-dated Furnace 1 and was thoroughly demolished when the latter was constructed. Although finds of vitreous slag were relatively scarce, there seems to be a slight concentration in the areas just outside the stokeholes of the furnaces, again a pattern that might reasonably be expected. The evidence for the distribution of crucibles shows a similar pattern. The strongest concentration falls within the confines of Furnace 1, again an unsurprising distribution given that crucibles were probably rarely removed from within the furnace until they failed and had to be replaced.

The distribution of glass fragments is also interesting (fig 7.5B): pieces of working waste and identifiable vessels or windows have a very similar distribution. There is again a very strong concentration of glass finds within the area of Furnace 1, with only a few fragments lying to the west. There is a second concentration of glass finds to the south of the stokehole of Furnace 1 and the western edge of Furnace 2. As with the crucibles and furnace structure, the association of glass fragments and Furnace 1 is unsurprising. However, the grouping of glass finds to the south might lend weight to the possibility that Furnace 2 was in fact a real structure, demolished and superseded by Furnace 1. The demolition of Furnace 2 might have caused the removal of larger finds, such as tile and clay superstructure, but not the finer glass that was left behind.

It is worthy of note that, with the exception of a single example from glass-making Area C, all the crucible fragments recovered from the excavations can be associated with Furnaces 1 and 2, and there are twenty-nine small sherds in total. All are highly fragmented, making reconstruction of the original shape difficult; Bayley offered an accurate approximation based on the two largest surviving sherds, a convex-sided shape with everted rim and narrow base.<sup>16</sup> Being around 180mm tall and having a rim diameter of 162mm, the capacity of such a vessel was clearly small; given the thinness of the walls of most surviving sherds, usually around 4–5mm thick, it seems unlikely that the vessels would have survived repeated or prolonged use in the furnace.



**Fig 7.5** (A) Glass-making area A: distribution map of find spots for furnace material and slag (scale 1:50); (B) Glass-making area A: distribution map of different coloured glasses (scale 1:50)

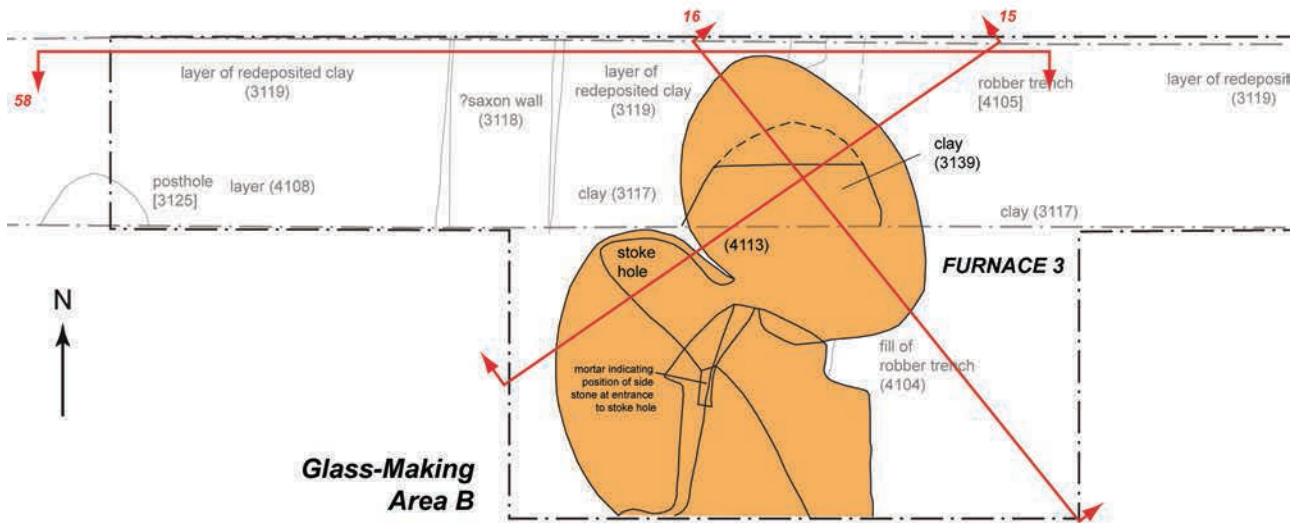
### Glass-making Area B

The second area of glass-making identified at the site was located 5m to the west of Area A (fig 7.1). First identified in trench CL1 and partially excavated during 1956, the area was reopened in 1957, incorporating CL1 Ext 3 to the south. One furnace was identified and this is the best recorded of the glass-making features recovered on the site. A number of good-quality plans and sections drawn by Peter Hart survive, as well as a significant number of photographs. In 1957 the whole area appears to have been excavated to natural clay, and therefore it can be said with confidence that Furnace 3 was the only glass-making feature within the confines of the trench.

### Furnace 3

The form of the industrial features is relatively easy to reconstruct in plan and consists of two major elements: an oval furnace measuring approximately 2m by 1.4m externally and oriented on a north–west to south–east axis, and an adjoining stokehole and stoking pit to the south west (fig 7.6). It is clear from plan LA10 that whilst the furnace was fully excavated, only the north-eastern portion of the pit was emptied, making its shape difficult to reconstruct precisely.<sup>17</sup> It appears to have been of similar size to Furnace 1, measuring approximately 1.9m by 0.9m.

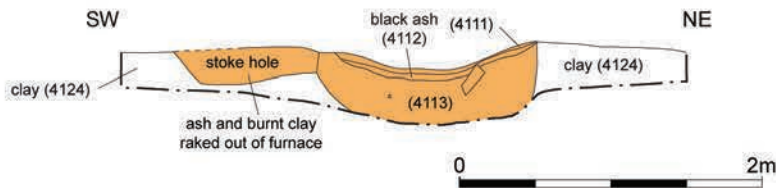
The sequence of construction for both elements can



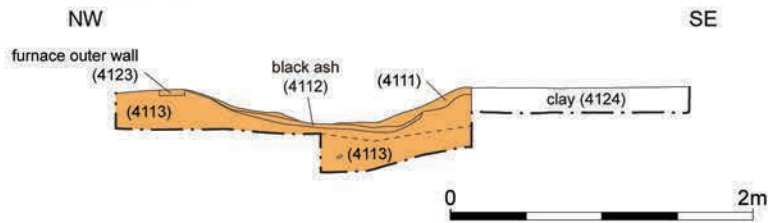
**Earliest possible phase**



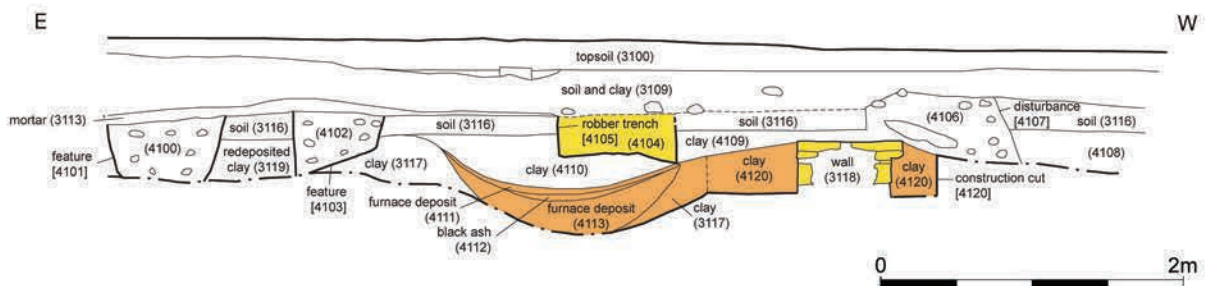
**Section 15**



**Section 16**



**Section 58**



**Fig 7.6** Detailed plan of glass-making area B (scale 1:50); Trenches 57 and 59, Sections 15 (1:50), 16 (1:50) and 58 (1:50)



clearly be seen in Sections 15 and 16 (fig 7.6). There appear to have been no earlier features pre-dating the furnace, and the structure was built directly onto the underlying natural clay. The first action was the laying of a band of redeposited clay [C:4113], noted as containing patches of mortar and ash (Section 16), which varied in thickness between 20cm and 35cm. In both Sections 15 and 16 the clay directly below this redeposited clay is differentiated from the surrounding levelling [C:4124]; these are likely to be the same context that was subsequently affected by the heat of the overlying furnace. It is noted on Section 16 that [C:4113] contained 'reddened clay and ash more at the top than the bottom', suggesting contamination from above; a sketch plan in Harden's notebook describes the same context as 'yellow clay with mortar and black specks', suggesting it is the same as the rest of the redeposited material.<sup>18</sup>

The floor of the furnace was formed directly by the redeposited clay. In both sections it appears as a shallow depression up to 24cm deep; as with Furnace 1, this is likely to have been part of the original design. Given the apparent absence of a tile base, the depression might have been created by the combination of heat damage from the furnace and the repeated raking out of the ashes. The outer wall of the furnace [C:4123] was also detected in the northern area of the excavation but not to the south, perhaps having been truncated here. Although not shown on the excavation plan, it can clearly be seen in several of the original photographs.<sup>19</sup> It is also recorded on the north-eastern edge of the furnace in Section 16 as a white mortar layer 15cm wide, resting on, and perhaps cut slightly into, the underlying redeposited clay [C:4113]. Although the mortar edge only survived in the northern part of the furnace and only to a depth of a few centimetres, it is clear that it originally formed a setting for a wall constructed at least in part from reused Roman tile, although none remained *in situ*.

The stoking pit to the south can be seen in plan adjoining the furnace with a narrow stokehole only around 23cm wide, although this area on the plan is the least clearly illustrated and may well have been disturbed by the later Saxon robber trench [C:4105]. Although only partially excavated, the pit appears to have had its sides faced with stones set on edge closest to the stokehole – as evidenced by a patch of *in situ* mortar [C:4125] immediately to the south of the stokehole – though not its base. It is also possible that the stokehole itself was stone-lined: a portion of burnt stone slab with two surviving chamfered edges and evidence of mortar on the surface was recovered from the entrance of the stokehole, although it could also have come from the superstructure of the furnace (fig 7.7).<sup>20</sup>

Within the interior of the furnace two layers were excavated on top of the burnt floor [C:4113]. The first was a lens of black ash [C:4112] up to 4cm thick, although Section 16 seems to indicate that this did not extend all the way across the floor of the furnace, being concentrated more towards the centre; this is likely to represent the final firing of the structure. Overlying this was a second layer [C:4110], up to 8cm thick, described as 'burnt clay' on Section 16, and 'reddened clay including collapse of superstructure' on Section 15. As has already been suggested for Furnace 1, this band is almost certainly what remained of the furnace's demolished superstructure once any reusable stone and tile had been robbed out. Within the stoking pit an *in situ* deposit [C:4126] remained to a depth of up to 24cm, although this was only excavated in the northern quarter of the feature. It was described as 'ash and burnt clay raked out of furnace' on Section 15.

Some confusion concerning the relationship between the two features in this area arises in correspondence between Jope and Harden in September 1957.<sup>21</sup> It is clear



**Fig 7.7** A burnt flat stone slab with two surviving chamfered edges and evidence of mortar on the surface recovered from the entrance of the stokehole of Furnace 3 in glass-making area B (scale c 1:3) (photo: C Steele)

that Jope thought that the furnace and the stoking pit were both separate furnaces, and that the former preceded the latter. On 4 September he wrote that 'sealed under this [the main furnace] was another furnace structure, N-S in the S extension', and in a subsequent letter of 14 September he concluded that, owing to the absence of high temperature material, they represented a 'succession of annealing furnaces'. This contradicts the sketches in Harden's notebooks and the measured plans and sections drawn by Peter Hart where there is clearly a direct relationship between the two. Furthermore his identification of these as annealing furnaces is open to question; this is the same interpretation that he suggested for Furnace 1 in 1955.<sup>22</sup>

### Finds from Area B

The stratigraphic remains of Furnace 3 in this area were amongst the clearest found on the site but virtually no finds were either encountered or survive today. Curiously, only ten small pieces of fired clay furnace superstructure remain, weighing just 171g; it is not certain why more was not collected or, if it was, why it no longer survives.<sup>23</sup> Likewise, nothing can be said concerning the nature of manufacture taking place here. Harden notes the find of a single fragment of green glass above the furnace, but by the time of the evaluation by Bayley this could not be identified and it is still lost today.<sup>24</sup>

### Glass-making Area C

In 1957 a further area, CLE1, to the south east beneath the east cloister walk was opened. This was then extended south to form a box 3.35m by 2.44m. Once glass-making waste and furnace material had been identified a further small trench was opened a little further south, CLE4, measuring 2.21m by 1.83m (see fig 5.18).<sup>25</sup> Extensive evidence for glass-making was found throughout the whole area, although its interpretation is hampered by three factors. First, the whole area was heavily disturbed by later activities, which included the construction of a medieval stone-lined drain [C:4080], a kerb [C:4083], a robber trench [C:4029] and three large scaffold posts and a post-hole from the dismantling of the area at the Dissolution [C:4077] [C:4082] [C:4085] [C:4079]. Second, it is clear from the surviving plans and sections that the trenches were not excavated to natural at any point, apart from a small portion of the north section of CLE1, making interpretation of the contexts revealed difficult. Finally, the recording of the features was rather sparse. Surviving documentation includes: a lower phase plan for

the whole area, LA47, and the southern east–west section of CLE1 South Ext, no 17, drawn by Peter Hart; a poorer quality but accurate drawing of the east–west North Section, no 53; and a slightly later variation, no. 60, that seems to have been drawn after further work had been undertaken.<sup>26</sup> No sections can be identified for CLE4. Two photographs showing the lowest excavated phase in CLE1 and the south section also survive (see fig 5.19).<sup>27</sup> It is important to note that the whole of the area appears to have been cleared incredibly quickly in just four days; Harden's site notebook states that CLE1 was opened on 27 August, CLE4 on the evening of the 28th and that the excavation was over by the end of the 30th.<sup>28</sup>

On reading Harden's notebook it is clear that at no point did Harden or Radford positively identify a furnace *in situ*, although Harden notes a stokehole filled with black ash [C:4091], running under the west section of CLE1, which is shown on Hart's plan LA47. Furthermore, it may be suggested that portions of not one, but two, different furnaces may have been encountered in this area based on the north and south sections of CLE1, nos 60 and 17 (the latter actually identified by Hart as 'furnace *in situ*').

### Furnace 4

In CLE1, below a later medieval clay levelling [C:4057], an extensive spread of burnt clay mixed with glass and slag [C:4062] was found covering the majority of the trench, apart from the south-west corner where there was a deposit of clean blue clay [C:4059]. On Hart's plan an east–west running stokehole [C:4092] is shown, but this is described by Harden as 'an area of charcoal (furnace stoking)', which 'ran down slope on inside of curve of red clay'.<sup>29</sup> It seems that, rather than being a defined feature, it was simply a layer of burnt material overlying the red clay [C:4062] and sealed by the later blue clay [C4059]. Plan LA47 clearly shows that the blue clay continued to overlie the burnt material in CLE4 to the south, forming an arc very approximately 2.7m in diameter north to south and, as Harden remarked, 'the whole looks like an apse end!'.<sup>30</sup>

This relationship can be seen in the southern section of CLE1, no 17, where the burnt clay layer [C:4062] can be identified running underneath the blue clay [C:4061] [C:4059] at a forty-five degree angle, although the black charcoal lens is not present in this area. Hart's section drawing describes [C:4062] as 'kiln *in situ*'; the suggestion that the very edge of a furnace may have been caught here is also indicated by other features in the section. Directly overlying the end of [C:4062] is an isolated area

of yellow clay [C:4058], with Roman tiles bedded both above and below it. Although any interpretation must be tentative, it is possible that this represents the lowest level of the outer wall of the furnace, consisting of clay-bonded and reused tiles.

If this is indeed the case, then Furnace 4 can actually be identified as lying directly beneath the baulk between CLE1 South Ext and CLE4, within the area described by Harden as the 'apse' (fig 7.1). As was the case with Furnace 3, the dark charcoal layer [C:4091] represents the residue of the final firing of the furnace, and is concentrated more to the west of the floor where the stokehole was likely to have been, based on the other excavated furnaces. Once the furnace ceased to be in operation, the whole area appears to have been levelled over with the blue redeposited clay.<sup>31</sup> The curve of the red clay [C:4062] in the south-west corner of the trench marks the outer edge of the furnace, which is shown still covered by the later levelling. This has been disturbed at the western section by the cut [C:4055] for the wall of the later medieval cloister walk. This explains why Harden and Radford were unable to identify a furnace positively, as the majority of the structure remained unexcavated. The reason why digging was not pursued further in this area is uncertain. Harden notes in his diary on 28 August that the 'blue lias clay which first thought natural ... must come out'.<sup>32</sup> However, just two days later the diary breaks off abruptly and it is clear the excavation had stopped at this point.

## Furnace 5

As suggested above, the most likely focus for glass-making in this area lay to the south of CLE1 South Ext and the northern part of CLE4. However, there is an intriguing suggestion that a second furnace may also have been encountered in CLE1, although this seems to have gone unnoticed by Harden. Hart's plan, LA47, clearly shows a semi-circular raised portion of burnt clay [C:4071] in the north-east corner of CLE1 (fig 7.1). Harden also sketches this in his notebook, but assumes it is the same context as the burnt area to the south.<sup>33</sup> However, the north section of CLE1 by Radford, Section 60, clearly shows a bowl-like depression in section which directly corresponds to the raised area of red clay in plan. The lack of comment from Harden concerning this feature can be explained by the fact that it was only really visible in a small boxed extension to the section, and this cannot be seen on the final phase photograph, or Section 53, suggesting Radford had cut this after Harden had left the site.<sup>34</sup>

The feature is of familiar form, being a depression 17cm deep and 82cm wide, cut into what was apparently the natural [C:4072]; as only the edge of the furnace was in the section, its full diameter must have been somewhat larger. The floor of the furnace [C:4071] was formed from the underlying clay that had been fired red to a depth of up to 25cm. The primary fill directly on top of the floor was a deposit of small stones, fragments of burnt clay and ash [C:4070], and this seems to represent the final firing of the furnace.

Although only tentative evidence remains for a previously unrecognised fifth furnace at Glastonbury, the recent reanalysis of the material suggests that there is a good case for one. The southern edge of Furnace 5 was at least 1.5m away from the closest point of the northern edge of Furnace 4, sufficient distance that both could conceivably have been in operation at the same time, although the absence of a clear stratigraphic relationship between them makes it impossible to determine this.

## Finds from Area C

The data recorded on the finds bags is less detailed in many cases than for glass-making Area A and a significant proportion of the material culture is now missing; of the thirty-three glass finds originally associated with the area, fourteen cannot now be located.

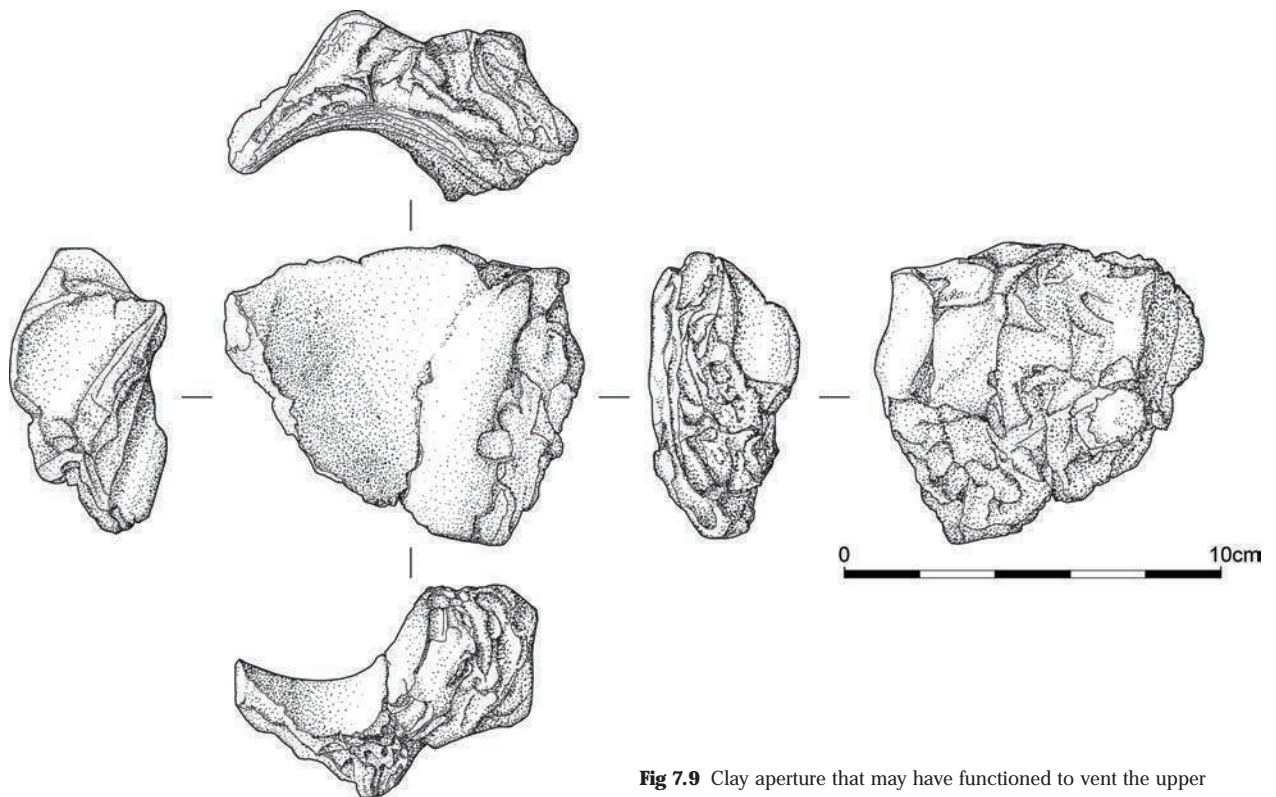
The excavations produced a significant quantity of structural material, presumably derived from the destruction of the furnaces, primarily in the form of relatively undiagnostic pieces of superstructure or sherds of Roman tile. However, eleven finds of inner furnace lining were also found, with vitrified surfaces and sometimes splashed with blue / green glass, and at least three of these had clear tile or wattle impressions preserved within them (fig 7.8). Three pieces of clay aperture were also recovered (fig 7.9), very similar to those from Furnaces 1 and 2, and, as with the previously discussed examples, these were too small to be gathering holes and must have functioned as vents in the upper superstructure.

An interesting find from the area is a small piece of curved iron tube (fig 7.10).<sup>35</sup> Although too small to be conclusively identified, it is just possible that this was a portion of a blowing iron. To date no glass-working tools have been identified on a Roman or early medieval site in England, but they have been found on late antique sites on mainland Europe.<sup>36</sup> Only a single body sherd of crucible was recovered from the area and this contained the remains of a blue / green glass residue (fig 7.11).<sup>37</sup>

Despite the significant number of missing glass finds,



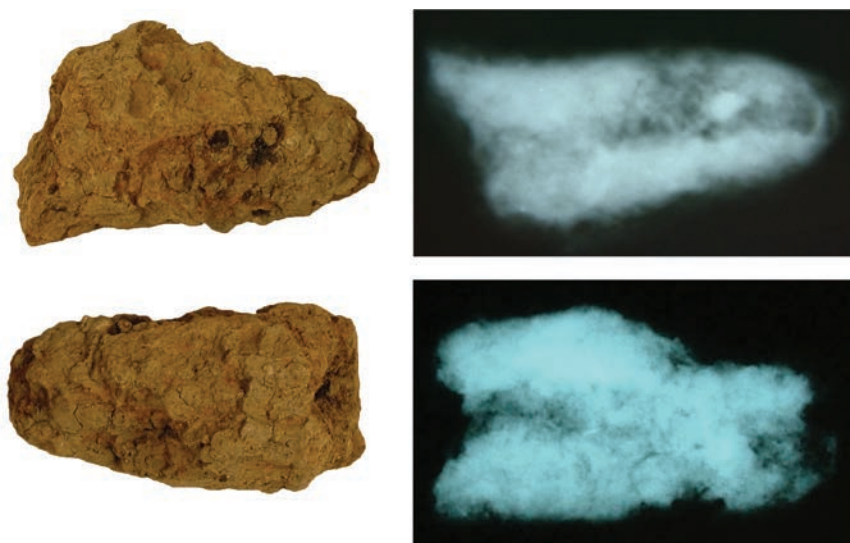
**Fig 7.8** Inner furnace lining with tile or wattle impressions (scale c 1:1) (photo: C Steele)



**Fig 7.9** Clay aperture that may have functioned to vent the upper superstructure (scale 1:2)

some interesting observations can be made. First, there is a significantly higher proportion of coloured glass in this area, rather than the natural blue / green, with twelve of the fragments (52 per cent) being turquoise or amber / brown in colour. Conversely, only one of the moils from this area was in a coloured glass (25 per cent), although the low numbers of finds overall and the high proportion of those that are now missing could be skewing these

proportions; it might be expected that a higher proportion of coloured glasses would actually have been sent for analysis and subsequently lost. However, within the surviving assemblage there is a strong correlation between blowing waste and blue / green glass. This leads to the tentative suggestion that blue / green glass was primarily used for blowing vessels, whilst coloured glasses may have been used more sparingly for applied



**Fig 7.10** A small piece of curved iron tube, possibly a portion of blowing iron (scale c 1:1)  
(photo: C Steele)



**Fig 7.11** A crucible sherd with blue-green glass residue (scale c 1:1)  
(photo: C Steele)

decoration. This pattern is also suggested by the presence of only blue / green glass splashed on the furnace lining and in the one remaining crucible.

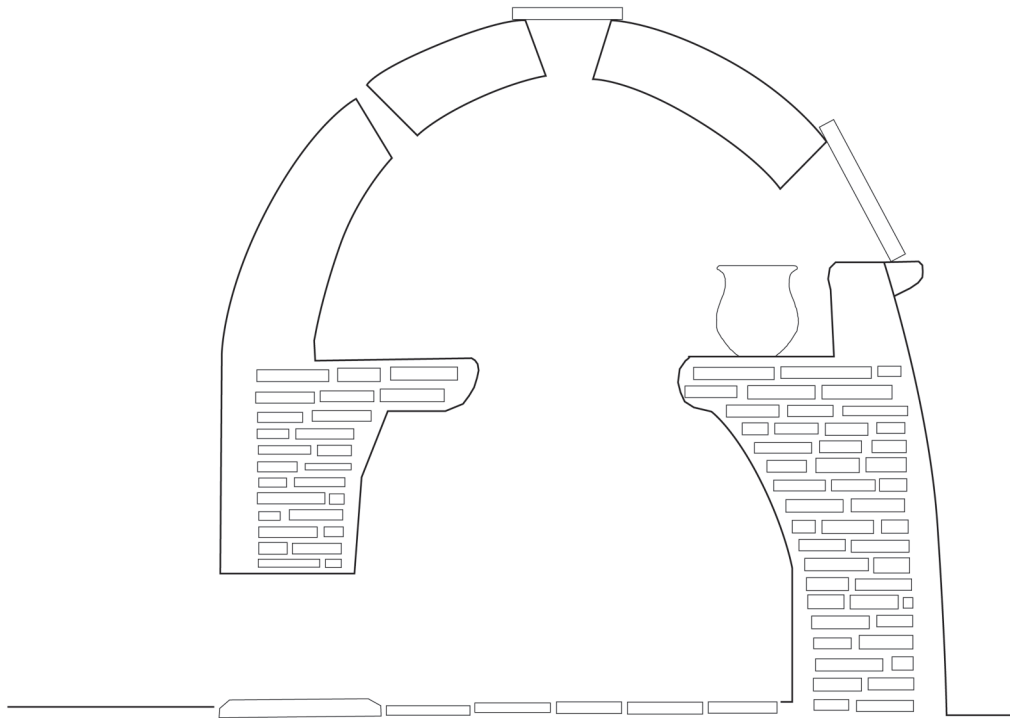
### Reconstruction and performance of the furnaces

Any reconstruction of the furnaces must be tentative, given the heavily truncated nature of the deposits and the partial recording of the evidence. Of those encountered only Furnaces 1 and 3 were sufficiently documented for their structure to be interpreted. Whilst these two furnaces differ in elements of their shape, they are similar enough to suggest that they were constructed to a common design and performed similar functions. Shortly after their excavation, Martyn Jope suggested that both Furnace 1 and Furnace 3 were in fact annealing ovens. He based this on the relative lack of evidence for burning within the structures, although he acknowledged that the closest excavated parallels at the time dated to the sixteenth century.<sup>38</sup> However, in light of recent research it seems likely that the structures were melting furnaces.

No other furnaces of Saxon date have been excavated to provide comparators for a reconstruction of the Glastonbury examples, with the exception of the unpublished structure excavated at the monastery of Barking (discussed below). However, recent experimental work undertaken by Mark Taylor and David Hill has provided an extremely useful analogy for Glastonbury.<sup>39</sup> Although their reconstructions of ancient furnaces have been based on Roman designs, some are sufficiently close

to the Glastonbury evidence to merit comparison. During their experiments, Taylor and Hill successfully constructed and operated two types of typical Roman melting furnaces over a three-week period, before demolishing and recording the remains.<sup>40</sup> They produced two varieties of a circular 'pot furnace': one where the tile-built wall of the furnace acted as the siege to hold the crucibles and the other where there was a separate shelf within the furnace.<sup>41</sup> At Glastonbury the demolition and subsequent truncation of the furnaces has removed all *in situ* evidence, but several fragments of flat Roman tile had glass splashes on the upper surface only.<sup>42</sup> This suggests that the first type of reconstruction proposed by Taylor and Hill might match the Glastonbury evidence most closely, and it is on this model that the proposed reconstruction is based (fig 7.12).

There are many similarities between Taylor and Hill's furnace and the excavated remains at Glastonbury. Both had their lower walls constructed out of bonded Roman tiles; the reconstructed Roman furnace used them on the floor, matching the evidence from Furnace 1. Taylor and Hill's furnace was successfully operated with a single stokehole 30cm in diameter – only slightly larger than the 22cm and 23cm sizes of stokeholes for Furnaces 1 and 3. Taylor and Hill successfully demonstrated that it was possible to raise the temperature to 1050° C and to run it consistently at this heat using a system of vent holes of almost identical size to those excavated at Glastonbury. Located in the top of the superstructure, these were opened or closed using stoppers to regulate the air flow and thus the temperature.<sup>43</sup>



**Fig 7.12** Reconstruction of the Glastonbury glass furnaces (drawing: H Willmott, based on Taylor and Hill 2008)

But there are important differences between the experimental reconstruction and the evidence from Glastonbury. The first is in the shape of the structure, with both Furnaces 1 and 3 being oval or elliptical in shape. The practical benefit for this is uncertain, but it might have better enabled the glass-workers to access the sieges from both sides of the furnace. The Glastonbury furnaces were also 40–60cm longer on their longitudinal axis than the reconstructed furnace, but had a width of 1.2–1.4m, which was almost exactly the same size as diameter of Taylor and Hill's furnace. Consequently, although of slightly different form and size, it is likely that the Saxon glass-makers would have been able to expect a very similar performance to the modern experimental reconstruction. One final difference was the level that the stokehole entered the fire chamber. Taylor and Hill observed that in excavated Roman furnaces the stokehole entered the fire chamber a short distance above the floor level, either creating a distinct step, or sloping down forming a ramp.<sup>44</sup> By contrast, both furnaces at Glastonbury appear to have had the stokehole entering at floor level, and in the case of Furnace 3 at least, access was improved through the use of a stoking pit.

A relevant observation made by Taylor and Hill was the effect that prolonged exposure to heat had on the furnace structure over time. Although the dome of their furnace was constructed only from daub, as is suggested for Glastonbury, and suffered considerable shrinkage and cracking, this could be easily managed through the

application of fresh daub to the affected areas. They also observed that even though the main walls had been built using Roman tiles bonded horizontally, when the three-week firing was over and the structure was deconstructed all the tiles were found sloping inwards towards the centre of the furnace.<sup>45</sup> The Saxon furnace may have been affected in a similar way through prolonged exposure to heat: the presence of tiles tipping inwards can be seen in the only surviving photograph of Furnace 1 (fig 7.3).<sup>46</sup>

## 7.3 Dating the Glastonbury glass production

### Previous date estimations

It is clear that immediately after excavation both Radford and Harden thought Furnace 1 to be Late Saxon in date. Nonetheless, Radford was initially cautious, writing to Harden on 29 December 1955 that they could still be as late as the eleventh century, although stating that 'I hope next year to establish a stratigraphical dating of pre-950, but at the moment this is only a possibility for which there is not sufficient evidence'.<sup>47</sup> Radford favoured a date before the mid-tenth century for Furnace 1, and presumably Furnace 2 upon its discovery in 1956, owing to the presence of what was later confirmed as a robbed-out Dunstan-period wall [C:2014] overlying the

structure.<sup>48</sup> Radford was still in favour of a tenth-century date in the 1980s when in correspondence with Harden.<sup>49</sup> Furnace 3 was also overlain by a robber trench [C:4105] for a pre-Conquest wall, suggesting a similar date stratigraphically. Excavating Furnace 3, Harden recorded in his notebook the presence of a 'sherd of pagan Saxon type found at 8in near middle' of the furnace structure, perhaps indicating this was an earlier feature than first thought.<sup>50</sup> Early archaeomagnetic samples taken by Robert Cook from Furnace 3 were inconclusive, and a more recent reinterpretation by Tony Clark suggests a very broad date range for the samples, from the Late Iron Age up to AD 910.<sup>51</sup> A sample was also taken from Furnace 4, but it was concluded to be from disturbed material.<sup>52</sup> Neither Radford nor Harden made any further suggestions concerning the date of Furnace 4, probably owing to the lack of identified *in situ* remains. Subsequent literature on both the history of glass and Glastonbury Abbey propose a date for the furnaces of the ninth to tenth centuries.<sup>53</sup>

Bayley challenged this assumption in her re-evaluation of the evidence, suggesting that the glass furnaces would more likely have related to a 'major rebuilding campaign' such as Dunstan's remodelling of the abbey in the mid-tenth century.<sup>54</sup> However, she conceded that an earlier date was a possibility, noting that a mid-tenth-century date would be rather late to fit comfortably with the stratigraphic relationship of the furnaces, as well as the archaeomagnetic dates that provided a *terminus ante quem* of c 910. Evison also thought that glass-making was likely to have taken place during a major building campaign. However, she was the first to note that the Glastonbury assemblage contains no potash glass, a type increasingly found from the ninth century onwards.<sup>55</sup> Importantly, she concluded that the glass from Glastonbury was likely to be even earlier and noted that some fragments had parallels with other sites of known late seventh- and eighth-century date.<sup>56</sup>

### C14 dating of the furnaces

Based upon the stratigraphic relationships alone, a case could still be made for a mid-tenth-century date for the glass-making phase. Although both Furnaces 1 and 3 were cut by Dunstan period walls, they could conceivably have been in operation just before this event, as the mid-tenth-century activity truncated parts of the structures. Furthermore, with the exception of the single sherd of now-missing 'pagan Saxon' pottery found within the burnt floor of Furnace 3, no datable evidence was found underlying the furnaces to provide a *terminus post quem*.

The presence of earlier glass fragments could be argued to represent the collection and remelting of old cullet, rather than the actual manufacture of glass in the seventh or eighth centuries.

However, in the light of recent C14 dating of the furnaces, a tenth-century date can now firmly be rejected. During the excavations charcoal samples were retained from the areas of CL1 and CLE-W in which Furnaces 1 and 2 were located, and five of these were submitted for analysis in 2011 (see Table 1).<sup>57</sup> Despite the length of time that the samples had been in storage, the delta 13C values for all five samples demonstrated that there was no contamination to the charcoal and the dates are therefore reliable.<sup>58</sup>

Three of the samples came from Furnace 1. Two of these (Samples 1 and 2) were recovered from the 'tile / ash / clay' demolition layer [C:2019] above the furnace, and one, Sample 3, came from the 'floor & filling of glass kiln' context [C:2092], which Harden noted as having been found 'on kiln floor'.<sup>59</sup> Taken together, they provide a broad age range for the furnace of AD 605–882, but this can be narrowed to AD 605–780, as the period at which all ranges overlap at the highest probability (at 2 sigma). Both Samples 1 and 2 coincide with a small plateau in the calibration curve, which has the effect of stretching the range. However, Sample 3 has a much more precise range of AD 605–85. Given that all three samples are securely stratified within Furnace 1 deposits, and are therefore of the same ages (in radiocarbon terms at least), these results can in all probability be interpreted as being indicative of activity in the latter part of the seventh century AD, around the 680s. Two further samples that were recovered from the area when it was reopened and extended in 1956 were also submitted for C14 dating. Sample 4 was described as coming 'from floor of furnace' and Sample 5 'within and under kiln'. Unfortunately it is not possible to tell whether these came from Furnace 1 or 2, although in the case of Sample 4 it is likely to have been the latter, as the floor of Furnace 1 was fully cleared in 1955. However, given the very clear stratigraphic association between the two furnaces the samples still help to date the *phase* of glass-making activity. Samples 4 and 5 can be said with certainty to date to between AD 662 and 773. If they both derived from Furnace 1, then they are statistically the same age as the other results and support a late seventh-century phase of production. A date in the 660s to 680s must be assumed if they are from Furnace 2, since it appears to precede Furnace 1 stratigraphically (and therefore Sample 3). Bayesian analysis of the five radiocarbon dates supports a date in the late seventh century (see Table 2).

## Contextualising the date

There is now sufficient evidence to demonstrate that glass-making was taking place at Glastonbury in the late seventh or early eighth centuries AD, and in all probability this can be narrowed down to the last decades of the seventh century. This confirms the dating of the vessel glass by Evison, and also ties historically with her assertion that it most likely coincided with a major building campaign at the abbey.<sup>60</sup>

The broad date of the glass furnaces falls within the reign of Ine, King of the West Saxons (see Chapter 3). According to the entry for AD 688 in the *Anglo-Saxon Chronicle*: 'This year Ceadwall went to Rome ... to him succeeded Ine in the kingdom of Wessex, and reigned thirty-seven winters. He founded the monastery of Glastonbury; after which he went to Rome.'<sup>61</sup> Ine is mentioned eight subsequent times in the *Chronicle* between AD 688 and 728. Although both the start and the end of Ine's reign are mentioned in the entry for 688, the fact that the reference to the founding of Glastonbury is the only event of his rule to be recorded at this point may suggest that it took place at the beginning of his reign.

Relatively little is known of Ine's monastery at Glastonbury, although stone foundations relating to a late seventh- or early eighth-century church were discovered underneath the western end of the later medieval nave. While no glass or evidence for glazing was found within these excavations, it seems likely that glass-making was established not only to provide windows for Ine's new buildings, but also vessels for the nascent community. There is a well-recognised connection, both historically and archaeologically, between ecclesiastic institutions and glass-making in the seventh century. The earliest documentary references allude to the glazing of St Peter's in York c AD 669–72 and to the import of Gaulish glass-makers on the foundation of Wearmouth in AD 675.<sup>62</sup> Cramp has highlighted the presence of window glass on other early monastic sites, including Brandon, Flixborough and Barking, and there appears to be a similar correlation between early glass use, if not production, in Ireland.<sup>63</sup>

## Glass-making in late seventh- to early eighth-century England

### Monastic sites and glass-making

With the exception of eleven crucible fragments found in a pit of supposed sixth-century date at Buckden, Cambridgeshire, and probably connected only with bead

making, there is no comprehensive evidence for glass manufacture in England before the second half of the seventh century.<sup>64</sup> Historically, the first references to glass-making occur in the 670s at York and Wearmouth and there seems to be a strong connection between the reintroduction of the glass industry and the establishment, or refounding, of monasteries in the late seventh century.

Although no direct evidence for glass manufacture was found during the excavations at Wearmouth, two sherds from a crucible were recovered from its sister house at Jarrow, established in AD 682.<sup>65</sup> This crucible is very similar to those found at Glastonbury, a convex form with everted rim, in particular [SF3332] from Furnace 1. Although the excavator thought this crucible was likely to be of ninth-century date, this was based on the assumption that the Glastonbury furnaces were later in date. Certainly Tite's analysis of the crucible residue suggests it contains a melt with a very similar soda-rich composition to the window glass found on the site, which is thought to date from the initial foundation period.<sup>66</sup>

The other monastic site closely associated with glass-making in the Mid Saxon period is Barking Abbey, founded in AD 666 and destroyed by Norse raiders in 870.<sup>67</sup> Excavations in 1990 produced the plan of a circular furnace approximately 2m in diameter, with a floor constructed from reused Roman tiles, but the evidence remains unpublished. Pits associated with the furnace contained glass waste, coloured reticello rods for adding surface decoration and, apparently, vessel wasters. Also found was a portion of Roman tile covered in glass, which was assumed to be a portion of a furnace tank, but was more probably part of the internal furnace structure, perhaps used to hold the pots, similar to the tile finds from Glastonbury.<sup>68</sup> The excavator of the site noted a dilemma in the dating of the glass-making phase: an archaeomagnetic sample taken from the burnt clay beneath the furnace produced a date of AD 925± 50 (although the data are still not fully published), making the furnace later than the destruction of the abbey.<sup>69</sup> At least nine of the vessel fragments recovered from Barking have been dated typologically to the eighth century by Evison, although any conclusions must remain provisional until a full analysis of the site is undertaken.<sup>70</sup> However, the balance of probability suggests that the glass-making was connected with the Mid Saxon monastery.

The pattern of glass-making evidence connected with monastic sites is repeated at Whitby in the eighth century and possibly at Whithorn as well.<sup>71</sup>



## Continental workers?

In her discussion of the glass-making evidence from Wearmouth, Cramp outlined a number of potential research questions relating to the probable Gaulish origin of the glass-workers there, and some of these are equally applicable to Glastonbury.<sup>72</sup> In contrast with Wearmouth, there is no direct historical evidence for foreign expertise being involved at Glastonbury. However, given the apparent cessation of all glass-making in England for nearly two centuries after the end of the Roman occupation, the presence of continental glass-workers must be assumed.

Cramp suggests that the glass-workers brought to Wearmouth from Gaul could have been trained in the eastern Mediterranean, whilst also recognising that if itinerant glass-makers were operating on the continent at this time this would make specific regional traditions difficult to identify.<sup>73</sup> To date there has been no comprehensive overview of all the evidence for early medieval glass-making in Western Europe, and much of the continental evidence has been overlooked by British authors. There is a considerable amount of evidence for glass-making across mainland Europe: for example, in southern France glass-working waste of fifth- to sixth-century date has been recovered at Marseilles and melting crucibles were found in sixth- or seventh-century contexts during the excavation of the cloister at Viviers, Ardèche.<sup>74</sup> Identification of furnaces is less common, but an early medieval glass-melting structure was identified at Wijnaldum, Frisia, as well as the well-known example at the monastery of San Vincenzo al Volturno.<sup>75</sup> However, perhaps the most interesting parallel was excavated at the monastery of Torcello, just north of Venice, where the base of a well-preserved seventh- to eighth-century circular furnace was found, very similar to the reconstructions of Taylor and Hill.<sup>76</sup> The crucibles are the only artefactual evidence for the origins of the Glastonbury glass-makers. Their form is otherwise unknown in the south west of England and they are made from refined 'ball clay'.<sup>77</sup> The closest source for this clay is the Isle of Purbeck, though the same stratum outcrops in northern France. This, combined with the find of single crucible rim of identical fabric and form at Jarrow, suggests that the Glastonbury glass-makers might also have come from Gaul, like those at Jarrow.<sup>78</sup>

Other elements of the earliest phases thus far identified at Glastonbury hint at a continental influence. For example, the technique used to construct the floor of the earliest stone church – probably attributable to Ine – with crushed-red-brick-tempered mortar, is strikingly

similar to contemporary techniques in Gaul and Italy.<sup>79</sup> It seems entirely possible that foreign workers, possibly from several different regions, were engaged in the construction of the refounded monastery.

## Glass-making practices at Glastonbury

Our understanding of early medieval glass-making practices has developed substantially since the first chemical analysis of the Glastonbury material was carried out in the 1950s. In spite of this, our knowledge of how production sites and glass-makers really operated is still hampered by a lack of archaeological evidence. Glastonbury remains one of the most complete groups of material that we have for glass production in this period and therefore one of the most important. In her reappraisal of Glastonbury, Bayley noted that the assemblage contained no apparent evidence for the raw materials required for *primary* glass production, and suggested that glass-working was much more likely to have been associated with *secondary* production.<sup>80</sup> Analyses of the glass indicated a soda-lime-silica composition,<sup>81</sup> fitting the characteristic pattern of other early medieval British material manufactured in the Roman tradition.<sup>82</sup>

It is now well established that the majority of early medieval glass appears to be related in some way to the large production centres discovered in the Near East and the Mediterranean.<sup>83</sup> Advances in the use of trace elements and isotopic analyses have allowed important links to be made between raw materials and their potential sources, thus enhancing our understanding of the production and distribution of glass at this time.<sup>84</sup> While it is highly likely that the origins of the Glastonbury glass can be traced back to these production centres, the recyclable nature of glass means that the material may have had a complex lifecycle. A number of studies have discussed the possibility that Roman sites may have been exploited for cullet during this time, and the glass-workers at Glastonbury may have gathered glass from many sources.<sup>85</sup>

In order to re-evaluate the Glastonbury assemblage a range of material was selected for compositional analysis. Samples were selected from finds that could be securely located using Radford's notes to within Areas A and C, reflecting both products and working waste from Furnaces 1, 2 and 4. A sub-set of glass was chosen for isotope analysis in order to understand the possible sources of this material and attempt to establish linkages to the compositionally defined groupings now known for the production centres mentioned above.<sup>86</sup> A short

discussion of the key results is given here.<sup>87</sup>

The compositional data from this study confirm that the majority of the Glastonbury samples are soda-lime-silica glass characterised by low levels of magnesia (<1.0%) and potash (<1.0%); as such, they fall into the Roman compositional tradition.<sup>87</sup> The isotopic data are as expected for natron-based glasses of this type.<sup>88</sup> The three crucible samples within this grouping are extremely close compositionally, possibly representing contemporaneous use with the same batch of glass. The other artefact classes (vessel, window, glass-working waste) are close in composition, but no easily discernible differences can be seen in the compositions of products from different furnaces. The use of a variety of colourants, including the use of tin oxide in the opaque white glass on the reticello rod, is in common with glass of this date from the British Isles.<sup>89</sup> Of note is the direct relationship between the tin and copper concentrations within the turquoise glasses, confirming Bayley's suggestion of the possible use of bronze, or an oxide thereof, as a colourant.<sup>90</sup>

The results can usefully be compared with data from Roman vessel glass from the first to fourth centuries and glass from the large production centres of later antiquity.<sup>91</sup> Similar conclusions can be drawn to those suggested by Freestone for the Jarrow material, and indeed compositional links can be detected between the glasses from the two abbeys (in particular the composition of the 'Wearmouth' group as defined by Brill).<sup>92</sup> The Glastonbury glass contains alumina levels that are generally higher than would be expected from the Roman vessels and fits closer with the groupings of material from the production centres of Levantine I and Bet Eliezer that were in operation during the second half of the first millennium.<sup>93</sup> As at Wearmouth and Jarrow, the Glastonbury material is very likely to contain some recycled Roman material. However, the compositional analysis also indicates the introduction of glass from the primary production sites in the eastern Mediterranean at this time, and trade in glass during this later period is well documented.<sup>94</sup> The elevation of transition metal compositions in the Glastonbury material provides evidence for an increased level of recycling.<sup>95</sup>

An unexpected result from the Glastonbury assemblage has been the identification of a small group of turquoise soda-based glasses with enhanced levels of potassium and phosphorus. All of these samples are from glass-working and include waste attached to the furnace lining and a pull. The glass is thought to be similar to the group described above, but the composition was altered by contamination with clay (from the furnace lining and /

or crucibles) and fuel ash during the melt.<sup>96</sup> The strontium isotope data from SF 4053 in this group does not correlate to the marine strontium isotopic signatures of the natron-based glasses produced in the large production centres of the Levant;<sup>97</sup> it is more analogous with the strontium isotopic signature for the local Glastonbury geology, strengthening the hypothesis of contamination by local fuel ashes.<sup>98</sup> In addition, the <sup>143/144</sup>Nd ratio for SF 4053 would normally reflect a western Mediterranean origin for the silica source,<sup>99</sup> but it is thought more likely that the lower epsilon value is primarily due to inclusion of clay, and also plant ashes as hypothesised by Meek.<sup>100</sup>

## 7.4 Conclusions

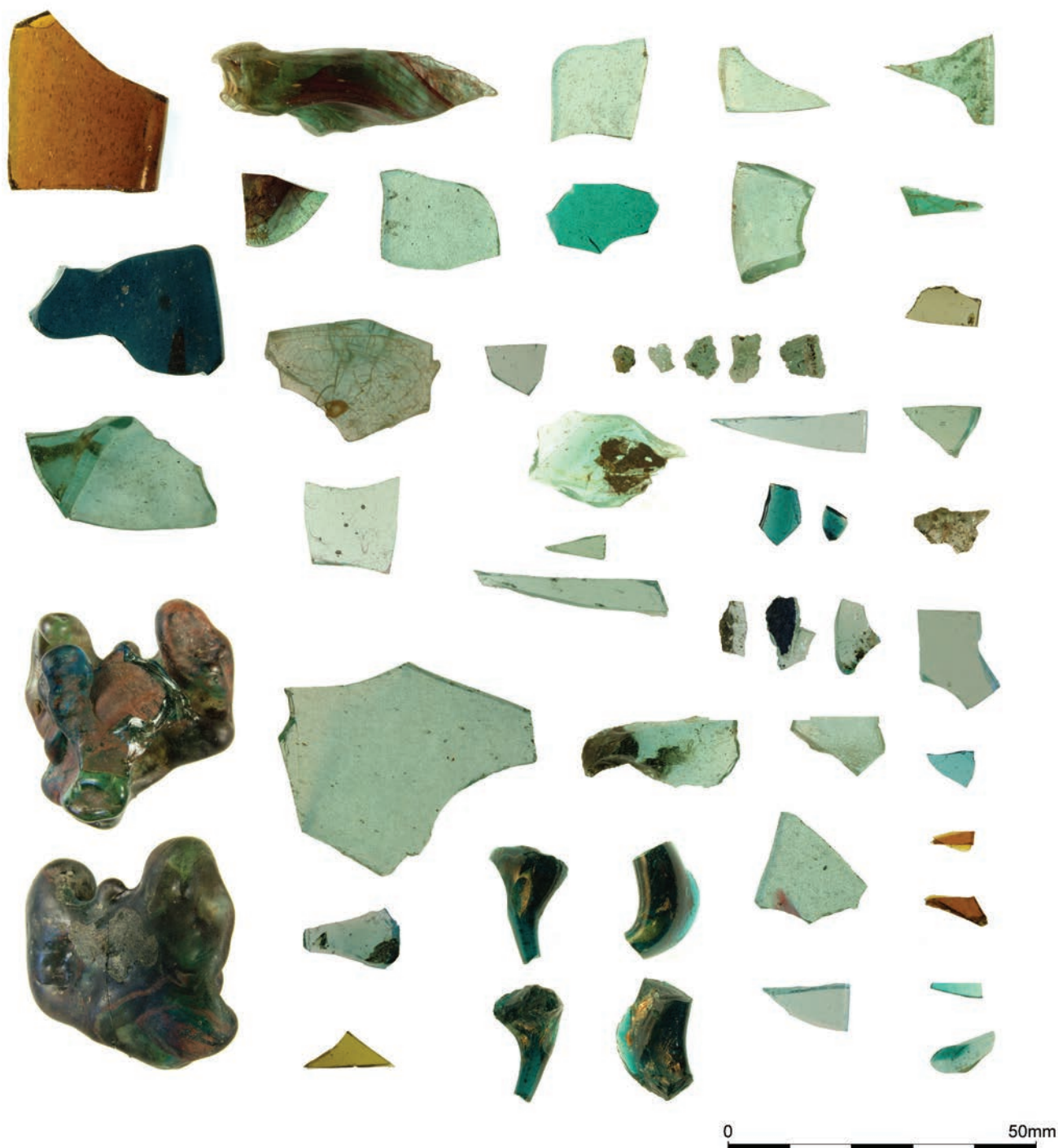
This report forms the most comprehensive examination of the glass-making evidence from Glastonbury Abbey to have been published to date. It has re-evaluated all the extant material for the first time, cataloguing all the artefacts anew and providing an interpretation based purely on the surviving evidence. The report published here concentrates primarily on the furnaces and glass-working practices, with a full catalogue and discussion of the finds available as part of the online archive. Evidence for glass-making was located in three separate areas within the later medieval cloister, with the definite remains of three furnaces encountered in two of these. The third area was only partially excavated, and whilst containing no positive *in situ* furnace remains, is now believed to have contained two further furnaces, rather than the one previously proposed. The glass-making waste demonstrated that both window and vessel glass was being produced, predominately in a blue / green glass, although coloured decorative elements were added to some of these (figs 7.13 and 7.14). There are clear parallels between the furnace remains at Glastonbury and the experimental furnace reconstructions undertaken by Taylor and Hill, who demonstrated that this style of furnace could have operated successfully at temperatures in excess of 1,000°C for a period of at least three weeks, if not longer.<sup>101</sup>

Five radiocarbon dates from charcoal recovered in direct association with two of the furnaces provides a broad date range of AD 605–780; in all probability this can be narrowed to around the 680s when the degree of overlap is taken into consideration. Consequently, the glass-making phase can be directly associated with the refounding of the monastery by Ine, rather than relating to campaigns of rebuilding in the ninth to tenth centuries

as has been proposed previously. Glastonbury fits into a wider pattern of practice that is now emerging in which there is a clear and direct connection between glass-making and the Church in the Mid Saxon period. It is likely that the glass-makers at Glastonbury were of a similar continental origin to those documented at Wearmouth and other English sites.

The glass production at Glastonbury fits well within the compositional picture we now have for early medieval

glass in the sixth to eighth centuries. Although quantities of glass were coming from the eastern Mediterranean at this time, the possibility of Frankish glass-workers at Glastonbury remains. The glass-makers were remelting mixed cullet to produce blue / green vessels and windows. The presence of a few coloured moils hints that glass was also being used for decorative use in a variety of other colours, although no crucible evidence has surfaced in relation to this.



**Fig 7.13** Saxon glass (approx scale 1:1) (photos: C Steele)

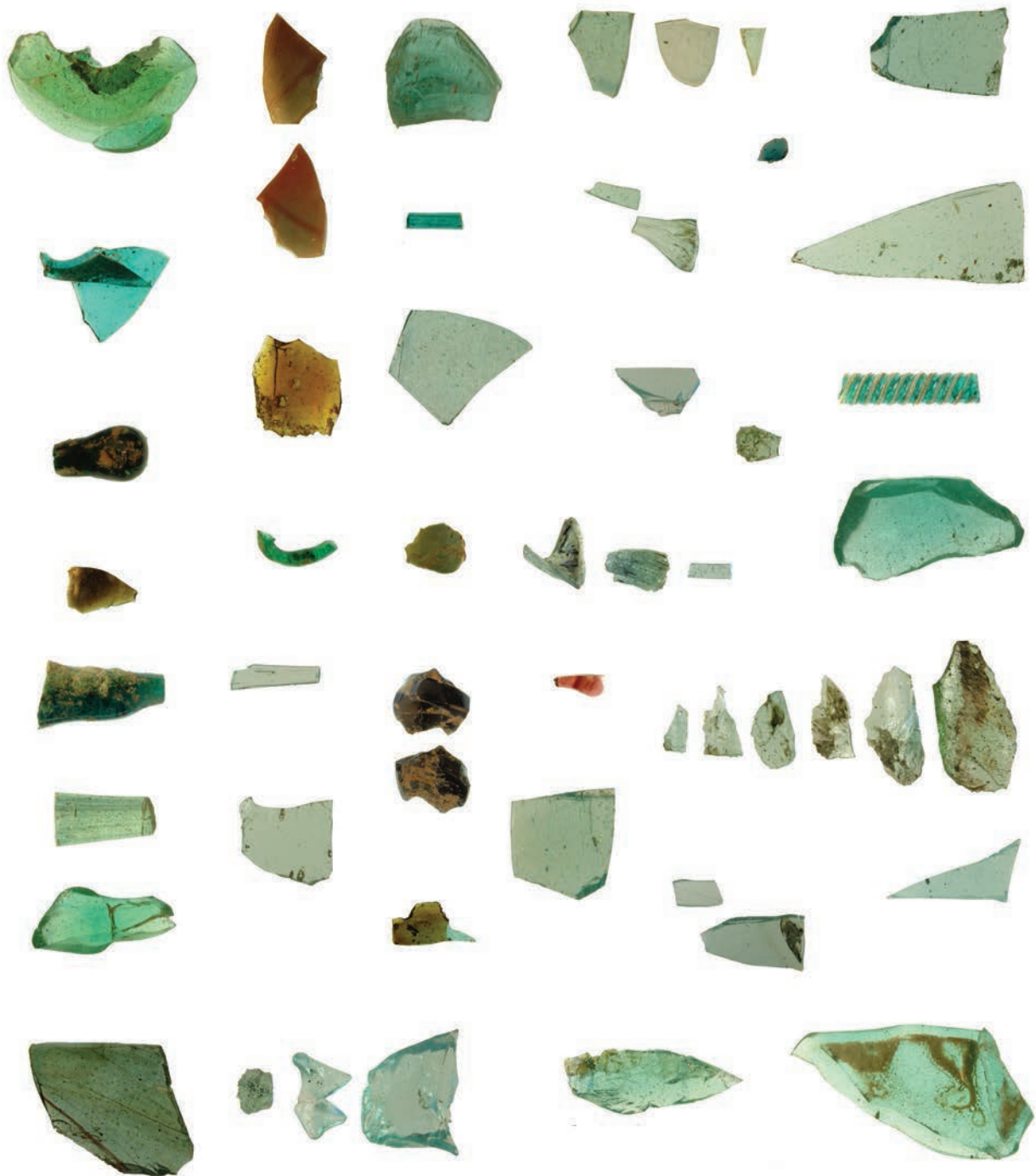


Fig 7.14 Saxon glass (approx scale 1:1) (photos: C Steele)



# The finds

*Edited by Roberta Gilchrist*

## 8.1 Prehistoric lithics

*Tim Phillips*

### The assemblage

There are thirty-seven prehistoric lithics from historic excavations at Glastonbury Abbey: two are orange chert and the remainder are flint of green-black-grey colour. This flint is typical of all prehistoric periods in the area and was probably sourced from beaches and river gravels; the chert may derive from the Frome Valley.<sup>1</sup> The archaeological contexts for the lithics are unknown. An extended discussion and catalogue are available as part of the online project archive.

Waste flakes dominate the assemblage (fifteen pieces), but there are also a number of amorphous ‘chunks’ (eleven pieces) and blades (seven pieces), as well as four cores. The majority of the pieces have no cortex present and only three of the pieces are primary struck flakes. This indicates that the assemblage does not represent the initial reduction of material, and instead that previously worked material has been brought from elsewhere. The condition of most of the assemblage is fresh, with only six pieces being burnt and two showing signs of patination.

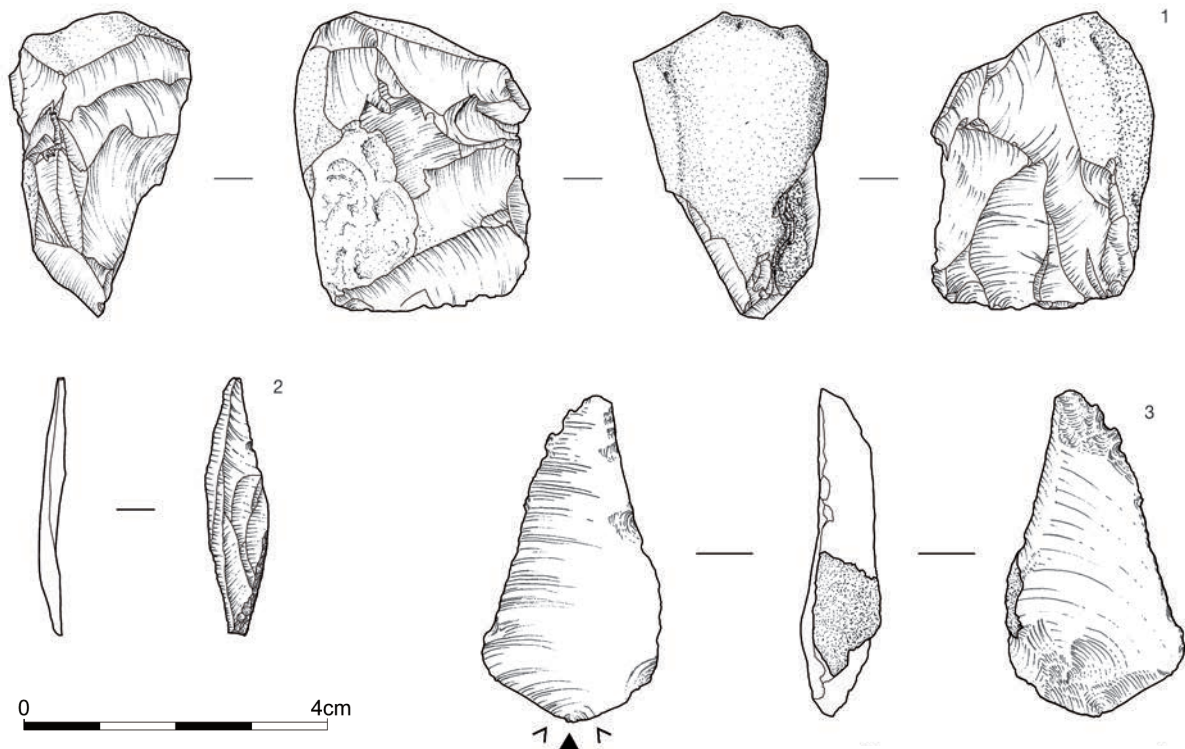
Six of the pieces are diagnostic: four small cores, one microlith and a retouched chert side scraper. Three of the cores (M1/10, M2/08, M2/09) are platform blade cores and are typical of the earlier Mesolithic. M1/10 is a bipolar core with a hinge fracture on one side (fig 8.1: 1). The fourth piece (M1/09) is a ‘rough’ platform core

with two small flake scars, typical of the early Neolithic. All the pieces are small and worked down to the point where it would not be possible to remove further blades or flakes. This indicates stress on the availability of raw material with the cores being exploited to their full potential. The microlith is a non-geometric, obliquely truncated type which is also typical of the earlier Mesolithic (M3/01; fig 8.1: 2). The chert side scraper is a Neolithic type (M130/01; fig 8.1: 3). The waste blades are broadly suggestive of an earlier Mesolithic date. Edge damage is visible on some pieces, which may indicate use wear; however, the damage on one piece on which patination is forming (M3/09) is fresh, suggesting that this is post-depositional damage. None of the waste pieces are very large, which supports the suggestion that the available raw material was being exploited to the full.

### Discussion

Further prehistoric lithics have been recovered in more recent excavations at Glastonbury Abbey: a waste flake and a small early Neolithic flake core, the latter found during investigations close to the refectory undercroft.<sup>2</sup> This piece is of fine black flint, possibly imported from Beer in South Devon. On the lower slopes of the north side of Glastonbury Tor, four pieces of flint were recovered, including a possible microlith.<sup>3</sup> All these artefacts were residual in later contexts.

The assemblage from the antiquarian excavations at Glastonbury Abbey has a strong earlier Mesolithic composition, as well as an early Neolithic element. The



**Fig 8.1** Excavated prehistoric lithics: (1) early Mesolithic blade core; (2) early Mesolithic non-geometric obliquely truncated microlith; (3) early Neolithic chert side scraper (scale 1:1)

presence of early Mesolithic foragers within the region has long been known from lithic scatters on sandy islands, or ‘burtles’, across the Somerset Levels.<sup>4</sup> The systematic fieldwalking carried out by the Shapwick Project, eight kilometres to the west of Glastonbury, has shown that activity in the earlier Mesolithic was much more widespread than previously recognised. Rather than being solely restricted to the ‘burtles’, concentrations of Mesolithic lithic material were found on calcareous soils from the lowest slopes of the Polden Hills upwards, in places overlooking the Levels. The densest scatters were close to springs and streams commanding wide panoramic views.<sup>5</sup>

There is very little evidence for a late Mesolithic presence in the region; there appears to have been a hiatus in activity at this time, linked to the Main Postglacial Transgression when a rise in sea level led to an inundation and the creation of salt marsh. Human activity appears to have recommenced in the early Neolithic with the construction of the Sweet Track, dated to 3806–7 BC. Along with the exploitation of local lithic raw material, good quality flint from other regions, such as Wessex and Beer on the south Devon coast, was being imported in the Neolithic period.<sup>6</sup> In contrast to the earlier Mesolithic finds, which had a close association with springs and water-courses, the early Neolithic material was concentrated in discrete sub-

circular scatters near to, but not adjacent to, water.<sup>7</sup>

The context of the prehistoric lithics from the Glastonbury excavations is unknown. There are three alternatives to explain its presence. First, the material could have been found *in situ*. Secondly, it could have been residual in later contexts, similar to the material found in more recent investigations. This would suggest that the lithics were initially deposited at the site. Thirdly, the lithics could have been introduced to the site at a later date with other material from elsewhere.

The small number of diagnostic artefacts from the Neolithic period does not allow for any meaningful interpretation. However, comparison with other lithic scatters in the region demonstrates that Glastonbury Abbey is consistent with the topographic locations of earlier Mesolithic activity. It is on a promontory at the lower slopes of the Tor, between the 30m and 40m contours, on a calcareous clay soil and with panoramic views to the west. At a short distance to the south east of the main abbey site there was a natural spring at Chalice Well. Excavations at this site recovered a small assemblage of Mesolithic flints composed of blades and cores.<sup>8</sup> The topographic location of Glastonbury Abbey and the excavated evidence from Chalice Well together suggest that this may have been a location for activity in the earlier Mesolithic period.

## 8.2 Prehistoric pottery

*Elaine L Morris*

A total of seventy-eight sherds (530g) of prehistoric handmade pottery has been identified from the excavations conducted by Radford during the 1950s and 1960s. The pottery includes one undecorated sherd from a late Neolithic / Early Bronze Age beaker, but the majority of fabrics and forms date from the first millennium BC. In the absence of stratified features containing solely prehistoric material, the collection is interpreted as redeposited material. Fifteen fabric types have been defined, belonging to five principal fabric groups. All of the descriptions are based on visual analysis using a binocular microscope at x10 power and are tentative in the absence of petrological analysis of thin sections. A full report, method statement and catalogue are available online.

### Fabrics

The most common group, representing 40 per cent of the collection by number of sherds and 42 per cent by weight, is that containing possible igneous and sedimentary rock fabrics RK1 and SS1. The popularity of these fabrics is similar to the frequency identified amongst the prehistoric pottery recovered by the Shapwick Project.<sup>9</sup> The range of inclusions present is similar to those associated with the Beacon Hill area, near Shepton Mallet, about 20km north east of the abbey.<sup>10</sup> The distance of the source area from Glastonbury Abbey demonstrates that the people who left sherds of their pottery at this location had participated in the well-known ceramic trading networks in this region during the second and first millennia BC. Fabric RK1 in particular was a resource used to make Early / Middle Bronze Age pottery found at Brean Down, Late Bronze / Early Iron Age pottery and Middle Iron Age Glastonbury ware from Norton Fitzwarren, and Early and Middle Iron Age vessels from Ham Hill.<sup>11</sup>

The second most common group is made up of calcite-bearing fabrics, representing 27 per cent of the collection by number of sherds and 30 per cent by weight. This group includes fabrics CA1 and CA3, which appear to have naturally occurring, less frequent calcite, and CA2, which has more frequent pieces of calcite that are distinctively crisp and angular in texture, suggesting that they may have been deliberately added as temper. The latter is typical of Middle to Late Iron Age pottery, while

the former have been identified as Late Bronze Age and Early Iron Age in date.<sup>12</sup> The most likely source for this range of calcite-bearing fabrics would be in the Mendip Hills.<sup>13</sup>

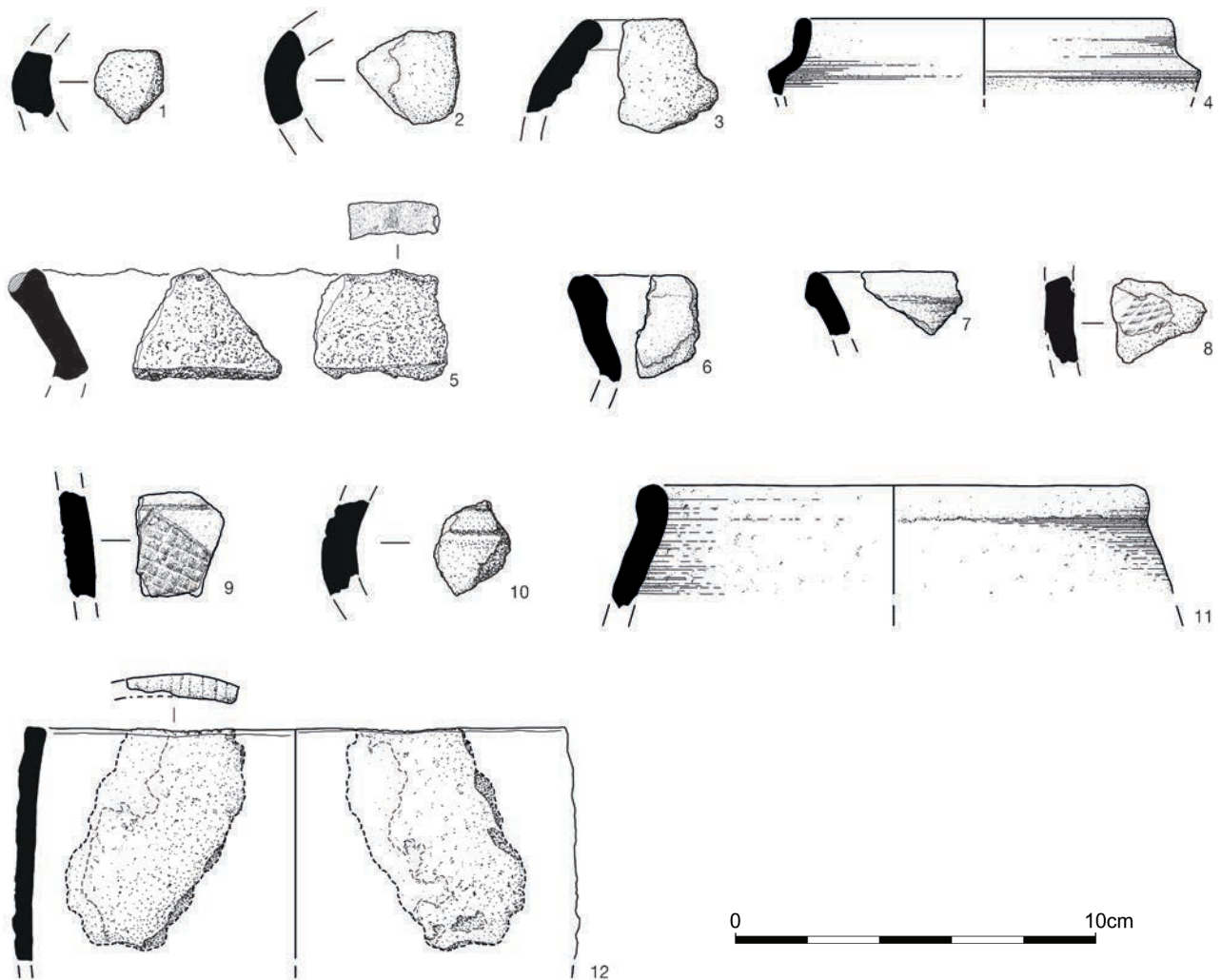
The group with the most variation in fabric types consists of the sandy fabrics Q1 to Q5 and QC1. There are very few sherds in each fabric and the range is likely to include material dating to any ceramic phase within the first millennium BC. The sources for these fabrics could be anywhere in the area, with the exception of fabric Q5, which is either Durotrigian Late Iron Age or black burnished ware of the Romano-British period, made in the Wareham-Poole Harbour area of Dorset.

Two different shell-bearing fabrics were identified, one with abundant fossil shell (SH1) and the other with only a moderate amount of shell and oolitic limestone (SH2). These fabrics could not derive from locally available clay resources in the abbey area. The former belongs to the range of later Iron Age Glastonbury ware / south-western fabrics, first identified by Peacock, for which the closest source would be a Jurassic limestone.<sup>14</sup> The Combe Hay area could be the source area for the shell and oolitic limestone fabric.<sup>15</sup>

One grog-tempered fabric (G1) is typical of many Beaker fabrics which have pieces of grog added to a sandy clay matrix;<sup>16</sup> the other handmade grog-tempered fabric (G2) is typical of Late Iron Age / early Roman wares.

### Vessel form types, decoration and surface treatment

Five distinctive rim types have been identified in the collection (R1–R5). One derives from an ovoid or convex-profile jar (R2; fig 8.2: 3) and has a lip shape that is nearly hooked in profile. It is similar to type J7 from Ham Hill and type PA1 from South Cadbury, which suggests that it might belong to the first half of the first millennium BC.<sup>17</sup> This vessel, made from a fine sandy fabric with infrequent iron oxides (Q3), could be contemporary with that represented by a fragment of lug handle (H; fig 8.2: 2), made from a different sandy fabric (Q2). The latter had also been used to make an obtuse-angle shouldered jar (A; fig 8.2: 1), similar to type J2B at Ham Hill and many shouldered jars from South Cadbury.<sup>18</sup> These three forms represent activity in the abbey area dated to the Late Bronze / Early Iron Age period due to their forms and quartz sand fabrics. They may or may not be contemporary with two other rim types which can be dated to the Early Iron Age more specifically. These include examples of short, slightly flared rims from three necked jars of uncertain lower



**Fig 8.2** Handmade prehistoric pottery: (1–3) Late Bronze / Early Iron Age; (4–7) Early Iron Age; (8–12) Middle / Late Iron Age (scale 1:2)

profile (R1; fig 8.2: 5–7), which can be paralleled with Early Iron Age examples from Ham Hill, South Cadbury and Danebury, and a single sherd from a tripartite carinated jar (R3; fig 8.2: 4), not dissimilar to larger examples of Early All Cannings Cross-style jars and bowls found at Potterne and coarseware bowls from Danebury that date from the fifth to fourth centuries BC.<sup>19</sup> This vessel is represented by the only sherd in the abbey collection made from fine sandy fabric Q4 and is black and highly burnished. The flared rim-necked jars are usually softly shouldered or round-shouldered forms typical of the seventh to fourth centuries BC. What may be most significant is that the type R1 jars were made in non-sandy fabrics, indicating very different sources that cannot be local. In this case, they derive from the Shepton Mallet area (RK1) and the Mendip Hills (CA1).

By contrast, the final two rim types derive from vessels from the Middle to Late Iron Age period. Type R4 (fig 8.2: 11) is one of the most common shapes of this

era, with a simple slack profile, reminiscent of a barrel, while type R5 (fig 8.2: 12) is much more distinctive with its straight-sided profile and can be referred to as a proto saucepan pot form, similar to examples from Danebury dated to the fourth to third centuries BC.<sup>20</sup>

Decoration occurs on five sherds. One of the Early Iron Age type R1 jars has a row of small finger-tip impressions along the top of the rim (fig 8.2: 5). Two body sherds from different vessels are decorated with tooled lattice designs typical of Middle to Late Glastonbury ware / South-western style pottery found commonly in Somerset and a third simply displays horizontal tooled lines (fig 8.2: 8–10). The proto saucepan pot (fig 8.2: 12) appears to be a transitional vessel, straddling the Early Iron Age, when decoration was applied to the top of the rim, and the Middle Iron Age, with the use of an incising tool to make the decoration rather than the more traditional fingernail slashing effect.



## Vessel size and evidence of use

Despite the small size of the sherds in the collection, a few provide clues to the size and function of the pots they represent. One example each of types R3, R4 and R5 measure between 100 and 160mm in diameter and belong to the generally small size (100–<200mm) of later Iron Age pots. These were vessels perhaps made for personal use, rather than medium-size vessels (200–<300mm) or large vessels (300–<400mm), which were for family and group food consumption and storage. Small pots are the most common vessels recovered on later Iron Age sites in southern Britain.<sup>21</sup> Equally significant is the evidence of use still visible on some sherds: three show the pitting-out of calcareous inclusions on the interiors of vessels used to hold acidic foods (fabrics CA2 and QC1), while the presence of soot or burnt residue occurred on two other cookpot sherds in fabrics SS1 and SH1. Interior abrasion from the scraping of contents was observed on the Beaker sherd, the barrel-shaped jar (fig 8.2: 11) and a body sherd from a vessel made from fabric SH1.

## Discussion

The variety of fabrics identified and their wide distribution of sources is typical of many assemblages from Somerset, particularly in the Glastonbury area. The significance of this collection lies in its principal focus on the middle centuries of the period, from the Early to the Middle Iron Age period, and on its representation of daily life, including cookpots and storage vessels, along with a number of identifiable personal pots for the daily consumption of food.

## 8.3 Roman pottery

*Jane Timby*

### Introduction

The small collection of unstratified Roman pottery from Glastonbury Abbey comprises 256 sherds. Although a moderately wide range of wares has been noted, it is dominated by a small group of fabrics, especially black burnished wares (DOR BB1 / SOW BB1) and local grey wares (26.2 per cent and 21.5 per cent by sherd count respectively). The assemblage is small and from dispersed locations and it is likely that some selection took place in terms of retention. Samian, for

example, accounts for 6.6 per cent of the group by sherd count. On average, rural settlements in the region usually produce c 1–2 per cent samian, although a slightly higher percentage might be expected from higher-status establishments. The higher representation of samian at Glastonbury may suggest that pieces were kept because of their distinctive appearance and usefulness for dating, whereas more local wares may have been discarded. The full catalogue and methodology are available online.

### Later pre-Roman Iron Age to early Roman

#### Calcite-tempered ware

Ten sherds including three jar rims; handmade forms in a reduced black ware containing a moderate scatter of calcite inclusions. Four of the nine sherds were recovered from beneath the Saxon floor level. The fabric is one typical of the later Iron Age and early Roman period in this area and probably derives from the Mendips.<sup>22</sup>

#### Grog-tempered ware

A single rim from a handmade jar. This ware is typical of the pre-Roman Iron Age but continued to be used and made up to the end of the first century AD.

### Roman: continental imports

#### Samian

Seventeen sherds of samian are present in the collection, with examples from the South Gaulish (LGF SA) (La Graufesenque), Central Gaulish (LEZ SA) (Lezoux) and East Gaulish (TRI SA) (Trier) and (RHZ SA) (Rheinzabern) production sources. The three Trier sherds are likely to date to the first half of the third century.<sup>23</sup>

#### Decorated sherds

D1. Flaked body sherd from a South Gaulish bowl. Probably Drag. 37. Thirteen petalled flowers set in notched circles set in panels with small seven-petalled rosettes at the corners. ?First century.

D2. A small decorated sherd from a Drag. 37 bowl showing a seated hare facing right. Flavian.

D3. Body sherd from a Central Gaulish bowl Drag. 37 decorated with a simple large scrolled vine-leaf similar to that used by Iustus or Mercator II. c AD 160–90.

### Roman: regional wares

Dorset black burnished ware (DOR BB1)<sup>24</sup>

By count this is the second most common fabric in the

collection; it is first by weight, accounting for 25.8 per cent. Most of the forms present span the second to fourth centuries. These include a number of jars with flared or beaded rims, plain-rimmed dishes (fig 8.3: 6), and flanged-rim conical bowls (fig 8.3: 7, 11). The three jars with beaded rims (eg fig 8.3: 1) could date to the first or early second centuries.

#### South-west black burnished ware (SOW BB1)<sup>25</sup>

Represented by thirteen sherds, largely of second- to third-century date, all of which are from jars (fig 8.3: 9).

#### New Forest colour-coated ware (NFO CC)<sup>26</sup>

Four sherds including an indented beaker, a barbotine scroll decorated beaker and a bowl, probably Fulford type 68.

#### ?New Forest grey ware (NFO RE)<sup>27</sup>

A rim sherd from a two-handled bowl (fig 8.3: 13).

#### Oxfordshire colour-coated ware (OXF RS)<sup>28</sup>

Seven sherds comprising two mortaria; one small beaker sherd and two bowls, probably Young forms C49 and C81.<sup>29</sup> All these vessels are likely to have been imported into the area in the fourth century.

#### Severn Valley ware (SVW OX)<sup>30</sup>

Five sherds were recorded including two identifiable as from tankards.

#### ?Wiltshire grey grogged ware (WIL GR)

A fine grey ware with a slightly lumpy texture from the presence of grog / clay pellets. A single, wheel-made everted rim jar with a rolled rim (fig 8.3: 10).

#### Roman: local / unknown wares

##### Black sandy ware (BW)

Six sherds, probably a local imitation of BB1 and typologically datable to the later third or fourth century.

##### Black-surfaced grey ware (BSGY)

A fine sandy grey ware with a black-slipped surface; probably a late Roman vessel.

##### Fine black micaceous ware (BWMIC)

Two very small sherds from under the Saxon floor.

#### Grey sandy ware (GREY1) / Grey micaceous ware (GYMIC)

A miscellaneous group of wares not necessarily from a single source but probably largely local. A range of forms are present; jars dominate (fig 8.3: 5, 8) but there are also examples of a flask, plain-rimmed dishes and bowls: grooved rim (fig 8.3: 4); flat rim (fig 8.3: 2) and flanged rim (fig 8.3: 12). Typologically, the group embraces material of mid-second- to fourth-century date. In addition to the sandy wares there were fourteen sherds with a distinctively micaceous fabric, which includes flared-rim jars and a flat-rim dish or bowl. One jar sherd with a slightly sooted exterior surface has quite crudely executed burnished-line chevron decoration.

#### Grey ware with glauconitic sand (GREY2)

A wheel-made, grey sandy ware with a sparse to moderate temper of fine, well-sorted black rounded grains of glauconitic sand; three sherds including one simple everted jar rim.

#### Grey sandy ware with limestone (GREY3)

A grey ware with a grey or sandwich red-brown / grey core with a sandy texture; the matrix also contains sparse inclusions of limestone; ten body / base sherds including both handmade and wheel-made vessels, probably mainly jars.

#### Fine grey sandy ware (GYF) / Fine grey micaceous ware (GYFMIC)

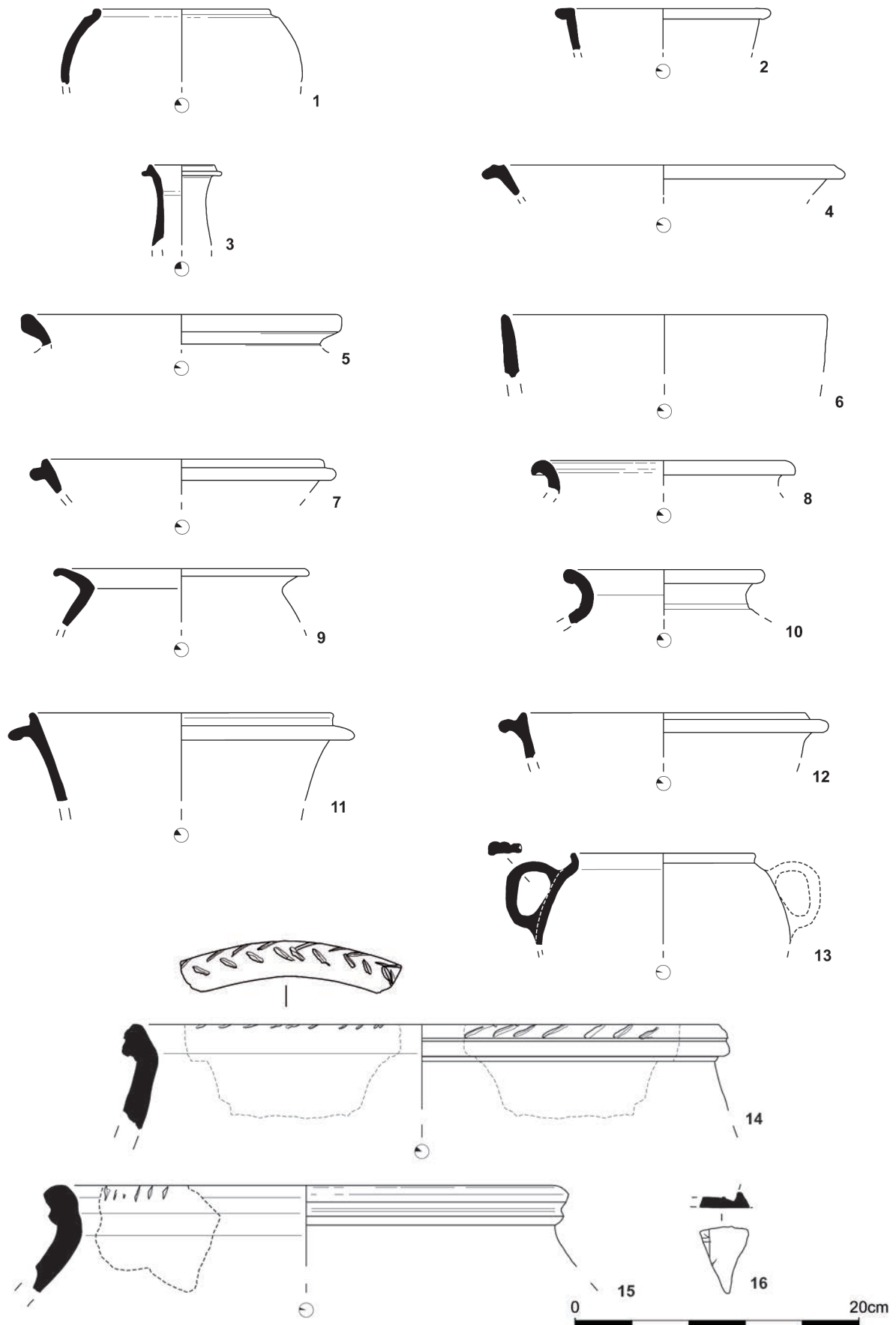
Eleven small body sherds and one jar rim from the former and two rim sherds of the latter. The fine grey micaceous ware rims include a bowl and a large storage jar with incised decoration on the rim (fig 8.3: 14). This latter vessel is typical of the Somerset area, with other similar examples well documented from such sites as Ilchester and Shapwick.<sup>31</sup>

#### North Somerset grey ware (NSOM RE)

Three sherds with a harder fired, darker grey, slightly pimply textured fabric are typical of the late Roman grey ware industry of North Somerset. The sherds include a flanged-rim conical bowl copying a BB1 form.

#### Oxidised sandy ware (OXID1)

Twelve sherds of sandy, oxidised wares including at least two storage jars, one with slashed decoration on the inner rim edge (fig 8.3: 15).



**Fig 8.3** Roman pottery: (1) beaded-rim jar; (2) flat-rim bowl; (3) flagon with a small bifid rim; (4) grooved-rim bowl; (5) everted-rim jar; (6) plain-rimmed dish; (7) flanged-rim bowl; (8–9) flared-rim jars; (10) everted-rim jar; (11–12) flanged-rim conical bowl; (13) handled bowl, Fulford type; (14–15) storage jar; (16) base with the edge of a post-firing graffito scratched into the underside (scale 1:4)

#### Oxidised sand with limestone (OXID2)

An oxidised version of GREY2; a single rim sherd from a vessel with a rolled rim, probably Roman.

#### Oxidised with grey burnished surface (OXID3)

A single sherd from a wheel-made vessel; soft fine oxidised fabric with a grey-slipped, burnished surface.

#### Oxidised sandy with clay pellets (OXID4)

A sandy ware with a common frequency of well-sorted quartz and sparse rounded clay pellets. One of the two sherds is from a lid with a flat rim.

#### Oxidised sandy with limestone and rock inclusions (OXID5)

A single handmade body sherd, red-brown with a sandwich grey core. The paste contains fragments of decaying limestone, sandstone and rock fragments up to 1 mm.

#### Fine oxidised ware (OXIDF)

Six sherds of fine, oxidised ware were recorded. One base (fig 8.3: 16) shows the edge of a post-firing graffito.

#### South-west oxidised ware (SOW OX)

An unslipped oxidised version of SOW WS.<sup>32</sup>

#### White-slipped oxidised ware (WSOXID) / white-slipped micaceous oxidised ware (WSOXMIC)

The former includes two sherds, one a rim sherd from a curved-wall dish. The latter is represented by a single sherd.

#### Miscellaneous white ware (WW)

Single fine white ware body sherd, source unknown.

### Discussion

The Roman pottery suggests occupation dating from the later Iron Age to early Roman period through to the fourth century. It is not possible from the assemblage to determine whether activity was intermittent or continuous. BB1 forms a significant component, but this figure is slightly on the low side when compared with other quantified assemblages in the region.<sup>33</sup> Similarly, an absence of Roman amphorae might indicate that featureless sherds were discarded. Other regional imports such as the later Roman colour-coated wares from the Oxford and New Forest industries are quite typical finds in the area. The balance of 'local' oxidised / reduced wares is probably broadly that which might be expected, but the low incidence of distinct featured pieces makes

dating of individual sherds problematic.

Many archaeological interventions around the abbey have produced odd Roman sherds.<sup>34</sup> The pottery from the Tor includes samian, DOR BB1 and probably Oxfordshire colour-coated ware. The coarsewares suggest a later Roman date; the samian includes sherds of first- and second-century currency.<sup>35</sup> A similar picture is shown with pottery from the mound, with a single first-century sherd and others dating to between the second and fourth centuries.<sup>36</sup> This is indicative of a Roman presence in the area, but the exact nature of this presence remains elusive.

## 8.4 Roman tile

*Jennifer Durrant, with a contribution from Roger T Taylor*

### Introduction

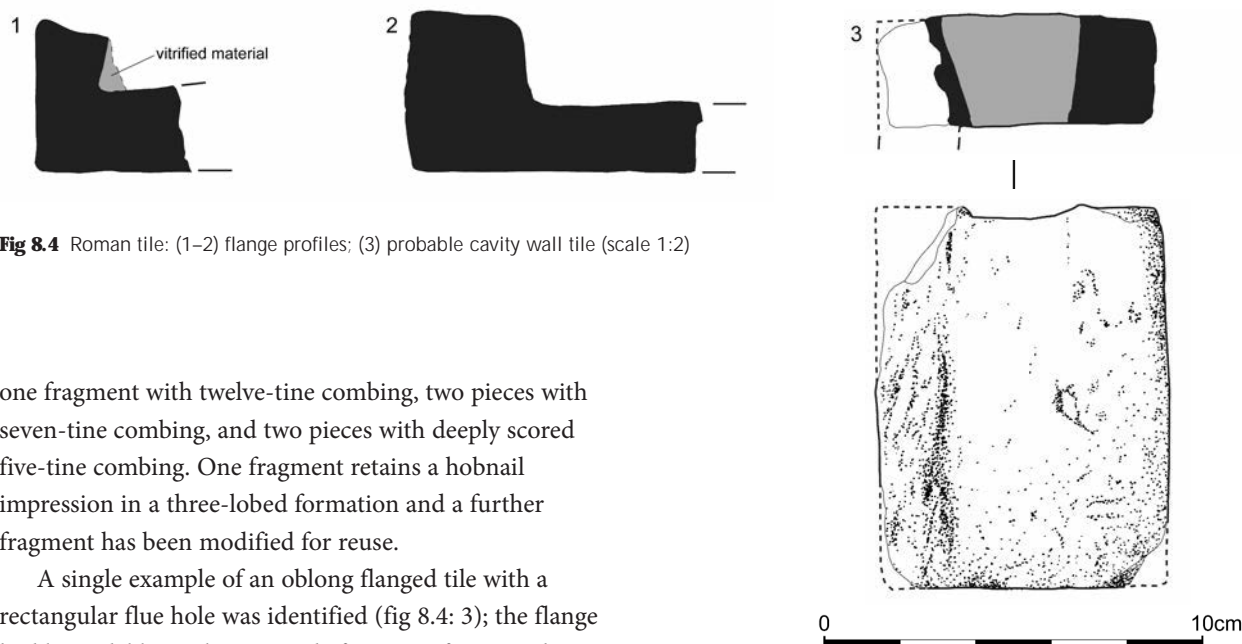
A small assemblage of forty-two Roman tile fragments derives from antiquarian excavations at Glastonbury Abbey. No complete tiles are present: the assemblage consists solely of small to medium-sized fragments in a varied state of preservation, from fresh breaks to very abraded surfaces. While the majority of the tiles are unstratified, eight pieces are from contexts associated with Saxon glass-making structures and a single fragment had been incorporated into a wall of the transept of the abbey church. Full details of the methodology and quantification can be consulted in the online report, together with the full petrological analysis by Roger Taylor.

Tile was manufactured throughout the Roman period in Britain with little stylistic change. The absence of diagnostic features in this assemblage, such as lower cutaways, signatures or stamps, prevents an attempt to establish the date of manufacture and primary use of these tiles.<sup>37</sup>

### Forms

Over one third of the assemblage lacks the diagnostic features to enable identification of form. Of the remainder, 52 per cent are the typical Roman forms of tegula (17 per cent), imbrex (14 per cent) and box tile (21 per cent). All the tegulae fragments are mid-section pieces and lack lower cutaways or evidence of signatures. Two flange profiles were recorded (fig 8.4: 1, 2), which may indicate different manufacturers. The flange had been deliberately removed from two tegulae.

Five fragments of box tiles retain combed decoration:



**Fig 8.4** Roman tile: (1–2) flange profiles; (3) probable cavity wall tile (scale 1:2)

one fragment with twelve-tine combing, two pieces with seven-tine combing, and two pieces with deeply scored five-tine combing. One fragment retains a hobnail impression in a three-lobed formation and a further fragment has been modified for reuse.

A single example of an oblong flanged tile with a rectangular flue hole was identified (fig 8.4: 3); the flange had been deliberately removed after manufacture. This unusual form is likely to be part of a cavity-wall heating system, although such tiles are not common with a single flange.<sup>38</sup>

### Reused Roman tiles

Eight fragments were recovered from contexts associated with the Saxon glass-making furnaces. A further nine fragments retain traces of glass or vitrified material or evidence of secondary heating, indicating they were associated with the glass-manufacturing process. All three common forms of tile – tegula, imbrex and box – were

**Table 4** Roman tile assemblage by form

Form	Quantity	Percentage
Tegula	7	17
Imbrex	6	14
Box tile	9	21
Brick	3	7
Other forms	2	5
Unclassified	15	36
Total	42	100

**Table 5** Roman tile reuse in Saxon glass manufacturing

Accession number	Reference	Form	Context	Use	Modification
GLSGA:1993/71	M105	U	Kiln	Glassy material	Reshaped
GLSGA:1991/269	T153	T	Kiln	Vitrified	
GLSGA:1998/3/257	T437	B	Kiln		
GLSGA:2008/3/34/4	T488a	U	Kiln	Reheated	
GLSGA:2008/3/34/4	T488b	U	Kiln	Reheated	
GLSGA:2008/3/34/4	T488c	U	Kiln	Reheated	
GLSGA:2008/3/65/2	T492a	I	Kiln	Reheated	
GLSGA:2008/3/65/2	T492b	C	Kiln		Flange removed
GLSGA:1988/968	T103	C	Unstrat	Glassy material	Flange removed
GLSGA:1988/1370	T484	T	Unstrat	Vitrified	Flange removed
GLSGA:2008/3/73/3	T493	U	Unstrat	Vitrified	
GLSGA:1989/970	T105	T	Unstrat	Reheated	
GLSGA:1988/1377	T485	I	Unstrat	Reheated?	
GLSGA:2008/3/35	T489c	I	Unstrat	Reheated	
GLSGA:2008/3/36/1	T490a	I	Unstrat	Reheated	
GLSGA:1991/225	M54	F	Unstrat	Reheated	
GLSGA:1991/225	M54	F	Unstrat	Reheated	

U = unclassified, T = tegula, I = imbrex, B = box tile, C = cavity wall tile

used in the manufacturing process, as was the possible cavity-wall tile. Three tile fragments had been reshaped for this secondary use. Details of the fragments associated with the Saxon glass industry are summarised online.

A single fragment of box tile (GLSGA:1998/3/297) is recorded from 1957 in the 'upper course of early transept wall'. The flange has been removed from this small fragment and the surfaces retain traces of mortar, both of which are appropriate for its reuse as structural hardcore material.

## Petrology

*Roger T Taylor*

The tiles were submitted for rapid petrological analysis (at x20 magnification) to indicate the source of raw materials. Three tile fabrics have been identified (further information is published online):

- smooth clay without any obvious sand content;
- sand-tempered fabrics, varying from a sparse to moderate sand content; the predominantly angular to rounded quartz sand is generally less than 3mm;
- abundant fine sand content.

Glastonbury is sited on the Jurassic mudstones of the Lias. These mudstones break down to clays which are normally calcareous and contain shelly fossils, and with near-surface weathering the clays become decalcified. It seems probable that the clays for the majority of the Roman tile production were worked at shallow depth. The source for the sand content of the tiles is likely to be Glastonbury Tor, which is formed by an outlier of the Bridport Sand Formation.

## Discussion

The material in this small assemblage originated from a Roman building with a tiled roof and hypocaust heating system. Fragments of Roman tile have been found at sites throughout Glastonbury town and therefore their presence at the abbey is not unexpected.<sup>39</sup> The building from which they originated was probably early Roman in date: changes in architectural fashion resulted in the declining use of tegula and imbrex tiles in Somerset after the mid-second century, in favour of stone roof slates.<sup>40</sup> Ceramic roof tiles are absent from many later Roman sites in Somerset including Chew Park Villa and Gatcombe.<sup>41</sup> The fabrics of the tiles suggest they were made locally to the area.

The small quantity and size of these fragments makes it doubtful that the Roman building was built on the site of the abbey, though it was probably located in the near vicinity. Tile assemblages from the sites of Roman buildings are often significant and the fragments large; small fragments from such sites were often discarded in preference for larger and complete fragments, especially from antiquarian projects. The retention of these small fragments from the abbey suggests that little Roman tile was discovered.

The clear association between the tiles and the Saxon glass industry indicates that they were brought to the site for this specific use. The reuse of tiles in the Saxon period is well recorded in parts of Britain, although the most typical form of secondary use in church architecture is not common in the West Country.<sup>42</sup> The evidence for reuse in the abbey church expands our understanding of local practice. There are other examples from the West Country of the movement of Roman tile after its primary use, for example in the Roman period at Chew Park and the medieval period in Devon.<sup>43</sup> The durability of Roman tiles made them eminently suitable for reuse – at Glastonbury both modified for specific purposes and used as found. The association of tiles with the Saxon glass industry is a significant addition to our understanding both of the reuse of Roman tile and of the construction of Saxon glass-making furnaces (see Chapter 7).

## 8.5 Roman small finds

*Hella Eckardt*

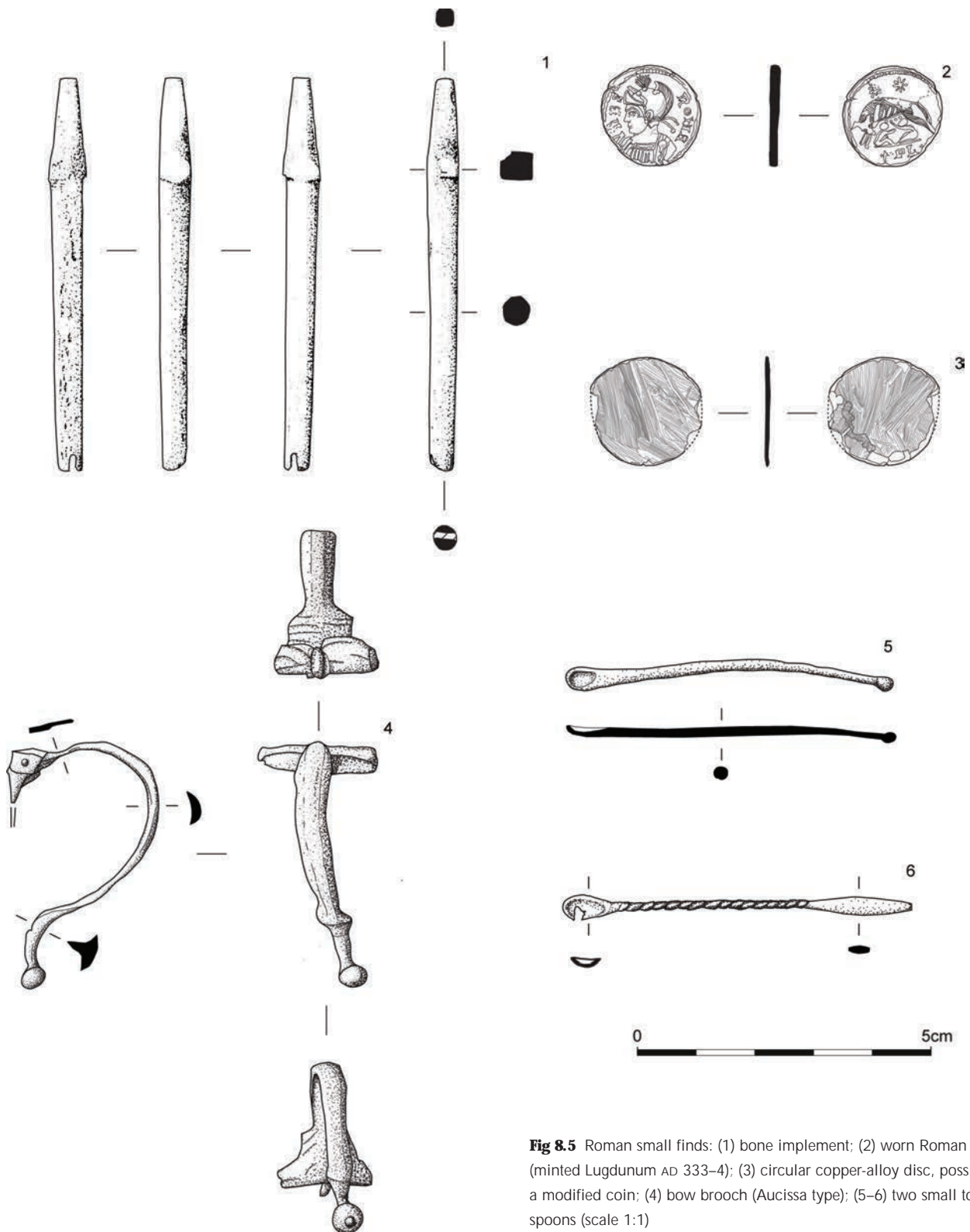
### Catalogue

1991/73/21 – M131 (fig 8.5: 1)

Bone implement, length 67mm. Only the shaft survives, making identification difficult, but the worn protrusions may indicate that this was the shaft of a bone spoon, or possibly a hairpin. The object was modified subsequently, resulting in a polished, square terminal at the end with the worn protrusions, and a slot cut 3mm deep in the opposing end. The resulting tool may have been used in textile or leather working. A Roman date is not certain.

1991/253 – M555 (fig 8.5: 2)

Worn Roman coin. Obverse: helmeted head of Roma facing left, legend: URBS ROMA; reverse: she-wolf and twins, two stars above; mint mark in exergue worn but could be \* PL[G], mint of Lugdunum;<sup>44</sup> dated: AD 330–5, and, if mint mark correctly read, AD 333–4.<sup>45</sup>



**Fig 8.5** Roman small finds: (1) bone implement; (2) worn Roman coin (minted Lugdunum AD 333–4); (3) circular copper-alloy disc, possibly a modified coin; (4) bow brooch (Aucissa type); (5–6) two small toilet spoons (scale 1:1)

1991/242 – M447 (fig 8.5: 3)

Thin, circular disc of copper alloy; two edges damaged; diameter 19mm. No design or decoration survives on either surface; both were apparently scratched clean, and now only show shallow incisions or scrape marks; possibly a modified coin.

1988/1043 – B144 (fig 8.5: 4)

Copper-alloy hinged bow brooch of the Aucissa type, length 42mm. The pin is hinged in a narrow tube formed from the top of the bow rolled back. The upper bow is highly arched while the lower bow is small and plain. The foot is defined by a pronounced knob. Aucissa brooches

are often associated with the Roman army, and in Britain mainly date to AD 43–70.<sup>46</sup>

1988/1041/1–2 – B142 (fig 8.5: 5 and 6)

Two small toilet spoons, quite possibly of Roman date. Such spoons were used for grooming, possibly as ear-scoops or for the extraction and application of perfumes and unguents. No 5 has a small scoop and, at the opposing end, a thickening rather than the more common suspension loop.<sup>47</sup> No 6 has a twisted wire shaft, a feature that occurs on some ear-scoops. It also lacks a suspension loop but instead has an olive-shaped thickening; it therefore has the appearance of a very short spoon-probe. Spoon-probes were used for cosmetics as well as surgical or medical procedures; they are generally slightly longer than this example, can have a twisted wire shaft and are often very well made.<sup>48</sup>

## 8.6 Post-Roman pottery

*John Allan, David Dawson and Oliver Kent, with contributions from Katherine Barclay, Hugo Blake, Alejandra Gutiérrez, Michael J Hughes, R McBride, Roger T Taylor and Jane Timby*<sup>49</sup>

### Introduction

The post-Roman pottery excavated at the abbey between 1908 and 1979 amounts to about 10,247 sherds. The collection is of great interest, since it demonstrates occupation on the site in the fifth or sixth century, includes the largest assemblage of Anglo-Saxon ceramics from the county and allows some conclusions to be drawn about the pattern of pottery consumption at the West Country's greatest monastic house. The post-Reformation ceramics provide an additional field of interest. A significant group of imported vessels includes Italian tin-glazed wares, South Netherlands maiolica, Spanish lustrewares and Seville *arista* tiles. Petrological study has improved our understanding of the sources for the Saxo-Norman coarse pottery, and ICPS analysis has identified the presence of tin-glazed wares from Montelupo in Tuscany. However, the greater part of the material is an unstratified and selected sample, limiting its value considerably. The assemblage has been shaped by the selective practices of curation and discard that were employed in the antiquarian excavations at Glastonbury Abbey.

### Context

The pottery falls into two groups: a large collection (over 8,000 sherds) whose context is almost entirely lost, and a smaller body of material (2,080 sherds) from Radford's excavations, much of which can be related to specific contexts.

### Unstratified pottery

Most of the unstratified collection was excavated before 1939. In a letter dated 1991 to Vicky Dawson, then curator of the abbey, Radford spelled out what he knew about the practices of collection and retention of pottery in the pre-war excavations:

When I started work at Glastonbury in 1951 I was faced with a large and undistinguished collection of medieval and later pottery and some Romano-British wares, all said to have been found on the site. None of the fragments were allocated to any particular area or level. The medieval pottery was valueless historically and not in my view representative of the wares likely to have been in use in Glastonbury.

The Romano-British collection was curious. It was nearly all *terra sigillata* with very little coarse ware. This problem was resolved by the casual remark of a workman employed before 1939: 'we only kept the red pottery'.<sup>50</sup>

By 1991, when Oliver Kent began the task of sorting and identifying the collection, further unlabelled material from subsequent excavations had been added to the unstratified sherds, some of it excavated as recently as 1978–9. A solitary label, detached from the material it referred to, was found: 'Dormitory east bank Feb 1936'. It illustrates the point that the context information from the early years would have been limited, even if the pottery from the different excavations had not been mixed together.<sup>51</sup>

In understanding the selective nature of the pre-1939 sample, the recent excavation by the Hollinrakes in the Gardeners' Compound, a short distance to the south of the excavations, is instructive.<sup>52</sup> The deposits they examined immediately below modern grass were certainly of twentieth-century date, but contained more than 1,500 fragments of medieval floor tile and a scatter of pottery, almost certainly discarded from the pre-war excavations. They included coarsewares of prehistoric, Roman and medieval date – not only plain body sherds but rims and bases. This confirms the impression that



much coarse pottery – possibly even entire categories of material – will be absent from the retained sample. It is more difficult to determine what happened to the late medieval and post-medieval pottery. Would post-medieval wares have been recognised and, if so, were they sometimes discarded? Would early tin-glazed sherds, with their glossy modern appearance, have been retained? In the absence of any record, these questions cannot be resolved.

A little documentation relating to finds of the 1920s and 1930s does however survive in the abbey's archive. An occasional exceptional find was mentioned in pre-war site notebooks: Wedlake's restoration of the Saintonge polychrome jug (fig 8.13: 95) is recorded in Captain Bowen's journal for 1938. By March 1939, about a dozen vessels reconstructed in plaster were ready for exhibition in the abbot's kitchen.<sup>53</sup> In 1991 twenty-six restored vessels were present in the collection; the variable quality of the restorations reflects their different dates and authors. Sketches in the site archive can be matched to some of these vessels.

### Pottery from Radford's excavations

Radford was less than enthusiastic about the value of the pottery from his own excavations. In a handwritten remark at the foot of his letter to the abbey of 1991, quoted above, he wrote: 'All the pottery with very few exceptions – perhaps only one or two per cent – is residual and of minimal value for the history of Glastonbury. I have all the information I need for this purpose.' The same letter states that in his first three seasons (1951–3) the contexts of pottery were carefully recorded, but the sherds were later deposited at the abbey gatehouse, where 'the unsealed envelopes were wrongly

replaced and in some cases lost'. He regarded the pottery from these years as 'valueless'.<sup>54</sup> Examination of the finds from these years also suggests that they are a selected sample.<sup>55</sup> Inspection of the surviving sherds from the excavations after 1954 strongly supports the view that all pottery from what Radford regarded as usefully stratified contexts was retained: there is a high proportion of very small, featureless coarseware body sherds. His policy regarding the retention of other pottery is less clear. He mentions that, after washing, pottery 'was disposed of, as agreed with the custodian'. He also states that many of the finds came from the fills of nineteenth-century robber trenches,<sup>56</sup> but none of the surviving collection is recorded as coming from such contexts. It seems likely that pottery which was not from early stratified deposits was discarded.

Finally, a small collection of pottery survives from Wedlake's excavations of 1978–9, mostly with associated labels giving information which cannot readily be translated into meaningful stratigraphic units. The overall character of the abbey collection, and the extent of stratigraphic information relating to its components, may be tabulated as shown below (Table 6).

The table shows a number of general points. The unstratified material is dominated by glazed wares of later medieval (post-1200) and later date. By contrast, Anglo-Saxon pottery forms 84 per cent of the 1,343 sherds in the Radford collection of 1955–9, and an even higher proportion in some years; in 1956, when the largest assemblage was recovered, it made up 96 per cent of the sherd total. Among the Radford finds are two significant groups of Anglo-Saxon pottery: they derive from the deposits overlying the glass furnaces in the cloister and from the western walk.

Radford's redirection of the excavations to the

**Table 6** Contexts of the post-Roman pottery from Glastonbury Abbey, 1908–79

Excavation date	Med cp	Tripod pitcher	Med jugs	Post-med	Total	Comment
mainly pre-1939	811	116	3147	3513	8124	no context info; certainly selective
1952–4	38	78	42	5	163	14% with context info, poss muddled; prob selective
1955	232	11	26	4	273	83% with context info
1956	568	–	22	–	590	68% with context info
1957	192	1	53	6	252	59% with context info
1959	142	26	59	1	228	77% with context info
1962	1	–	109	23	133	no context info
1963	10	3	253	13	279	abbot's hall, Cross Trench, E extension, no context info
1964	1	2	148	11	162	abbot's hall, no context info
1978–9	2	–	41	–	43	abbot's hall, all with some context info

exploration of the abbot's hall in 1963–4 brought a major change in the character of the pottery recovered; only a few residual Anglo-Saxon sherds are present among the ceramics found in these years, which consist very largely of late medieval jugs (91 per cent of total). The same pattern is evident among Wedlake's finds of 1978–9, where medieval jugs form an even higher proportion of the total (98 per cent of sherds: Table 6).

The history of study of the collection will be found in the online report. Regarding earlier studies in the region, Philip Rahtz's pioneering analysis and publication of the Late Saxon and Norman pottery at Cheddar, only 15km to the north, remains of fundamental importance.<sup>57</sup> The other key local study is Alejandra Gutiérrez's fine report on the ceramics from Shapwick, which offers a remarkably full picture of the pattern of pottery consumption at one of the abbey's rural manors from the Late Saxon period into the nineteenth century.<sup>58</sup> It offers revealing contrasts with the finds from the abbey.

This is the only large collection of pottery from any of the monastic houses of Somerset, the best comparative collection being the appreciably smaller one from Cleeve Abbey.<sup>59</sup> Elsewhere in the south west, good collections of medieval ceramics from monastic houses are also rare, the exceptions being some useful material from Bristol and from Exeter and Polsloe Priory, Devon.

## Methodology

This report combines visual examination of the entire collection with detailed petrological and chemical studies of specific classes of ceramics. The collection was sorted by hand, then quantified by sherd count and minimum vessel count (MNV). When dealing with large collections of coarsewares, the latter is a highly subjective index, but it is valuable in presenting the more unusual wares, where it is often possible to determine the true number of vessels represented. In view of the selective nature of the larger part of the assemblage, and the lack of variety in the stratified material, there seemed little value in weighing the collection. We have also been selective in illustrating the collection, concentrating on the stratified finds, using photographs rather than drawings to show the character of much of the later medieval material, and avoiding most of the abbey's collection of vessels restored in plaster. The full catalogue of the collection is online.

In studying the medieval coarsewares, we have built on a recent survey of the Late Saxon and Saxo-Norman pottery of the county.<sup>60</sup> When studying the later medieval jugs and the post-medieval wares with their more refined fabrics, distinctive inclusions are often sparse, making

even detailed petrological study difficult or unrewarding. In publishing this kind of material we have therefore chosen to target chemical analysis of particular classes of material which present specific problems. The study extends our published work on other Somerset sites and should be seen as a step towards a regional picture drawing on analyses from many places.<sup>61</sup>

## The post-Roman imported pottery

*R McBride and Jane Timby*

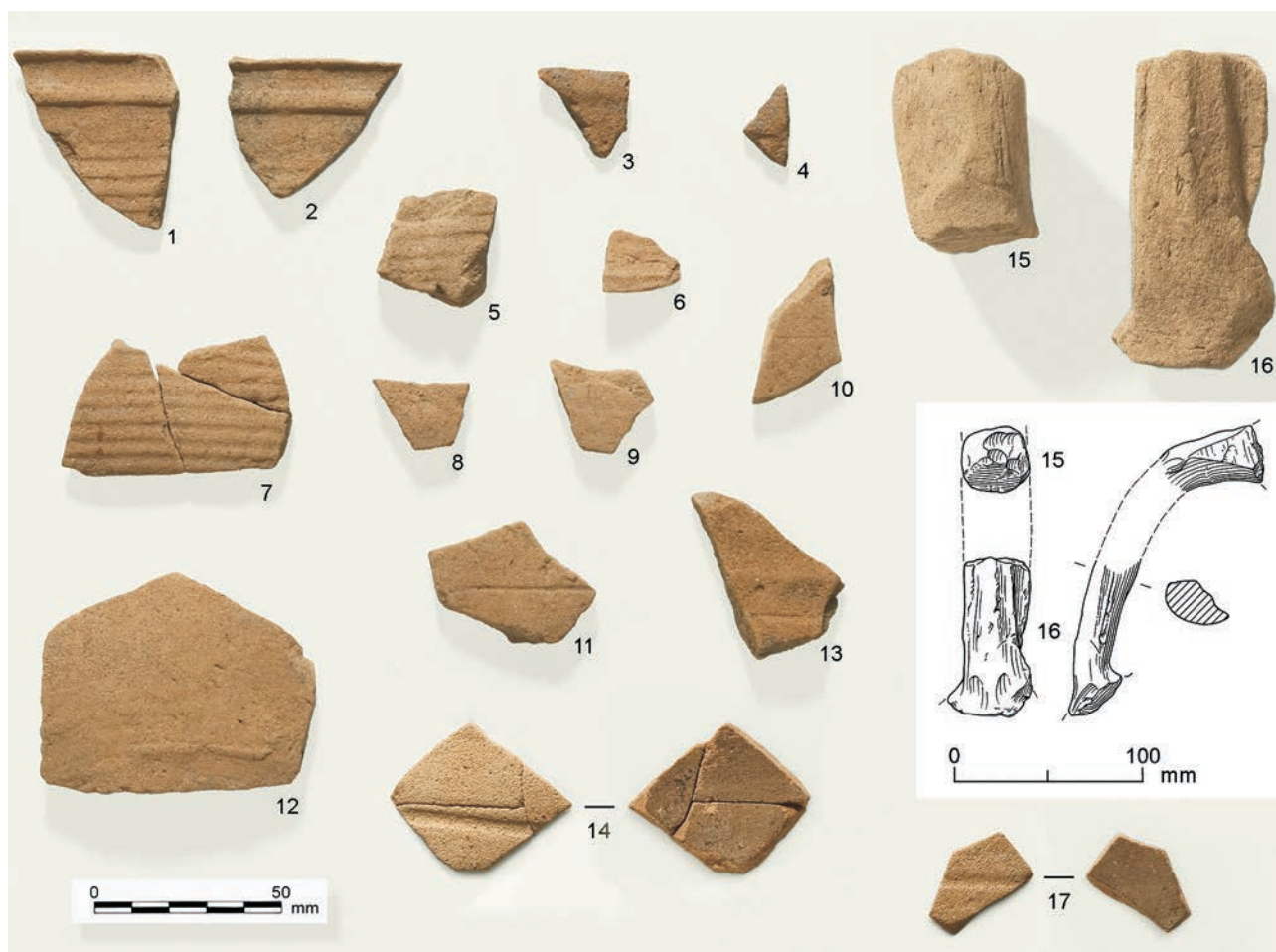
In total, twenty-one fragments of post-Roman imported pottery are present in the collection, including two handle fragments, possibly from the same vessel.<sup>62</sup> All are from Late Roman Amphora 1 (LRA1), also known in Britain as Bii (fig 8.6);<sup>63</sup> collectively they weigh 0.244kg. Some of the body sherds show rilling of the shoulder and basal areas of the amphora; others display the stepped, wide flat sections divided by small raised ridges from the central portion of the body. Two fabric variants are present: one sandy and reddish-yellow (nos 14, 17), the other a slightly darker reddish-yellow ware containing abundant sub-angular calcareous inclusions up to 0.75mm (nos 1–13, 15–16). The sherds in the former fabric have a dark brown internal coating or slip, probably the remains of pitching, which allowed the vessel to carry wine. A strict minimum vessel count is two vessels but there are probably more – perhaps as many as five – a point which might be explored in the future by chemical analysis.

## Contexts

*John Allan*

Fourteen body sherds (nos 1–12) were found in 1952. According to the museum accession register, they were found in the 'bedding of the twelfth-century floor' but Radford's comments about the muddling of labels after the 1952 season casts doubt on the reliability of this information. The sherds do not look like a collection of residual material, as they would have been in a twelfth-century deposit; there are joining sherds, and only a few vessels are represented, perhaps only one. It seems more probable that they represent an undisturbed post-Roman context.

In fact, Radford's account of the excavation below the bedding of the Norman west walk of the cloister in 1951–4 probably records these sherds. The pottery associated with the earlier phase of timber buildings, found 'a few inches above the natural surface', consisted of



**Fig 8.6** Post-Roman imported pottery: Late Roman Amphora 1 (LRA1) (scale 1:2) (photo: G Young); line drawings 15–16 (scale 1:4) (drawing: J Reed)

single sherds of samian and first-century coarseware with 'a quantity of sub-Roman fragments' indicating a date for the context 'in the fifth or sixth century'.<sup>64</sup> Since these finds are the only ones from any of Radford's excavations fitting his description, it seems probable that they are the ones described.

Of the other finds, one (13) was found in 1954 in the 'second bone hole from N end of trench', ie a post-pit cutting the same deposit, and two 'under a Saxon cross base'; the remaining pieces were unstratified. The two handle fragments are unprovenanced and likely derive from pre-1939 excavations.

## Discussion

The source of LRA1 is in the eastern Mediterranean, with production centres in areas that include Cyprus and the Antioch region.<sup>65</sup> The date range of production spans the period from the early fifth to mid-seventh centuries, but importation to Britain is believed to be mainly in the period c AD 450 / 475–550.<sup>66</sup> The amphorae contained

wine or possibly olive oil.<sup>67</sup>

These important finds were unknown to earlier commentators such as Rahtz,<sup>68</sup> and they were not recognised by Kent.<sup>69</sup> They are not unexpected, however, since several sites near the abbey have yielded sherds of post-Roman imported ceramics. Fragments of Bi (LRA 2) and Bii (LRA 1) amphorae have been documented from Glastonbury Tor,<sup>70</sup> and LRA 1 from the sporadically occupied mound located to the south west of the abbey precinct.<sup>71</sup> Late Roman amphorae are also well documented elsewhere in Somerset, with further examples from Cadbury Congresbury, South Cadbury, Ilchester and possibly Cannington.<sup>72</sup> The complete distribution of such imported wares, spread across some fifty sites, is largely in the south west and along the Atlantic coast.<sup>73</sup>

Given the large number of known find spots in the south west, it is not possible to make any meaningful judgement about the status of the sites concerned when small numbers of sherds are found unrelated to structural remains, as in this instance.

## Anglo-Saxon and Saxo-Norman pottery, c AD 950–1200

### Date of the earliest Anglo-Saxon pottery

When excavations were conducted at the abbey in the 1950s and 1960s it was believed that the earliest medieval pottery encountered was of Mid Saxon or even Pagan Saxon date. This view is no longer tenable. At Cheddar, Rahtz demonstrated that pottery was either extremely rare or non-existent in his Period 1 (AD 850–930), despite the presence of thousands of animal bones, three coins and other metal objects.<sup>74</sup> Indeed, it now seems probable that the few sherds in pre-AD 930 deposits, which Rahtz thought might be Anglo-Saxon, are in fact of prehistoric date; the single vessel from this period that he illustrated in his 1974 paper is clearly an Iron Age vessel,<sup>75</sup> and the other sherds from his Period 1 are close to it in fabric. This amounts to strong evidence for believing that this part of Somerset was aceramic before c 930. Further evidence has since emerged to support this conclusion.<sup>76</sup>

Rahtz believed that pottery was still scarce at Cheddar in his Period 2 (mid-tenth century) and came into general circulation there in the late tenth century.<sup>77</sup> The quality of evidence he was able to bring to bear on this question is still the best available in the county (and indeed in the West Country), but it may be noted that, further afield, a similar picture has emerged in the Late Saxon towns of Gloucester, Hereford and Exeter.<sup>78</sup>

It follows that any features at Glastonbury containing Anglo-Saxon coarse pottery, or stratified above such material, belong to the period after c 930, and probably after c 950. Almost all the stratified pottery that is broadly of Late Saxon or Saxo-Norman character comes from below the Norman cloister, which appears to have been laid out c 1140–50, and the unstratified finds from earlier

excavations are very similar in character. This material is broadly attributable to the period c 950–1100 and is probably of Late Saxon date, based on the absence of local glazed wares in this large assemblage, the presence of small jar forms, which seem to be absent from twelfth-century groups elsewhere (nos 24, 55–6), the vessels paralleled in Late Saxon contexts at Cheddar Palace (nos 26, 44; sherds comparable to Cheddar B ware)<sup>79</sup> and the presence of Late Saxon Winchester ware.

### Fabrics

#### Late Saxon Winchester ware

##### *Katherine Barclay*

The ten Late Saxon glazed wares in the collection (fig 8.7) are all examples of Winchester ware. At least five vessels are represented; they all belong to the most common sub-fabric, MSR.<sup>80</sup> The two most notable fragments are described and discussed here; a full report is presented online. Three plain glazed sherds, including sherd no. 20, were excavated in stratified Late Saxon deposits in Radford's excavations in the cloister in 1955–7. No context information survives regarding the others, which may have been found before 1952. None of these vessels was distinguished in earlier studies of the abbey pottery.

#### Sherd 18

Body sherd, probably from the shoulder of a pitcher, beside the springing of a handle or spout. Decoration consists of a horizontal cordon with vertical to diagonal notching thus: \\\\", bordered by three rows of incised parallel lines below, and at least two above. At the site of the springing, below and to the left, these meet at least three rows of not quite vertical incised lines. The lines may have formed the border of a panel. Parallel to and inside both remaining borders of the surmised panel are two rows of stamped circles.

This fragment may be compared with a body sherd recovered from an early twelfth-century construction deposit at Winchester Castle (CY rf [1900]). That fragment displays similar decoration of carefree circles below two, or perhaps three, parallel horizontal incised lines and comes from a vessel of similar diameter. It is of fabric MOF, whose source is unknown.

#### Sherd 19

Body sherd, glaze, fabric and decoration much as no. 18, though the glaze is thicker, the stamped circles are bigger, the lines are neater and, notably, the notching is in the opposite direction – //\\. The surface of the sherd is



**Fig 8.7** Late Saxon Winchester ware (scale 1:2) (photos: 18 G Young; 19–20 S J Mather)

damaged, and the circles within the centre of the panel remain only as impressions.

Other sherds

The other fragments (the glazed sherd no. 20 and nos 21–24, not figured but described online) include one sherd with stabbed oval notches, another with incised lines, a sagging base, and glazed body sherds, some tiny.

Commentary

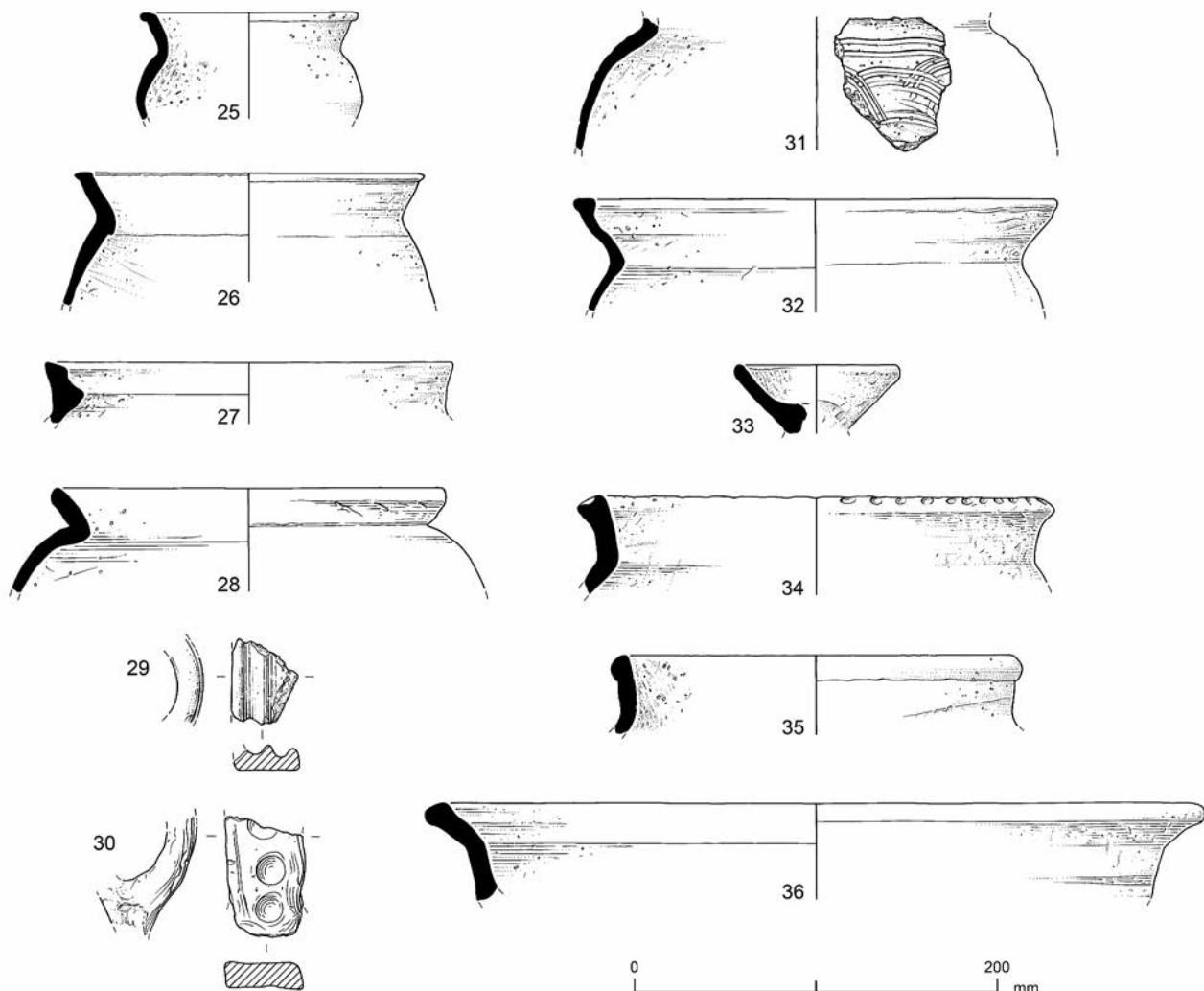
*John Allan*

The recovery of five vessels of Winchester ware is highly significant: in total, only three examples of Late Saxon glazed wares of any sort have been found elsewhere in Somerset: a vessel from Cheddar, three sherds from South Cadbury and a Winchester ware pitcher from Ilchester.<sup>81</sup> Further afield in the West of England, Vince noted single vessels of Winchester ware from Gloucester, Bath and Hereford, and further sherds have been claimed at Bristol

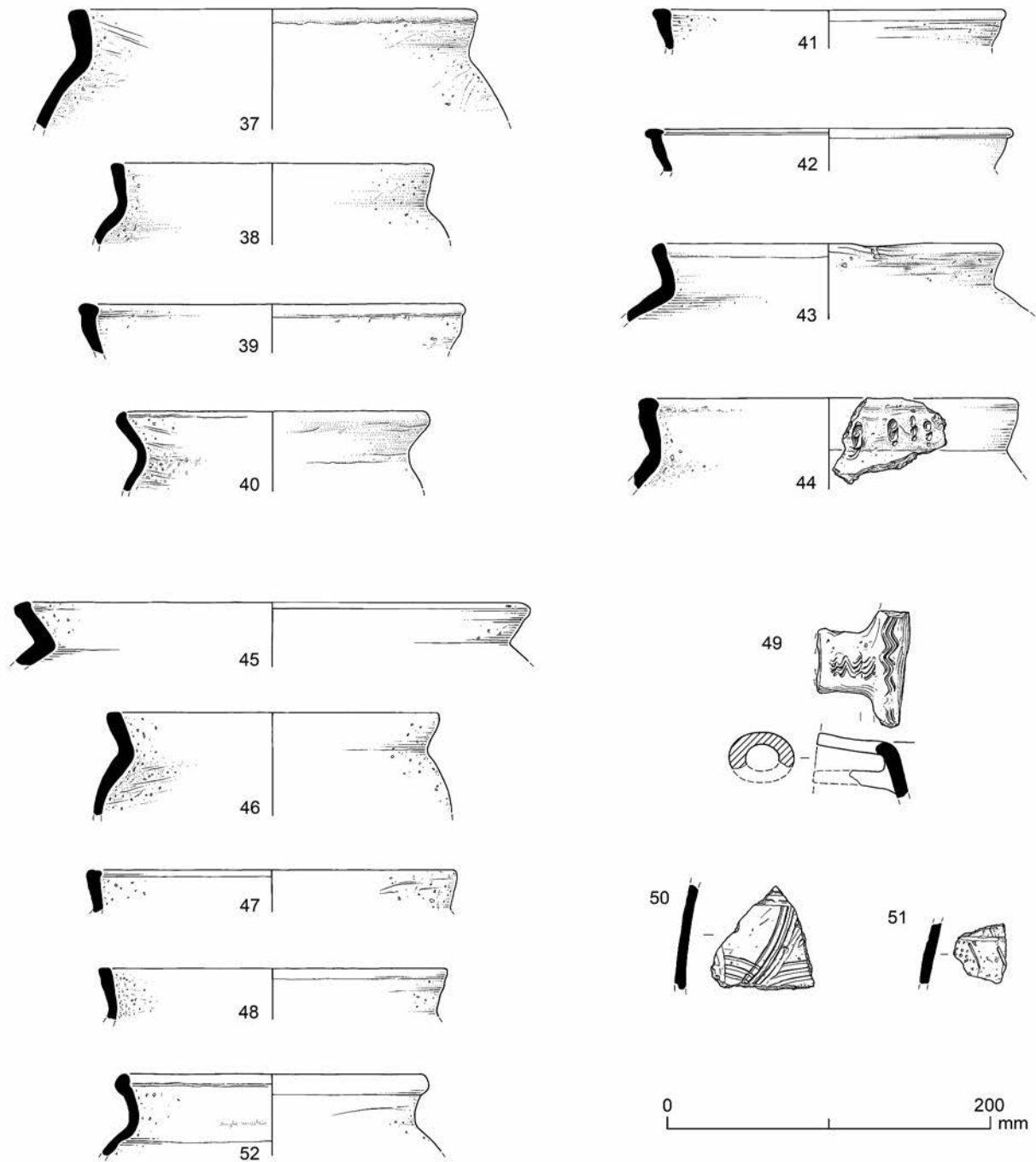
and Cirencester, but no examples have yet been distinguished in Devon or Cornwall.<sup>82</sup> Since all these finds lie outside the normal distribution range of Winchester ware, it seems reasonable to regard them as exceptional objects expressing some form of exchange – as vessels used in the carriage of particular substances, as goods travelling with mobile households, as gifts, or as evidence of contact between ecclesiastical centres. The fact that as many as five vessels of Winchester ware are represented at Glastonbury Abbey, whilst only eight further examples at most are known from a huge area of western England, suggests that they are likely to represent specific links between the monastic centres of Glastonbury and Winchester. The sherds lie outside the normal distribution range of Late Saxon glazed wares and can therefore be regarded as exceptional objects.

Coarsewares (figs 8.8–8.10)

The fabrics of the Anglo-Saxon and Norman pottery of Somerset have been the subject of a recent study by three



**Fig 8.8** Late Saxon coarse pottery from pre-Radford excavations: fabric 1 (25–30); fabric 2 (31–33) and fabric 3 (34–36) (scale 1:4) (drawings: J Read)

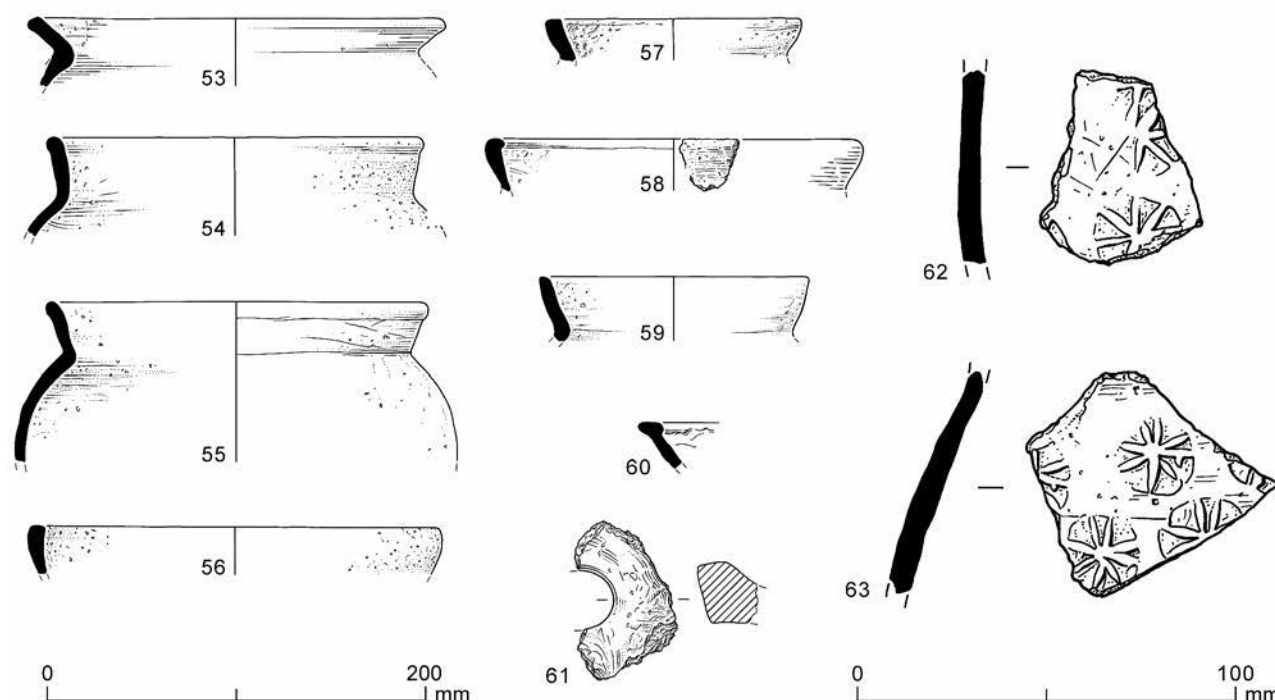


**Fig 8.9** Late Saxon pottery from Radford 1955, Radford 1956a and Radford 1956b: fabric 1 (37–39, 46–48); fabric 2 (40–42, 49–51) and fabric 3 (43–44, 52) (scale 1:4) (drawings: J Read)

contributors to the present report. This combined formal examination with petrological study and characterisation of the pottery's chemical composition.<sup>83</sup> It showed that by far the most common class of Saxo-Norman ceramics used in south and central Somerset, and distributed further north, contained inclusions derived from the Blackdown facies of the Upper Greensand; this fabric will be described below as 'Upper Greensand-derived' (UGSD). Pottery of this type is also found through much of Devon, and in parts of Cornwall and Dorset.<sup>84</sup>

Petrological study of a large sample of the abbey collection of Saxo-Norman pottery (online, with a summary in Appendix 1 below) distinguishes the following three fabric groupings:

- Fabric 1: limestone-tempered wares whose only gross inclusions visible on visual inspection are limestone fragments which have sometimes weathered, leaving a pitted surface. This is comparable to Rahtz's 'Cheddar B' fabric.<sup>85</sup>



**Fig 8.10** Late Saxon pottery from Radford 1958: fabric 1 (53–54), fabric 2 (55–59) and fabric 3 (60–63) (scale 1:4, except 62–63 scale 1:2) (drawings: J Reed)

- Fabric 2: Upper Greensand-derived wares, characterised by polished quartz, angular to sub-angular chert, rare angular flint, soft red inclusions (probably formerly limonite) and silicified shell.
- Fabric 3: wares tempered with both limestone and inclusions from the Upper Greensand.

Fabric 2 is the principal grouping, accounting for about 70 per cent of the Saxo-Norman sherds from the abbey. Analysis of the chemical composition of a random sample of six vessels in this fabric (Hughes, online report) shows that all six showed quite close matches to pottery from the kilns at Donyatt, South Somerset, which is therefore likely to be close to their area of production. The petrology of Fabric 3 shows that this also comes from a different area or areas on the fringes of the Blackdowns – possibly on the Lower Lias. Thus at least 85 per cent of the Late Saxon ceramics used at the abbey came from potteries about 30km to the south. The source of Fabric 1 may have been much more local: as Vince has suggested,<sup>86</sup> this ware was probably made in or around the Mendip Hills, and this would explain its occurrence at Cheddar and absence from Saxo-Norman pottery collections in the south of the county.<sup>87</sup>

Large and well-preserved sherds of these wares can often be separated with relative ease. In the case of the

**Table 7** Saxo-Norman pottery at Glastonbury, c 950–1150+

Pottery type	No. of sherds Radford	No. of sherds unstrat	Total sherds (% of sherds)
Late Saxon glazed	7	3	10 (0.5%)
Fabric 1: limestone-tempered	112	26	138 (6%)
Fabric 2: UGSD	920	585	1505 (70%)
Fabric 3: UGSD, calcareous	252	62	314 (14.6%)
Unclassified coarseware	52	135	187 (8.7%)
Total	1343	811	2154

Glastonbury material, however, identification has often proved challenging: many of the sherds are small (thumbnail-size or smaller), some are burnt, many with weathered or stained edges.

Overall manual sorting of every sherd has therefore been followed by a detailed petrological study of a high proportion of the coarsewares in the assemblage. Petrological examination by Taylor has confirmed the visual identification in about 80 to 90 per cent of instances; division of the two limestone-tempered fabrics has been the principal problem. The totals offered below will therefore be imperfect.

## Forms

As on most Late Saxon sites, the jar is by far the most common form; sooting suggests that most were used as cooking pots. Sherd no. 36 is an example of a wide bowl-like form, and a handle rising from a rim (no. 61) may come from another open-sided bowl.<sup>88</sup> The more unusual vessels – including a pan with a tubular handle (no. 49), two lamps (one figured: no. 33), at least two vessels with vertical handles (perhaps storage jars: nos 29–30) and five tubular spouts, either from pitchers or from bowls – have been published already and are therefore not republished here.<sup>89</sup> Finally, two sherds from a large vessel with applied strips are fully discussed by Kent.<sup>90</sup>

## Medieval pottery, c 1150–1550

### The mid-twelfth to mid-thirteenth centuries

With the construction of the new cloister in the mid-twelfth century, the series of stratified ceramics from Radford's excavations effectively comes to an end; sadly,

no pottery can be associated with the fire of 1184. The plentiful unstratified material, however, allows a general picture to be drawn of pottery consumption in the twelfth and thirteenth centuries.

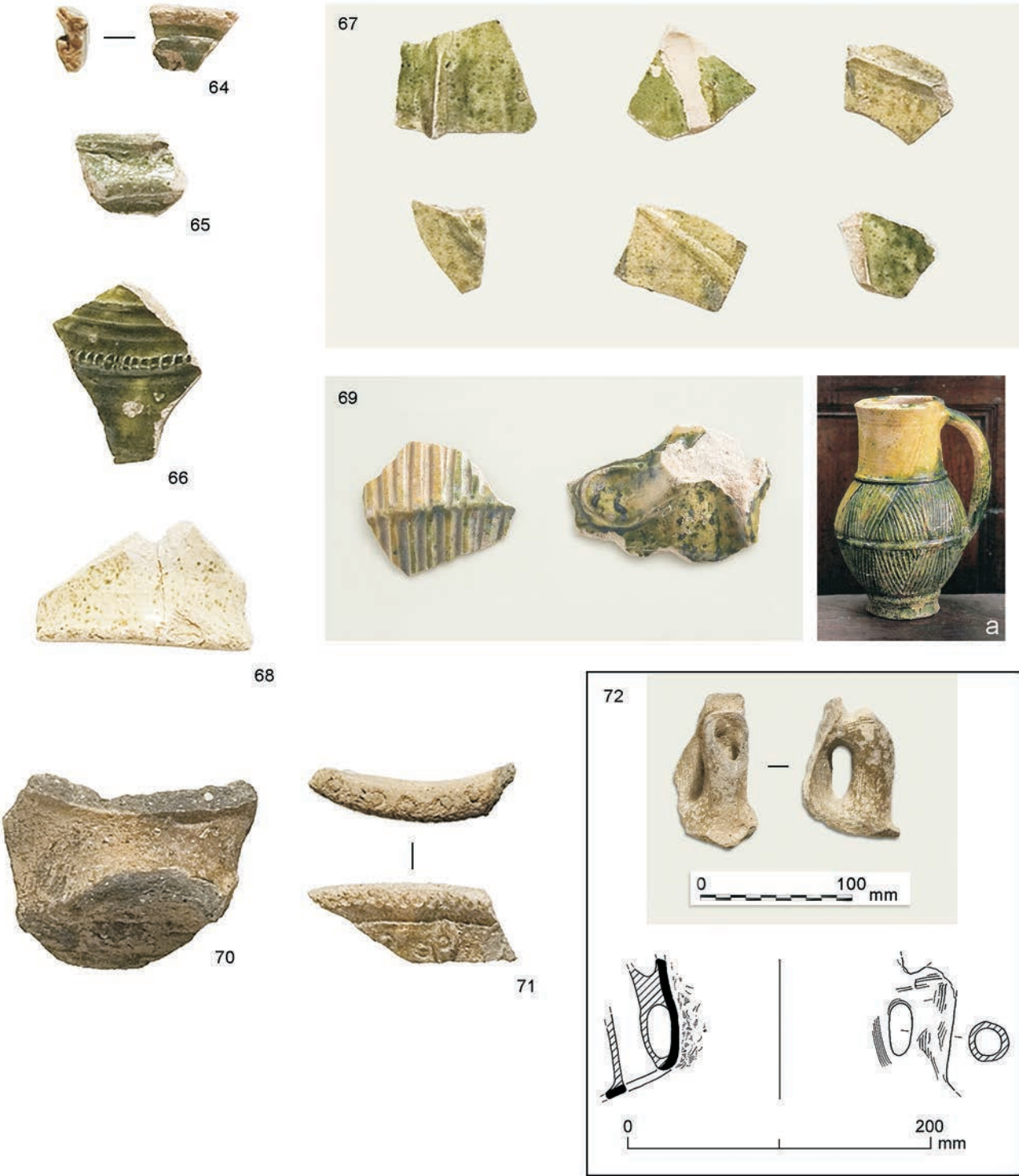
### North and west French wares, c 1170–1250 (fig 8.11)

A key theme of late twelfth-century ceramics in much of southern England, especially in towns and on high-status sites, is the rise in the market for glazed tableware. The abbey collection reflects this process. Part of its demand was met by jugs imported from north and west France. The series of at least six of these vessels is a comparatively large one in a regional context: not only are such wares unusual in Somerset; they are far from common even in Bristol.<sup>91</sup> The first five belong to the most common class of French imports of the period c 1170–1250: fine white-ware jugs with copper-green glazes, the most likely source for which is the Lower Seine valley around Rouen (including fig 8.11: 64–68). The exceptional item is the last one (fig 8.11: 69), which

**Table 8** Pottery types at Glastonbury Abbey, c 1150–1550

Pottery type	Date	No. of sherds	Min. no. of vessels	Forms/comments
<i>Imports</i>				
North French white wares	L12–mid 13C	15	5+	Jugs
'Rennes-type'	L12–E13C	2	1	Jug
Saintonge polychrome	1280–1330	14	2	Jugs
" all-over-green	1280–1350	1	1	Jug
" mottled green-glazed	L13–E15C	12	7	4 <i>pégaux</i> ; 3 jugs
French, source uncertain	13/E14C	2	2	
Montelupo maiolica	15–E16C	2	2	Albarello, deep dish
Andalusian & Valencian	L13–15C	3	3	Bowl, 2 dishes
Seville, Morisco, green-glazed	L15–E16C	1	1	Dish
Seville olive jars	14–17C	7	4	1 carrot form
Portuguese coarseware	15–16C	6	4	
Beauvais earthenware	L15–E16C	8	3	Drinking jugs
Martincamp	L15–E16C	4	2	Type 2 flasks
South Netherlands maiolica	E16C	5	4	Flower vases?
Raeren	L15–mid 16C	55	c 30+	Drinking jugs
Cologne	1520–50	4	2	Cup with sprigged decoration
Cologne/Frechen	Mid 16C	2	1	Jug with acanthus leaves & central band
Tudor Green	15/16C	13	6	3 cups; 1 lobed cup
<i>South-west English wares</i>				
Tripod pitchers	12–E13C	237	147	
Ham Green	Mid 12–13C	341	c 140+	Jugs; 1 cooking pot
Bristol: Redcliffe-type	L13–15C	1853	c 800+	3 costrels; jugs
Sand-tempered, SE Dorset	L12–13C	4	2	Jug
Somerset redwares	L13–15C	325	90	Jugs
South Somerset	15–16C	387	c 130+	Jugs
Sand-tempered, ?Somerset	13–15C	38	16	Jugs
Unclassified jug fabrics	13–15C	135	65	Many prob S Soms or redwares





**Fig 8.11** North French imports (64–68); body sherd and handle attachment of ‘Rennes-type’ ware (69) with a complete example from Exeter (a); tripod pitchers (70–72) (scale 1:2, except 72 scale 1:4) (drawing: J Read; photos: G Young)

belongs to a different class of fine green-glazed white-ware jugs, distinguished by their incised body decoration and hollow handles. Following the identification by Jean Chapelot of a complete example of this type from Exeter (fig 8.11, inset), such vessels were named ‘Orléans-type’ wares.<sup>92</sup> Jugs of this group are also present at Southampton,<sup>93</sup> and a series of fragments was found at Wood Quay, Dublin.<sup>94</sup> The source of these vessels now appears to have been resolved by the discovery in 2014–15 of kiln wasters of this type at Chartres de Bretagne, near Rennes.<sup>95</sup>

Tripod pitchers and handmade jugs, mainly c 1150–1250 (fig 8.11)

The collection contains 237 sherds of roughly glazed handmade coarsewares, which represent tripod pitchers or the related forms of handmade jugs; nearly all are unstratified or lack context information.

Upon analysis, the great majority of these vessels (including fig 8.11: 70 and 72) have proved to contain Upper Greensand-derived (UGSD) inclusions, showing that they come from the fringes of the Blackdown Hills, but there are a few examples with limestone inclusions (including fig 8.11: 71). The evidence for dating such wares in Somerset remains rather poor; Alan Vince’s conclusion remains a good summary of our current understanding – that they were certainly in circulation in the region before 1150, and that they became far more common in the late twelfth and early thirteenth centuries.<sup>96</sup>

Elsewhere in the West Country, glazed wares normally form only a minority of the ceramics of this date, the bulk of the material consisting of unglazed and often featureless body sherds.<sup>97</sup> At Glastonbury it may be presumed that many of the unstratified UGSD sherds in the collection date to this period – and that much of this kind of plain handmade pottery has been discarded.

Ham Green wares (fig 8.12)

The period must also have seen the growing success of the Bristol potteries in the Glastonbury market. Their earliest products are a few Bristol / Ham Green-type tripod pitchers. Ham Green ware jugs, now known to date to the period c 1140–1300 rather than the thirteenth century,<sup>98</sup> are far more common and are represented by 341 sherds (Table 8).

Alongside rouletted wares and plain jugs, these sherds include some elaborate wares with applied human and animal figures (nos 84–91). However, we have identified only one cooking pot of Ham Green ware.

## The high medieval period, c 1250–1450

### Imported wares (fig 8.13)

The number of medieval imported vessels of the high medieval period (thirteen or more) is modest, and is exceeded, for example, by the finds from a single excavation of moderate size in the small Somerset river port of Bridgwater.<sup>99</sup> As usual in deposits of the period throughout western England, Saintonge wares form most of the imports, but the vessels from this source represented at the abbey are not a typical selection of such products. The ordinary Saintonge green-glazed jugs, the most common imports of the period, are represented by only three vessels (by minimum vessel count) compared with two polychrome jugs, four of the giant *pégaux*, and one jug with all-over-green glaze (Table 8). The poor showing of the more everyday Saintonge products in this prestigious market may show that the wares of the local Bristol kilns were regarded as equally desirable high-quality tablewares.<sup>100</sup> Much more suggestive of the site’s high status are the Spanish and Italian sherds, discussed below, since these are rare on sites with collections of the more everyday imports.

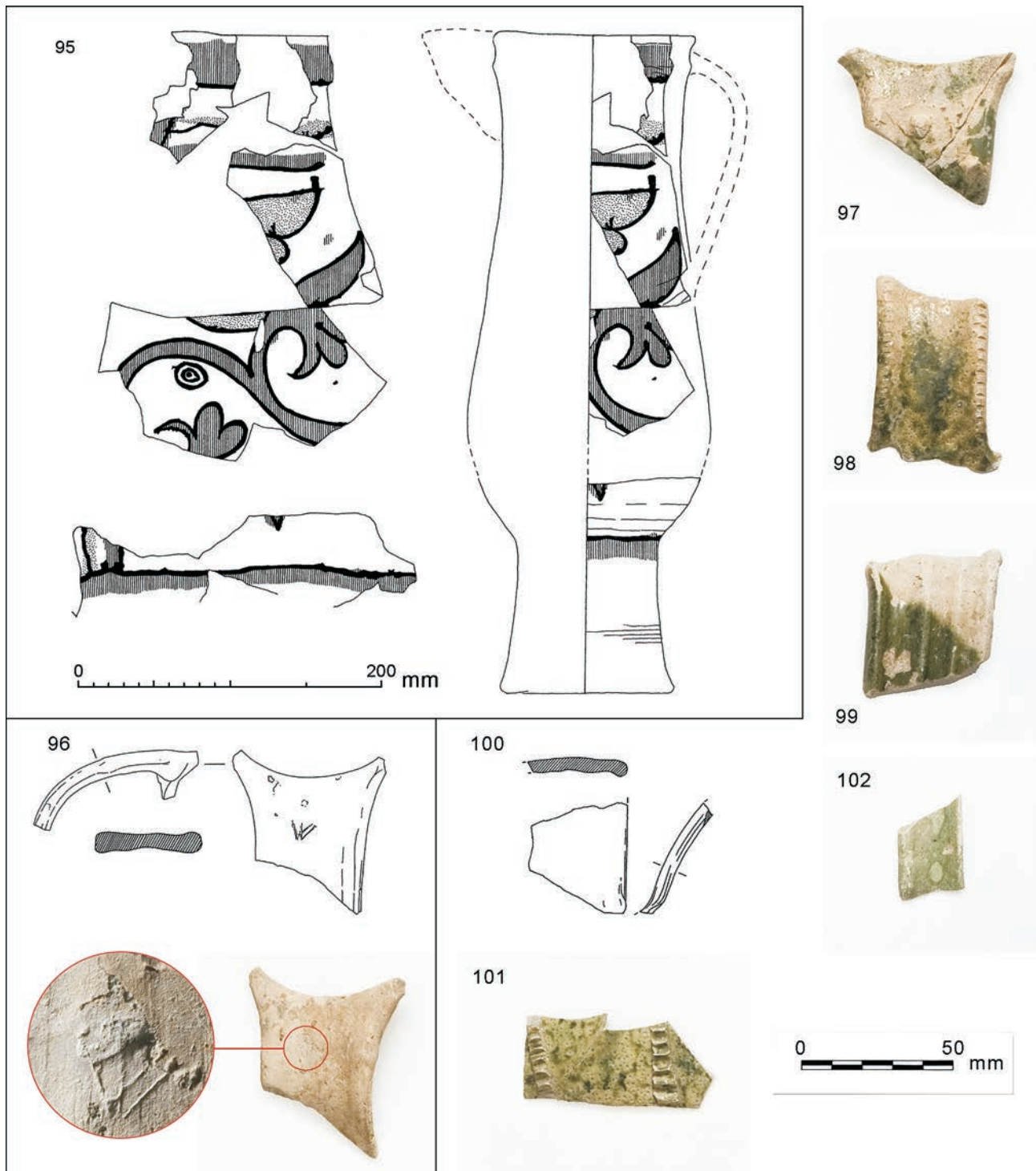
### Bristol Redcliffe wares (figs 8.14 and 8.15)

The central feature of the medieval pottery collection of the period 1250–1450 is the rise to overwhelming dominance of pottery made at Bristol: the series of Ham Green wares is far exceeded by the collection of more than 1,850 sherds of Bristol Redcliffe wares, broadly datable to c 1250–1450 / 1500. They include some splendid examples of elaborate jugs decorated with human faces and birds (nos 103–107), alongside the more commonplace applied scales and vertical strips, spirals and horseshoes (e.g. nos 110–114).

These fragments form about 68 per cent of the pottery of the period.<sup>101</sup> Given the documentary evidence for local ceramic production in this part of Somerset, including the presence of a pottery just outside the abbey precinct (below), this is a surprisingly high proportion. The pattern of consumption at the abbey forms a striking contrast with that on its nearby manor at Shapwick, where Ham Green jugs and later Bristol wares make up only 3 per cent of all the excavated medieval sherds, and where the later medieval wares of the city are less well represented than Ham Green products.<sup>102</sup> The pattern at Shapwick is likely to be much more typical of local consumption; the contrast suggests that the abbey was supplied by some specific



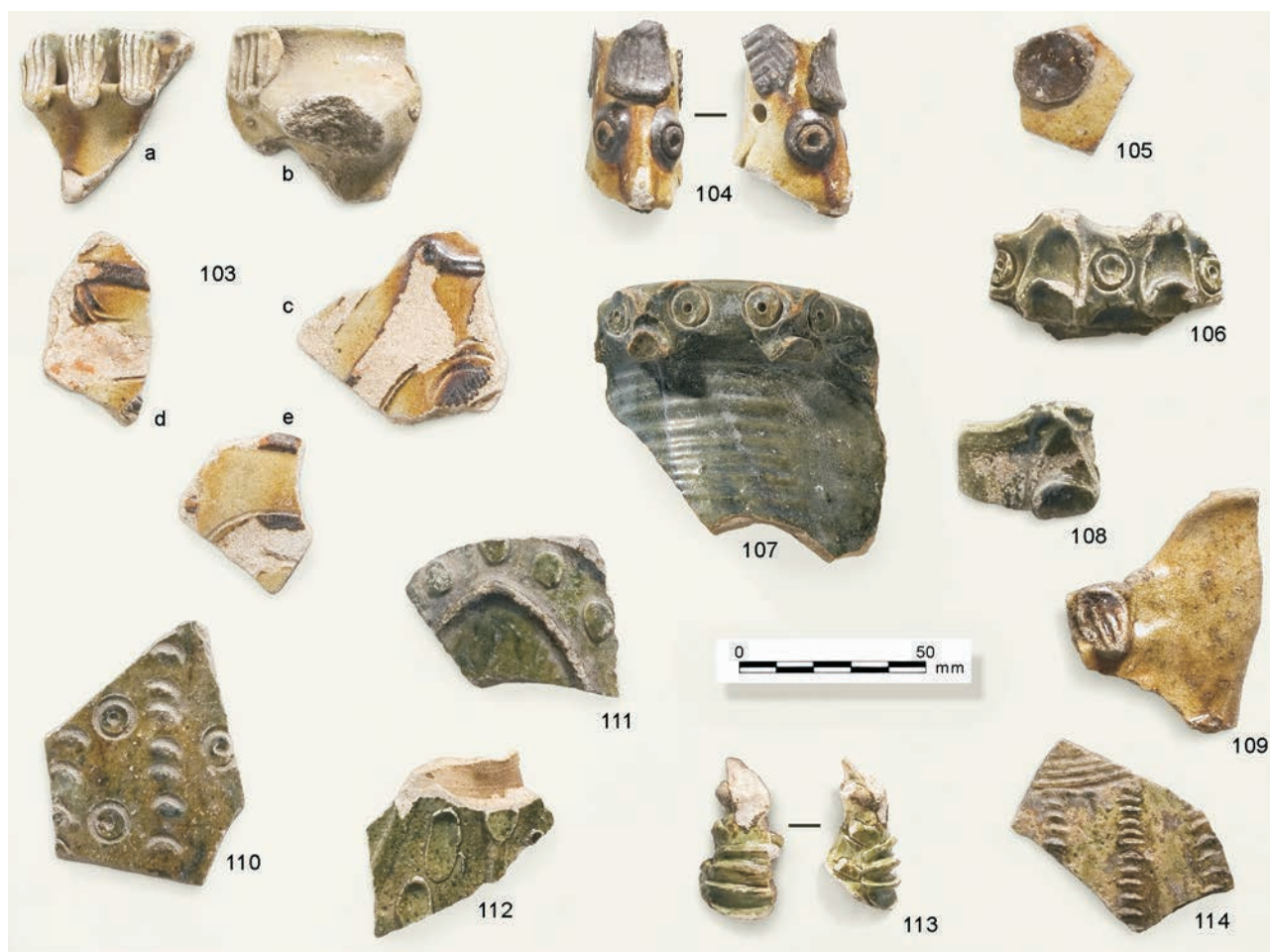
Fig 8.12 Ham Green wares (scale 1:2) (photo: G Young)



**Fig 8.13** Saintonge wares: polychrome (95); *pégaux* (96–100, 96 with graffito); roulette-decorated jug (101); all-over-green ware (102) (scale 1:4 (95–96); 1:2 (remainder) (drawings: O Kent; photos: G Young)

mechanism separate from local markets. Bulk purchasing of pottery from an established source over a long period seems a likely explanation. This practice may be inferred from documentation relating to other elite households: for example, the series of records of purchases by the king's butler at Westminster, each of 500

or 1,000 pitchers, from the potters at Kingston-on-Thames between 1260 and 1265; or the royal orders for Laverstock pottery, again 1,000 at a time, between 1267 and 1270 – presumably for the royal households of Clarendon and Winchester.<sup>103</sup> In the case of Glastonbury the choice of the Bristol potteries may have been



**Fig 8.14** Elaborately decorated Bristol jugs: with bird decoration (103); rod handle with face (104); with faces on rims (106–107) (scale 1:2) (photo: G Young)

motivated not only by the high quality of the wares but by the abbey's strong commercial links to the city, where it held valuable property and had other commercial interests.<sup>104</sup>

#### Other south-west English wares (fig 8.16)

The sources of the remaining wares are less clear, but some were certainly made very locally. A series of sherds from the abbey with a distinctive fine dense red fabric (eg fig 8.16: 178–182) can probably be attributed to the town itself; excavation by Nancy and Charles Hollinrake in 2005 at Bove Town, Glastonbury, recovered wasters of this type, including highly decorated jugs, on a site only 150m outside the monastic enclosure.<sup>105</sup> Documentary evidence indicates that it was occupied by customary servants of the abbey; it is therefore probable that the abbey was the pottery's principal intended market. Chemical analysis of kiln waste shows that the fabric is characterised by unusually high levels

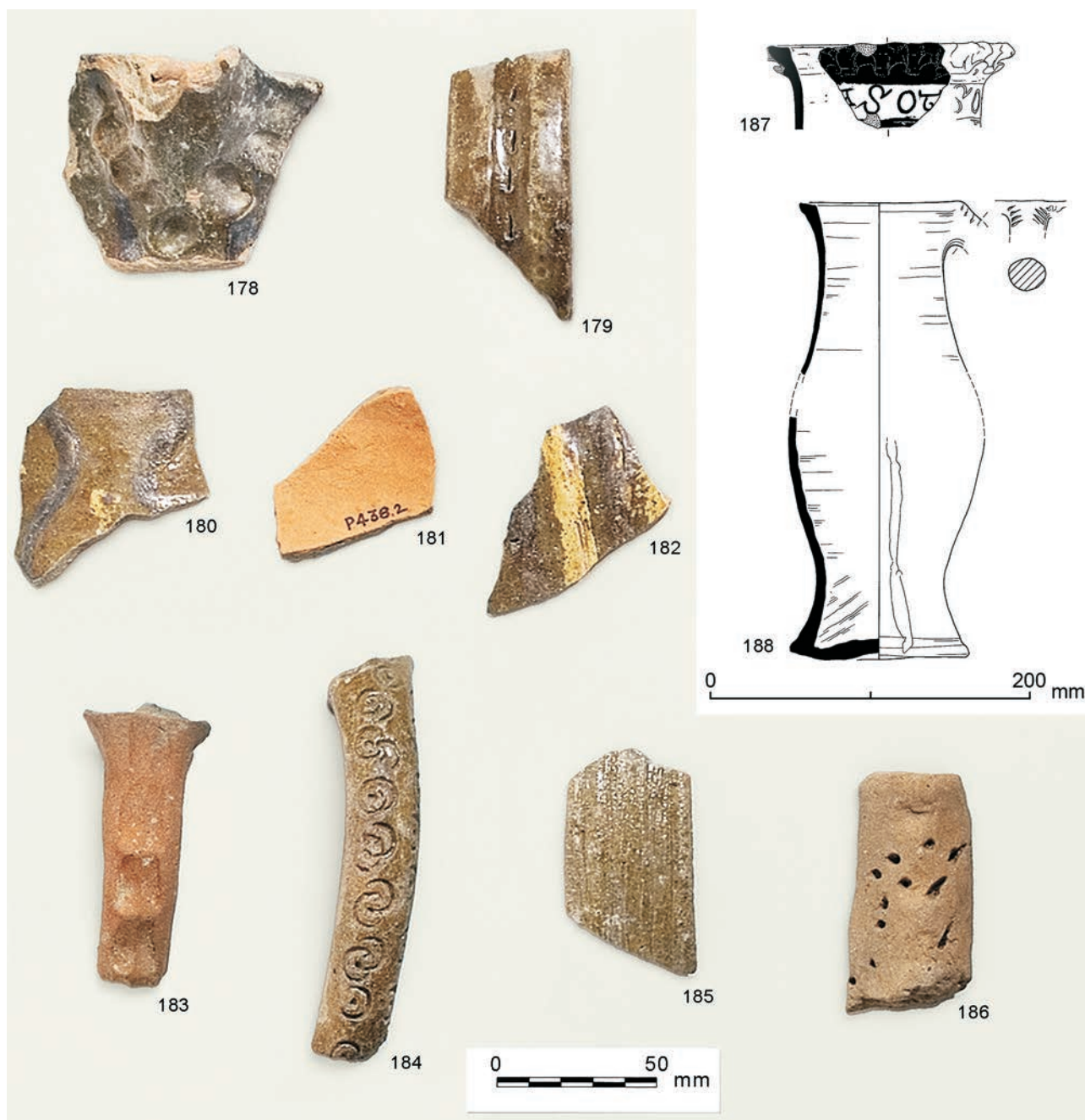
of iron oxide.<sup>106</sup> The fact that this fabric is uncommon at the abbey suggests that the venture was short-lived.

Regarding the remaining redwares, often sand-tempered and sometimes with calcareous inclusions, there are many possibilities: no fewer than thirty-one medieval pottery production sites are known in the county,<sup>107</sup> with a still larger number of producers of post-medieval pottery, brick and tile.<sup>108</sup> A medieval potter is documented at the abbey's manor of Butleigh, just 8km away, and others within 20–30km.<sup>109</sup>

Among these Somerset redwares is a fragment of a slip-decorated jug on which the letters [...]ASOT[...] are incised in Lombardic capitals in sgraffito technique (fig 8.16: 187). The sherd was found during Wedlake's excavation at the south-west corner of the abbot's hall in 1979.<sup>110</sup> Since lettering is extremely rare on medieval English pottery, the find has been the subject of a paper discussing its wider setting, and is discussed in detail online.<sup>111</sup>



**Fig 8.15** Bristol wares: costrels (115–117); jugs (118–177) (scale 1:4) (photo: G Young)

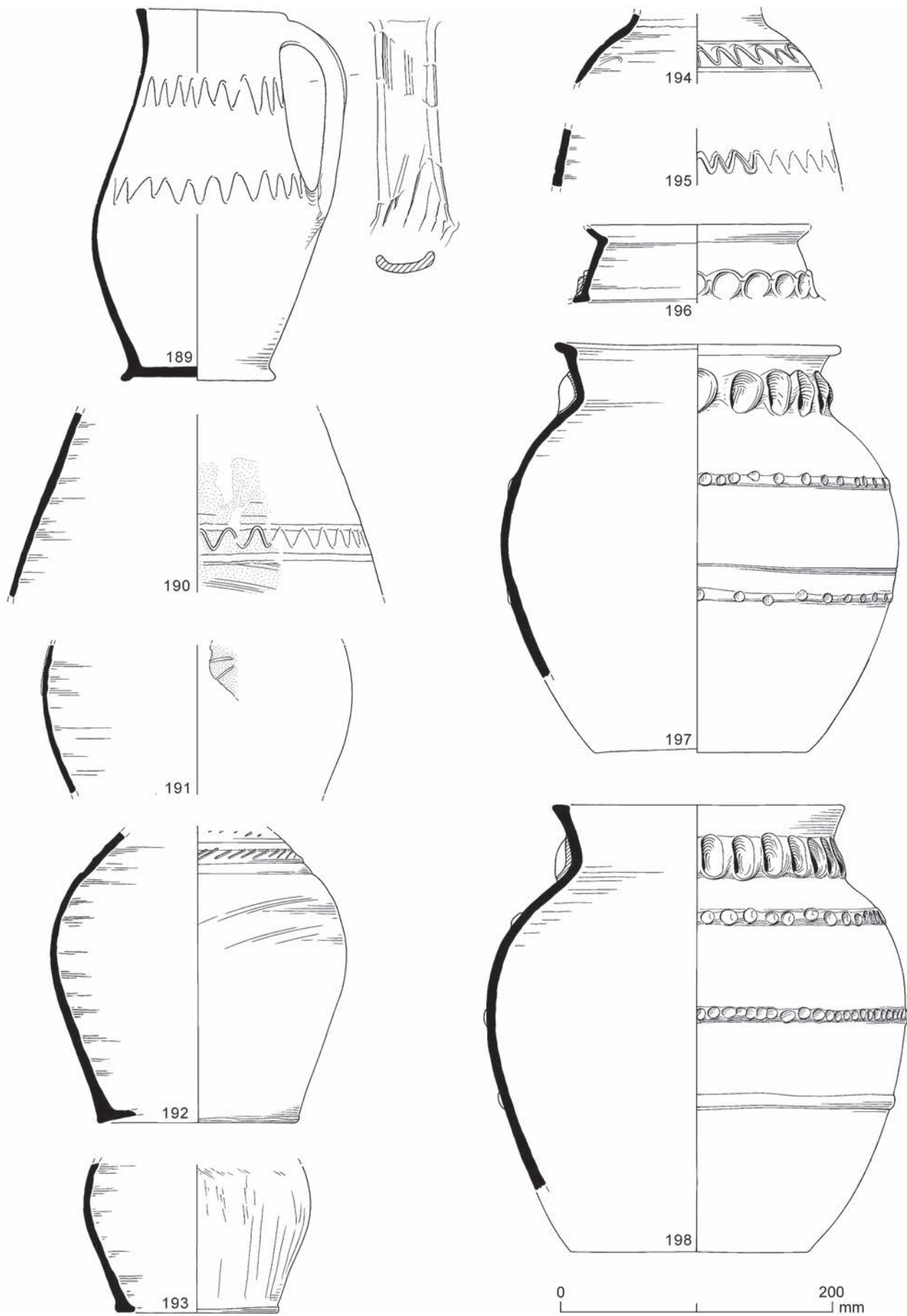


**Fig 8.16** Other late medieval wares: redwares similar to those from Bove Town, Glastonbury (178–182, 188); sand-tempered redwares (183–186, 187 with inscription) (scale 1:2, except 187–188 scale 1:4) (photo: G Young; drawings: O Kent)

### Late medieval South Somerset wares

In the late fifteenth and sixteenth centuries the South Somerset potteries made jugs that typically include bands of white slip on the shoulder and applied thumbed strips below the rim (fig 8.17: 189–195). Such jugs were widely marketed in Somerset.<sup>112</sup> Following the discovery of wasters of this type at Donyatt,<sup>113</sup> such wares have been attributed to the Donyatt kilns, but chemical analysis of a selection of samples of this type

from Cleve Abbey showed that at least one other major production centre made such vessels,<sup>114</sup> and the recent discovery of very similar wasters at Hemyock, east Devon, has demonstrated another production source. To throw light on the origins of these products at Glastonbury, eight jugs of this type were subjected to chemical analysis.<sup>115</sup> In six of the eight instances examined an attribution to Donyatt kiln 3 can now be offered, the other two samples probably coming from nearby (report online).



**Fig 8.17** South Somerset wares, c 1470–1575, nos 190–195 with chemistry matching Donyatt kiln waste (scale 1:4) (drawings: J Read)



## Post-medieval pottery, c 1550–1900

The volume of post-medieval pottery is surprisingly large: over 3,500 sherds, with an unusually high proportion of big diagnostic fragments suggesting the disposal of the smaller and less interesting body sherds. A breakdown of this biased sample is shown in Table 9.

Since many of the common coarseware forms were already in circulation before the Dissolution, they could represent ceramics used in the abbey, or pottery from the subsequent use of the site. Consideration of the accompanying imported wares and other classes of artefact is helpful in refining the probable date of the bulk of the collection, since these are much more closely datable than the coarsewares. There is a strong showing of late fifteenth- or early sixteenth-century imports: about forty-eight datable vessels, including sherds of at least thirty Raeren stonewares, the most common import of the period. Many of these items may represent the clearance of household effects of little financial value upon the closure of the abbey.<sup>116</sup> Unexpectedly, the volume of later sixteenth- or early seventeenth-century imports exceeds that total, with at least seventy-three imported vessels of the period

c 1550–1630. These could in part represent material discarded from the post-Reformation use of the abbot's lodging, and may include refuse from the brief-lived community of 230 French and Walloon clothworkers resident here in 1551–3.<sup>117</sup> They seem too large an accumulation for a single household, yet too consistent a collection to represent general dumping of town rubbish over a long period.

The new feature of the early modern pottery market is the large share taken by the potteries of north-east Somerset, notably Wanstrow, which operated in the area around Frome, about 25–30km from the abbey. They appear to have captured most of the market for coarsewares, especially bowls (nos 211–212). The South Somerset kilns around Donyatt came to hold a secondary place, with rather less than a third of the total, the principal product marketed at the abbey being the jug. Only an occasional item came from the more distant north Devon and Dorset potteries. Since the imported vessels of the period 1500–1630 form much the largest collection of this date in rural Somerset, they suggest the continuing high status of the site after the Reformation, although all the types represented have occasionally been found elsewhere in rural Somerset.<sup>118</sup>

**Table 9** Pottery at Glastonbury Abbey, c 1550–1900

Pottery type	No. of sherds	MNV	Forms
Montelupo maiolica L16–E17C	1	1	dish
Later olive jars, 16–18C	5	2	1 narrow base
Saintonge polychrome, E17C	1	1	chafing dish
Antwerp maiolica, L16C	3	3	'Malling' jugs
Frechen stoneware, 16–17C	91	68+	1 mid-16C jug with inscribed band
English delftware	19	13	1 17C cup, 1 candlestick, 1 porringer, 6 drug jars, 2 salts (also 1 18C tile)
South Somerset, 16–19C	1131	1070	16–17C types: 2 dripping pans, 18 plain cups, 16 slipped cups, 31 sgraffito dishes, 3 chafing dishes, 800 jugs, 38 jars, 2 candlesticks, 3 pipkins, 2 handled bowls, 35 other bowls, 1 curfew, 4 bucket pots, 14 jars, 1 cistern, 27 manganese wares 18C types: 20 sgraffito bowls, 27 shallow dishes, 9 small bowls, 2 large pans; 2 large trailed dishes
Wanstrow/NE Somerset, 16–18C	1968	1355	579 jars, 534 bowls, 81 large bowls, 7 colanders, 1 watering jar, 1 drug jar, 9 porringers, 25 cups, 85 jugs, 2 candlesticks, 1 pipkin, 14 chafing dishes, 1 apple baker, 13 dripping pans, 2 bottles
N Devon 16–20C	26	14	1 sgraffito dish, 5 bowls, 2 jars
Verwood, 18–20C	8	5	3 bowls, 1 jar, 1 dish
Somerset coast, 18–20C	5	5	3 jugs, 1 bowl, 1 garden pot
Bristol/Staffordshire, 18C	96	90	47 press-moulded plates, 36 yellow slipware cups & hollow wares; 5 treacle-brown tankards, 1 treacle-brown bowl, 1 agate ware sherd
Bristol/Staffs etc, L18C+ misc incl creamwares, mocha, basalts, stonewares	159	110	
Total	3513		

Pottery dating from the period c 1620–1700 is less well represented, with few delftware and modest numbers of decorated tablewares of the mid- and late seventeenth century. Early eighteenth-century pottery is however plentiful; the small quantity of later ceramics probably represents the discarding of most recent material.

### **Petrological study of Saxo-Norman coarse pottery from Glastonbury Abbey**

*Roger T Taylor*

A large sample of the Saxo-Norman pottery from Glastonbury was inspected by the writer in hand specimen. Detailed petrological descriptions of fifteen vessels are presented online; general descriptions of the three fabric groups are presented here.

#### **Fabric 1**

A fabric tempered with finely crystalline or granular calcined white limestone, with a minor content of rare grains of quartz, sandstone (with colourless quartz in a calcareous matrix), cleaved crystalline calcite, and rock fragments in a smooth, finely micaceous clay matrix. Very weakly and patchily calcareous.

#### **Fabric 2**

Wares with characteristic Upper Greensand-Derived indicators: polished quartz sand grains, chert fragments, silicified sandstone, silicified shell, tourmaline, etc. There are considerable variations in their quality and thickness, and the degree to which they display the typical inclusions. These variations may indicate that more than one pottery exploiting Upper Greensand-derived temper supplied the abbey. Numerous examples from other sites in Somerset have been described elsewhere.<sup>119</sup>

#### **Fabric 3**

A fabric showing the same UGSD inclusions as Fabric 2 but in a matrix containing limestone, probably indicating input from the Lower Lias clay.

Petrological study has distinguished a further fabric grouping (Fabric 4): a finely sand-tempered medieval coarseware with a calcareous matrix, which may be local to the Glastonbury area; petrological descriptions are

presented online. The date of this ware is at present uncertain.

### **Inductively coupled plasma spectrometry (ICPS) analysis of tin-glazed pottery from Glastonbury Abbey**

*Michael J Hughes*

In view of the uncertainties that commonly arise in distinguishing the different centres of production of medieval and early modern tin-glazed pottery, the ten examples of such wares found at the abbey were subjected to a programme of chemical analysis using inductively coupled plasma spectrometry (ICPS), which gives a chemical fingerprint and thus information about the sources of ceramics. The methodology employed, and the comparative samples from Italy, the Netherlands and the British Isles used in the study, are described online.

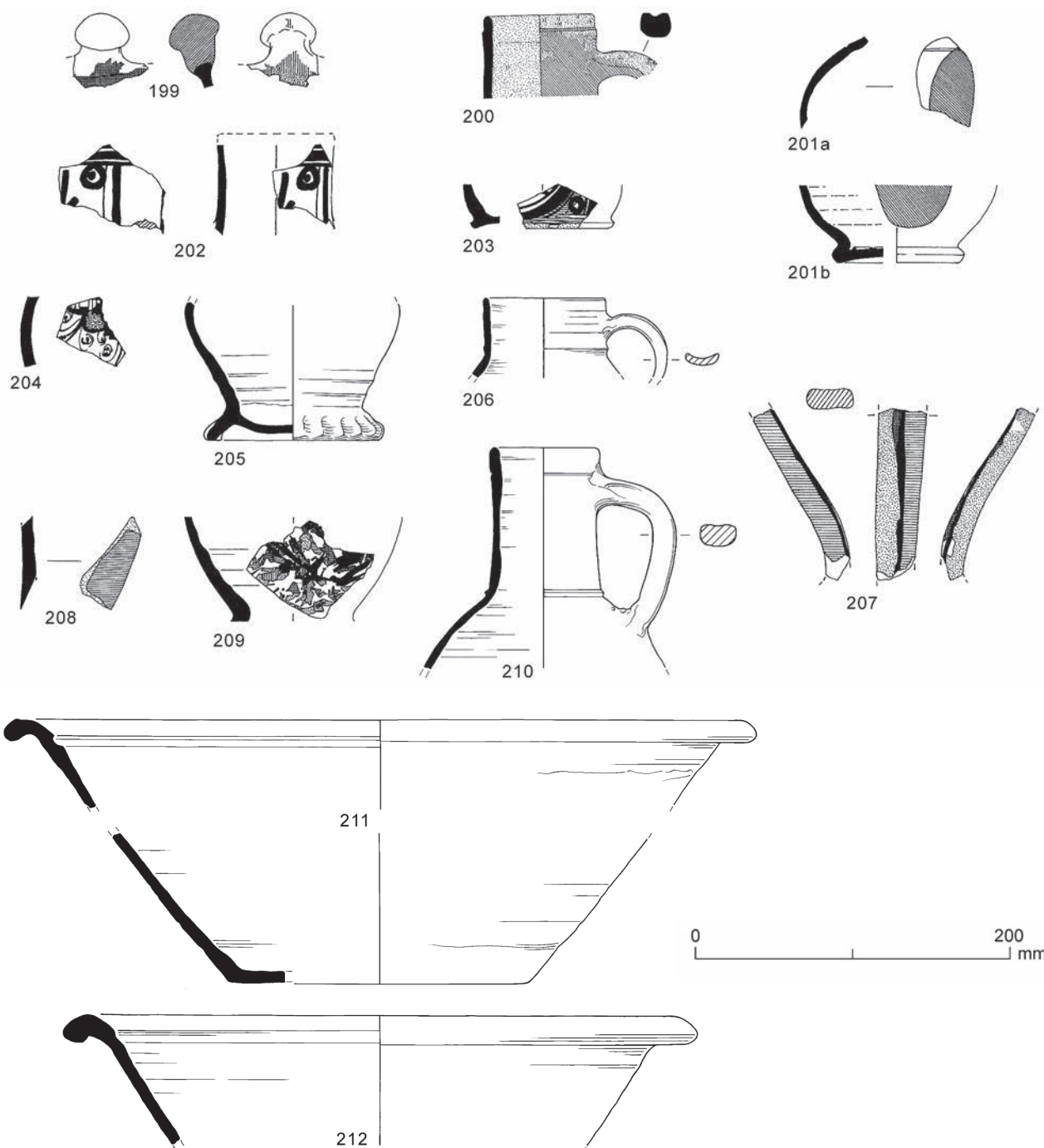
#### **Italian tin-glazed wares**

The chemistry of three Glastonbury samples (1, 3 and 8) proved consistent with previous analyses of Montelupo ceramics. At present there are not sufficient comparative analyses by ICPS of Montelupo pottery to draw more detailed conclusions.

The results of the analyses of these three vessels contrast with those of seven other early sixteenth-century maiolica vessels found in south-west England, which all share a very similar and very distinctive clay chemistry signature.<sup>120</sup> The latter appear to be further examples of the 'Italian' version of tin-glazed pottery, first identified by chemical analysis in 1999.<sup>121</sup>

#### **South Netherlands maiolica (fig 8.18: 202–204)**

The chemical composition of sample 6 is almost identical to the average of maiolica from the kilns found at Steenhovensvest, Antwerp, analysed previously by neutron activation.<sup>122</sup> The maiolica from the latter kiln differs from the production sites at the National Museum of Navigation and at Schoytestraat, also in Antwerp. Samples 4 and 10 are a little further away from the average analysis for the Steenhovensvest kiln. They may be from the same centre though produced at different times. A further vessel (sample 5) shares a similar clay chemistry to Malling jugs 2 and 9 described below, so its production is probably related to them.



**Fig 8.18** Pottery, c 1470–1650: Saintonge polychrome chafing dish (199); Beauvais drinking jugs (200–201); South Netherlands maiolica (202–204); Raeren stoneware (205–206), Malling jugs (207–209); Frechen stoneware (210), Wanstrow bowls (211–212) (scale 1:4) (drawings: O Kent and J Read)

### Malling jugs (fig 8.18: 207–209)

In an earlier study, five out of eight Malling jugs found in London overlapped with some examples of this type of vessel found in Antwerp in an analysis of maiolica made at the production centre near the National Museum of Navigation, Antwerp,<sup>123</sup> though a few did not, indicating that production took place at more than one centre.<sup>124</sup>

Apart from slightly higher rare earth elements, one Malling jug from Glastonbury (sample 7) is almost identical to the average chemistry of Malling jugs found in London analysed in that programme,<sup>125</sup> and to other vessels found in the UK.

The other two (samples 2 and 9) are slightly different from sample 7 but show a fairly close similarity to each other. They are also very similar to tiles and dishes from

Jeffrey Street, Edinburgh, and all are not unlike the chemistry of finds from the National Museum of Navigation, Antwerp. Despite the slight difference from sample 7, all three vessels are attributable to the Antwerp area.

## Italian wares

### *Hugo Blake*

Three of the fragments analysed by Hughes have a chemistry consistent with Montelupo in the lower Arno valley. In each case the full description and discussion are presented online.

#### ICPS sample 8 (fig 8.19: 213)

The wall of what may have been a drug jar; fairly hard pale pinkish-brown fabric; dull greyish tin glaze on both sides. The decoration consists of a herringbone pattern of broad diagonal lines within three vertical lines delimited by a horizontal one below (or above), all in dull dark blue, flanked by blank bands alongside and below (or above). There is no apparent trace of lustre.

The closest parallel is a complete drug jar, once owned by Bode (fig 8.19: a).<sup>126</sup> Its ornament, which is wholly in blue, is divided into horizontal tiers separated by blank bands. The lowest tier is filled with vertical rectangular areas consisting of a herringbone or upright pinnate needle-like leaf pattern alternating with areas less populated by a linear crossed element and a hanging tuft of grass or splayed needle leaves. The typological features, fabrics and glazes of this group of wares are discussed in detail online. Attribution is difficult, since very similar items were produced in both Valencia and northern Tuscany in the early fifteenth century.<sup>127</sup> Cora published Bode's jar and another in the Victoria and Albert Museum as Tuscan.<sup>128</sup> Since then Berti has reattributed both to Spain, and Ray has assigned the Victoria and Albert Museum's jar to Paterna or Manises on the basis of close decorative similarities with 'striated' leaves on pottery from Paterna.<sup>129</sup> So, the ICPS analysis provides new and independent evidence for the Tuscan source of some of these drug jars.

Regarding their date, Cora placed the decoration of the two drug jars within Ballardini's wider *famiglia italo-moresca* (Italo-Moresque family), datable to 1430–60.<sup>130</sup> Ray proposed a date about 1400 for the Victoria and Albert Museum jar and Berti dated Bode's to 1430–40.<sup>131</sup>

Jars decorated only in blue may have been 'common' in Valencia,<sup>132</sup> but the representation of an Italian jug in the

Brussels *Annunciation* suggests that this ware may have been prized more highly in north-west Europe. It is possible that the jar's content was more important than the container. As very similar items were produced in both Valencia and north Tuscany in the early fifteenth century, the Glastonbury jar may even have been chosen by an Italian merchant in order to mislead a north European consumer about the origin of the commodity enclosed.<sup>133</sup> It does suggest – if such evidence were needed of the abbey's or the abbot's connections and consumption – that someone acquired an unusually packaged exotic product early in the fifteenth century. By whatever means it reached Glastonbury, this tall and strangely decorated pot would have been a striking possession.

#### ICPS sample 1 (fig 8.19: 214)

The junction of a broad brim and the deep cavity of a dish, in fairly soft buff fabric. Parts of the tin glaze have flaked off: shiny white on the brim, dull outside and tinged pink, also pinkish inside cavity. The upper side of the brim is painted with foliage outlined in blue and a central tear drop filled with yellow and marked by two longitudinal blue lines, flanked by darker blue elements, one marked in orange, another crossed by four blue lines, and a green-filled frond. Trace of blue inside the cavity, which is otherwise plain, as is the outside.

The decoration is similar to the orange tear drop and lush green and blue leaves of the palmettes on the wide brim of a 'plate' in the Victoria and Albert Museum, which, however, lacks the blue lines along the tear drop and across the blue leaf. It is attributed to Deruta or Siena and a date of about 1500 is proposed.<sup>134</sup> Similar fronds are on Berti's *girali fioriti* (floral scrolls) and *grottesche* (grotesques) decorative 'genera', examples of which are dated to 1544 and 1509 respectively.<sup>135</sup> Two *grottesche*-decorated vessels with blue and white palmettes on an orange ground, displayed in the Museo della Ceramica di Montelupo, may be compared. The first is a wide-brimmed dish with a relatively small capacity (fig 8.19: b); the second is a 'tray' or plaque whose border is marked by a series of palmettes and green fronds (fig 8.19: c). The museum display labels propose dates of 1490–1500 and 1490–1510.<sup>136</sup> The form of the Glastonbury fragment resembles the slightly inclined broad-brimmed dishes with a narrow deep cavity illustrated by Berti.<sup>137</sup>

#### ICPS sample 3 (fig 8.19: 215)

A dish rim with part of a decorative scheme, shown in its entirety in a restored example from Castle Street,



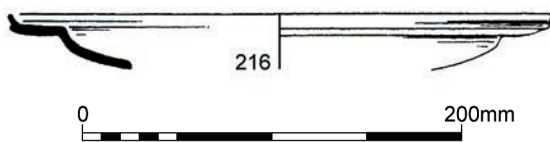
**Fig 8.19** Italian pottery, with complete examples of the types represented: 213 (sample 8) cp; (a) concave-sided jar with blue decoration, height 295mm (from Schmidt 1929, pl 8, no. 33); 214 (sample 1) cp; (b) wide-brimmed dish, rim diameter 155mm (Berti 2008, pl 25d); (c) plaque fragment, c 100 x 100mm, displayed in the Museo della Ceramica di Montelupo; 215 (sample 3), cp; (d) restored dish from Castle Street, Plymouth, rim diameter 335mm (photos 213–15: G Young; b–c courtesy of the Museo della Ceramica di Montelupo; d © Plymouth City Council (Museums & Archives), acc no. AR.1980.1.1.193)

Plymouth (fig 8.19: d).<sup>138</sup> Various terms have been used to describe this pattern; the name ‘lozenge net design,’ employed by Hurst, is preferred here. Berti dates the type to c 1540–1620, when it was one of the commonest Montelupo decors.<sup>139</sup>

The Glastonbury Abbey fragment seems to belong to a dish that was smaller than most and lacked the yellow- or orange-filled oval or another motif to separate the diamond from the band on the rim; the simpler ornament is commensurate with a smaller item.

## Discussion

That these three fragments – even the well-known lozenge net design (sample 3) – cannot be matched exactly with material found at Montelupo confirms the impression gained that at times there is a discrepancy between exported items and those common in their country of origin.<sup>140</sup> The study also demonstrates the importance of analysing the chemistry of exotic fragments in order to provide independent evidence of their origin. Sample 3 is of the period between the middle of the sixteenth century and the middle of the seventeenth, when Montelupo’s tin-glazed pottery was most copiously and widely exported to the Atlantic world,<sup>141</sup> probably stimulated by the English and Dutch mercantile presence in Livorno.<sup>142</sup> Sample 1 is one of a growing number of items datable to around 1500, which – thanks to Hughes’s investigations of what were called South Netherlands maiolica and Faenza-type jugs – have been identified as Tuscan.<sup>143</sup> However, sample 8 is the first early fifteenth-century item in north-west Europe which has been identified with certainty as from Montelupo.



**Fig 8.20** Malagan early lustreware dish (216) with (a) similar bowl from Winchester (photo: A Gutiérrez)

## Spanish and Portuguese wares

### *Alejandra Gutiérrez*

A handful of Spanish finewares and coarsewares were found during the excavations, but with one exception (no. 217) no record has survived to indicate where they were found within the abbey. Some of this pottery had a long lifespan of production and is difficult to date in itself, although it seems likely that all the material catalogued here belonged to pre-Dissolution phases. Detailed descriptions, references and fuller discussion will be found online.

### Malagan early lustreware

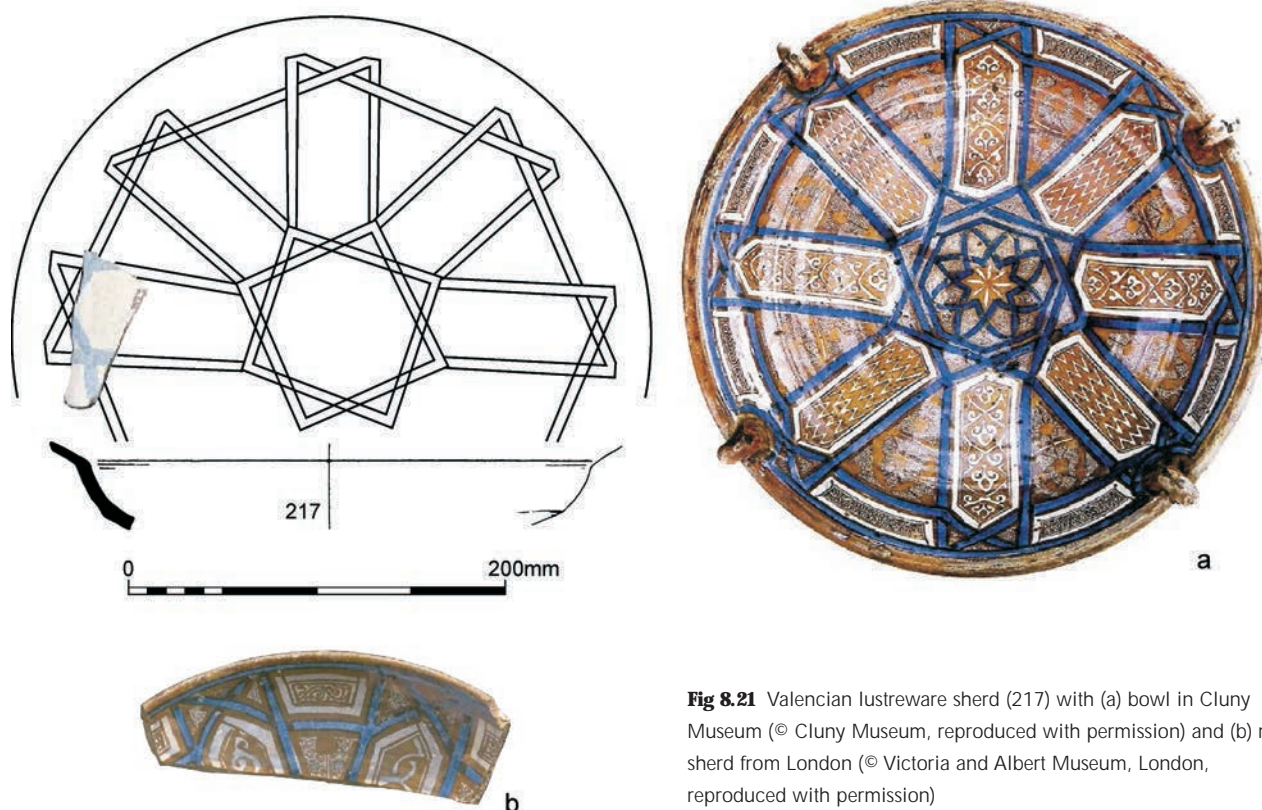
No. 216. ?Late thirteenth century (fig 8.20). Two sherds from a small dish. Fine light orange fabric with visible inclusions of red schist; buff surfaces. The sherds were originally entirely covered with a white glaze, but this is much decayed, as is typical of early Malagan lustrewares. No decoration survives. The closest parallels are a small flanged bowl from Winchester and two others from Southampton, discussed online.

This type of early lustreware is uncommon in England, having been found at just twenty sites concentrated in the south.<sup>144</sup> So far no other examples are known from Somerset and no further sherds have come to light since John Allan published his round-up of finds from the south west.<sup>145</sup>

### Early Valencian lustreware

No. 217. Unstratified; from excavations by H Woods in 1989. Late fourteenth century. Large flanged dish, the fabric orange throughout, with some mica spots, clay relicts and small voids. Interior and exterior white tin-glazed. Originally decorated in lustre and blue, but the lustre has now completely disappeared.

The blue decoration resembles very closely the radiating pattern associated with a group of dishes of complex and intricate decoration, best illustrated by a complete example in the Cluny Museum, Paris (fig 8.21: a);<sup>146</sup> a similarly decorated rim sherd found in London is now in the Victoria and Albert Museum (fig 8.21: b).<sup>147</sup> In the past it was uncertain whether this pattern was Malagan or Valencian, but chemical analysis of the sherd in the Victoria and Albert Museum has shown that that piece was made in Valencia.<sup>148</sup>



**Fig 8.21** Valencian lustreware sherd (217) with (a) bowl in Cluny Museum (© Cluny Museum, reproduced with permission) and (b) rim sherd from London (© Victoria and Albert Museum, London, reproduced with permission)

### Valencian lustreware

No. 218. Late fourteenth / fifteenth century. Large dish with dark orange fabric throughout. Interior and exterior white tin-glazed; painted lustre and blue decoration; the lustre colour is very faint and has disappeared in some areas. The motifs are lustre 'dotted flowers' and blue Gothic writing on the interior surface; on the exterior are concentric bands of lustre lines with a ladder pattern of diagonal hatching.

Gothic writing was used by Valencian potters as decoration during the fifteenth century;<sup>149</sup> the combination of dotted flowers in lustre covering the whole interior surface together with a large blue central motif (animal, letter or flower) can be seen in numerous examples surviving in museum collections (fig 8.22: a). It is not possible to identify the central motif on the Glastonbury dish but the letter is certainly large, and this discounts the possibility of its being a long phrase. It could well be a single initial or the bottom part of the 'i' or 'h', as in 'ihs'.

Fifteenth-century Valencian lustrewares have been identified from well over 100 places all across the country.<sup>150</sup> If these two finds were indeed purchased for use at the abbey, the low numbers of vessels recovered surely suggest that they were reserved for special

occasions or restricted to the use of guests rather than being for the religious community as a whole.

### Seville Morisco ware

No. 219. Late fifteenth / early sixteenth centuries (fig 8.23). Dish with buff fabric throughout, glazed emerald green on both surfaces. Probably a Plain Green dish (covered in tin green 'glaze all-over'), but possibly a Half Dipped White and Green dish.<sup>151</sup>

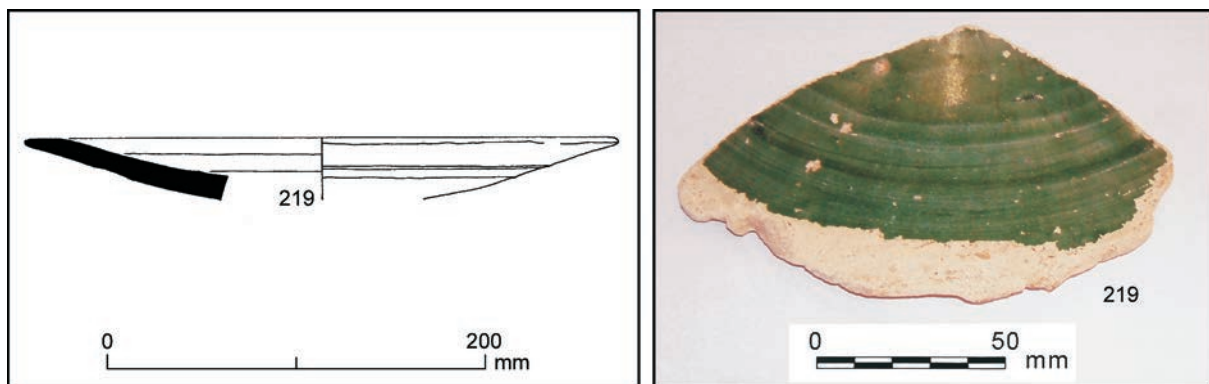
The fabric and profile are typical of dishes produced in Seville, from where they were exported in vast quantities down the Guadalquivir river. What is unusual about this vessel is its lack of decoration; exported wares from Seville are typically white tin-glaze, sometimes with colourful decoration (blue and purple; or blue). It is most likely that these less typical wares arrived by means other than regular trade in pottery.

### Seville-type olive jars

Four sherds from two different early olive jars were found. They are thinner (*c* 6mm) and with a finer sandy fabric than later olive jars. The shape is that of a barrel costrel with two handles, and this early type is traditionally dated to the late fifteenth century and



**Fig 8.22** Valencian lustreware sherd (218) with (a) vessel with crowned Y for King Juan II of Aragon (© Instituto Valencia de Don Juan, reproduced with permission) and (b) trigram IHS (© British Museum AN483067001, reproduced with permission) (scale of 218: 1:2)



**Fig 8.23** Seville green-glazed dish (219) (scale of line drawing 1:4) (drawing: O Kent)



sixteenth centuries.<sup>152</sup> There are also five sherds of the much more common Seville-type olive jars of the sixteenth to eighteenth centuries.<sup>153</sup>

### Portuguese micaceous redware

The four fragments of Portuguese micaceous redware, also known as ‘Merida-type ware’, include handles from two different vessels, perhaps standing costrels, and the rim of a straight-sided vessel (fig 8.24: 220). A wall sherd is lightly incised on the exterior with what may be a merchant’s mark (fig 8.24: 221).

These sherds are not easy to date with any precision. Portuguese coarsewares arrived in Britain from the thirteenth century onwards, the earliest type to arrive being the standing costrel. From the sixteenth century the range of forms becomes much wider. Finds of this type have been recorded on at least seven other sites in Somerset (details online).

Although neither kiln nor production sites have been discovered so far, Portuguese micaceous redware is believed to have originated in the area around Aveiro in northern Portugal although this whole area, which also includes western Spain, also

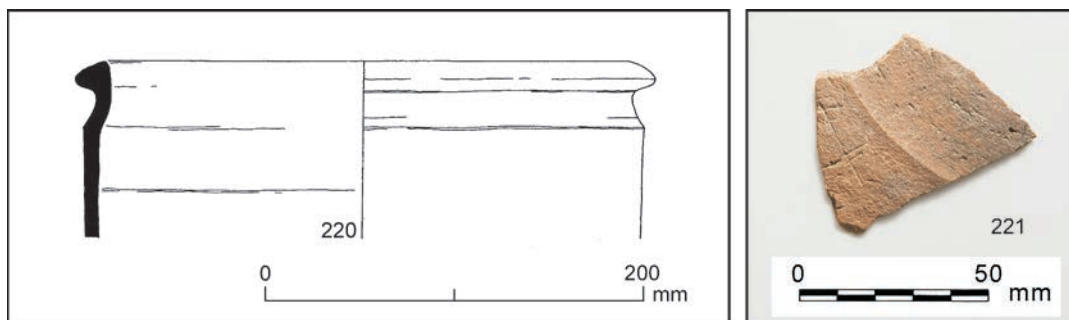
produced micaceous wares that have yet to be characterised.

### Seville *arista* tiles, early sixteenth century (fig 8.25)

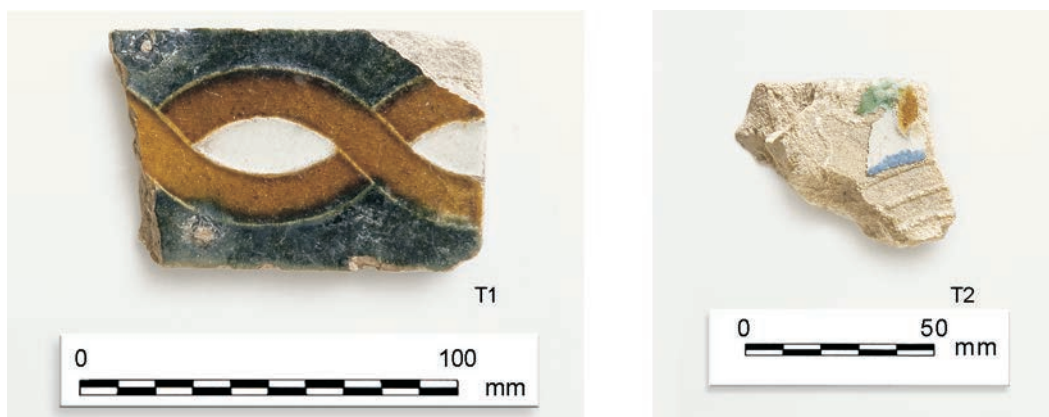
T1. Rectangular border tile, buff fabric, decorated with white, honey brown and very dark green glazes. Similar to examples from the Pisano workshop excavated in Seville.<sup>154</sup>

T2. Small fragment with remains of white, blue, honey brown and green glazes. *Arista* or *cuenca* tiles were made by impressing a design with a carved wooden mould or stamp onto the soft tile surface. They were produced from the sixteenth century in several areas of Spain, especially in Seville, Toledo and Muel (Zaragoza), but only those made in the Seville area seem to have been exported in great numbers.

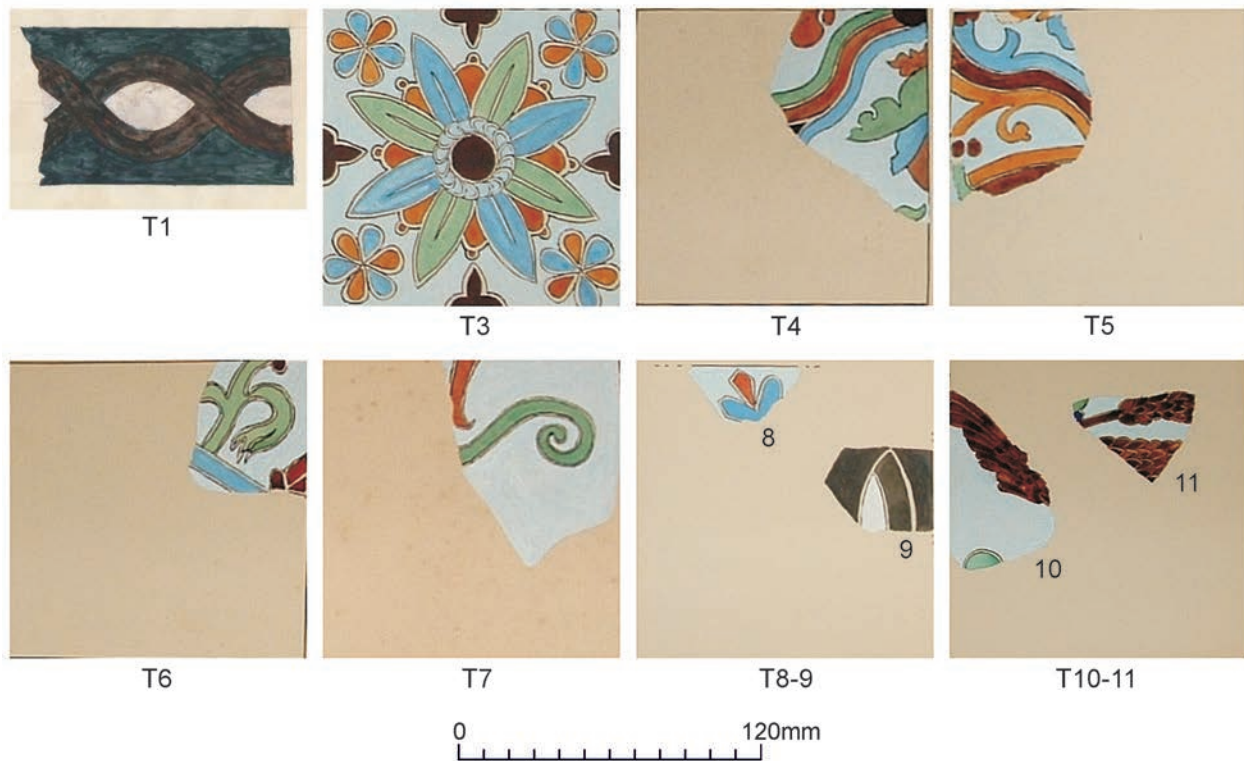
Apart from these two excavated tiles, the abbey archive also contains a set of original pen-and-ink drawings made by Wedlake that depict ten tile sherds, including T1 (or a close match) but not T2 (fig 8.26). A note accompanying the drawings specifies that ten sherds were found ‘during the years 1936–9 excavations on the



**Fig 8.24** Portuguese micaceous redwares (220) (scale 1:4); (221) with possible incomplete graffito (scale 1:2) (drawing: O Kent)



**Fig 8.25** Seville *arista* tiles T1 and T2 (scale 1:2) (photo: G Young)



**Fig 8.26** Ink drawings by Wedlake showing *arista* tile sherds from the abbot's lodging and hall (© Glastonbury Abbey)

site of the abbot's lodging and the abbot's hall; all of these occurred in building debris'. Only the drawing of T1 is labelled 'Glastonbury Abbey 1938. Abbot's lodging. Spanish tile'. The other nine tiles illustrated by Wedlake are all now missing.

Thus it seems that the excavations of the abbot's hall and lodging produced a small group of 11 *arista* tiles from Seville, nine of which are unlocated at present. Their drawings show a variety of motifs – in fact no two sherds belong to the same pattern – although the small size makes it hard to reconstruct them or find parallels in some cases (T7–T11). Patterns such as these were used for most of the sixteenth century and were never exclusive to particular workshops.

*Arista* tiles have been identified at some thirty sites in England, a third of these being monastic sites and churches.<sup>155</sup> The only group of any size is that in the floor of the Lord Mayor's Chapel in Bristol, where more than 700 tiles are still *in situ*.<sup>156</sup> This is an extraordinary survival, given that *arista* tiles are mostly found in low numbers, and often as single specimens. It is not understood how the tiles arrived in England and how they were acquired. In most cases it seems unlikely that they were special commissions if, with the exception of the Bristol group, there are too few to complete a full panel, let alone a whole floor or wall.

If the Glastonbury tiles come from the abbot's lodging and hall, they must surely pre-date the abbey's dissolution in 1539. A date of between c 1510 and 1539 would link the tiles to either of the last two abbots, Beere (1494–1525) and Whiting (1525–39). The numerous building projects of Abbot Beere are well documented.<sup>157</sup> If he was indeed responsible for obtaining the tiles, their use at Glastonbury would have been contemporary with the Mayor's Chapel in Bristol, which was commissioned by Sir Robert Poyntz (1467–1520) and finished after his death.<sup>158</sup> It is not known if he or his son Sir Francis, who finished the chapel, actually purchased the tiles.<sup>159</sup>

The abbot's lodging at Glastonbury stood until around 1700 but the hall seems to have fallen into decay much earlier.<sup>160</sup> Given that the abbey was used as a quarry for building materials after the Dissolution, many other tiles that once graced the site may well have been dispersed.

## Wares associated with specialist scientific and technical activities

### *Oliver Kent*

Eight vessels in the collection – two perforated jars, four distilling bases and two crucibles – can be associated with specialist scientific and technical activities. A full

description and discussion of these vessels has been published<sup>161</sup> and is available online; a summary is presented here.

Perforated vessels

The functions of perforated vessels have been discussed by Moorhouse, who has noted documentary evidence for their use in the production of white lead and in a variety

of distillation and fermentation processes,<sup>162</sup> and has suggested they may also have served as braziers, curfews or lanterns.<sup>163</sup> Two examples of such vessels are present at the abbey (fig 8.27: 222–223). The first appears to have had a pattern of regularly spaced drilled holes and may have been used in the production of white lead, the most important white pigment available to the medieval artist; the holes may have held rods from which strips of lead were suspended over vinegar.

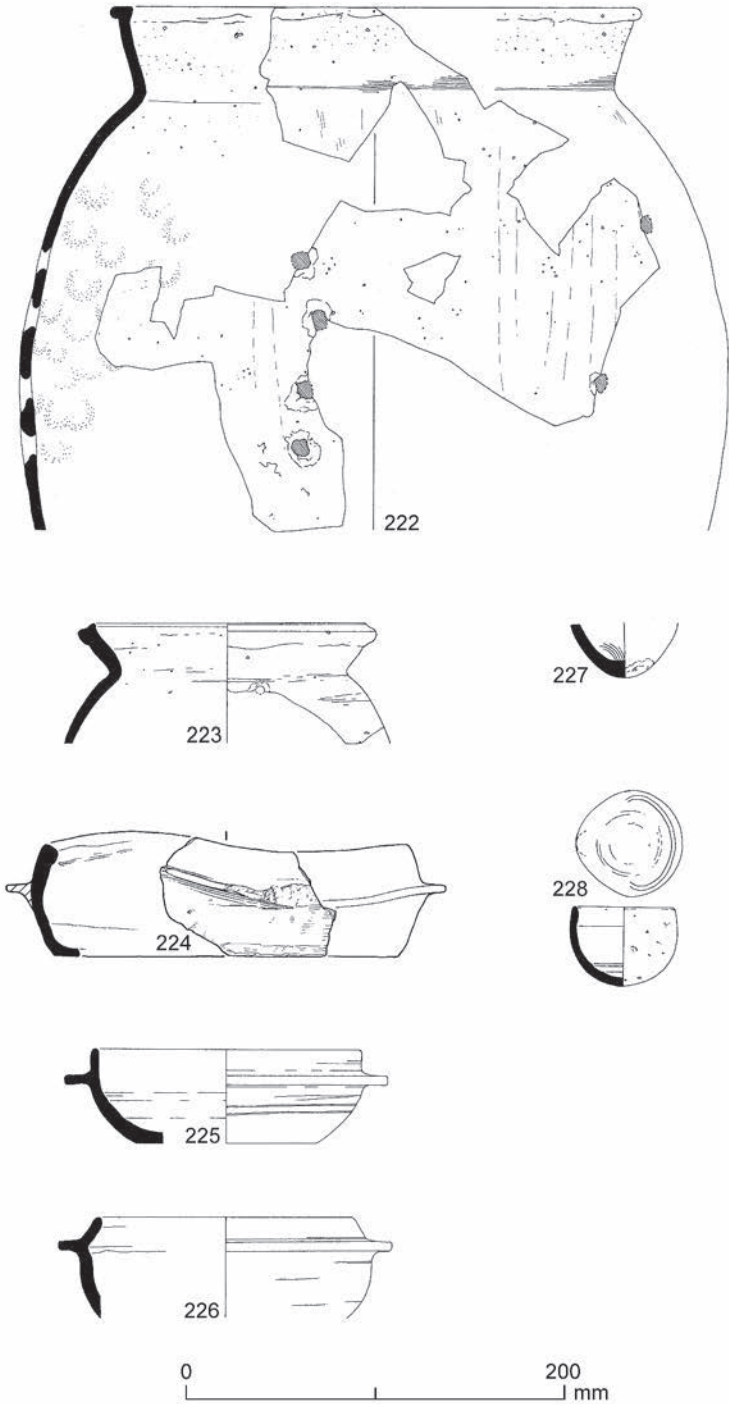


Fig 8.27 Industrial vessels (scale 1:4) (drawing: O Kent)

## Distillation bases

Four fragmentary shallow bowls display the rim with external gallery characteristic of a cucurbit – the lower member of a pair of vessels used in distillation. One hand-built vessel in a sand-tempered redware (fig 8.27: 224) is probably of thirteenth- or fourteenth-century date; the other examples (including fig 8.27: 225–226) are Somerset redwares, probably of fifteenth- or sixteenth-century date.

The parallels and possible uses of these vessels have been discussed in detail elsewhere<sup>164</sup> and are presented online. Their most likely use is as components of stills used in the production of medicines. Distillation for this purpose was certainly practised at Glastonbury. The Obedientiary Roll of 1538–9 records the income and expenditure of leading abbey officials; chief among the expenses of the infirmarer were those entailed in running the four stills of the abbey, in which cordials and liqueurs were produced for the sick.<sup>165</sup>

## Crucibles

In addition to the crucibles found in the Anglo-Saxon glass furnaces, there are sherds from two small high-fired wheel-thrown sand-tempered crucibles (fig 8.27: 227–228), comparable to those known elsewhere in tenth- to early thirteenth-century contexts.<sup>166</sup> Such vessels may have been used in small-scale working with copper alloys, enamels or even precious metals; a lack of residues precludes detailed discussion.

# 8.7 Medieval floor tiles

*Jane Harcourt, with contributions from Michael J Hughes and Roger T Taylor*

## Introduction

There are approximately 7,000 tiles in the collection at Glastonbury Abbey, representing a very small fraction of the original total (perhaps less than 3 per cent of the floor area of the church). The small size of the collection results from the discard policy of early excavations and the likely removal of tiles as salvaged materials following the Dissolution. The early excavators evidently did not retain plain tiles, and often only one example survives of some inlaid designs. This suggests that smaller and unidentifiable fragments were also discarded. No tiles were recorded *in situ* in excavation reports, although tile bedding matrices are indicated, for example in the abbot's

hall, which confirms that tiles were not confined to the church and areas of ecclesiastical importance.

The surviving collection dates from the mid-thirteenth century onwards, although Wedlake reported tiles of late eleventh-century date in the nave of the early church; these formed a central tiled strip about 2m wide, flanked by stone paving. These tiles (now lost) were of red clay with white inlay inset in a semi-circular pattern.<sup>167</sup> This report has identified 142 designs described below. Classification into groups was assisted by chemical analysis of the fabric as well as through similarity of features, dimensions and manufacturing detail. Chemical analysis was undertaken by Michael Hughes using inductively coupled plasma spectrometry, and fabric analysis was undertaken by Roger Taylor. The full reports are available online. These analyses have identified the sources of raw materials for two kiln sites in the Glastonbury area and a third to the south west, in the area of Nether Stowey, which was active in the late fifteenth to early sixteenth centuries.

## Tile classification

### Group 1

Designs 1–19 (fig 8.28: 1–13; fig 8.29: 14–19)

The earliest surviving group of tiles was made at a site in Glastonbury that is likely to have been quite close to the abbey precinct. The fabric of these tiles is thick, with many creamy limestone inclusions. The inlay is also thick, up to 3mm, and in some instances has been mixed with body clay to give a creamy-pink colour. A dump of tiles of this fabric was found in nearby Silver Street during excavations in 1982, the presence of wasters indicating that the kiln must have been located in the vicinity.<sup>168</sup>

Group 1 is divided into three categories determined by size. Group 1a consists of large rectangular step tiles with either a rebate or a bevel, showing that both methods of effecting the junction between tread and riser were in use. These tiles are generally over 30mm thick and have multiple keying scoops on the reverse. The mounted rider tile (fig 8.28: 1) is a very rare example where the enhanced detail of mail, horse's hooves and emphasis of bridle, stirrup and rider's foot has been incised after the inlay had been inserted but before the glaze was applied. The only other examples displaying this time-consuming emphasis on detail are step tiles from Clarendon Palace, where the Glastonbury tiler may have worked previously.

Group 1b contains designs associated with borders. The small square inlaid tile (fig 8.28: 5) may have been used either at intersections of border tiles or randomly as

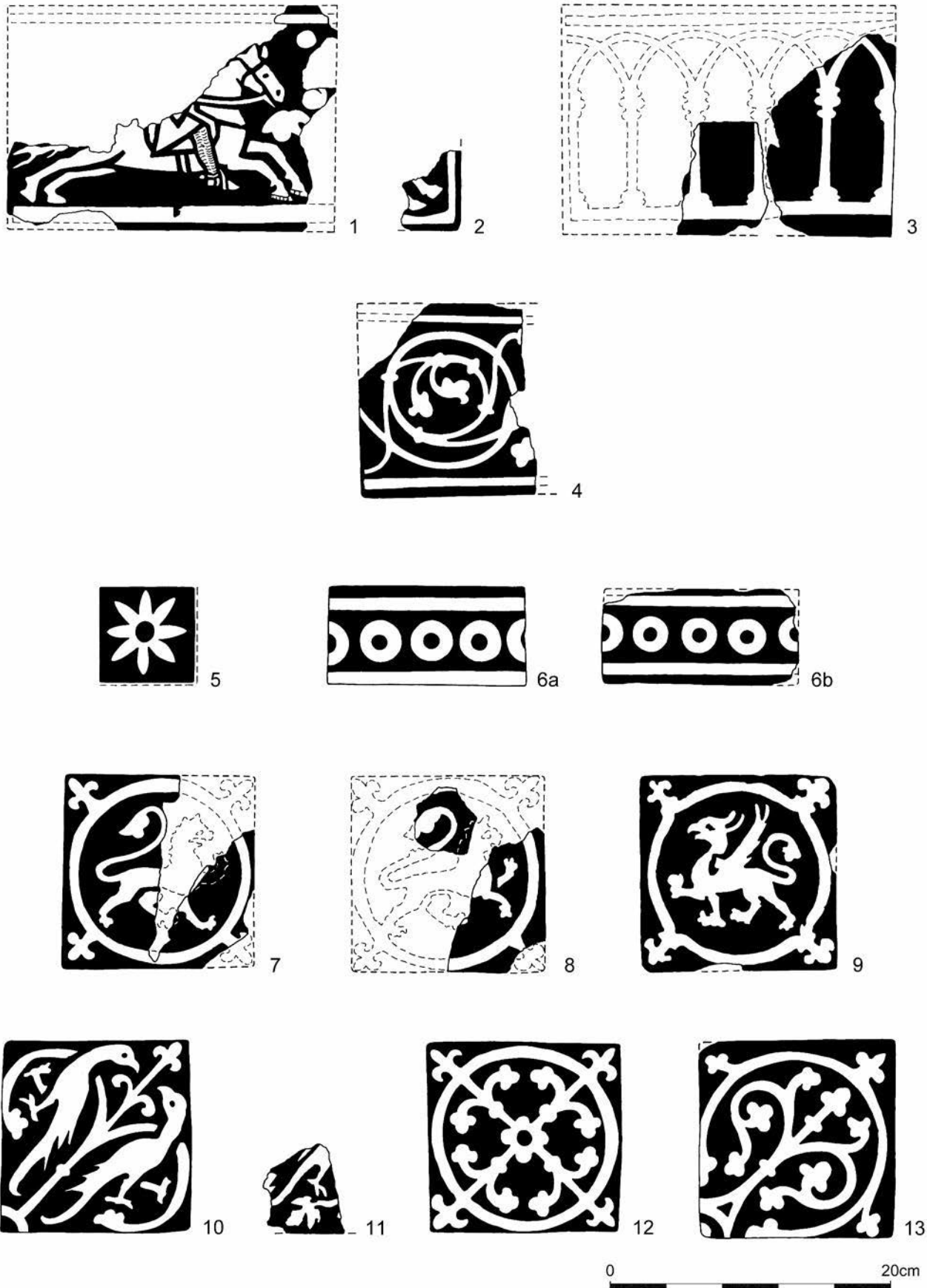


Fig 8.28 Group 1 floor tiles, designs 1–13 (scale 1:4) (drawings unattributed)

part of a border with plain square tiles. Both layouts appear at Wells: in the Lady Chapel square tiles inlaid with six foils are found at the intersections with border tiles that are inlaid with rings within parallel lines.

The regular square tiles of group 1c, although still thick at 28–31mm, are unkeyed. These also feature designs originating from Clarendon Palace kiln 1, which had been active twenty years earlier in the 1230s. A date of c 1250 for group 1 is likely.

The exact location of this early Glastonbury kiln site and the reasons for its demise are unknown. The noxious fumes of glaze production might have led to the banishment of new kilns well beyond the abbey environment. None of the stamps are reused in later groups, which suggests a slight hiatus in production after group 1 and the possibility that the subsequent kiln was a completely new enterprise rather than one that was simply relocated. The juxtaposition of group 1 tiles with fragments from group 4 in the Silver Street excavations relates to their use as foundation material for a thirteenth- or fourteenth-century building.

## Group 2

Designs 20–25 (fig 8.29)

These few fragments are from a circular pavement design similar to that which can be seen in two forms in the parish church at Muchelney, taken there from the abbey in the late nineteenth century. A visual comparison with a fragment from Muchelney Abbey shows that the fabric at Muchelney is less well prepared and the fragment is thinner, implying a different production to those at Glastonbury. A different stamp has also been used for the dragon framing tile; however, as the stamp must have been susceptible to breakage because of its shape, the use of a different stamp may not necessarily indicate a different kiln site.

Group 2 has characteristics in common with groups 3 and 4, such as similar preparation and keying. However, ICPS analysis indicates that this fabric is quite distinct, suggesting a separate source of clay, although still in the Glastonbury area. Fragments were also found at Beckery Chapel, which was extensively restored by John of Taunton who became abbot in 1274. This association suggests a date of c 1275.

## Group 3

Designs 26–32 (fig 8.30)

These are large heraldic tiles surviving only in very fragmentary form. The three forms in group 3a were also

found at Cleeve Abbey, Bridgwater Friary, Gloucester Cathedral and Wells Cathedral.<sup>169</sup> These are high-quality tiles commissioned to celebrate the marriage of Edmund of Cornwall to Margaret de Clare in 1272 using well-executed stamps and well-prepared fabric and glazes.

Tiles in group 3b are probably copies of these designs; figure 8.30: 29 has reversed heraldry and figure 8.30: 30 is a happy-looking lion, probably intended for the arms of England, also reversed.

Tiles in group 3c are well made and apparently from the same kiln site. Smaller than the England, Clare and Cornwall types but larger than regular-sized tiles, these must have had a limited production as they would not easily be accommodated in a design with regular-sized tiles.

The refectory at Cleeve Abbey probably gives a good indication for the layout of the larger tiles.<sup>170</sup> Here, approximately one-quarter of the pavement comprised larger tiles laid in a significant position at the dais end, with regular-sized tiles leading up to it.

## Group 4

Designs 33–71 (figs 8.31, 8.32 and 8.33)

This group has the same characteristics as the large heraldic group; the fabric is fine and well prepared, burnished scoops are deeply cut with a sharp pointed knife and ICPS analysis confirms that they are from the same kiln site. The heraldry of the large tiles in group 3 is repeated and combined with others having royal connections, such as the *checky* shield of de Warenne (fig 8.31: 36). This shield also appears on the refectory pavement at Cleeve Abbey and the same stamp is used. The quality of the stamps is variable, from the inexpert (fig 8.31: 34) to the exceptional (fig 8.31: 39). This suggests that some of the heraldic stamps were commissioned, perhaps at a slightly later time, but were certainly not produced by the same craftsmen who executed the principal designs.

The non-heraldic stamps feature designs deriving from Clarendon Palace and the slightly later Nash Hill kilns, but not always as direct imitation. Most are individual designs, but some were intended to be laid as four-tile sets of the same design, notably the intricate window (fig 8.32: 58) and canopy (fig 8.32: 57). The same fabric and designs appear at Cleeve Abbey, some from the same stamp (fig 8.31: 36), while others have the same design but a different stamp (fig 8.32: 57). This, combined with the known distribution of tiles with these designs and this fabric, implies a large and well-organised industry, although it probably only existed for a relatively

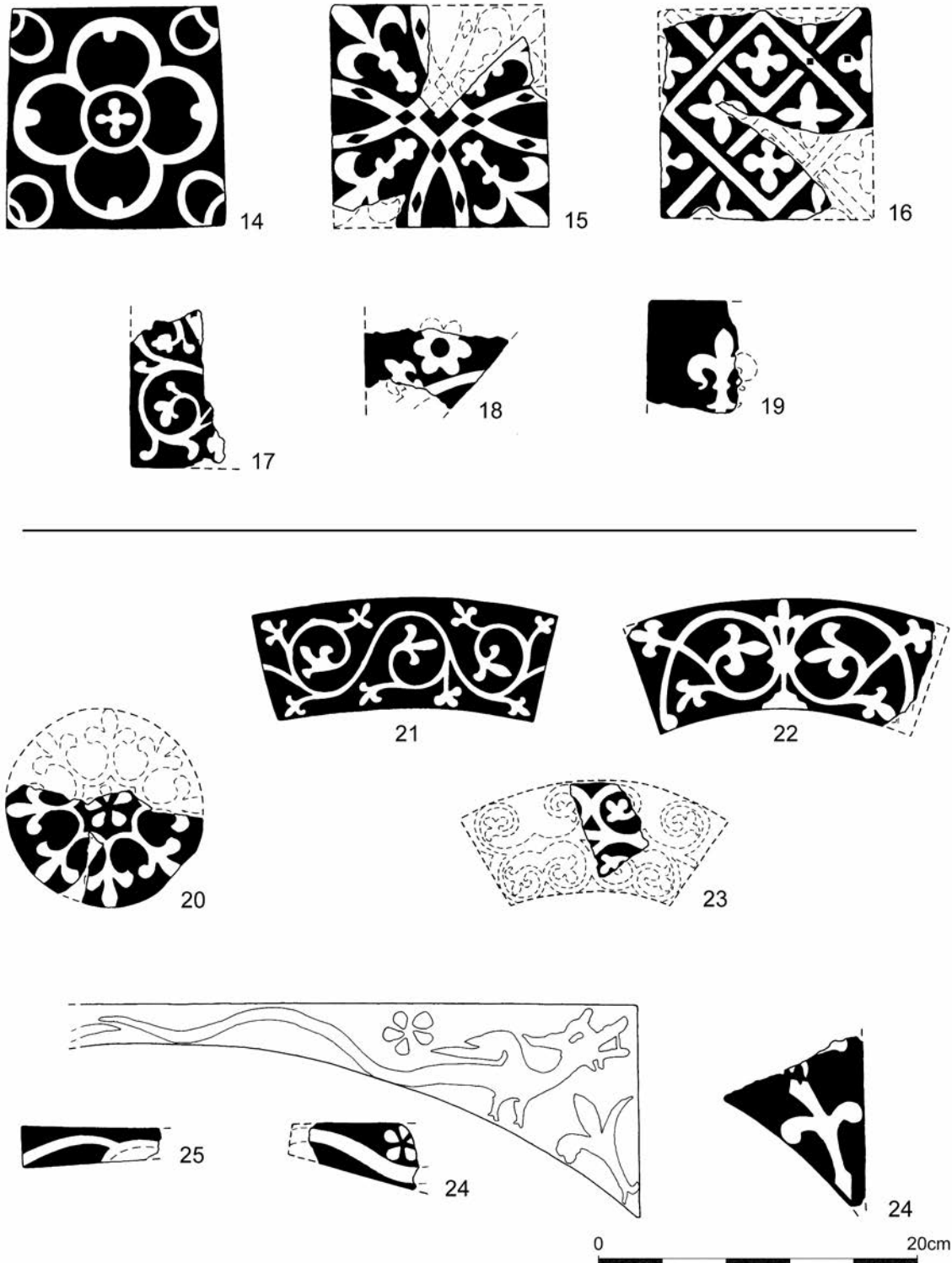


Fig 8.29 Group 2 floor tiles, designs 14–25 (scale 1:4) (drawings unattributed)

short period. Tiles of this type are found at Cleeve Abbey, Bridgwater Friary, Gloucester Cathedral, Gloucester Blackfriars, Wells Cathedral and across the Severn at Tintern Abbey, Raglan Castle and Chepstow Castle.<sup>171</sup>

The wide distribution has in the past led to the suggestion that the kiln site was located in Gloucestershire, using the Severn as the chief transport

system, but ICPS analysis by Michael Hughes has clearly demonstrated a source close to Glastonbury, which would have had relatively accessible routes to these other sites. The dating of this group is more problematic. The tiles were obviously made to commemorate the 1272 marriage, which was a highly significant alliance, but the revival of Glastonbury Abbey and its corresponding demand for

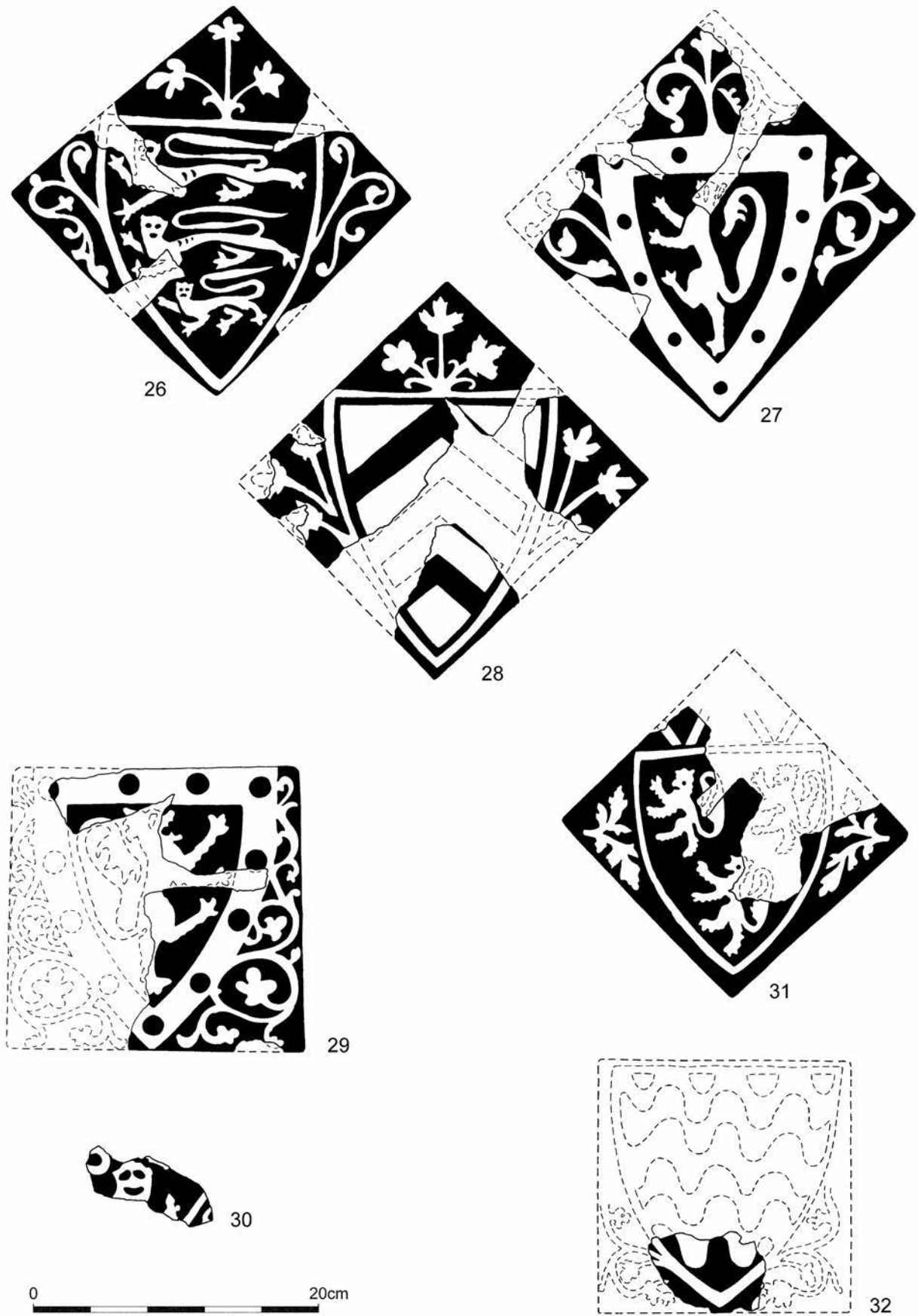


Fig 8.30 Group 3 floor tiles, designs 26–32 (scale 1:4) (drawings unattributed)



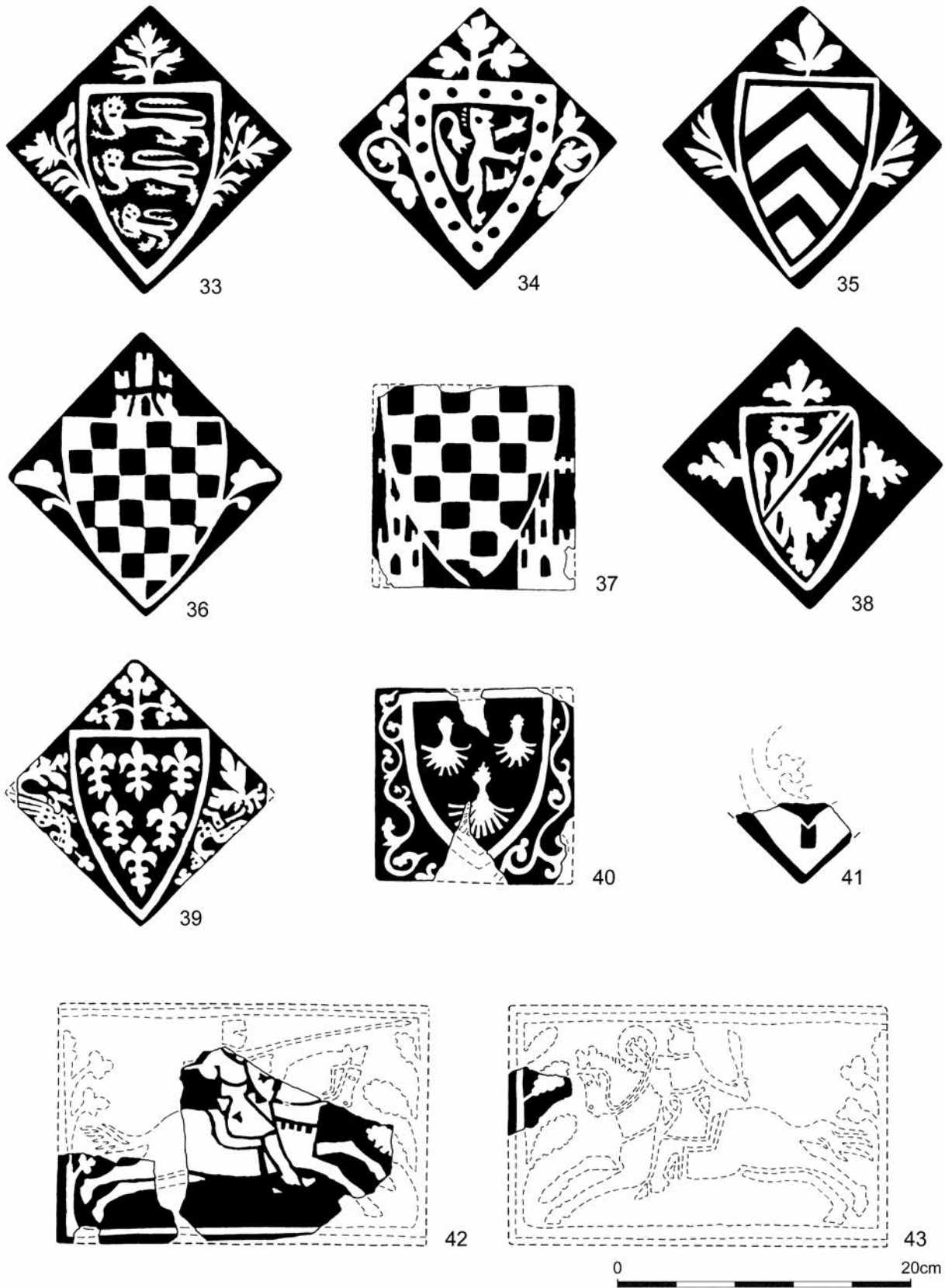


Fig 8.31 Group 4 floor tiles, designs 33–43 (scale 1:4) (drawings unattributed)

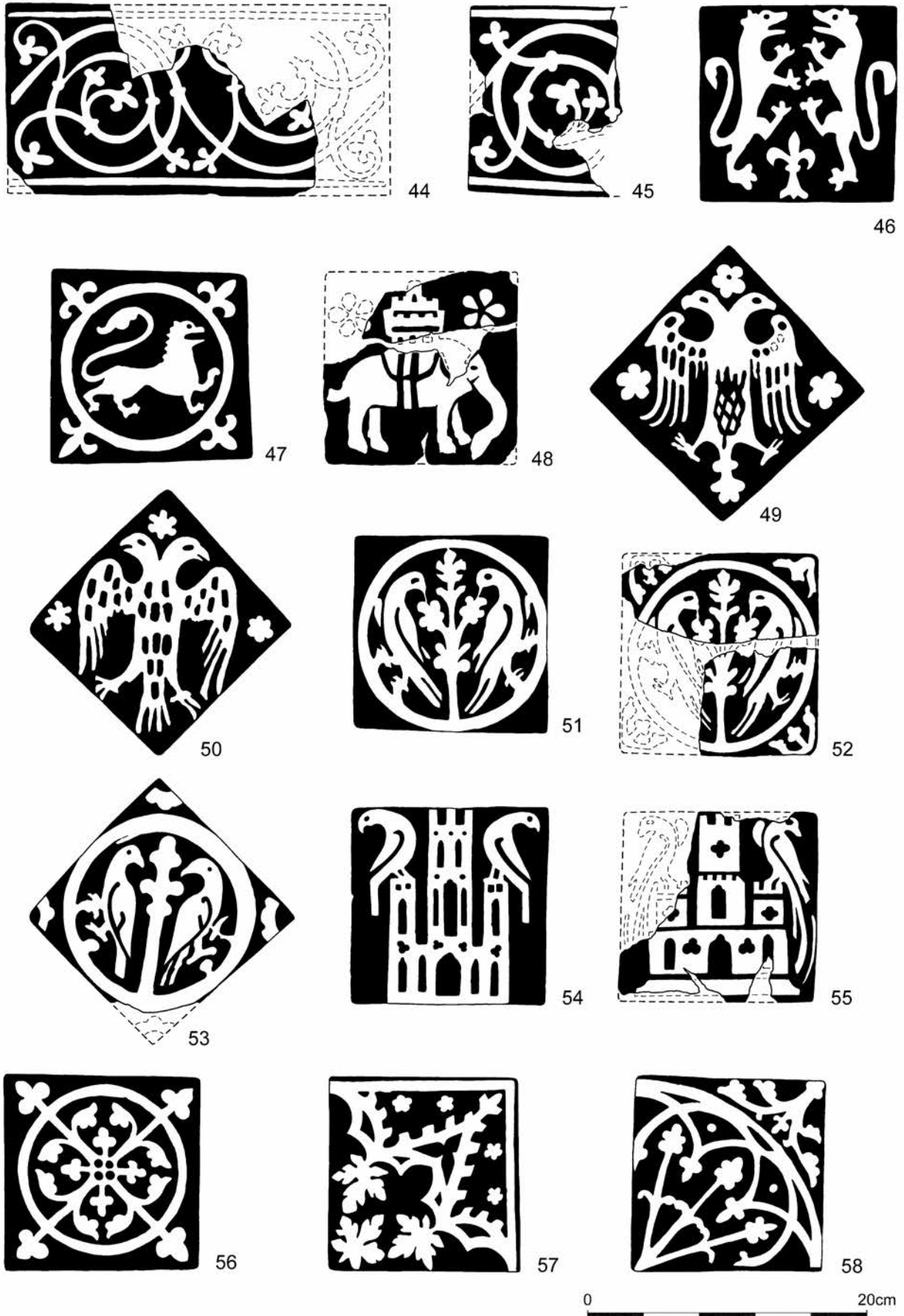


Fig 8.32 Group 4 floor tiles, designs 44–58 (scale 1:4) (drawings unattributed)

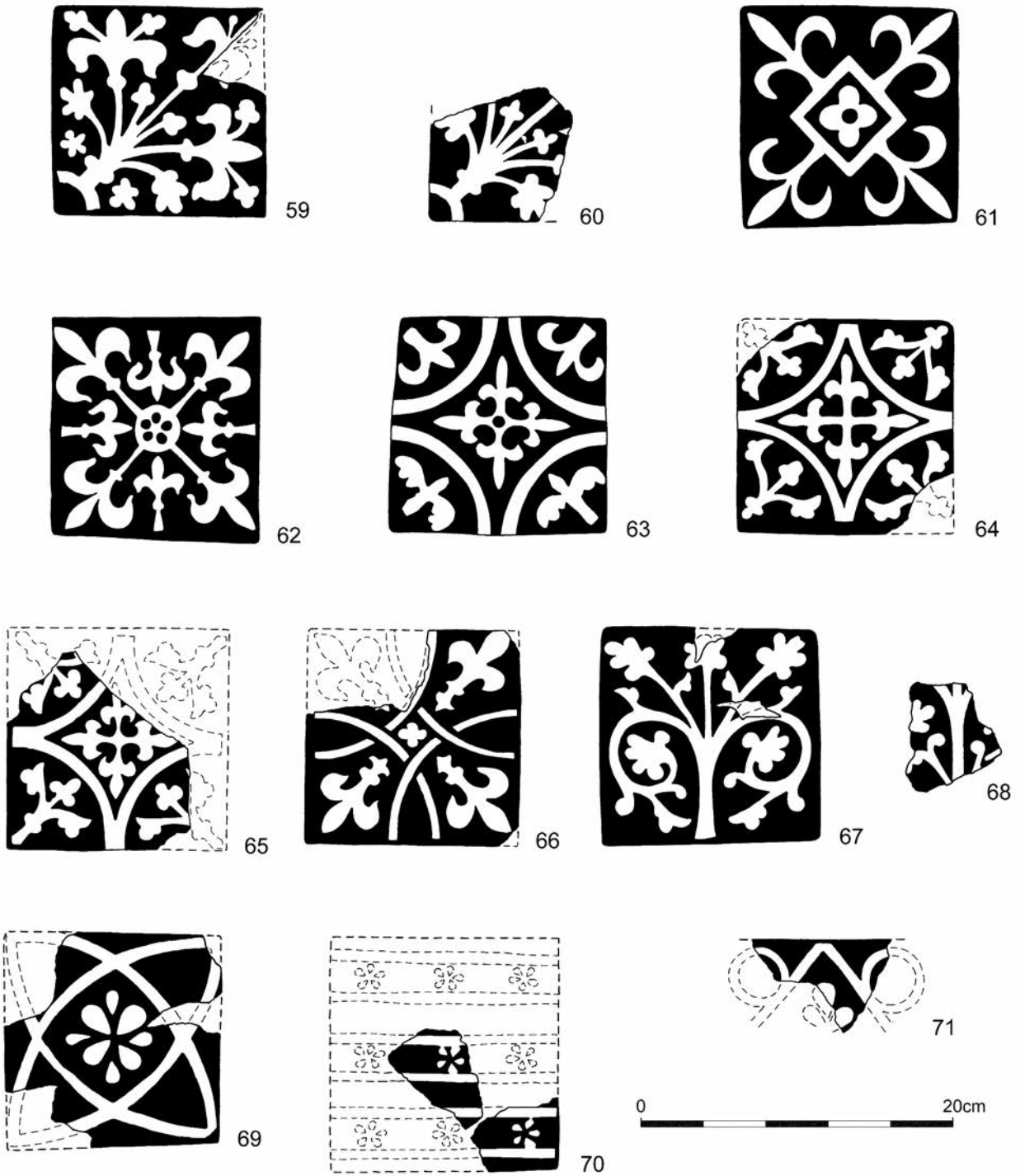


Fig 8.33 Group 4 floor tiles, designs 59–71 (scale 1:4) (drawings unattributed)

tiles did not begin until two years later, in 1274 when John of Taunton became abbot.

### Group 5

Designs 72–75 (fig 8.34)

This group also derives from the kiln site that produced groups 3 and 4. Its products have well-prepared fabric with deep scoop keys, some of which are burnished. The size of the tiles suggests that these were used as step tiles, although they are not as thick as those in group 1. The sharpness of the stamps and the intricacy of the designs indicate that they were produced by highly skilled craftsmen, and these tiles appear to be unique to Glastonbury, produced *c* 1275.

### Group 6

Designs 76–77 (fig 8.34)

Chemical analysis indicates a similar, well-prepared fabric to groups 3–5, but there are differences in manufacture. The tiles have a steep bevel and are only 17mm thick. The only other site with these designs is Witham Friary. This may suggest a period of contraction in the industry. No specific date is indicated.

### Group 7

Designs 78–125 (figs 8.34, 8.35, 8.36 and 8.37)

This is a large group with a diverse repertoire of designs but ICPS analysis reveals a common production site in the Glastonbury area. To economise on white clay, and possibly to increase the rate of production, the tiles of this group have slip rather than inlay to create a contrast with the body clay. There are variations within the group: group 7a contains heraldic, geometric and stylised foliage designs. Some tiles are well made while others are less so, but both levels of expertise use the same stamp and identical keying techniques. The number and shape of keying scoops varies even within the same design. The inference is one of varying expertise among the tile makers, which is also reflected in the quality of the stamps. One particularly poor example appears to be an attempt at the arms of Edward III or the Black Prince (fig 8.34: 78), and is therefore dated *c* 1340 onwards. The Trivet tile (fig 8.36: 95) may refer to Sir Thomas Trevet, one time steward to the abbot of Glastonbury and Justice Itinerant, who died in 1281. There are also representations of Cornwall and de Clare, so it would not seem improbable that production followed directly on from the fine fabric groups and continued for nearly a

century. This is not unlikely for an established industry where the market could sustain demand. For example, the Nash Hill site, in Wiltshire, is thought to have been producing tiles until the late fourteenth century, which would give a working span of about 150 years. The large number of heraldic designs suggests a continuing market rather than a specific period of manufacture.

Group 7b has a naturalistic theme: the undulating stem with varying trefoils and its mirror image and stylised foliage on a border tile that is also found at Muchelney Abbey. These may belong to the later part of the period covered, or even a little later. The lack of comparable material from other sites and datable contexts may make this an artificial sub-division.

The disappearance of this kiln site could be due to economic and political circumstances. The market for groups 3 and 4 was extensive, although only for a relatively short period around the last quarter of the thirteenth century. Groups 3 to 5 were all made once John of Taunton became abbot with Edward I as his patron. These tiles may all have been laid in the church, possibly as part of a concerted effort in advance of the visit of Edward I and his queen for the translation of King Arthur's bones in 1278. Tiles of these groups were also laid at strategic pilgrim sites around Glastonbury. Groups 6 and 7 appear to have had a more limited market in geographical terms, despite the longevity of their production.

Glastonbury was on a secure financial footing from John of Taunton's time onwards, and most of the abbots who followed him undertook some building works within the church or precinct. It is therefore difficult to attribute later tiles to any particular abbacy. The last major builder of the medieval period was Walter of Monington, 1342–75, whose works were completed by John of Chinnock. There may have been a small-scale continuation in production, perhaps in the stylised foliage designs, but the later groups suggest that all trace of the tile industry had disappeared by the time new tiles were next required and had to be sourced from further away.

### Group 8

Design 126 (fig 8.38)

This fragment has been placed in a group of its own since it does not clearly fit in any of the other groups. It is narrower than other border types and it has no keying. The slip as background design would normally make it susceptible to speedy erosion, although this tile is clearly legible unlike other inscription tiles in the collection. The uneven sides show wood grain which suggests a 'butter pat' style of manufacture.

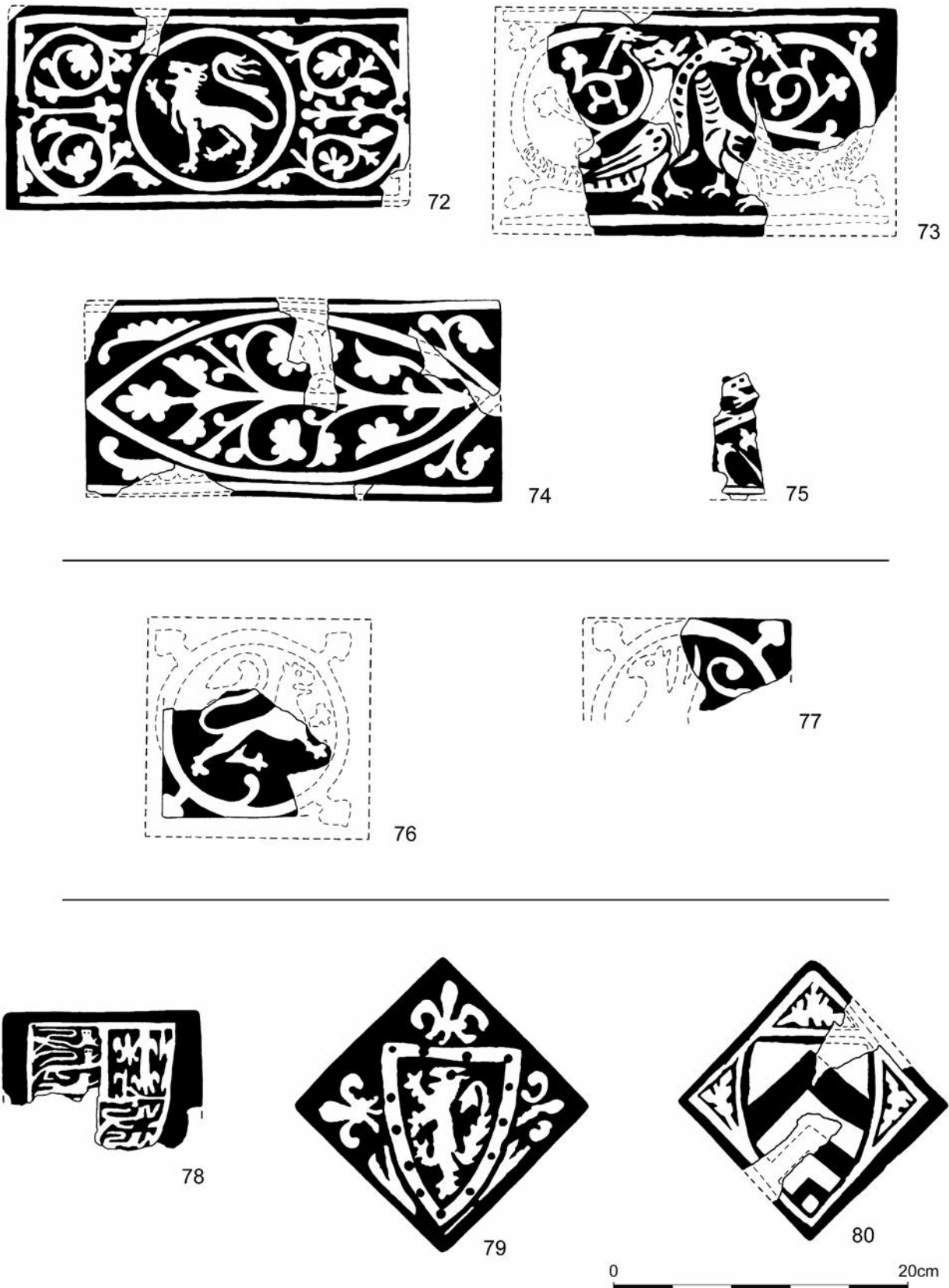


Fig 8.34 Group 5 floor tiles, designs 72–75; Group 6 floor tiles, designs 76–77; Group 7 floor tiles, designs 78–80 (scale 1:4) (drawings unattributed)

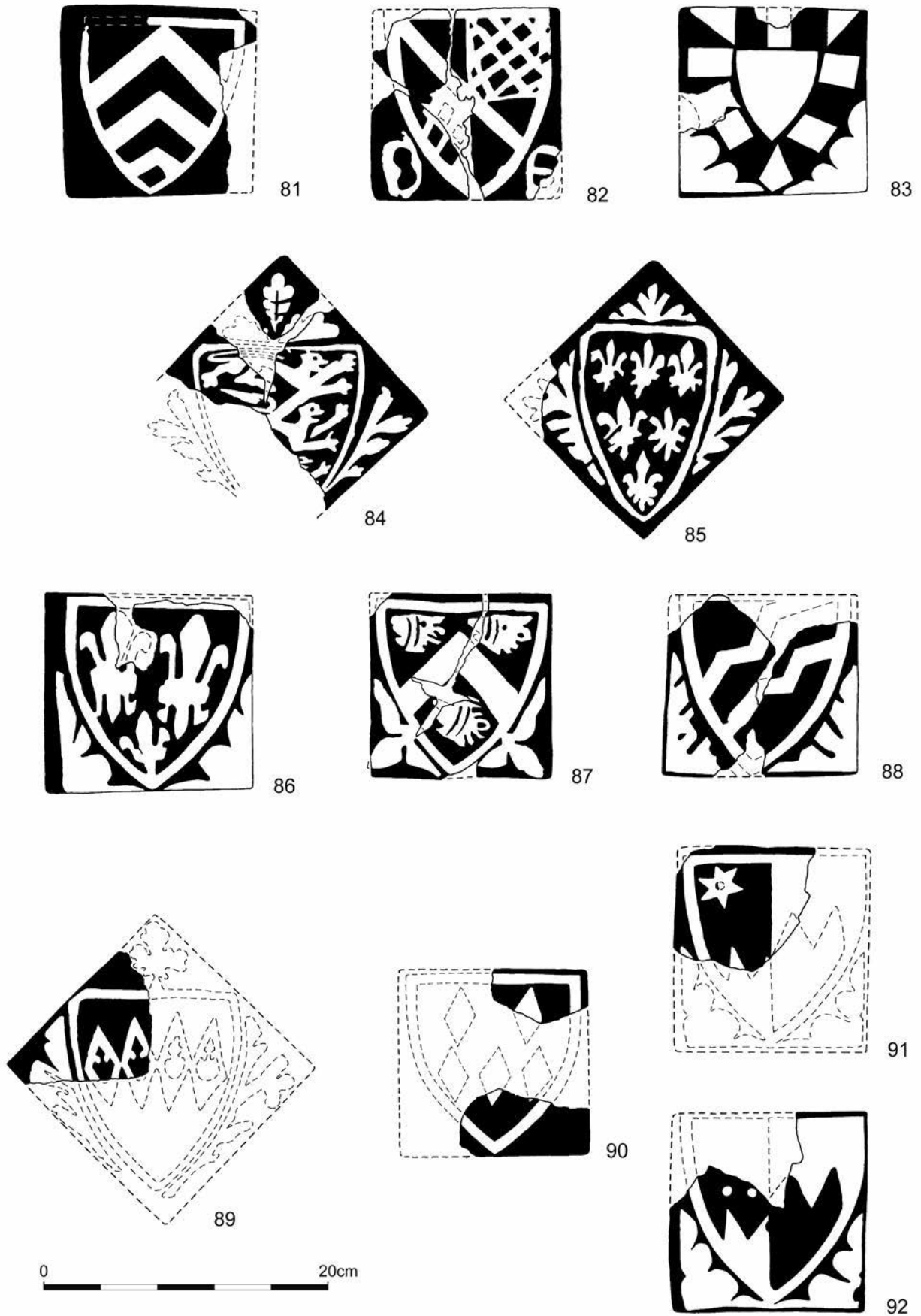


Fig 8.35 Group 7 floor tiles, designs 81–92 (scale 1:4) (drawings unattributed)

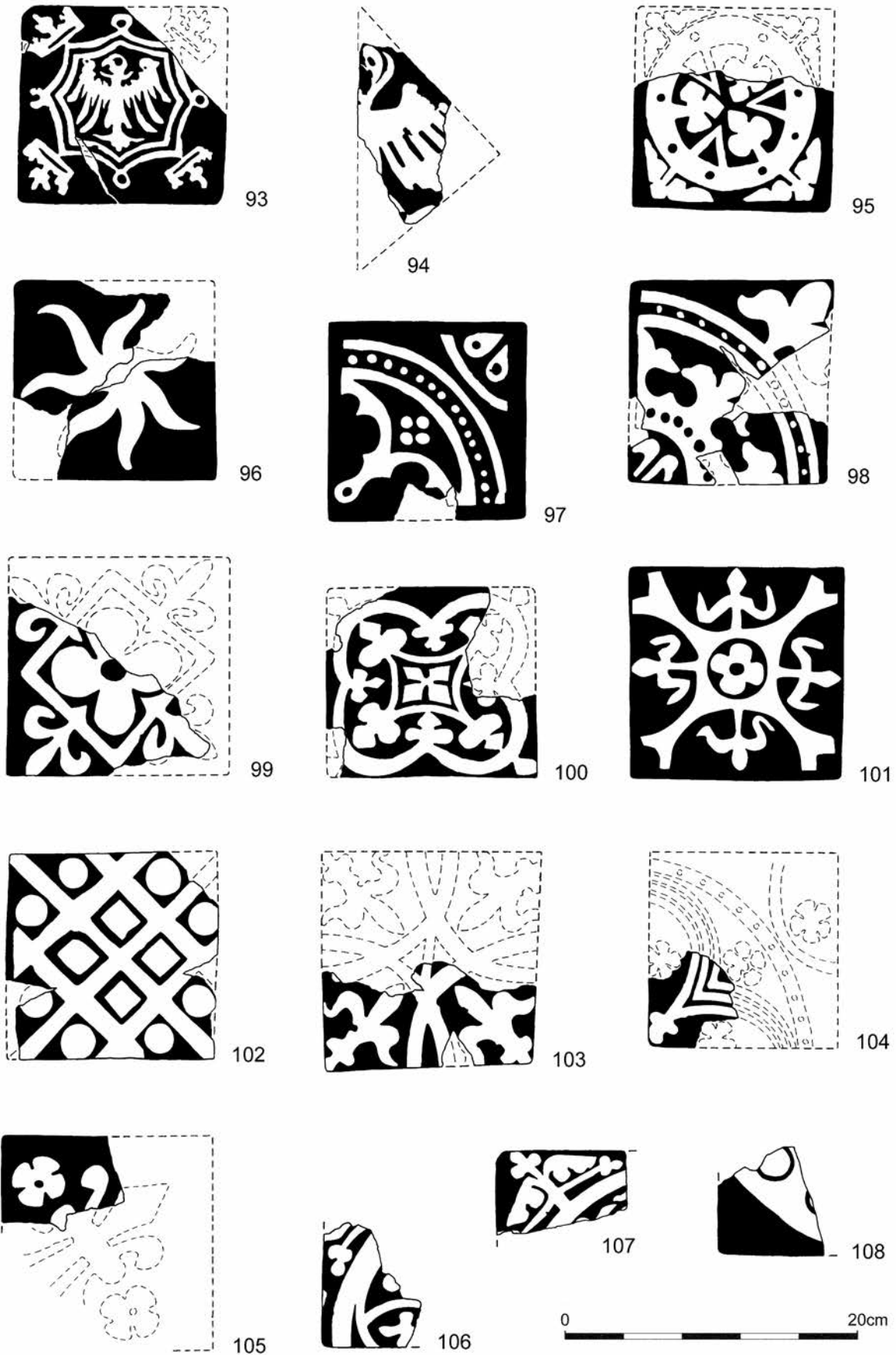


Fig 8.36 Group 7 floor tiles, designs 93–108 (scale 1:4) (drawings unattributed)

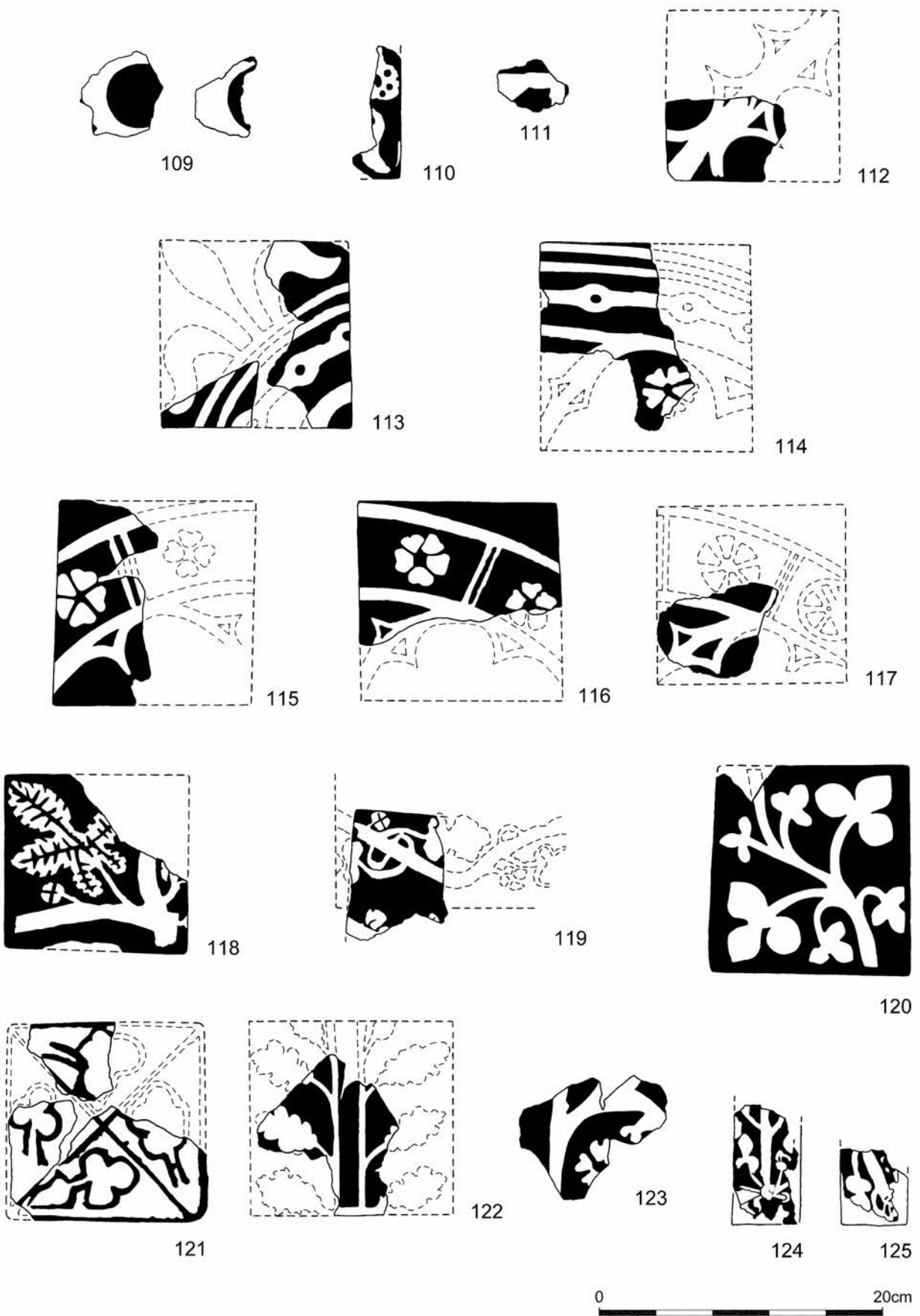
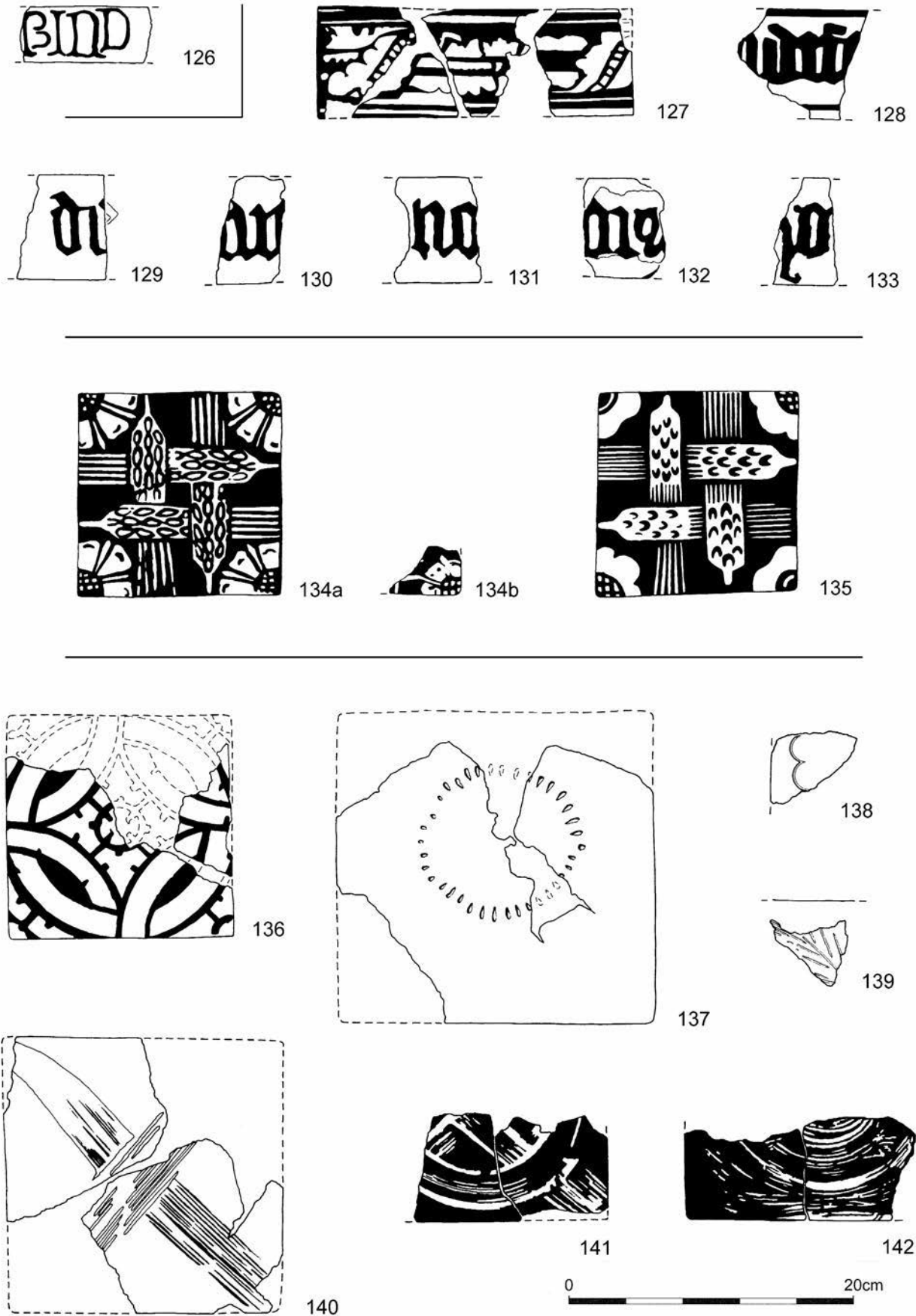


Fig 8.37 Group 7 floor tiles, designs 109–125 (scale 1:4) (drawings unattributed)





**Fig 8.38** Group 8 floor tile, design 126; Group 9 floor tiles, designs 127–133; Group 10 floor tiles, designs 134–135; Group 11 floor tiles, designs 136–142 (scale 1:4) (drawings unattributed)

## Group 9

Designs 127–133 (fig 8.38)

The designs of this group are indistinct as slip has been used as background, with the result that the stamped area is shallow and has quickly eroded. The shape indicates that they were used as border tiles, presumably in association with plain tiles. Some of the foliate scroll tiles have a mitred end showing that they were used in the border as corner tiles.

These are very similar to tiles found at Cleeve Abbey and derive from the same region. However, chemical analysis does not support an identical source of clay, and a kiln site east of the Quantocks is likely, while the Cleeve tiles were made to the west. That these tile designs have been found only at Cleeve and Glastonbury suggests a small and short-lived production. The move away from Glastonbury suggests that the kiln site there had completely disappeared; a date from the fifteenth century is probable.

## Group 10

Designs 134–135 (fig 8.38)

Chemical analysis shows that the fabric of group 10 is very similar to that of group 9, indicating a common origin. There are two designs, both representing stalks of wheat, and there are two stamps for each design. These designs have not been found at any other location, which suggests a specific commission for Glastonbury and quite a large one. The corner motifs suggest a date in the late fifteenth or early sixteenth century, and the designs may be an intended rebus for Richard Beere (1493–1524) since beer was made from a combination of grains. His emblem on stonework is a cross between two beer flagons, as can be seen at St Benedict's Church in Glastonbury. According to Leland, who recorded a visit in 1533, Beere had built the majority of the Edgar Chapel and the Loretto Chapel, had excavated under the Lady Chapel for the chapel of St Joseph, and had carried out remedial work, such as building supports for the central tower. Several secular building projects were undertaken including almshouses, lodgings for priests and lodgings for Henry VII, who visited in 1497.<sup>172</sup> The chapel of the almshouse and the royal chamber may well have had tiled floors.

## Group 11

Designs 136–142 (fig 8.38)

These tiles, small in number, are decorated without the use of stamps. Their decoration takes the form either of

slip, apparently applied with a brush, or freehand incision. Without the restriction of stamps, sizes are variable both in depth and area, which can be up to 224mm square. The keying is unusual, with both deep conical scoops and multiple oblique stabs made with a rod with a diamond-shaped cross section, presumably some sort of punch. Similar tiles have been found at Muchelney Abbey and Huish Champflower Church and analysis has confirmed that they are from the Donyatt site, although not all from the same kiln. These tiles may originally have been more plentiful but they lack the appeal of inlaid tiles and were less wear-resistant so may have not been retained in any numbers.

## Plain tiles

There are also plain tiles in the collection that seem to span all the kiln sites discussed above. The numbers are few but this is probably not an accurate reflection of the original layouts. Plain tiles were less likely to be retained as they lack the aesthetic appeal of the patterned tiles and were also reused as hardcore in later building works. The abbot's hall, for example, completed in the latter half of the fourteenth century, was paved with plain tiles from the kiln site associated with groups 3–7.

## Conclusion

The earliest surviving tiles date from the mid-thirteenth century, although Wedlake reports having seen earlier tiles dating from the late eleventh century. The vast majority of the tiles in the collection were made in Glastonbury: the early kiln site was probably very close to the abbey, as wasters were dumped as foundation material near the new precinct wall in the thirteenth or fourteenth century. At least one tile from this early kiln near the abbey shows a direct link to Clarendon Palace in terms of the design and the treatment of the fabric, showing exceptional attention to detail. The kiln appears to have been short-lived, and neither the stamps nor the manufacturing characteristics reappear at the later thirteenth-century kiln site further away from the abbey. This later kiln not only produced tiles for Glastonbury Abbey, but also Wells Cathedral, Bridgwater Friary, Cleeve Abbey, Gloucester Cathedral and several sites in Wales. ICPS analysis has established that these high-quality products came from the Glastonbury area and not from an unidentified Gloucestershire kiln as had previously been thought. This period of intense production commenced in 1272, when the large heraldic

tiles commemorating the Cornwall / de Clare alliance were commissioned. Another factor was probably a concerted effort to pave as much of the abbey as possible prior to Edward I's visit in 1278. Production continued at this site for at least a century.

A resurgence of building in the late fifteenth to early sixteenth centuries led to a demand for tiles, but this could no longer be met by a Glastonbury-based kiln. Instead, these tiles were sourced from Donyatt and later from east of the Quantocks, in the Nether Stowey area.

## 8.8 Small finds

†Paul Courtney, †Geoff Egan and Roberta Gilchrist, with a contribution from John Cherry

### Introduction

The eclectic assemblage of artefacts from Glastonbury Abbey was recovered from excavations conducted between 1908 and 1979. Some 372 items were catalogued, ranging in potential date from the Late Saxon period to the twentieth century. Basic stratigraphic evidence is available for approximately one quarter of the finds from Radford's excavations, but this includes fifty-five items listed as nails or groups of nails. Study of other categories of material from Glastonbury Abbey has confirmed that the collection is incomplete and biased towards decorative and high-status objects. The small-finds assemblage is likely to have been shaped by similar processes of selection: religious and military items make up an unusually high proportion and iron objects such as tools are under-represented. In addition, several excavated objects have been lost, stolen or have disintegrated without conservation. Some of the more significant items noted in interim publications never reached the museum stores (eg an iron crozier and lead chalice excavated in 1957). Wooden, leather and textile items are absent, reflecting both the nature of archaeological deposits and the antiquarian character of the excavations. Important wooden objects were observed in 1825 but were not retained: eighteen oak coffins recovered from the crypt of the Lady Chapel contained skeletons with their skulls resting on wood shavings (probably from pillows), and each was accompanied by a rod of hazel or thorn placed on their right-hand sides.<sup>173</sup>

Preliminary analysis of the finds assemblage was undertaken by Geoff Egan and the identification was

completed by Paul Courtney, with additional context provided by Roberta Gilchrist; seals and bullae are discussed by John Cherry. The published catalogue comprises eighty-five objects, twenty-four of which were X-rayed. The discussion here focuses on the medieval and sixteenth-century objects; the dearth of pre-Conquest material is noteworthy. Of key significance is how the assemblage enhances our understanding of Glastonbury Abbey as one of medieval England's premier monasteries and major pilgrimage shrines. Of additional special interest is the brief period, from 1551 to 1553, when the former precinct housed a community of 230 Walloon worsted weavers, French-speaking Protestant refugees from Flanders.<sup>174</sup>

### Catalogue

The B/I/L/M numbers used in the catalogue below (B=Base metal ie copper alloy; I= Iron; L= lead / pewter and M= Miscellaneous) relate to a pre-existing numbering scheme for the museum objects. The finds are organised by function rather than by material and grouped by themes selected for their particular relevance to the study of monastic material culture.<sup>175</sup>

#### Devotional objects (see also dress accessory 56, B47) (figs 8.39 and 8.40)

**1** B99 (1908, church crossing; see Bond 1908): 29.5mm diameter by 6.4mm thick. Terracotta medallion: circular with flanged edge, unglazed and red to grey in colour. Hand with sacred wound and a damaged foliate cross on reverse. Together IHV and MCY read as 'Jesu Mercy'. The bent fingers are probably to indicate a right hand which is linked iconographically to the 'well of mercy'.<sup>176</sup> Probably fourteenth to fifteenth century, although the Lombardic letter forms have their best parallels in the early to mid-fourteenth century.<sup>177</sup> File marks indicate that a metal stamp was used to impress this object and hint at mass production.

**2** Lost Object (1932, ?dormitory). This find is known only from a drawing. Lead amulet with the seal of Solomon (Star of David) enclosing a small six-pointed star.<sup>178</sup> The reverse has four trefoils with the space between forming a cross (possibly an allusion to the Trinity). The seal of Solomon served as a protective or curative amulet.<sup>179</sup>

**3** B111: 94 × 36mm with an attachment hole inside the top left shield; B112: 68 × 14mm. Two elaborate decorative

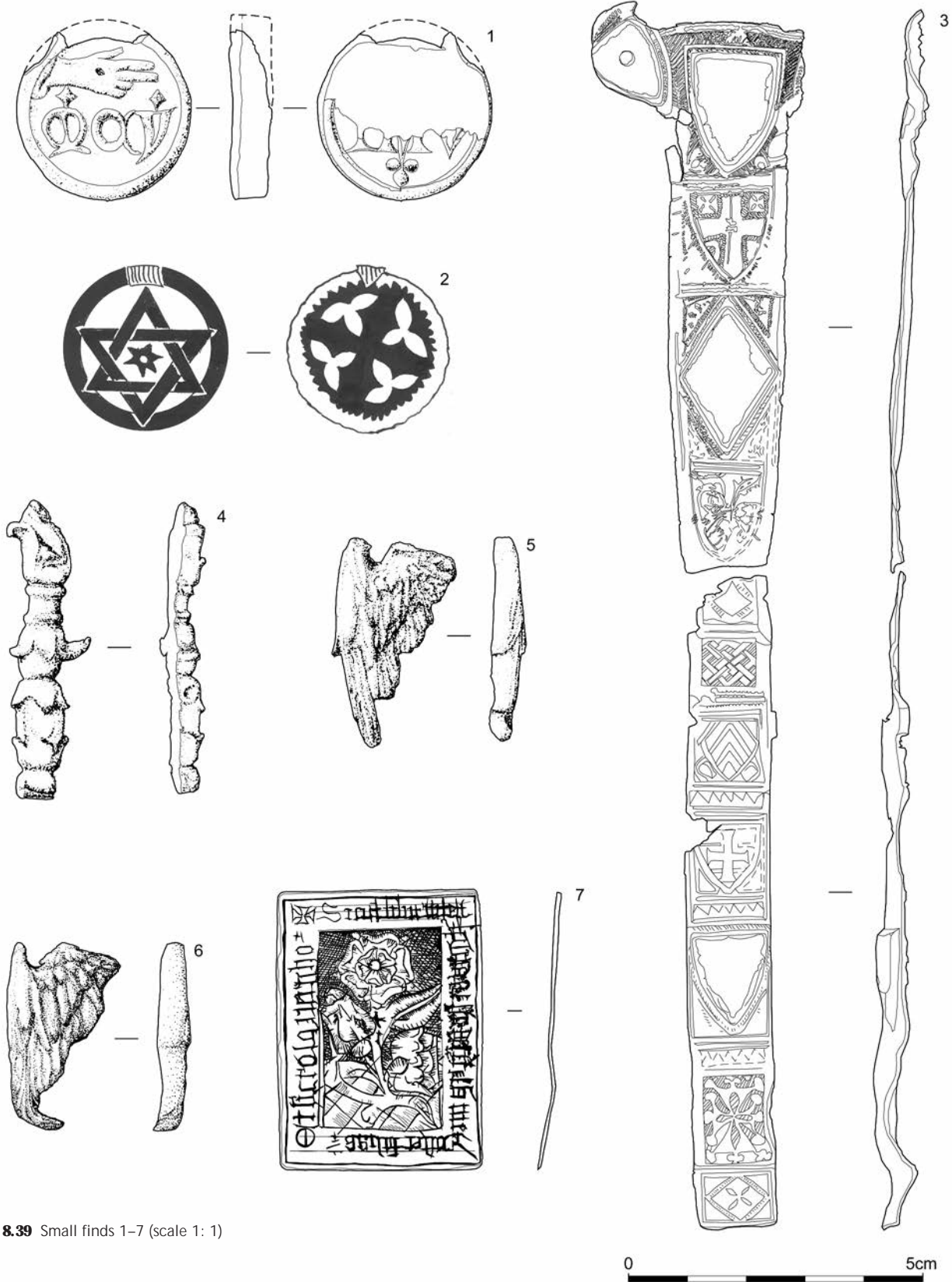


Fig 8.39 Small finds 1-7 (scale 1: 1)

mounts made of gilt copper-alloy sheet; possibly part of the same object or decorative strip. Jewelled sheet-strips are found on a wide variety of surviving medieval objects, including reliquary crosses, boxes and books.<sup>180</sup> These are stylistically comparable to high-status girdles of thirteenth-to fourteenth century date.<sup>181</sup>

4-6 B137 Gilt copper-alloy rod with foliate and baluster decoration; 50 × 13 × 4.5mm; wing with extensive gilding on front; 32 × 13 × 5mm; wing from a separate mould, heavily corroded but has a patchy brown surface crust

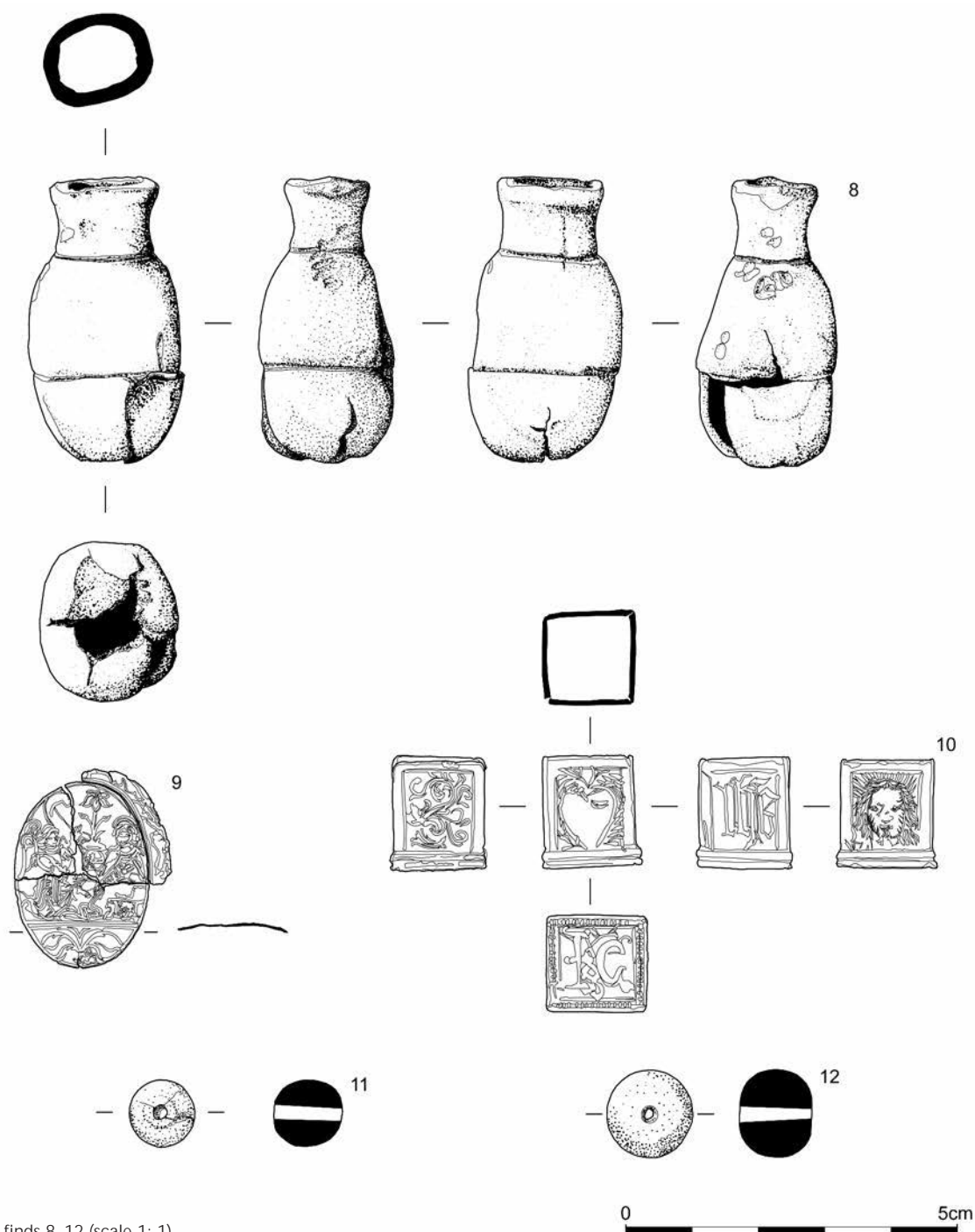


Fig 8.40 Small finds 8–12 (scale 1: 1)

which may represent decayed gilding; 35 × 20 × 5mm. The stratigraphic contexts for these objects are unknown but they share a very similar technique and style. The rod-like object with its floriated mouldings is probably a sprouting staff, a symbol with Old Testament origins connected to Aaron but also a symbol for St Joseph.<sup>182</sup> In the context of Glastonbury, this iconography may represent one of two sprouting staffs associated with the abbey’s sacred legends. The cult of St Benignus (supposedly made Abbot of Glastonbury in 472) was

commemorated by a relic of his staff, which put out branches and flowered when he reached Glastonbury on his pilgrimage from Ireland. The staff of Joseph of Arimathea was transformed into the ‘Glastonbury Holy Thorn’, a legend closely connected with Glastonbury’s post-medieval hagiographic tradition.<sup>183</sup>

7 B94 (1933 excavation, garden south of abbot’s kitchen): 47 × 34 × 5mm. Copper-alloy plaque, corroded. Central rose bush with background cross-hatching surrounded by

a crudely inscribed inscription with the emphasis on the vertical strokes of the letters. It reads *SICUT LILIUM INTER SPINAS SIC AMICA MEA INTER FILIAS ET SIC ROSA I JERCHO* ('As the lily among the thorns so is my love among the daughters and as a rose in Jericho'). This combines two biblical quotes closely associated with Marian worship: Song of Songs 2:2 and Eccles 24:18.<sup>184</sup> The content and style are influenced by woodcuts, pointing to a late fifteenth- or early sixteenth-century date.

**8 B62:** 42 × 22mm. A cast copper-alloy ampulla or flask with a projecting carination on the lower body. The carination on the Glastonbury flask is almost certainly functional as it has no flat base and would have served to hold the flask within a circular cut-out, such as survives in a chrismatory box of c 1200 from St-Viance in France.<sup>185</sup>

**9 B95** (1937, west of reredorter): 28 × 20 × 3mm, max thickness 0.5mm. Oval medallion in thin copper-alloy sheet / foil with Annunciation scene stamped in relief; broken in four pieces. This object belongs to a group of stamped foil pilgrims' medallions produced in England in the late fifteenth and early sixteenth centuries. Brian Spencer suggests that these were products of Walsingham (Norfolk), Britain's premier centre of Marian pilgrimage.<sup>186</sup>

**10 B98** (excavated ?1938): 15 × 15mm. Box made from two pieces of copper-alloy sheet, possibly a small portable reliquary box.<sup>187</sup> The hollow interior suggests that something was fixed into it; an alternative suggestion is that this may have been an early form of desk seal with a wooden handle, or the base of a pointer.<sup>188</sup> Engraved symbols on sides: an IHS inscription in Textualis script, a sacred heart, a vine and Christ's head with a crown of thorns. IC (Iesu Christi, or Jesus Christ) is engraved on the base: the classical C suggests an early sixteenth-century date or possibly very late in the fifteenth century.<sup>189</sup> A recent survey recorded over 500 objects associated with the cult of the Holy Name in England, two-thirds of which date to the period c 1450–1550.<sup>190</sup>

### Beads (fig 8.40)

The collection includes two black beads, one jet and one glass. Prayer beads on strings were used to count cycles of prayers, thus lending the name of 'paternoster'. This general practice developed in the late fifteenth century into the rosary, a cycle of prayers associated with the Virgin.<sup>191</sup>

**11 M92** (1957 excavation, CL12): 10 × 9mm, with c 2mm diameter central hole. Black jet bead: oval-shaped with cracks, flattened at one end; confirmed by XRD analysis as deriving from the Whitby area of North Yorkshire.<sup>192</sup>

**12 M61** (1955, East-West Cloister Trench): 10 × 13mm. Black glass bead of globular shape with flattened ends.

### Bells (fig 8.41)

Eleven bell fragments weigh a total of 2.67kg. Two fragments from the 1915 excavations of the dormitory are illustrated. Seven further fragments (1.21kg) came from the 1930 excavations of the church crossing.

**13–14 B100/1–2** (1915 excavation, dormitory sub-vault): 45 and 50cm diameter respectively. Two fragments from different bells with visible turning marks from the mould on interior (and exterior of 13).

### Bone tuning pegs (fig 8.41)

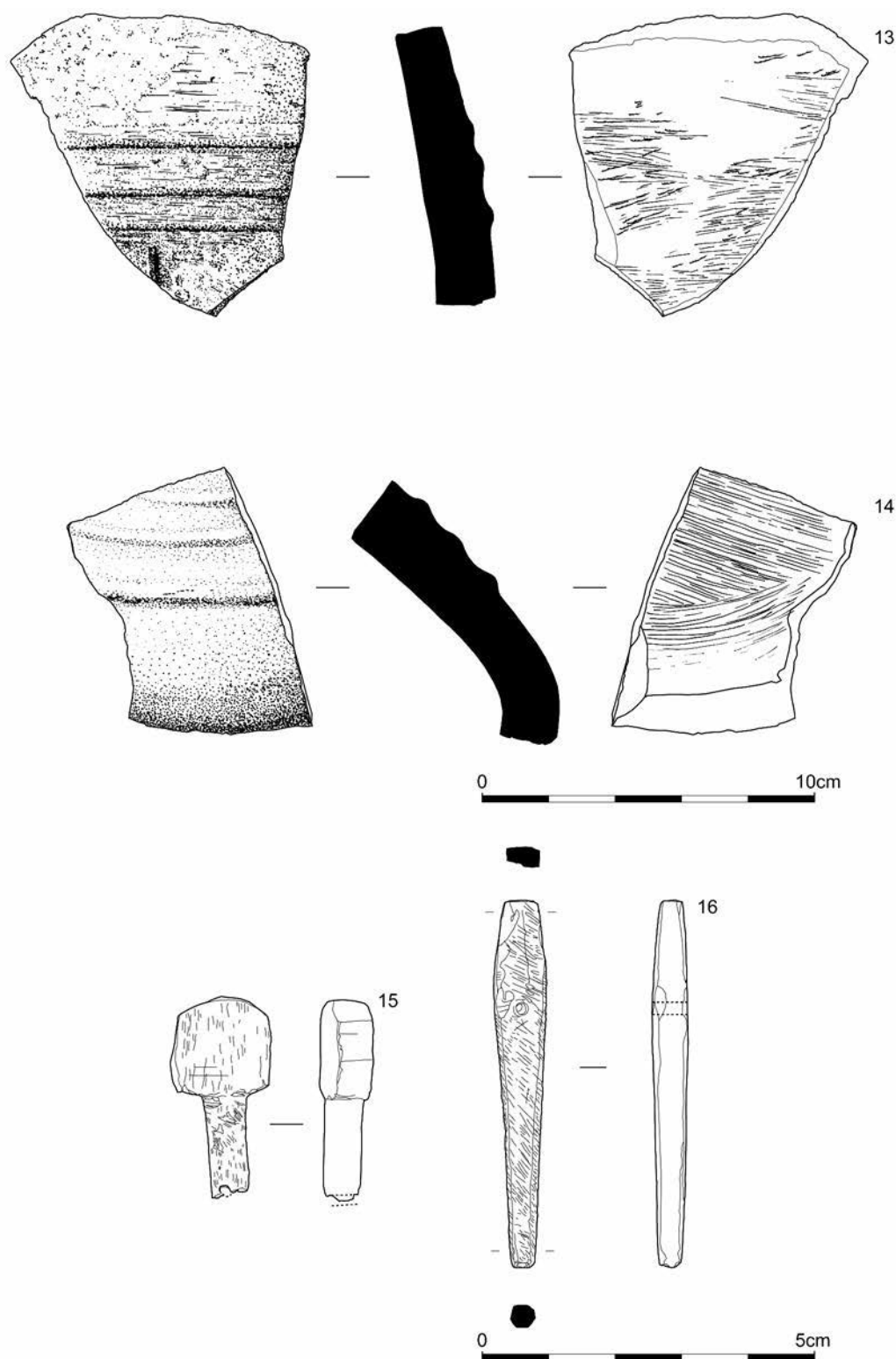
These are not uncommon on monastic sites; Battle Abbey produced twelve examples.<sup>193</sup> Both Glastonbury pegs suggest relatively sophisticated instruments; they appear to have come from the reredorter, which was a frequent location for casual losses. In 1534 a Master 'Renyger' was appointed as choirmaster to sing and play the organ in the Lady Chapel and to play music at feasts at Christmas and other times.<sup>194</sup>

**15 M30** (1934 excavation, reredorter): 30 × 15 × 5mm. Lawson's Type C bone tuning peg with wide head, broken at string-hole, made for a late medieval to post-medieval instrument with a peg box, such as a viol or lute.

**16 M30** (1934 excavation, reredorter): 55 × 8 × 5mm; wire hole c 1.5mm diameter. Lawson's Type B bone tuning peg with faceted stem and diagonal filing marks, used in an early keyboard instrument or a box-like instrument with restricted rear access such as a psaltery.<sup>195</sup>

### Grave goods (fig 8.42)

The remains of an iron crozier and the bowl of a lead chalice (both now lost) were excavated in 1951 from grave 136 in the east end of the chapter house; this also contained jumbled skeletal remains and four coffin nails (see Chapter 5) and is likely to represent the translated remains of an earlier monk or abbot moved to the new



**Fig 8.41** Small finds 13–16 (scale 1:2 and 1:1)

chapter house after its rebuilding in the late twelfth to early thirteenth centuries. The practice of placing funerary chalices and patens is dated archaeologically from the late twelfth to the early sixteenth centuries; however, the majority of examples date from c 1250–1350.<sup>196</sup>

17 L11 (GLSGA:1988/620): 78mm diameter × 2mm thick. Roughly cut circle of lead alloy (?pewter), with an inscribed daisywheel or marigold motif set within concentric circles. The date and function are uncertain but the form and decoration resemble mortuary

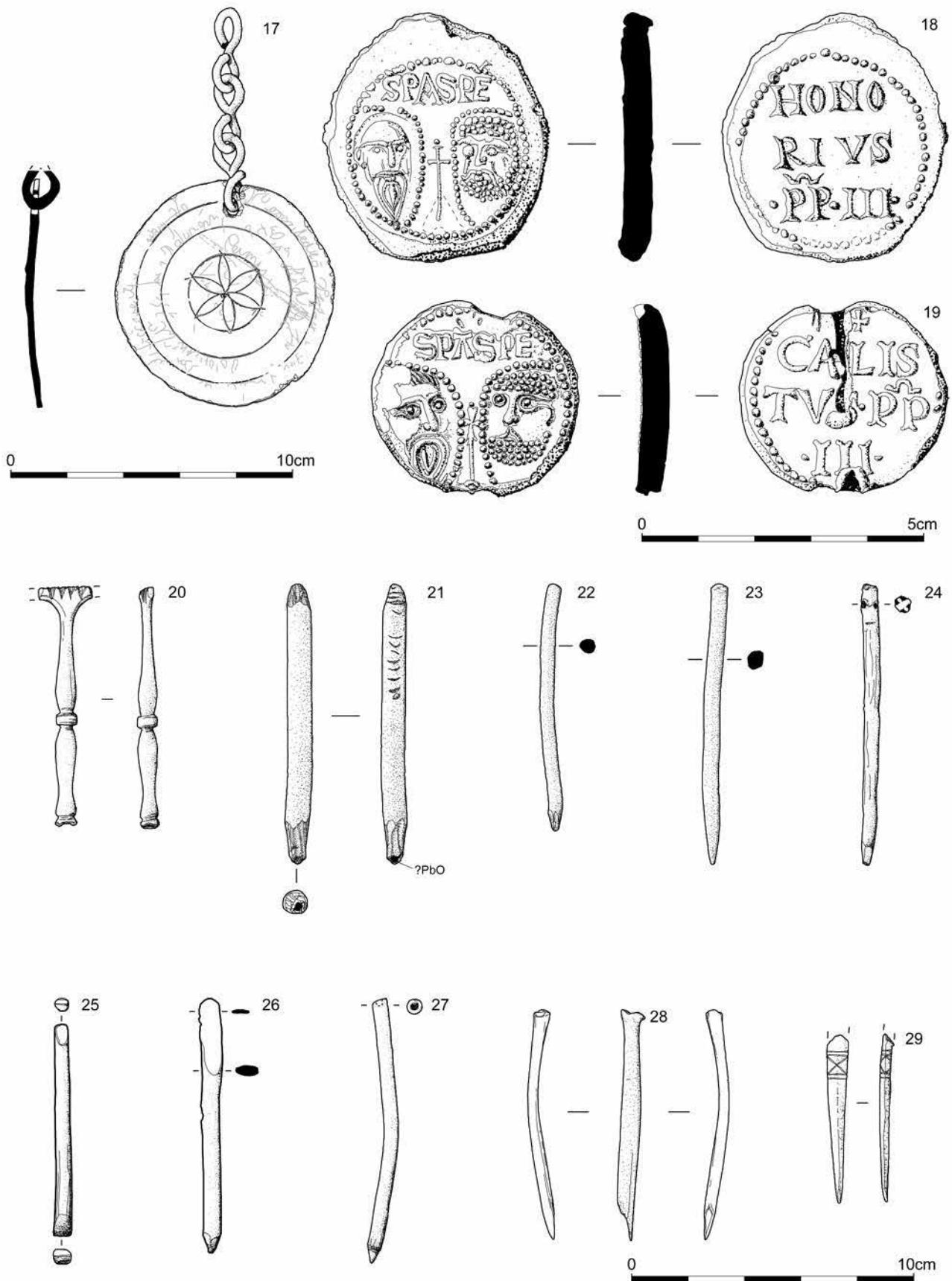


Fig 8.42 Small finds 17-29 (scale 1:2, 1:1 and 1:2)



patens, for example one found at York Minster.<sup>197</sup> However, this object is smaller than the average size for mortuary patens (c 100mm) and perhaps slightly thicker. It also resembles the base of lead canisters used to contain viscera burials.<sup>198</sup> The chain of copper-alloy links may indicate a secondary use for the object. Scanning has revealed writing superimposed on the surface, suggestive of eighteenth-century copperplate.

## Papal bullae (fig 8.42)

### *John Cherry*

Papal bullae are lead seals attached to authenticate papal documents and letters (bulls). They are regularly found on church and monastic sites: Gilchrist and Sloane listed nineteen papal bullae from monastic burials in Britain. It is not clear whether the presence of such bullae in graves indicates the use of detached seals as grave goods or whether the entire papal document was buried with the dead.<sup>199</sup> Of the nineteen listed by Gilchrist and Sloane, none is earlier than 1316–34 or after 1431. Both the Glastonbury examples fall outside this chronological range, but it is not certain that these particular bullae were employed as grave goods.

**18** Leaden bulla of Pope Honorius III (1216–27; unknown find spot): 40mm diameter.

**19** Bulla of Callistus III (1455–58; found in 1911 from topsoil over the area of the monks' cemetery immediately west of the cloister): 37 × 33mm. The inscription reads CALIS / TUS PP / III.<sup>200</sup> Bond published an extensive discussion of this object.<sup>201</sup>

## Book binding tool (fig 8.42)

**20** B116/1 (S end of dormitory): 83 × 7 × 20mm. A copper-alloy tool, probably for decorating leather-bound books by blind tooling. The shaft is moulded and has a serrated terminal. Probably dating to the late fifteenth or early sixteenth century, when blind tooling was revived.<sup>202</sup>

## Writing equipment (fig 8.42)

The abbey collection includes a total of eight lead styli (or pencils).<sup>203</sup> Rods with one or more flattened wedge-shaped terminals were used to clean wax tablets. Two lead styli from Glastonbury have hollowed-out terminals which may be for the insertion of iron points or other fittings. However, this is a most unusual feature in lead

styli and this interpretation is tentative. A turned bone stylus with a socket for a metal point was stolen from the museum in 1974.

**21–27** L20: 56 × 6mm; L21: 100 × 8mm; L22: 87 × 5mm; L24: 100 × 6mm; L32/1: 90 × 8 × 6mm; L32/2: 100 × 6mm; L32/3: 94 (unfolded) × 4mm; L32/4: 75 × 5mm. These objects were once thought to be for marking lines on manuscripts; they have been reinterpreted as styli for writing on waxed tablets, though a dual function is also possible.<sup>204</sup> In London, they occur in ceramic phases 9–12, c 1270–1450.<sup>205</sup> A rare find is the copper-alloy stylus (6.4 mm in length: not illustrated), with both pointed and flattened terminals, which is now in the Taunton Museum collection.

**28** M560 (1954): 81 × 9 × 5mm. Bone pen, made from the curved radius of a hare, rather than the usual goose bone, with a single angular cut used to form the point.<sup>206</sup>

**29** B55 (1931, reredorter): 59 × 8 × 3.5mm. Cast copper-alloy pointer with flat back and faceted cross section; incised decoration. The most likely function of this object is as a pointer for reading manuscripts such as are illustrated in depictions of St Anne teaching the Virgin to read.<sup>207</sup>

## Book bindings (fig 8.43)

**30** B2: 26 × 16mm. Copper-alloy strap-end made with hooked terminal and perforated projection soldered onto one of the sheets, mineralised leather. The recent publication of several similar clasps on fifteenth-century bindings in German and Austrian libraries confirms earlier speculation that these were used on book bindings.<sup>208</sup> London examples derive from ceramic phases 11–12, c 1350–1450.<sup>209</sup>

**31** B3: 30 × 12 × 6mm Copper-alloy strap-end with a hooked terminal and mineralised leather between plates. It has a decorative dome and a single copper-alloy rivet *in situ*. The only parallel that could be found was a book-clasp on a fifteenth-century book in Lübeck City Library.<sup>210</sup>

**32** B234 (1959 excavations, Trench D7): 33 × 18 × 4mm. Copper-alloy book-clasp made from a cast terminal with two holes at right angles, hinged to a plate made from a single sheet. Late fourteenth to fifteenth centuries; similar clasps occur in phases 11–12 in the London waterfront deposits, c 1350–1450.<sup>211</sup>

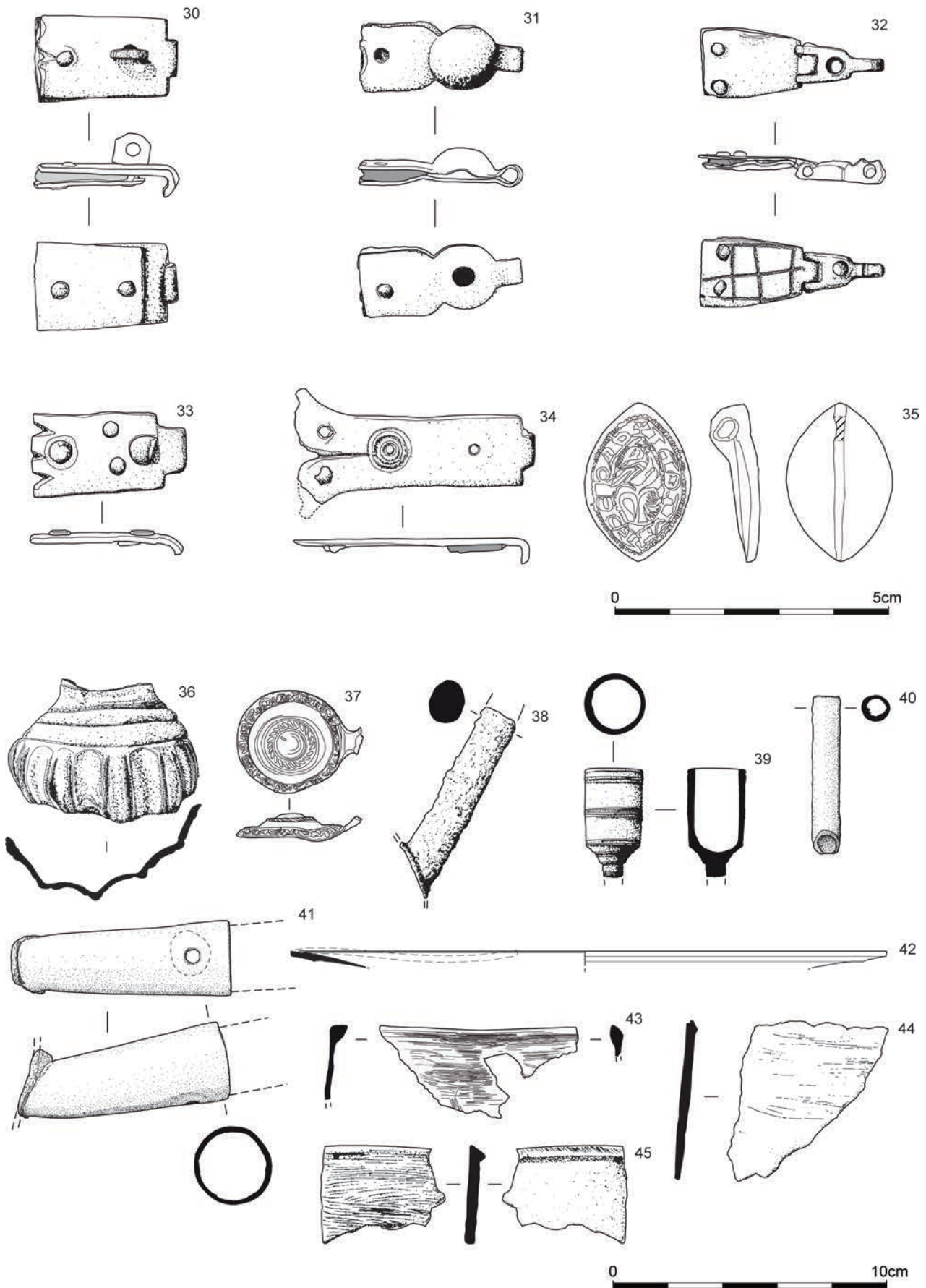


Fig 8.43 Small finds 30-45 (scale 1:1 and 1:2)

**33 B104:** 27 × 14mm. Copper-alloy book-clasp. Two copper-alloy rivets *in situ* plus two other rivet holes, no decoration.

**34 B105:** 43 × 21mm. Book-clasp with damaged bifid terminal; two iron rivets *in situ* plus two further rivet holes. Mineralised leather survives underneath one rivet hole. Simple incised decoration: like B104, this form appears in the late fifteenth century but becomes more decorative during the sixteenth.<sup>212</sup>

Seals (fig 8.43)

*John Cherry*

**35 B96** (1938, abbot's lodging): 29 × 19mm.<sup>213</sup> Copper-alloy seal of pointed oval shape: the legend reads CREDEI MICHI; the device in the centre is a bird perched on a tree. The seal probably dates to the thirteenth century and was probably used for sealing letters. The legend related to love or friendship and it was clearly widely used.<sup>214</sup> A number of examples of seals with birds show a clear association between the depiction of the bird and the inscription *Crede Michi* in various forms, though none exactly parallels the Glastonbury seal.<sup>215</sup>

Vessels (fig 8.43)

**36 B110:** 72 × 45mm. Distorted and battered fragment of cast copper-alloy vessel with polished exterior and rough interior surfaces and evidence of filing on the flattened 'rim' which suggests it was a base. The form of the complete vessel is highly uncertain. The lobate form suggests a fifteenth-century date based on comparison to a Leuven censer and German ewers.<sup>216</sup>

**37 B140:** 44 × 40 × 7mm. Cast copper-alloy domed lid, possibly from a jug or ewer, probably of fourteenth- to fifteenth-century date.<sup>217</sup>

**38 B174** (1954, Trench S of St Michael's Chapel): 76 × 25 × 25mm. Fragment of cast copper-alloy handle (oval cross section 16 × 12mm) and part of attached vessel wall, probably from a fourteenth- to fifteenth-century ewer.<sup>218</sup>

**39 B138:** external diameter (at top) 22mm; internal diameter 18.4mm, stem diameter 7.2mm. Cast copper-alloy candle holder (complete) with horizontal ribbed decoration. This would have been one of a pair that fitted onto a two-branched candlestick of fifteenth- to early sixteenth-century date.<sup>219</sup>

**40 B70** (1935, reredorter): 56 × 10mm max. Small cast copper-alloy spout with angled end for soldering to a vessel.

**41 B66** (1935, reredorter). Cast copper-alloy (probably brass) socketed handle of vessel with fragment of rim and single rivet hole (5mm diameter) in socket for wooden handle. The handle is soldered to the vessel wall. Similar finds are recorded from Westbury (Wilts), Kimbolton (Cams) and Nutfield (Surrey).<sup>220</sup> The closest parallels are three-legged skillets, known from north Germany, Denmark and Norway in the sixteenth century and later.<sup>221</sup>

**42 B108:** 85 × 29mm max. Vessel rim, probably from flatware, possibly plate or dish, flared up to 2mm thick; turning marks on both sides.

**43 B109:** 75 × 33mm and c 2mm max thickness. Thickened rim of a cast copper-alloy vessel, perhaps a cauldron or skillet, with turning marks on the exterior.<sup>222</sup>

**44–45 B67:** body 57 × 49 × 3mm; B68 rim 35 × 45 × 3mm. Body fragments and vessel rim, probably from the same globular cauldron or cooking pot with traces of turning lines (probably from the mould) on the surfaces and filing on top of the rim.<sup>223</sup>

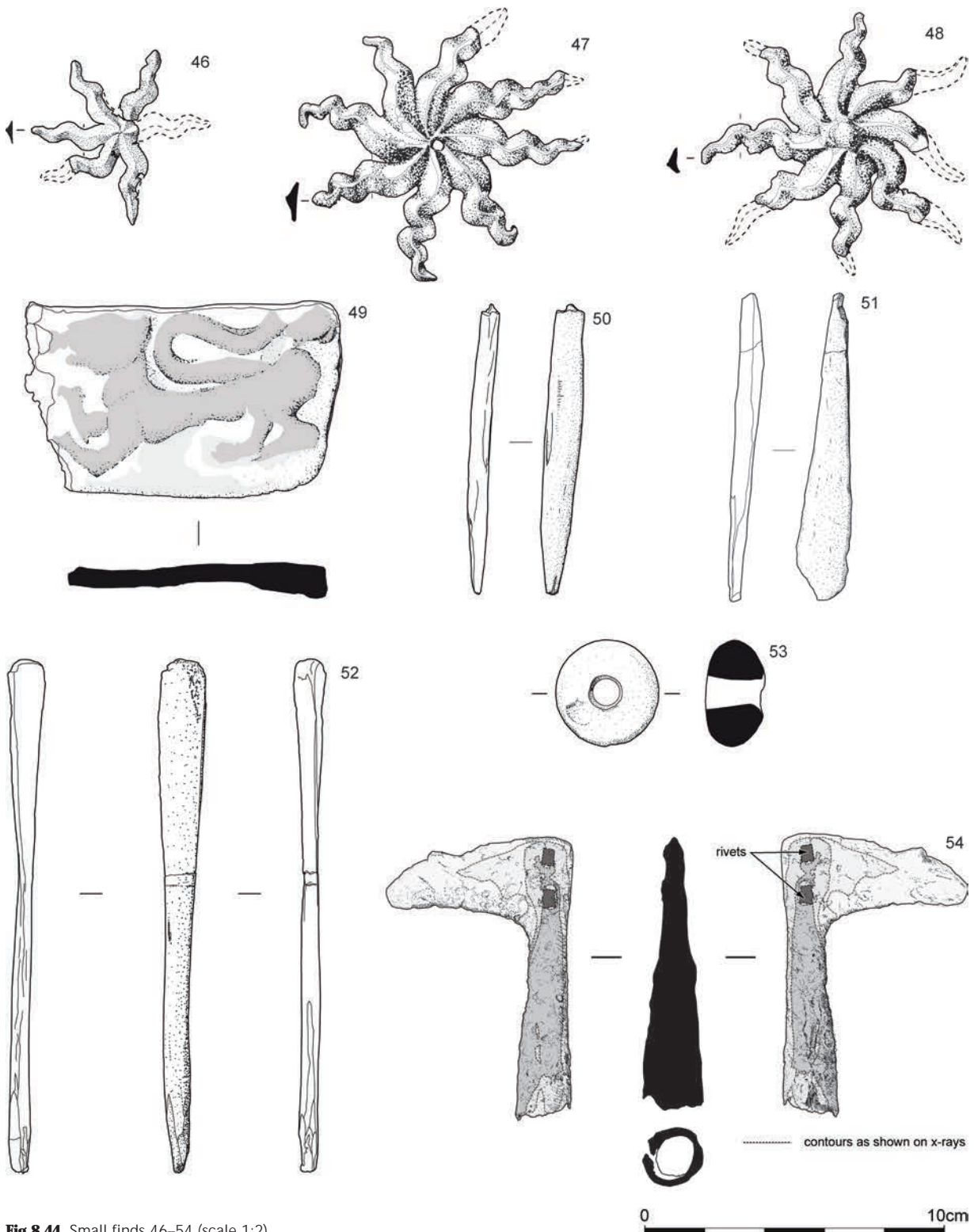
Keys

Seventeen iron rotary keys are in the collection. They are fifteenth- to sixteenth-century types with solid or partly hollow stems and symmetrical bits (Goodall's Types 3, 7 and 8), with oval or kidney-shaped handles.<sup>224</sup>

Lead work (fig 8.44)

The excavations produced a range of architectural lead work in addition to the window lead and grilles. These include lengths of lead pipe, such as an example recorded *in situ* in 1911, interpreted as providing the water supply to the abbot's lodging.<sup>225</sup> There are also plugs that appear to have been used to seal water-supply or drainage channels cut within layered masonry, in addition to lead-encrusted iron clamps for tying together masonry blocks. Numerous small off-cuts of lead and copper alloy are impossible to date and could represent maintenance and / or demolition work undertaken following the Dissolution.

**46 L18** (1933 excavation, dormitory): 95 × 31mm. Part of a lead star fitting, with no central piercing.<sup>226</sup>



**Fig 8.44** Small finds 46–54 (scale 1:2)

47–48 L30, L31 (1933 excavation, dormitory): L30 95 × 89mm; L31 80 × 77mm. Two complete eight-armed lead stars with central piercings and traces of gilt on their upper surfaces. Gilt stars adorned ceilings and possibly walls in churches and high-status apartments, for example at Stratford Langthorne Abbey (then Essex, now London Borough of Newham) and Clarendon Palace (Wilts).<sup>227</sup>

There are indications at Glastonbury of how such features were attached: fixing holes survive in the arcade of the Lady Chapel, indicating that such armatures were part of the polychromy.<sup>228</sup>

49 L25 (1933 excavation, dormitory): 105 × 94 × 11mm. Cast lead plaque with lion *passant*. The left-hand edge of

the plaque is torn but the other edges appear to be cast; the upper edge has signs of secondary work, possibly damage caused by removal.

### Bone-working tools

Several objects indicate the working of cattle bone and red deer antler on site. None have geographical locations or stratigraphic contexts, but are perhaps Saxo-Norman or even earlier in date. The animal bone assemblage also includes a large fragment of worked red deer antler from a Late Saxon context (see Animal bone, below).

### Textile-working tools (fig 8.44)

Three bone objects appear to be pin beaters used in textile production. The two complete examples have a pointed end and an opposing spatulate terminal, a form linked with use of the vertical two-beam loom.<sup>229</sup>

**50** M9/1: 97 × 13 × 5mm. Large mammal bone worked into point (tip missing) and shaft (broken).

**51** M9/2: 102 × 18 × 8mm. Cattle metapodial worked into a point with opposing spatulate terminal (two pieces that join).

**52** M9/3: 170 × 15 × 6mm. Pig fibula worked into bone point (blunted) with opposing spatulate terminal (two pieces that join).

**53** M11: 35 × 17mm with perforation 9mm max diameter. Spindle whorl in pale grey mudstone; potential date range Roman to fifteenth century.<sup>230</sup>

### Miscellaneous tools (figs 8.44 and 8.45)

**54** I30: 95 × 63 × 20mm. Iron weeding hook with socketed handle and mineralised wood within the socket.<sup>231</sup> Blade repaired with two rivets visible in the X-ray. In 1333–4 the abbey gardener (with four *famuli* under him) paid 1d to a smith for repairing two hoes.<sup>232</sup> This hook would have been mounted on a long stick and used in conjunction with a forked stick to cut weeds, as shown on many medieval manuscripts.<sup>233</sup>

**55** L35 (1955, from scaffold pit): 28 × 24 × 13mm; 15g. A piece of roughly cast lead with suspension hole (4mm diameter), probably a plum bob, given its context.

### Dress accessories and grooming items (fig 8.45)

**56** B47: 23 × 7mm. Copper-alloy hooked tag, probably a clothing fastener. These date from the seventh to eleventh centuries: sheet-metal examples with shield-shaped plates are most common towards the end of the period.<sup>234</sup>

**57** B145: length 92.85mm. Copper-alloy brooch pin (bent) with Romanesque dragon head, probably of the twelfth century.<sup>235</sup> The form of the pin suggests it is from an open-work brooch, which allows the head to be visible. The hinge can be compared to the eleventh-century gold brooch from Pitney churchyard (Somerset).<sup>236</sup>

**58** B141: 42 × 33 × 4mm. Strap-end made of cast spacer with acorn-shaped terminal and two sheets, and mineralised leather.<sup>237</sup> Two other complete examples: a detached spacer and one detached plate. The monastic site of Battle Abbey produced five similar strap-ends, but this decoration is not necessarily associated with monastic dress. The acorn motif was popular on a wide range of objects from secular medieval sites in the late thirteenth to fourteenth centuries.<sup>238</sup>

**59** B60: 58 × 78 × 12 max. Copper-alloy purse frame of Ward Perkins type B6, dated to the early to mid-sixteenth century on iconographic evidence.<sup>239</sup>

**60** B155 (1954, W of 'Norman' drain below floor): 6.5 × 4mm. Quatrefoil belt decoration with separate rove attached to pin; thirteenth- to fourteenth-century type.<sup>240</sup>

**61** B92 (1978 excavation, abbot's guest hall Cutting III): 39 × 1.35 × 1.5mm. Copper-alloy cast strap-end with terminal hook and one rivet hole.

**62** B97: 23 mm diameter. Gilt roundel of copper-alloy thin sheet stamped; possible attachment hole but damaged. This object falls into the category of decorative gilt mounts that have been found in large quantities in the London waterfront deposits of late fourteenth- to early fifteenth-century date.<sup>241</sup>

**63** B71 (1952 excavations): 12mm diameter. Annular brooch made from copper-alloy sheet with incised decoration or mock inscription and cut-sheet pin; thirteenth- to fourteenth-century type.<sup>242</sup>

**64–65** B64, B65 (1956 excavation, north transept burial: see Radford 1958): both c 47mm diameter. A

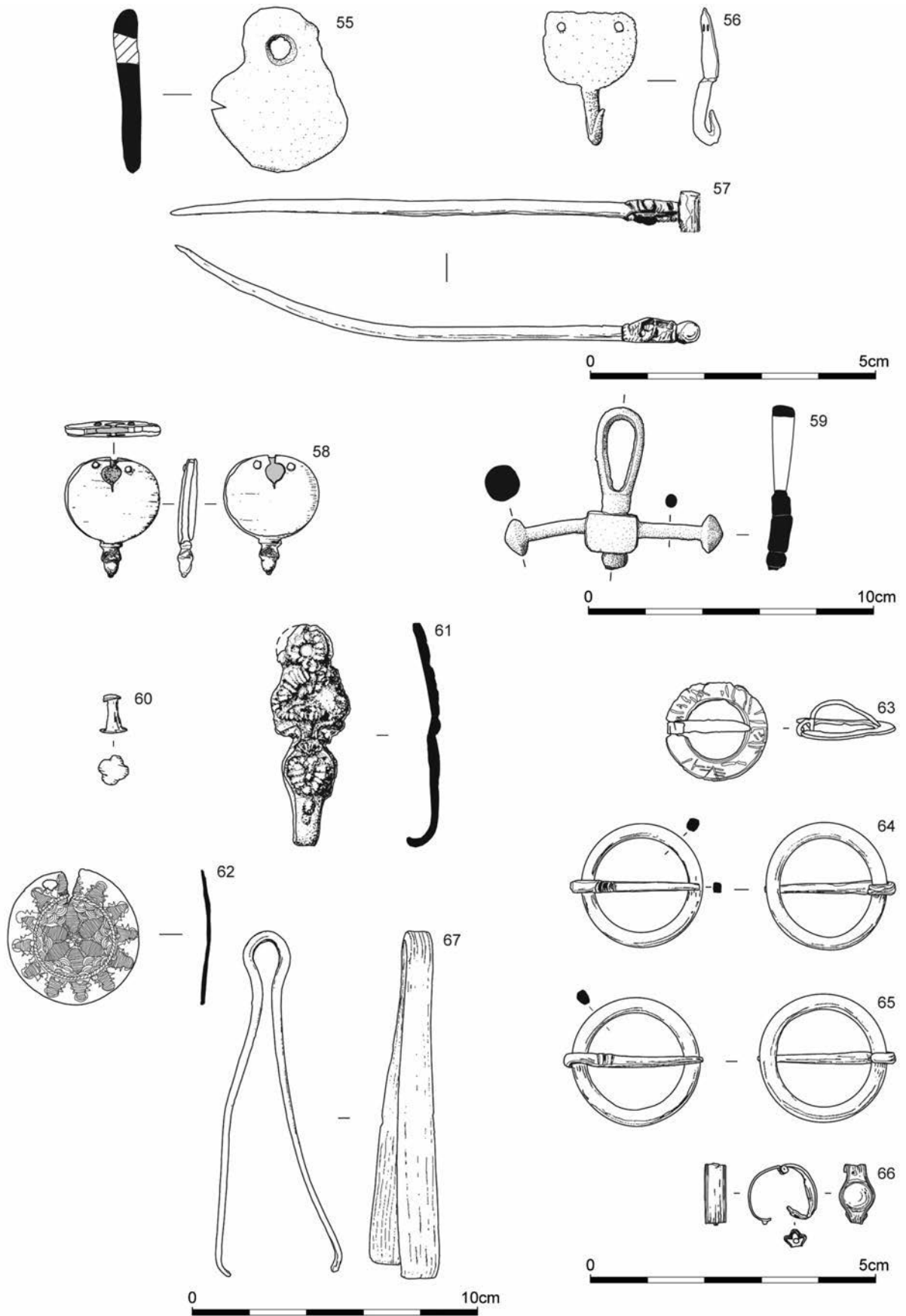


Fig 8.45 Small finds 55–67 (scale 1:1 and 1:2)

pair of annular buckles found at the hip of a burial in the north transept. Russell-Smith suggested that they were used to attach hose to a *brygyrdel* or waist belt. Recent research by Gilchrist and Sloane on artefacts from monastic burials confirms a fourteenth-century date.<sup>243</sup>

**66** B147: 21 × 12mm. Hinged and gilded copper-alloy ring with a trefoil terminal at the catch. It has no trace of a bezel for attaching a jewel on its gilded front. This is a most unusual ring and it may have been intended to adorn a religious statue.

**67** B162 (1956 excavation CL11): 60 × 22 × 7mm. Copper-alloy tweezers, made from a folded piece of sheet. Probably medieval but single-sheet tweezers of the Roman, Anglo-Saxon and medieval periods are often impossible to tell apart.<sup>244</sup>

### Assorted mounts (fig 8.46)

These items may derive from dress accessories, such as girdles, or from small chests or boxes that were used for storage of personal and religious items.

**68** B46: 44 × 10 × 2mm. Incomplete copper-alloy object (?mount) in the form of a stylised animal head, eleventh-century.<sup>245</sup>

**69** B113 (Trench CL1): 46 × 15mm. Copper-alloy decorative strip mount, broken at both ends, made from sheet stamped to give a repeated relief pattern of a star-like design in a rectangular frame. Sheet metal mounts first appear in London in the early thirteenth century.<sup>246</sup>

**70** M26 (1948, abbot's lodging): 49 × 20 × 6mm. Carved and polished bone fitting or mount with a copper-alloy strip with diagonal incised decoration set in the centre; possibly a casket fitting.

**71** M78 (1956): 50 × 6 × 3mm. Carved bone mount, made from a small long bone. The mount is broken at both ends across the rivet holes; possibly a mount for a box or leather belt.

**72** M28 (1917, refectory): c 24 × 5mm. Ivory disc-like object with flange, possibly a box / reliquary lid or casket mount. It has the concentric cracking characteristic of ivory and is decorated by nine tiny drilled holes.

### Weapons and horse equipment (figs 8.46 and 8.47)

**73** B61: 69 × 69 × 4mm. Cast copper-alloy cruciform strap-distributor for a horse harness, eleventh-century.<sup>247</sup>

**74** I19: 290 × 23 × 14mm. Iron sword quillion (cross piece); parallels date from the thirteenth to fifteenth centuries.<sup>248</sup>

**75** B139/1: 35 × 47 × 21mm. Scabbard chape made of a single piece of sheet copper alloy with cut upper fringe, damaged; fifteenth- to sixteenth-century.<sup>249</sup>

**76** B139/2: 48 × 25 × 10mm. Dagger or sword chape made of folded copper-alloy sheet with two attachment holes; band of punched dots between two incised lines along front top edge; fifteenth- to sixteenth-century.<sup>250</sup>

**77** I31: 65 × 49 × 16mm. Iron arrowhead of barbed hunting (Jessop H3) type with trapezoid section with damage to socket and barbs.<sup>251</sup> The British parallels date to the mid-thirteenth century.

### Coins

This brief summary is based on a list prepared by Taunton Museum, where most of the numismatic material is held. Thirteen coins of the realm are recorded from the site pre-dating the Dissolution. Three pre-Conquest coins have been published previously: a silver penny of Aethelred II of 'First hand' type from the Ilchester mint (979–c 985); and two coins of Edward the Confessor, one of 'pointed helmet' type (c 1052–5). Metcalfe and Minnitt suggested that all three were disturbed finds from the Late Saxon cemetery; none were from primary grave fills.<sup>252</sup>

The greatest concentrations of coins by reign date to George III (1760–1820) and George IV (1820–30) (twenty-one and three coins, respectively); this could be explained by the loss of a single purse. Alternatively, it may reflect the increased use of the abbey grounds in the early nineteenth century for fairs. Nine English jettons have been identified from the period c 1272–1400, fifteen French jettons of the fourteenth to fifteenth centuries, two Low Countries jettons of the late fifteenth to early sixteenth centuries and twenty-one Nuremberg examples of the late sixteenth to seventeenth centuries. Unfortunately, many of the jettons are corroded and are thus difficult to read and date closely.

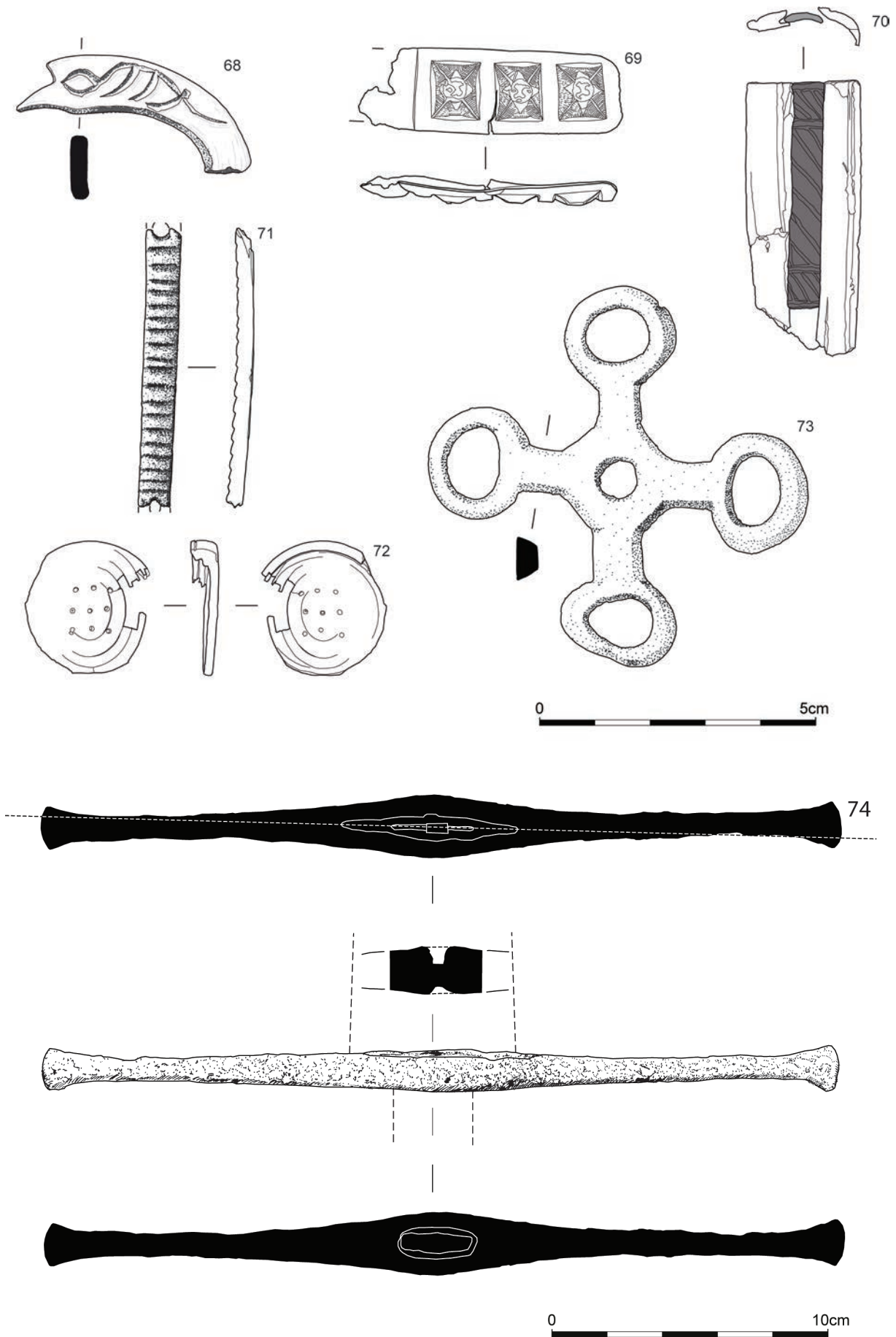


Fig 8.46 Small finds 68-74 (scale 1:1 and 1:2)



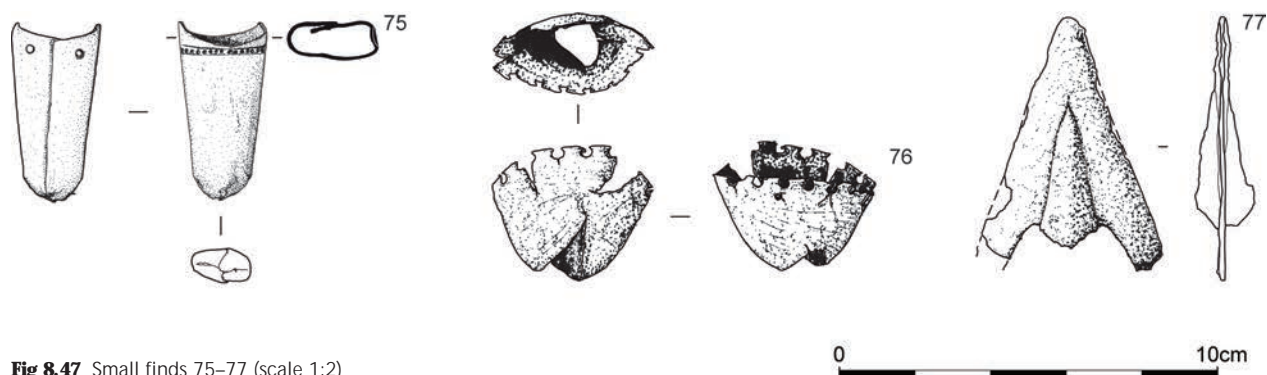


Fig 8.47 Small finds 75–77 (scale 1:2)

## Discussion

There are no obvious regional characteristics in the Glastonbury assemblage but this is perhaps to be expected; in contrast with medieval pottery, metal small finds did not generally vary on a regional basis.<sup>253</sup> Distinctions are seldom gleaned between medieval urban and rural assemblages but the material culture of monasteries is indicative of their religious function. This becomes apparent when the finds from Glastonbury are compared with those from the rural village of Shapwick and its environs, located 8km from the abbey. A large assemblage was garnered from field walking and excavation but there were virtually no objects associated with religious belief, literacy or military equipment, in stark contrast with the collection from Glastonbury Abbey.<sup>254</sup> Geoff Egan compared the excavated assemblages from sixteen monastic sites and identified twenty-one categories of object that may be regarded as diagnostic of the monastic lifestyle, regardless of variations between monastic orders.<sup>255</sup> Table 10 develops Egan's analysis to include Glastonbury and other monastic sites from the south west of England.

Of the twenty-one recurrent artefact types listed by Egan, at least fourteen occur at Glastonbury. Two more possible items are a thimble (B7: not illustrated), which may pre- or post-date the Dissolution, and a possible copper-alloy balance arm (B204: not illustrated).<sup>256</sup> This score of fourteen (or sixteen) is substantially higher than the next highest scoring site of St Augustine's, Canterbury, which yielded eleven monastic indicators. Of the types in Egan's list that are absent from Glastonbury, the scourge is unique to Bordesley Abbey and its identification is uncertain.<sup>257</sup> No writing tablets, spectacles, parchment holders or coin / measuring weights survive at Glastonbury.<sup>258</sup> Lead piping is present in the assemblage but no taps have been recorded; there is a single candle holder (fig 8.43: 39), one fragment from the base of a

glass hanging lamp (GL1; see Vessel glass, below) and two fragments of pottery lamps (see Post-Roman pottery, above).

The monastic character of the assemblage is evidenced especially in the objects linked with music and literacy, including bell fragments, bone tuning pegs, book bindings, styli, a seal and a possible tool for book binding. Of particular significance are the two perforated ceramic vessels that may have been used for the production of white lead for illumination (Post-Roman pottery: wares associated with specialist scientific and technical activities, above). Other objects possibly associated with manuscript production were recorded in interim reports but do not survive in the collection. Peers reported the discovery in 1934 of a small pair of bronze dividers, which may have been used in manuscript production.<sup>259</sup> Bond noted the recovery in 1914 from the south-east corner of St Michael's Chapel of 'numerous' oyster shells used as palettes containing pigments of red vermilion, black and azure blue. A convex fragment of rock crystal (of unknown dimensions) was found in the same season, which he supposed may have been used as a magnifier in illuminating manuscripts.<sup>260</sup> An alternative interpretation is provided by comparison with two convex pieces of rock crystal recovered from Trig Lane in London: it was suggested that they formed parts of a *soudé* gem in which a wax *Agnus Dei* amulet was enclosed.<sup>261</sup>

There are no items in the assemblage that are unequivocally liturgical, but it is feasible that some of the metal vessel fragments may have had a ceremonial use. In particular, there are fragments of possible ewers (fig 8.43: 37, 38) that could have been used for domestic or ecclesiastical purposes, the latter including the ritual ablutions of priests. The copper-alloy flask or ampulla (fig 8.40: 8) may come from a *chrismatory*, a set for holding the three holy oils used by priests and bishops in administering the sacraments of baptism, confirmation and the anointing of the sick. Similar vessels of twelfth-

**Table 10** Finds from religious houses

	Glastonbury Abbey	Battle Abbey	Bayham Abbey	Bordesley Abbey	Bristol St Bartholomew's Hospital	Bristol St James' Priory	Cirencester Abbey	Eynsham Abbey	Hulton Abbey	Kirkstall Abbey	Leicester Austin Friary	Sandwell Priory	St Augustine's Abbey, Canterbury	St Mary Spital, London
<b>Religious order</b>	Ben	Ben	Premons	Cist	Hosp	Aug	Aug	Ben	Cist	Cist	Aug	Ben	Ben	Hosp
<b>Items with religious connotations (A–E)</b>	A, B, C, D	A		E (?)	D	D	A, B, C, D	A	A, B, C, D		D	A, B, D		A, B, C
<b>Fixtures/fittings often associated with religious houses (F–G)</b>	F, G	G						G		F		F		
<b>Clerical items relating to production and use of documents (H–O)</b>	H, I, J, L, O	H, J (ae), L, N	K, L, O	H, I, J (ae), L				H, I, J (ae)	I, J (ae), L, M (?), O	H	H (wood), J (bone), L, O	I, L, O	H, I, J (ae), L	H
<b>Items relating to maintenance and industry/'trade' (P–T)</b>	P, Q (?), R, T	R, S	P, Q, S (coin wt)	R	R	R	R, T (?)	R	Q, S		P, R	Q, R	R	Q, R, S
<b>Other (items not comparative with Spital assemblage are bracketed)</b>	U, CR	U	SH	CR	U					CR, WV		SH	CR	CR, SH, WV

Key

A	ornate metalwork for display including gems
ae	copper alloy
B	rosary/paternoster beads
C	papal bullae
coin wt	coin weight
D	burial goods
E	scourge
F	pipings/taps
G	lead ventilator grilles
H	bone styli
I	lead pencils
J	copper-alloy writing tools/bone pens
K	writing tablets
L	book mounts/clasps
M	parchment holders
N	spectacles
O	seal matrices
P	spindle whorls
Q	thimbles
R	jettons
S	weights
T	balances
U	tuning pegs
CR	curtain rings
SH	swivel hook
WV	wooden vessels

Key (cont)

Aug	Augustinian
Ben	Benedictine
Cist	Cistercian
Hosp	Hospital
Premons	Premonstratensian

References

Battle Abbey:	Geddes 1985
Bayham Abbey:	Goodall and Goodall 1983
Bordesley Abbey:	Rahz and Watts 1983
Bristol St Bartholomew's Hospital:	Good <i>et al</i> 1998
Bristol St James' Priory:	Burchill <i>et al</i> 2006
Cirencester Abbey:	Wilkinson <i>et al</i> 1998
Eynsham Abbey:	Allen <i>et al</i> 2003
Hulton Abbey:	Wise 1985; Boothroyd 2004
Kirkstall Abbey:	Duncan <i>et al</i> 1987
Leicester Austin Friary:	Clay 1981
Sandwell Priory:	Egan 1991
St Augustine's Abbey, Canterbury	Henig, Sherlock and Woods 1988
St Mary Spital, London:	Egan 1997

century date have recently been recognised as chrisms containers, but these generally have handles for suspending them from neck cords.<sup>262</sup>

Keys are well represented at excavated hospitals, including St Mary Spital, London, and St Bartholomew's, Bristol, interpreted as keys for lockers to hold the personal possessions of hospital inmates.<sup>263</sup> The group of seventeen keys from Glastonbury is substantial and may be compared with the assemblage of twenty-nine keys from St Saviour's Priory, Bermondsey, including a single bunch of twelve that is likely to represent everyday monastic use.<sup>264</sup> A concern for security is also evidenced in the decorative mounts in bone and copper alloy that are likely to come from small boxes and chests used for storing books, vestments and liturgical items.

One of the metal vessel fragments (fig 8.43: 40) possibly indicates a specialist function in feeding the sick and infirm, although an alternative use is discussed below. The copper-alloy angled spout has no obvious parallels but can be compared with pewter pots from the Low Countries dating from the fifteenth to early sixteenth centuries. This object may indicate a special commission by the monastery for use in the infirmary.<sup>265</sup> Specialist equipment for care of the sick is also evidenced in the urinal represented in the assemblage of glass vessels (GL2; see Vessel glass, below) and the fragment of fifteenth-century drug jar from Tuscany. Four shallow ceramic bowls may represent the remains of distillation vessels used to produce medicines (see Post-Roman pottery, above). A possible amulet for healing was recovered from the dormitory area: a lead seal of Solomon (Star of David) enclosing a small six-pointed star (now lost). Glastonbury has two examples of hooked curtain rings, an artefact that Egan notes as occurring at the abbeys of Bordesley, Denny and Kirkstall, perhaps representing the use of curtains for privacy in monastic infirmaries.<sup>266</sup> 'Hung beds' may have been present also in the abbot's guest hall and the monastic dormitory.

There were no definite grave goods among the extant assemblage, but the two buckles from a burial in the north transept confirm that the rite of clothed burial was practised at Glastonbury. A circular object of lead (fig 8.42: 17) may represent a mortuary paten or canister later reused as a lid.<sup>267</sup> Grave goods were recorded by Radford but do not survive: a lead chalice and staff of base metal were found associated with a 'translated' burial near the east wall of the chapter house, and a token of c 1320 was recovered from the grave fill of a burial in the monks' cemetery to the south of the Lady Chapel.<sup>268</sup> A papal bulla came from topsoil in the monks' cemetery and may derive from a disturbed grave. Three copper-

alloy letters from tombs (B106, B107, B115) are also in the collection.

Perhaps the most distinctive characteristic of the assemblage is the large number of devotional items dating from the fourteenth to the sixteenth centuries, corresponding with the abbey's florescence as a major pilgrimage destination. An unusual gilded copper-alloy ring (fig 8.45: 66) may have embellished the hand of a statue of a saint; in 1909, excavations near the chapter house recovered a gloved hand from a life-size figure, carved in stone, gilded and studded with black.<sup>269</sup> Although Glastonbury possessed myriad saints' relics and shrines to Patrick, David and Dunstan, special devotion to the Virgin is evident. Pilgrims to Glastonbury would have begun or ended their tour by visiting the Lady Chapel at the west end of the abbey church. Here, they would have viewed a miraculous statue of the Virgin, 'adorned with gold and precious jewels'. The blistered effigy had endured the fire of 1184; its survival was regarded as proof that she could protect the pious from the flames of hell.<sup>270</sup> Objects associated with the Virgin include a copper-alloy plaque (fig 8.39: 7) and a foil medallion (fig 8.40: 9), possibly from Walsingham. Several items reflect the later medieval concern for veneration of the Passion and the blood and wounds of Christ,<sup>271</sup> including a possible portable reliquary (fig 8.40: 10) and a terracotta medallion (fig 8.39: 1) recovered from the crossing of the church.

One object perhaps commemorates the Glastonbury cults of either St Joseph of Arimathea or St Benignus: a gilt copper-alloy rod with foliate decoration (fig 8.39: 4). This may represent St Benignus's staff sprouting flowering branches or St Joseph's staff miraculously transforming into the living Glastonbury Thorn; however, the legend of the Thorn appears to have developed only from the sixteenth century onwards.<sup>272</sup> It is relatively unusual to recover pilgrim souvenirs on the sites of the abbeys with which they were directly associated; for example, the pilgrimage site of Bromholm Priory (Norfolk) produced 600 small finds by metal detecting, but not a single pilgrim's badge was found representing Bromholm's relic of the True Cross. Extensive metal detecting and field walking of the precinct at Bromholm yielded residues of the practical infrastructure of pilgrimage, including large quantities of metal cooking vessels perhaps associated with pilgrims' camps, horse furniture, dress accessories and coins.<sup>273</sup> Similar items at Glastonbury may represent the casual losses of pilgrims or guests visiting the abbey rather than objects that were in institutional use at the monastery.

Items for personal use include weapons and a horse

harness fitting, lost by visitors or perhaps belonging to corrodiars (pensioners) who, during the period of the Hundred Years' War, included several former soldiers. Items such as the sword part perhaps represent personal possessions, although an armoury was recorded at the abbey in 1539.<sup>274</sup> Other personal items likely to be associated with the laity include a purse frame (fig 8.45: 59) and tweezers (fig 8.45: 67). Relatively few dress accessories are represented in the assemblage, although there are examples of highly ornamented pins (fig 8.45: 57) and mounts (fig 8.45: 62). An annular brooch was incised with 'mock inscription', false lettering that was intended to resemble a devotional formula (fig 8.45: 63). This object could have been worn by an illiterate person, most likely a pilgrim to the abbey. A wide range of small, personal items could have been present but were either overlooked during the excavations or were not retained. For comparison, the assemblage from the site of the Visitor Centre (to the north west of the church), excavated between 1987 to 1993, included dress accessories such as wire twists, dress pins and numerous lace ends.<sup>275</sup>

There are remarkably few objects associated with everyday activities, such as food preparation and consumption, industry and craft-working. Those that there are include four objects indicative of bone working, a plumb bob, a weeding hook and four tools associated with textile working: three pin beaters and one spindle whorl. A Roman bone object was also reused as a tool, possibly for textile working (see Roman small finds, above). The pin beaters are roughly Saxo-Norman in date, corresponding with a period in which weaving and spinning were associated exclusively with women's work in the home. There were women resident in the north-west corner of the precinct after Abbot Richard Beere founded an almshouse for ten poor women in 1512,<sup>276</sup> but these bone tools are likely to have been lost from the purses of female servants or visitors to the precinct.

Indications of salvage undertaken at, or after, the Dissolution are provided by fragments of scrap metal excavated from the crossing of the church: the cauldron and bell fragments are likely to represent materials collected for recycling. The precise date of demolition of the church and monastic buildings is unknown: the lead was still on the roofs when the site was granted to Edward Seymour, Duke of Somerset, in 1547 and the bells, although reserved to the Crown, were in the main crossing tower as late as 1548.<sup>277</sup>

The precinct was put to an unusual use following the Dissolution: in 1551 the Duke of Somerset established a refuge for worsted weavers from Flanders, who were

persecuted in their home country for their Protestant faith. Walloons and Huguenots were distinctive in their language, dress, occupations and lifestyles; however, it has proven difficult to identify them archaeologically even in London and Norwich, where there were large populations of so-called 'Strangers'.<sup>278</sup> Sue Margeson suggested that women's dress fittings and hair pins were heirloom objects retained by Stranger households who had migrated to Norwich.<sup>279</sup> The absence of good stratigraphic evidence at Glastonbury makes it difficult to identify mid-sixteenth-century objects with any certainty. However, a number of sixteenth-century objects have their closest parallels in the Low Countries and could potentially be associated with the short-lived Walloon community.

The socketed handle (fig 8.43: 41) may be from an imported skillet but it has also been suggested that such handles could be from English ladles.<sup>280</sup> A copper-alloy stylus from the abbey (not illustrated) in Taunton Museum is also probably of Low Countries origin and could be late monastic or post-Dissolution in date.<sup>281</sup> A small, cast copper-alloy spout (fig 8.43: 40) has its closest parallel in pewter infant feeders from the Low Countries, and it is tempting to suggest a connection to the migrant families who lived in the former precinct. However, the best candidate for a Walloon item is the tagged hook or clasp (fig 8.45: 61) that has its closest analogies in the Low Countries, although a variant on Norwich examples.<sup>282</sup> This artefact was excavated from the abbot's guest hall, which was used by the leader of the Walloons.<sup>283</sup>

In summary, there is no clear regional patterning in the assemblage and the medieval material dates principally from the fourteenth to sixteenth centuries, with noteworthy items dating from the eleventh century onwards. The overall character of the assemblage may be biased towards religious objects, perhaps reflecting a policy of selective collection and retention. The national significance of the Glastonbury assemblage is immediately apparent in the outstanding range of objects associated with monastic life and religious devotion. It boasts the widest range of material correlates for the monastic lifestyle of any medieval English monastery excavated to date, including ornate metalwork, paternoster beads, papal bullae, grave goods (now lost), lead pipes and grilles, styli, pencils, writing tools, book mounts, a seal, jettons, tuning pegs and curtain rings. Many of the devotional objects reflect the 'affective piety' that was characteristic of later medieval worship, a contemplative focus on the physical humanity of Christ and a personal identification with his birth and death.

These devotional objects are likely to represent the spiritual concerns of pilgrims, guests or corrodians at Glastonbury Abbey.

## 8.9 Vessel glass

*Hugh Willmott*

### Introduction

A small assemblage of vessel glass dating to the later medieval and post-medieval periods was retained from the antiquarian excavations, numbering 125 fragments. The majority of this material is without identifiable context; consequently, the glass is reported typologically rather than contextually. This report focuses on material from the monastic occupation to the mid-seventeenth century. The greatest number of vessel glass fragments derives from post-medieval wine bottles (ninety-seven fragments, post-dating the 1650s). The low representation of medieval vessel glass may be partly explained by the nature of the material itself: most later medieval glass was made from a potash-rich composition that decays easily in certain soil conditions. The full catalogue and report can be consulted online.

### Medieval vessel glass

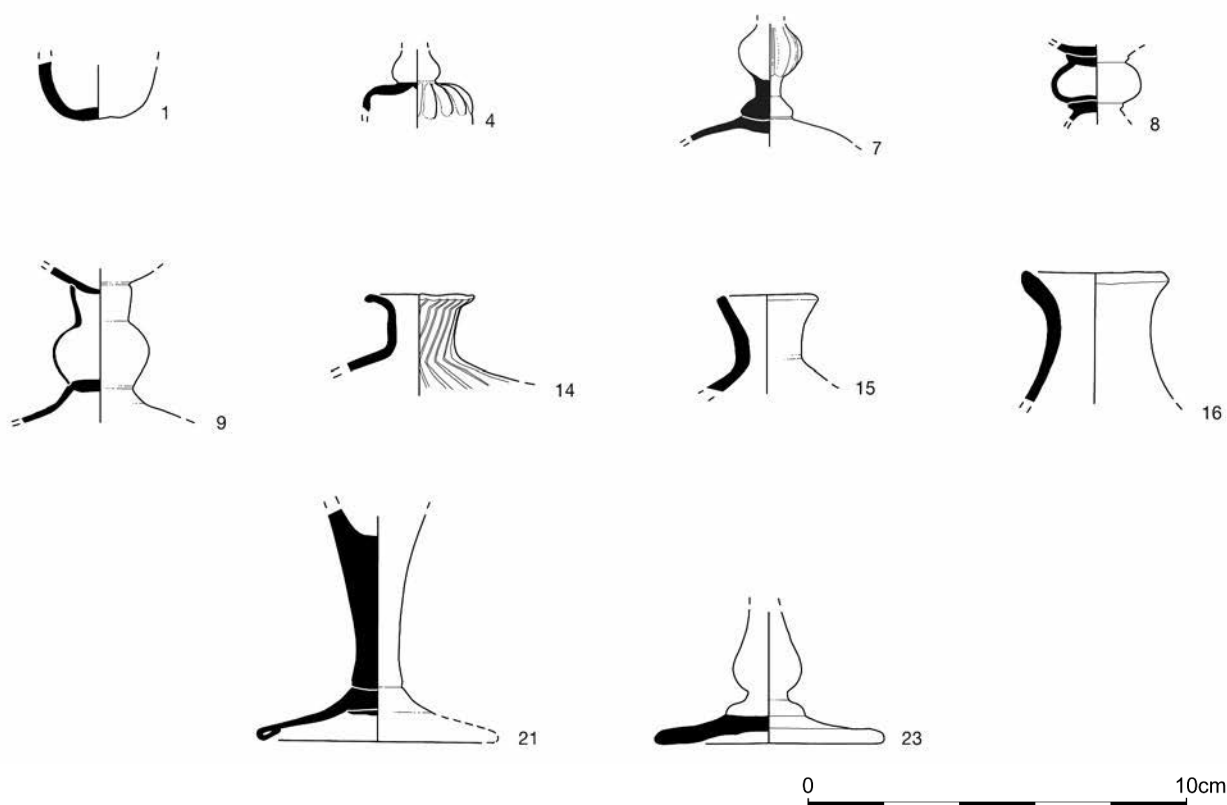
Only four vessels belonging to this period can be identified. The first is a thick, convex tapering base from a hanging lamp, GL1 (fig 8.48: 1). This form, often illustrated in medieval manuscripts, could either be suspended from a chain or inserted into a wooden holder. Although difficult to date accurately, they first appear on monastic sites in the twelfth century and continue in popularity until the end of the fifteenth century.<sup>284</sup>

The second medieval form present in the assemblage is a urinal, GL2, a glass vessel used extensively in medical diagnoses during the Middle Ages.<sup>285</sup> The fragment from Glastonbury represents the thick, curved base of the urinal, rather than the thinner-blown sides (which are less likely to survive).

The final fragments are from two separate globular flasks, GL3–4 (fig 8.48: 4). Such flasks are a common medieval form produced in large numbers on domestic glass-making sites.<sup>286</sup> The two fragments from Glastonbury are both portions of pushed-in base, which is the element most likely to resist devitrification in the soil.

### Post-medieval vessel glass

An interesting and diverse range of drinking glasses and



**Fig 8.48** Glass vessels GL1, GL4, GL7, GL8, GL9, GL14, GL15, GL16, GL21 and GL23 (scale 1:2) (drawings: H Willmott and E Gardner)

containers dates from the century following the Dissolution, c 1540–1640. This coincides with a period when the English glass industry was starting to flourish, before it reached a hiatus with the onset of the Civil War. Although the assemblage is small and rather fragmented, it contains a representative sample of the types of glasses being used in England at this time.

Two of the drinking glasses (GL5–6) are ordinary pedestal beakers. Made in a poorer-quality green-tinted glass, these vessels were amongst some of the earliest of the new forms produced in England following the arrival of immigrant glass-makers from the continent from the mid-sixteenth century onwards. Pedestal beakers rapidly became the most common form of drinking ware during the late Tudor period and are found on almost all classes of site.<sup>287</sup>

More unusual are several examples of sixteenth-century goblet. These are made in a much better-quality soda-rich glass and are almost colourless except for a grey or yellow tint. Although too fragmented for more certain attribution, it is possible that at least some of these might be early English products of the 1570–80s, when the fineware industry was transformed by the establishment of furnaces in London, initially by Jean Carré and then Giacomo Verzelini.<sup>288</sup> GL7 (fig 8.48: 7), a goblet with a short, inverted baluster stem decorated with vertical ribbing, is typical of this early period of English manufacture and therefore almost certainly has domestic provenance. GL8 and GL9 (fig 8.48: 8, 9), both goblets with rounded knops, are harder to attribute. The rounded stem knop was a popular style employed by glass-makers across Europe during the late sixteenth century. While they could be London products, they might equally have come from Antwerp or even Italy. The final goblet stem fragment, GL10, is the upper portion of a mould-blown lion mask. This form also appeared during the second half of the sixteenth century and remained popular well into the seventeenth, being a staple product of virtually every European glasshouse. Three further fragments from good-quality drinking vessels are also present in the assemblage. Two, GL11–12, are curved portions from different goblet bowls, whilst GL13 is a fragment of goblet base.

A number of small containers belonging to this period were also recovered. The first, GL14 (fig 8.48: 14), is the small portion of a rim, neck and shoulder from a fine-quality bottle made in a colourless soda glass and decorated with heavy, but even, ribbing. Although the majority of the vessel is missing, this clearly dates to the sixteenth century, making it a rare and fairly high-status item.

More utilitarian in nature are fragments of two different rims and the body from several small, square-section case bottles, GL15–17 (fig 8.48: 15, 16). Made in a mixed alkali glass with a heavy green tint, these vessels first appeared during the sixteenth century and continued in popularity right up until the nineteenth century. The small examples from Glastonbury are all earlier types, dating to the late sixteenth or early seventeenth centuries, used for containing domestic liquids and foodstuffs. A slight variation on the design of these bottles can be seen with a further example, GL18, which is hexagonal in cross section rather than square. This type of bottle, although rarely found in most parts of England, has been recovered in quite large numbers at the late sixteenth-century glass furnace at Woodchester (Glos), suggesting they might have been a more specialised West Country product.<sup>289</sup>

The final glass fragment is a small piece of cast mirror glass, GL19. Mirrors are one of the least understood areas of archaeological glass research, probably because they often go unrecognised due to the soluble nature of their tin and mercury ‘silvering’. It was previously believed that mirrors were produced by casting and polishing sheets of glass only from the 1670s onwards. However, it is now known that by the very early sixteenth century the Venetians had perfected the manufacture of high-quality cast glass ‘sites’; these were either fully finished in Murano, or exported in cast but unpolished form for finishing elsewhere. The interesting example from Glastonbury has a scored line running parallel to its edge, a feature seen on a large number of mirrors found on the Venetian wreck at Gnalčić (Croatia), which sank in the 1580s while transporting a cargo of glass that included over 550 mirrors.<sup>290</sup>

## Discussion

Although a small and limited assemblage, the medieval vessel glass is typical of what might be expected from a monastic context. The most appropriate comparison is with the large assemblage from the Benedictine house at Battle, where excavations in the eastern range produced the remains of nine lamps, twelve urinals and thirteen flasks.<sup>291</sup> The absence of any fine tablewares at Glastonbury is interesting, especially as these were made in a higher quality, more durable soda glass.

The early post-medieval vessel glass – notably the sixteenth-century goblets, the fine bottle and the piece of cast mirror glass – is of high quality. They suggest the presence of affluent households in the vicinity by the early sixteenth century. Much of the former precinct was in agricultural use at this time, but a new stone house was

built by 1635, when it was occupied by Thomas Brooke, gentleman.<sup>292</sup>

## 8.10 Slag and metal residue samples

*Stuart Black, with a contribution from Phil Andrews*

### Introduction

*Phil Andrews*

Radford's excavations recovered approximately 3.99kg of material that was initially classified as metal-working debris. On the basis of visual assessment, just over half of this assemblage (2,146g) appeared to be associated with copper-alloy working, with a smaller quantity of iron-working debris (891g) and the remainder comprising non-specific debris.

The copper-alloy includes six small fragments of ingots of variable form: two 'blocky' pieces (weighing 123g and 350g respectively) may come from larger bars; three pieces are relatively thin (50g, 150g and 170g); and there is also one flat piece (133g) that has been melted. Analysis indicates that all are high-leaded tin bronze, with the exception of the melted piece which is leaded brass (see below). In addition to the ingot fragments there are a number of pieces of copper-alloy slag or dross, which may derive from melting and casting, although it should be noted that no crucible or mould fragments have been found.

The iron-working residue was vesicular and some pieces contained many charcoal inclusions. Smithing hearth bottoms are absent from this small assemblage but it is likely that all the residues derive from iron-smithing. No soil samples were available and it was therefore not possible to determine whether hammerscale was present. In addition, there was a relatively large piece of hearth or furnace lining (weighing 566g) with some iron slag adhering, and a few pieces of fuel ash slag and vitrified clay (295g), which may be the residues from metal- or glass-working processes.

The largest concentrations of metal-working debris came from the areas of the cloister and the abbot's hall (the latter comprising 154g, including one ingot fragment), although much of the material has no secure context or location information (Tables 11–12). Iron-working, specifically smithing, is likely to have been undertaken for a variety of constructional and other

needs within the abbey. It was initially considered that the ingots and copper-alloy debris might be associated with bell-founding; however, subsequent scientific analyses have shown that none of the material is consistent with medieval 'bell metal' (see below) and, furthermore, no pieces of bell mould have been recovered.

### Scientific analyses

*Stuart Black*

This study analyses and characterises the residues in order to suggest the types of activity that were taking place in the monastic precinct. The characterisation involved removing the altered margin of the materials in order to fully define the metal components and residues using X-Ray Diffraction (XRD) and X-Ray Fluorescence Spectrometry (XRF) analysis; thirty-seven samples were analysed (Tables 11–12).

In the post-Roman and early medieval periods, there is little evidence for copper production or mining in Britain,<sup>293</sup> though a great deal has been published on later medieval copper metallurgy and its composition.<sup>294</sup> The published material is mainly concerned with the production of ecclesiastical objects, as well as cannons, bells and ornamental objects.<sup>295</sup> Post-Roman bronze and brass has been studied less than Roman material due to the scarcity of finds, with most of these associated with burials.<sup>296</sup> Equally, all of the Early Saxon copper objects that have been analysed to date have been associated with burials, with little evidence of mining waste, smelting residue or objects connected with any other activity. Although Middle to Late Saxon metal-working residues and metal objects have been reported from Coppergate, in York,<sup>297</sup> the analysis of material from the early medieval monasteries of Wearmouth and Jarrow indicated an absence of smelting or the production of metal.<sup>298</sup> The consensus of opinion is that early medieval metal-working was associated with the reworking of Roman material as well as the importation of goods from continental Europe.<sup>299</sup>

### Metal-working contexts

Stratigraphic evidence was not available for the majority of samples but two groups of contexts were linked with excavated features located in the areas of the medieval cloister and dormitory, respectively.

Furnaces identified for the manufacture of glass-making within the cloister have been dated to the late seventh century, based on five radiocarbon dates (see Tables 1–2; Area A). The only find from a secure, late

**Table 11** Contexts and analyses of copper-alloy objects and materials

IADB no.	Accession no. GLSGA	Visual assessment by Phil Andrews	Comments	Wt. (g)	Trench/Area	Excavation date	Context	Metal type (this study)	Cu wt%	Sn wt%	Pb wt%	Ag wt%	Bi, As, Sb, S wt%	Ni, Zn, Fe wt%
-	Spl1	-		-	cloister	1955–7	-	leaded, tin bronze	75.6	20.4	2.5	0.4	0.6	0.8
-	Spl2	-		-	cloister	1955–7	-	leaded, tin bronze	71.1	19.9	4.4	0.5	0.8	0.9
SF1300	1991/131/2	Cu alloy slag		6	22 St Michael's Chapel	1954	C1318 Med	high leaded, tin bronze A	60.6	22.8	16.6	<0.1	0.3	0.1
SF4112	1991/303	Cu alloy slag		38	59 cloister	1957	-	high leaded, tin bronze A	60.8	33.6	5.5	<0.1	0.4	0.1
-	1988/955	Cu alloy slag and ingot fragments	Incl at least one 'blocky' ingot fragment (350g), one relatively thin ingot fragment (50g) and a melted, fairly flat lump (133g)	1431	-	-	-	high leaded, tin bronze A	63.6	23.5	12.8	<0.1	0.3	0.1

seventh-century context is SF3100, visually characterised as an 'iron-rich fuel ash slag'. This was recovered from the mortar floor of a glass furnace in glass-making Area A (SF3121). 'Copper-alloy slag or iron slag' may derive from the layer beneath SF3100, but alternatively could be from a mortar layer containing pottery dated after 950. The other furnaces in the cloister (Area B), and those in the east cloister walk (Area C), are also thought to be contemporaneous with the dated furnaces in Area A (see Chapter 7).

A number of residues (SF3004, SF3101, SF3102 and SF3104) were found above the furnace in glass-making Area A in close proximity to the glass furnaces but in association with post-950 pottery. One (SF4000) was taken from a cobbled surface possibly above the furnace floor in glass-making area C. Some of this material may be associated with the demolition of the furnaces.

The dormitory area produced samples SF5201, described as a copper-alloy ingot fragment, SF5215, slag redeposited within a late twelfth-century robber trench, and SF5006, slag iron redeposited from a furnace.

## Results of the analyses

### Copper-alloy and metal-rich samples

The analysis of the copper-alloy samples is shown in Table 11. For comparative purposes, the copper-alloys from Glastonbury Abbey are presented with published

bell-metal compositions through time, Roman bronzes and brass (Table 13). The preliminary assessment suggested that these materials might possibly be associated with bell-making but this is challenged by the following observations:

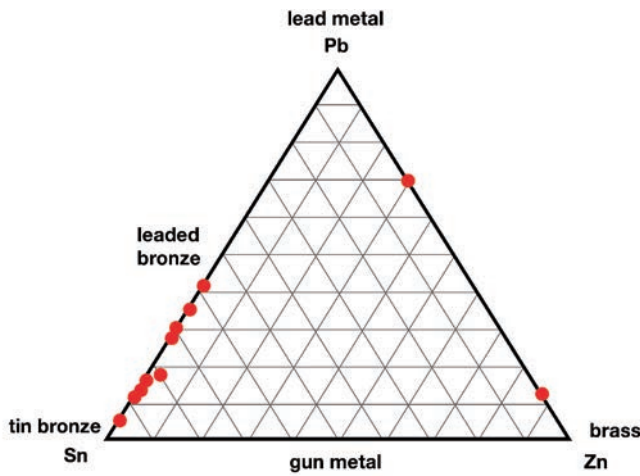
- the bulk of the metal samples are copper-alloys (copper, tin bronzes) with copper contents from 23–89 wt% and tin from 0–34 wt%. Many of the samples also contain significant concentrations of lead (1–17 wt%) and some with other elements (eg zinc and iron up to 24 wt%);
- in comparison to bell-metal compositions, the analysed alloy samples are unlike any previously recorded, except modern bell metal;
- The presence of large quantities of lead is unusual in copper-tin alloys, especially at such an early date (late seventh century), as the use of lead to lubricate casting of copper-alloys did not become widespread until the eighteenth century.

The final point is illustrated in the formal classification of the metal samples as shown in figure 8.49. Here, a ternary plot of copper-tin-zinc shows that most of the metal samples analysed as part of this study are either tin bronze or heavily leaded tin bronzes. Two samples (GLSGA:1988/1375 and SF5201) are also classified as brass and leaded brass, which are unusual given the restricted use of brass in the Saxon period and could



Table 12 Contexts and analyses of processing residues

IADB no.	Accession no. GLSGA	Visual assessment by Phil Andrews	Comments	Wt. (g)	Trench/Area	Excavation date	Context	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub> wt%	Fe <sub>2</sub> O <sub>3</sub> wt%	P <sub>2</sub> O <sub>5</sub> wt%	MnO wt%	Cu, Pb, Zn <sup>1</sup> ppm
SF103	1998/3/316	Fuel ash slag/vitrified clay		200	48 chapter house	1957	C139 ? <i>vallum</i> ditch	7.17	2.56	2.27	0.25	0.05	103
SF3100	2008/3/85/1	Fuel ash slag		6	35 cloister	1956	C3146 glass furnace 1/2 Mid Sax	24.55	6.62	63.51	0.66	0.06	263
SF3101	2008/3/86	Fuel ash slag		14	35 cloister	1956	C3116 Med near glass furnace 1/2	66.61	13.02	7.65	0.68	0.12	163
SF3102	2008/3/89	Fe smithing slag?	Fayalitic slag with 'dribbles' on surface and charcoal inclusions	68	35 cloister	1956	C3116 Med near glass furnace 1/2	23.61	7.57	63.21	1.29	1.12	143
SF3104	2008/3/91/2	Fe smithing slag?		79	35 cloister	1956	C3116 Med Near glass furnace 1/2	48.90	9.04	31.89	0.50	0.09	159
SF4000	2008/3/64/2	Fe smithing slag		18	64/65 east cloister	1957	C4057 Late Sax/ Med above glass furnaces	23.43	6.98	63.81	1.05	0.11	797
SF4060	1991/328/2	fuel ash slag		5	67 east cloister	1957	-	63.21	13.53	10.19	1.36	0.10	341
SF5005	1998/3/353	Fe smithing slag?		168	78 dormitory	1959	-	24.24	8.97	57.18	1.77	1.71	91
SF5006	1998/3/358	Fe smithing slag?		110	75 dormitory	1959	-	69.39	15.24	6.78	0.21	0.04	150
SF5215	1998/3/339	Fe smithing slag?		89	72 dormitory	1959	C5246 robber trench Med	23.03	8.57	57.90	1.28	0.52	330
-	1988/1375	Cu alloy slag		23	-	-	-	30.59	9.75	53.76	0.61	0.48	623
SF5002	1998/3/349	-			80 dormitory	1959	C5024 Med	49.51	11.21	30.44	0.59	0.04	139
SF2048	1991/284	Fe smithing slag?	Common charcoal inclusions	96	34 west cloister	1955	-	22.81	6.74	64.83	0.68	0.09	95
SF2015	2008/3/31/1	Fe smithing slag?		35	24 cloister	1955	C2021 above glass furnace 1 Late Sax	24.99	6.74	63.06	0.53	0.04	95
BF4062	2008/3/74	Cu alloy slag?		90	64 east cloister	1957	Glass furnaces Mid Sax	66.61	12.84	5.10	0.31	0.03	111
SF4131	2008/3/82	Cu alloy or Fe smithing slag		10	64 east cloister	1957	Glass furnaces Mid Sax	57.51	12.46	19.68	0.60	0.09	1865
SF3179	1988/3/132	glass slag, possibly Saxon			37 cloister	1956	Glass furnace 1/2 Mid Sax	50.69	11.56	28.28	0.64	0.05	133
SF3204	1991/283	Fuel ash slag		70	41 cloister	1956	C3216	38.27	12.29	37.52	1.23	0.09	463
BF101	2008/3/58	Fe smithing slag?		172	48 chapter house	1957	C139 ditch ?Mid Sax	28.30	6.97	58.16	1.26	0.11	215
SF5004	1998/3/341	Fe slag + hearth/furnace lining	Conglomerated iron slag and burnt stone	566	74 dormitory	1959	-	26.39	8.63	60.16	0.19	0.07	708
-	G57 CLE			-	-	-	-	33.21	9.34	43.14	2.29	0.11	701
BF3105	2008/3/49	Cu alloy or Fe smithing slag		48	36 cloister	1956	-	70.05	14.56	6.48	0.30	0.05	206
BF4100	2008/3/59	Cu alloy or Fe smithing slag		6	57 cloister	1957	Outside basin of glass furnace 3	72.98	13.79	5.57	0.23	0.03	379
SF4002	2008/3/73/2	Fe smithing slag?		56	63 east cloister	1957	Above glass furnace	21.83	5.43	68.10	1.13	0.18	213



**Fig 8.49** A ternary diagram showing proportions in the system Pb-Sn-Zn. Red dots correspond to Glastonbury metal samples analysed as part of this study. The majority of samples plot between tin bronze and lead bronze, showing the large Pb content of the samples (diagram: S Black)

represent recycled Roman brass. The high-lead bronzes and brasses could also have been recycled from Roman material as they reflect the composition of Roman coin

drops and leaded bronze materials used in the latter part of the Roman Empire.<sup>300</sup>

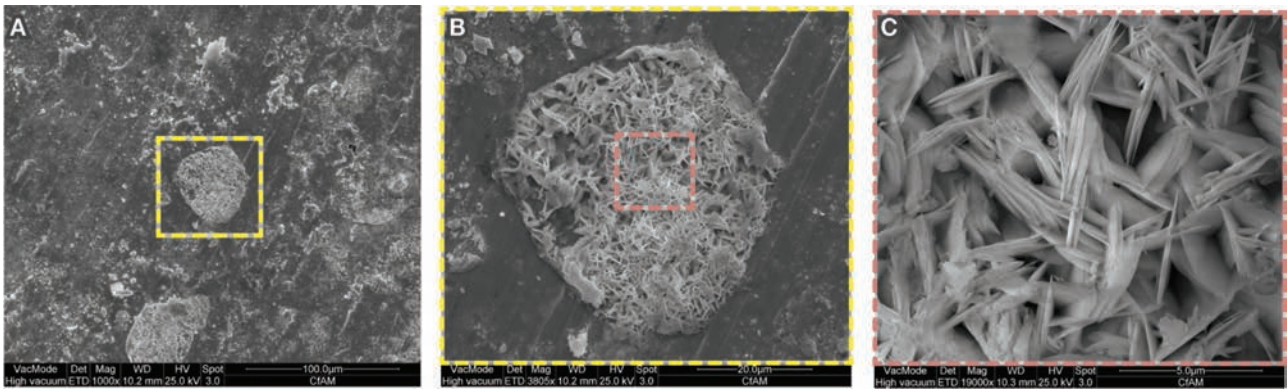
It is important to determine the nature of the leaded bronzes, particularly if they were a product of recycled Roman materials or represent deliberate additions of lead in bronze during the Saxon period. Scanning Electron Microscope (SEM) analysis of cut surfaces of the leaded bronze samples shows them to be composed of interspersed lead in the bronze alloys (figs 8.50: a-c and 8.51). Further examination of the lead in the bronze shows it to have been added as a liquid (by the chilled margins) and that the lead and copper-tin alloy are thoroughly mixed as noted from the copper-alloy content of lead in figure 8.52. The nature of the lead addition is illustrated by the very small crystal sizes of the lead, suggesting it was added as a liquid and also chilled quickly. Lead addition is known as a lubricant for casting and was used extensively in Roman leaded bronzes and for debasing coinage, but has not been reported in the Saxo-Norman periods.<sup>301</sup> This strongly suggests that these materials were recycled Roman metals.

There are also a number of metal samples that are not readily explained in terms of the standard alloy

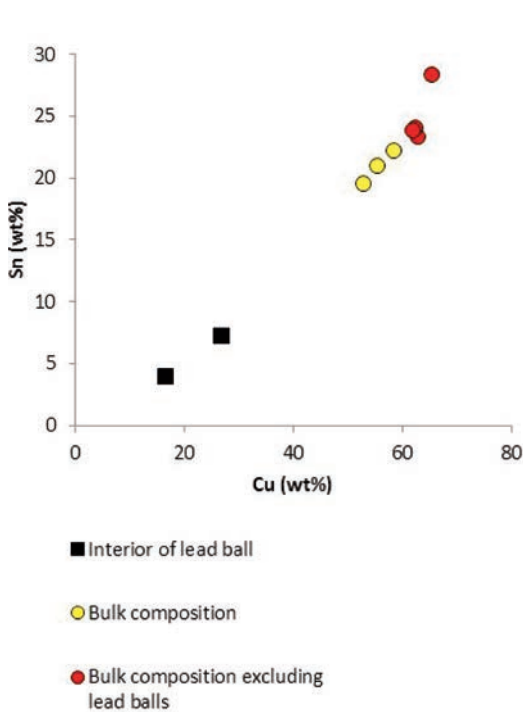
**Table 13** Average composition of bell metal and brass in comparison to selected metal objects from this study

Period	Metal type	Cu	Sn	Pb	Ag	Bi, As, Sb, S	Ni, Zn, Fe	
1000 BC Greek bronze	tin bronze	85–90	9–14	<LLD	<0.1	<0.1	0.8–1.3	
200 BC Chinese bronze	high leaded, tin bronze	75–79	17–18	5–7	N.D.	N.D.	N.D.	
100 AD Roman statue bronze	high leaded, tin bronze	69–87	4–9	6–25	<0.1	<0.1	0.1–4.4	
100 AD Roman brass	brass							
1150–1560 AD	bell metal	80–82	10–12	2.0–3.0	0.2–0.4	3.7–5.5	0.3–0.4	
1580–1750 AD	bell metal	80–81	11–15	1.5–1.7	0.1–0.2	3.0–3.5	0.9–1.1	
1800–1870 AD	bell metal	79–81	16–18	0.5–1.8	<LLD	1.0–1.2	1.2–2.5	
1900–1938 AD	bell metal	74–79	23–25	0.3–2.5	<LLD	0.2–0.4	0.3–0.6	
modern	bell metal	74–78	22–26	1.0	<LLD	0.3	0.5	
IADB no.	Accession no.	Metal type	Cu	Sn	Pb	Ag	Bi, As, Sb, S	Ni, Zn, Fe
<i>Cu-alloy samples</i>								
SF1300	GLSGA:1991/131/2	high leaded, tin bronze A	60.6	22.8	16.6	<0.1	0.3	0.1
SF4112	GLSGA:1991/303	high leaded, tin bronze A	60.8	33.6	5.5	<0.1	0.4	0.1
-	GLSGA:1988/955	high leaded, tin bronze A	63.6	23.5	12.8	<0.1	0.3	0.1
SF7502	GLSGA:1991/560	high leaded, tin bronze A	65.1	24.2	10.7	<0.1	0.6	0.2
-	GLSGA:1988/949	high leaded, tin bronze B	70.7	23.3	4.6	<0.1	0.5	0.8
SF3706	GLSGA:1991/277	high leaded, tin bronze B	70.9	21.0	8.0	0.2	0.2	0.2
SF7500	GLSGA:1991/557	high leaded, tin bronze B	74.4	21.8	3.0	<0.1	0.7	0.6
SF4023	GLSGA:1991/310	leaded, tin bronze B	74.7	23.8	1.5	<0.1	0.5	0.3
<i>Metal samples</i>								
-	GLSGA:1988/1375	leaded brass	76.3	0.0	16.6	0.5	0.0	7.1
SF5201	GLSGA:1998/456	Cu metal with Fe	89.2	0.0	1.3	0.1	0.0	9.1
SF3121	GLSGA:1993/80/6	Cu alloy with Fe	23.4	20.0	4.6	0.2	0.0	23.5

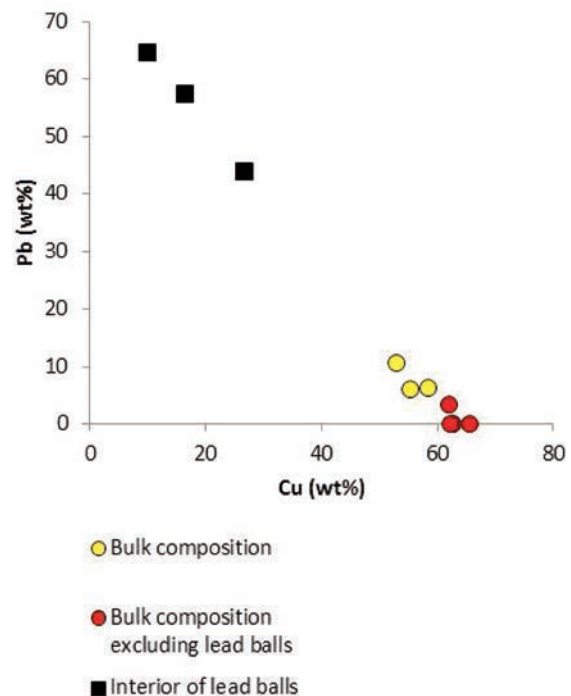
Values in weight percentage; ND = Not detected; <LLD = Less than detection limit, c 0.01 wt%



**Fig 8.50** (A) Scanning Electron Microscope (SEM) image of lead 'ball' embedded in copper metal sample GLSGA:1991/277. Note the crystalline nature of the lead (C), with dendritic crystals approximately  $5\mu\text{m}$  in length,  $0.5\mu\text{m}$  in diameter, and the chilled margins to the lead 'ball' (B), with cooling features (crystal sizes decreasing inwards) denoting that the lead was an immiscible liquid in the copper and may have been added as a lubricant for casting (scales noted on bottom right of each image) (photo and diagram: S Black)



**Fig 8.51** Tin (Sn) versus copper (Cu) plot for SEM analyses undertaken on sample GLSGA:1991/277; sample analyses are for those shown in figure 8.50a-c (diagram: S Black)



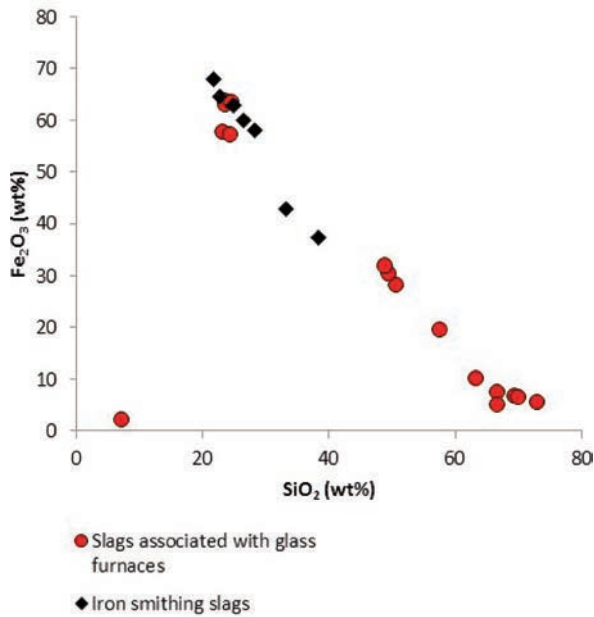
**Fig 8.52** Lead (Pb) versus copper (Cu) plot for SEM analyses undertaken on sample GLSGA:1991/277; sample analyses are for those shown in figure 8.50a-c (diagram: S Black)

compositional range. For example, SF2016 is a leaded copper alloy but has also been mixed with iron. On examination, this sample is not simply a slag residue with a copper alloy but a mixed sample with globules of lead and iron in the copper alloy. This makes it very unusual and of little value as an alloy; hence, it must have been cast for another purpose.

### Slag samples

The analysis of samples identified as slags, or processing residues, is shown in Table 12. Eleven samples are

associated with the glass furnaces, most of which date prior to the Norman period.<sup>302</sup> These materials are composed mainly of a mixture of fayalite (olivine;  $\text{Fe}_2\text{SiO}_4$ ), fused quartz ( $\text{SiO}_2$ ), high-temperature quartz derivatives (cristobalite), feldspar and remnants of organic fragments (opal silica). The slag samples show a range of compositions between high iron content ( $>60$  wt %  $\text{Fe}_2\text{O}_3$ ) and high silica content ( $>60$  wt %  $\text{SiO}_2$ ) (fig 8.53). Samples identified from hand specimen as smelting slags are all predictably high in iron; the slag samples associated with the glass furnaces are varied in



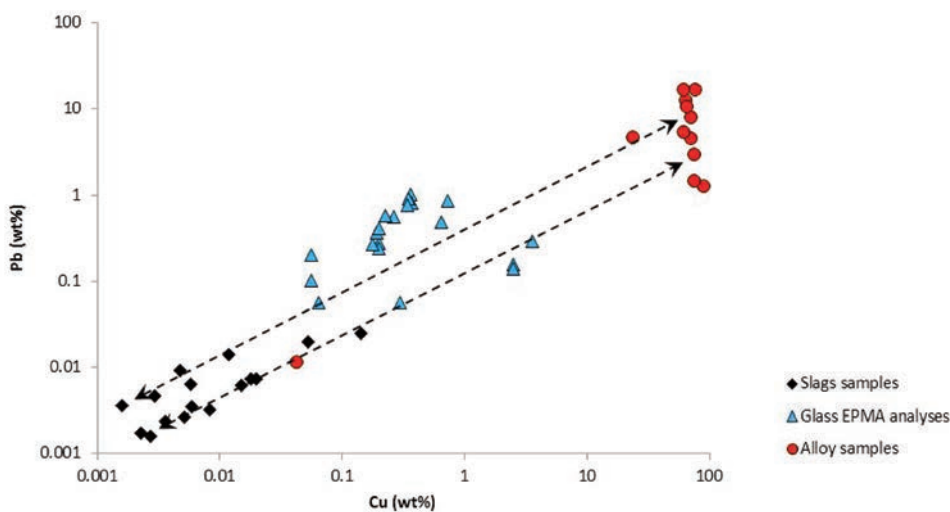
**Fig 8.53** SiO<sub>2</sub> versus Fe<sub>2</sub>O<sub>3</sub> plot for all the slag and residue samples from this study (see Table 12 for details). Note the distinctive linear trend and one sample (SF103; GLSGA:1998/3/316) that does not follow this trend (diagram: S Black)

their composition, but have a larger SiO<sub>2</sub> content. However, many of the high iron content slags (>40 wt % Fe<sub>2</sub>O<sub>3</sub>) came from the vicinity of the glass furnaces or have little contextual information. This indicates that they could easily be multi-purpose or a mixture of residues. Four slag samples are associated with the furnaces and a further eleven came from the vicinity of the furnaces. They all have low iron content (<30 wt % Fe<sub>2</sub>O<sub>3</sub>) and high silica content, with very low concentrations of trace elements.

## Discussion

Residues from copper production can take at least four formats: 1) ore pieces that are unrefined prior to the smelting and heating process; 2) slag residue from the initial firing and melting of the copper ore (this is done primarily to remove unwanted residues of silica prior to refining); 3) smelted, partly refined copper metal from the initial heating process; and 4) refined metal in either ingot or worked object format. This four-stage process can also help to identify the nature of the smelting and furnace processes.<sup>303</sup> Until more efficient furnaces were introduced in the nineteenth century, furnace efficiency was highly variable in the post-Roman period, leading to impure copper being produced from an initial heating process.<sup>304</sup> In addition, the slag residues produced from the initial firing and smelting process are composed of gangue materials (silicate minerals including quartz, feldspar, olivine and pyroxene), ore fragments, charcoal and fragments of the fuel and furnace.<sup>305</sup> This leads to large chemical variation in the slag residues.

Slag residues are the result of two processes: melting slag is created when metal is melted in order to cast it; and slag is produced when ore is smelted. The source for melting slag is created from the metal components, any interactions that occur with the crucible, and from any additional fluxes added to the samples to remove impurities left over from smelting. The fluxes most commonly used are quartz (sand) and lime.<sup>306</sup> For the melting slag process, this slag is removed before the molten alloy is poured (known as skimming). All of this indicates that melting slags are produced from metal



**Fig 8.54** Cu versus Pb plot for the slag metal alloy and glass samples from this study. The samples plot on linear relationships on a log diagram indicating that there are close chemical relationships between the samples (diagram: S Black)

processing or refining on a small scale. Slag samples produced from the smelting of ore materials are slightly different. In this process, ore is first roasted to drive off impurities in the ore (eg sulphur and, in Roman technology, arsenic). This material is then refired with fuel plus the addition of fluxes to derive a metal-rich component and a slag.

Copper alloys are classified according to their components and can consist of copper plus one or more additional metal components (fig 8.49). The most common copper alloys are tin bronze (copper plus tin), leaded bronze (copper, tin and lead in varying amounts), brass (copper plus zinc) and, occasionally, gunmetal (copper, tin, and zinc). Each metal alloy has a different hardness, viscosity when pouring and colour, and therefore a certain degree of variation is expected from each metal composition. For example, on average tin bronze contains from 5% (low tin bronze) to 20% tin (high-tin bronze). Once above 11%, tin in the bronze alloy changes from having tin effectively dissolved in the structure to having tin exsolved as discrete particles in the alloy.<sup>307</sup> This results in the high-tin bronze being weaker and having a lower tensile strength, and hence its use for abrading and cutting is much reduced. Similarly, when lead is added to bronze to produce leaded tin bronze, the copper content of the bronze is c 80–85 wt% with <10 wt% tin, and 5–10 wt% lead. However, this ratio of metal in the alloy reduces the tensile strength, making it weaker and lowering its viscosity, allowing it to be cast and poured much more easily. Leaded bronze, when poured, separates such that the lead and the bronze form two immiscible liquids creating a lubricated alloy. This type of leaded bronze is not suitable for hammering, beating or shock treatment as the addition of the lead will make it shatter and fracture on impact. The samples with high lead content must therefore have been for pouring as a cast.<sup>308</sup> The leaded bronze samples analysed were all cast and were not suitable for shock treatment; this supports the suggestion that they were recycled Roman materials. In addition, these compositions are also distinct from early bell metal and are unlikely to represent bell-making.

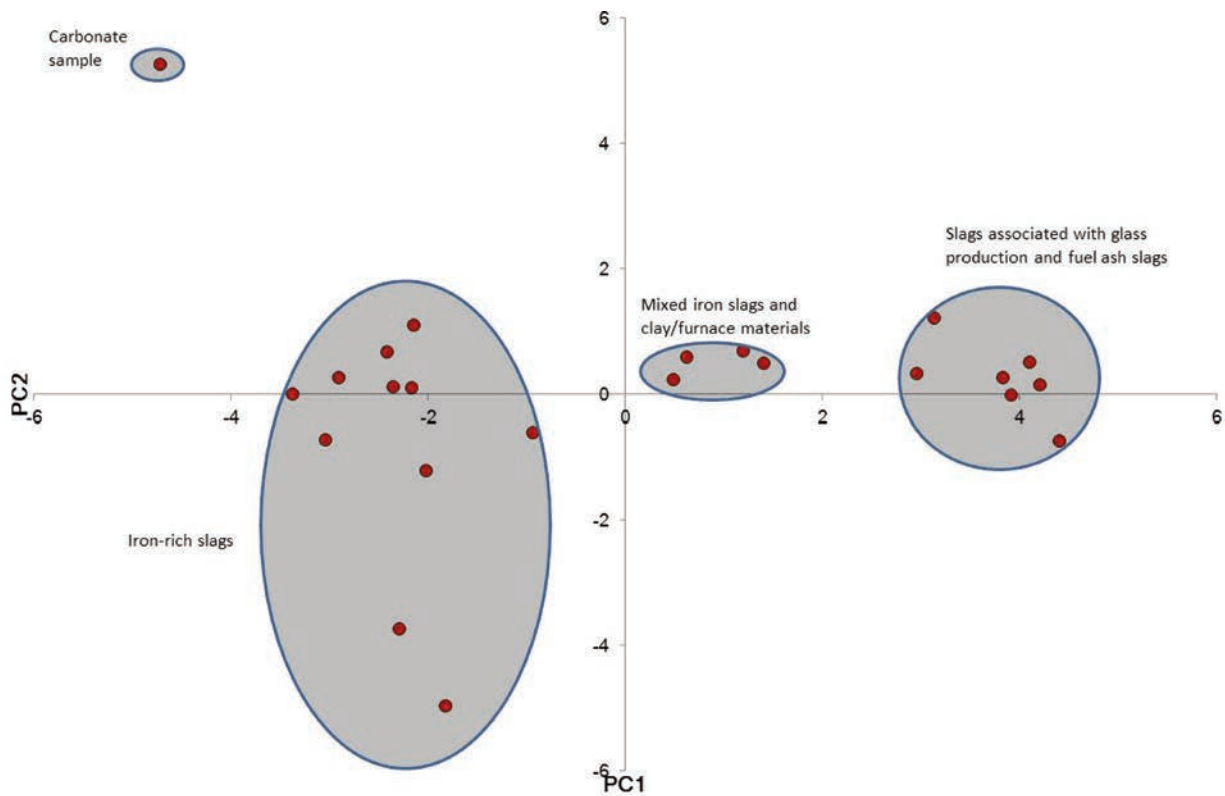
The colour of different alloy compositions is also significant. Pure copper has a reddish, gold colour which quickly oxidises to a dull green.<sup>309</sup> The addition of iron and sulphur to copper has the effect of turning the copper a soft pink colour.<sup>310</sup> Adding zinc, iron and lead to copper to form an alloy has the effect of turning the copper a reddish brown colour (referred to as gilding);<sup>311</sup> whereas the Glastonbury leaded bronzes were turned more silver-red in colour. Brass was often used as an ornamental

metal as it looked very similar to gold; it was used extensively in the Roman period but less so in the Saxon period.<sup>312</sup> The brass samples from Glastonbury contain varying amounts of zinc, iron and lead and would have varied from reddish or greenish (depending on the oxidation of the iron) to brownish-gold in colour. In short, the metal alloys could have been processed for their colour as well as their alloy composition.

This is very pertinent when considering the production of glass; many of the slags and metal residues were found in close proximity to the glass furnaces and one came from a secure stratigraphic context. The need for lime, metal-colouring and small-scale production of metals would be consistent with the glass industry. If this was the case, there should be some sort of linear relationship between the final glass products, the slags produced for the glass processing and the metal components used as colourings. Figure 8.54 shows this relationship for glass samples, slag and metal residues from this study. The glass furnace samples are evenly distributed across the slag samples, although two linear patterns are produced. In order to test whether these relationships are statistically valid, a Principal Component Analysis (PCA) was also undertaken. Figure 8.55 shows the results of these analyses and clearly indicates that the different types of slag are chemically distinct based on contextual types: in other words, slags in the vicinity of the glass furnaces have a distinctive chemistry.

## Conclusions

The alloy metal samples from Glastonbury Abbey show a range of compositions including mixed copper alloy and iron, brass and low- and high-leaded bronzes which are distinctly different from all bell-metal compositions other than modern (post-1900) examples. High concentrations of lead in the alloys (1–17 wt%) occur discretely as balls of crystalline metal as a result of a casting process and strongly suggest that these were recycled Roman leaded bronze materials. Slag samples in the vicinity of the early glass-making furnaces show a large range of iron-rich through to silica-rich varieties. These are the result of iron activities (smelting, iron production) rather than copper processing, due to the low concentrations (<620 ppm) of metals (Cu + Pb + Zn), as well as glass production (high-temperature quartz minerals, soda, lime and plant ash residues). There is a consistent composition between slag residues, glass and metal samples analysed from the contexts suggesting they were part of a glass-making operation.



**Fig 8.55** Principal Component Analysis (PCA) of the slag samples from Glastonbury (diagram: S Black)

## 8.11 Stained and painted window glass

*C Pamela Graves, with contributions from Chris Caple and R Barnett*

### Introduction

The assemblage of window glass from antiquarian excavations at Glastonbury Abbey comprises 2,085 fragments (not including items on display); this represents over 15,952cm<sup>2</sup> in area. The condition of the glass varies: the post-medieval glass is generally well preserved and translucent, with the fragment sizes often remarkably consistent; most of the thirteenth- to fourteenth-century material is opaque and friable, and of varying fragment size; the material identified as 'durable blue', probably dating to the twelfth century, is either well preserved and translucent, or has been subject to heat distortion. Interim excavation reports noted that window glass was found but gave no detailed account of find spot, description or quantity of glass recovered.<sup>313</sup> The major work on the excavated glass is by A R Lewis (1991), an art-historical survey of all the painted glass from the Saxon period to the sixteenth

century.<sup>314</sup> Relatively little of the glass was recovered from contexts for which there is good archaeological information. Much of the material had already been sorted by colour and some by stylistic identification of painted pattern, but there has been no previous effort at quantification.

This report re-examines the excavated material in order to identify the various painted patterns present and their date. The material is analysed according to stylistic motifs and date range, characteristics of production method, grozed shape, colour and colouring technique; the material was quantified by area (in preference to number of fragments). In conjunction with such spatial and stratigraphic data as there is, suggestions are made about glazing schemes, locations, and any transformative processes that the material may have undergone. In order to confirm the identifications of motif, and to establish as far as possible any difference of stylistic 'school' or origin within the excavated assemblage, the material has been compared with glass of known and suggested connection to Glastonbury. Glass related to post-Dissolution activity on the site is also of interest due to the large quantities of clear or white glass.

Of major significance is the recognition for the first time of considerable quantities of durable blue early medieval window glass, confirmed by compositional

analysis to have a mixed soda potash composition. The durable blue glass is likely to date to the twelfth century and presents stylistic affinities to northern French glass-painting. The assemblage of durable blue glass confirms that early glazing schemes at Glastonbury were of the highest quality – for example, comparable to York, Winchester, Chartres and St-Denis. It is suggested that this early glass may have been reused in the rebuilding of the church that followed the fire of 1184, a practice that would be consistent with the abbey's deliberate use of archaic style for ideological purposes.<sup>315</sup> The assemblage has comparatively low representations of thirteenth-century grisaille and later figural glass, perhaps the result of selection and retention policies.

An extended report, methods statement and full catalogue are published online, together with an assessment of glass connected with Glastonbury Abbey and now located elsewhere in the precinct or beyond (at St Patrick's Chapel and the abbot's kitchen within the precinct; St John's Church and the Tribunal Chapel, Glastonbury; Taunton Museum and Taunton Castle; and the Somerset churches of Butleigh, Chilton Polden and High Ham). Separate online reports provide detailed analysis of the lead comes from Glastonbury Abbey and the compositional analysis of durable blue window glass.

## The excavated material

### Romanesque

#### Palmette and acanthus scrolls and leaves

Eleven fragments of acanthus scrolls and leaves were recorded (1–11), in addition to ten fragments of palmette borders (12–21), principally in translucent mid-blue pot-metal but also including opaque (1, 13) and translucent light green pot-metal (9). Palmettes and acanthus leaves are amongst the most frequently occurring of Romanesque and early thirteenth-century vegetal motifs in all media, having their origins in classical art, and transmitted through late antique and Byzantine decoration. They occur both as individually drawn leaves and as composites in borders in major windows in England and France. The semi-circular grozed shapes, and at least one portion of a broken or recut semi-circle probably formed the central point of an arrangement. It is accepted that the design principles of reliquaries and windows are similar and, on this basis, we may compare the Glastonbury palmette borders with the small-scale palmette frieze on the reused Byzantine cloisonné cross panel of the Mosan Stavelot Triptych of c 1150–6/8,

thought to originate at the imperial abbey of that name in Belgium.<sup>316</sup> Palmette and acanthus borders, finely detailed in outline and in internal articulation, are also used throughout the Winchester Bible.<sup>317</sup>

#### Foliolate scroll and trefoil foliage meander borders

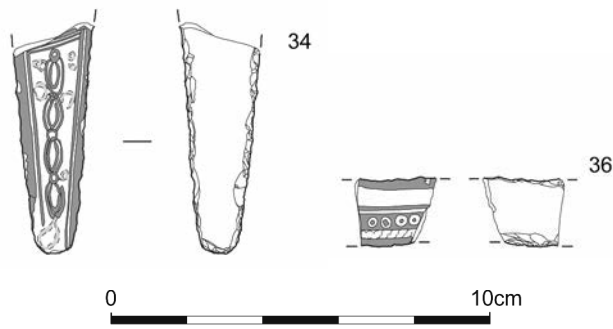
Five fragments were recorded in translucent mid-blue pot-metal (22–26). The tendril-like stickwork pattern is very similar to border patterns excavated in Winchester and dated to the fourteenth century.<sup>318</sup> The length and basic form of the side-alternating units is the same as that of the palmette borders, but whereas the palmettes have at least two widths of stickwork detail, this pattern generally eschews fine detail. Side-alternating trails on a ground picked with extensive stickwork detail occur on both the base and body of the cross of the Crucifixion panel in the *Arche d'Alliance* window of the mid-twelfth century at St-Denis, in the Moses window and in the Annunciation scene in a choir window, both of 1140–4, in the same church.<sup>319</sup> It is also a pattern that is found directly paralleled in metalwork of the second or third quarter of the twelfth century, including the detail of small protrusions where the tendrils split.<sup>320</sup> Given that visually the glass is of the same blue pot-metal as the Romanesque glass, and of the same width and grozing as the early glass, it seems likely that these patterns are also of the twelfth century in this case.

#### Drapery

Six fragments of drapery were recorded in translucent mid-blue pot-metal (27–32). The paintwork identified as drapery mostly consists of deeply recessed or nested V-folds or a number of V-folds set at ninety degrees.<sup>321</sup> The variety of V-folds and slightly curved V-folds (especially the nested, overlapping V-folds of no. 29) are all consistent with mid- to late twelfth-century drapery forms.<sup>322</sup> Catalogue no. 10, if not a foliate detail, may be the kind of internally swirled highlight of drapery visible over the hips and thighs in figures in manuscript illumination such as the Bury Bible, c 1135, and the Winchester Psalter, c 1150.<sup>323</sup> Little more can be reconstructed from these pieces with regard to scale or the nature of the iconography.

#### Miscellaneous narrative designs

Two fragments in translucent mid-blue pot-metal may represent the body of an animal (33) and a decorated sword scabbard or knife (fig 8.56: 34). The deep slope of the animal's chest suggests that the animal is kneeling on its front legs, the front paw of which divides into three very distinct claws. This appears to be a very small-scale



**Fig 8.56** Romanesque stained glass 34 and 36

lion or possibly griffin, of the elongated claws of the St-Denis griffins, dating to 1141–4.<sup>324</sup> The possible sword scabbard suggests a narrative theme with soldiers or knights. Throughout the Romanesque period, in stained glass and in manuscript illumination, much armour and weaponry was portrayed in the colour blue, presumably as an approximation to the colour of steel.<sup>325</sup> At least one scabbard in the Winchester Bible is depicted as decorated with a central meander pattern highlighted from the main colour in a way analogous to stickwork in glass, although the main scabbard colour here is pink, against a general background of blue.<sup>326</sup>

#### Border and diaper patterns

Five fragments of stickwork beading were recorded in translucent mid-blue pot-metal of four different types of design (35–39; fig 8.56: 36). Six fragments of stickwork lozenge and bead pattern were recorded in translucent mid-blue pot-metal of five different types of design (40–45). One characteristic of these repeated patterns or diapers (a description usually applied to later medieval work) is their extremely small-scale and fine execution. There are at least two variations on the circles and squares or lozenges theme (G14 (40); G22 (42); G24 (41)). Lozenge and bead patterns (or ‘crosshatch with pinpoints of light in the centers’) were used in ornament now located in the retro-choir tribune of the abbey church of St-Remi, Reims, dated to c 1170–80.<sup>327</sup>

In manuscript illustration, lozenge-based or cross-hatched patterns were used to represent textiles, for example the bed on which King Henry is sleeping when he has his vision of peasants in the *Chronicle of Florence and John of Worcester*, c 1130–40, Worcester Cathedral Priory.<sup>328</sup> Variations on the lozenge and bead design occur repeatedly throughout the Winchester Bible as floor or roof tile patterns.<sup>329</sup> Cross-hatching was a technique used widely in metalwork – where chased surfaces bordered or formed the background for other

metalwork techniques on champlevé enamels of the Romanesque period, particularly reliquaries, triptychs and ornaments of Mosan and Rhenish origin – and might be one of the patterns most easily evoked in glass painting. The larger lozenge / cross pattern represented by number 43 may be the glass equivalent of patterns found in architectural sculpture of the mid–late twelfth century; for example fragments of 1140–5 from Lincoln Cathedral, and the door to the late twelfth-century hall of Durham Castle.

The appearance of the glass, the metal itself and the consistent corrosion patterns strongly suggest that this comprises one category and period of glazing. Consequently, patterns have been identified within the early glass that were not detected by Lewis.<sup>330</sup>

#### Bead-and-reel design

Six fragments were identified in dark blue and translucent mid-blue pot-metal (46–51). This pattern is not a conventional bead-and-reel, given that there are normally paired (or more) upright elements in classical bead-and-reel; here there are circles. The format is more like the medieval convention for a jewelled border or hem, used from the eleventh century and throughout the Middle Ages. In such jewelled borders, the elongated bead or ellipse often has at least one line of emphasis on one side. Here, however, the distinguishing element is the number of emphasising lines on either side of the elongated bead or ellipse. Three fragments of durable blue early medieval window glass of the Winchester Group 3 were painted with drapery folds and a ‘jewelled’ border, dated by Kerr to the twelfth century.<sup>331</sup> Even so, the ‘jewels’ of these three fragments are very much simpler than the Glastonbury patterns.

The bead-and-reel passed into the Romanesque repertoire from classical and late antique art and appeared in many media and in many variations, not only as a border pattern, but as representative of lathe-turned stonework and woodwork balusters. A bead-and-reel pattern constructed mosaic-like from separate pieces of glass for each bead-and-reel was used to emulate lathe-turned wood on the uprights of an emperor’s throne at Strasbourg in the late twelfth century; it occurs as an elaborate linear stickwork design in the glass borders preserved c 1170–80 in York Minster.<sup>332</sup>

#### Unidentified or miscellaneous designs

Ten fragments exhibited miscellaneous designs on translucent or semi-translucent mid-blue pot-metal (52–61), including Lombardic script (52) and overlapping scale pattern (61).



## Discussion

In total, more than 1,347cm<sup>2</sup> of the Glastonbury assemblage is identified as early (Romanesque) glass, principally early blue with smaller quantities of opaque glass with side-curling acanthus or palmette (4cm<sup>2</sup>) and light green glass painted with a variation on the fleur-de-lis or lily (8cm<sup>2</sup>). At least 28cm<sup>2</sup> of creamy or streaky blue were identified.

These identifications were not based on painted decoration alone: instead, the colour and nature of the glass were considered, how it has weathered (a distinctive iridescent weathering, often quite white / white opal but ranging through to a deep multi-coloured, or black opal, iridescence in some instances), the close-set, often very precise, nature of the grozing and the occasional heat-distortion of the material. In addition to this, it was evident that the paintwork survived in different ways and to different extents. On very few pieces was the original dark paint still discernible. In most cases it was traceable as a faint fawn to white colouring; in many more instances the paint was hardly detectable to normal inspection at all. As a consequence, all the blue fragments were subjected to scrutiny under a variety of lighting conditions.

There are some extremely fine, carefully grozed shapes amongst this material;<sup>333</sup> there are numerous curved or tapering round-ended shapes (G14, G22; c 16.25mm wide × c 53.68mm long). The bow or bracket shape is similar to shapes used frequently to depict waves: for example St Peter walking on the water from the axial chapel window of Sens Cathedral, possibly of the 1150s.<sup>334</sup>

The bead-and-reel, linear beaded patterns and linear palmette borders may all have been used in ornamental strips and knotwork, which bounded some border designs; for example the two pieces of border from the *Infancy of Christ* window of St-Denis in the Victoria and Albert Museum, dating to c 1140–4.<sup>335</sup> Given that the Glastonbury fragments tend to be grozed to particular repeated modules of length, width and shape (straight and curved), it seems likely that they originated in the borders, if not of these direct designs, then something in this vein. However, another source is possible, suggested by a combination of other shapes and designs. The repeated vesica shapes – one of which certainly had a grozed concave curve at the bottom – along with the partial roundel with a concave curve at the bottom suggest repeated geometric shapes leaved around a central roundel. Geometric shapes like quatrefoils and sexfoils, centered on roundels and squares, and bounded

by strapwork, made up the principal design elements of windows such as those from the retro-choir tribune of St-Remi.<sup>336</sup> Since two of the St-Remi designs employed variations on the crosshatch / lozenge-and-bead ornament, the Glastonbury assemblage includes several elements or design motifs that could be said to be part of the vocabulary of contemporary northern French glass-painting.

Some of the motifs are directly paralleled in metalwork and manuscript illumination in both France and England of the second to third quarter of the twelfth century: Mosan and Rhenish *vernis brun* metalwork, in particular, share manufacturing characteristics involving the scraping away of darkened oil to reveal an area of trefoil foliage meander, cross pattern or diaper pattern.<sup>337</sup> Many of the beaded and stickwork borders and patterns can be paralleled in metalwork and enamel work of this period. It is noticeable, however, that all these shapes – and indeed the majority of this collection – consists of very small pieces. This, and the attention to minuscule detail in the paintwork, suggests something about the level of investment in this medium, both artistically and in terms of the patronage. It may also suggest something about the scale and visibility of the windows.

A number of sites have produced twelfth-century glasses that have proved highly resistant to corrosion when compared to other contemporary and later glass. The light blues of the St-Denis and Chartres west windows have survived in this way, albeit that some of the St-Denis glass has not been exposed to weathering or industrial pollutants since the eighteenth century.<sup>338</sup> Excavated glass from York Minster and Winchester has similar properties, which is extraordinary given that they have lain in the soil for such a long time. SEM analysis of three samples of the Glastonbury blue confirms that they have a mixed soda potash composition, with the presence of copper in all three and cobalt in two of the three samples giving the distinctive blue colouration. These analyses correspond well with Cox and Gillies Group 1 glasses and Biddle and Hunter Group 3 glasses, a durable soda lime blue glass, primarily coloured by cobalt, or cobalt and copper.<sup>339</sup> Normally derived from tenth- to twelfth-century contexts, it is frequently reused and present in later stained glass windows.

A high proportion of the early blue has been subject to heat damage. It was noticeable that in many cases the heat distortion was greater on the outer, unpainted sides than on the painted surfaces. In the case of the worst-affected of the border strips, the glass had almost folded around the unpainted surface, leaving the painted surface as an external skin. This begs the question whether the

paint inhibited the rate of melt in the glass, protecting these surfaces; or whether the fire started on the exterior of the building, or at least exterior in relation to the position in which this glass was installed?

## Post-Romanesque glass

### Thirteenth-century grisaille

Eight fragments of opaque glass were recorded (62–69), representing at least 89cm<sup>2</sup> of this type of grisaille (with a further 7cm<sup>2</sup> of possibly related stickwork beading).

Compared with most excavated assemblages of window glass from monastic sites in Britain, there is surprisingly little identifiable thirteenth-century grisaille. The scale and crudity of number 65 implies that this may have been located in a position in a window far from the eye, whereas the scale and fineness of the cross-hatching from number 67 is more akin to most grisaille of this period. There is insufficient representation of this type of pattern to be able to make specific statements about comparison with Salisbury grisaille, the most famous representation *in situ* in the region. According to Marks, there is no evidence for this type of grisaille before the beginning of the thirteenth century.<sup>340</sup> There are stylistic distinctions between, for example, French and English grisailles, but these tend to relate to how either interlacing or 'layering' of geometric planes is represented in the treatment of the lead work and painted straps or bands. Without a substantial representation of grisaille motifs and the relationship between the leading and the glass designs, it is difficult to make any more interpretative comment. However, the five-lobed design and the relationship of the curling stem to the painted strap may be a characteristic feature. There are no identifiable pieces of twelfth-century grisaille.

### Late thirteenth- to early fourteenth-century grisaille

Thirteen fragments of translucent white to opaque glass were recorded (70–82; fig 8.57). Number 70 is painted with a wide bow or cup in reserve from a solid ground, with a central stem, highlighted in yellow stain, and an acorn to the right-hand side; ivy and oak leaves were also represented. The finer quality painting represents 149cm<sup>2</sup>.

### Quarry edges and strapwork

Three fragments showed a distinctively painted quarry edge (83–85; 15.5cm<sup>2</sup>; fig 8.57). Naturalistic foliage featuring vine leaves, oak leaves, ivy and maple leaves were illustrated in English manuscript illumination by c 1270; and featured in architectural sculpture in the late thirteenth to early fourteenth centuries. The use of

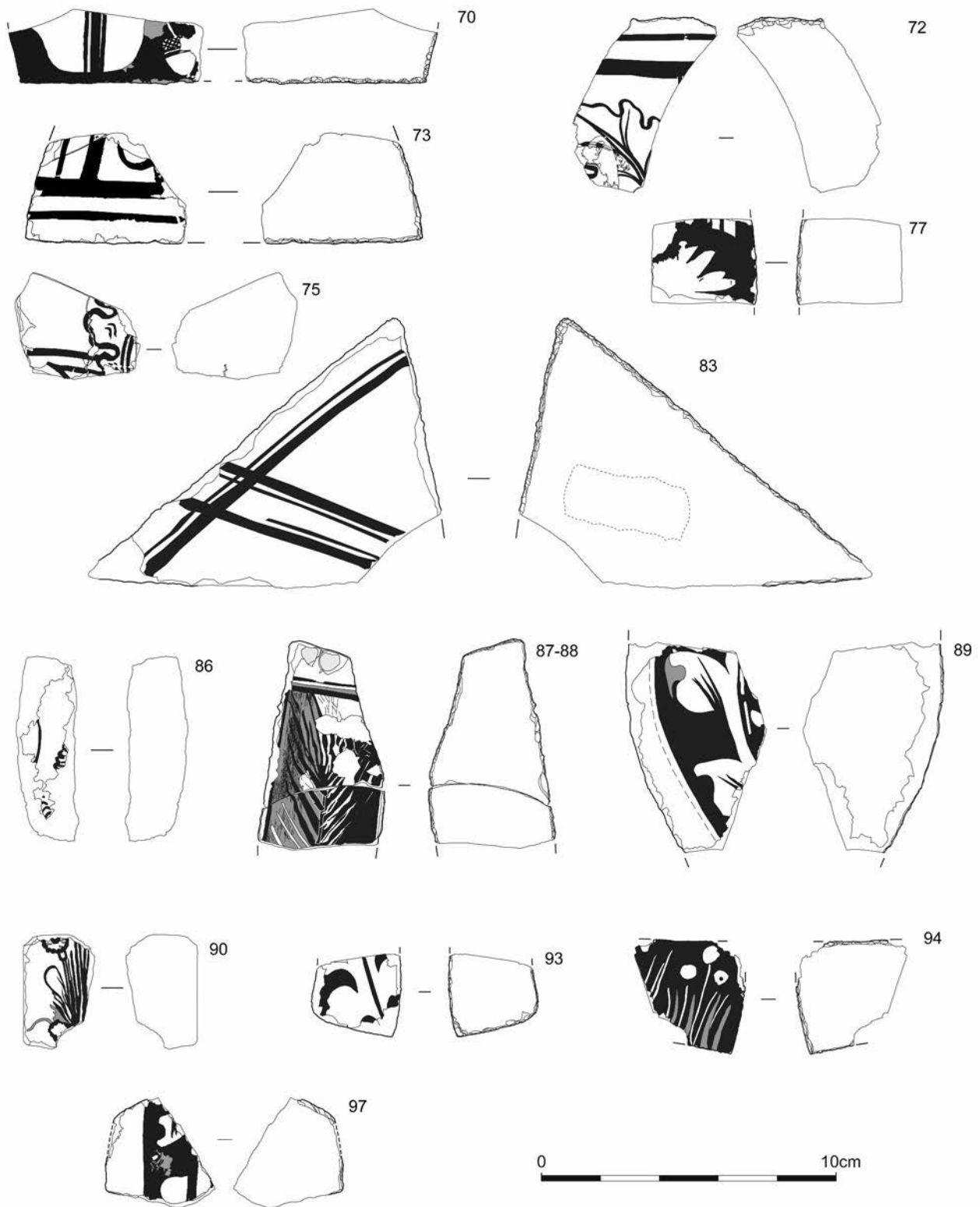
naturalistic foliage in English stained glass seems to have occurred slightly later, but the windows of the Chapter House vestibule at Wells Cathedral featuring ivy leaves may have been amongst the earliest manifestations, dating to c 1286.<sup>341</sup> It is possible that some grisaille at Exeter dates to the 1280s, but amongst the most cited examples are the windows of the Chapter House at York Minster, c 1285–90, and Merton College Chapel, Oxford, c 1294.<sup>342</sup> The Glastonbury examples are rather fragmented, and it is not really possible to establish an affiliation to 'schools' of artistic production at this time, but the glass is certainly of this date bracket. There are also examples of oak leaves and probable oak leaves; all this material has painted strapwork or bands.

The grisaille is unlikely to have been used on its own but to have featured in so-called band windows, in which the glazing formed alternating horizontal bands of grisaille and figured glass. This form of glazing was probably introduced from France, appearing at Tours Cathedral in the 1260s.<sup>343</sup> Naturalistic grisaille was certainly used in England, in conjunction with figured panels – usually under micro-architectural canopies – in York Minster and Merton College Chapel; this type of window became widespread in the early fourteenth century. The implication is that the grisaille was part of a suite of contemporary painted designs that would have been used in any single glazing programme of the time. The Glastonbury assemblage has therefore been searched for indications of micro-architecture, background patterns, figural and animal detail and border patterns that may have complemented the grisaille settings.

Pieces from the edges of grisaille of this period are not necessarily diagnostic in themselves, as without accompanying floral or foliate designs they cannot be identified and dated with certainty. The glass tends to be of a consistent thickness and reacts within the soil to produce the opaque, corroded products typical of much thirteenth- to fourteenth-century glass. However, it is clear that the edges, painted with straps or bands, are more highly represented than the central foliate elements of the designs. This perhaps tells us more about the processes by which glass was extracted from the comes for reclamation of the lead. In other words, the lead was valued, not the glass, and in recycling the lead no great care was taken to preserve the integrity of the panes.

### Quarries

There was one quarry fragment of mostly transparent white glass (fig 8.57: 86), a Somerset / Wells quarry design of the fifteenth century. Woodforde recognised that there are variations on quarry designs specific to, or



**Fig 8.57** Post-Romanesque stained glass 70, 72, 73, 75, 77, 83, 86, 87, 88, 89, 90, 93, 94 and 97

at least indicative of, Somerset glass. Some of these patterns appear within the Wells Cathedral windows, with an extended typological range identified by Ayers.<sup>344</sup> The tendrill trail is the most recognisable motif and can be compared with those excavated from Winchester Castle and St Mary's Abbey, Winchester.<sup>345</sup>

#### Floral and foliate patterns

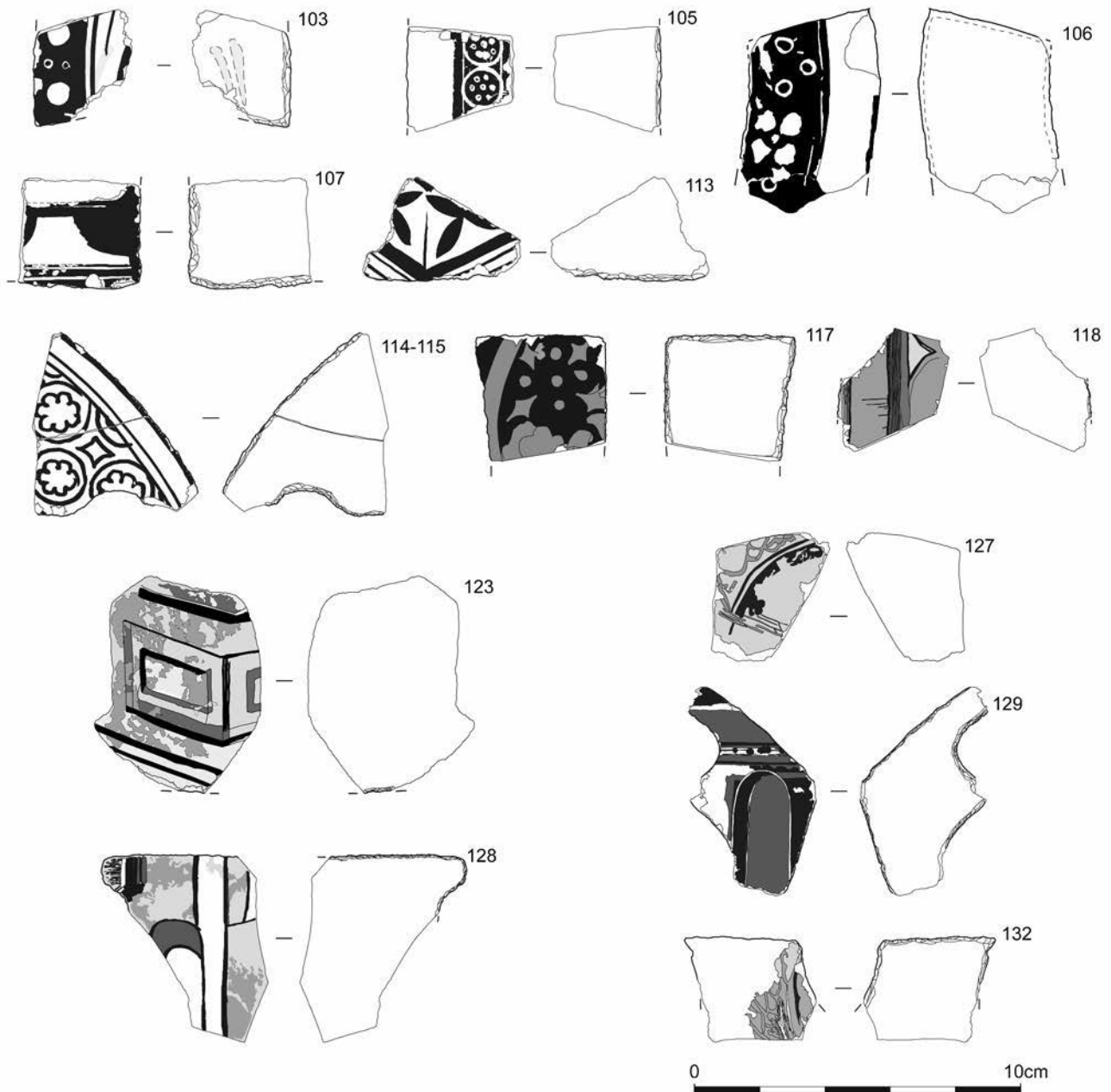
Fourteen fragments were recorded of translucent to opaque white and transparent to opaque blue pot-metal (87–100; fig 8.57). Foliage designs were used from the late eleventh century onwards in English glass. Certain

conventions of design are characteristic of different periods, however, as has been seen with the Romanesque glass and the stylised foliage of the thirteenth century. In the early fourteenth century, in particular, certain foliage patterns were used as backgrounds against which figures were placed, usually under architectural canopies (see below). Some details, which may be part of diaper patterns, are so isolated that they have been classed here, however. These include number 96 as well as 97 (fig 8.57), the example from G31, which resembles a rinceau commonly used in the 1320s–40s in Yorkshire. The Glastonbury fragment, however, has been reserved from a far thicker area of matt paint than is usual for rinceaux.

Foliolate designs were used particularly from the early fourteenth century to fill the backgrounds of architectural canopies and figural glass. Number 89 is this form of foliage, though its use was fairly widespread in England. The long tear drop / loop leaf of number 90 resembles shapes frequently used in the ‘Somerset’ type of quarry, and resembles a small-scale version of flower heads and long tear drop / loop of quarries in the Old Deanery porch at Wells Cathedral (sI 1a), dated to c 1472–98.<sup>346</sup>

Beaded and other border patterns

Ten fragments were recorded (101–110; fig 8.58) and a further 4.5cm<sup>2</sup> from group G31. A range of beaded and



**Fig 8.58** Post-Romanesque stained glass 103, 105, 106, 107, 113, 114, 115, 117, 118, 123, 127, 128, 129 and 132

stickwork border patterns are represented, some of which were used throughout the Middle Ages and were not particular to any one period. Nonetheless, the examples described here can be compared with patterns in extant windows. The most extensive sample from Glastonbury has been preserved in the framed glass, namely the running lozenge-and-circle pattern. This combination could have formed a decorative border of alternating roundels and strips. It may even have been used within a grisaille design of the thirteenth century. It is noticeable that many of these stickwork patterns are relatively crude in execution, whereas stickwork could be immensely detailed and fine (contrast, for example, the stickwork patterns on blue pot-metal identified as Romanesque in this assemblage).

#### Rinceaux and diaper patterns

Seven fragments (111–117; fig 8.58) were found, including one of opaque flashed ruby glass (111). Whilst some of the diaper patterns here were most probably used as grounds for figural glass and for architectural canopies in particular, one might have expected a greater range of types of diaper and rinceaux, particularly the more common forms used in the West Country. The hawthorn-type leaf (77) may in fact be a fragment of background leaf diaper, similar to that seen amongst fragments from the Chapter House at Wells Cathedral.<sup>347</sup> The pattern in numbers 114–115 resembles one used as a background in the early fifteenth century, for example a form of wall-painting or tapestry in an architectural setting (in 1g) of the Great East Window of York Minster.<sup>348</sup>

#### Micro-architecture

Twelve fragments were identified representing crockets, cusps, column bases, arches and buttresses (118–129); a further six shaded fragments are probably architectural (130–136; figs 8.57 and 8.58); a final fragment may be either anthropomorphic or architectural (137).

A number of these pieces are painted with parts of design, too fragmentary in themselves to be accurately diagnostic, but they are forms recognisable in surviving window glass. The representation of canopies in window glass was at first very two-dimensional. Three-dimensional depiction was used in the choir clerestory glass of Wells Cathedral in the early 1340s.<sup>349</sup> More sophisticated renderings of depth, recession and perspective were conveyed by use of shading, highlighting and angle of line. Different periods used different forms of crocket decoration for canopy gables, pinnacles, cusped openings and arches, and offsets and niches on the side-shafts or buttresses supporting the canopies.

Furthermore, different ‘schools’ developed distinct traits in depicting these elements. By far the largest category of micro-architectural depiction represented at Glastonbury is the side-shaft. From the 1340s onwards, architectural canopies and their side-shaft supports in Wells Cathedral, and more generally in Somerset, as elsewhere in England, were depicted on white glass with yellow stain highlights. Particularly in the late fourteenth and fifteenth centuries, when depth and three-dimensional depiction is prominent, fragments of these design elements are only recognisable as having angled lines and graded shading, with an increased use of scratchwork highlighting. The cylindrical column and base (122) is perhaps typical of the early fifteenth century, as seen in, for example, the Great East Window of York Minster.

The use of shading and highlighting to depict recession is represented in catalogue numbers 123, 126 and 136 (figs 8.58 and 8.59). These could be portions of the bases of the supports of architectural canopies, or they could be solid balustrades with recessed rectangular panels or mouldings.

It is also interesting to note what appears to be missing or under-represented at Glastonbury compared with many other excavated assemblages. This includes castellated features, such as the merlons, towers, cusping and offsets of the early to mid-fourteenth century or later, especially as castellated features occur in the superstructure of canopies of the choir clerestory windows in Wells Cathedral;<sup>350</sup> tiled floors (although there may be at least one example); cross-hatched window recesses of the late fourteenth to fifteenth centuries; pinnacles and pinnacle neck-rings; and the characteristic ‘scumbled’ shading of the undersides of canopy vaults of the fifteenth and early sixteenth centuries.

Architecture is the single biggest category that allows an indirect inference of the presence of figural representation to be made. In conjunction with drapery fragments, the picture overall is of a (proportionately) large presence of late fourteenth- to fifteenth-century windows.

#### Heraldry

Only one fragment (fig 8.59: 138) was identified: probably a lion, *passant gardant*, in reserve from plain ground and now completely opaque. Heraldic borders began to feature in English stained glass windows towards the end of the thirteenth century at Merton College Chapel, Oxford, and in York Minster Chapter House in the first half of the fourteenth century.<sup>351</sup> Lions or leopards *passant gardant* were extremely popular as border motifs, and the scale of the Glastonbury fragment is consonant with a border location. Wells Cathedral, in particular,

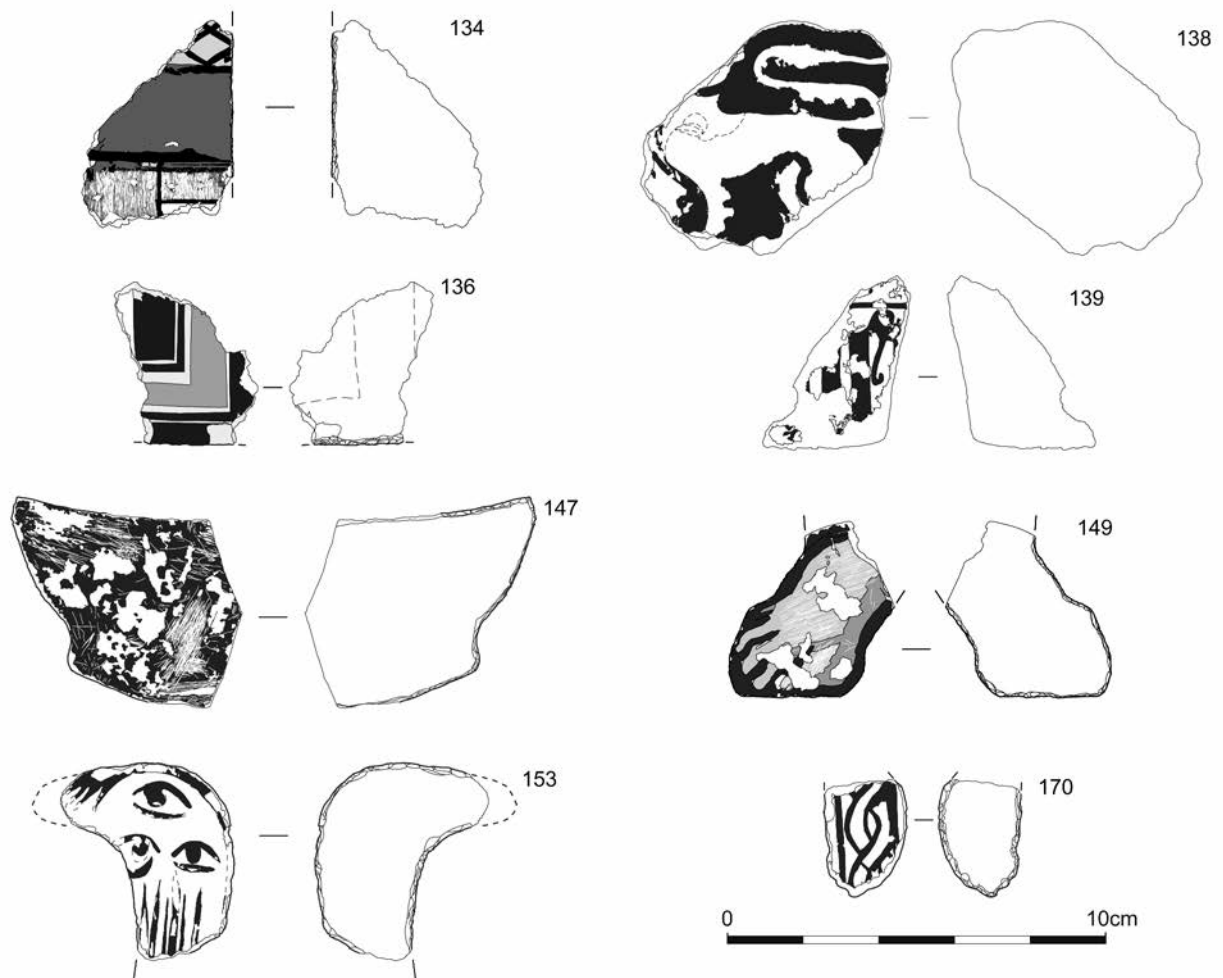


Fig 8.59 Post-Romanesque stained glass 134, 136, 138, 139, 147, 149, 153 and 170

used the lion *passant gardant* border motif in alternation with crowns, and both could be seen as indications of loyalty to the reigning house. Examples can be found in Wells windows EI 6–7d and SIII 2–3a.<sup>352</sup> The Wells type of lion has noticeably projecting ears and whiskers, and the Glastonbury example has one scratched whisker, but has been broken off before the ear.

Ayers notes that lions have a hierarchical significance at Wells, and possibly an iconographical one as well.<sup>353</sup> In borders, they may play an equivalent part to beasts in the marginalia of manuscripts, but in windows they may also evoke royalty, both as a specific allusion to the heraldry of the kings of England and because bestiaries refer to the lion as the king of beasts. He argues that the lions in the Lady Chapel glass of the early to mid-fourteenth century at Wells evoke the royalty of Christ and the lions of the Throne of Solomon. The latter imagery informed the iconography of the thrones and the seals of Henry III and Edward I. At Glastonbury Abbey, Leland reported that lions supported the monument to King Arthur, who had been interred in 1278 in the presence of Edward I, and

thus the use of lions in windows here may have had an additional resonance.

#### Inscription

One fragment (fig 8.59: 139) and at least seven conjoining fragments (140) were found of letters in solid paint against a plain ground in Gothic Black Letter script (*textualis quadrata*) with elaborate serifs and decorative terminals, in at least two registers. In later medieval stained glass, Black Letter text accompanied the depictions of saints and recorded the names of donors; they also referenced parts of the liturgy and evoked particular feasts and fasts. In certain contexts, contemporary poems were written out as sub-text to figural or narrative glass. The ornate serifs, decorative terminals and stops or word spacers here suggest a date in the mid- to late fifteenth century.<sup>354</sup>

#### Shaped fragments

Grozed shapes (as seen in the seven fragments, 141–147; fig 8.59) can often indicate something of the sort of space

which they filled; for example, tightly curved glass fitting into the multi-cusped (usually cinque-foliated) heads of late fourteenth- to fifteenth-century lights. This may explain number 141: a fragment of translucent pot-metal green with a grozed and curved outer edge. The grisaille of the early to mid-thirteenth century often used geometrically shaped panes to complement the painted designs and this may explain the origin of the tear-shaped piece, number 145. At least two examples had been carefully grozed to have a protruding hump or hook (142–143), and these may have echoed or accommodated some aspect of architecture, for example the shapes surrounding the neck-ring at the base of a micro-architectural finial.

As an excavated assemblage the Glastonbury material is notable for its relative under-representation of what are often called glaziers' side strips, frequently recurring rectangular or rhomboidal strips of unpainted white glass that were used as a frame of white glass between the main panels and the stone or wooden embrasure into which the panels were sunk or affixed. Curved pieces of the same width and equivalent length would continue this plain frame around the curves and cusps of the heads of windows. Whilst the exact width of such strips might vary between periods or campaigns, they tended to be very consistent, at least in terms of width, within each window. In many assemblages from monastic contexts there is a fair representation of this type of glass, suggesting that the margins of windows have been left to enter the archaeological record, whereas the pictorial centres of the windows were either broken up and removed, or separated from their surroundings for sale or reuse elsewhere. This point is illustrated at Clarendon Palace, Wiltshire, where one season's assemblage of window glass amounted to only four pieces, but of these one was a plain, rectangular side strip.<sup>355</sup> The relative paucity of side strips at Glastonbury may indicate a very thorough stripping of the windows at the Dissolution.

### Figural details

Two fragments of white glass showed figural painting. One (148) has a combination of fine stipple and smear shading: a human eye and brow are discernible as a combination of outline and scratched highlights, as is part of the ear; the hair is largely shaded, highlighted and coloured in yellow stain on the outer face, indicating a fifteenth- to early sixteenth-century date. The other (fig 8.59: 149) is late fourteenth to fifteenth century, painted with either a human foot or an animal claw in reserve and moulded with shading.

### Drapery and other figural attributes

Two fragments of drapery (150–151) and one possible drapery (152) were identified. Other attributes include part of a wing (fig 8.59: 153), possible parts of armour (154–155) and two fragments of partially translucent flashed ruby showing rays, such as those of a halo (156–157).

Of these, the most significant is number 153 (fig 8.59), in semi-opaque white glass, grozed all round. It is painted with tapering lines at the top left-hand side and three eyes – one at the top, two beneath – and tapering lines beneath, with part of a wing. This piece was tentatively identified by Lewis as the wing of a seraph or the Beast of the Apocalypse.<sup>356</sup> There are references in the Bible and the Apocalypse of the Virgin to many-eyed cherubim and six-winged seraphim, and in many places the attributes of many eyes are given to the seraphim as well. Seraphim are depicted with eyes scattered across their wings in the vault mosaic of Cefalù Cathedral, Sicily, dated *c* 1150, and both seraphim and the Beasts of the Apocalypse / Evangelists have eyes on their wings in the Bury Bible (*c* 1135) and the illuminated initial of the vision of the Prophet Ezekiel in the Winchester Bible.<sup>357</sup> In a scene from the Winchester Psalter of *c* 1050, Christ is shown being tempted by the Devil who has a wing with exactly three eyes on the upper part, and long tapering wing feathers below.<sup>358</sup> Lucifer was, of course, a fallen angel. The wing must have been depicted with longer lower wing feathers originally, either in a separate piece of glass, or on this piece when it was a longer shape. Since this lower edge has grozing it may reflect a breakage and re-leading at some point. Presumably, there would have been six wings in the original design from which this fragment came, unless it was a more or less faithful copy of the Winchester Psalter Devil, who only has one many-eyed wing.

Since the piece came from group G22, Lewis felt that it was a piece of mid-twelfth-century glazing, along with the early blue material. This fragment is definitely white, and is of the thickness and weathering condition akin to potash glass from the late twelfth through to the early fourteenth centuries, so that the condition of the glass does not help in dating it. There are fragments of a range of dates in this context. However, the iconographical currency of the many-eyed seraphim / cherubim is persuasive of a date from the mid-eleventh to mid-twelfth centuries.

There is at least one portion of a book in the assemblage, represented by G220, encased in the separately leaded glazed frame held in the museum store.

This depicts a book in three dimensions, with the leaves conveyed by scratchwork through a wash of paint. The cover is depicted in a thicker wash, and part of a cover decoration has been picked out in stickwork and highlighted in yellow stain. Books representing sacred texts are a common attribute of saints, clerics and scholars.

## Discussion

Figural glass, other than drapery, tends to be under-represented in excavated medieval window glass assemblages relative to its former dominance of the glazing schemes of most periods and institutions. The reasons for this may be to do with iconoclasm, but the pattern is so widespread that there may be other factors (considered below). A possible foot or claw is formed in reserve from a matt ground, on thick glass, which is largely opaque from the progress of corrosion (fig 8.59: 149). It has not proved possible to specify whether this is a human or animal foot as neither toenails nor claws are depicted. This is a much earlier depiction than is represented by the head. Again, this is a relatively small scale of depiction.

The largest category of anthropomorphic representation is undoubtedly drapery / textile. Whereas details of different kinds of drapery fold can be seen in numbers 150–151, and these have come from very small-scale figures, the greatest proportion of drapery fragments must come from figures of a larger scale. By the later Middle Ages a great deal of drapery was conveyed by combinations of shading and highlighting to depict the three-dimensional moulding of the fabrics around figures and as they fell towards the ground. In a large-scale figure, this means that large expanses of fabric have no other details than just this shading and moulding. When this has been broken up, the fragments may not look very convincing in isolation. Certain repeated painted patterns, such as simple roses or flowers, were used to convey fabrics, especially highlighted in yellow stain, but it has not been possible to identify any of this amongst the excavated fragments.

## Miscellaneous colour (painted and unpainted)

A detailed discussion of colour and shades can be consulted in the online report. In summary, the assemblage can be characterised as follows:

- 672cm<sup>2</sup> blue pot-metal in total (not including the ‘early blues’)
- 7.5 cm<sup>2</sup> turquoise pot-metal

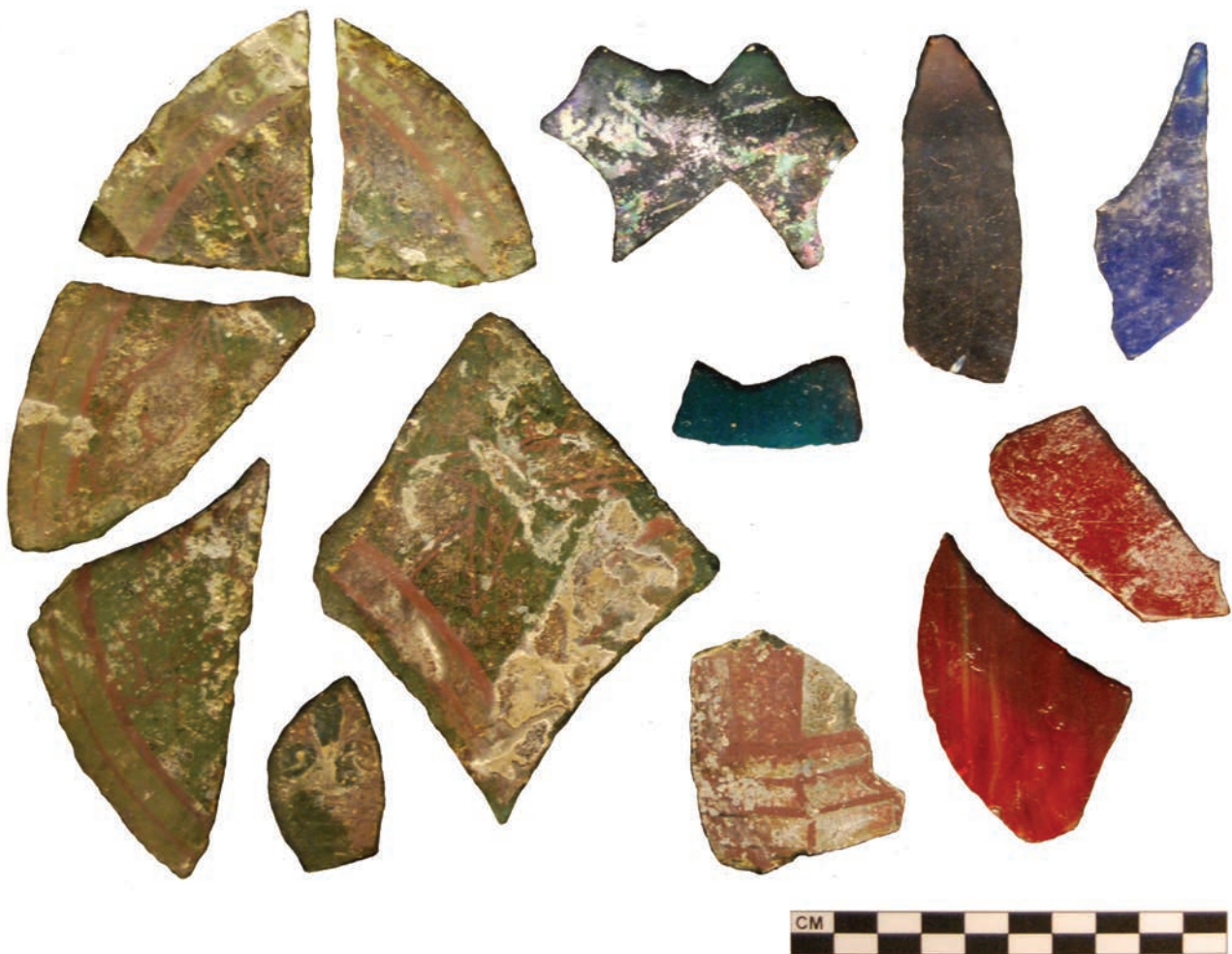
- 212cm<sup>2</sup> green pot-metal
- 406cm<sup>2</sup> flashed ruby
- 342cm<sup>2</sup> murrey
- 55.5cm<sup>2</sup> yellow pot-metal
- >450cm<sup>2</sup> total yellow stain

Whilst some deep blues can be attributed to the later Middle Ages, thanks to their painted detail, a particular shade of grey-blue was also popular. The turquoise pot-metal is extremely similar in colour and metal to the Anglo-Saxon turquoise examples from Glastonbury. However, one example (178) clearly has applied yellow stain, indicating a date after *c* 1320.

Recent research has demonstrated that flashed ruby glass was produced by a complex technology in which multi-layered glasses were formed by the incomplete mixing of an oxidised high-Cu and a reduced low-Cu glass. The red colour forms due to the diffusion of oxidised copper into the reduced glass and the nucleation and growth of metallic copper during heat-treatment.<sup>359</sup> A great deal of the Glastonbury ruby glass has a fine layer visible through the chipping of the edges. Glass that appears to be ‘red streaky’ occurs at least three times in the Glastonbury assemblage (G18, G28 and one unknown context in the separately leaded glass frame held in the museum store (fig 8.60)). On close inspection, however, the Glastonbury streaky appears to be flashed ruby that has had the ruby layer abraded to produce a variety of reds, pinks, and white glass. The differential thickness of the surfaces can be felt with the human hand on the loose fragments. Consequently, it is likely that the red streaky glass encased in the glazed frame is also a product of controlled abrasion techniques. However, there is at least one fragment that does appear to be genuinely streaky or reamy red, from G18 (214). Glass described as ‘red streaky’ occurs at Wells, for example, in the eyelet sII A4b, beside the St Wulfstan trefoil, dated to *c* 1325–30, and elsewhere.<sup>360</sup>

The murrey glass in the Glastonbury assemblage occurs in variations from pink, to light and mid-lilac, to a deep dark purple. The pale murreys (pink and lilac-pink) are often badly corroded, and this may be due to the deterioration of the specific colourants within the metal in conjunction with the soil conditions. The condition may, however, also be indicative of relative age. Some of the deepest purple occurs in large fragments of fairly consistent thickness, and can be judged to be late medieval. Broad pieces of deep murrey were used for garments in much late medieval glass composition, and this seems to have been the case with some of the Glastonbury examples.





**Fig 8.60** Selected stained glass in the Glastonbury Abbey Museum (photos: Cheryl Green)

Pot-metal yellow occurs, but is not a significant proportion of the overall colour representation. In particular, a deep amber or tobacco yellow is noticeable (43.5cm<sup>2</sup> in total). Where pot-metal yellow might be expected, for example, as the base glass for the heraldic lion, the glass is so corroded that it is no longer possible to tell if this was so.

A relatively high proportion of yellow stain was present in the overall assemblage, most of it occurring on relatively thin glass, and in combination with smear shading and stipple shading. As yellow stain is known to have been deployed in English glass from at least 1307–12 when it appears in the Heraldic Window of York Minster nave (nXXIII), this probably means that all the yellow-stained fragments post-date this point in time.<sup>361</sup> In reality, most of the yellow-stained fragments can be dated by their painting and shading to the later Middle Ages. Much of the staining seems to have been used to highlight architectural detail.

The relative quantities of pot-metal, coloured glasses

are noteworthy. It might be expected that yellow staining would have the highest representation, but blue is by far the best represented colour.

### Glass manufacture and technology

There are examples of both crown and cylinder glass manufacture (240–243). Study of the lead came provides additional insights into the technology deployed (see online report). There are two small roundels of came that give no indication that another lead came was soldered onto them (L16 and L19). This integrity and implied isolation suggests that they may have been used as discrete inserts, sometimes referred to as ‘jewels’, meaning that a hole would have been drilled in the piece of host glass into which the jewel was set without the need for a supporting lead network. This technique took a great deal of skill, both in drilling the host glass without breaking it, and in fixing the insert securely.<sup>362</sup> Consequently, this technique is usually an indication of virtuosity in

artisanship and expensive, high-status commissions.

Where medieval potash glass has corroded to the point of being completely opaque, it can be almost impossible to determine the original colour of the glass from visual inspection alone. Materials analysis can be used to determine the presence and relative quantities of metal oxides and trace elements. In the course of visual examination of the Glastonbury material, it was noticed that a distinctive verdigris corrosion occurred on glass of two distinct colours. It is visible in two conjoining fragments from G20, in which the broken section revealed a substantial layer of ruby flashing. The verdigris corrosion had taken place in both the white and the ruby layers. In another sample, verdigris corrosion was observed on green pot-metal glass. Copper oxide was commonly the colourant used to produce red, and iron oxide was commonly used to produce greens. A sample from G20 (area: 6.5cm<sup>2</sup>; thickness: 3.76-3.25mm) also displays verdigris corrosion on what is still plainly visible as green-tinted white glass. Verdigris corrosion may result from the presence of iron in the constituent elements of the white glass. Observing verdigris-coloured corrosion, therefore, is no failsafe means of identifying original colour by eye.

### The unpainted white glass assemblages

Very little of the medieval white glass was unpainted relative to the painted and pot-metal material (5,801cm<sup>2</sup>). Whilst medieval potash glass may display a number of weathering traits (eg pitting, opacity, friability, scaling or lamination), medieval glass-working techniques are also indicative of date (eg grozed edges). It was obvious, however, that a great deal of the white unpainted glass did not have any of these traits and fitted the profile of post-medieval glass with a greater soda content, and modern glass. Much of this glass was consistently thin, and there was a preponderance of fire-rounded edges, indicative of broad and crown glass manufacture.

There were four distinct assemblages of white glass among the post-medieval / early modern material: 1) one that has a consistent blue tint, and tends to be transparent; 2) one that is extremely colourless and transparent; 3) one that is relatively colourless and thin, but has a consistent iridescent corrosion product, often with lead ghosting; 4) one that is olive-green in tint, and tends to be less transparent due to a fairly consistent orange-coloured corrosion product, generating pits that coalesce (ie more like potash glass pitting), and which also has signs of lead ghosting. Only the last of these assemblages has any signs of grozing (48cm<sup>2</sup>), the rest all

having cut or broken edges. The iridescent white (3) and the olive-green-with-orange-corrosion (4) were both used to form diamond-shaped quarries that were glazed into a leaded trellis of diamond or lozenge panes, suggesting late medieval to early modern use. The olive-green type (4) bears more resemblance to late-medieval metals in its characteristic corrosion, and it may be that this material bridges the late-medieval and early-modern traditions. The picture is further complicated by the fact that some of the better-preserved late-medieval painted glass is very colourless and free of inclusions. Some of the metals (1-4) have a great many inclusions (seeds or air bubbles, usually characteristic of hand-blown window glass manufacture). Furthermore, there are large quantities of fire-rounded edges in all four metals, characteristic of the hand-blown cylinder manufacture of flat glass. Quantities of fire-rounded edges in concentration are not unknown but they are relatively uncommon and tend to indicate an episode of glass installation (ie these tend to be off-cuts from the glazing process).<sup>363</sup>

There is a very limited amount of information to be deduced from visual inspection of early modern and later glass alone. Recent studies have demonstrated the value of chemical analysis applied to window glass in the post-medieval period.<sup>364</sup> Without chemical analysis, little more can be done to characterise the Glastonbury colourless and post-medieval window glass, but it is worth considering the evidence of the lead window came in respect of this glass. At least 441.24g of lead came (maximum 605.01g) were deemed to have been produced in an untoothed mill, dating them according to Knight's 1986 typology (Type D) to the mid- to late sixteenth century.<sup>365</sup> This category includes at least 290.79g with secondary comes soldered to create a triangle, perhaps from the edges of diamond-quarry lead lattices [L19].

### General discussion

There are several significant groups amongst the excavated window glass from Glastonbury Abbey. Undoubtedly the most important is the assemblage of largely still-translucent blue pot-metal, painted mostly with leaf designs, running beading, fragments of drapery and some swirling patterns, which may be decorative grounds, comparable to those used in twelfth-century manuscripts (fig 8.61). Lewis identified this as mid-twelfth century, and a twelfth-century date seems sustainable. Moreover, the fairly consistent condition of the blue (as opposed to the heavily pitted and opaque thirteenth- and fourteenth-century material of potash composition) suggests that some of it is of the 'durable'



**Fig 8.61** Durable blue glass in the Glastonbury Abbey Museum (photos: Cheryl Green)

soda-lime composition identified by scientific analysis.<sup>366</sup> At Winchester the date for this type of glass ranged from the late Anglo-Saxon to late twelfth century and beyond. Similar material has been excavated from York Minster, Old Sarum and Dover Castle.<sup>367</sup> As it seems highly unlikely that blue was the only colour used, the entire assemblage was scrutinised for any other candidates for twelfth-century design, but this has proved extremely limited. The major collections of twelfth-century glass remaining in England are at Canterbury and York

Minster, although there are examples in a few other churches and a little is known from excavation. The stylistic affinities in this period may also relate to French glass painting, in particular. Chemical analysis has demonstrated that blue glass from Chartres Cathedral and the abbey church of St-Denis also share this durable soda-lime composition. The results of Scanning Electron Microscope (SEM) analysis on three Glastonbury examples confirm that the glass composition falls within the range of recognised durable blues, of mixed soda and

potash composition, with both cobalt and possibly high levels of copper causing the distinctive blue colouring (see below).

The predominance of blue in the surviving ambulatory chapel windows and relocated panels from St-Denis has been attributed to a deliberate evocation of 'divine darkness' and the 'inaccessible light in which God is said to dwell' that were referred to by Pseudo-Dionysius the Areopagite.<sup>368</sup> A patron such as Abbot Suger may have drawn on a number of theological sources for his choice of glass painting, and his schemes are thought to have been variously narrative and anagogical in theme. Beyond the theological, however, iconographic and stylistic sources need not coincide; in other words a *composition* for a specific biblical or hagiographical episode could be borrowed from an iconographic source, like a manuscript or a reliquary, but the *style* in which that scene was conveyed might come from entirely different sources, only to be further subject to creative adaptation and invention.<sup>369</sup>

Much of the 'early' blue from Glastonbury has been subject to heat distortion, which has rounded the edges, produced bevelling and often created a dull, frosted appearance. Most of this category of glass exhibits an iridescent weathering product. Lewis assigned fragments from group G22 to the period of Henry of Blois from art-historical comparison of the painted designs, from Bond's description of the 'azure-blue' glass he found in the area of Edgar's Chapel and on the rationale that the burning was probably the result of the great fire of 1184.<sup>370</sup> There seems to me to be a logical inconsistency here, for if the glass had been burnt in the 1184 fire, why was it located where it was, with both burnt and unburnt fragments? Did the pre-fire church extend this far eastward? It seems more likely that the burning was connected with the destruction at the Dissolution, the glass having been used in the Edgar Chapel until that point. The relevant group [G22] is not exclusively 'early' glass, but contains later medieval glazing, albeit a small relative quantity – less than twelve per cent of the contents of this context. If the glass was deliberately reused in the later Middle Ages, this would be particularly interesting in the light of Glastonbury's demonstrated deliberate evocation of the past in architectural and other matters.<sup>371</sup> It would not be the only major church to reuse old glass in later glazing schemes for ideological purposes. At St-Denis fragments of glass dated c 1150 were included in a thirteenth century scheme after having been damaged by fire in 1184.<sup>372</sup> Glass from Troyes dated to before 1188 was also repaired in the thirteenth century. The twelfth-century glass at York Minster was used in glazing of the

fourteenth century to emphasise the depth of history and the equally deep claims to primacy of the See of York in comparison with its rival Canterbury. It is conceivable, then, that portions of the Romanesque glass at Glastonbury were deliberately redisplayed to emphasise the depth of history at the site, with one eye to its historic rivals as well. Furthermore, if some of the stickwork rinceau / trefoil foliate meander borders (22–26) are in fact fourteenth-century approximations of twelfth-century designs, the Romanesque glass may have been reglazed along with later medieval glass deliberately intended to emulate or blend in with the older revered material.

Many, if not most, monastic sites produce some grisaille of the thirteenth century (eg Bayham Abbey, Sussex),<sup>373</sup> and some sites produce a great deal of this type of glazing (eg Rievaulx Abbey, N Yorks). By contrast, thirteenth-century grisaille is relatively under-represented at Glastonbury. One must be cautious in making judgments based on the overall paucity of window glass from the site (all the glass, of all periods put together, would not fill one large window). The choice of thirteenth-century grisaille at many sites may coincide with the major building campaigns and respect either aesthetic or ideological preferences on the part of the institution or the patron. Grisaille was, for example, used by some Cistercian houses perhaps as a deliberate ideological and doctrinal choice to avoid coloured narrative or historiated windows. Other monasteries chose this method of glazing because it would have admitted more light than narrative windows typical of the mid- to late twelfth century, and thus perhaps have enhanced the elaborate contemporary architectural mouldings. This type of glazing could be much cheaper than coloured glass, which was probably imported through most of the thirteenth century.

The small representation of grisaille at Glastonbury may be worth considering a little further, however. Salisbury Cathedral, in particular, had set the example of grisaille glazing in the south west of England, but here historiated glass was 'confined to the east end and to windows above altars'.<sup>374</sup> Thus, the juxtaposition of grisaille and narrative glass could be used to articulate the relative liturgical importance and sanctity of the space within the building. Ayers suggests that the same was probably true of Wells Cathedral in the early to mid-fourteenth-century work.<sup>375</sup> Draper emphasises the points of difference architecturally between Wells and Glastonbury in the late twelfth and early thirteenth centuries in respect of window decoration, that at Wells being very simple, with simple hoods, and plain

chamfered surrounds, 'whereas at Glastonbury the heads of the very similar form of windows are enriched with chevron ornament'.<sup>376</sup> The argument goes that Glastonbury and Wells were great rivals at this time over their relative antiquity and their rights to the 'seven churches' and to the See, and that this was consequently borne out in their respective architectural and artistic directions. Glastonbury chose to emphasise depth of history and continuity, combining the latest developments with conscious artistic quotations of the past. Overall then, two hypotheses may be suggested with reference to the paucity of grisaille at Glastonbury. The first is that areas that might have used grisaille extensively have not been excavated (or the locations in which this glass was dumped have not been excavated). The second is that widespread use of thirteenth-century grisaille may have been eschewed as part of a more integrated architectural and ideological programme.

There were few indications of figural glass of this period. In a house of the size and wealth of Glastonbury, figural or narrative glass would have been expected. The paucity may well be the result of the retention policy of earlier excavations or, as with the patterning of the grisaille, the result of the selection of areas excavated. It is also possible that figural glass was excavated but is now missing from the collection.

A small quantity of early to mid-fourteenth-century grisaille was identified, as was some contemporary diaper or decorated ground, possibly architecture and drapery, but this is not extensive. Moreover, where comparisons can be made stylistically, there are no definite associations with the major glazing programmes in Wells Cathedral. The evidence for later medieval glass, particularly of the late fourteenth to late fifteenth and possibly even early sixteenth centuries is far more extensive. This includes some pieces of Gothic Black Letter inscription, as well as a great deal of three-dimensional architectural, drapery and figural detail, including the finely delineated head fragment. Some of this material suggests a late fifteenth-century glazing programme. Even some of the colour ranges – for example the quantity and range of murreys, plums and purples, and the grey-blues – suggest later medieval glazing programmes. All this is congruent with the building activities of the later abbots. Indeed, as the evidence from St John's Glastonbury, Butleigh, Chilton Polden and elsewhere demonstrates, the later abbots introduced glazing bearing their own arms, or those of the abbey, in many churches throughout the region over which they had any influence (see online report). Although the use of heraldry in connection with patrons, benefactors and donors was widespread in this period,

there may be a deliberate policy of imprinting a recognisable institutional connection far and wide as a sort of religious *imperium*.

Since this period witnessed a *floreat* of production in Somerset and Devon, and in such cities as Bristol and Gloucester, many workshops were available to the abbot and convent throughout the Middle Ages, a point emphasised by both Woodforde and Ayers.<sup>377</sup> Consequently, one of the aims of this report was to try to identify stylistic detail by which an attribution to a regional 'school' of glass-painters might be made. Archaeological assemblages, being so fragmentary, are notoriously difficult to link to recognised workshops. Nothing, for example, may be attributed definitely to 'Thomas Glasier' or 'Thomas of Oxford', whose work is recorded at Winchester College and New College, Oxford, in the late fourteenth to early fifteenth centuries under the patronage of William of Wykeham, and whose work may also be represented amongst fragments excavated in Winchester.<sup>378</sup> The three-dimensional character and exceptional quality of some of the architecture depicted amongst the Glastonbury assemblage is possibly of this date, but too fragmentary to be attributable.

There is no evidence for a particular affinity with the Wells glass, with the exception of the characteristic heraldic lion. It may be that successive patrons of Glastonbury chose to avoid obvious similarities with its great rival, Wells. On the other hand, glass supposedly initiated by abbots of Glastonbury in parish churches (such as High Ham) appears to have been of Woodforde's 'Somerset School', and one or two fragments of identifiable Somerset-type quarries remain in the abbot's kitchen at Glastonbury and St John's Church in the town. Woodforde also identified work of his 'Devonshire School' amongst the figures in St John's and related work in St Patrick's Chapel.<sup>379</sup> It is thus probable that the patrons of Glastonbury used different sources for their glass painting at different times, and probably for varying reasons of cost, workmanship, precedent and distinctiveness.

### Reuse of glass within the Middle Ages

Quite apart from the possible reuse of early glass in later buildings for political and ideological reasons, one of the aims of this report was to recognise any post-installation alterations or damage and post-depositional processes. Examination of the relationship between grozed edges and the integrity of the painted design suggests that many fragments were regrozed, and therefore presumably releaded within the course of the Middle Ages. Lead

deteriorates and tends to be replaced every 100 to 150 years. However, it is also demonstrable that some leadwork survives from the Middle Ages. The regroozing at Glastonbury may indicate releading of a window for occasional ‘maintenance’ purposes when, by and large, the integrity of the original glazing scheme was maintained. In some instances, however, a window may have been dismantled and replaced by a newer composition. In this instance fragments from older designs may have been redistributed to be used as space-savers or repairs in other designs to which they were not original. In some instances this may have been due to deliberate retention: perhaps the earlier glass was invested with significance in asserting the antiquity of the abbey and to distinguish it from its rivals, most notably Wells Cathedral. In some instances, older glass may have been used more haphazardly to fill in spaces in later releadings.

Regroozings were detected, for example, in group G23 (foliage, or a possible architectural canopy crocket 94), G24 (159), G25 (112), G29 (123), G30 (a stylised floral design 113), G36 (a quarry edge 76) and several times in G31 (ivy leaf grisaille 74; indented leaf 96). Whilst some of this material dates to the late thirteenth or fourteenth centuries, and may, therefore have been subject to reuse, it is perhaps more surprising that late medieval fragments have been regroozed.

### Spatial patterning

Apart from the possible relationship between the durable blue and the area of Edgar’s Chapel (see above), the spatial patterning seems to relate mostly to Dissolution-period activities, to post-Dissolution / early modern probably domestic fenestration debris, and to possible clearance during the early excavations. Late thirteenth- to early fourteenth-century grisaille (G36) was recovered in the area of the abbot’s hall, outside a wall beside a burnt floor. The abbot’s hall would contain painted glass of equal quality to anywhere in the church or chapter house. If the fragments releaded into the abbot’s kitchen relate to the abbot’s hall in origin, their high quality can be confirmed.

### The Dissolution process

The Glastonbury stained glass assemblage is quite distinctive in terms of the archaeological pattern it represents with respect to the process of Dissolution. Many monastic assemblages produce quantities of thirteenth-century grisaille, fourteenth- and fifteenth-century background diaper and rinceaux, micro-

architectural fragments, border motifs and glaziers’ side strips: in other words characteristically peripheral motifs or older glass. This could be the result of the best glass having been reclaimed for sale or even the results of iconoclasm that targeted the figural representations. At Glastonbury, this pattern is less clear-cut and, indeed, there is a noticeable absence of the most peripheral glass, in the form of border motifs and plain side strips. Study of the lead comes provides additional insight to the process: almost every single fragment of came has been twisted, torn or pushed together in some way (see online report).

The much-cited Rievaulx Inventory states that the glass from the church was ‘to be layd up under lok and key and out of danger of wastyng and stelyng’. It was ‘to be sortyd into iij partes. One the fayrest to be sortyd. The second sort to be sold. The iij sort to be taken out of the lede and the lede molten.’<sup>380</sup> The lead, a valuable commodity, was to be kept for the king in order that the value might be realised for the Crown. The fairest and much of the second sort may account for the glass which was sold and reused in houses and churches. However, much of the selection of the second category to be sold may have required discrete panels, such as armorials, to be removed from a background of other glazing. The debris from such selection and stripping may have contributed to the archaeological deposits recovered. The treatment of the poorest glass implies thorough stripping of the lead comes, with little or no consideration for the glass at all. What constituted ‘the iij sort’ of glass in the context of a house as wealthy and glorious as Glastonbury from the perspective of someone in the 1530s–40s? Given that the glass of the late fifteenth and early sixteenth centuries could be exquisite in both colour and drawing, as demonstrated by the extant examples of this date found in St Patrick’s Chapel, St John’s Glastonbury and elsewhere, it may be that a lot of the older grisaille, for example, constituted ‘pore glasse’.<sup>381</sup> This, if it existed in quantity, may have been discarded altogether. The best glass may have been resold or appropriated, and even the second-best glass at Glastonbury may have been worthy of retention for domestic purposes by those with the money and influence to acquire it.

### Compositional analysis of durable blue medieval window glass

*Chris Caple and R Barnett*

Three fragments of blue medieval window glass and one of clear glass were selected for compositional analysis. A

full method statement and discussion is available online. Table 14 sets out the results, confirming that the blue glass fragments (samples G14, G24P, G24E) are all durable soda-lime glasses, of similar composition to that identified as coming from eleventh- and twelfth-century contexts in York Minster, Dover Castle, Old Sarum, Chartres, St-Denis and Winchester.<sup>382</sup> The trace levels of cobalt and low concentration of copper were responsible for the blue colouration. The clear glass (sample G25) is similar in composition to other examples of the potash and lime-rich ‘forest glass’ which is used for most medieval window glass during the twelfth to sixteenth centuries.

Cox and Gillies suggest an impure cobalt oxide ‘zaffre’, also known as ‘Damascus pigment’, as the colouring agent. Henderson, however, suggests the cobalt copper mineral ‘trianite’ ( $2\text{Co}_2\text{O}\cdot\text{CuO}\cdot 6\text{H}_2\text{O}$ ) as one of a number of possible colouring minerals for cobalt-blue coloured glasses produced in ancient Egypt and by other ancient civilisations.<sup>383</sup> The use of such a mineral would explain the presence of both copper and cobalt in the samples. These fragments from Glastonbury extend the known distribution of the durable blue glass into the West Country.

## 8.12 *Ex-situ* painted wall-plaster

Chris Caple, with a contribution from C Pamela Graves

### Introduction

The collection comprises some 474 fragments of painted wall-plaster (30.3kg), in addition to six larger fragments of painted wall-plaster that are displayed in the museum at Glastonbury Abbey. This represents a relatively large assemblage in comparison with many monastic sites and indicates extensive internal décor. However, the quality of the decoration and the pigments represented among the excavated fragments are more characteristic of the basic schemes that were executed at parish churches. In almost all cases, the decoration is in the form of red line on white plaster, possibly representing foliage, scrollwork or drapery. There is nothing in the *ex-situ* painted wall-plaster that compares with the extant polychromy in the Lady Chapel at Glastonbury – for example, the expensive ultramarine dated c 1187, which is comparable with the use of the same pigment in the Holy Sepulchre Chapel, Winchester Cathedral, c 1175.<sup>384</sup>

**Table 14** Compositional analysis of Glastonbury blue glass fragments

Element Oxide wt %	G14 Blue Glass	G24 - P Blue Glass	G24 - E Blue Glass	G25 Clear Glass
Silicon	65.48	58.90	55.08	61.25
Sodium	6.97	10.83	14.13	2.95
Calcium	6.92	9.03	11.20	15.03
Potassium	5.55	7.00	6.60	7.13
Aluminium	4.90	2.53	1.83	3.98
Chlorine	2.43	2.57	1.98	2.15
Copper	4.12	4.17	4.10	2.73
Iron	1.63	1.50	1.48	1.13
Magnesium	0.62	1.10	1.35	0.93
Sulphur	0.58	0.60	0.35	0.28
Phosphorous	0.32	1.03	1.08	1.60
Manganese	0.36	0.63	0.85	0.33
Cobalt	0.09	0.04	0.00	0.00
Titanium	0	0	0	0.40

It can be suggested that medieval wall-paintings fulfilled three primary roles: to support religious ideals through reproducing scenes from the Bible or allegorical tales; to create visual interest through the enjoyment of colours and shapes and the ideas and emotions that they generated; and to serve as a sign of wealth and sophistication. The fact that only medieval churches, monasteries and lordly private apartments were decorated in this manner clearly marked them out as places of importance, where the affluence of their owner was displayed. Wall-paintings in twelfth- to sixteenth-century Britain were normally executed in *fresco secco*, in which the dry plaster was painted with pigments that were dissolved in lime water, possibly with an additional skimmed milk binder (*secco*), rather than the true (*buon*) fresco that is more common in southern Europe,<sup>385</sup> a technique that holds the pigments in a partially lime-cemented layer on the surface. Occasionally, pigments were applied in other media, such as egg or oil (*tempera*); for example, the wall-paintings of the Byward Tower, Tower of London and the feretory of St Albans Cathedral.<sup>386</sup> *Tempera* media were often used to apply valuable pigments, such as ultramarine (lapis lazuli), or unstable pigments, including lakes (inorganic materials, such as dyed powdered chalk), which could discolour in direct contact with the alkaline environment of the plaster. Wall-paintings were normally executed either by journeyman painters, who travelled from one building project to another applying paint to the walls of recently constructed and plastered buildings, or by members of the monastic community.<sup>387</sup>

This report summarises the results of the analysis of a 5 per cent sample of the painted wall-plaster using



**Fig 8.62** Selected painted plaster in the Glastonbury Abbey Museum (photos: Cheryl Green)

Energy Dispersive X-Ray Fluorescence (EDXRF). The full report and method statement is available online, together with a full catalogue of the painted wall-plaster that is displayed in the museum (based on visual analysis only) (fig 8.62).

### The assemblage

The friable nature of painted plaster means that only small fragments survive. After initial quantification and visual appraisal, it was clear that only a limited range of pigments and colour schemes had been used in the Glastonbury assemblage. Consequently a five per cent sample was selected (twenty-five fragments), including examples of all the different colours used in the wall-paintings and one oyster shell palette. Given the limited number of pigments available in the medieval period,<sup>388</sup> the mineral pigments used can be identified through the elements present and the analysis of peak heights, peak height ratios and comparison with known materials (Table 15).

All the wall-painting samples from Glastonbury have

a base plaster or render layer (*arriccio*) surmounted by a thin layer of smooth, hard white plaster (*intonaco*). It was onto this surface that the painted layer was applied. At least two different types of base plaster layer were identified: a hard sandy render / plaster and a coarse white lime plaster with little sand. The pigments had, in most cases, adhered well into and on the top of the plaster layer. They appear to have been applied in limewater, possibly with a dilute protein binder solution, such as skimmed milk.<sup>389</sup> In almost all cases the decoration takes the form of red line on white plaster. In two fragments (W39, W11), examples of a scale pattern are visible; this could represent the feathers of a bird or angel wings, house roof shingles or armour. Several examples of drapery were also detected amongst the fragments. Definitive identification is difficult with such small fragments, but many have curvilinear lines indicating plants or scrollwork, rather than linear ashlar blocks, such as survives at Marten's Tower, Chepstow Castle (Monmouthshire).<sup>390</sup>

Analysis of the plaster background (*intonaco*) indicates that there are traces of iron (oxides) in the lime



Table 15 Painted wall-plaster pigment analysis

Analysis				Pigment elements M = major, m = minor, tr = trace)					Pigment minerals
No.	Year	Assigned no.	Description	Fe	Mn	Pb	Cu	Other	
1	1991/172		red line	M	tr				red ochre
2	1988/548	W23	blue/black line	m	tr	tr			magnetite?, carbon black?, lead white?
3	1988/548	W23	red line	M	m	m			red ochre, minium, manganese dioxide?
4	1988/543	W18	orange (folds)	m					red ochre
5	1988/543	W18	red line	m		tr			red ochre, minium
6	1988/527	W3	yellow/brown line	M	m	m	tr		yellow ochre, minium or lead white, manganese dioxide?
7	1988/551	W26	blue/black line	m		tr	M		azurite, magnetite, lead white?
8	1988/541	W17	orange/red	M		M			red ochre, minium
9	1988/541	W17	yellow/brown	M		m			yellow ochre, minium or lead white
10	1988/525	W1	white 1	m		m	M		white lead, azurite
11	1988/525	W1	white 2	m					plain lime plaster, no pigments
12	1988/525	W1	line	m			M		azurite, magnetite?, carbon black?
13	1988/806	W8	pink	m	tr				red ochre, manganese dioxide?
14	1988/818	W60	plain plaster	m					plain lime plaster, no pigments
15	1988/818	W60	red	M		M			red ochre, minium
16	1988/965	W65	bird - blue	M	tr	M	tr		magnetite, lead white, azurite?
17	1988/965	W65	bird - white body	m		M			lead white
18	1988/965	W65	background	M	tr	m	tr		magnetite/ochre, lead white, azurite?
19	1988/965	W65	bird outline	M		M			lead white, magnetite
20	1991/257	M77	oyster shell palette	m	m	m		Zn	ochre, minium, manganese dioxide?
21	1991/265	W93	red	M					red ochre
22	1991/265	W93	white	m					plain lime plaster, no pigments
23	1988/817	W56	yellow	M		M			yellow ochre, white lead
24	1988/817	W56	plaster	M		M			white lead
25	1988/817	W56	red (no spectrum)						
26	1991/573	W108	orange	M		M		Hg, Ti	red ochre, minium

used to make the plaster. The white background to the designs is normally achieved by the basic lime plaster itself, in which only small amounts of the iron contaminant are detected. However, in a number of examples (16, 24) lead is present in the white plaster exterior coat and thus the presence of lead white pigment (cerussite) can be inferred. This is certainly the case for the samples from context W65 (16–19) and from W56 (23, 24), all of which have very high lead values associated with their background white colours.

The analysis indicates that the red pigment was composed of iron oxides such as red ochre / haematite and lead oxide minium. The iron oxides give a brown red colour, which can appear pink when partially worn away or applied in thin coat. The lead oxide / minium is orangey; the red pigment is a mixture of haematite / red ochre and minium. This gives a strong mid-red colour, although it is possible that iron oxides were used as an extender to make the more expensive minium go further. The absence of any arsenic in the red pigmented areas of

these samples discounts the use of the expensive pigment cinnabar / vermilion (mercury sulphide). The single example of a trace of mercury (sample 26) comes from an orange pigment and is probably contamination from the extremely large quantity of red lead (minium) present in the sample. Vermilion / cinnabar is a bright scarlet colour, and visual inspection suggested that it was not present on any of the recovered fragments of wall-plaster. Cinnabar was frequently used on high-status wall-paintings of the later medieval period, as at St Gabriel's Chapel, Canterbury Cathedral,<sup>391</sup> and its absence at Glastonbury is surprising.

There are a number of examples of a yellow-brown pigment; these also only contain iron and lead. It is probable that the yellow pigment is the iron oxide yellow ochre. The presence of lead in some samples may suggest small amounts of lead white (cerussite) or the yellow lead oxides litharge or massicot as being present in the yellow pigment mixture. There was no trace of arsenic, which would indicate the presence of the bright and expensive

pigment orpiment ( $\text{As}_2\text{S}_3$ ). Again, visual inspection did not detect any examples of bright yellow on any of the excavated fragments.

Copper was detected in three samples (7, 10, 35). In two cases it is used to form a blue-black line. The copper probably derives from the presence of the blue pigment azurite (copper carbonate); small amounts of this blue pigment were mixed with black or grey pigments such as charcoal (carbon black) and iron minerals (magnetite). Manganese is detected as present in most samples. It occurs as a contaminant of iron oxides (typically  $\text{Fe}:\text{Mn} = 9:1$ ).

The majority of the samples show a single phase of wall-painting, normally red-line decoration on white plaster with occasional blue-black lines and areas of ochre yellow. However, several fragments show a second phase of wall-painting: after the deposition of a very thin grey plaster covering to obscure the initial paint scheme, a second layer of orange pigment was applied. Sample 26 (W108) is typical: the orange is created (like the red) with a mixture of minium and red ochre, but with a higher percentage of the orangey minium. The presence of mercury and titanium (another iron impurity) distinguishes it from the earlier pigments. A later phase of redecoration is clearly suggested, although the absence of identifiable motifs prevents dating.

The extensive use of red-line decoration using iron and lead pigments, with black line and areas of red and yellow infill, is characteristic of the type of basic scheme typical of a local parish church. One would expect to find high-value pigments, such as ultramarine, cinnabar or orpiment, at a high-status abbey such as Glastonbury, but none were present in the samples tested and no visual trace could be found of the bright colours associated with these pigments.

### The painted wall-plaster in the museum display

The museum collection of six larger fragments of painted wall-plaster presents a greater variety of colours and designs (see the catalogue online) (fig 8.62). These include floral and geometric detail (possibly Romanesque or thirteenth-century) and possible drapery and architectural details (fourteenth-century), in addition to false jointing. The colours represented include buff, green / yellow, red, white and oyster. The sample is very small relative to the wall area that must originally have been plastered in the abbey precinct and, as such, this sample is not representative of the range of dates, motifs and colours once used.

## 8.13 Clay tobacco pipes

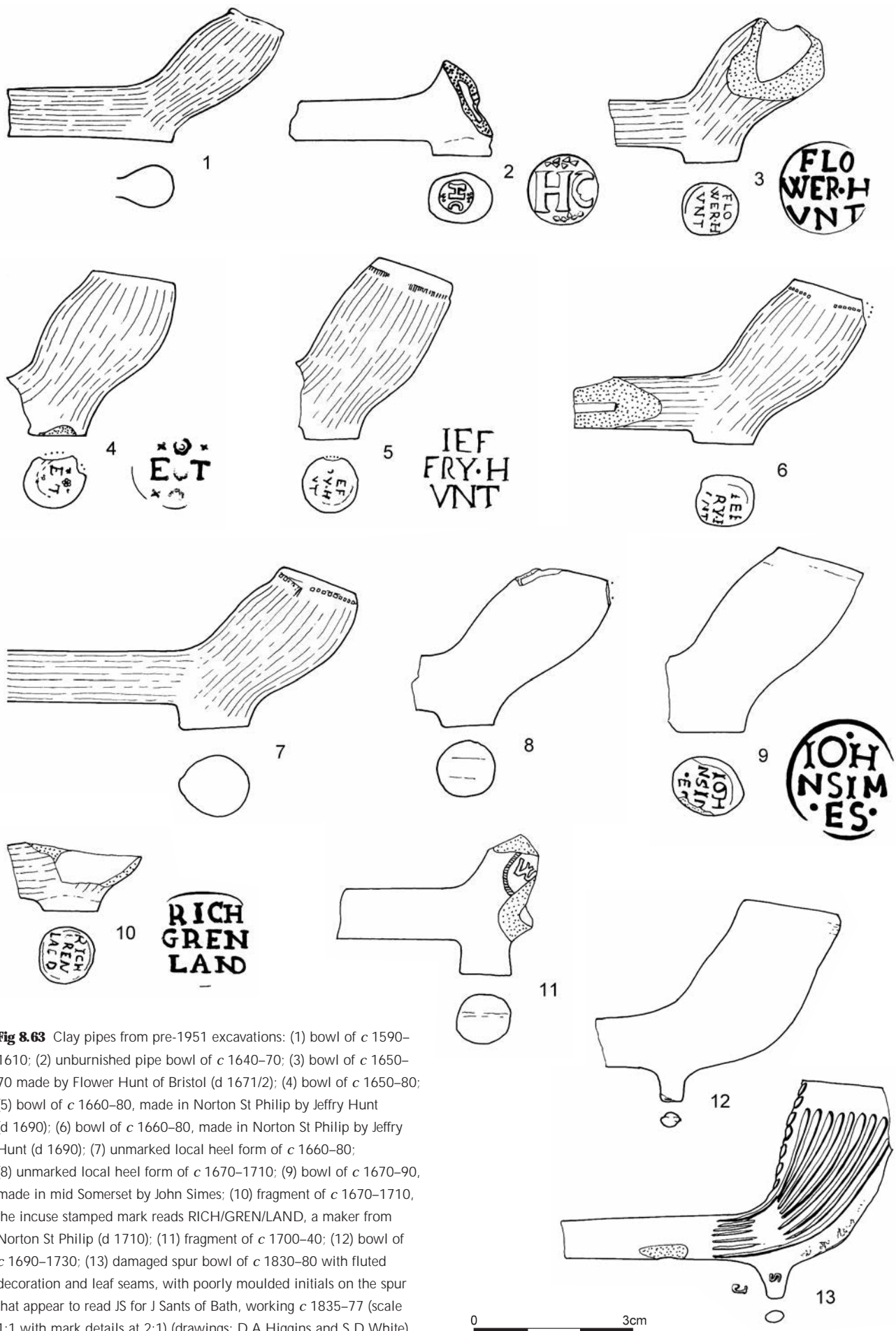
*David A Higgins*

### The assemblage

Twenty-four fragments of clay tobacco pipe were recovered from early excavations or as unstratified finds from the precinct, comprising sixteen bowls and eight stem fragments. These range in date from *c* 1590 to 1910, with a marked concentration of pieces dating from the mid-seventeenth to the early eighteenth centuries. This may be in part due to a collecting bias, which has clearly favoured the retention of bowls, many of which are substantially complete. The fragments were recorded individually and the full details can be consulted in the online report.<sup>392</sup> Most of the context groups are too small to provide reliable dating evidence, although the fragments provide an indication of the possible date of some contexts. One of the bowls was found in a scaffold-hole in the Lady Chapel; its date of *c* 1670–1710 (and most likely *c* 1670–90) provides a *terminus post quem* for the feature (fig 8.63: 10). Two fragments dating to the seventeenth century were excavated from the abbot's hall in 1962 (fig 8.63: 2, 4).

The excavations have produced one very early pipe bowl that dates from *c* 1590–1610 (fig 8.63: 1).<sup>393</sup> Tobacco was still an expensive luxury at this date, and bowls of this form are very rare nationally. The Glastonbury Abbey Museum collection includes another early bowl of this type (U/S 63) and a slightly later but very good-quality Gauntlet pipe of *c* 1620–50 with a finely burnished surface (U/S 82). Pipes made by the Gauntlet family of Amesbury were renowned for their outstanding quality and sold for many times the price of ordinary pipes. It is clear that high-status material was being used and discarded on the site during the late sixteenth to early seventeenth centuries. It is also notable that the earliest Glastonbury bowls have quite a tall, slender form, which contrasts with more dumpy early forms generally found in London.<sup>394</sup> This difference hints at the early development of regional styles, which would, in turn, imply that local production was taking place in this area at an early date (*c* 1580–1610).

The majority of the pipes, however, date from *c* 1640–1730 (fig 8.63: 2–12), a chronological range that is also reflected in the much larger assemblage at the Glastonbury Abbey Museum. The presence of these pipes shows that the abbey continued to attract visitors throughout the post-medieval period, while the origin of the pipes



**Fig 8.63** Clay pipes from pre-1951 excavations: (1) bowl of c 1590–1610; (2) unburnished pipe bowl of c 1640–70; (3) bowl of c 1650–70 made by Flower Hunt of Bristol (d 1671/2); (4) bowl of c 1650–80; (5) bowl of c 1660–80, made in Norton St Philip by Jeffry Hunt (d 1690); (6) bowl of c 1660–80, made in Norton St Philip by Jeffry Hunt (d 1690); (7) unmarked local heel form of c 1660–80; (8) unmarked local heel form of c 1670–1710; (9) bowl of c 1670–90, made in mid Somerset by John Simes; (10) fragment of c 1670–1710, the incuse stamped mark reads RICH/GREN/LAND, a maker from Norton St Philip (d 1710); (11) fragment of c 1700–40; (12) bowl of c 1690–1730; (13) damaged spur bowl of c 1830–80 with fluted decoration and leaf seams, with poorly moulded initials on the spur that appear to read JS for J Sants of Bath, working c 1835–77 (scale 1:1 with mark details at 2:1) (drawings: D A Higgins and S D White)

reflects the areas from which people travelled and / or goods were traded. A total of eight stamped seventeenth-century marks and two later moulded marks were present in the excavated sample. The marks confirm that pipes were regularly reaching the abbey precinct from up to 40km away, with occasional examples coming from much further afield, thus giving a very large catchment area for the site. One of the principal supply sources was Norton St Philip, as represented by the pipes of Jeffry Hunt (fig 8.63: 5, 6) and Richard Greenland (fig 8.63: 10).<sup>395</sup>

There are a few fragments of late seventeenth- or early eighteenth-century pipe, including part of a bowl with a relief-moulded cartouche mark on its right-hand side (fig 8.63: 11). This style of marking was particularly used in Bristol, but was also copied by makers in surrounding areas. Nineteenth-century pipes are very poorly represented amongst the excavated bowls, the only definite example being a fluted bowl with leaf-decorated seams and some poorly impressed maker's initials, which are probably JS (fig 8.63: 13). This piece can be attributed to Joseph Sants of Bath, who is recorded working from 1835 until his death in 1877.<sup>396</sup> There are one or two later stems amongst the excavated finds, however, and it seems likely that pipes of this period are under-represented in the retained sample from the earlier excavations.

## 8.14 Animal bone

*Lorrain Higbee*

### Introduction

The assemblage comprises 981 fragments of animal bone, collected by hand during excavations undertaken by Radford (1954–64) and Wedlake (1979). Hand-recovered assemblages of animal bone are generally biased in favour of large bone fragments and therefore the bones of larger species, in particular mammals.<sup>397</sup> This is to some extent true of the Glastonbury Abbey assemblage; however, in this instance the large fragments are mostly bird bones. The dietary restrictions imposed on monastic communities by the Rule of St Benedict stipulated that fish and the meat of birds were allowed but the meat of quadrupeds was forbidden. The sample of hand-recovered bones is therefore broadly representative of the dietary range of the Glastonbury monks, while the lack of sieving accounts for the near absence of fish bones (Table 16).

The largest sample of animal bone is from Radford's excavations within the cloister (*c* 94 per cent of the total), in particular from mid-twelfth-century contexts beneath

the floor level (71 per cent); a small amount of bone was recovered from within, and beneath, three Late Saxon glass furnaces. The condition of the bone fragments is consistent between contexts and is generally good to fair. There is little or no sign of weathering, and fine surface details such as cut marks are clear and easily observed when present. This suggests that bones were deposited and buried fairly rapidly, rather than being allowed to accumulate on the ground surface where they would have been exposed to physical weathering. This theory is supported by the low incidence of gnawed bones (less than 1 per cent of the total). A detailed method statement, full report and tables are provided in the online archive.

### Animal species represented

#### Avian species

Chicken is the dominant species in the assemblage (*c* 32 per cent NISP) and at least twenty-two individuals are represented. The major meat-bearing parts of the carcass, as represented by the humerus and femur, are more numerous than other parts of the wing and leg. No skulls are present, and only a small number of phalanges were recovered; this evidence suggests that the chicken bone assemblage is almost entirely composed of dressed carcasses (ie table waste). No butchery marks were evident on any of the bones; however, the carcasses of birds can easily be subdivided without leaving marks.

The sex ratio of the chickens could not be established due to the complete absence of tarsometatarsi, which is deposited inside the long bones of hens in lay, although medullary bone was noted for a small number of broken shaft fragments. This evidence, coupled with the dominance of adult chicken bones (*c* 59 per cent), suggests that egg production was important. Under this regime the immature bird bones could potentially represent male capons that were fattened for eating. The proportion of immature birds is relatively high in comparison to broadly contemporary lower-status secular sites. For example, the chicken bone assemblage recovered from the poorer suburbs of Winchester is almost entirely adult birds (90 per cent). This demonstrates that wealthier establishments could afford to eat younger, more palatable chickens.<sup>398</sup>

Bones from domestic geese and ducks are also relatively common (*c* 11 per cent and *c* 9 per cent NISP respectively) and both species are represented by a minimum of nine individuals. The skeletal elements represented for both species are similar to that for chicken, indicating that most of the domestic bird bone

**Table 16** Number and percentage of identified specimens present (NISP)

Species		Late Saxon	%	Medieval	%
<i>Bos</i> f domestic	cattle	1	1.2	9	2.2
Ovicaprid	sheep/goat	4	4.8	48	12.1
<i>Sus</i> f domestic	pig	6	7.2	94	23.8
<i>Equus</i> f domestic	horse			1	0.2
<i>Canis</i> f domestic	dog			6	1.5
<i>Cervus elaphus</i>	red deer	1	1.2		
<i>Dama dama</i>	fallow deer			6	1.5
Cervid	deer	4	4.8	1	0.2
<i>Lepus</i> sp.	hare			3	0.7
<i>Oryctolagus cuniculus</i>	rabbit			1	0.2
<i>Talpa europaea</i>	mole			1	0.2
<i>Rattus</i> sp.	rat			2	0.5
<i>Gallus</i> f domestic	chicken	19	22.9	128	33.3
<i>Anser</i> sp.	goose	39	47	12	3
<i>Anas</i> cf <i>platyrhynchos</i>	?mallard	2	2.4	38	9.6
Columbidae	pigeon/dove			10	2.5
<i>Gallus</i> f domestic/ <i>Phasianus colchicus</i>	chicken/pheasant	4	4.8		
<i>Anas crecca</i> / <i>A querquedula</i>	teal/garganey	1	1.2	15	3.8
<i>Pluvialis</i> sp.	?plover			1	0.2
<i>Ardea cinerea</i>	grey heron			1	0.2
<i>Cygnus olor</i>	mute swan	1	1.2		
<i>Gallinago</i> cf <i>gallinago</i>	?snipe			1	0.2
<i>Scolopax rusticola</i>	woodcock	1	1.2	11	2.8
small wader sp.	wader			4	1
Turdidae sp.	?thrush/blackbird			1	0.2
<b>Total identified</b>		<b>83</b>		<b>394</b>	
<i>% identified</i>		<i>71</i>		<i>46</i>	
large mammal		5		13	
medium mammal		1		300	
small mammal				1	
mammal		3		65	
bird		25		90	
fish				1	
<b>Total unidentified</b>		<b>34</b>		<b>470</b>	
<i>% unidentifiable</i>		<i>29</i>		<i>54</i>	
<b>Overall Total</b>		<b>117</b>		<b>864</b>	

assemblage is table waste. All of the duck bones, and all but one of the goose bones, are from adult birds. Adult geese were known as 'stubble geese' and were generally eaten in October and November, whilst juvenile or 'green geese' were eaten in May and June. The fact that most geese were fully mature when eaten suggests that they were valued for their feathers, which can be plucked from live birds, as well as their meat.<sup>399</sup>

The only other possible domestic bird species is the pigeon or dove (*c* 2 per cent NISP). These birds are difficult to distinguish from wild birds; however, all of the specimens are rather small and this, coupled with the presence of immature birds (squabs), suggests that they were from a managed (ie domestic) population. Squabs are a seasonal resource principally available during the summer and around Easter and Michaelmas.<sup>400</sup>

The rest of the bird bone assemblage includes a range of wetland and some woodland species: teal / garganey and woodcock are relatively common (*c* 3 per cent NISP each), while plover, grey heron, mute swan and snipe are rare. All of these birds could have been obtained directly from professional wildfowling operating in the Somerset Levels or from local markets.<sup>401</sup> Although they do not represent a significant food resource, it is clear from historical sources that these particular species were amongst the most highly prized birds served at elite and monastic sites.<sup>402</sup>

### Mammalian species

Pig is the most common mammalian species (21 per cent NISP) and the second most abundant species after

chicken. In terms of MNI, post-cranial bones indicate that there are five immature individuals, while canine teeth suggest that there are at least fourteen adults. The body part data contrast with that for domestic poultry and suggest that the pig bone assemblage is mostly waste from primary butchery (ie heads and feet). Despite the under-representation of some skeletal elements, the body part data also suggest that whole carcasses are represented and it is highly likely that live pigs were brought to the abbey precinct from its estate to be slaughtered and butchered.<sup>403</sup>

Age information based on epiphyseal fusion of the post-cranial skeleton indicates that most pigs were slaughtered early in their first year of life. Only one mandible was recovered, and this is from a piglet aged between birth and two months old.<sup>404</sup> This confirms a preference for the tender meat from suckling pigs; however, it is clear from a number of loose canine teeth that adults are also represented in the assemblage. Pig canines are sexually dimorphic, permitting the sex ratio of the adult pig population to be estimated. In total there are twenty-five canines, eleven from the left side of the mandible and fourteen from the right side. Only two of the left canines and one of the right canines are from sows; this gives a ratio of almost seven boars to each sow.

Butchery marks were noted on five pig bones, three vertebrae, a pelvis and a tibia. The vertebrae had all been chopped in half down the mid-line (ie dorso-ventrally). This evidence indicates that pork carcasses were divided into sides, a common technique for the period but one which only came into practice with the advent of professional butchers.<sup>405</sup>

Sheep bones are also fairly common in the assemblage (11 per cent NISP) and at least four individuals are represented. All of the major meat-bearing bones are present and bones from the forequarters are particularly numerous, which suggests a preference for shoulder joints. No foot bones and only a few cranial fragments were recovered, indicating that dressed joints rather than whole carcasses were purchased. The general size and epiphyseal fusion state of sheep post-cranial bones indicates that most are from lambs just a few months old. However, tooth eruption and attrition analysis indicates the presence of two older sheep.<sup>406</sup>

Only ten cattle bones were recovered, and horse is represented by just one loose upper molar. A possible dog burial is indicated by several articulating elements from the foundation trench of the abbot's hall. These include a skull with terrier type morphology (ie pronounced sagittal crest) and three cervical vertebrae; a radius from this context might also belong to this individual.

A large fragment of red deer antler was recovered from a Late Saxon context. Saw marks are clearly visible where the tines had been removed from the beam, indicating that this particular antler had been reduced into small sections for object manufacture. Two smaller off-cuts of antler were also recovered from Late Saxon contexts. Several fallow deer teeth and a metatarsal were also identified but are unprovenanced. Since the Normans are generally attributed with introducing this species to Britain, it can be assumed that these remains are from a medieval context.<sup>407</sup>

## Discussion

The assemblage is characteristic of the monastic diet as defined by St Benedict of Nursia (c 480–550). This rule permitted fish and the meat of birds but forbade the meat of quadrupeds, commonly referred to as 'flesh meat', to all except the sick.<sup>408</sup> Writing c 1129–30, William of Malmesbury observed that the diet of the Glastonbury monks was dominated by eggs and fish.<sup>409</sup> It was not uncommon for fish-substitutes to be consumed in monasteries during the fast seasons. These substitutes included animals that were considered to have a similar anatomical, physiological or ecological resemblance to fish (ie an aquatic habit).<sup>410</sup>

These dietary restrictions were relaxed within the Benedictine Order by Pope Benedict XII in 1336 to allow the consumption of flesh meat on four days in the week outside the fast seasons, but only in an appointed room other than the refectory.<sup>411</sup> Since most of the animal bone from Glastonbury Abbey pre-dates this amendment it is possible that the bones of livestock species represent the remains of meals that were fed to sick monks or lay servants and guests, all of whom were exempt from dietary restrictions. The alternative is that the abbey monks did not strictly observe the rule of abstinence from the consumption of flesh meat. However, the pittance accounts for 1538–9 record fish purchased to supplement the diet during Advent and Lent. Extra rations included pea soup, fresh fish and fish soup flavoured with pepper, cinnamon and raisins. Easter was marked by a feast of six lambs and Easter eggs; suckling pigs were consumed on the feast of the Dedication of the Church.<sup>412</sup>

Excavations at monastic sites generally yield little in the way of animal or fish bone, particularly where sieving has not been carried out.<sup>413</sup> The hand-recovered assemblage from Glastonbury Abbey is dominated by bird bones and is therefore broadly representative of the monastic diet. In common with most monastic

assemblages, the Glastonbury material includes a significant proportion of the bones of new-born pigs and sheep.<sup>414</sup> The presence of these prohibited delicacies indicates that there is little to distinguish the diet of the monastic community from secular, high-status medieval society.

## 8.15 Wood and charcoal

*Dana Challinor*

### Introduction

Fragments of wood and charcoal were retained from twenty-one contexts excavated in the 1950s and 1960s at Glastonbury Abbey. Radiocarbon dating was carried out in 2010–11 on seven samples, confirming dates from the seventh to the twelfth centuries (see Tables 1–2). Several of the samples represent spent fuel associated with the Saxon glass furnaces (see Chapter 7). The methodology and full results are archived online.

### Wood

Four contexts produced pieces of wood, three of which were desiccated and one of which was mineralised (M327); they all appear to be *Quercus* sp. (oak).

### Charcoal

The condition of the charcoal was generally good with clean, reasonably firm pieces (>2mm in size). A total of 182 fragments was examined, from which eight taxa were positively identified, all native to Britain:

- FAGACEAE: *Fagus sylvatica* L., beech; *Quercus* sp., oak
- BETULACEAE: *Alnus glutinosa* Gaertn, alder; *Corylus avellana* L., hazel. The last two genera have very similar anatomical structures and can be difficult to separate, hence the category *Alnus* / *Corylus*. Both species were positively identified.
- SALICACEAE: *Salix* sp., willow; *Populus* sp., poplar; rarely possible to separate on the basis of their anatomy.
- ROSACEAE: Amygdaloideae, subfamily including *Prunus spinosa* L., blackthorn, *P. avium* L., wild cherry, *P. padus* L., bird cherry and *P. domestica* L., plum. These species can be difficult to distinguish, but the wide rays were characteristic of *Prunus spinosa*.
- Maloideae, subfamily including *Pyrus* sp., pear; *Malus* sp., apple; *Sorbus* sp., rowan / service / whitebeam and

*Crataegus* sp., hawthorn; all are anatomically similar.

- ACERACEAE: *Acer campestre* L., field maple

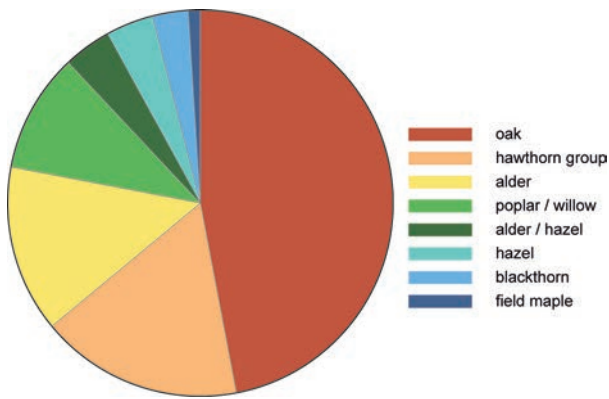
### Discussion

The wood samples could have come from structural or natural provenance and oak would have been available and utilised for various activities. Interpretation of the charcoal must take taphonomy and sampling into account. The excavations by Radford in the 1950s and 1960s pre-dated the establishment of environmental archaeology and modern guidelines for sampling. Consequently, the charcoal from Glastonbury is hand-collected and does not provide a representative sample of the preserved material.

A range of deposition types occur at Glastonbury Abbey, but there is no record associated with the charcoal to suggest burning *in situ*. Several contexts were recorded as fills of features (eg post-holes, fire pits) but the majority were soil layers, either make-up for floors or accumulated over time (eg between cobbled surfaces). This means that the charcoal could have derived from several activities or events and does not represent the deliberate dumping of single-event debris. However, the majority of the charcoal represents the spent remains of fuel wood and therefore indicates species preferences and, to a lesser extent, the available resources for fuel. Of particular interest are the layers associated with the Saxon glass furnaces, which provide a secure provenance for the charcoal.

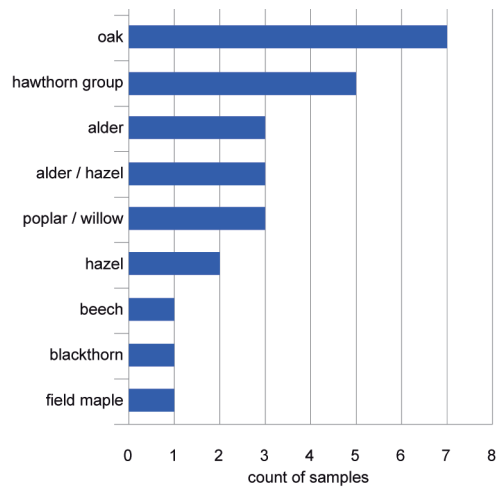
Seven samples were associated with furnaces that have been radiocarbon-dated to the Mid Saxon period (AD 605–780). Unfortunately, the varying amounts of charcoal make it difficult to provide a comparison across different furnaces or activity types (only five fragments from three samples associated with Furnace 1, compared with forty-one from sample M117). However, it is clear from an analysis of fragment count across all seven samples that oak accounts for 47 per cent of the assemblage, with hawthorn group, alder and willow / poplar between 10 and 17 per cent each (Table 17). This suggests that oak was the primary fuel wood; a number of heartwood fragments were recorded, indicating the wood used was of some maturity. In addition, many of the fragments of other non-oak species were from roundwood, consistent with small diameter branchwood that might be used for kindling.

Despite the bias of the sample, some comment can be made on woodland resources. First, oak is the most commonly identified taxon (Table 18), whether utilised for fuelwood or other activities, in the Late Saxon and



**Table 17** Percentages of charcoal taxa in furnace-related assemblages

medieval periods. This use of oak was supplemented by a range of other taxa, mostly represented by small branchwood and including hedgerow or woodland margin types (hawthorn, blackthorn), but also a fairly strong component of damp ground species (alder and willow / poplar). Beech was only present in one sample (M71) dating to the twelfth century or later. The low representation of beech is significant: charcoal



**Table 18** Charcoal taxa by ubiquity analysis

evidence from medieval sites in southern England, such as Oxford<sup>415</sup> and Southampton,<sup>416</sup> suggest that beech became an important resource for fuel from the early medieval period onwards, and was used alongside or in preference to oak as the main choice for fuel wood.



# The medieval worked stone assemblage

## 9.1 Romanesque carved stones

*Ron Baxter*

### Introduction

Eighty-three carved stones were identified as Romanesque, employing the date of the 1184 fire as the *terminus ante quem*, rather than the more usual date of c 1200 for the style. The loose stones were photographed, measured and examined visually to identify the stone type. Only three types of stone were discovered in the group: there were fifty-one pieces of blue lias, thirty-one of Doultong stone and one of Dundry. Blue lias is a late Triassic or early (Lower) Jurassic formation – a fine limestone or mudstone – that outcrops in a belt running south from Glastonbury and Shepton Mallet to Ilminster and Whitchurch. Physically it is hard, wear resistant and very small-grained, and its attractive colour and fine texture make it one of the best English stones for sculpture, but its beds are rarely more than 0.3m thick. Its layered formation makes it suitable for the production of gravestones and paving slabs, but it is susceptible to splitting and is therefore largely used for rubble building and as a source of lime for cement.<sup>1</sup> Doultong stone is a Jurassic Inferior Oolite limestone, quarried at Doultong, near Shepton Mallet, some 16km to the west.<sup>2</sup> It was fairly widely used in local parish churches and at Wells Cathedral, as well as Glastonbury, where it forms most of the ashlar facing of the abbey church. For sculpture it is

useful, being hard and fairly uniform with a medium grain size and a sugary texture, although it cannot take fine detail. Dundry stone is another Jurassic limestone from Dundry Hill, south of Bristol. It is yellowish with a fine even grain – finer and softer than Doultong but susceptible to weathering and industrial smoke. It was widely used in medieval Wales and the west of England, notably at St Mary Redcliffe, Bristol, St John's, Cardiff, and Llandaff Cathedral.

The Romanesque blue lias stones will be considered first, describing the history of their discovery, their style and date, and the types of architectural components represented by the assemblage. A similar treatment of the Romanesque oolitic limestone sculpture follows; full catalogues of both groups are published online. Finally, discussion will concentrate chiefly on the more artistically significant blue lias sculpture, examining the evidence for the form of the cloister from which it came and placing it in a workshop milieu associated with its patron, Henry of Blois.

### Blue lias sculpture

Fifty-one of the carved or moulded blue lias stones at Glastonbury were identified as certainly or possibly Romanesque (see online catalogue). Three (S514, S516, S936) are parts of waterleaf capitals, a design typical of the 1170s; four (S507, S510, S512, S941) are pieces of plain roll-necking with no decorative carving; and three (S931, S962, S513) are fragments of an uncertain form that cannot be attributed to the Romanesque group with any confidence. This leaves the main group of forty

stones, normally associated with the mid-twelfth-century cloister built by Abbot Henry of Blois, and the so-called fragment of Abbot Herlewin's tomb (S759), which is discussed below.

### Provenance of the blue lias stones

The earliest mention of this group of stones is found in Warner's *History of the Abbey of Glaston* (1826). This illustrates two carved stones dug up 'some years ago, in the area of the great church' that 'are now in the collection of Mr Reeves' (fig 9.1: 1).<sup>3</sup> One is now in the Glastonbury Abbey Museum (fig 9.1: 2), while the other, distinguished by what appears to be the body of a horse tangled in foliage, has not been identified. The next discovery was a capital presented by the local antiquary James Brown to the Salisbury and South Wiltshire Museum between 1864 and 1870 (fig 9.1: 4).<sup>4</sup> It is not known where Brown found the capital: it was assumed for many years that it came from Old Sarum (Wilts) until a comparison with the bulk of the Glastonbury Abbey cloister material revealed its true provenance (see 'Discussion' below). This capital is the surviving half of a free-standing double capital, of full height and including large parts of two faces. These are carved with similar designs, with lion masks at the upper angles from whose mouths issue pairs of stems carved with zigzag and beading.<sup>5</sup>

Bligh Bond published photographs of 'two pieces of carved blue lias' in 1913, describing them as in private hands and probably relics of Herlewin's church, built around 1100 AD.<sup>6</sup> He further reported that a large number of similar stones had been discovered in the course of excavation under the crossing of the abbey church and in the surrounding area, and that these were in the custody of the abbey trustees. He recognised that the two stones illustrated by Warner were of the same order, and suggested that 'all this series of lias-stones are from a presbytery wall-arcade in the earlier church, whose eastern limit probably came under the central tower of the later church'. More fragments of blue lias sculpture were recorded in 1927 when Theodore Fyfe was digging at the west end of the church.<sup>7</sup>

Radford's brief report on the excavations conducted between 1951 and 1964 noted fragmentary material in Dundry stone that was described as coarse in detail and considered to derive from the capitals of the Romanesque church.<sup>8</sup> The blue lias sculpture from the cloister he described as finer in detail and dating from the later years of Henry of Blois's abbacy, illustrating it with a photograph of S519, the stone described by Warner and dug up before 1826. It is clear from the archaeological

archive that carved fragments from Henry of Blois's cloister were being excavated in various parts of the site from 1908 onwards, and that many of them were excavated around 1952–7 by Raleigh Radford, who was digging in the cloister area at that time. Unfortunately, detailed find spot records are not available for every stone.

Of the fifty-one blue lias stones under consideration, only five have a specific archaeological context, and just one of these belongs with Henry of Blois's cloister group. This is S635, part of a capital – including its necking and intersecting stems, decorated with typical beading and zigzag ornament – found in the cloister in 1957, although no more precise context is supplied (fig 9.1: 3). The other contextualised stones are S936, a fragment of a waterleaf capital; S941, a section of plain roll-necking from a capital, both found in the abbot's hall cross trench or its eastern extension in 1962–3; S931, a tiny fragment that cannot be dated, discovered in the west cloister walk trench in 1954; and S962, perhaps from a monument that has no carving diagnostic of date that was found in a north transept trench in 1956. Two other stones are known to have been excavated by Raleigh Radford in 1957, but no excavation spot was recorded: S521 and S522 both belong to the Henry of Blois cloister group. Other stones photographed by Radford in 1952, and therefore assumed to have been excavated by him in that year, are S506 and S784, S779 and S629. There are also undated photographs of stones S781, S627, S783 and the right-hand part of the broken capital S521.

### Characteristics of the blue lias stones

Of the forty-one stones in this group, one is the so-called Herlewin tomb fragment, eight are parts of decorated shafts, three are fragments of bases, identifiable by the presence of a heavy cuboidal plinth, and twenty-two are certainly parts of capitals, confirmed by the presence of sections of necking or abacus. The remaining seven fragments could be from either capitals or bases, but it is usually assumed that they come from capitals. The sculpture is characterised by a crisp and precise style of carving and a polished surface. Foliage stems are fleshy and decorated with surface patterns of beading, nailhead or zigzag, and there is a liberal use of beaded clasps. Leaves and flowers are either furled or multi-lobed, and have a similar repertoire of decoration (fig 9.3: 21). A common and attractive feature is the berry cluster, found on the Salisbury capital (fig 9.1: 4) and on S520, S521 (fig 9.1: 5), S624, S627 and S630. The Salisbury capital has lion masks on the angles, similar to the head on the base



**Fig 9.1** Carved stones: (1) drawing from Warner 1826; (2) S519; (3) S635; (4) Salisbury Museum capital; (5) S521; (6) S522; (7) S523; (8) S636; (9) S524 (photos: D Cousins)

of S522 (fig 9.1: 6). A few fragments include parts of human figures: a head (S523), a hand (S6368) and a lower leg (S524) (fig 9.1: 7–9). Animal figures include the head of a lion (fig 9.1: 6) and the feathers of a breast or wing of a bird (fig 9.4: 25). The head at least belonged to a figural capital, as part of the distinctive abacus remains on the same fragment. Unfortunately, none of these contain features associated with a specific iconography. The date of the assemblage of blue lias stones is generally agreed to be shortly before the middle of the twelfth century.<sup>9</sup>

## Oolitic limestone sculpture

### Description and provenance

Thirty-one of the surviving Romanesque stones are of Doulling stone and one is of Dundry (see online catalogue). Of the Doulling pieces, only one is questionable as being Romanesque: S963, a tiny fragment with two concave faces, one of which bears traces of bright red paint. The precise function of another is unclear: S769 has foliage carving on the rectangular main face, but a short face that meets this at an acute angle is apparently carved with parallel shallow rolls (fig 9.2: 10). Ten voussoirs and seven capitals make up the bulk of the remaining material. There are also four grave markers; two jamb stones and one corbel, grotesque head, impost, shaft, double label stone and arch spandrel. The Dundry piece S672 (fig 9.2: 11) is a centripetal chevron voussoir (cf 9.2: Gothic sculpture and worked stone, where Sampson argues for a post-1184 date). There are two carved Romanesque stones known from Radford photographs but identified at present only by their photograph numbers (18501 and 18519; fig 9.2: 12–13).

Few of the stones have detailed provenances. A record for the scallop capital S720 (fig 9.2: 14) describes it as having come from a post-medieval rebuilding of the precinct wall. A chevron voussoir, S1278, was found among a pile of stones heaped up against the north wall of the precinct, but no excavation site is known.

### Function and design

#### Daisy labels

Two of the voussoirs (S622 and S757) and the double label (S1235) are from similar arches with a hollow chamfer carved with a row of six-petalled daisies in relief, and outside this a face carved with a row of beading (fig 9.2: 15). The voussoirs must therefore be assumed to come from labels too, and the geometry of the stones suggests blind arcading or double window openings rather than a main arcade or a gallery.

#### Chevron voussoirs and jamb stones

Voussoirs S1213 and S1239 are from similar arches, with a design of point-to-point chevron on two faces of an order that meets at a right angle (fig 9.2: 16; 9.3: 17). S1216 and S1240 both have a frontal chevron (fig 9.3: 18); S1278 and the Dundry stone S672 both have centripetal chevrons (fig 9.2: 11). The most complex chevron is found on S1221, which is unfortunately in a very poor condition, but is clearly carved with free-standing chevrons over a roll (fig 9.3: 19). A similar design may be seen in the 1180s at Worksop Priory church (Notts) on the west doorway, or in the infirmary arcade (c 1170–90) at Ely (Cambs) (fig 9.3: 20).

#### Capitals

Six of the Doulling capitals are variants of the scallop capital, and the seventh is a related multi-fluted form. Typologically S720 is the earliest, c 1100 (fig 9.2: 14). Its size suggests that it may have capped the central shaft of a small double opening, such as a window or a gallery. S724 is a nook-shaft capital, probably from a multi-order doorway or window (fig 9.3: 23). The sheathed cones are accurately carved, and the heavy roll-necking points to a date in the first quarter of the century. S704 is another heavy capital, carved on three faces at the end of a long block intended for insertion into masonry, as in blind arcading (fig 9.3: 24). The scallops are single on the side faces and double on the central face, with shields outlined by grooves. S857 is another scallop capital carved on three faces, but it is lower in aspect and has an integral impost block. The triple capital, S730, was made for a wide shaft flanked by two thinner ones, typical of gallery openings or complex blind arcades (fig 9.4: 26). Its integral imposts are tall and have been cut back on all but one face, which has a hollow chamfer below an upright face with a pronounced quirk between the two elements. Stylistically later is the beautifully carved trumpet-scallop capital, S698 (fig 9.4: 27), dated c 1170–90.

#### Heads and corbels

S695 is a comical grotesque head with bulging, drilled eyes surrounded by circular ridges, a bulbous, fleshy nose and a wide mouth drilled at either end so that the tongue is left in the centre (fig 9.4: 28). The lion stone, S655, has lost its head but the way the mane is treated, with short tufts ending in drilled spirals, identifies it as twelfth-century work, as does the beading found elsewhere on the block (fig 9.4: 29). It is hollow, and it looks as if it were designed to channel water, but a gargoye would be



**Fig 9.2** Carved stones: (10) S769; (11) S672; (12) Radford photograph of Romanesque sculpture (EHA:GLA/Site/7/7); (13) Radford photograph of Romanesque sculpture (EHA:GLA/Site/7/25; A526 and A706); (14) S720; (15) S757; (16) S1213 (photos: Ron Baxter)



**Fig 9.3** Carved stones: (17) S1239; (18) S1240; (19) S1221; (20) Ely Infirmary arcade CRSBI 19457; (21) S520; (23) S724; (24) S704 (photos: Ron Baxter)



**Fig 9.4** Carved stones: (25) S781; (26) S730; (27) S698; (28) S695; (29) S655 (photos: D Cousins (25); Ron Baxter (26)–(29))

revolutionary at this date, and the square hole was more likely to fix the lost head.

#### Grave markers

There are four Douling stone grave markers in the collection: three originally had cross pattée heads, two of

which were recut for use as corbels after the 1184 fire. One (S659) has decoration remaining in the form of a six-petalled daisy surrounded by a beaded ring in the central boss (fig 9.5: 30); the other (S660) has been shaved back for its reuse, so that any ornament is gone. The most interesting is S688 (fig 9.5: 31–32), carved on



**Fig 9.5** Carved stones: (30) S659; (31) S688 Agnus Dei; (32) S688 beast holding severed head; (33) S843 (photos: D Cousins (30) and (31); Ron Baxter (32) and (33))



one face with an Agnus Dei surrounded by beading, and on the other with a crouching beast holding a severed human head between its front paws: a visual reminder of the alternative fates awaiting the occupant of the grave. This stone has also been reused, but as a gravestone for someone whose initials – J A D – are carved on the front face below the Agnus Dei.

#### Arch spandrels

Only one survives (S843): a simple quadrant with a fat soffit roll (fig 9.5: 33).

### Discussion

By the mid-1950s, a large number of blue lias stones had been excavated, finely decorated with distinctive beaded and zigzag ornamented foliage forms, but at this stage they had not been associated with Henry of Blois or his cloister. It was at precisely this time that two important and influential books on English Romanesque art appeared.<sup>10</sup> The capital in Salisbury Museum was accepted as high-grade blue marble work from Old Sarum: T S R Boase associated it with Bishop Roger's rebuilding of the church as described by William of Malmesbury (1100–39).<sup>11</sup> Boase described the capital as 'admirably carved with an elaboration of cutting unknown in English work of the period and probably an import from abroad'. George Zarnecki proposed that it was from Old Sarum and that it was a Flemish import of Tournai marble.<sup>12</sup> He dated it to 1150–75 but divorced it from Bishop Roger's work and linked it instead to the time of Joscelin de Bohun. He was aware of the Glastonbury capitals but assumed that they 'were brought to England ready-made from Flanders and used in places widely separated'.

The stones were first identified as blue lias in a Master's dissertation by Josephine Turquet, a student of Zarnecki at the Courtauld Institute in 1974. She used the conclusions of Bond (1913) and Peers *et al* (1931) to establish that the stone was not imported, but carved from local blue lias, and concluded from this that the work was by local sculptors, rather than a foreign import.<sup>13</sup> The Salisbury capital was finally recognised as having originated at Glastonbury, from where it was taken to Salisbury by its discoverer, James Brown, in the mid-nineteenth century. This is a double capital, a form usually associated with cloisters, and Turquet concluded that all of the material came from the documented cloister of Henry of Blois. The arcaded blue lias stone previously identified as part of the tomb of Abbot Herlewin (S759) was interpreted as part of a *lavatorium* basin. This attribution

was based on comparison with a similar fragment from Lewes Priory (Sussex), and this added weight to the cloister interpretation (fig 9.6: 34). This enigmatic stone is not easy to place: certainly, the furled leaf forms and nailhead ornamented stems above the fictive capitals and in the arch spandrels are comparable with fragments from the Henry of Blois cloister group (fig 9.6: 35). However, the fictive capitals themselves are comparable with stylistically later flat leaf or waterleaf forms, normally dated in the 1160s or 1170s. But it is unsafe to compare fictive and real forms: objects like tombs and *lavatoria* provided an opportunity for experimental micro-architecture and are often *avant-garde*.

Zarnecki also played a role in re-evaluating the importance of the Glastonbury blue lias sculpture. He was the driving force behind the exhibition of English Romanesque art held at the Hayward Gallery in 1984, and he selected seven of the blue lias cloister fragments for display.<sup>14</sup> The sheer volume of Glastonbury material and its prominence in the exhibition and the catalogue marked an important watershed. The Glastonbury material at last took its rightful place alongside the sculptures from Reading Abbey, Hyde Abbey and Norwich Cathedral as a paradigm of English Romanesque cloister sculpture of the highest quality.

Visual analyses have largely been directed towards establishing a style associated with Henry of Blois. His two chief positions were the abbacy of Glastonbury from 1126 and the bishopric of Winchester from 1129, and he held both offices until his death in 1171.<sup>15</sup> At Winchester he began the enlargement of Wolvesey Palace in 1138, his official residence alongside the cathedral;<sup>16</sup> the site was excavated under the direction of Martin Biddle between 1961 and 1971.<sup>17</sup> In 1965 Biddle unearthed a section of door jamb that matched other colonnettes in Winchester City Museum; these are carved in deep relief with designs of beaded stems and a great variety of leaf forms, including multi-lobed leaves, furled leaves and pods and berries. They are so similar to the Glastonbury stones as to suggest that the same sculptor was at work. The major difference is in the choice of stone: the Winchester shafts are in Caen limestone rather than a hard fine-grained pseudo-marble like blue lias, Tournai or Purbeck. Turquet and Zarnecki have also made comparisons with works in other media associated with Henry of Blois, such as the Winchester Psalter,<sup>18</sup> the two pierced-ivory panels from book covers now in the Victoria and Albert Museum, and the walrus ivory arm of a stool in the Bargello Museum in Florence, attributed by John Beckwith to Winchester and certainly datable to Henry's time there.<sup>19</sup> While comparisons are very close, especially with the psalter,



**Fig 9.6** Carved stones: (34) S759; (35) S625; (36) Gundrada tombstone; (37) St-Denis west-front colonnette; (38) S783; (39) S766; (40) S760; (41) S785; (42) S34 (photos: D Cousins (34), (38)–(42); Ron Baxter (35) and (36); © Kathryn A Morrison (37))

there cannot possibly be any connection at the level of production between such works and stone carvings. Indeed, it is difficult to see under what circumstances the stone carvers would have seen manuscripts and ivory book covers at all, and therefore any similarity must represent copying of the masonry capitals by the miniature painters and ivory carvers rather than the other way round.

The object most commonly associated with the Glastonbury cloister capitals is the tomb of Gundrada: a Tournai-marble slab carved with two rows of palmette-like foliage forms with furled leaves, beaded stems, berries and cat-masks (fig 9.6: 36). Gundrada was the wife of William de Warenne, Earl of Surrey, who died in childbirth in 1085. Together, William and Gundrada founded the Cluniac priory of St Pancras in Lewes (Sussex) in the 1070s, but her tomb slab dates from the rebuilding of the priory church in the years 1142–7.<sup>20</sup> The repertoire of motifs on the Gundrada tombstone is close enough to that of the Glastonbury capitals to have convinced Zarnecki that the two are the products of the same workshop. He maintained this association even when it had been established beyond any doubt that the Gundrada tombstone was of Tournai while the Glastonbury capitals were of blue lias. By the 1980s, he regarded both as English work, rather than imports.<sup>21</sup>

Zarnecki stressed the similarities between the material from Wolvesey Palace and Glastonbury Abbey with sculpture from the abbey of St-Denis on the outskirts of Paris. While there are general similarities between the Henry of Blois group and the sculpture at St-Denis, these are not sufficient to imply any kind of connection at the level of production. Turquet placed the Glastonbury and Wolvesey work in a broad line of development through the Canterbury crypt capitals and the Reading Abbey cloister capitals, and there are sufficient parallels there and in the capitals from Hyde Abbey, Winchester, to render any reliance on St-Denis unnecessary.<sup>22</sup>

This sculpture is highly significant as a coherent group of high-quality carvings associated with a figure of international importance in Henry of Blois, King Stephen's brother. Its artistic connections are not with south-western English workshops, but with work produced at sites controlled by Henry of Blois. Although the direct connection between the Glastonbury capitals and Abbot Suger's west front at St-Denis has been rejected here, it is important to remember that it was once considered reasonable. These pieces have often been attributed to continental workshops precisely because they demonstrated no local stylistic affiliations. It was not until they were put together with other works produced

under Henry's patronage – the Gundrada tomb slab and Biddle's discoveries at Winchester – that their true position and significance began to emerge. Turquet's suggestion that they were descendants of the Reading Abbey style is an interesting one: that magnificent assemblage of cloister sculpture was produced under the royal patronage of Henry I. Its stylistic antecedents are not local either; instead they too are related to other sculpture produced under his patronage, originally in his Norman abbeys of Lonlay, Domfront and Goult, and later at Westminster and Norwich castle.<sup>23</sup> In addressing the national and international significance of the Glastonbury blue lias sculpture, it is probably helpful to see it as akin to a court style, transcending local links and expressing a visual ideology personal to Henry of Blois.

### The design of Henry of Blois's cloister arcade

Of the forty-one stones in this group, eight of are parts of decorated shafts; three are fragments of bases, identifiable by the presence of a heavy cuboidal plinth; and twenty-two are parts of capitals, confirmed by the presence of sections of necking or abacus. The remaining seven fragments could be from either capitals or bases, but it is usually assumed that they come from capitals.

Both the Salisbury capital and stone S783 (figs 9.1: 4 and 9.6: 38) were double capitals, as shown by the preservation of the adjoining neckings and parts of the bells in both cases. In contrast, there is no stone that can be shown incontrovertibly to have come from a single capital. It has therefore previously been assumed that the entire cloister arcade was carried on paired shafts, as at Norwich Cathedral or Bridlington Priory (E Yorks) rather than single ones, as at Reading Abbey, but while the evidence in these cases is unimpeachable, at Glastonbury it is not.<sup>24</sup> The capitals and bases here are in a fragmentary state, and while a small piece of a double capital can be identified by the junction of two bells and their neckings, a similarly small part of a single capital could have no such diagnostic feature. In short, there is no fragment that represents enough of the capital to identify it certainly as single. It is thus entirely possible that Glastonbury had a system of alternating single and twin shafts, as in the contemporary infirmary cloister at Christ Church Canterbury. At Canterbury the fat single shafts were of imported onyx marble while the slimmer paired shafts were of Purbeck.<sup>25</sup> At Glastonbury fragments of eight shafts survive, but in only four cases is there enough to estimate the diameter. Three of these have diameters between 140 and 142mm, while the fourth is significantly fatter at 180mm. This evidence is

by no means conclusive; the fatter shaft may have come from a doorway or other feature, but it does keep alive the possibility that the cloister arcades had alternating single and double supports.

The shafts are not plain but are decorated with two different forms of spiral ornament and three of chevron. A double-cable design in which broad hollows and triple wedges alternate – best preserved on S766 (fig 9.6: 39) – is the most common form of spiral ornament. The other spiral design, found only on S760, is identical except that there are double wedges rather than triple ones alternating with the broad hollows (fig 9.6: 40). The directional chevron designs, found on the other three shafts, are similar but not identical. In S502, the chevrons are alternate concave and convex sections with triple-wedge mouldings separating them; S784 has broad, shallow rolls alternating with the triple wedges and S785 has broad hollows, again alternating with triple wedges (fig 9.6: 41).

The three surviving base fragments are identified by the presence of a tall cuboid plinth or socle, integral with the carved work above it (S34, S522 and S625; fig 9.6: 42–44). The lion base, S522, is justly among the most celebrated of all the cloister stones. Both S34 and S625 are carved with beaded foliage forms in bold relief, and each shows an angle of the base, but the designs differ and they are assumed to be from different bases. The blue lias capitals, shafts and bases from the cloister described above supported arcades in the original arrangement. It is therefore surprising that no richly carved blue lias voussoirs or springers have been found. Of course, the arches could have been carved from Doulling stone but it seems more likely that they were either plain or simply moulded.

### The oolitic limestone sculpture

The Doulling and Dundry stone sculpture has not aroused the same kind of art-historical interest as the blue lias, and for two very good reasons. First, it does not form a coherent group in terms of either style or function; and second, it does not display anything like the same kind of virtuosity. In brief, it seems to be a small and incoherent collection of pieces of common types. Apart from the daisy label sections and the grave markers that form a separate group, no two oolitic carved stones seem to be associated together, by contrast with the blue lias stones, almost all of which belong together as a group. This must be related to the dispersal and reuse of carved stones after the fire of 1184: the discovery of the scallop capital S720 reused in a thirteenth-century context supports this hypothesis.

## 9.2 Gothic sculpture and worked stone

*Jerry Sampson*

### Introduction

Glastonbury Abbey's stone collection represents a small percentage of the mass of masonry which once stood on the site. The clearance of the debris from the site in the first and last decades of the eighteenth century would appear to have dissipated what fragments may have survived the quarrying of the standing buildings, when 'thousands of loads' were taken in the reduction of the ground levels in order to turn the precinct into pasturage.<sup>26</sup>

The collection of worked stone at Glastonbury Abbey comprises 1,439 numbered fragments (with a further eighty unnumbered or duplicate numbers), of which eighty-three pieces have been already been described in the Romanesque section. Of these, only a tiny percentage have a recorded context, or even place of discovery, and even where a find area is recorded this may not reflect the actual origin of the fragment. Thus, the eastern bay of the refectory undercroft produced not only fourteenth-century sculpture and fifteenth-century screen work (which Bond believed had fallen from the refectory above), but also an immediately pre-1184 Purbeck marble capital and Romanesque carved work.

Only the worked stone from the 1987–93 excavations has been properly published; the remainder were occasionally referred to in the narrative reports of Bond and his successors.<sup>27</sup> A group of over 100 fragments of worked stone was retrieved from a rebuilt section of the north precinct wall in Silver Street during its demolition in 1978 and these were recorded and drawn by the Committee for Rescue Archaeology in Avon, Gloucestershire and Somerset (CRAAGS), but their present whereabouts is not known (except for the few pieces incorporated into the abbey collections).

The stone collection at present probably reflects a long-term process of selective curation, aimed at reducing the bulk of the material, the stone assemblage being by far the most storage-hungry part of the collections. The existing collection of worked stone has clearly been sorted on at least two occasions: once in the earlier twentieth century, when the fragments were marked with Indian ink; and again in the 1980s, when all the stone fragments received the inked accession numbers (prefaced by the letter 'S') that have been used in the

current catalogue. The earlier arrangement of the fragments resulted in their numbering as a typological series, rather than in a numerical accession sequence: thus A200 was applied to fragments with significant polychromy, fragments labelled A41 are circular mouldings or annuluses, A81 are stiff-leaf volutes, A23 ball-flower, and so forth.

The 'thinning out' of the collections by the alienation of repetitive elements can be illustrated in the twentieth-century treatment of the Early English roll mouldings. Some of these were reused in the repair of the ruined church under W D Caroe, and others can be seen in twentieth-century contexts in Glastonbury town and on the wall top fronting a house on Glaston Street in the nearby settlement of Street. Following the sorting of the stone in the 1980s, others were buried in the precinct. Similar 'editing' of the corpus is likely to have accompanied the earlier sorting of the stone collection, and it is evident that not all the stone retrieved by the excavators has been preserved at the abbey. Thus, Bond reported the discovery of black marble fragments from the Edgar Chapel and 'many fragments of black marble-like stone bearing the marks of elaborate workmanship' from around the high altar, which he interpreted as deriving from the reredos.<sup>28</sup> No black marble (or other black stone) has been located in the collections.

## Methodology

While the physical form and style of the fragments provides the most reliable guide to their age and sometimes their provenance, the pieces are often too small to determine from what element of the structure they derive. A further proviso must also be added: while carved detail and mouldings from the earlier part of the history of the abbey post-dating the fire of 1184 can be dated with some degree of confidence, the same is not true of the later period. As Gardner notes, 'the Decorated type of foliage continued in use in the western counties right through the Perpendicular period', and much the same is true of the fragments of moulded stone.<sup>29</sup> Small, incomplete fragments of mouldings can sometimes be matched with their larger relatives, but many are unidentifiable; and many moulding profiles persisted throughout the fifteenth and early sixteenth centuries with no regard for the typologies of architectural history.

The formal and stylistic analysis of the fragments in the abbey's collections and their relationship to the remnants of the standing fabric remain key to the understanding of the corpus. However, their geological provenance and some of the survivals of surface finishes

(both medieval and post-medieval) provide further means of analysis. Thus, there are groups of fragments that are stylistically similar and executed in the same type of stone which must belong together, and which, despite their similarities to other fragments of different geological origin, can be divided from the rest of the contemporary material.

## The geological background

Constraints of space preclude a full consideration of the geology of the standing building and the collections.<sup>30</sup> However, an understanding of the exploitation of the various stones used by the medieval builders and carvers is essential to this analysis. The surviving standing fabric demonstrates that the church and conventual buildings were faced almost exclusively with freestone from the abbey's own quarries at Doulting and that other freestones were used relatively rarely.<sup>31</sup> This pale grey-buff granular limestone of the Inferior Oolite is characterised by the presence of crinoid ossicles; it has been exploited since Roman times and is represented in pre- and post-Conquest contexts prior to the 1184 fire. It was used at Wells from the 1170s, but temporarily disappears from the cathedral in the construction of the transepts, probably as a result of the stone from the quarry being required for the rebuilding at Glastonbury. Doulting stone is widely used as freestone in later medieval buildings in the east Mendip region, being displaced by Ham stone to the west and south, and Bath and Dundry stones to the north. Like Dundry stone, it was exported along the Bristol Channel, and has been identified in Ireland in an effigy at New Ross, probably shipped as a finished item.<sup>32</sup>

At Glastonbury, Doulting stone not only comprises the vast bulk of the standing fabric but also the great majority of the stone collections of all periods, reflecting the quality and versatility of the material as freestone and the abbey's ownership of the quarries. A gradual reduction in the overall quality of Doulting stone through the medieval and later contexts can be observed.<sup>33</sup> Some of the finest late twelfth-century Doulting stone is of such fine texture that it can be difficult to differentiate it from Dundry, especially where the surface has been discoloured, but in later medieval contexts the texture of the stone tends to become coarser, more granular and fossiliferous, even where it is employed for finely carved work, and this can provide assistance in dating. Likewise, block size tends to increase gradually over the period from the fire to the Dissolution.

Of the other stones that feature in the architecture,

blue lias and Purbeck marble were employed as inserts for their natural polychromy.<sup>34</sup> Used extensively as a rubble stone throughout the Middle Ages and for foundations from the earlier periods at Glastonbury, blue lias was probably first employed decoratively by Henry of Blois (1126–71), and its most influential use was in the reconstruction of the Lady Chapel (1184–7). Draycott marble was utilised for water-holding bases, but this conglomerate is unsuitable for fine carving, and no shafts in this material have been reported.

A flirtation with Purbeck marble took place at Glastonbury Abbey in the late twelfth century. Donovan and Reid see the uses of the two stones as successive in Somerset, and indeed in the West Country generally insets of lias began in the ninth decade of the twelfth century and ceased about 1300. Thereafter Purbeck marble from the south coast was used until about 1330, when the whole process was given up except for tombs.<sup>35</sup> However, several pieces from the Glastonbury corpus, including an early stiff-leaf capital, show signs of burning that suggest a pre-1184 date and the exploitation of Purbeck immediately prior to the use of blue lias in the Lady Chapel. In general, however, the pattern suggested above holds true at Glastonbury, with Purbeck only occurring again in the abbot's hall complex of the earlier fourteenth century.

The strongly oolitic Bath stone, differentiated from Taynton stone by the presence of narrow calcite veins, is found both as building stone and as elements of micro-architecture, since, like Beer and Portland, its fine grain made it eminently suitable for sculpture and delicate carving. There must have been a thriving Anglo-Saxon stone industry in Bath, with evidence at Winchester for freshly quarried Bath stone at all Anglo-Saxon periods from the seventh century onwards.<sup>36</sup> The distribution of Anglo-Saxon sculptures in Bath stone (including the majority of the cross shafts at Glastonbury) extends from Sidbury in Devon and Porlock in the far west of Somerset to Minety in Wiltshire and east to Winchester, roughly a 50km radius from the quarries. However, following the Norman Conquest the area of distribution for Bath stone appears to have contracted markedly;<sup>37</sup> no further use of this freestone has been identified at Wells prior to the second quarter of the fourteenth century, when it was utilised for fittings rather than architectural work. Its first large-scale use in the cathedral may be for the bishop's throne (c 1338), and by the fifteenth century it once again becomes the stone of choice for fine carving.

The use of Bath stone at Glastonbury reflects this pattern. As structural material it is found only in the first season of rebuilding in the Lady Chapel, immediately

following the 1184 fire, and this almost certainly indicates architectural salvage. It has not been identified elsewhere in the medieval standing fabric of the abbey. As elements of micro-architecture it seems probable that all of the loose fragments date from the second quarter of the fourteenth century or later.

Beer stone, a very fine-grained white to pale grey Cretaceous clunch, is represented by seventy pieces in the assemblage. The use of white lias at both Wells (c 1235) and Glastonbury (?1250s) for small-scale, high-quality carving that is stylistically related, suggests contacts between the two workshops, if not the direct involvement of the same carvers. Its later use again shows the Glastonbury workshops exploiting the fine-grained stone for its ability to render small-scale detail in micro-architectural contexts.

The nature of these finds in Bath stone, white lias and Purbeck marble – as groups of small-scale shattered pieces, with no major surviving associated blocks – is probably indicative of the process of quarrying on the site at and after the Dissolution. The structures from which the fragments derived were presumably taken apart with a view to their reuse as building stone: all of the large reusable blocks were taken away from the site, leaving these residual fragments, mainly small delicate and deeply undercut pieces of carving that probably became detached in the demolition and salvage process.

Dundry is used exclusively in the fabric of the building and apparently within a very specific period: from the first season of rebuilding to the hiatus in construction of c 1189. This cream-buff, fine-textured Inferior Oolite from just south of Bristol was used as structural carving block in the Lady Chapel, choir aisles and triforium, but disappears from the fabric at approximately the height of the springing of the choir high vaults. Used for its fine grain and ability to take fine carved detail, it forms one third of the figure sculptures on Wells's west front. It was exported to Llandaff (c 1170) and Ireland from c 1175. Within the stone corpus it has not been identified in carvings other than early work post-dating the fire of 1184, so it is probable that it was associated only with the first phase of reconstruction at the abbey.

Ham stone, a shelly, iron-rich orange-brown limestone from Ham Hill, is barely represented in the collection. Only one stone (probably intrusive) is known in the ruin itself: S793, a life-size female head, is probably part of an early fourteenth-century effigy, heavily weathered and unlikely to derive from the abbey itself. It is interesting to contrast the geology of Glastonbury and Athelney Abbeys: the former is overwhelmingly of

Douling stone, while the latter is almost exclusively of Ham stone. The two sites are roughly equidistant from Ham Hill, but Athelney lies on the River Parret, the course of which runs within a few miles of Ham Hill, while Glastonbury owned the Douling quarries.

### The 1184 fire and its aftermath

According to Adam of Damerham:

on St Urban's day [1184], fire destroyed the whole abbey except the chamber built by Abbot Robert with its chapel (here the monks took refuge), and the bell-tower built by Abbot Henry. The glorious buildings lately built by Abbot Henry, the world-famous shrine, the Church, the resting place of Saints – all were reduced to a heap of ashes. Only those who have witnessed a similar disaster can imagine the desolation of the monks: and even at this distance of time one can hardly hear of the destruction of the relics, treasures, vestments and books and remain unmoved.<sup>38</sup>

The ferocity of the great fire is attested both by the chronicler and by the results of the excavations.<sup>39</sup> Both serve to show that the ruins of the burnt-out church and conventual buildings were cannibalised at the inception of the rebuilding campaign. Adam of Damerham says that the stone from the palace of Bishop Henry and the precinct wall were reused in the foundations, while the first season of rebuilding – comprising the lower parts of the Lady Chapel – used architectural salvage, incorporating Bath, Chilcote and other freestones not seen elsewhere in the early fabric.

Both Bond and Peers commented on the paucity of Romanesque carving retrieved from the site and, in 1930–1, Peers provided an explanation from the excavation of the sleeper wall on the south side of the crossing, which

was found to be built with stones from the Norman church. They were known by their red colour, having been in the great fire, and pieces of Norman carving and other fragments of worked stone of that date had all been used up in the construction of this huge wall.<sup>40</sup>

Of the eighty-three Romanesque-style fragments in the abbey collections at least nine (S672, S761, S982, S1213, S1216, S1239, S1240 and perhaps S1278, with S963 and S843) derive from the 'Romanesque' detailing of the post-1184 Great Church and Lady Chapel or other post-fire sources; of the remaining seventy-four pieces, fifty-one are of blue lias, with at least forty of these believed to

derive from Henry of Blois's cloister (and apparently unburnt; see 9.1: Romanesque carved stones). This disproportionate ratio could perhaps be accounted for by a partial survival (and restoration) of the mid-twelfth-century cloister in the wake of the 1184 fire.

That the rehabilitation of the cloister took place during the first years of the rebuilding is shown by the inclusion of the lower part of the south nave aisle wall in the 1184–9 phase of building (the door to the west cloister having its detailing carved in Dundry stone). The scars of the first cloister remaining on this wall show that its general form was similar to that of Bishop Henry's cloister, and therefore that the retention of part of the earlier structure would not have presented an architectural challenge in its integration. These scars imply the former presence of a regular arcaded pentice, uninterrupted by formal bay divisions, similar to that hypothesised for the mid-twelfth-century cloister, and it seems possible that this new work was imitating the old in terms of its overall form and dimensions. In this context, three of the Draycott marble fragments in the abbey collection (S131, S768 and S772) – two double and one single water-holding base of late twelfth- or earlier thirteenth-century date made to house shafts of four inches in diameter (fig 9.7: 47) – are intriguing survivals that could derive from such a pentice. There are no free-standing double capitals of Early English form in Draycott or any other stone.<sup>41</sup>

### The Romanesque / Gothic overlap

Adopting the boundary of the great fire of 1184 facilitates classification of the post-fire stones in relation to the surviving elements of the standing building, all of which post-date the fire. However, the architecture and decoration of the rebuilt abbey church is distinctly conservative, and in some instances deliberately archaic, so that, stylistically, much of the new structure remains embedded in the late Romanesque. Nonetheless, much of the detailing in the first seasons of the rebuilding is fully Gothic in style, to the extent that the advanced figural carving of the Lady Chapel doorways (executed in 1185–9) has led to their being dated erroneously to the 1220s on stylistic grounds. The emergency of the fire and its aftermath evidently led to the formation of a workshop at Glastonbury accommodating carvers operating in both advanced and retrospective styles.<sup>42</sup>

The overall conservatism of Glastonbury's design – drawing on the high Romanesque giant order of such earlier Benedictine abbeys as Gloucester, Tewkesbury and Reading – is also seen in the detailing of the surviving



**Fig 9.7** Carved stones: (43a) S673 voussoir carving of man and dragon in combat, probably from the Lady Chapel north door; (43b) BS144 furling leaf foliage, probably from the choir; (44) components from the Lady Chapel turrets; (45) S1209 (bottom left), a Dundry stone voussoir, a hybrid monster, probably deriving from the Lady Chapel; (46) the lias inserts of the Lady Chapel (exterior elevation): the lower tier with abaci, capitals, annuli and bases, the shafts now lost; (47) S870 upper face (top) and side elevation (below): one of a group of bases from the Galilee windows including S841 and one unnumbered example (photos: Jerry Sampson)

parts of the church, where chevron ornament is extensively deployed. The Lady Chapel combines round-headed arches and interlacing arcading with chevron-

work and lias inserts, the latter probably in imitation of the destroyed buildings of Henry of Blois; chevron work is also common in the painted decoration here. The Lady



Chapel is a strong candidate for a consciously retrospective design that was intended to evoke the venerability of the lost *vetusta ecclesia*.<sup>43</sup>

### Fragments from the Lady Chapel

Nine pieces (S761, S818, S665, S805, S806, S872, S877, S847, S1256) derive from the Lady Chapel turrets of 1184–9 (fig 9.7: 44) – probably from the south-western turret, which collapsed in the mid-eighteenth century – and there are numerous fragments of the lias inserts, including at least eight pieces (S908, S909, S913, S914, S916, S917, S1082, S1422) recently brought in from the standing building for safe-keeping.

Of the non-lias elements, two (S673 and S1209) are voussoirs, which almost certainly derive from the inner order of the arch of the north door. Stylistically and iconographically related to the north door carvings, these are executed in Dundry stone like the remainder of the arch. One (S1209) bears a sculpture of a riding or hybrid figure directly comparable to the battling man / bird hybrids near the top of the northern jamb of the outer order (fig 9.7: 45); the other (S673) is probably part of a man / dragon combat scene like those of the southern jamb of the outer order and elsewhere on the door (fig 9.7: 43a). These survivals indicate that the inner order (like the outer and centre orders) was carved with marginalia rather than sacred subject matter; sacred imagery was restricted to the alternating second and fourth orders.

### 'Furled-leaf' foliage fragments

The archaic furled-leaf carvings resemble those from Keynsham and the west bays of the nave of Worcester Cathedral (fig 9.7: 43b). They typify one strand of the immediate post-fire sculptural style of the Lady Chapel and the earliest work of the choir, which is also represented in the stone corpus. Six pieces (S35, S141, S142, S144, S297 and S298) can be regarded as fairly certain identifications, with three other possible examples (S124, S143 and S145).

S144 had been broken in antiquity, and the break and carving-surfaces both bear traces of a buff lime mortar, indicating reuse in the Middle Ages. Since this style of carving ceases just prior to the time when the choir aisle vaults were erected, it presumably belonged originally to the choir aisles or arcades, and the mortar residues therefore probably result from the carving having been reused in Monington's choir extension. S558 from the group of chevron-ornamented pieces also bears buff

mortar residues that are likely to derive from the same cause, and is one of the group of seven such stones (S558, S672, S982, S1213, S1216, S1221 and S1255) cut from Dundry stone, probably between 1184 and 1189.

### The blue lias carvings

The relatively good state of preservation of the Lady Chapel means that considerably more lias survives in the standing fabric than in the post-1184 stone collection of the abbey, which comprises forty-four fragments. The lower half of the elevation of the Lady Chapel displays the most sustained use of decorative blue lias and must have been a polychromatic *tour de force* when newly built, with its polished lias contrasting with the limewashed and painted walls (fig 9.7: 46). Blue lias is not found in the contemporary work of the choir, but there are fragments of furled-leaf carving in the collections with traces of black paint, and there is similar black paint on mouldings in the choir and transept (fig 9.17: 78), suggesting that the architecture was being painted to imitate lias. This may have been necessitated by a shortage of masons skilled in the working of the more intractable lias; it is only on the lias elements that the marks of claw-chisel work are seen, suggesting specialist workers using a different tool-kit.<sup>44</sup> In the surviving fabric, lias first occurs within the Great Church in the clerestory of the transept, and there are no further instances of surviving architectural lias in the remaining fragment of the south nave aisle. In the west front and Galilee, however, lias is used for shafts, bases and abacuses, and in the arch between the Lady Chapel and Galilee; twelfth-century lias elements have been reused in the responds.

Of the forty-four post-1184 fragments, eleven are from plain cylindrical shafts of various diameters, and while the identifiable Romanesque shafts bear spiral ornament, some of these plain examples could also pre-date the great fire.<sup>45</sup> A number of pieces (including shafts S263, S568 and S897) bear a thin skim of white lime on the surface, which is sufficiently fine to suggest that it may represent a medieval coating applied during a period when the natural polychromy of the stone was subsumed into a more general overall colour-scheme.

Abacuses of two types are represented: the square-plan type which is found in the Lady Chapel (S687, S866, S884, ?S1236) and the circular form of west nave and Galilee type (S865). The former has two different mouldings, perhaps suggesting that some may derive from the clerestory of the Great Church, where the shape of the abacus itself is not known. Bases or annuluses (indistinguishable where only the moulding survives) are

represented by S689 and S909, but a group of three large bases derive from the Galilee mullions (S841, S870 and one unnumbered), and may be representatives of those referred to by Bond in his fifth report (fig 9.7: 47).<sup>46</sup> The nine-inch high capitals of the Lady Chapel are certainly represented (S767, S1422) and several more fragmentary examples also probably come from there (S913, S914, S916, S1082). S981 is a moulded, rather than a foliate capital, and since the exterior capitals of the transept clerestory appear to have been moulded it may have been an internal capital from this part of the Great Church. S649 is a very fine and well-preserved double capital with simple stiff-leaf volutes similar to those of the burnt Purbeck marble capital S693, and despite showing no sign of burning this could be an immediately pre-fire piece, since there is no obvious parallel for it in the post-fire structure.

### Other fragments from the Lady Chapel and Great Church

Identifiable fragments of the thirteenth-century components of the church include three head-stops from the Lady Chapel, seven voussoirs from the vaulting (S984, S1193, S1224, S1243 and three unnumbered), of which two are certainly Dundry stone, and all but one could be from that same quarry. Of the latter, four bear deliberately incised mortar channels and one has a bed-joint roughened to assist the bond. Five bear incised lines which could be masons' marks, of which two are simple 'X' marks.<sup>47</sup>

Attached keeled roll mouldings, a relatively common feature of the corpus, were typical of the architecture of the Great Church, and probably occurred extensively elsewhere in the late twelfth- and earlier thirteenth-century buildings. Twelve keeled and two plain rolls are represented in the collections, but no fewer than seventy roll mouldings were reburied and nineteen reassembled in a stone-pile in 1989. There is considerable variation in the diameters of the rolls in the collection: two are of 2¼ to 2½ inch (S406, S411); six are of 4 to 4½ inch (102–114mm) (S735, S994, S996, S1005, S1084 and one unnumbered); and three are of 5 to 5½ inch diameter (127–140mm) (S1044, S1046 and S1280); the one measurable plain roll (S1047) is also of the larger diameter. The smaller diameter fragments probably derive from wall-shafts framing the windows, the larger ones from the compound piers and arcade responds.

One of the largest single categories in the abbey collections consists of fragments of stiff-leaf carving. Seldom represented by more than a detached floret or volute, these include 108 pieces for which no architectural

context can be determined, twenty capital fragments, and thirteen pieces from an assortment of spandrels, canopies, paterae and relief panels, amounting to just over 140 examples in total. The relatively high proportion of stiff-leaf carving in the corpus (just below 10 per cent) is likely to result in part from selective preservation during the curation of the finds, but is also indicative of the extent of the rebuilding during the Early English period. This is especially significant when compared to the number of finds of later thirteenth- and early fourteenth-century carving, and is further circumstantial evidence for an early date for the completion of the Great Church, from which the majority of these fragments are likely to derive.

It may also be significant that dog-tooth ornament appears to be absent from the corpus. First introduced at Wells in the internal voussoirs of the west windows just before the dedication of 1239, this is otherwise found there only in twenty-five of the fragments that probably derive from the Wells west cloister of c 1250.<sup>48</sup> It is not present in the surviving fragments of the west nave or Galilee at Glastonbury. Naturalistic leaf forms, which typically replace stiff-leaf forms in the later thirteenth century, are also rare in the abbey collections. All this serves to suggest that the Great Church was largely complete and roofed (but not vaulted) by c 1230. The Galilee is stylistically of this period and bonded with the west front; it was built to unite the Lady Chapel with the nave and would only have been needed if the nave were fully functional.

Developmentally the stiff-leaf corpus begins with hybrids like S297, and with volute capitals with long, prominent ridged stems; many examples of the latter survive in the choir and eastern transept aisles and chapels. The early stiff-leaf forms of the Lady Chapel appear fully developed: the second stiff-leaf carver who worked on the south door in 1189 shows remarkable skill and inventiveness in his leaf-work. Many of the motifs found in the later corpus of carving are already present in this earliest phase, so that it is difficult to propose a developmental sequence with confidence, particularly with all but a tiny fragment of the nave lost. Fragments of anything recognisable as historiated capitals are rare (S301, S306).

### The white lias fragments

A group of twenty-two fragments of a very fine-grained white stone are also stylistically late, Early English; the stone has a smooth, porcellanous surface texture and has been identified as white lias. These include four male heads of outstanding quality (fig 9.8: 48, 49, 50) and fragments of drapery (fig 9.9: 51) representing up to nine



**Fig 9.8** Carved stones: (48) head S787, dexter and frontal-sinister; (49) head S788, frontal and sinister; (50) head S790, dexter and frontal (photos: Jerry Sampson)



**Fig 9.9** Carved stones: (51) S789 (left) and S620 (right) fragments of dexter shoulders and upper torsos in white lias stone; (52) S302 (left) with the head-stop of a king from the interior of Wells Cathedral west front; note the similar treatment of the tight curls above the forehead; (53) S274 (right) from the Glastonbury white lias stone group, with two sections of the Wells Cathedral west front foliage carvings from the west door voussoirs, executed in the same stone, for comparison (photos: Jerry Sampson)

figure sculptures, eight foliage fragments and three pieces of architectural detail. At least two further lost fragments were sketched by Skinner in 1825.<sup>49</sup>

The head of a monk (S790 (fig 9.8: 50) was found in the north transept,<sup>50</sup> but others (including the lost pieces) were found in or near the Galilee, and it is possible that, despite the overall geological and stylistic resemblances of the whole group, they derive from two discrete entities. Most (including those described by Skinner) bear residues of a red ground, but S790 has a different polychromy and is slightly different in style; unlike the other heads it was not bridged at the back, suggesting it may have been free-standing. Also lacking the red ground is a capital designed for a 4½ inch (114mm) diameter shaft, to which it was originally fixed with lead grout, probably implying that it was load-bearing and supported canopy work.

The finds attested by Skinner in the undercroft of the Galilee and the eastern part of the Lady Chapel could indicate an origin in the furnishings of the Galilee for the 'red ground' group of fragments. At least two screens existed in this vicinity. One, probably an original fitting of the Lady Chapel, sited in the second bay from the east, was removed and the sockets for its attachment to the side walls carefully repaired; this removal probably dated from the opening up of the east end of the chapel into the newly constructed Galilee. The other stood in the eastern half of the new arch between the Lady Chapel and the Galilee, where there is a scar from a screen probably erected to form a liturgical barrier between the two structures once the Galilee was completed. Fragments of historiated and foliate panels and small-scale architectural elements could well have originated in the latter structure.

The provenance of S790 in the north transept could suggest an origin in the subsidiary sculpture associated with the tomb of Abbot Michael of Amesbury (d. 1253), which stood in St Thomas's Chapel; his mutilated effigy in Doultling stone still survives (S652) and is stylistically related to the Wells Cathedral west front workshop. If so, the capital fragment could also belong with such a monument, and it is possible that this possessed a tomb canopy of the sort exemplified by the Purbeck marble monument of Archbishop Walter de Gray (d. 1255) at York Minster, in which an arcaded superstructure with foliate spandrels is supported on eight shafts; or perhaps by the somewhat more substantial monument of Bishop Bridport (d. 1262) at Salisbury, in which taller historiated spandrels are accommodated above gabled and traceried openings supported on shafts.

On the interior of Wells west front there is a series of

small heads that bear a striking resemblance to the Glastonbury heads; these form the stops for the hood mouldings of the lower tier arcading on the west wall (fig 9.9: 52). They form part of the distribution on the west front of what appears to be the same fine-grained porcellanous white limestone from which the Glastonbury fragments are carved, all probably derived from a single load of the stone, which includes a series of ten standing female figures (WWFV1-10) and an order of stiff-leaf foliage set within the voussoirs of the west door (fig 9.9: 53), two demi-angels from the quatrefoils above the lowest tier of life-size figures (WWFS311 and 314), and a series of repair piecings set with hot mastic into figure sculptures concentrated in the area around the west windows.

The 'Beer stone' carvings on the west front of Wells Cathedral belong firmly to the workshop style of the west front of which they form a part, but there are also strong stylistic connections with the slightly later Glastonbury carvings. The high arching brows of the west front head-stops are seen in S787 and S788 (fig 9.8); the treatment of the Wells king's beard, particularly at the centre of the chin, is very similar to that of S788; and the idiosyncratic, tightly curled hair-lock terminals seen on the king at Wells are the same as those on the weathered head of S302. Technically the two sets of carvings are also very similar, with much drill-work and the use of fine lead dowelling. As with the effigy of Michael of Amesbury itself, there would appear to be direct stylistic connections with the best of the production for the adornment of Wells west front during the period immediately following its completion.

### A screen or monument decorated with fine ball-flower ornament

A group of twelve fragments (S194, S216a, S217a, S221-S223, S225-S226, S656, S686, S744, S886), representing 75 per cent of the total surviving ball-flower carving, can be grouped on the basis of having been carved from Bath stone and possessing ball-flower ornament of identical design (fig 9.10: 54-56).<sup>51</sup> All these blocks (where sufficiently well preserved for identification) are of limited projection (not generally exceeding 150-60mm) and have their backs worked to a flat finish, suggesting that they may have been applied to a pre-existing ashlar-faced wall surface. The largest of these pieces (S656) has a complete bed-height of 500mm and incorporates the lower half of a seated figure (perhaps of an angel) in a spandrel (fig 9.10: 56). The north wall of St Thomas's Chapel has a series of cramp



**Fig 9.10** Carved stones: (54) fragments of an early fourteenth-century screen or monument in Bath stone decorated with ball-flower: S886 (far left) a jamb stone from the springing of the dexter side of an arch: S226 (upper left) part of a string-course (or jamb): S686 (lower left) fragment from a cusp: (55) head fragments possibly deriving from the spandrel figures of the ball-flower screen / monument: S117 (far left) and S473 (left): (56) S656, the lower half of a seated ?angel from a spandrel, the hollow mouldings decorated with ball-flower ornament (photos: Jerry Sampson)

positions cut in at one-metre intervals, suggesting that the whole wall above an inserted arched tomb recess was clad with later carved work. If cramps were set at alternate course heights these pieces could derive from the superstructure of this major monument, possibly that of John of Taunton (d. 1291), the latest of the abbots known to have been buried in the chapel (although this would be a very early use of ball-flower). No find spot for any of the Glastonbury ball-flower fragments has been recorded. There is no certainty whatsoever that this group of fragments derives from the Great Church, but major screen work and monuments of their period were undoubtedly being made as fittings for the building.

### **The Bath stone corpus: fragments from a major reredos?**

The second largest geological group, with 105 items (117 including the ball-flower group discussed above), is that carved from Bath stone. Amongst these fragments, a surprisingly large proportion appears to come from a single structural entity, since a whole series relates to canopy-work that is stylistically identical. Furthermore, given that these canopies belong to niches for figure sculpture, some of the fragmentary remains of figural carving in a very similar bed of Bath stone may also come from this lost fitting of the abbey church.

One third (thirty-six) of the total comprises small fragments of finials and pinnacles from canopies. These canopies clearly had a demi-hexagonal projection, since there are larger and smaller varieties of finial: the larger set being those on the main frontal axis; the smaller on the side elevations; and with the pinnacles rising at the angles between them. Of the canopies themselves, a few fragments also appear to survive, the whole group representing up to nine niches, and it is probable that more canopies of this type originally existed than have survived (given the paucity of pieces that can be related together elsewhere on the site). This in turn suggests that the fragments derive from a reredos or screen bearing niches for figure sculpture, rather than from a monument. This group also includes twenty fragments of foliage carving of considerable delicacy, some (but probably not all) of which may belong with the canopies. Most show a remarkable degree of undercutting, consistent with the treatment of the canopy finials.

Of the seventeen fragments of figure sculpture in Bath stone, some (such as the demi-angel corbel S690) certainly derive from a different source. There are small pieces that cannot be reliably attributed to any particular source, but others have a very similar geology to the

canopy fragments. One such unnumbered piece also exhibits the same sort of skilful undercutting as is seen in the niche and foliate fragments: for example, the dexter hand from an approximately three-quarter life-size figure.

### **The Beer stone corpus: micro-architecture**

Seventy pieces derive from the slightly granular Beer stone, including fourteen fragments of figure sculpture, nine of foliage and thirty-four that derive from finely detailed canopy or screen work. It has been suggested that much of the Bath stone group comes from a series of niches for figure sculpture, including as it does twenty-two canopy and fourteen pinnacle fragments from a total of 118 items. The Beer stone group is similar in incorporating eleven canopy and seven pinnacle fragments out of a total of seventy items. The foliage and figural carving ratios of the two groups are also similar: the Bath stone foliage carvings total twenty fragments, with seventeen pieces of figure sculpture; the Beer corpus incorporates nine foliate and fourteen figural pieces. Evidently the two stones were being utilised in very similar ways, with the assemblage conforming to the expected pattern of use of this fine-grained stone for detailed carving associated with monuments or screens and with no indication that it was being used for major architectural work.

That the Beer stone group is genuinely derived from a separate architectural source to the Bath stone fragments is confirmed both by stylistic differences in the associated foliage carving and by the differences in the section of the pinnacle fragments between the Bath, Beer and Doulling groups. As with the Bath stone corpus, there are several fragments of figure sculpture that could have been housed in the niches implied by the surviving canopy fragments (eg S465, S118, S479, S486 and S485).

### **Late medieval screen work**

Amongst the fragments of screen work two important groups can be identified. S840 (fig 9.11: 57) is a relatively complete block from a possible ogee arch with crocketed decoration, having the same moulding and very similar crocketing to S814 and S8080; in all three cases the crockets are treated in relief against a plain background, rather than being free-standing, as would be more likely to have been the case in a canopied monument.<sup>52</sup> Several other pieces in the corpus bear similar mouldings: S811, probably from the upper part of an ogee arch, and S848 with a different but related moulding. All of these pieces bear substantial traces of white paint, were fixed with a



**Fig 9.11** Carved stones: (57) S840 (far left lower stone) and S814 (far left upper stone) from a crocketed arch; S848 (top left) with a related moulding also bears the same mason's mark as S840; S814 has a recess from the loss of a (?hot mastic) repair (lower left); (58) the S815 group of screen-work fragments: S832 (far left) retaining the springing of the cusped lights; S862 showing the side profile of the mouldings (top left) and the mason's mark on the back of S862 (lower left); (59) the S815 group of screen-work fragments: S815 and 832 (far left) and S862 (left) moulding profiles; (60) masons' marks cut by 'triple triangle': at Ottery St Mary (upper left) on the north-eastern lancet window of the south transept (c 1342); on the north door of the Vicars' Hall at Wells Cathedral (c 1347) (upper right); on the soffit of the south-eastern squinch in the abbot's kitchen at Glastonbury Abbey (?late 1320s) (lower right), and on S848 (lower left) (photos: Jerry Sampson)



buff lime mortar, and have traces of incised 'arrow-head' mortar-channels to assist the bond; furthermore, S848 bears the same mason's mark as that on S840.<sup>53</sup>

The mark on S840 and S848 belonged to a mason who worked on the extension of the choir of Wells Cathedral (completed *c* 1337), Ottery St Mary (*c* 1337–45) and the Vicars' Hall at Wells (*c* 1347), all projects attributed to the master mason William Joy (fl. 1329–47) (fig 9.11: 60). The mark is also found (with those of two other masons from the same workshop) on the standing structure of the abbot's kitchen, and the careers of these masons suggest that they were involved relatively early in the building of the abbot's hall complex, John of Glastonbury noting that this had already been constructed as far as the top of the windows under Abbot Adam of Sodbury (1323–34)<sup>54</sup> and completed by John of Breynton (1334–42). Their association with William Joy's workshop suggests the possibility that Joy was also the master in charge of this work.

The other group consists of four fragments of open screen work (S815, S832, S836 and S862) bearing the same moulding and carved from Doulling stone. The flat back of S832 suggests that it was only intended to be viewed from the front elevation, probably implying an origin in a tomb canopy (rather than a major dividing screen through which passage was possible), or a cage chantry chapel. Enough survives of the upper element to allow tentative reconstruction. S862 bears a mason's mark in the form of a neatly incised double-headed arrow 26mm long, which could be the mark of one of the masons recorded at St John's, Yeovil, who worked only in the chancel aisles (*c* 1382). It is therefore possible that these fragments are from a monument of the later fourteenth century.

### Abbot Chinnock's cloister

Material recovered from the early fifteenth-century cloisters by Bond included 'moulded divisional piers, very similar to those at Wells; sections of vaulting ribs showing sunk tracery, and what appeared to be wall-panelling of a like character.'<sup>55</sup> His plate V shows only a few such fragments, but these include examples with projecting roll mouldings of a type that is relatively common in the abbey stone collections, as well as pieces of what may be wall-panelling.<sup>56</sup> The similarity between the stonework in the photographs of the refectory excavations and the eighteen fragments in the abbey collection bearing similar blind panelling and two-inch diameter roll mouldings strongly suggests that all of these pieces derive from Abbot Chinnock's rebuilding of the cloisters (fig 9.12: 61).

Of the fenestration, little can be identified with any confidence; Bond believed the cloister to have been glazed, and so presumably found fragments with glazing grooves. S57 is a mullion or jamb with glazing groove and plentiful remains of white limewash; S875 is a fragment of tracery with glazing groove and a lightly incised 'X' mason's mark. Both bear buff mortar of the type forming the mortar pads where the cloister vaulting was attached to the south nave aisle; S879 is a further example of this mortar on glazed tracery. Good candidates for the arch head of the cloister windows are two pieces both bearing the accession number S987. Several of these pieces retain traces of painted white finishes on their interior surfaces.

The scars of the elevation of the north cloister walk on the south elevation of the south nave aisle show that the new fabric was relatively lightly attached to the 1184–9 wall-face: the new wall-shafts merely pinned to the nave wall with cramps, the interface being roughened to assist the mortar bond, and the wall-plates fixed with mortar (fig 9.12: 62).<sup>57</sup>

### Fan vaulting

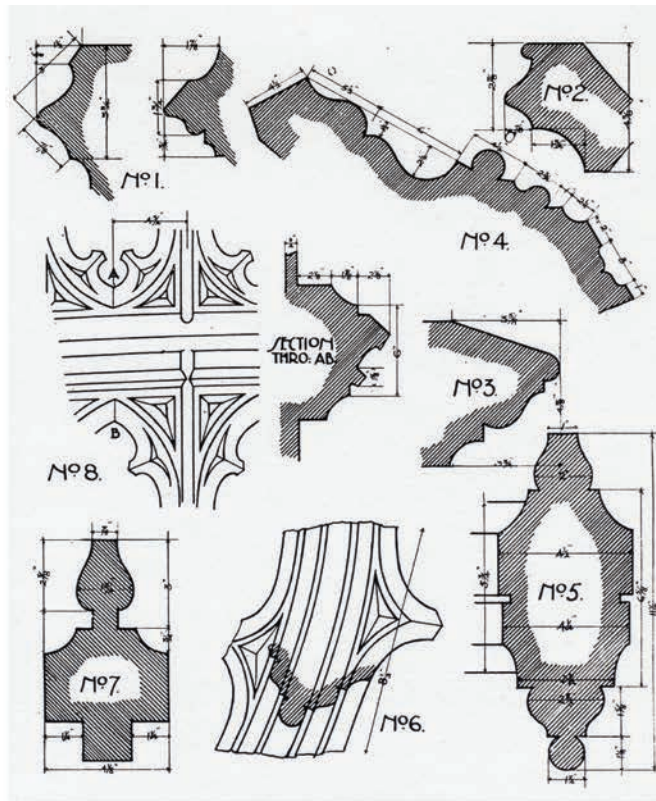
The fragments recovered and drawn by Bond in his second season of work on the Edgar Chapel (fig 9.13: 63) prove that the building was fan-vaulted. Leland's assertion that 'Abbate Beere buildid Edgares chapel at the est end of the church: But Abbate Whiting performid sum part of it',<sup>58</sup> shows that the chapel was sufficiently advanced to be largely attributable to Beere, but that it was not complete by his death in 1524.

Bond's reconstruction drawing of the crossing shows fan vaulting beneath the tower, although it is not clear what evidence he had for this. Wells does possess this feature, erected during William Smyth's tenure as master mason, together with fan vaults in the Stillington Chapel (1477–88) and Suger Chantry (1489). These 'are sufficient to establish the characteristics of a personal style which can be recognised in several other buildings of the region',<sup>59</sup> and on this basis Harvey attributes to him the nave vaults of Sherborne Abbey (1486–93), the crossing vault of Milton Abbey (after 1481), and work at Wells Deanery (probably completed by 1491). Smyth is known to have worked at the church of St John at Glastonbury in 1465. However, the fragments of fan vaulting known from the abbey are different in style to his work (fig 9.13: 64). All of these have in common the motif of a horizontal rib running across the stone between the cusped divisions of the conoid, rather than the more usual device employed by Smyth of allowing the heads of the cusped arches to interpenetrate. In the south west of England such mid-



**Fig 9.12** Carved stones: (61) '2 inch roll' type mouldings with roof boss (far left), all probably deriving from the vaulting of Abbot Chinnock's cloisters (?after c 1407); (62) scars left on the south elevation of the south nave aisle wall from the erection of the fifteenth-century cloister (left). The rectangular recesses in two regular registers belong to the first post-fire cloister. An analogous campaign in Wells Cathedral's west cloister (from the third quarter of the fifteenth century) also pinned the new wall-shafts to the thirteenth-century wall using lead-grouted iron dog-cramps which have subsequently spalled the stone surface exposing their ends (right) (photos: Jerry Sampson)

63



64



64b



**Fig 9.13** Carved stones: (63) Bond's illustration showing architectural details from the Edgar Chapel, including elements of fan vaulting; (64) conoid fragments from a fan vault, probably that of the Edgar Chapel built by Abbot Beere (d. 1524) and completed by his successor Abbot Whiting; (64b) central boss from a fan vault now in the museum (photos: Jerry Sampson)

height ‘ring-ribs’ on the conoids seem to represent a relatively late feature, and are found at Shepton Mallet (inserted *c* 1540 into an earlier tower), Chewton Mendip (under construction 1541), Taunton St James (*c* 1500) and Taunton St Mary Magdalene (tower 1488–1514); only the last shows the use of cusping at the base of the upper panels. Thus, Glastonbury’s fan vaulting seems to be part of that regional tradition, rather than being a stylistic leader in the field of vault design.

## The monuments

Glastonbury Abbey, ‘the tomb of saints’, contained a series of major monuments, including those of four kings, the majority of the abbey’s own abbots<sup>60</sup> and a number of lay benefactors. The most important source for the form and disposition of these is the account by John Leland who saw them *in situ* prior to the Dissolution. However, while many of the fragments in the abbey’s stone collection could derive from these tombs, the absence of find spots and contexts for the excavated material means that none can be confidently associated with any of them.

The only effigies, or fragments derived from effigies, that can be identified with some certainty are those attributed to Abbots William of St Vigor (d. 1223) and Michael of Amesbury (d. 1253). That of William Vigor (fig 9.14: 65) is the more complete of these.<sup>61</sup> According to Collinson, the blue lias figure was dug up in 1780 in the north aisle of the church, not in the chapter house where the abbot was buried. Considering the abbot’s status, it is not of particularly high quality and it is possible that, rather than commemorating a contemporary abbot, this effigy is a retrospective monument made to house the remains of an earlier abbot who was translated into the new church in the same way as the Saxon bishops at Wells. The completion of the choir in 1213 could well have triggered such an exercise.

Strangely, there appears to be no published literature relating to the effigy of an abbot in mitre and mass vestments attributed to Michael of Amesbury (fig 9.14: 66). Damaged at head and foot, the Doulling stone effigy bears strong stylistic similarities to the upper tier of west front statues at Wells Cathedral, particularly in the form of the drapery of the chasuble and dalmatic (though the Glastonbury effigy is slightly more subtle in the modelling of the folds over the lower legs and knees). West front figures such as S162 offer the closest parallels, and these are amongst the latest of the life-size sculptures to have been executed at Wells, shortly before the carvers departed *c* 1243. It may also be significant that there are traces of four large squared recesses from lost hot mastic

repairs on the effigy, a feature also typical of the Wells west-front workshop, particularly towards the end of the project. It is therefore possible on both stylistic and technical grounds that it was produced by a sculptor from the same workshop.

In this context it may be significant that the Buneton family first appear in Glastonbury in 1249,<sup>62</sup> in a document witnessed by Thomas *cementarius* (?Thomas Norreys, the master mason at Wells), ‘and afterwards in Edward II’s time called “de Buneton, the sculptor”, is possessed of lands and houses at Glastonbury, and gives name to a street in Glastonbury called after their own name, Buneton Street.’<sup>63</sup> While the name of Simon of Wells or Simon Pictor is more often associated with the west-front workshop at Wells, it is noteworthy that his other claim to fame is in connection with a bronze effigy for Westminster Abbey, and it may be that he was the author of the bronze effigy of Bishop Jocelin (d. 1242). While metal and stone sculpture would not have been mutually exclusive skills, it is nonetheless possible that Roger and / or William Buneton were senior west-front sculptors who removed to Glastonbury with the end of the sculpture campaign at Wells *c* 1242–3.

## Other figure sculpture

The surviving fragments of figure sculpture from Glastonbury Abbey can only represent a tiny proportion of the carvings that once graced the church and conventual buildings. Not only are there relatively few fragments of figural sculpture, the pieces that do survive are generally quite small, and almost all are damaged. In only two instances (S689, and the effigy of Abbot Vigor) do substantial sculptures retain heads, in both instances with damaged faces. Otherwise, detached heads or headless torsos are the main representatives of the larger fragments, with even the otherwise complete angel corbel S690 having been beheaded. This suggests the possibility that the monastery may have been ‘reformed’ before it was dissolved, or at least that the subsequent process of demolition included the deliberate breaking of its imagery. One indicator of this is the apparent removal of the rood beam from the eastern crossing piers and the repair of its sockets, implying that the work was done before the abbey was surrendered.<sup>64</sup>

Despite the majority of the figure sculpture having been on display in the abbey throughout most of the twentieth century, little of it has been published or even referred to in previous literature. The only carvings to have received the consistent attention of art historians are those of the Lady Chapel north door, which have



65



66



67



68



69



70

**Fig 9.14** Carved stones: (65) effigy of Abbot William of St Vigor; (66) effigy of Michael of Amesbury S652, with Wells Cathedral west front bishop S162 for comparison (right); (67) S689; (68) recorded by Skinner in his 1826 diary, the sculpture was painted in blue, scarlet and gold when found, with lettering on the (?back of) the hood; (69) S753 seated ecclesiastic from the refectory undercroft; (70) S719 seated ecclesiastic from the refectory undercroft (photos: Jerry Sampson)

generated considerable discussion.<sup>65</sup> Otherwise, the effigy of Abbot Vigor (though not that of Michael of Amesbury) was published by Fryer;<sup>66</sup> the white porcellanous stone heads and some of the related drapery fragments have been twice exhibited and are described in the associated catalogues;<sup>67</sup> and two seated ecclesiastics (S719 and S753) have been discussed by Neil Stratford in the context of early fourteenth-century ivory carving.<sup>68</sup> A few have been described in excavation reports, but the majority are probably pieces retrieved before the twentieth century, and a number are weathered, suggesting exposure in the ruin.

Severely broken and weathered, many even of the larger pieces are difficult to date with confidence. The thirteenth-century fragments include a male torso (S740), perhaps from a Coronation group, a sinister leg (S794) from a seated or kneeling figure (perhaps of a censuring angel), and the upper torso of a monk (S702). From the fourteenth century comes the life-sized upper torso of a king (S689) stylistically related to the Salisbury (*c* 1330) and Exeter (1342–7) west-front sculptures (fig 9.14: 67); a headless standing priest (S731) of *c* 1350, excavated in 1826 (fig 9.14: 68); and the ecclesiastics described by Neil Stratford (figs 9.14: 69–70).<sup>69</sup> Probably of the later fourteenth or fifteenth century are the fragment of the head of a pope (possibly St Peter: S476); a male head in a round cap damaged by deliberate blows (S697); a heavily weathered possibly monastic torso (S725); a bird holding a scroll (for St John) in stylised clouds (S700); a life-sized hand holding a scroll (S420-2); and two fragments of life-sized sculptures of standing monks (S745, S728). Probably of later fifteenth- or early sixteenth-century date are weathered Bath stone (S683, S844) and Beer stone (S771, S796, S849, S1428) sculptures of torsos and drapery, the last being a head and shoulders wearing a chain of office. The relatively late date and use of exotic stones might associate some or all of these weathered fragments with the Edgar Chapel.<sup>70</sup> The inventory of chambers quoted by Collinson makes mention of ‘a number of costly altars’ in the high church, and in the Edgar Chapel ‘the altar set with images gilt’.<sup>71</sup>

Amongst the group of angels holding shields, two from the refectory excavations (S729 and one in the kitchen) have a known provenance.

### Technical features

Hot mastic repairs<sup>72</sup> are found in the south choir aisle (*c* 1187) at the abbey several decades earlier than at Wells (where they first appear *c* 1210), suggesting that the first years of rebuilding involved London- or even French-

trained masons with technical knowledge in advance of the local workshops (fig 9.15: 71). The technique seems to disappear after the 1189 building hiatus, however, and is not seen again until the early thirteenth century work in the south nave aisle. This suggests that the workshop established after 1189 was not the same organisation as that which operated in 1184. The few masons’ marks located on the building would tend to support the assumption that the 1184 workshop did not return once Glastonbury’s finances were restored. In the context of the stone corpus, twenty-one possible repairs were identified of which only five were definitely fixed with hot mastic, these exhibiting reddening of the joint surface (S128, S129, S652, S799, S814). The first two examples also had the joint surface lightly scored in order to assist the bond; this technique is also present on three other instances (S28, S487, S1219) suggesting that these are also hot mastic repairs. Four bear possible traces of brown mastic (S23, S61, S227, S367).

The use of lead grouting, on its own or in association with hot mastic / lime mortar repairs, is well attested throughout medieval mason-craft, and was usually employed either to secure larger repair piecings or to attach capitals to shafts, etc. Two lead ‘pours’ from bed joints separated from their associated stones remain in the Glastonbury collection (L13, L14) (fig 9.15: 72). A more usual use of lead was the creation of a poured internal armature to connect two stones by drilling connecting holes into two (or occasionally more) stones and pouring molten lead to grout them solid across the joint (fig 9.15: 73). Surviving lead was recorded in five cases (S10/11, S209, S277, S920, S1021), but there are twenty-four instances of the empty drill holes. The diameters of the holes, ranging from 4 to 25mm, are largely dependent upon the size of the stones being fixed. It is interesting that the fine pinnacle work from the Bath and Beer stone canopies (discussed above) tend to vary in their dowel-hole diameters even where the sections of the pinnacles are the same or similar, supporting the hypothesis that they originate from different workshops.

A coarser technique for giving additional support to architectural features used lead grout to clad iron reinforcements (fig 9.16: 74). An iron dog-cramp grouted with lead is preserved in S803, and there are chases for similar cramps in the top beds of two of the rose-trail cornice stones from the refectory undercroft, as well as possible traces of up to seven other cramps or fixings in other stones in the collection.

The vast majority of the setting-out consists of scribed centre-lines on bed-joints, suggesting the use of half-templates for mouldings with a single (central) axis of



**Fig 9.15** Carved stones: (71) irregular break in an ashlar block in bay 2 of the south choir aisle refixed with a brown mastic; (72) S987a (left) with incisions of the bed joint to assist the mortar bond, and L14 (right), a lead pour from a more deeply incised bed joint grouted with lead; (73) S1067 (top left) showing the empty lead grout channel in the soffit and the pouring hole below the floret; S209 (left) a fragment from a pinnacle reinforced across the joint; (right) an internal armature of poured lead connecting two stones (photos: Jerry Sampson)



**Fig 9.16** Carved stones: (74) S728 (left) with a detail of the ferrous dowel used to fix the upper block (right); the angular drapery over the sinister arm resembles S849, also in white lias stone; (75) S692 with dual setting-out lines 1 inch apart; (76) S767 (left) and S614 (right) showing the fine polished finish of some of the lias work (photos: Jerry Sampson)



symmetry. Only occasionally is direct geometrical setting-out seen, and this seems generally to have been relatively simple (fig 9.16: 75–76). Stones bearing masons' marks are surprisingly few in number, and in many instances such marks could equally be position markers, particularly the deeply incised '+' marks on voussoirs, which occur at several different dates, and are also found on the early fourteenth-century Draycott marble capitals. The rarity of marks in both the corpus and the standing fabric could suggest that the abbey generally employed either well-established external workshops or maintained its own masons' yard, so that requirements of marking for piecework or quality control were less relevant.

### Polychromy

A great deal of painted decoration has survived on the architectural stonework, evidenced by the accounts of the discovery of many of the stone fragments and from examination of the extant corpus. However, it is also likely that a considerable amount has been lost subsequent to the excavation of the fragments. A number of small pieces of stone bearing paint traces also retain earth from their excavation contexts, probably indicating that they were left partially uncleaned in order not to risk cleaning the paint off; however, there are also examples where the earth remains but there are no paint residues, suggesting that these have been lost subsequently. Both Skinner and Bond describe freshly excavated stonework bearing well-preserved painted decoration.<sup>73</sup>

Gilding is found in considerable quantity, and tends to be associated with a white ground where it occurs on stiff-leaf carving (usually with red and especially blue) (fig 9.17: 77), and with either a brown bole or a red under-paint in later contexts. Mention has already been made of the practice of painting freestone black in imitation of *lias* in the early phases of the rebuilding of the Great Church (fig 9.17: 78). One of the post-fire chevron fragments (S672, fig 9.2:11, in Dundry stone) bears considerably more paint than any of the comparable pieces on the standing building, and exhibits the same sort of red and white patterning seen (with more attrition) on the ruin. Late twelfth- or early thirteenth-century red ashlar lines on a thin pale buff layer laid over a white ground are preserved on S1199.

Also dating from the thirteenth century is a small group of vault ribs bearing stiff-leaf foliage trails, all of which have important polychromy (S839, S856, S1082). On S1082 the foliage trail retains orange-buff and black pigment, and in the deep hollow and on the roll adjacent to the inner parts of the foliage the background has been

painted black or very dark blue, enhancing the shadows. S1066 and S1083 also bear orange-buff on the leaves and black or dark blue on the deeper parts of the carving and must be broken elements of the same feature (fig 9.17: 79). Like the rich polychromy of the Lady Chapel, these fragments serve to give some insight into the richness of the decoration of the medieval abbey; the treatment of the stiff-leaf carvings, for instance, surpasses anything so far found at Wells.

### Discussion

Examination of the stone corpus confirms the overall conclusions of the study of the standing building undertaken in concert with the conservation of the stonework over the last decade. Fragments of foliage carving from the assemblage show evidence of large-scale building activity from the 1180s into the 1250s (eg 'furred' leaves from the period c 1184–7 and Dundry stone stiff-leaf of 1184–9). But there is an apparent absence of dog-tooth work and very little naturalistic leaf carving, suggesting that work had slowed or ceased in the second half of the thirteenth century. It may be that the whole of the Great Church was roofed (even though not vaulted) by 1230, since the Galilee would only have been required once the processional space of the nave was operable. This interpretation is supported by the way in which the Galilee is in bond with the west front; its stylistic affinities with mid-thirteenth-century parallels; and the possible association of the white porcellanous carvings with a screen, perhaps on the site of the scars in the arch linking it with the Lady Chapel.

No fragments matching or resembling the fourteenth-century vault-springers of the nave have been recorded, but there are oddly retrospective voussoirs that appear to derive from the double-roll forms of the Early English church. Initially these show stiff-leaf foliage trails between the rolls, but the later forms substitute hemispherical projections, like unfinished ball-flower for this (fig 9.17: 80). The use of a form of voussoir dependent upon a design from the previous century could be a response to the need to replicate earlier elements during the completion of a partially built vaulting system; alternatively, it could also represent the architectural retrospection visible in the standing fabric of the abbey. While this is most obvious in the immediate post-fire reconstruction, it is also evident in the complete reuse of twelfth-century windows and masonry from the twelfth-century east end in the choir extension under Abbot Monington in the mid-fourteenth century. Indeed, it is ironic that the reuse of the 1184–9 material in



**Fig 9.17** Carved stones: (77) S286 gilding and blue paint over a white ground; (78) S65 black paint used to imitate blue lias on a late twelfth-century abacus; (79) S1083 a fragment from a stiff-leaf trail voussoir retaining polychromy: general view (left) and detail (right); (80) vaulting types: S856 (lower stone) voussoir with stiff-leaf trail; S1194 (upper stone) voussoir having a related moulding but with the foliage replaced by 'proto' ball-flower ornament (photos: Jerry Sampson)

Monington's fourteenth-century choir extension means that, while the two elements of the Great Church that show the greatest stylistic difference (the 'Romanesque' Lady Chapel, and the early Gothic choir) are directly contemporary, those that show the greatest stylistic similarity (the windows of the two phases of the choir) were actually erected 170 years apart.

While a certain degree of retrospection appears to be a characteristic of West Country Gothic architecture generally, Glastonbury was obsessed with its own antiquity and consciously used this to stress its primacy.<sup>74</sup> This deliberate policy perhaps rendered it more resistant to architectural innovation: the adoption of a Gothic version of the Romanesque giant order for the choir and transept elevations placed Glastonbury outside the mainstream of Early English architectural development. By contrast, the detailing of the church appears remarkably advanced. The carving of the Lady Chapel doors, of a kind normally dated on stylistic grounds to as late as the 1220s, must be considered part of the 1184–9 phase of work. Furthermore, the exceptional quality of the white stone heads and drapery from the Galilee and north transept has led to their being described as 'the finest English sculpture of the third quarter of the thirteenth century',<sup>75</sup> and it may be only the limited extent of the surviving ruin and corpus of loose stone that prevents us following this trend for innovation into the later Middle Ages. So little survives that detailed reconstruction of the appearance of the monastery must remain conjectural and its place in the development of European architecture obscure.

The geological composition of the ruin and the loose stone assemblage is also complementary, and the latter serves to confirm the conclusion that the use of Dundry stone at the abbey is of very limited duration, datable to 1184–9. Despite previous assertions by Radford and others that Dundry stone was being used for carved work in the Romanesque period, the only twelfth-century Dundry stone which has been identified comes from post-fire contexts.<sup>76</sup> There seems to be a brief (and possibly pre-fire) flirtation with Purbeck marble in the late twelfth century, but as at Wells, the great majority of the colour-contrasting stone for shafts, capitals and bases is the local blue lias. The relatively small number of pieces of blue lias recovered from excavation that cannot be directly related to the Lady Chapel, however, suggests that this material may not have been a significant element of the earlier architecture of the Great Church (it is only found in the transept clerestory, west wall and Galilee in its standing fabric). There is, however, some supporting evidence in the loose stone collection that Doulling and

Dundry elements in the Great Church were being painted black in imitation of the coloured inserts of the Lady Chapel.

The other aspect of Glastonbury Abbey that the stone corpus serves to underline is the rivalry between it and Wells. Not only do the two fabrics show the demand placed upon resources and manpower by the construction six miles apart of the two cathedral-sized buildings, but each seems to respond to building activity at the other. The similarity in the design of the two late twelfth-century churches has been partly masked by the later additions at Wells Cathedral, but it is clear from recent work at Wells that both churches possessed wide eastern terminations, probably with five chapels.<sup>77</sup> The odd decision at Glastonbury to extend the transept's eastern chapels out from an eastern aisle may have been taken in the light of the contemporary experience at Wells, where the site of the eastern chapels was used as a processional aisle while the rest of the transept was under construction (meaning that they could not be used as chapels until the transept was finished). Glastonbury seems to have achieved the use of her transept altars at the price of partly blocking the choir aisle windows.

Not only were the local stone supplies a source of contention for the thirteenth-century builders, so too was manpower: evidence for masons moving from one site to the other exists in the form of the masons' banker marks preserved on the buildings. There is significant evidence that senior members of the Wells carving workshop transferred to Glastonbury around 1250: for example, in the close stylistic affinity between the white porcellaneous heads carved for the west front of Wells and those that could derive from screen work in the Galilee and a monument in the north transept; and the similarity between the effigy of Abbot Michael of Amesbury and the Wells west-front upper-tier bishops.

Further evidence for the exchange of skilled workmen between the two buildings is available from the banker marks of masons working on the abbot's hall and kitchen complex in the later 1320s, found both on the standing fabric of the latter and on excavated material probably from the former. Here, at least two of the masons can be shown to have worked subsequently on the choir extension at Wells (c 1330–7), and the collegiate church of Ottery St Mary (1337–45), with one of them returning to Wells to work at the Vicars' Hall (before 1348). The major projects at Wells and Ottery were designs by the master mason William Joy, and it is possible therefore that he also designed the abbot's kitchen.

The Glastonbury choir extension and the remodelling of its western bays under Abbot Monington is usually

seen in terms of imitation of the work at Gloucester,<sup>78</sup> but Wells had extended its choir and remodelled the late twelfth-century elevation of the western bays in the 1330s; the impetus for the work, if not the design, may thus derive from her closer neighbour. Likewise, following the rebuilding of the cloister at Glastonbury under Abbot Chynock (perhaps begun following the 1408 Visitation), Bishop Bubwith of Wells began the rebuilding of the Wells Cathedral cloisters around 1420; the constructional techniques used by Bishop Bekynton in the west walk clearly imitate those of the north walk at Glastonbury. Bubwith was also probably responsible for the refenestration of the cathedral, inserting Perpendicular tracery into the Early English openings, an operation that was also carried out at Glastonbury contemporary with, or some time after, Monington's choir extension.

### The fittings

While the standing fabric preserves what little can be inferred of the architecture of the convent, the stone corpus gives some insight into the richness of the stonework of its fittings. The standing fabric retains the scars of the screens and monuments adorning the church: for example, the sockets for two successive screens in the chapel of St Thomas, as well as for the reredos which stood high enough to block the lower part of its east window, and a whole wall of carved cladding above the lost canopied monument on the west wall. The few fragments of carving that survive from excavation serve to suggest the richness of this decoration.

The Bath stone corpus represents in part a wealth of niche canopies, and the similarity of the stone from a number of fragments of figure sculpture suggests that these all come from a major fourteenth-century reredos. Likewise, the Beer stone fragments (and in particular those from the 1250–70 group) serve to illustrate the quality of the work that Glastonbury's wealth could command. These two stone types seldom seem to support much polychromy, but examples of painted stone do survive (or are described in early diaries and accounts of the excavations); these few fragments illustrate the colour

that formed an essential part of the finish of the architecture of the medieval abbey. The richness of the red, blue and gold on several of the stiff-leaf fragments, for instance, eclipses anything that remains on the contemporary foliage carvings at Wells.

While there is little that can be confidently ascribed to any specific monument or fitting, it may be significant that there is nothing in the collection which can be associated with any of the abbey's shrines. There is a slight possibility that the ball-flower fragments could be part of the superstructure of a shrine base, but they could equally well derive from a monument. Bond found black stone fragments in the choir, one of which (now lost) he tentatively ascribed to the shrine-tomb of King Arthur; and fragments of black marble (now lost) from the Edgar Chapel could have come from the tomb of King Edgar.

There is evidence in the standing building that 'abused' images and structures were being cleared away before the convent was dissolved.<sup>79</sup> The socket for the rood beam above Monington's pulpitem in the south-eastern crossing pier has been crudely filled, an action which would not have been necessary once the church was subject to demolition. It may be that the shrine bases were also destroyed along with the removal of the feretories which they supported, in or shortly before 1539. One of the seated ecclesiastics (S719) from the excavations in the refectory seems to have been deliberately cut with a chisel in the process of removing an attribute, and it may be that other images were subject to reformation while the convent was still operating – perhaps illustrative of the compliance of the community with the orders of the King's Commissioners in the vain hope that their monastery might be spared.

The church may have stood into the 1550s, but with no function, and with the cathedral of Wells only six miles away, its demolition was inevitable. As Parker says:

While bewailing the polemical hate and fury, or the wretched greed for the value of the stones, either one or the other of which, or probably both together, have robbed us of so grand and eloquent a monument of the skill and piety of past ages, all we can do is to care for and treasure up the few traces which remain to us.<sup>80</sup>

# 10

## Chronological summary

*Roberta Gilchrist and Cheryl Green*

### 10.1 Introduction

This chapter summarises the main findings by period. There is significant new archaeological evidence for occupation pre-dating the first Christian settlement at Glastonbury, including material culture dating from the Iron Age to Roman and post-Roman periods, and a timber structure and trodden floor associated with imported Late Roman Amphora 1 (dated *c* 450–550). The sequence of Anglo-Saxon churches has been re-examined in association with radiocarbon dates for the glass furnaces: a date of *c* 700 is proposed for the first phase of the church of St Peter and St Paul. Compositional analysis of the Saxon glass and associated metal-working debris has confirmed that glass-working at Glastonbury incorporated recycled Roman materials. Several details of Radford's interpretation are challenged, including the existence of a pre-Christian 'British' cemetery, a Late Saxon cloister and Arthur's grave. Radford's interim reports provide very little detail for the Norman and later medieval monastery. Re-examination of the records has confirmed stratified evidence for the Norman monastic ranges and revealed the sequence for the replacement of the Saxon buildings. The archaeology of the abbot's range has been particularly significant: reinterpretation of this area reveals a large complex within a distinct zone organised to serve the needs of the abbot and his guests. Evidence for the Dissolution includes salvage activity and stone-breaking; post-medieval evidence includes high-status material culture associated with the use of the former abbot's lodging as a mansion up to the seventeenth century.

### 10.2 Chronological overview

#### **Prehistoric**

Thirty-seven prehistoric lithics were identified from Radford's excavations: the assemblage exhibits a strong earlier Mesolithic composition and an early Neolithic element (see Chapter 8: Prehistoric lithics). It is possible that the lithics were introduced to the site as dumped material brought from elsewhere; however, it is also highly likely that prehistoric people were active in the area. The topographical location of Glastonbury, on a promontory sited at the lower slopes of the Tor, is consistent with the local pattern observed for Mesolithic scatters to concentrate on raised sites with panoramic views.<sup>1</sup> Excavations at the natural warm spring located at Chalice Well, to the south east of the abbey, recovered a small assemblage of Mesolithic flints composed of blades and cores, in addition to Iron Age and Roman pottery.<sup>2</sup> Seventy-eight sherds of handmade, prehistoric pottery have been identified from Radford's excavations at the abbey, with the majority of fabrics and forms dating from the first millennium BC (see Chapter 8: Prehistoric pottery). The fabrics and sources are typical of many local assemblages and are consistent with the well-known ceramic trading networks in this region. The significance of the Glastonbury prehistoric pottery is in its representation of daily life, including cookpots, storage vessels and a number of pots for individual consumption of food.

## Roman

It has been suggested that two wells in the abbey complex may have Roman origins. St Joseph's Well was identified in the south-east corner of the crypt of the Lady Chapel in 1825 and investigated again in 1992. The well is fed by a spring from a hole in the natural rock and overflows into a conduit leading to the abbey drain. A possible Roman date for the well was proposed based on the significance of springs to Roman ritual sites and the broad consistency of its construction with Roman wells in the region.<sup>3</sup> The location is also significant to the sacred topography of the abbey: the Lady Chapel is regarded as the successor to the *vetusta ecclesia*, the earliest and most highly venerated church at Glastonbury (see Chapter 3). Wells were significant features in liturgical planning: at nearby Wells Cathedral, they were integral to the linear layout of ecclesiastical features of the early minster. Some cathedrals, including Glasgow and Lichfield, incorporated wells within their crypts in situations similar to that at Glastonbury.<sup>4</sup> A second possible well was reported by Radford during the 1956 excavations in the north transept, located at the base of the Saxon enclosure ditch. However, the roughly circular setting of stones is not convincing evidence of a well, and the two sherds of Roman pottery in the layer above are likely to have been residual.

A total of 256 sherds of Roman pottery have been identified from Radford's excavations, with the assemblage dominated by black burnished wares and local grey wares (see Chapter 8: Roman pottery). The Roman pottery suggests occupation dating from the later Iron Age to early Roman period through to the fourth century; it is not possible from the assemblage to determine whether activity was intermittent or continuous. Radford believed that the Roman pottery was secondary and arrived in the precinct within dumped clay that was used to level up the church for the rebuilding that followed the fire of 1184.<sup>5</sup>

The small assemblage of forty-two Roman tile fragments represents mainly unstratified material (see Chapter 8: Roman tile). However, eight pieces of Roman tile were from contexts associated with Saxon glass-making furnaces and a further nine fragments retain traces of glass or vitrified material. The three common forms of Roman tile – tegula, imbrex and box – were reused in the glass-manufacturing process. This suggests that the tile was taken from a Roman building with a tiled roof and hypocaust heating system probably dating to the early Roman period (before the mid-second century). The small quantity and size of these fragments makes it

doubtful that this Roman building was on the site of the abbey, but it was possibly in the near vicinity. Radford was selective in retaining excavated material, and it is highly likely that greater quantities of Roman pottery and tile were excavated and not kept. However, the relatively small quantity of Roman material in comparison with later periods suggests that this area of the precinct was not densely occupied during the Roman period.

Only six artefacts were identified of Roman or possible Roman date: a bone object that was worn and cut for reuse; a worn coin dating to the fourth century; a possible modified coin, scratched clean; a hinged bow brooch of the Aucissa type; and two small toilet spoons (see Chapter 8: Roman small finds).

## Post-Roman and Saxon

Radford published an extended interim report in 1981 which summarised his interpretation of the archaeology of Glastonbury Abbey before the major fire of 1184. The key Saxon findings were: 1) the *vallum monasterii*; 2) a series of early churches (excavated by Fyfe in 1926–7 and continued by Peers, Clapham and Horne in 1928–9); 3) the early monastic cemetery, comprising early cist burials, two *hypogea*, numerous timber shrines and the proposed grave of Arthur; 4) timber buildings evidenced by post-holes, including a 'wattle' oratory beneath the medieval cloister; and 5) a pre-Conquest cloister and glass furnaces.

## Post-Roman

Reanalysis of the pottery assemblage has confirmed the presence of LRA1 (also known as Bii ware), deriving from Cyprus and Antioch in the eastern Mediterranean (see Chapter 8: Post-Roman pottery). The period of importation of this ware to Britain is estimated to be c 450–550. The pottery was recovered from the area of the medieval west cloister, where one or more timber structures were located within the bounds of the early cemetery, indicated by a series of small post-pits pre-dating alterations made to the cemetery in the tenth century. The post-pits appear to relate to a roughly trodden floor, which yielded fourteen sherds of post-Roman, imported pottery (LRA1). The floor lay several centimetres above the natural clay surface; the sherds of LRA1 represent only a few vessels and there was little abrasion to the pottery. The condition of the sherds suggests that the floor is an undisturbed post-Roman context. The timber buildings are therefore likely to represent the earliest excavated structures at the abbey. A

radiocarbon date obtained from one of the post-pits suggests a final destruction date between the late eighth and the ninth centuries (Table 1). A further nine sherds of LRA1 were recovered from other contexts at the abbey but are likely to be residual.

Radford interpreted the post-pits as the foundations of a timber building comprising wooden uprights with a wattle and daub filling. He took this as confirmation of the Glastonbury tradition that the *vetusta ecclesia* was built of wattles and claimed this building was a small chapel within the ancient cemetery.<sup>6</sup> No material evidence of wattle and daub was recorded in the site notebooks. The original excavation drawings of this area bear little resemblance to any of the published plans, showing a fairly irregular pattern of post-pits more suggestive of a single large, post-built structure (approximately 5 × 9m) or perhaps two separate buildings (fig 10.1). The post-pits are sealed beneath twelfth-century features and are associated with one sherd of Iron Age pottery and the floor containing LRA1. The combined evidence suggests that this is the earliest occupation yet recognised at Glastonbury Abbey, potentially dating to the fifth or sixth centuries.

## Middle and Late Saxon

### *Vallum monasterii* (Plan 1)

Radford regarded the monastic boundary as the most significant physical component in identifying an early monastery.<sup>7</sup> The *vallum*, or boundary marker, enclosed the area of sacred space defining the monastic community and setting it apart from the secular world. He claimed to have found Glastonbury's *vallum* in 1956 in the form of a substantial bank and ditch extending from north to south beneath the medieval transept and chapter house. This ditch is 4.25m wide and 2.21m deep, measured from the original ground surface. Mapping of Radford's excavations has shown that the previously published location was incorrect.<sup>8</sup> The western side of the ditch was located 0.41m east of the published location, while the eastern edge was 1.67m further east. This feature may have formed the eastern limit of the pre-Conquest monastery: nothing earlier than the twelfth century has been found to the east of the ditch. There was no pottery or dating evidence in the bank or underlying surface, or within the fill of the ditch; organic material was preserved in the ditch fill but was not retained. The absence of pottery may suggest that the boundary was a primary feature of the monastery and that it was first constructed in the seventh century; alternative models and dating are explored in the final chapter. Tentative

evidence of recutting suggests that the ditch was maintained; however, only one fill was recorded by the excavators. Reanalysis of the site records indicates evidence of some deliberate backfilling in the form of several dumps of material.

Subsequent excavators have located four further ditches at Glastonbury in the vicinity of the precinct, and it has been suggested that these may connect to form a single boundary ditch surrounding the monastery (fig 10.2).<sup>9</sup> In Silver Street, to the north of the precinct, a ditch and bank were identified, and stakes from the clay fill produced radiocarbon dates of AD 670+100/-30 and AD 610+50/-70.<sup>10</sup> Between Silver Street and the High Street, a ditch was found aligned with the precinct wall; twelfth-century pottery was recorded on the surface of its organic silts.<sup>11</sup> A ditch excavated to the north west of the church, in the area of the current museum, contained a silty organic fill with the upper silts yielding pottery dated to the tenth to twelfth centuries.<sup>12</sup> The fourth ditch was observed during a watching brief in Magdalene Street to the west of the precinct; a twig from the base was radiocarbon-dated AD 970–1230 and AD 780–1040 at 2 sigma.<sup>13</sup> With the exception of the ditch excavated by Radford in 1957, complete profiles were not obtained, making direct comparison of the ditches difficult.

Nancy and Charlie Hollinrake have suggested that the ditches are part of a single system associated with the proposed Saxon canal that had its northern terminus located at Glastonbury. There is convincing evidence for a medieval canal system running for 1.75km from the River Brue to the market place at Glastonbury to the west of the precinct. The canal has been sectioned in two places, yielding radiocarbon dates suggesting construction in the ninth or tenth centuries.<sup>14</sup> The Hollinrakes argue that the ditches formed a substantial moated boundary for the monastery and that this is likely to be associated with the major rebuilding of the abbey in the tenth century under Abbot Dunstan. The symbolic role of the monastic *vallum* was sometimes combined with practical water management: for example, the *vallum* ditch at the Pictish monastery of Portmahomack (Easter Ross) collected water from a hill slope and delivered it to other parts of the monastery.<sup>15</sup>

## The Anglo-Saxon churches

There is no archaeological evidence for the earliest church at Glastonbury, the *vetusta ecclesia*, but it is widely accepted that it was the gravitational point around which the sacred topography of Glastonbury orbited. It was described by William of Malmesbury in the early twelfth century as a 'wattle church', dedicated in honour of the

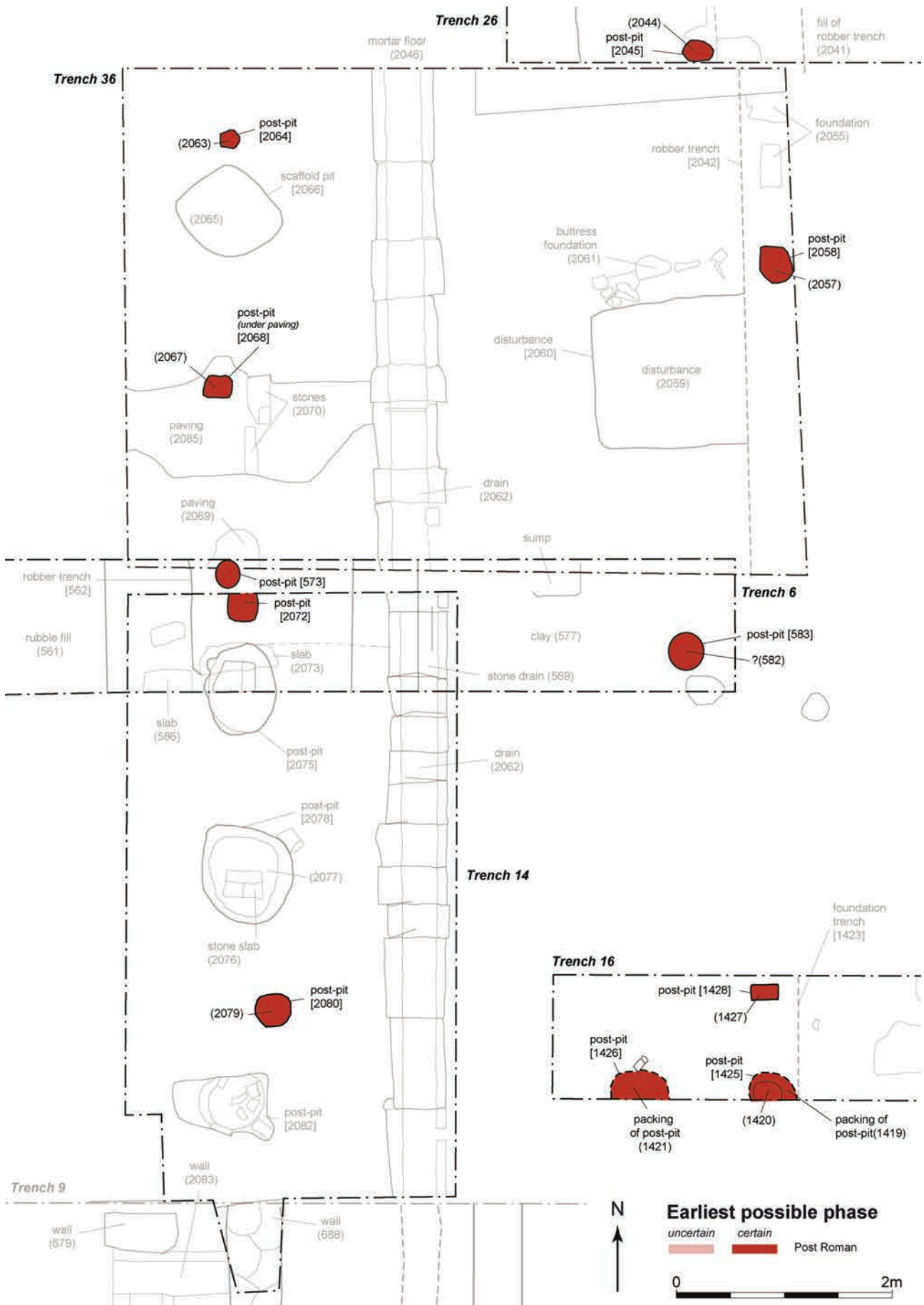


Fig 10.1 Post-Roman structure(s) (scale 1:50)



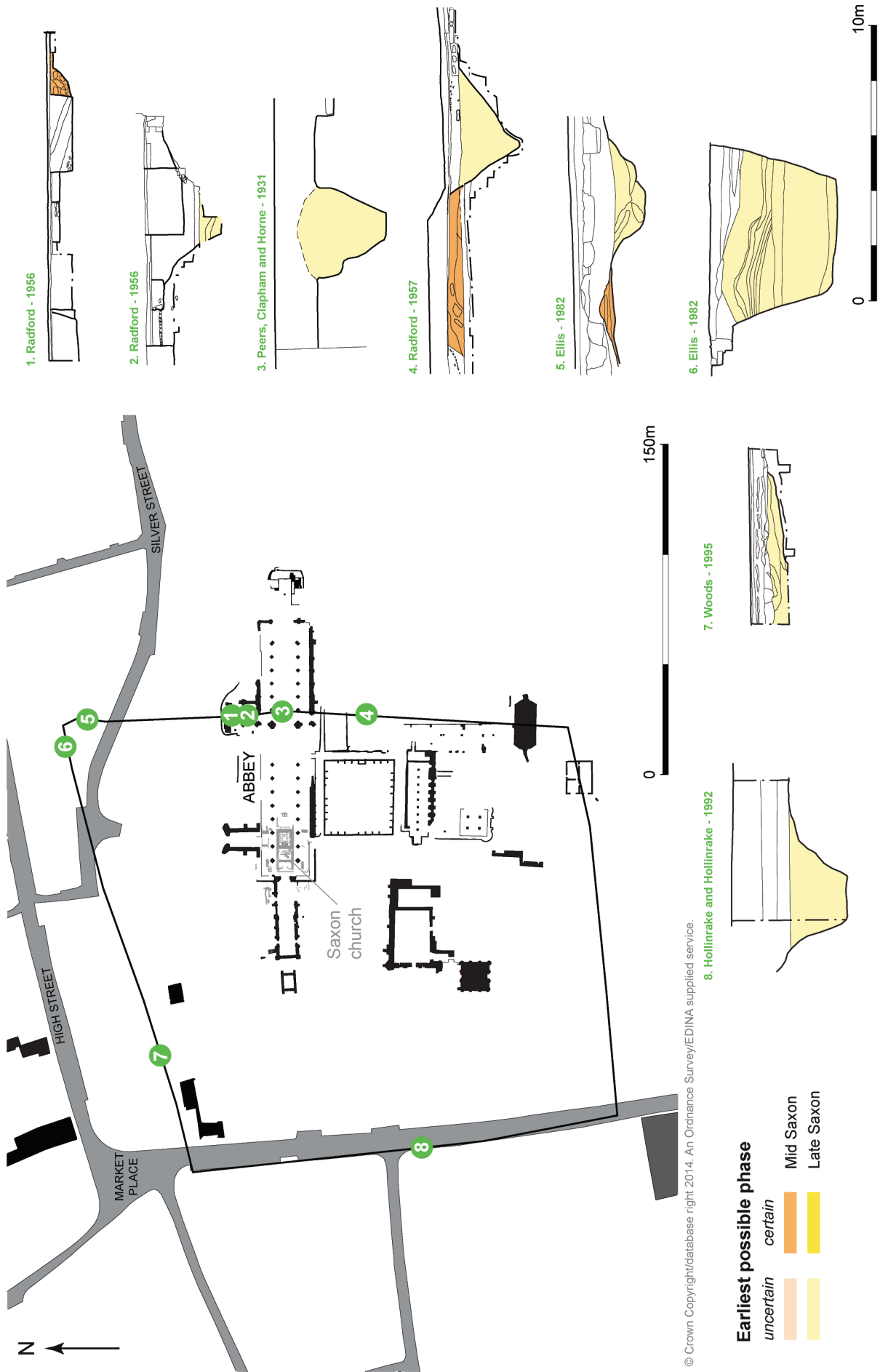


Fig 10.2 Excavated sections across ditches and banks (scale 1:2500 and 1:200)

Blessed Mary and attributed with very early origins. According to later accounts, this primary church was replaced by the medieval Lady Chapel, which was built around or on the site of the earlier building, following the fire of 1184. Although the *vetusta ecclesia* is not attested by archaeological evidence, it is believed to have determined the sequence and alignment of churches at Glastonbury for nearly 1,000 years.

The archaeological evidence for the Anglo-Saxon churches was uncovered when the entire width of the western area of the medieval nave was excavated between 1926 and 1929. The published accounts were synthesised and reconsidered by Radford: three phases were recognised on the basis of stratigraphic relationships and mortars characteristic to successive phases. Dates and patronage were assigned with reference to the *Anglo-Saxon Chronicle* and William of Malmesbury. The earliest stone church was attributed to the reign of King Ine of Wessex (688–726); the final Saxon phase was regarded as the documented rebuilding by Dunstan (940–57). We can be confident in accepting a pre-Norman date for this sequence of churches: fragments of twelfth-century masonry sealed their remains.

The first-phase church had walls constructed of shallow courses of limestone and there were traces of a pink, *opus signinum* floor (fig 10.3).<sup>16</sup> The remains were interpreted as three cells: a nave, presbytery and the western end of an apsidal chancel, inferred from the sudden truncation of the presbytery side walls. Significantly, there was evidence for a foundation at the chord of the apse. There were north and south porticus (lateral chambers), flanking the nave and overlapping the presbytery; at other early monastic churches, similar porticus are documented as having been used for burial.<sup>17</sup> A detached crypt was located 1.2m to the east of the first church, a rectangular stone structure that was partially subterranean. The excavators inferred that the chamber was reached by steps from the west but there was no archaeological evidence to confirm this. Clapham interpreted this feature as a raised chapel over a burial crypt, resembling the extant *hypogeum* at Poitiers (the Hypogée des Dunes, dated to the seventh or eighth centuries).<sup>18</sup> A key feature is the blue lias slab with a circular aperture in the east wall of the chamber, interpreted as an oculus for viewing relics. Fyfe, one of the excavators of the church, was the first to associate it with the rebuilding of Glastonbury by King Ine that is recorded in the *Anglo-Saxon Chronicle* (688–726). The radiocarbon dates for the glass furnaces confirm the construction of stone buildings with glazed windows in the late seventh to early eighth centuries (see Chapter 5:

Table 2). King Ine is claimed to have built the church to honour Mul, brother of King Caedwalla, who was murdered in Kent after his installation in 687. Ine extracted compensation for the murder from the men of Kent in 694.<sup>19</sup> Ine's church is therefore likely to have been constructed around 700, consistent with the Bayesian analysis of the radiocarbon dates obtained for the glass furnaces (see Chapter 5: The radiocarbon results for the glass furnaces). It is suggested here that the first phase of the church of St Peter and St Paul dates to around 700 and was associated with the rebuilding of Glastonbury by Ine.

The second phase of the church was characterised by the use of purple mortar and involved the incorporation of the free-standing crypt to the east (fig 10.4). The earlier chancel was remodelled to replace the apsidal termination with a square east end; an additional square chamber was constructed to the east, above the pre-existing crypt. The Taylors argued on the basis of the published plan that the crypt was contemporary with the tenth-century tower of phase three.<sup>20</sup> However, there is clear archaeological evidence that the crypt was an earlier feature incorporated into the church in phase two: the space between the walls of the crypt and those of the surrounding chamber were filled in with rubble to provide bedding for a floor.<sup>21</sup> There are descriptions of asymmetrical porticus at the west end of the church and an atrium to the west. This open space was apparently aligned on the *vetusta ecclesia* and linked the old timber church to the Saxon stone church. However, it should be noted that in the 1920s Bond recorded evidence for the possible atrium only on the north side of the proposed courtyard.

In the third phase of the church, the crypt was partially destroyed and backfilled, and a tower was built in its place, represented by foundations 1.5m wide (fig 10.5). There was stratigraphic evidence to confirm that the tower walls were built above remnants of the east end of the phase-two church, with the exception of the east wall which survived on the eastern side of the tower. The tower was flanked by substantial new porticus that are likely to have been two-storey chambers that served a liturgical function. These features were described by William of Malmesbury as 'aisles or porticus' added by Dunstan.<sup>22</sup> Drawing on two pieces of unpublished evidence from the 1928 and 1929 excavations and based on Cluny II, dating from 948, Radford envisaged an extensive eastern arm to the east of 'Dunstan's tower'. A short stretch of walling was recorded on the eastern side of the northern porticus, extending to the east of the tower; a row of three stones, with holes to support a metal

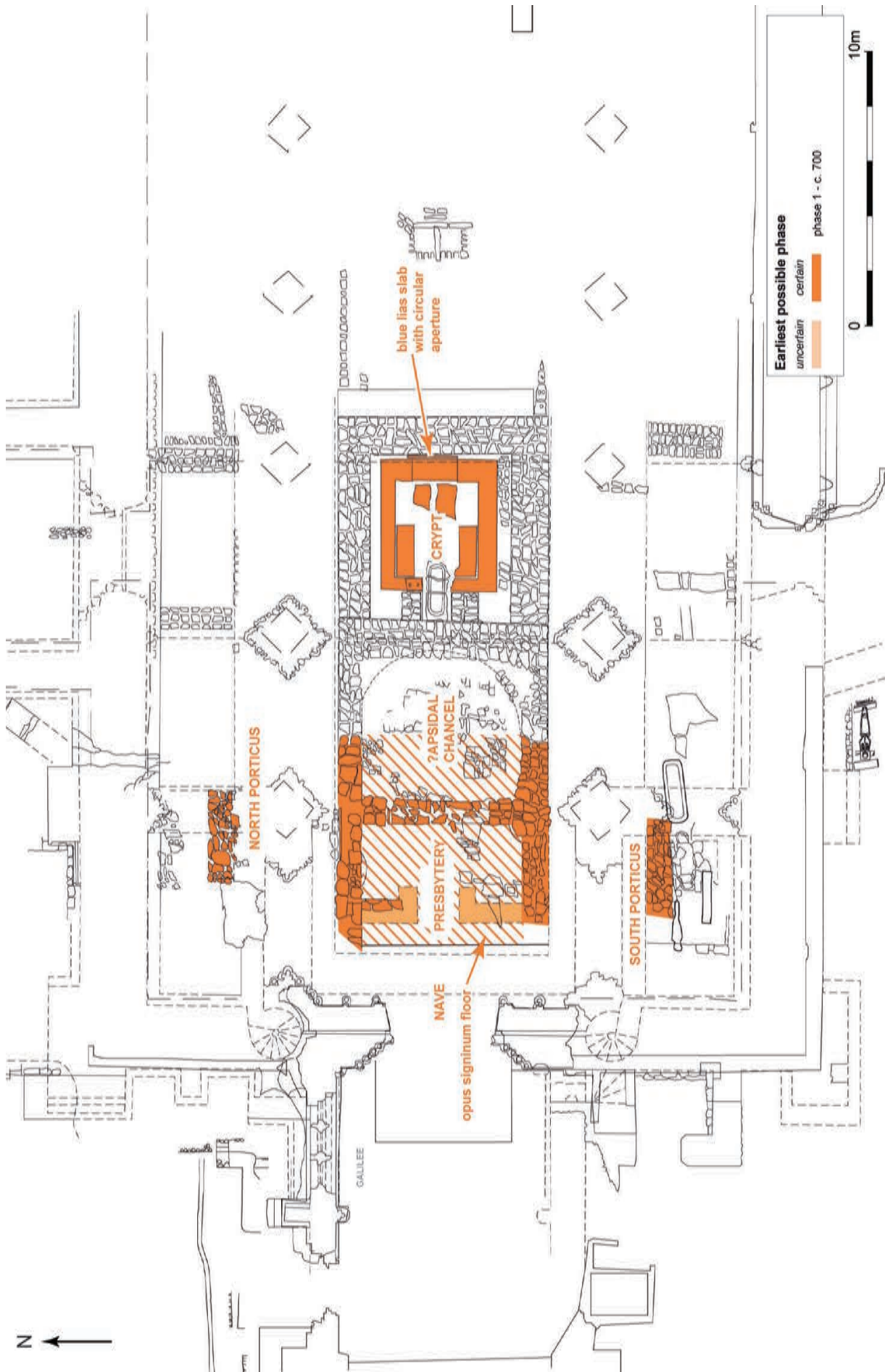


Fig 10.3 The Saxon church: first phase (scale 1:200)

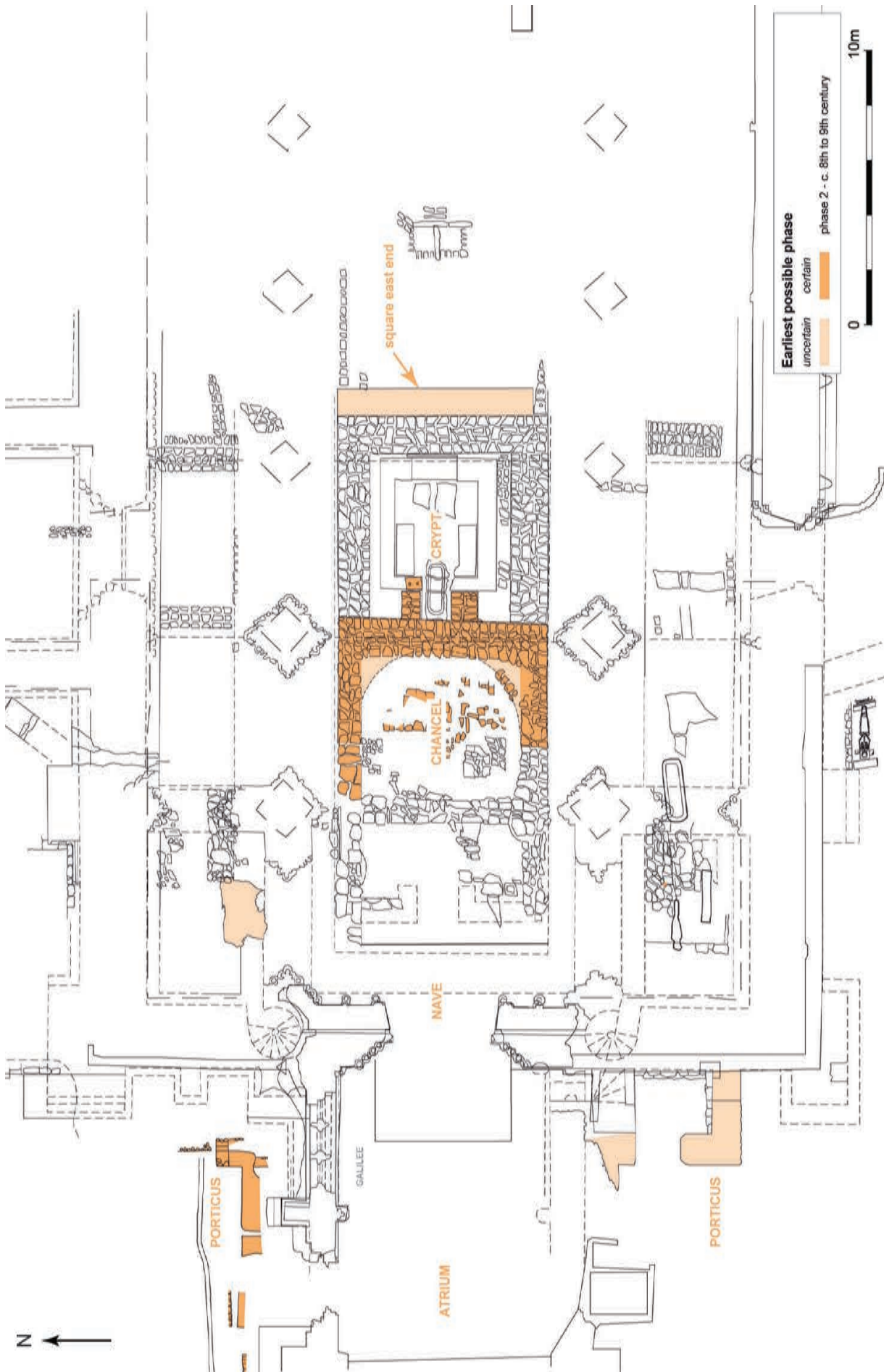


Fig 10.4 The Saxon church: second phase (scale 1:200)

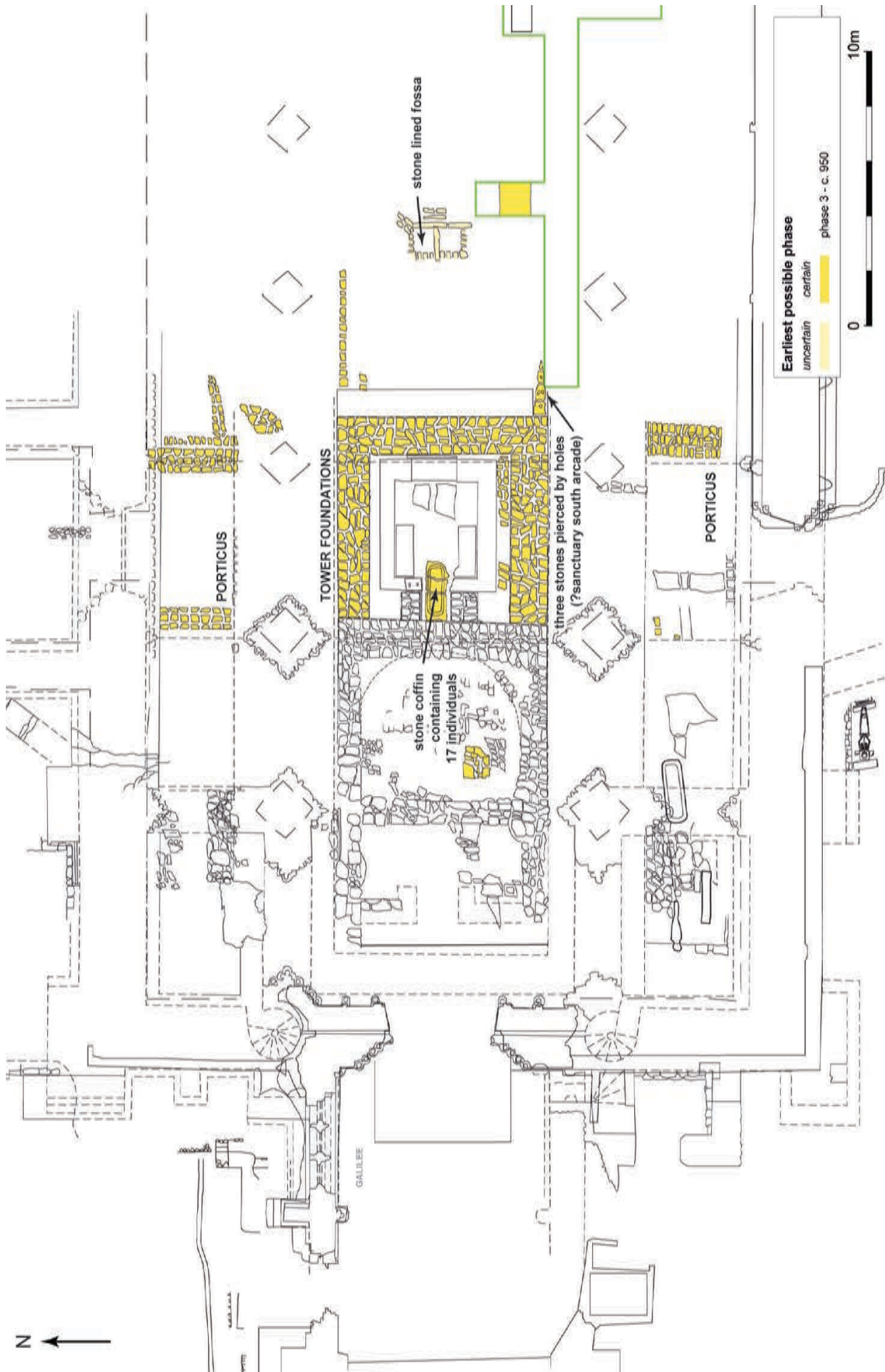


Fig 10.5 The Saxon church: third phase (scale 1:200)

screen, were located on the eastern side of the tower. Stratigraphically, these were above the east wall of the second-phase east end, which enclosed the earlier crypt, and were therefore related to the postulated phase-three eastern arm. One of Radford's trenches identified a robber trench to the east of the stones. Both features were interpreted as relating to the south arcade of the presbytery of the Late Saxon church, although they are not precisely aligned. The robber trench was sealed beneath twelfth-century mortar bedding, confirming a Saxon date. A short stretch of masonry was believed to relate to a north aisle. However, the remainder of the eastern arm shown on Radford's plan is entirely conjectural.

A stone coffin discovered within the western entrance of the earlier crypt beneath the tower contained the commingled skeletal remains of seventeen individuals. Radford proposed that these were the contents of graves disturbed during Dunstan's remodelling. A stone-lined receptacle to the east of the phase-three church, recorded by Wedlake in 1929, was interpreted by Radford as a 'fossa' for relics placed under an altar. A tile in the clay overlying the receptacle indicates that it was still in use as late as the thirteenth century, with the relics possibly translated following the choir extension in the mid-fourteenth century.<sup>23</sup> Although the fossa was in use by the twelfth century, as shown by the pavement levels, an earlier date cannot be proven.

Glastonbury exhibits the axial church layout that is characteristic of Anglo-Saxon monasteries, in contrast with the more concentric layout of the Irish tradition, in which churches were not generally aligned. Saxon minsters typically had two or more aligned churches at their core (see fig 11.1).<sup>24</sup> The 'family' of churches at Glastonbury was extensive, comprising at least three, and possibly up to five, ecclesiastical components sharing the same axis. From the seventh to eighth centuries, there were three churches on the same alignment: the *vetusta ecclesia* and, to the east, the church of St Peter and St Paul and the detached crypt or *hypogeum*. It has been conjectured that two further features to the west may have been aligned on the *vetusta ecclesia*:<sup>25</sup> a small, square chapel or gate was excavated by Bond in 1911 and tentatively identified as the chapel of St John the Baptist that was mentioned in the *Life of St Dunstan*. The building is located 6.8m to the west of the Lady Chapel; a tenth-century date was assumed but not demonstrated archaeologically. Outside the precinct, the church of St Benignus (now St Benedict) is aligned on the Anglo-Saxon churches of the abbey; St Benignus is located to the west of the market place, outside the abbey's west gate

and near the terminus of the possible canal. There is no early fabric in the present building and no excavations have taken place. It has been suggested that this string of five ecclesiastical nodes was aligned on a Roman road, the eastern and western extensions of which survive as features in the modern landscape (see fig 3.3). However, there is no archaeological evidence to confirm that St Benignus or the chapel of St John the Baptist were part of the early family of churches.

### The Anglo-Saxon cemetery

A cemetery was located to the south of the *vetusta ecclesia*, interpreted as the monks' cemetery and believed to measure *c* 70 × 20m; it comprised a raised platform formed by a deep layer of redeposited clay (fig 10.6). The raised cemetery was retained by southern and eastern boundary walls and there was stratigraphic evidence that the dumped clay pre-dated the twelfth century. The archaeological evidence shows a remarkable correspondence with the statement by William of Malmesbury that Dunstan raised the cemetery to seal the graves of early saints and revetted the platform by building a wall on the south side.<sup>26</sup> Both Bond and Radford located the retaining walls for this terrace in the lay cemetery, to the north of the *vetusta ecclesia*.<sup>27</sup> In the monks' cemetery, the terrace itself was evident despite the removal of *c* 0.3m of medieval deposits in 1911, the clay sloping downwards to the north to meet the rise in the natural ground surface near the *vetusta ecclesia*. A date before 950 can be supported on the basis that pottery was absent from the terrace: pottery is abundant on the site only from *c* 950 onwards. It was suggested that the clay bank appeared to be contemporary with the wall enclosing the monks' cemetery. Although the medieval south cemetery wall was located in several trenches, it had been extensively robbed; nevertheless, the presence of 'Dunstan's clay' on the north side of the medieval wall line confirms that the south wall was not located any further north. The Saxon cemetery wall seems to have anticipated the medieval alignment, although the east wall of the Saxon cemetery was moved westwards to accommodate the twelfth-century cloister.

Radford reported that numerous 'cist burials' had been uncovered in this area, interpreting them as evidence of a 'British' Christian cemetery pre-dating the foundation of the Anglo-Saxon monastery.<sup>28</sup> These inhumations were lined with slabs of lias limestone set on edge and covered with further slabs. The 'original ground surface' was identified in several places, and it was from this level that the early series of cist graves were supposedly cut at a depth of 2.13–2.44m below the

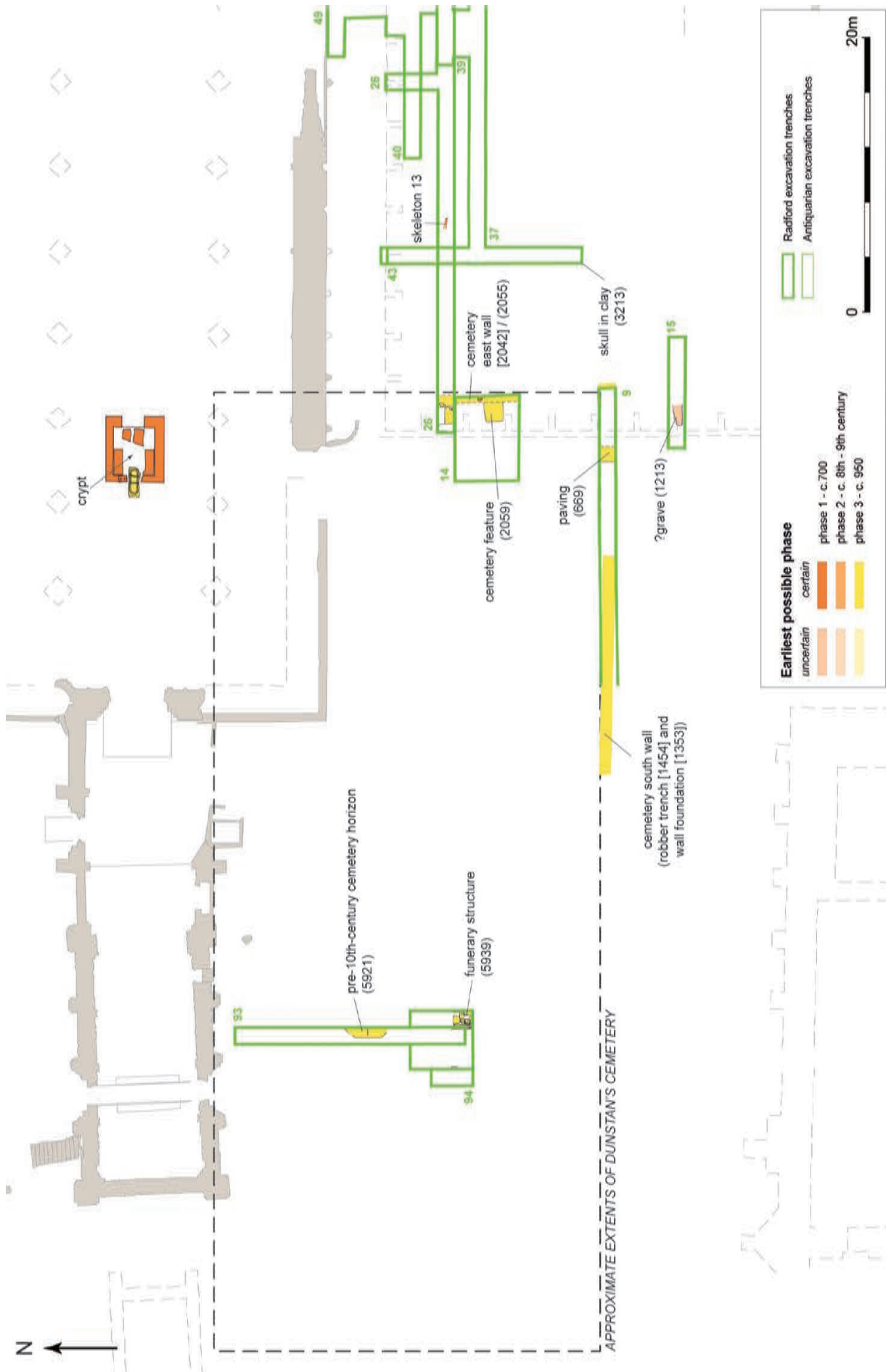


Fig 10.6 The Saxon cemetery (scale 1:400)

modern turf.<sup>29</sup> However, these graves are *c* 1.2m too shallow and actually cut through ‘Dunstan’s clay’, including the cist graves used to illustrate the ‘British’ cemetery section within the 1981 report. A note in the field records states that the excavations did not continue to the natural clay specifically because Radford wished to avoid disturbing the graves. The cist graves were all dug *through* the layer of redeposited clay; if we accept that the clay is a Dunstan-period horizon, the graves must therefore be later than the mid-tenth century in date.

Radford identified a second *hypogeum* structure within the monks’ cemetery, comprising thin walls and a mortar floor, which he proposed was contemporary with the crypt to the east of the phase-one Saxon church. Radford’s dating is challenged by the presence of pottery dated post-950 in the disturbed clay beneath the mortar floor. However, the structure does appear to have been overlain by ‘Dunstan’s clay’, which would support a date earlier than the mid-tenth century; the insertion of a medieval burial above the walls indicates that the structure became redundant while the cemetery was still in use. Radford identified the post-holes of timber buildings within the bounds of the early cemetery, in the west cloister area, and these certainly pre-date the mid-tenth century. He interpreted them as funerary structures and this function remains a possibility; however, it is argued above that post-holes associated with a trodden floor and fragments of LRA1 may instead be evidence of occupation pre-dating the Anglo-Saxon monastery. The remnants and robbing of Dunstan’s east cemetery wall lay within the later cloister garth, on average *c* 2m east of the west cloister walk. On the western side of the wall was a square pit (*c* 1.35m square) which may represent the robbed remains of a cross-base.

#### ‘Arthur’s Grave’

Features such as crosses and shrines are well attested at early medieval monastic cemeteries: for example, the post-holes of timber shrines were identified at Beckery and possible cross-bases were located at Glastonbury Tor and Wells. Cult structures and grave markers could take the form of significant monuments, such as pillars or posts ‘in the manner of a totem-pole.’<sup>30</sup> The written sources describe monuments at Glastonbury as ‘pyramids’, referring to both tomb-shrines and memorials in the cemetery. Two Glastonbury ‘pyramids’ are central to the story of Arthur’s grave: in 1191, Abbot Henry of Sully instructed the monks to dig between the two pyramids bordering the monks’ cemetery to find the king’s tomb. A popular legend had emerged during the twelfth century that King Arthur had died at Glastonbury

Abbey and was buried there. For political and financial reasons, it was expedient for the monks of the abbey to produce tangible evidence of his remains (see Chapter 3).<sup>31</sup> They announced in 1191 that excavations in the cemetery had discovered the joint grave of King Arthur and Queen Guinevere; the exhumation was described graphically by Gerald of Wales (*c* 1193).

In 1962, Radford deliberately searched for the exhumation site of Arthur’s grave, using the account of Gerald of Wales to identify the approximate location in the cemetery. Gerald described the grave as positioned between the two stone pyramids that had also been recorded by William of Malmesbury, while a fifteenth-century account by William of Worcester located the remains southwards from the second window from the east end of the Lady Chapel. Radford located a large pit within this vicinity and reported the ‘high probability’ that this was the exhumation site. In his interim report of 1981, this feature was described without qualification as ‘the graves identified in 1191 as those of King Arthur and Queen Guinevere.’<sup>32</sup> Radford argued that the hole had been dug out and then shortly afterwards refilled in the 1180s or ‘90s. His evidence for this precise dating was based on the presence of chippings of Doulling stone, which Radford supposed was first used at Glastonbury in rebuilding the Lady Chapel in 1184–9. At the base of the pit were two (or possibly three) of the cist graves that Radford believed to be sixth-century in date. Radford’s dating of the pit is easily refuted. Doulling stone is now recognised as the principal building material used in all phases of Glastonbury Abbey: Doulling has been identified among the Anglo-Saxon carved stone from the abbey and was certainly used before the rebuilding of the Lady Chapel in the late twelfth century.<sup>33</sup>

#### The Late Saxon ‘cloister’

Radford claimed to have found evidence for a Late Saxon cloister, comprising an eastern range and traces of a south and west range. The narrow claustral ranges were said to measure between 6m to 8m wide and to have surrounded a courtyard or garden measuring 55m by 36m, with the cemetery wall forming the north side. He found evidence for the alleged Saxon east range sealed beneath the west range of the twelfth-century cloister, to the south of the line of the south cemetery wall. The published sketch plan (which includes early walling recorded by Bond) shows two rooms in the west cloister area with the range continuing southwards, albeit slightly set back. The incomplete excavation plan (dated 1951–2) shows only the robber trench and masonry remnants of the eastern wall, which was aligned with the east cemetery wall,



along with fragments of a cross-wall between the two rooms and at the south end of the later west cloister walk. The latter had been interpreted by Bond as the foundation for a *lavatorium*, but Radford argued that its construction indicated a Saxon date. Mortar and plaster layers within the cloister garth were interpreted as bedding and construction deposits associated with this structure and with the construction of the mid-twelfth-century cloister.

Walling found to the south of the refectory in 1938 was described as resembling masonry belonging to the latest phase of the Saxon church, attributed to Dunstan. Radford identified this as the southern end of the Saxon east range, which he assumed was connected to the remains beneath the later west cloister walk. This was thought to have formed one long east range, even though the eastern walls were misaligned. It was claimed that south and west ranges of the proposed Saxon cloister were traced beneath the later abbot's range in 1962 and 1978, comprising fragments of walling and a floor horizon. Wedlake and Radford ascribed a Late Saxon date on the basis of similarities with the proposed Saxon 'east range', observed in the early 1950s. On the basis of very tenuous evidence, it was suggested that these fragmentary remains formed part of a coherent cloister and were dated to a single building period.

There is no proof that the structures to the north and south of the refectory were connected or that the junction of two rooms to the south of the refectory represents the meeting of a south and east range (fig 10.7). The archaeological evidence is insufficient to reconstruct a full cloister as envisaged by Radford. Instead, it appears that several free-standing structures were located across the later west cloister, south of the refectory and possibly below the later abbot's hall. The buildings in the area of the later west cloister and refectory are sealed by twelfth-century deposits and therefore may be Late Saxon in date. It is likely that Radford's identification of a cloister relied heavily on B's *Life of St Dunstan*, which described Dunstan's devotion to the Rule of St Benedict and his building of a cloister. B states that Dunstan 'surrounded the cloisters on every side with solid monastery buildings' (*septa claustrorum monasticis aedificiis ... ex omni parte firmiter muniuit*).<sup>34</sup> However, the Latin term *claustrum* can refer either to an enclosure as well as to a formal cloister.

### Saxon industry and craft-working

Important evidence for Saxon industry was concentrated in the area of the cloister garth and the east cloister walk,

where five glass furnaces were excavated in 1955–7 (see Chapter 7: The Saxon glass furnaces). The floors of the furnaces were preserved, providing unique structural evidence for early medieval glass technology in Britain. There were 262 associated finds, including vessel and window glass, waste and crucible fragments and production materials, including a glass block and a reticella rod and a curved iron tube that is perhaps a blowing tube (see Table 3). The predominant colour of the glass was blue / green, with coloured glasses (turquoise, amber / brown) used more sparingly for applied decoration. Radford assigned a date of the ninth to tenth centuries for the glass-working complex, based on glass-vessel typology, pottery and stratigraphic associations.<sup>35</sup> The vessels were subsequently reassessed as more typical of the late seventh to eighth centuries,<sup>36</sup> and the dating based on pottery and stratigraphic evidence has been challenged (see Chapters 5 and 7). Charcoal associated with Furnaces 1 and 2 was retained in the 1950s and five samples were submitted for radiocarbon dating in 2011. Despite the length of time that the samples had been in storage, the delta 13C values for all five samples demonstrated that there was no contamination to the charcoal. The dates provide a broad age range for the furnaces of AD 605–882, but this can be narrowed to AD 605–780 (at 2 sigma), and one sample has a much more precise range of AD 605–85 (see Tables 1–2). Bayesian analysis of the radiocarbon dates supports the proposal that the glass-making was a short-lived 'single-event', likely to date to the late seventh or early eighth centuries (see Chapter 5: The radiocarbon results for the glass furnaces) and possibly linked to the building of the first stone church by King Ine (AD 688–726), who is credited with a major role in founding or refounding the monastery (see Chapter 3).

Compositional analysis was undertaken on glass samples to determine whether *primary* glass production took place at Glastonbury using raw materials, or whether production was *secondary* and based on recycled materials.<sup>37</sup> It is now well established that the majority of early medieval glass appears to be related to large primary production centres discovered in the Near East and the Mediterranean, with an additional source of materials for secondary production provided by Roman sites exploited for cullet.<sup>38</sup> The compositional analysis confirms that the majority of the Glastonbury samples are soda-lime-silica glass consistent with the Roman compositional tradition. As at Wearmouth and Jarrow, the Glastonbury material is very likely to contain recycled Roman material.<sup>39</sup>

Metal residues associated with the glass furnaces have been analysed using XRD and XRF, identifying copper-



alloys with significant concentrations of lead (1–17 wt%) (see Chapter 8: Slag and metal residue samples). Most of the metal samples analysed from Glastonbury Abbey are either tin bronze or heavily leaded tin bronzes. There are two samples that are also classified as brass and leaded brass; given the restricted use of brass in the Saxon period, this is likely to represent recycled Roman brass. SEM analysis indicates that the lead in the bronze was added as a liquid, possibly as a lubricant for casting. This observation supports the hypothesis that these materials were recycled Roman metals. Saxon non-ferrous metal-working relied on scrap salvaged from Roman sites or imported material; there is no evidence for post-Roman extraction of copper in England until the twelfth century.<sup>40</sup> Slag samples associated with the glass furnaces show a large range of iron-rich through to silica-rich varieties. These are likely to result from iron rather than copper processing activities due to the low concentrations of metals (Cu + Pb + Zn). Principal Component Analysis shows a consistent composition across the slag residues, glass and metal samples, suggesting they were part of the same glass-working operation (See Chapter 8: Slag and metal residue samples). A close relationship between glass and metal-working has been demonstrated at other early monasteries, in particular Portmahomack, where glass and enamel-working were found in the same assemblages with metal-working waste.<sup>41</sup>

## Norman

The Norman rebuilding of the Saxon monastery was instigated by Abbot Turstin (1077–1100), continued by Abbot Herlewin (1100–18) and brought to fruition by Abbot Henry of Blois (1126–71). Radford discovered evidence for Turstin's church while pursuing the twelfth-century remains. He presented a conjectural reconstruction (Plan 2) based on just three features; unfortunately, this exaggeration of the evidence tainted the credibility of his archaeological interpretations.<sup>42</sup> His elaborate reconstruction of Herlewin's church (Plan 3) has also met with scepticism, but there is considerably more evidence for this building.<sup>43</sup> Radford's interim report provides detailed discussion of the church but omits the interior arrangements; the significant evidence for Henry of Blois's claustral range is contained within just a single paragraph.<sup>44</sup> The *Chronicle of Glastonbury* notes that Henry of Blois raised the cloister and other buildings 'from their foundations' (see Chapter 3),<sup>45</sup> implying the presence of an earlier Norman cloister. However, there is no archaeological evidence for a cloister pre-dating the structure erected by Henry of Blois in the mid-twelfth

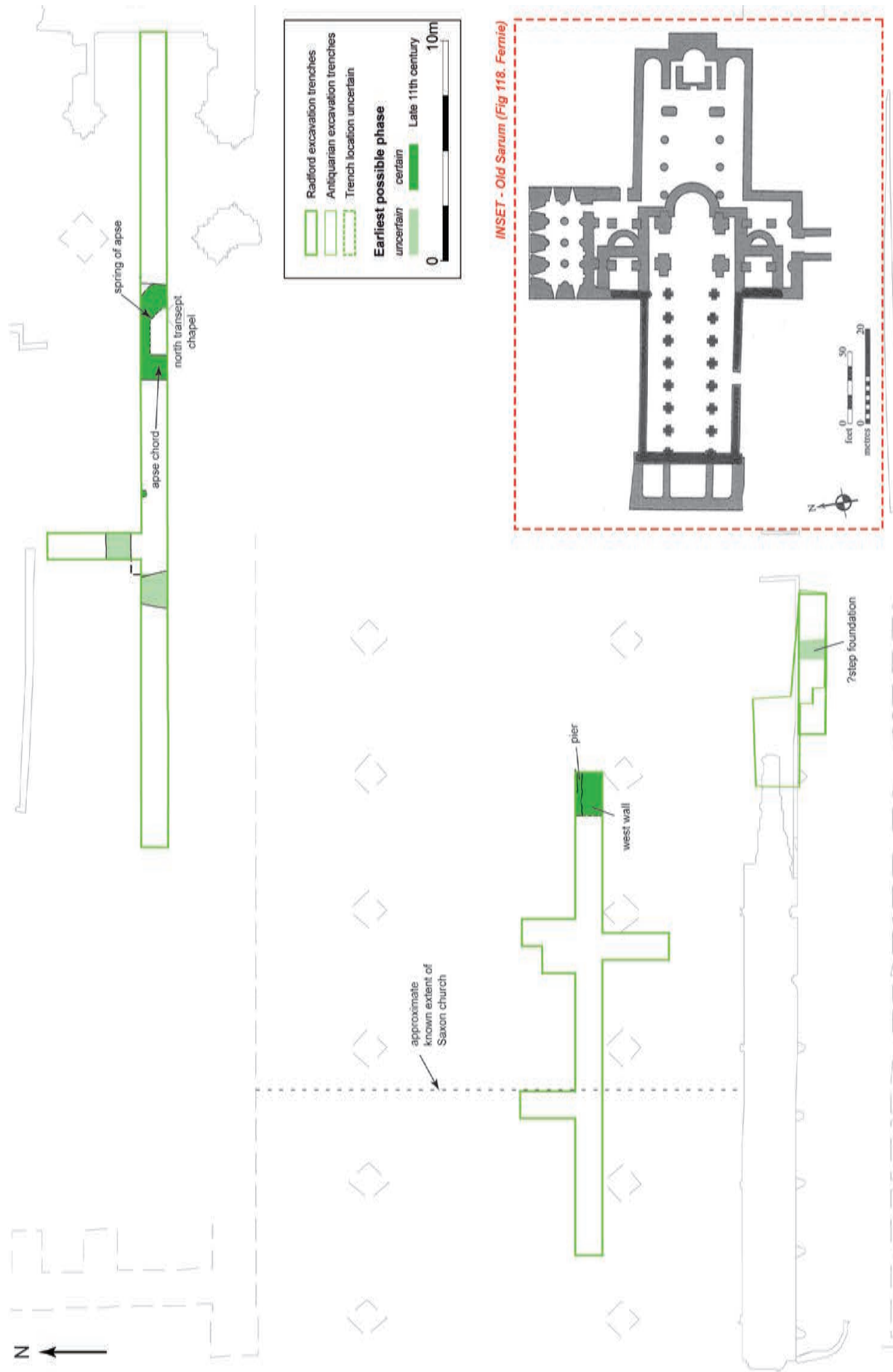
century. Parts of the Late Saxon buildings were retained, and it is feasible that they were incorporated within an Anglo-Norman cloister or courtyard layout.

## First phase (Plan 2)

The tumultuous abbacy of Turstin must have severely restricted the initial Norman campaign of rebuilding;<sup>46</sup> there is very little archaeological evidence for the church, and no other buildings have been identified either historically or archaeologically. Radford noted tentative archaeological evidence for a late eleventh-century cloister but this is unconvincing. Instead, details contained within the archaeological records suggest that elements of the Saxon layout remained in use until the mid-twelfth century. The maintenance of existing buildings may be inferred from the repair of two Late Saxon walls relating to a structure beneath the later west cloister, following the insertion of a Norman drain. The robber trench for the Late Saxon east cemetery wall (fig 10.8) contained pottery dated after 1130, indicating that this boundary was extant until the construction of the mid-twelfth-century cloister.

Radford's reconstruction of Turstin's church shows an apsidal east end, flanking aisles with enclosed apsidal terminations, narrow apsidal transepts and a short nave of two bays (Plan 2). The length of the nave implies that the church was not completed and that the Saxon church to the west (fig 10.8) was still in use.<sup>47</sup> A late eleventh-century date is credible on stratigraphic evidence for the feature associated with the nave west wall, including the possibility of an internal pier for an arcade. More convincing are the remains of a small apsidal chapel within the north transept, pre-dating the twelfth-century counterpart. The robber trench associated with the north transept west wall pre-dates the thirteenth century, while the north wall may be represented by a further robber trench that was not shown on the published plan. It is doubtful that these features are contemporary: the only indication is the similarity of the robber fills as noted by the excavators.

Radford proposed that Turstin's church was similar in plan to those at Whitby (N Yorks) and Eye (Suffolk). Comparative discussion is confined here to the north transept chapel, the only feature that can be reconstructed with some certainty. The position of the apse chord and the springing of the apse indicate a chapel measuring *c* 2m long internally. This compares to the late eleventh-century apsidal transept chapels at Old Sarum (Wilts) (fig 10.8) but is smaller than those at St Augustine's, Canterbury, St Albans and Tewkesbury Abbey, all of



**Fig 10.8** The eleventh-century church (scale 1:250); plans of St Albans and Old Sarum (reproduced with permission from Fernie 2000)

which have transept chapels measuring 3m long.<sup>48</sup> This supports Radford's conclusion that the scale of Glastonbury's eleventh-century church was modest in comparison to contemporary abbeys of similar status.<sup>49</sup>

## Second phase (Plan 3)

Turstin's church is known to have been replaced by a larger structure built by Herlewin and possibly completed by Henry of Blois.<sup>50</sup> Masonry, robber trenches and paving relating to the western end of the nave were recorded in 1912 and between 1926 and 1929 (fig 10.9). A lower level of paving, initially interpreted as belonging to Turstin's church, was subsequently reinterpreted as a vestibule at the western end of Herlewin's church. This seems likely, given that the two levels of paving were not superimposed, and there is no other evidence to indicate that Turstin's church extended this far west. The higher level of paving had extensive evidence of burning, including melted lead in the joints, indicating the ferocity of the 1184 fire within the nave.

Radford's postulated reconstruction indicates an apsidal east end, flanking aisles with enclosed apsidal terminations and transepts with two apsidal chapels positioned *en échelon* (Plan 3). A nave of nine bays is indicated by the transept positions and the previously established location of the nave west end, immediately to the east of the later west end. The sleeper trenches of the arcades and the side walls were on approximately the same lines as the post-fire church, although the nave was on a slightly different axis from the remainder of the church (fig 10.9). For the north transept, Radford identified evidence of the west wall, the apse of the northern chapel and the apse of the southern chapel. The eastern arm was contained within the first five bays of the later eastern arm: the evidence comprised the eastern curve of the central apse, massive piers projecting beyond the line of the later sleeper walls, a southern enclosed apsidal chapel and the high altar.

Features that were not shown on Radford's reconstruction plan provide additional detail. The mortar bedding of the nave was a fairly consistent deposit, sealed beneath the deep post-fire make-up and with evidence of a step or partition marking a small rise in the floor level. In the north transept, the apse chord of the northern chapel continued southwards as the sleeper wall for the south chapel aisle (fig 10.9). The southern chapel was built above a stone platform constructed deep within the Saxon ditch and supporting the remains of the southern apsidal chapel. A small, partially robbed stone feature was sited along the central axis of the south chapel and above

the chord of the apse; Radford suggested that this was Herlewin's shrine, but a more likely interpretation is that it was a primary burial. Radford tentatively identified the tomb of King Edgar as a robbed feature within the east end and near the axis of the central apse chord.<sup>51</sup>

Although there is no archaeological evidence to support this identification, a tomb located 0.3m west of the high altar indicates the interment of a person of importance. The mortar bedding for the twelfth-century pavement was located directly below the thirteenth-century mortar bedding layer.

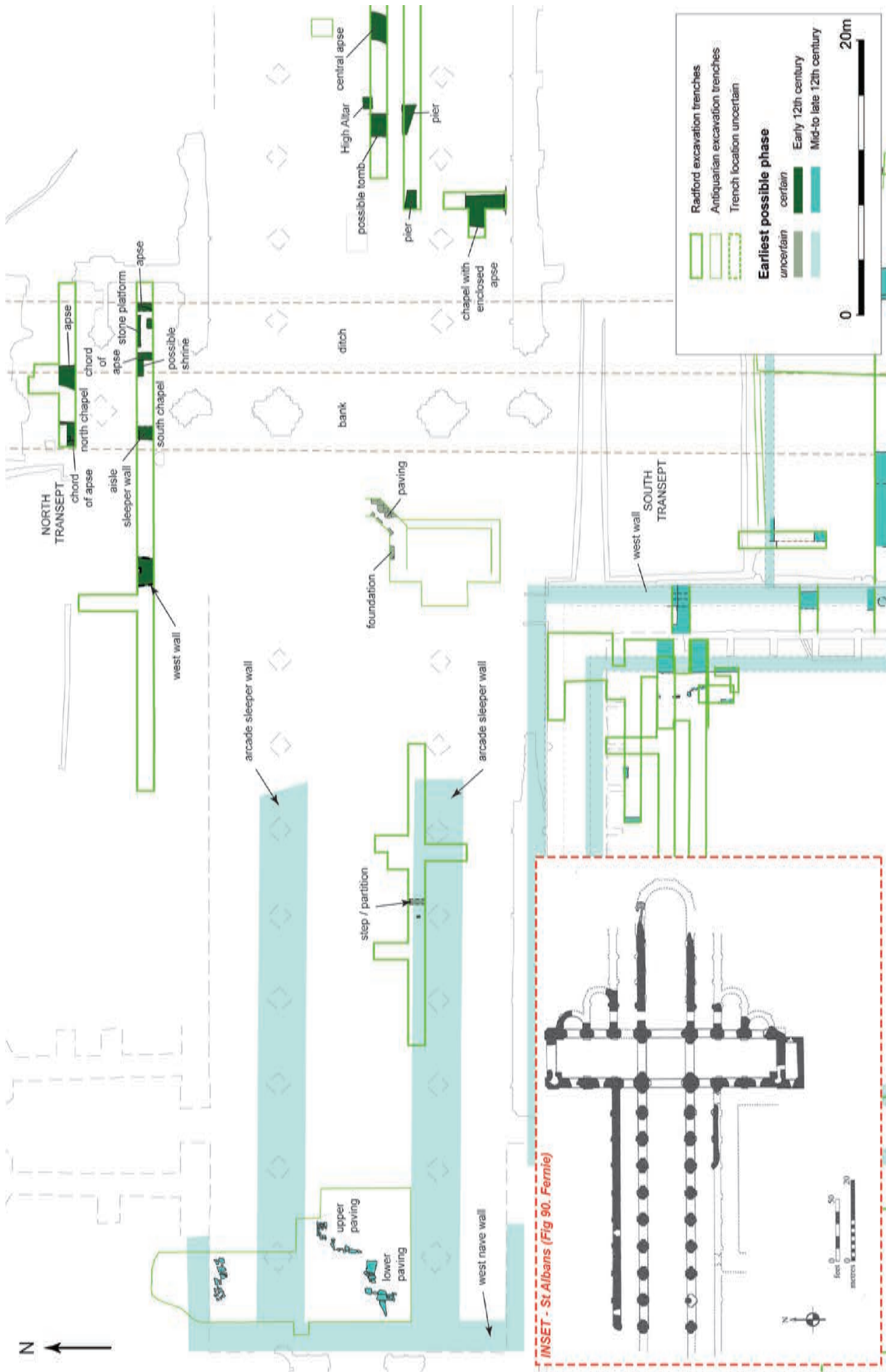
Most of these features are unrelated to the thirteenth-century plan; they are located in the centre of later bay divisions and pre-date them stratigraphically. They are generally sealed beneath the bedding layers for later floors or cut by post-Dissolution robber trenches relating to the foundations of the later church. Robber trenches for the twelfth-century church were backfilled with firmly packed rubble and stones, presumably to provide a firm base for the later structure, whereas the robber trenches of the later church were filled with loose material. There were no datable finds but this negative evidence is significant: it contrasts with the debris and datable finds recovered from the post-Dissolution robber trenches such as pottery, glazed tile and carved stone.

Radford concluded that the church resembled the plan of St Albans (built after 1077) very closely (fig 10.9). There are similarities based on the enclosed apse identified for the east end south aisle, but more evidence is required to make any meaningful comparisons.

## Third phase (Plan 3)

### Claustral range

The cloister is the most vivid testimony of Henry of Blois's work, with extensive archaeological remains discovered beneath the later cloister and forty-one fragments of worked stone dated stylistically to just before 1150. The architectural fragments derive from elaborate arcades and are carved in the distinctive local blue lias. The richly carved capitals exhibit leaves, flowers, berries and some human figures. The shafts are carved with spiral and chevron ornament and may have comprised either paired shafts with double capitals or alternating single and paired shafts (see Chapter 9: Romanesque carved stones). The scale of the Norman cloister can be estimated from the position of robber trenches: the external dimension was c 42.5m square, with the cloister garth c 29m square. In the west cloister walk, evidence of flooring was located c 1m below the later cloister floor, and paving has been identified for the south cloister walk and the



**Fig 10.9** The twelfth-century church (scale 1:400); plan of St Albans inset (reproduced with permission from Fernie 2000)

contemporary refectory undercroft. This was at the same level as the top of a stone-lined drain, which ran beneath the west cloister walk, with a series of scaffold-holes relating to construction (fig 10.10).

The west and north cloister walks were approximately contiguous with their later counterparts, whereas the south and east cloister walks were positioned slightly inwards: the outer walls ran along the later cloister walks and the inner walls ran just inside the later cloister garth. Paving in the south cloister walk was recorded at a depth of *c* 1.4m below the modern topsoil. No twelfth-century paving or mortar bedding layers were recorded in the north or east cloister walks; however, the depth of the twelfth-century foundation trench for the east cloister walk indicates that the floor must have been at *c*. 0.3m below the modern turf (therefore considerably higher than the south and west cloister walks). A burnt floor layer was recently excavated in the east cloister walk at 0.25m below the modern turf and interpreted as relating to the 1184 fire (see below). Although modern landscaping may partly explain the discrepancy, the difference between the twelfth-century and later medieval paving in the west cloister walk was recorded at 0.9m, while the section drawings for the east cloister walk show the difference from the later medieval paving cannot have exceeded 0.15m. In conclusion, the east cloister walk was located at a higher level than the south and west cloister walks, reflecting the rise in natural topography towards the east. The floor level in the north cloister walk was not identified; however, a substantial foundation at the eastern end of the north cloister walk, dating before 1184, may represent steps leading upwards to the east cloister walk.

Several interesting features were recorded within the cloister garth. Structural remains near the south cloister walk were interpreted by Radford as an octagonal *lavatorium* with a central basin; unfortunately, the records are not sufficiently detailed to assess his theory. Octagonal *lavatoria* projecting into the cloister garth are known at Durham Cathedral Priory, Much Wenlock Priory (Shropshire) and Mellifont Abbey (Louth, Ireland). Circular forms of free-standing *lavatoria* were constructed at Christ Church, Canterbury, Lewes Priory (Sussex) and St Nicholas's Priory, Exeter.<sup>52</sup> Free-standing circular, square or polygonal fountain-houses were widespread in continental Europe, with piped water rising through a central column flowing into a small reservoir and distributed to a larger basin via taps and spouts.<sup>53</sup> It has been suggested that these forms were also widespread in Britain prior to the mid-thirteenth century, reaching the height of their popularity in the late twelfth century

before being superseded by wall-mounted lavers.<sup>54</sup> For example, excavations at Eynsham Abbey (Oxford) recorded evidence for two successive free-standing *lavatoria* in the south-west corner of the cloister garth: these were round and dated to the late twelfth and late thirteenth centuries respectively.<sup>55</sup>

A twelfth-century cultivation soil above the Saxon remains abutted a kerb that extended for over *c* 6m along the eastern side of the cloister garth, a hard-trodden soil indicating a path around the edge. This supports Radford's conclusion that a twelfth-century cloister garden may have existed at Glastonbury. Substantial foundations with some upstanding walling and paving were recorded in the north-west quadrant of the cloister garth. Radford's idea that this may represent a free-standing bell-tower is unlikely. First, the tradition of free-standing stone bell-towers dates from the thirteenth century.<sup>56</sup> Secondly, known examples were located on the periphery of monastic and cathedral precincts at public access points; the siting of a detached bell-tower within the cloister would therefore be unusual.<sup>57</sup> An alternative interpretation is that the remains may represent a conduit house. Two phases are apparent, with dating evidence from one of the robber trenches revealing that the structure was not removed until after the Dissolution. The plan is difficult to discern from Radford's narrow trenches and there is no evidence of any water features providing supply and distribution, although a substantial stone-lined drain extended along the length of the west cloister walk (see below). Conduit houses were located within cloister garths at some Benedictine monasteries and were a feature of Carthusian monasteries, from which water was distributed to the individual cells.<sup>58</sup> Most famously, the mid-twelfth-century 'waterworks plan' of Canterbury Cathedral shows a water-tower and laver located to the south of the north cloister walk. Although this corresponds with the location of the remains at Glastonbury, the refectory at Canterbury was located to the north of the cloister and the water-tower was therefore sited further away from the church and closer to the refectory.<sup>59</sup> It is also worth noting that there was a conduit house in the courtyard at Wolvesey, Winchester, the bishop's palace constructed by Henry of Blois, who was simultaneously Bishop of Winchester and Abbot of Glastonbury.

The external walls of the chapter house (fig 10.11) reveal a buttressed rectangular structure measuring 21m by 9.75m internally, with an internal dais against the eastern wall. The side walls are very thick and not supported by buttresses; it is possible that the chapter house was provided with a barrel vault. The generic

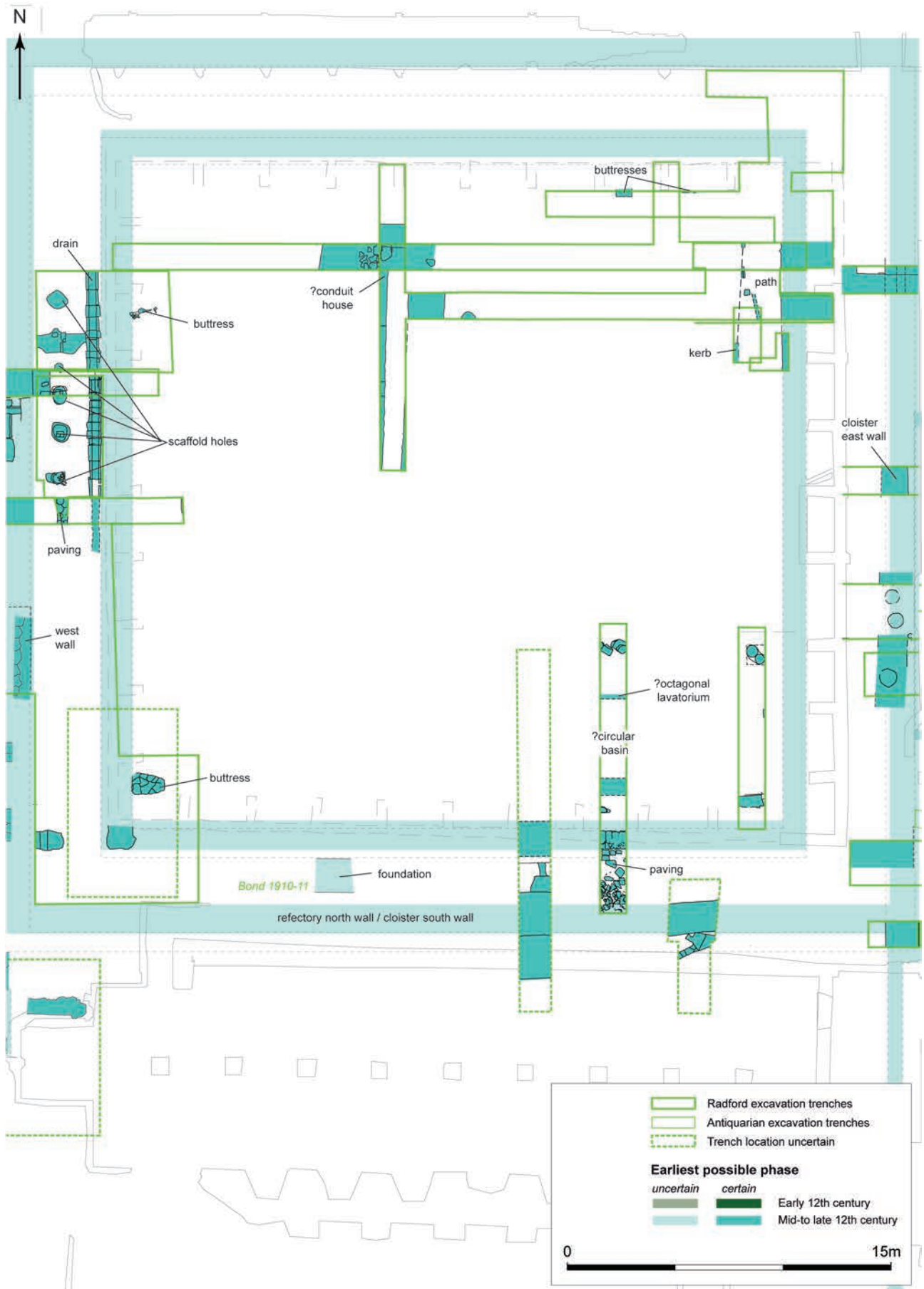


Fig 10.10 The twelfth-century cloister (scale 1:250)



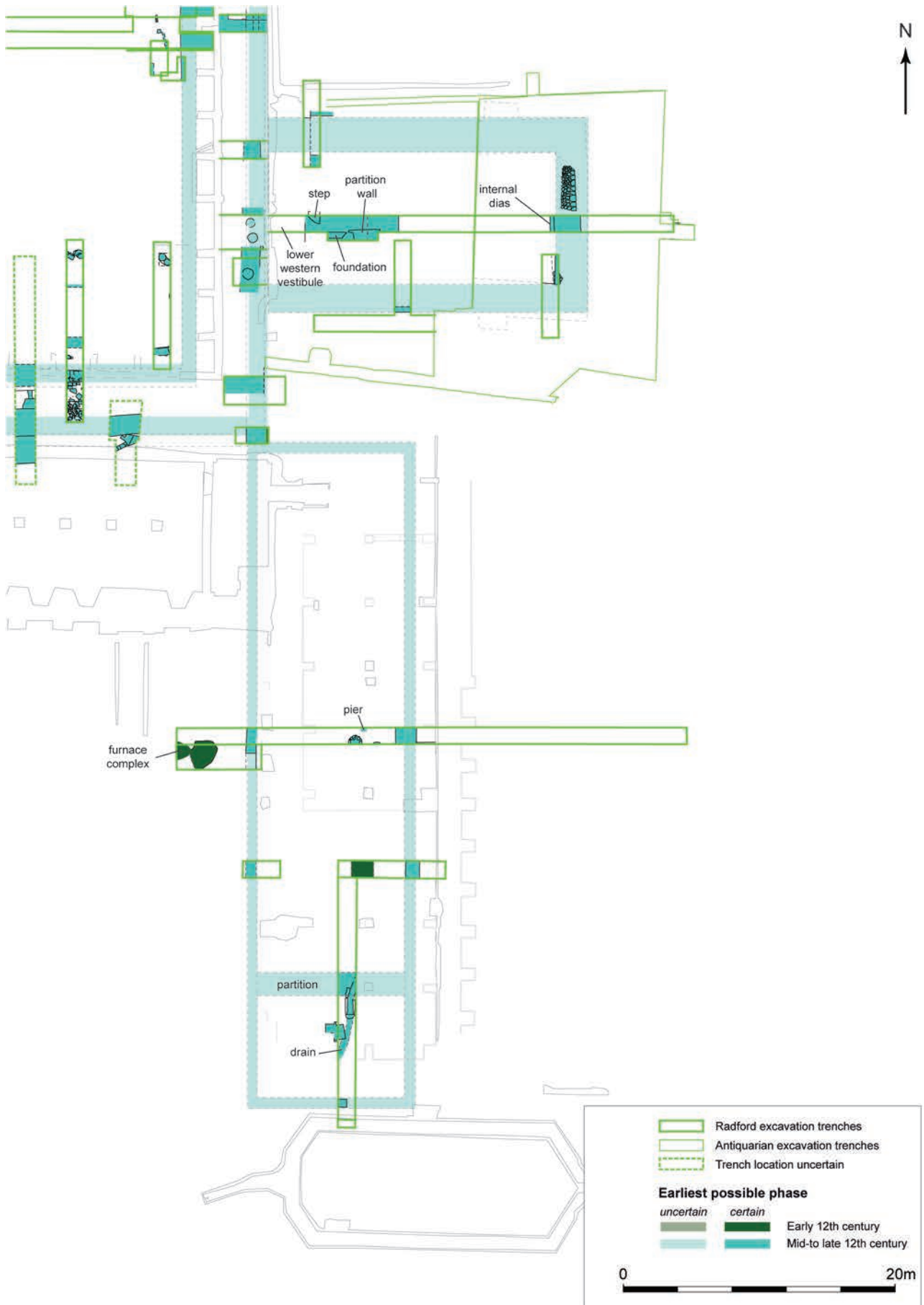


Fig 10.11 The twelfth-century east range (scale 1:400)

English chapter house of this date was apsidal and projected from the eastern range, with late eleventh-century examples at Battle (Sussex) and Gloucester, and early twelfth-century examples at Norwich, Bury St Edmunds, Reading and Durham.<sup>60</sup> The Glastonbury chapter house had a square east end, reflecting its slightly later date. Evidence of a partition wall (confirmed by the geophysical survey) and steps indicates a lower western vestibule, as first proposed by Bond.<sup>61</sup> The vestibule was a western compartment one bay deep and roughly three square bays wide. The mortar bedding horizon to the west of the vestibule showed evidence of burning relating to the 1184 fire. The floor level rose to the east of the vestibule steps; based on the height of the contemporary eastern foundation, the floor was at the same level as the later mortar bedding.<sup>62</sup> The vestibule provided access from the east cloister walk (which was at the same level as the vestibule) to the chapter house; the change in height reflected the natural rise in topography towards the east. It is likely that a passageway existed at first-storey level within the vestibule, crossing the slype and providing access from the dormitory to the south transept via night stairs, and allowing the main body of the chapter house to be full-height. Similar arrangements existed at Norwich in the last two decades of the thirteenth century and at the cathedral-priory of Rochester and at Cistercian Rievaulx (N Yorks).<sup>63</sup>

The twelfth-century dormitory (fig 10.11) was sealed by 1184 fire deposits and located to the immediate west of its successor. Archaeological evidence for one internal, east-west partition indicates a smaller room at the southern end of the dormitory undercroft. Remnants of mortar bedding indicating a pavement were recorded during Radford's excavations across the central and southern parts of the undercroft, c 1m below the modern topsoil. Of the refectory, only remnants of the north wall and paving have been identified (fig 10.10), revealing that the earlier refectory was positioned slightly to the north of the later building.

Structural remains were recorded to the south west of the cloister and refectory, indicating a range of two rooms separated by a cross-passage (fig 10.12). The southern room was larger and had internal responds indicating a high-status function. A twelfth-century date was surmised from the stratigraphic location of some of the walling beneath the refectory; Radford suggested that this was an early abbot's hall. With no evidence of the 1184 fire in this area, the buildings may relate to a chamber and chapel built by Abbot Robert (1173–80), which was said by Adam of Damerham to have survived the fire.<sup>64</sup> However, the archaeological recording was very limited

and the only firm conclusion is that the range was demolished prior to the construction of the fourteenth-century abbot's hall.

Immediately to the west of the fourteenth-century abbot's hall, and sealed beneath thick fire deposits, were two substantial stretches of foundation; Wedlake proposed these remains as an alternative location for a twelfth-century abbot's hall. Adam of Damerham recorded that the stone of Henry of Blois's great palace was reused in the foundations of the Great Church. Poorly constructed buildings were recorded between the fourteenth-century abbot's hall and the cemetery, suggested by Radford to be part of the twelfth-century outer court. The plans of both areas are too incomplete to facilitate detailed discussion; however, it is clear that a combination of both substantial and insubstantial buildings existed here in the twelfth century.

### **Late twelfth to mid-sixteenth centuries (Plan 4)**

Very little of the archaeology for the period after the 1184 fire has been published, although most of the key buildings are marked out today in the grounds. The evidence for the extent of the 1184 fire is discussed here in order to consider the sequence of rebuilding. One important discovery is the location of the reconstructed transepts and east range immediately to the east of their earlier counterparts. This indicates that the Norman buildings remained in use during construction, allowing the monastery to continue to function as the rebuilding advanced. Large quantities of Norman architectural fragments have been noted within later foundations, suggesting that some masonry may have been directly transferred from old walls into adjacent new foundation trenches. The layout of the abbot's range has been traced, a complex located on the western edge of the inner precinct and accessed directly from the Broad Court. Wedlake's interpretation of the plan of the 'abbot's lodging' is reassessed to offer a new interpretation of the evidence.

### **The 1184 fire**

Archaeological evidence for the 1184 fire was recorded beneath the abbot's hall and the area immediately to the north: the monks' cemetery and lay cemetery, the cloister garth, east cloister walk, chapter house, dormitory and church. There are some areas that appear to have escaped the conflagration to a greater or lesser degree, including the west cloister walk. The absence of scorching on the blue lias sculpture within the Romanesque corpus

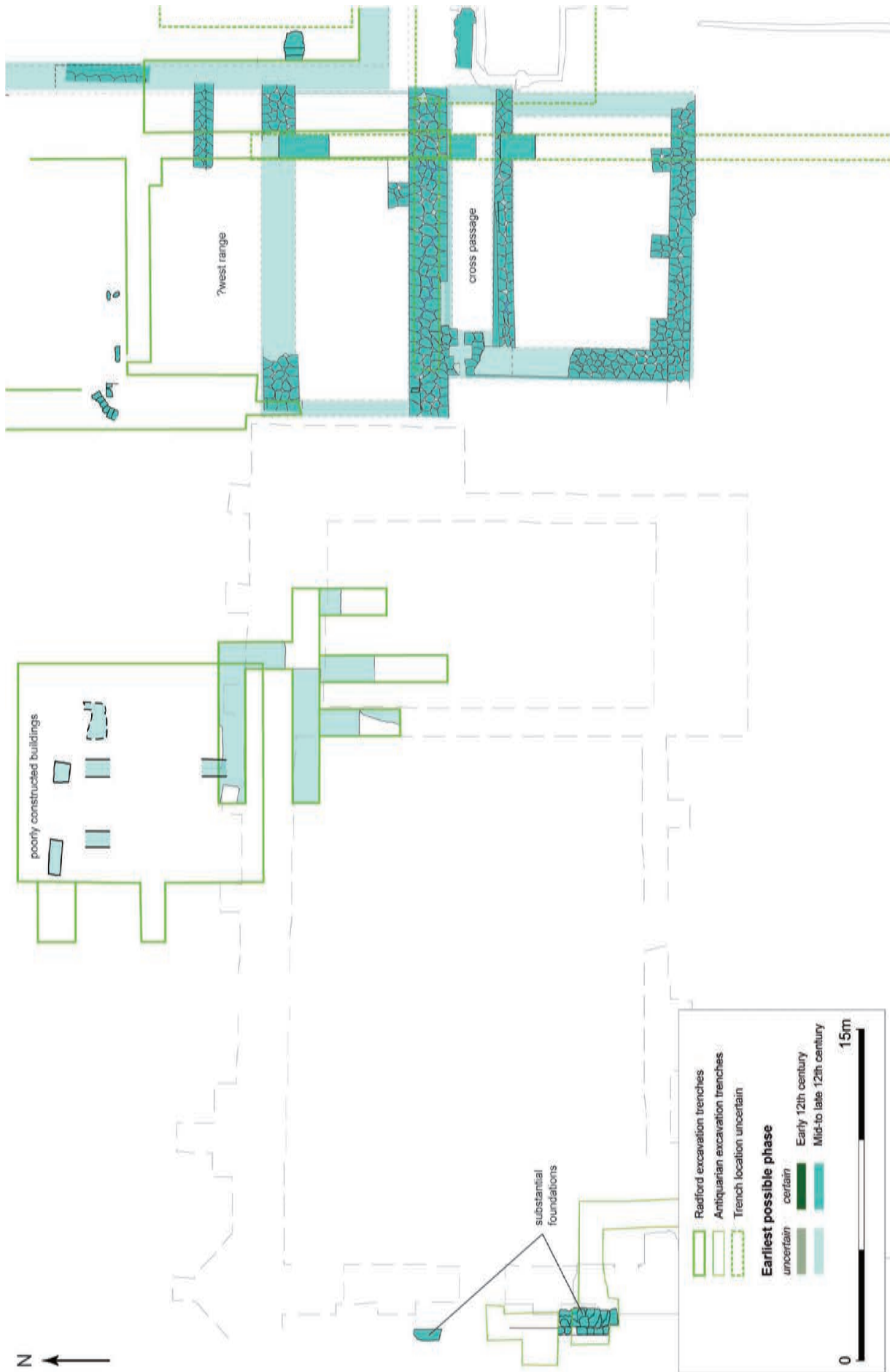


Fig 10.12 The twelfth-century west range (scale 1:250)

suggests that at least part of the cloister was undamaged. Indeed, the programme of post-fire repair undertaken by Abbot Ralph Fitzstephen comprised complete reconstruction of some areas and making good in others, supporting the suggestion that some buildings were less seriously affected. Recent investigations in the east cloister walk exposed a mortar floor with heavy burning *in situ*, located only 0.25m below the modern turf. A radiocarbon determination yielded a date of AD 1160–1225 at the lowest probability (at 1 sigma) and AD 1050–1270 at the highest probability (at 2 sigma), suggesting that it may have resulted from the 1184 fire.<sup>65</sup> Allowing for modern landscaping, this is at approximately the same depth as the twelfth-century burnt mortar bedding in the chapter house vestibule and the twelfth-century east cloister walk.

## Church

The side walls and arcades of the post-fire church were along roughly the same lines as their twelfth-century antecedents; however, the axis of the nave was corrected so that only the Lady Chapel retained the orientation of the Saxon churches (Plan 4). The western termination of the nave was located immediately to the west of its twelfth-century predecessor; the west and east walls of the north transept were immediately east of their Norman counterparts, along with the sleeper walls of the aisle and chapels (fig 10.13). The same pattern would have applied to the south transept.

Beneath the mortar bedding of the nave pavement was a layer of redeposited clay containing Roman pottery and sealing the Saxon and Norman remains, *c* 1.2m deep. The thickness of the clay gradually diminished towards the east, counteracting the rise in ground level in this direction. By contrast, the mortar bedding at the east end covered a fairly thin layer of redeposited clay (*c* 0.1m thick) containing residual Roman pottery and sealing the twelfth-century remains. The twelfth-century mortar bedding in the north transept was directly overlain by the thirteenth-century bedding layer, probably reflecting the slight rise in ground level towards the north. Some of the robber trenches relating to the twelfth-century east end were given special treatment, covered by harder and more compact deposits. This may have been intended to prevent sagging of the pavement but was ultimately unsuccessful.

Within the north transept, the thirteenth-century mortar bedding horizon occupied one level with some paving *in situ*. The mortar bedding for the east end also seems to have been at one level; occasional fragments of

late thirteenth-century glazed tile were recovered from medieval deposits suggesting episodes of repaving. A small step is apparent at the western end of bay four which would have given access to a raised area for the thirteenth-century high altar to the east. Located beneath the high gable wall, the location of the new high altar replicated the twelfth-century position, perpetuating the location of this most sacred place.

Radford's excavations in the nave identified the location of the thirteenth-century monks' choir stalls prior to their translation to the eastern arm during Monington's remodelling (1342–75). A robbed foundation in bay four possibly represents the *pulpitum* or screen that formed the west end of the stalls. A layer of rubble covered by a later floor horizon may indicate the continuation of the choir stall foundation eastwards. Evidence for partition walls near the north wall of the north transept could indicate the presence of a caged chantry; Radford's excavation notes propose that this perhaps represents Abbot Beere's Loretto Chapel (1493–1524). Bond claimed the discovery of this chapel as a free-standing structure in the area to the west of the north transept, with a possible passage leading from the nave. The evidence for the structure is unconvincing and the 'passage' coincides with a remnant of walling recorded by Radford.

Further information can be gleaned for Abbot Monington's remodelling of the eastern arm in the mid-fourteenth century, as first noted by Willis.<sup>66</sup> Evidence for the extension of the high vault from four to six bays is evident in the standing remains and from the robber trenches discovered by Radford. The extension included the provision of a new eastern ambulatory of one bay and a second bay divided into separate chapels, as previously established by Bond. Bond identified clay which he believed indicated the base of the fourteenth-century high altar, but this was reinterpreted by Radford as natural subsoil; evidence for the actual site was discovered *c* 0.91m further west, between the fifth piers from the west and backing against the reredos wall. A foundation discovered 3.6m to the east was interpreted as Monington's screen, a passage envisaged between the screen and the high altar reredos (between the sixth piers from the west).<sup>67</sup>

## Claustral range

The cloister walks may have partially survived the 1184 fire, as previously discussed, but there is some evidence for thirteenth-century construction. The east cloister walk was shifted *c* 1m eastwards of the Norman east

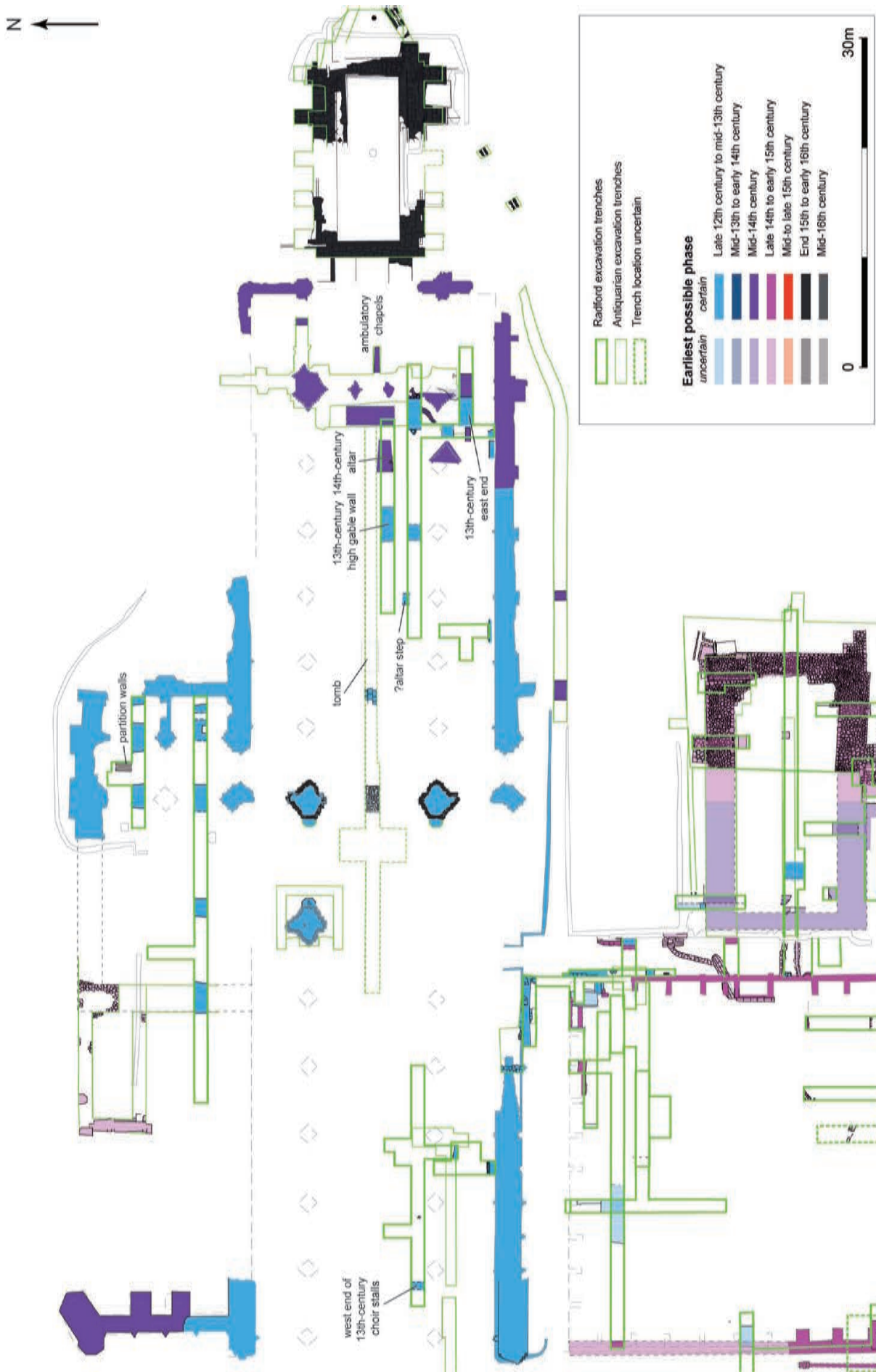


Fig 10.13 The post-1184 church, eastern arm (scale 1:500)

cloister walk in order to align with the door at the eastern end of the new nave (fig 10.14). The refectory dates from the late fourteenth to early fifteenth centuries, and it is not clear whether the south cloister walk was repositioned simultaneously. Four buttresses are unrelated to the Norman cloister and stratigraphically pre-date the rebuilding under Abbot Chinnock c 1400. In the north-east corner of the cloister garth, foundations of three flying buttresses were recorded relating to the roofing of the nave which was completed by c 1230 (see Chapter 9).

Thirteenth-century pottery recovered from hollows within the surface of the twelfth-century paving indicates that the west cloister walk continued in use. Radford recorded evidence for thirteenth-century paving and, although the dating evidence is insecure, two increases in pavement level are evident after the twelfth century, with fourteenth-century pottery found beneath the fifteenth-century paving. Indeed, a significant rise in ground level is noted across the claustral ranges with the deposition of deep make-up layers measuring up to 0.9m thick across the cloister and thinner make-up layers in the east cloister walk, chapter house and dormitory. The later medieval flooring level is confirmed by remnants of mortar bedding for robbed pavements recorded just below the modern topsoil within the cloister walks and chapter house. This reveals that the level of the north, south and west cloister walks was brought up to the same level as the east cloister walk, chapter house and dormitory. Recent archaeological recording in the east cloister walk found no trace of the later medieval floor, probably as a result of modern ground reduction.<sup>68</sup>

A builders' yard was indicated by a thin layer of mortar and Doultling stone chippings recorded throughout much of the cloister garth and overlying the twelfth-century garden deposits and features. This area would have been used when the Great Church was under construction. It was overlain by an extensive deposit of soil and clay with a *terminus ante quem* of 1450, relating to the fifteenth-century cloister garden.

A glimpse into the spatial arrangements within the north-east corner of the cloister is provided by evidence for several possible carrel walls and a small area of paving (fig 10.14). Features within the cloister garth include the structural remains which may relate to an earlier conduit house, the second phase of which was present until the Dissolution. Also recorded were foundations interpreted by Radford as the fifteenth-century library steps and a small garden feature, but the evidence is ephemeral.

In common with the east cloister walk and transepts, the chapter house and dormitory were located on the immediate eastern side of their earlier counterparts,

although there appears to have been a gap of 0.6m at the eastern end of the chapter house between the old and new builds. Despite extensive fire deposits recorded within the western vestibule of the chapter house, there is no historical evidence for rebuilding until the fourteenth century. There is some archaeological evidence of repair in the vestibule area: a lower mortar layer perhaps represents an initial increase in ground level above the 1184 fire deposits and simultaneous removal of the twelfth-century vestibule partition; an upper mortar layer probably relates to the fourteenth-century rebuild.

Bond suggested that the two campaigns of rebuilding by Abbot Monington (1342–74) and Abbot Chinnock (1375–1420) may have led to a structural division. Certainly this would have caused less disruption to the monastic community and is supported by the building of the side walls on an almost identical alignment to the twelfth-century chapter house. The length of the chapter house was also similar to the twelfth-century structure. There was some evidence of a western dais but no evidence of a vestibule; the pavement mortar bedding was positioned at the same level throughout.

Radford proposed that the dormitory was rebuilt in the thirteenth century, although there is no firm dating evidence. Within the dormitory undercroft, evidence of three internal partitions indicates sub-divisions aligned both east–west and north–south, creating a room within the northern bay and a room in the southern two bays. As with the twelfth-century phase, there is no evidence for hearths or fireplaces to indicate whether these relate to a parlour or warming room. Later additions may be represented by an external and an internal buttress, which Radford dated to the fourteenth century. Remnants of mortar bedding survived for the undercroft, indicating the presence of paving. To the south of the dormitory, evidence for the reredorter (excavated in 1933–4) comprised a retaining wall filled with solid clay and surrounded by open sewers (see below). The solid clay platform was thought to have supported a rectangular structure measuring 24.38m by 12.19m, the floor located at the same level as the dormitory.<sup>69</sup>

No convincing archaeological or geophysical evidence has been forthcoming regarding the location of the infirmary range, although the most likely position is to the east of the claustral range. English Benedictine monasteries typically sited the infirmary to the east of the cloister, for example at Ely and Canterbury, in order to facilitate direct access to the monastic cemetery and to the presbytery of the church. All monastic orders favoured a location for the infirmary to the east of the cloister in order to meet spiritual, medical and practical



Fig 10.14 The post-1184 cloister and east range (scale 1:400)

needs, in particular the provision of fresh water.<sup>70</sup> A document recording rebuilding of the infirmary cloister and chambers by Abbot Monington (1342–75) notes its close proximity to the treasury, which was located near the south transept.<sup>71</sup> It is likely that the infirmary complex was sited between the chapter house and the presbytery, corresponding with ruins depicted by Stukeley (see figs 3.14 and 3.15).

The refectory was excavated by Bond in 1910–11 and the undercroft was found to be well preserved: the extant walling contained reused Norman stone and the floor retained extensive evidence for water supply and drainage features (see Chapter 11). Bond suggested that the thick masonry at the north-west corner of the refectory indicated a tower possibly containing a flight of stairs connecting the undercroft to the refectory above.<sup>72</sup> The monks' kitchen was thoroughly explored in 1937 and was traced to within 11m of the refectory. The excavations identified an inner wall measuring 3m square; the latter was situated beneath the kitchen floor and was thought to have been the sleeper for piers supporting a vaulted roof comparable to Ely.<sup>73</sup> The plan is distinctive in having apses or turrets on the southern corners, although no corresponding features were recorded on the northern side. This plan is replicated precisely at Eynsham Abbey, where the excavated kitchen has been dated to the 1130s or 1140s. The striking similarity with Glastonbury led the excavators of Eynsham to suggest that the same mason or architect may have been responsible for the kitchens at both abbeys.<sup>74</sup>

### St Michael's Chapel

St Michael's Chapel was centrally located along the approximate southern boundary of the monks' cemetery (fig 10.15). The archaeological evidence appears to support the idea that the cemetery wall and the chapel north wall were held in common; however, the floor level of the chapel crypt indicates that the chapel foundations must have been considerably deeper. The chapel crypt was thought to date from the thirteenth century while the enclosing chapel walls dated from c 1382; archaeologically, two phases are evident from a difference in mortar between the crypt masonry and the chapel walls. The chapel walls were dated by Radford to the fourteenth century on the basis of an external, moulded plinth. An accurate plan of the chapel has not been recovered: Radford's excavations concentrated on the east end and the stacked bones within the crypt, while Bond described finding evidence for the south, west and east walls.

### Abbot's range

The remains of a thirteenth-century building were supposedly discovered by Radford beneath the southern area of the early fourteenth-century abbot's hall, although it was noted that this was virtually obliterated by the later structure. The original records are not sufficiently precise to securely identify the remains. Wedlake provides more detail on the 1962 discovery, stating that an earlier building measuring 4.27m wide with a stone-paved floor was found within the later hall.

The fourteenth-century abbot's range formed a complex c 70m square in the south-western corner of the inner court (fig 10.15); the results of the excavations in this area have never been published and previous understanding has been extremely limited. The abbot's hall is the earliest building in the sequence, constructed from the early fourteenth century and forming the northern side of the complex. The extant abbot's kitchen, dating to the mid-fourteenth century, was located on the western side, with architectural evidence for walls extending to the north and south of all four corners of the building, enclosing the complex and creating two large bounded spaces. The geophysical survey indicates the presence of further structures contained within these walls. The eastern side of the complex was bounded by a substantial house (commonly known as the 'abbot's lodging'), the northern part bordering the monks' kitchen immediately to the east. The house fronted onto a rectangular walled garden to the west which occupied the central space of the complex.

The early fourteenth-century abbot's hall was constructed over extensive make-up layers sealing the 1184 fire deposits; the raised floor level was evident from patches of mortar bedding and a possible paved area. The plan of the early fourteenth-century hall was exposed during excavations conducted in 1939 and 1978–9; the later excavations recorded details of external buttresses against the north and south walls and evidence for responds and two arcades of four bays. Internally, the hall measured approximately 16.23m by 23.93m. In 1962–3, Radford recorded remnants of foundations for the partition between the great hall and the eastern chamber.

There was no service passage within the hall and instead a service range was located on the western side of the hall (see below). A robber trench in the north-west corner of the great hall was interpreted by Wedlake as evidence for a possible octagonal turret with a spiral staircase. He also suggested that the thickness of the east wall of the eastern chamber could have accommodated internal stairs. Radford proposed that the south-eastern



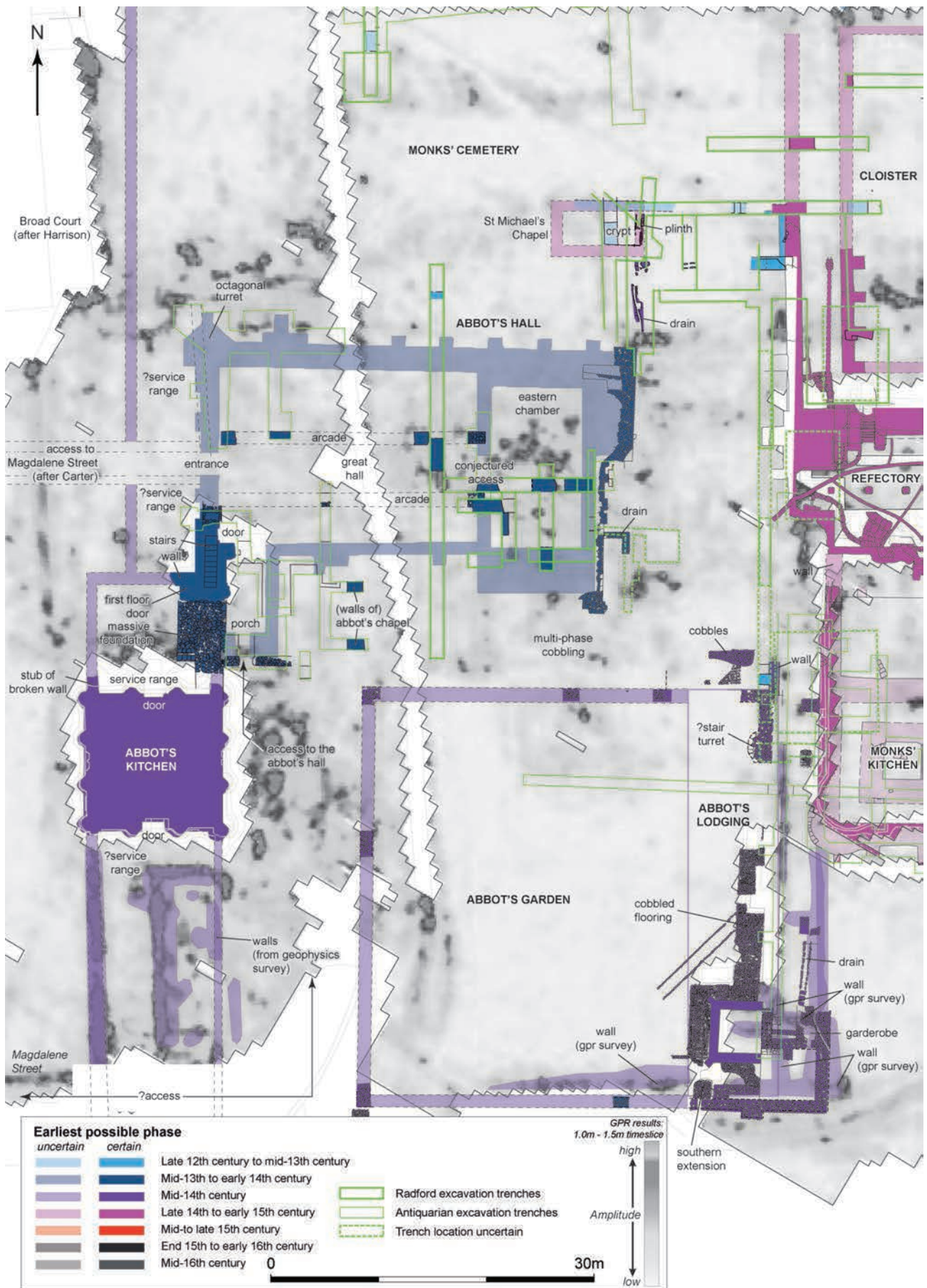


Fig 10.15 The post-1184 abbot's range (scale 1:500)

corner contained a latrine, indicated by a small drain exiting from the south-east corner, which may have been fed by a drain to the north-east of the hall. This evidence for domestic occupation suggests that the eastern chamber served as the abbot's private lodgings. It is likely that the abbot relocated to more expansive accommodation following construction of the 'abbot's lodging' in the fifteenth century (see below).

The porch at the western end of the south wall was excavated in 1979 together with a massive foundation that formed the west side of the porch. This was wider than the west wall of the abbot's hall and continued southwards to the abbot's kitchen, blocking access between the kitchen and the porch. The north section of this wide wall accommodated the stairs leading from the great hall. The southern section of the wall may represent an additional structure in the angle between the porch and the south-west corner of the hall, possibly associated with the extant staircase and providing access to chambers above the porch or to rooms above the possible service area to the north of the kitchen (see below). The standing fabric confirms that the porch was approached from the south, indicating a thoroughfare between the abbot's garden on the right and the abbot's kitchen on the left.

In 1979, limited excavations took place to the north of the abbot's kitchen, although there are no drawings within the archive. It is likely that a narrow structure may have existed here, based on the excavation photographs and the structural evidence of roof lines on the north elevation of the extant kitchen. The geophysical survey suggests a more substantial structure against the western half of the north elevation. Wedlake envisaged three rooms attached to the west wall of the abbot's hall, probably relating to a buttery and pantry.

The western boundary of the complex was formed by the wall which extended northwards from the north-west corner of the abbot's kitchen (fig 10.15). This is indicated by the geophysics survey and is in the same position as a wall shown on the Carter map of 1784; this also depicts a gateway to the north of the kitchen, providing access from Magdalene Street to the west. The archaeological evidence for this supposed service range is confined to two walls running west from the west wall, only one of which is evident in plan. The absence of an external plinth to the west wall of the hall, as confirmed during the excavations, indicates an internal room to the west. Unfortunately, no clues are forthcoming from Stukeley's sketches (see figs 3.14 and 3.15): substantial masonry and arches are depicted in various positions around the abbot's kitchen but must relate to the extant south-western corner of the abbot's hall. Finally, a further room

was identified by excavation to the east of the porch and interpreted as the abbot's chapel, a later fourteenth-century addition to the hall, although the evidence is insufficient to outline a plan.

The remains of a narrow building discovered on the eastern side of the abbot's garden in 1938 were interpreted as the 'abbot's lodging', as depicted on Stukeley's sketches (see figs 3.14 and 3.15). The form of the house remains uncertain. Eyston described a three-storey building with western projections at the northern and southern ends and several stone steps providing access to the central entrance. Stukeley's sketch of the building before it became ruinous was based on Eyston's description. This shows shallow western projections: the southern one met the south wall of the walled garden, while a further small extension was attached to the northern side of the north projection, with a hexagonal tower at the northern end. The tower is depicted within the north-eastern corner of the walled garden, while the line of the south wall is shown continuing eastwards as a substantial wall with windows (implying additional buildings) and continuing further east as a low wall.

Previous knowledge of this building has been sketchy, despite the excavations that took place in 1938. Misunderstanding was compounded by Wedlake's later attempts to synthesise the data, his major error being the misinterpretation of the mortared foundations and internal flooring still visible today on the western side (in front) of the building as cobbled paving. This results in a building of unlikely plan, with narrow proportions (less than 4m wide) directly abutting the monks' kitchen to the east. His interpretation shows the round buttress at the south-west corner of the monks' kitchen actually protruding into the house. New insight is provided by the GPR survey: this shows a definite wall running north-south, at a depth of 1.0–1.5m, which is likely to represent the eastern wall of the lodging (see figs 2.13 and 10.15). The mortared stones may be reassessed as internal cobbling or foundations within the range, or they may relate to post-medieval occupation. This reconstruction presents a range of more likely proportions and located away from the monks' kitchen (by *c.* 2.75m), indicating a passage between the two buildings. Indeed, a wall between the monks' kitchen and the refectory, as shown on Stukeley's eastern aspect, divided the abbot's range from the east range. This may be the wall constructed by Monington (1342–75), described in the *Ostensa* as a stone wall erected between the abbot's garden and a private dormitory to separate a filthy place overseen by the abbey cook.<sup>75</sup> The new reconstruction interprets the supposed turret as an internal feature such as a stair well.

Excavations established that the southern end of the range had been extended and was aligned with the south wall of the garden, perhaps suggesting that the enclosed garden was contemporary with the extension. This continuation of the south wall may represent a further structure, as indicated by Stukeley's sketch. Areas of cobbling to the north of the 'abbot's lodging' may indicate the existence of walkways that connected this building to the great hall.

## Dissolution

The majority of buildings were demolished and the walls thoroughly robbed in the two to three centuries following the Dissolution. The whole abbey complex was covered with post-Dissolution layers. This summary focuses on some specific observations, and the accompanying plan (Plan 5) does not include the numerous robber trenches that were identified during excavation.

Following the abbey's dissolution and the execution of its final abbot in 1539, the buildings of Glastonbury remained intact for at least a decade (see Chapter 3). When the site was sold following the death of Henry VIII in 1547, the church and cloister were recorded as still standing with lead remaining on the roofs.<sup>76</sup> The process of dissolving a monastery usually involved its complete or partial demolition and the salvage of stone and lead. It may be suggested that Henry treated Glastonbury as an exception, leaving the abbey intact to serve as a monument to the Dissolution. This interpretation is supported by study of the worked stone assemblage: the corpus of figure sculpture indicates a systematic programme of iconoclasm before the buildings were demolished. The assemblage comprises detached heads and headless torsos; only two heads are intact and their faces are damaged (see Chapter 9: Gothic sculpture and worked stone). During the period of the Reformation, iconoclastic attacks on the images of saints focused on the heads and hands, the human body parts that would have been targeted in cases of capital and corporal punishment.<sup>77</sup> It may be suggested that the abbey church and conventual buildings stood empty for a decade, with its mutilated images displayed as examples of false saints.

There is no demonstrable archaeological evidence for the Walloon occupation of 1551–3, although a number of sixteenth-century objects recovered from the abbot's hall excavations have possible associations with the Low Countries. The leader of the community was given the abbot's hall as a residence, and by March 1552 six houses had been completely built for the community, with a

further twenty-two nearly completed.<sup>78</sup> Archaeological evidence for the sequence of demolition appears to suggest the continued occupation of the abbot's hall while adjacent structures were demolished. There is some evidence for a post-Dissolution construction phase in the abbot's hall area, including a mortar layer, a 'stone pack floor', a stone-lined drain and a series of deposits. These cannot be securely linked to the Walloon community, however.

To the north of the abbot's hall a robber trench projected a short distance from the northern side of the 1963 trench and was labelled as a 'late medieval wall'. Radford describes both this and a further robber trench to the east as being post-Dissolution; although they could relate to the north wall of the abbot's hall, they may represent a later structure. Across the centre of the hall, two possible robber trenches extend from the north side of the 1963 trench and terminate in the same southerly position. These trenches may represent a post-Dissolution structure, with one cutting through the post-Dissolution soil horizon, and the other cutting through the robber fill of the abbot's hall south wall.

Salvage activities are indicated by fragments of scrap metal excavated from the crossing of the church: cauldron and bell fragments are likely to represent materials collected for recycling (see Chapter 8: Small finds). The abbey's rich collection of stained glass appears to have been comprehensively stripped for resale or reuse: almost every fragment of lead came has been twisted or torn, and the glass border motifs and side strips are absent from the excavated assemblage (see Chapter 8: Stained and painted window glass).

There is evidence of a possible stone-breakers' yard above the initial demolition layer in the lay cemetery. Much of the cloister garth was covered by post-Dissolution layers, including rubble and crushed slate, indicating that the area was also used for dismantling activity. In the monks' cemetery, the upper layers of Radford's trenches show extensive post-Dissolution robbing of walls and funerary monuments, with the sequence of robber trenches and demolition layers suggesting that the abbot's hall was demolished before St Michael's Chapel. In contrast with other areas of the site, extensive post-Dissolution demolition layers were generally absent in the cloister walks; this could result from Bond's clearance work to expose the cloister plan, however.

## Post-medieval

Several distinct periods of activity were observed across the abbot's range in the post-medieval period. The

followers of Monmouth are known to have camped in the abbey ruins in 1685 and Radford recorded hearths, rubbish pits and a possible structure that he linked with this episode (Plan 5). However, the brevity of Monmouth's occupation makes the association highly speculative. The typical demolition deposits recorded across the site were present but spanned a longer period of time. In particular, the abbot's lodging was occupied by the abbey tenant in 1554; it was still standing in 1653 and partially extant in 1712 before final demolition in 1714.<sup>79</sup>

A reverberatory furnace was built within the ruins of the south porch. On the basis of associated pottery, this was operating in the seventeenth and eighteenth centuries. It contained some large fragments of bronze plate and was probably used for the melting of abbey bronze.

Evidence for a garden horizon in the monks' cemetery possibly relates to the orchard shown on nineteenth-century photographs. Both this layer and the 'relic turf' which covered the demolition layers were covered by a landscaping deposit, creating the slightly humped profile to the cemetery, with its southern bank, that is still

evident today. Two features relate to modern landscaping and enclosure, including a late eighteenth-century wall crossing the eastern end of the great hall and continuing southwards. Extensive modern disturbance resulting from excavation and landscaping was also evident.

Although most of the former monastic precinct was given over to agriculture, the range of excavated material culture confirms the presence of affluent households. The post-medieval pottery assemblage comprises over 3,500 sherds, including imported stonewares and Montelupo maiolica (see Chapter 8: Spanish and Portuguese wares). The small assemblage of vessel glass represents a diverse range of drinking glasses and containers dating from the century following the Dissolution, c 1540–1640, including fine-quality drinking goblets and an early piece of cast mirror glass (see Chapter 8: Vessel glass). The assemblage of clay pipes from the West Country reflects the presence of very early pipes, at a time when tobacco was a luxury commodity (see Chapter 8: Clay tobacco pipes). Much of this material is likely to relate to the use of the former abbot's lodging as a mansion up to the early seventeenth century.

# Conclusions

*Roberta Gilchrist*

## 11.1 Introduction

This final chapter explores the significance of the antiquarian excavations for our understanding of the archaeology of Glastonbury Abbey and its place within English monasticism. Stratigraphic evidence is integrated with specialist and scientific analyses to address the research questions established by the Glastonbury Abbey Archaeological Archive Project (Chapter 1). A number of themes are drawn out for discussion of the Saxon and medieval monastery, including the development and form of the abbey buildings, the provision of hospitality, the practice of industry and craft-working, monastic material culture, burial practice and water management. A concluding discussion proposes key questions for future archaeological investigations at Glastonbury Abbey.

## 11.2 Overview and significance

### Early occupation

#### Prehistoric and Roman

The peninsula of Glastonbury has produced relatively little evidence of prehistoric date, in contrast with the exceptional remains of prehistoric trackways located to the west, and the unique 'lake settlements' to the north-west, dating to the Iron Age. Roman evidence around Glastonbury is also slight, despite the close proximity of

the Fosse Way, the Roman road from Exeter to Lincoln.<sup>1</sup> The artefact assemblages from Glastonbury Abbey contribute to the growing evidence for prehistoric occupation in the locality, including Mesolithic flints and Iron Age pottery (see Chapter 8). The presence of small quantities of Roman tile, pottery and small finds indicates that substantial Roman structures were located in the vicinity of the abbey. The tiles and possibly the small finds suggest a pattern of deliberate reuse of Roman material. The clear association between the tiles and the Saxon glass industry indicates that they were brought to the site for this specific use. The degree of wear on the Roman small finds may suggest a tradition of curation, in which Roman coins in particular were collected by medieval people as special objects or amulets.<sup>2</sup> It is well known that early medieval Christians actively sought out Roman buildings and materials in order to emulate Mediterranean ritual practice;<sup>3</sup> this motive may have extended to the curation of portable material culture of distinctive Roman appearance. It is possible that the early material excavated in the abbey precinct may have been *ex situ* and redeposited: the archaeological contexts are unknown and could have originated from outside the precinct. However, sufficient material was recorded to confirm a significant prehistoric and Roman presence at Glastonbury.

#### Post-Roman

The identification of LRA1 at Glastonbury Abbey is of major significance. The fourteen sherds were apparently associated with a roughly trodden floor and post-pits

connected with one or more timber structures within the bounds of the early cemetery (see fig 10.1). The condition of the sherds suggests that the floor represents an undisturbed post-Roman context. Radford's failure to recognise LRA1 (Bii ware) is perplexing, since he was the first to identify and classify Mediterranean pottery imported to early medieval Britain.<sup>4</sup> The Mediterranean fabrics first identified by Radford remain a strong indicator for high-status sites dating from the fifth to the seventh centuries; ten sites in Somerset have produced imported Mediterranean pottery, half of which are candidates for monastic settlements.<sup>5</sup> The inhabitants of these settlements were exchanging tin and other British commodities for wine, oil and fine pottery from North Africa and the eastern Mediterranean c 450–550. The date range of LRA1 in the south west of Britain has been confirmed by excavated sequences with radiocarbon dates indicative of settlement dating from the fifth to seventh centuries, for example at Bantham and Mothecombe (Devon).<sup>6</sup> LRA1 is now regarded as the most commonly occurring class of amphora in south-west Britain (although LRA2 dominated at Tintagel).

This new evidence refutes Rahtz's hypothesis that Glastonbury Abbey was a secondary development to the monastic occupation on the Tor and at Beckery.<sup>7</sup> However, the key question is whether the early occupation at Glastonbury was religious or secular in character? Does the presence of LRA1 confirm the 'British monastery' that is attested by the abbey's legendary traditions or, to the contrary, does it indicate a secular settlement that was engaged in trade? An important religious artefact of early date was reputedly found at Glastonbury: a copper-alloy censer dating to the sixth or seventh century and likely to be eastern Mediterranean in origin. A dark, burnt deposit within the bowl has been analysed and consists of ash, metal corrosion products and traces of gum resin, presumably from incense materials such as myrrh or olibanum.<sup>8</sup> It was claimed that the censer was found in a trench in Silver Street, to the north of the abbey precinct, during drainage works in the early 1980s.<sup>9</sup> However, the authenticity of the find spot at Glastonbury has been questioned: it has been suggested that the story of the censer's origins may have been fabricated in order to create a provenance.<sup>10</sup>

The presence of LRA1 pottery confirms occupation at Glastonbury in the sixth century, but there is no evidence to suggest whether this was a religious community, or a high-status secular settlement engaged in long-distance trade, more comparable to the reoccupied Iron Age hillforts of South Cadbury and Cadbury Congresbury.<sup>11</sup>

The place name emphasises the ambiguity: the suffix *bury* can refer to a fortified place such as South Cadbury; however, before the mid-eighth century, *burh* refers most often to minsters such as Malmesbury.<sup>12</sup> It is increasingly apparent to scholars of the early Anglo-Saxon Church that the boundaries between religious and secular life and Christianity and paganism were permeable and not clearly differentiated at this time.<sup>13</sup> Glastonbury in the sixth century may have served as the central site for a settlement network in the marshes that combined religious and secular components.

An alternative model suggests that the 'central' monastery of the British church in the locality was based elsewhere, with a monastery first established at Glastonbury as late as c AD 700. Mick Aston noted that many early monasteries comprised a central communal settlement surrounded by satellite hermitages that were used for spiritual training. He suggested that 'Glastonbury, with its halo of surrounding chapel sites on the islands of the Somerset marshes, might fit the same pattern.'<sup>14</sup> In addition to the Tor and Beckery, he noted the possibility of hermitages at the nearby islands of Meare, Godney and Marchey. Theresa Hall argues that the British precursor to the Anglo-Saxon monastery at Glastonbury was in fact located at nearby Street. This is inferred from mention of the monastery at *Lantocai* in the copy of a charter in which Bishop Haedde granted three hides of land to Glastonbury.<sup>15</sup> The place name *Lantocai* can be linked tentatively to Leigh in Street, where the oval churchyard and early church dedication suggest a foundation of considerable antiquity. Hall suggests that the British monastery at *Lantocai* was transferred by Anglo-Saxon bishops to the new location at Glastonbury.<sup>16</sup> However, reassessment of Radford's excavations confirms that a significant community *did* exist at Glastonbury before the seventh century; Glastonbury is likely to have formed the central focus of a dispersed network of eremitic sites that included Glastonbury Tor and Beckery.

### Mid and Late Saxon

A number of questions about Glastonbury's *vallum* have yet to be resolved. It has not been possible to adequately compare profiles of the five sections of ditch that have been excavated, nor have dates been obtained for all of their primary fills. Seventh-century dates are suggested for the ditch beneath the chapter house and at Silver Street; a Late Saxon date may be assigned to Magdalene Street; and the upper fills of the remaining ditches contained pottery dating from the tenth to twelfth

centuries. It is likely that the ditches would have been recut on successive occasions, and some inconsistency in their dating may therefore be expected. The enclosures of British monasteries were often delineated by natural topography or thorn hedges, as at Oundle (Northants), or by timber palisades or modest ditches.<sup>17</sup> The *vallum* ditch excavated by Radford is exceptional in its width and depth. But *vallum* ditches on a comparable scale have been excavated at the minsters of Bampton (Oxford), Brixworth (Northants) and Beverley (E Yorks).<sup>18</sup> If the ditches at Glastonbury are contiguous and form part of a single boundary enclosing the monastery, they would form a square enclosing c 14ha, as constructed by Rodwell, or just 4ha, as constructed by the Hollinrakes.<sup>19</sup> For comparison, the well-preserved early precinct traced at Hoddom (Dumfries) comprised 8ha and that at Brixworth has been estimated at 3ha.<sup>20</sup>

The substantial *vallum* at Glastonbury has the appearance of a defensive feature. However, it is not yet clear whether the five sections of ditch located in and around the precinct formed part of a single contemporary boundary system; nor is it certain that it dates to the Anglo-Saxon period (see fig 10.2). If they are connected, the ditches formed a square enclosure that is characteristic of Anglo-Saxon monasteries, including Reculver, Bradwell-on-Sea and the Dorset minsters, and in contrast with the round enclosures that followed the Irish model.<sup>21</sup> Alternatively, it may be possible that the very substantial ditch excavated by Radford was a pre-existing boundary of Iron Age or Romano-British date, or that it was associated with a post-Roman precursor to the monastery. It was not uncommon for monasteries to adapt existing features for this purpose: the ditches that defended Alfred's Late Saxon monastery at Athelney (Somerset) have been shown by radiocarbon dating to be Iron Age; and the *vallum* at Iona produced radiocarbon dates confirming that it originated in the Roman Iron Age.<sup>22</sup> An Iron Age date for the Glastonbury ditches may be countered by the complete absence of prehistoric pottery, although Romano-British material was recovered from the ground surface sealed by the bank at Silver Street.<sup>23</sup>

It has been argued that the concept of enclosure was fundamental to early monasteries, in contrast with Anglo-Saxon secular sites that lacked continuous and substantial boundaries. However, the south west of Britain was a special case in which fortified places dating to the Iron Age were reoccupied as 'princely citadels'.<sup>24</sup> Martin Carver has suggested that the early medieval monastic tradition in the west and north of Britain drew more extensively from Iron Age ritual practice than from

Roman precedent, including the reuse of fortified sites.<sup>25</sup> There are significant earthworks located near Glastonbury Abbey that are likely to pre-date monastic occupation on the peninsula. Excavations at Ponter's Ball, roughly 4km to the east, suggested an Iron Age or post-Roman date of construction, based on the presence of pottery in the original ground surface below the crest of the bank. The substantial bank of Ponter's Ball is 10m wide and 3.5m high and extends 100m across the neck of higher ground that forms the only entry to the Glastonbury peninsula that avoids marshy ground (see fig 3.1).<sup>26</sup> The bank and ditch of Ponter's Ball were evidently intended to regulate access to the Glastonbury peninsula; however, it is not clear whether this defensive system originated in the Iron Age or early medieval periods.

Within this broader context, the *vallum* at Glastonbury may be reconsidered as a possible defensive bank and ditch *pre-dating* the monastery. Its physical character resembles a fortification more than a symbolic boundary intended to delineate sacred space. The date and extent of the *vallum* have yet to be resolved but it is potentially Iron Age, or post-Roman in origin, rather than contemporary with the foundation of the Anglo-Saxon monastery. The possibility of a fortified site on the Glastonbury peninsula, associated with imported Mediterranean pottery dating to the fifth or sixth century, once again demands comparison with the reoccupied Iron Age hillforts of Cadbury Congresbury and South Cadbury.<sup>27</sup>

## The form and construction of the abbey buildings

### The Anglo-Saxon churches

The first phase of the excavated Saxon church appears to have had an apsidal east end, inferred from the sudden truncation of the side walls; this form is typical of seventh-century churches in the south east of England (see fig 10.3). It may also be compared with the Late Saxon church of St Andrew at nearby Wells, which had an apsidal or polygonal termination. There was a foundation across the chord of the apse at Glastonbury, probably indicating the presence of an arcade separating the nave and chancel, as at St Pancras, Canterbury, Reculver and Bradwell-on-Sea.<sup>28</sup> The apse was the same width as the nave, again following the same pattern as Reculver, which was founded after 669. The antiquarian excavations at Glastonbury failed to recover evidence for internal fittings or liturgical arrangements but we can make some inferences from the plan evidence. The altar is likely to

have been located at the east end of the nave, in the position corroborated by modern excavations at the churches at Raunds (Northants) and Whithorn (Dumfries and Galloway).<sup>29</sup> The foundation at the chord of the apse indicates that a separate chamber to the east of the altar was provided for the clergy.

*Opus signinum* floors were recorded in the first-phase church at Glastonbury. In an early medieval context, *opus signinum* indicates the use of recycled Roman tile or brick which was crushed and mixed with mortar to create a distinctive pink floor.<sup>30</sup> Its use at Reculver, Canterbury and Jarrow has been dated to the seventh century; the proposed date at Glastonbury is c 700. Early monasteries declared their *Romanitas* through plastered masonry buildings and terracotta-coloured floors in stark contrast to the timber and earth constructions of vernacular tradition.

Glastonbury shares a recurring group of patronal dedications with St Augustine's, Canterbury, and Jarrow (fig 11.1). However, at Glastonbury the Marian church (*vetusta ecclesia*) is located to the west of the church of St Peter and St Paul, in contrast with its location to the east at the other sites.<sup>31</sup> Glastonbury is unusual in having the Marian dedication as its primary foundation, but consistent with Canterbury and Jarrow in their pattern of accretive development and their apparent veneration of early church fabric as a relic of monastic founders. At both Glastonbury and Jarrow, there is evidence for the eastern component having served a funerary purpose. The crypt at Glastonbury and the eastern church at Jarrow both have indications of a possible oculus in the east wall through which to view a tomb or relics.<sup>32</sup>

The Glastonbury crypt or *hypogeum* is a modest structure, only 4.8m in length, and is unlikely to have functioned liturgically as a funerary church. It may have served as a mausoleum or a shrine chapel, housing the remains of one or more prominent individuals, such as a royal founder or founder-saint. It can be placed in the late Roman tradition of mausolea but also resembles the diminutive shrine chapels of early Irish monasteries.<sup>33</sup> The excavated sequence at nearby Wells has been interpreted as a late Roman mausoleum, which continued in use as a Christian sepulchre right up to the tenth century. John Blair has argued, however, that the 'mausoleum' at Wells was merely a substantial lined pit of Late Saxon date, representing a cellar beneath an ossuary or relic platform located in the Saxon cemetery.<sup>34</sup>

The Glastonbury *hypogeum* can be compared with extant crypts sited beneath the chancels of the Anglo-Saxon churches at Repton (Derbys) and Wing (Bucks). The crypt at Repton is of similar size (roughly 5m square)

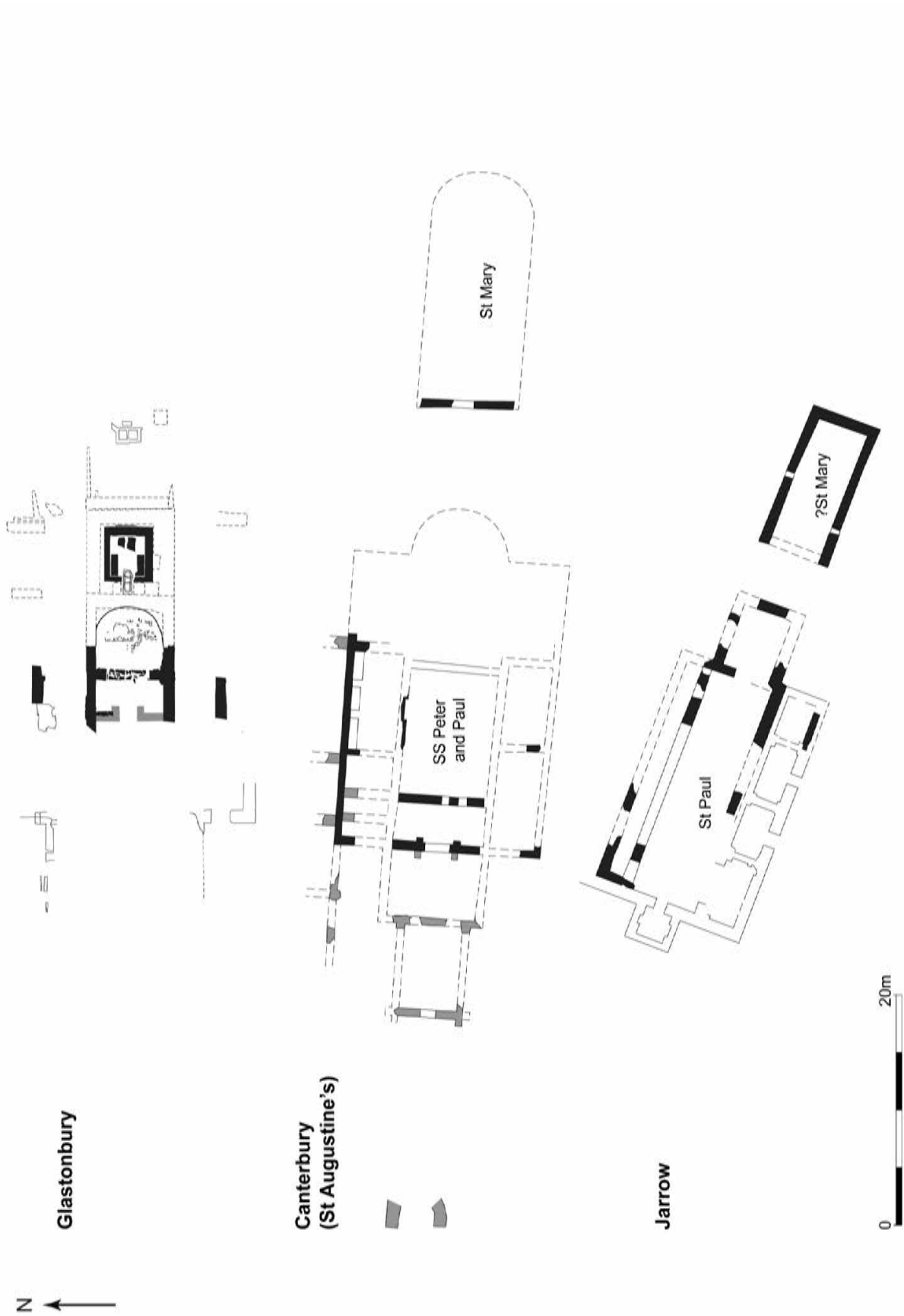
and is dated to the seventh century. The west walls of the crypts at Repton and Wing have features that may have served as apertures for viewing relics or tombs, similar to the oculi in the east walls at Jarrow and Glastonbury.<sup>35</sup> These examples confirm that free-standing, semi-subterranean burial chambers were significant features of Saxon minsters, serving as places of interment and repose for coffins and reliquaries. Such funerary features were eventually incorporated within the main church through the addition of connecting structures: it is estimated that this occurred around c 800 AD at Jarrow, in the eighth or ninth century at Glastonbury, and in the tenth or eleventh century at Repton.<sup>36</sup> Semi-sunken burial chambers have also been excavated in the eastern arm of the Old Minster at Winchester and at New Minster, Gloucester.<sup>37</sup> The Anglo-Saxon practice was to incorporate these mausolea eventually within the main structure of the church, in contrast with the Irish tradition of retaining 'shrine chapels' as discrete structures.<sup>38</sup>

Glastonbury also bears comparison with St Augustine's, Canterbury: the two monasteries shared a close association with Abbot Dunstan and the monastic reform of the tenth century. Both sites present significant challenges in interpreting the evidence of antiquarian excavations, but their earliest phases appear to have included apsidal east ends and porticus in their primary construction, in contrast with the square east end and secondary construction of porticus at Jarrow (fig 11.1). Each has evidence for three successive rebuildings of the main church between the seventh and tenth centuries. There are some similarities in their Dunstan-period remodellings: both have possible archaeological evidence for an open space or atrium at the west end and a new space created at the east end, perhaps to accommodate a monastic choir. Richard Gem argues that Canterbury may have had a tower inserted, like the tower confirmed archaeologically at Glastonbury.<sup>39</sup>

### The Late Saxon 'cloister'

Radford's assertion of a Late Saxon cloister at Glastonbury has been widely accepted and repeated as confirmation of the influence of Dunstan and the importance of Glastonbury in reforming the character of English monasticism.<sup>40</sup> However, reassessment of Radford's excavation archive has challenged the evidence for a tenth-century cloister at Glastonbury, which seems to have been based principally on documentary evidence. Canterbury is also credited with an early cloister, first documented in the early eleventh century but not proven conclusively by excavation.<sup>41</sup> We have confirmed the





**Fig 11.1** Comparative drawings of Saxon churches: Canterbury St Augustine's and Jarrow (after Blair 2005) (scale 1:500)

presence of free-standing stone buildings to the south of the church at Glastonbury but their form and extent is unknown (see fig 10.7).

For comparison, large stone ranges were excavated at Jarrow; these were multi-purpose buildings located immediately to the south of the church.<sup>42</sup> A series of five stone-built ranges has been identified at the abbey of Eynsham (Oxford), dating to the early eleventh century. These are interpreted as a complex of domestic ranges grouped around an open space and located to the south of a possible cloister.<sup>43</sup> Formal cloisters based on the prototype of the Roman villa had been developed by the eighth century at German monasteries such as Lorsch (Hesse) and Reichenau (Lake Constance).<sup>44</sup> Archaeological evidence suggests that Eynsham adopted a courtyard layout by the tenth or early eleventh century, but there is no firm archaeological evidence of formal cloisters at English monasteries pre-dating the Norman Conquest. It is possible that the preference for axial 'families' of churches at Late Saxon monasteries was simply not compatible with the claustral plan. The evidence at Glastonbury suggests that parts of the Late Saxon free-standing stone buildings were retained and perhaps incorporated within an Anglo-Norman cloister or courtyard layout. However, there is no archaeological evidence for a cloister before the rebuilding by Henry of Blois in the mid-twelfth century.

### **The medieval monastery: planning and construction**

Planning of the medieval buildings was sensitive to both the sacred and physical topography of the precinct. Glastonbury was unusual in having its most venerated space located to the west of the abbey church: the *vetusta ecclesia*, later replaced by the Lady Chapel, was the focal point for pilgrimage and popular devotion. The monastic church and cloister were developed to the east of the *vetusta ecclesia*, with the high altar representing a second locus of sacred space (see Plan 4). The physical topography of the precinct facilitated the standard siting of the cloister to the south of the abbey church, which offered more level ground than the sloping terrain to the north. The natural topography also sloped downwards from east to west, and this physical characteristic was harnessed to emphasise gradations in sacred space. The twelfth-century church and cloister were constructed to slope upwards from west to east, creating a raised elevation for the more holy spaces of the presbytery and east range. The delineation of sacred space was particularly complex at Glastonbury, where two

competing foci were created by the *vetusta ecclesia* and the high altar of the Great Church. Reassessment of the archive of excavations also provides new understanding of the sequence and logistics of successive programmes of rebuilding. Work was organised to keep the main areas in use during extended periods of construction.

The western expansion of the Norman and later medieval churches was confined by the presence of the *vetusta ecclesia* and subsequently the Lady Chapel. In contrast there were no restrictions in building towards the east, and consequently it is in this direction that expansion took place. The late eleventh-century church was located to the east of the Saxon church, of which only the east end and one or two bays of the nave appear to have been constructed (see fig 10.8). There is a gap of c 10m between the known eastern extent of the Saxon church and the known western extent of the late eleventh-century church, indicating that the Saxon church remained in use during the Norman reconstruction. The continued use of Saxon buildings during this period is also suggested by what appears to be repair to the Late Saxon range in the south-west corner of the later cloister, following the insertion of a Norman drain. The rate of rebuilding at Glastonbury was slow in comparison to the usual Norman practice of rapid rebuilding following the Conquest. The conservative pace probably reflects the unstable abbacy of Turstin, characterised by ongoing conflict between the Norman abbot and the resident monks.

In contrast, the twelfth-century building campaign was comprehensive. Construction began at the eastern end of the church, creating a difference in axis with the nave that would have brought the church back into alignment with the *vetusta ecclesia* (see fig 10.9). Logistically this would have allowed the Saxon church to remain in use during the campaign, with the late eleventh-century church probably being demolished at the outset to make space for the new eastern arm and transepts. Although the eastern extent of the eleventh-century church has not been established by excavation, the small scale of the north transept apsidal chapel suggests that it extended only a short distance beneath the twelfth-century east arm. Indeed, the small scale of the eleventh-century church is cited by William of Malmesbury as a reason for its replacement. The west end of the twelfth-century church terminated c 5m to the east of the west end of the Saxon church, perhaps implying a desire to maintain a respectful space between the church and the *vetusta ecclesia*.

The eastward expansion of the east arm of the church continued following the 1184 fire, with the new east end

extending just one bay further east than the twelfth-century church; the twelfth-century east arm would have fitted within the first five bays of the later east end (compare figs 10.9 and 10.13). This was further extended by two bays by Abbot Monington in the mid-fourteenth century and the Edgar Chapel was added in the late fifteenth to early sixteenth centuries, marking the final extent of the church in this direction (see fig 10.13). In contrast, western development was restricted by the Lady Chapel, which is traditionally believed to have replaced the *vetusta ecclesia* and to have followed the same alignment. There is no prospect for further understanding of the *vetusta ecclesia*, given that any potential evidence was destroyed by the insertion of Abbot Beere's crypt (Plan 4). The only building to the west of the Lady Chapel was the small chapel of St John the Baptist, which also replaced an earlier building. This was located just within the western limits of the inner precinct and completes the axial alignment of church buildings.

The archaeological evidence confirms that later medieval walls were built immediately adjacent to their predecessors: the west nave wall was built on the western side of the twelfth-century wall and the transept walls were positioned on the immediate eastern side of the twelfth-century walls (see fig 10.9). Rebuilding alongside antecedent walls aided the reconstruction process, enabling the monastery to continue to function without too much disruption and facilitating the reuse of construction material in the new foundations and wall cores, evident from the presence of twelfth-century building stone within later foundations. Eastward expansion was favoured, with no restrictions from extant buildings to the east of the twelfth-century church. To the west, a space was maintained between the nave and the Lady Chapel, which was regarded as the most sacred location in the precinct.

The initial rebuilding after the 1184 fire focused on the Lady Chapel (completed by 1186) and the east end and transepts of the church. Although the lower parts of the nave walls were completed predominantly during this period, the upper parts belong to the final stage of construction. The clerestory and roof of the east arm were completed *c* 1200 and the clerestory and roof of the transepts and the tower to *c* 1213, when the church was reconsecrated. The areas prioritised highlight the importance of re-establishing the Lady Chapel as a locus of pilgrimage and the east end to serve the liturgical needs of the monastic community. Following a hiatus in building, subsequent development of the church included the construction of the Galilee that connected the Lady

Chapel with the church. This was completed by *c* 1230, creating an integral liturgical space that would have allowed the community to process from the Lady Chapel through to the east end.

The plan of the twelfth-century monastic buildings has not been published previously, despite the considerable evidence gathered in the 1930s and in Radford's excavations. The chapter house, cloister, dormitory and fragments of the refectory were recorded, together with a small building range to the west of the west cloister walk and further buildings to the west (Plan 3; see figs 10.10, 10.11 and 10.12). The complex included the twelfth-century church begun by Herlewin and completed by Henry of Blois.

The rebuilding of the east range and east cloister walk followed the slight eastward shift in the church transepts after the 1184 fire. The east cloister walk, chapter house and dormitory were repositioned one to two metres to the east of their earlier counterparts, while the wall shared by the south cloister walk and refectory was constructed immediately to the south (see figs 10.10 and 10.11). The shift eastwards would have been necessary for the east cloister walk to align with the door into the slightly extended nave, while the southward extension of the south cloister walk enabled a square plan to be retained for the cloister (Plan 4). Although the cloister, chapter house, refectory and dormitory were rebuilt in the fourteenth and fifteenth centuries, the initial replanning seems to have occurred in the thirteenth century to accommodate the new layout. The worked stone assemblage suggests that construction had slowed or ceased in the second half of the thirteenth century (see Chapter 9: Gothic sculpture and worked stone) indicating that some rebuilding took place soon after the fire, possibly once the church was sufficiently progressed to be used. Perhaps enough was done to make the buildings usable and for the space to function liturgically to meet the needs of the community.

There is evidence that the natural topography was harnessed to emphasise the east end of the church and cloister. This was particularly pronounced in the twelfth century with the nave floor located approximately 1m below the floor of the transepts and east end. In addition, Radford identified a small rise in the floor level just east of the central point of the nave, divided by a step or partition, indicating a rise within the nave floor itself. This may indicate the location of the monks' choir, which was sited within the nave before it was transferred to the east end in the mid-fourteenth century (see below).

There was a similar difference in levels across the twelfth-century cloister and chapter house, with the south

and west cloister walks located  $c$  0.7m below the east cloister walk. The east walk was only  $c$  0.3m below the modern turf, as confirmed by the discovery of a burnt floor layer during recent archaeological work.<sup>45</sup> The pavement of the north cloister walk was not identified but the stratigraphy suggests it was located at least  $c$  0.6m below the 1950s topsoil and therefore lower than the east cloister walk pavement. It is likely that steps were located at the eastern end of the north and south cloister walks, of which there is some possible evidence in the form of a substantial pre-1184 foundation in the north cloister walk (see fig 10.10). The east cloister walk pavement was at a similar level to the chapter house vestibule, which was separated from the main chapter house by a partition wall. The floor of the chapter house was higher than that of the vestibule, with evidence for steps between the two levels (see fig 10.11). A passageway may have run above the vestibule between the dormitory to the south providing access to the night stair into the south transept.

Following the 1184 fire, the deposition of a deep clay layer within the nave significantly reduced the difference in levels within the church. However, the floor level of the Lady Chapel and Galilee remained lower than the nave; steps were still required between the nave and crossing, and the Edgar Chapel was considerably higher than the floor of the east end. In contrast, the post-fire cloister and east range were all at a similar level, with only the abbot's range to the west significantly lower.

The cloister garth functioned primarily as an open garden space both in its twelfth-century and post-fire forms. This enclosed space at the heart of the monastery served symbolic, metaphorical and practical roles, representing a paradise garden and being used for monastic contemplation.<sup>46</sup> At Glastonbury this is evident in the two zones of the twelfth-century garth: a central garden area and a path around the circumference edged by a kerb. Radford believed he had found evidence for an octagonal *lavatorium* on the southern side of the garth, near the refectory. Although the archaeological evidence is unconvincing, free-standing *lavatoria* within cloister garths are a common feature during this period (see Chapter 10). Certainly the garth was employed in the system of water management for the abbey: several drains and water-courses crossed the garth running approximately north east to south west, relaying water (both fresh water and foul water from roof run-offs) from the east range towards the refectory and the abbot's range to the south west.

A curious feature that never reached publication was part of a stone structure dating from the twelfth century within the north-western area of the cloister garth (see fig

10.10). Radford's original records identify this tentatively as Henry of Blois's bell-tower. We have argued that this is more likely to represent a conduit house (see Chapter 10). At Glastonbury, with the natural downward gradient from north to south, location of a conduit in the northern part of the cloister garth may have been necessary for the distribution of water.

### **Hospitality and lordship: the abbot's hall complex**

The abbot of a prestigious monastery such as Glastonbury lived a lifestyle comparable to a secular lord of baronial status. Indeed, he was treated as a feudal lord: the head of a monastery was bound by military tenure to the king and required to supply knights for military service. Private residences were built for his use on the abbey's estates: eight houses were provided for the abbot of Glastonbury in Somerset alone, and successive abbots rebuilt these on a grand scale in the later Middle Ages.<sup>47</sup> Within the monastic precinct, the abbot resided and dined separately from the monks of his community: by the early fourteenth century, he had established a palatial, self-contained residence to the south west of the cloister (see fig 10.15). The location of his chamber prior to this date is unknown, although it is certain that separate accommodation would have been provided much earlier. By the twelfth century, it was common for Benedictine monasteries in England to site the abbot's lodging in the west range of the cloister.<sup>48</sup> Indeed, the west claustral range was the preferred location for the abbot's household at the great majority of Benedictine, Augustinian and Cluniac monasteries. The subsequent development of abbots' lodgings sometimes expanded beyond the confines of the cloister to include additional ranges and courts, although these retained their primary focus on the west range, as at Battle, Castle Acre and Westminster Abbeys.<sup>49</sup> Glastonbury is an exception to this classic pattern in that the abbot's lodging is a large, self-contained complex that is completely independent of the cloister.

It is not certain whether accommodation for the abbot may have been provided initially in the west range, but this does not appear to have been the case. Glastonbury is highly unusual in the apparent *absence* of a west range to the monastic cloister. The west range is very occasionally absent in smaller monastic cells and nunneries (such as Carrow Priory, Norwich) but was a standard and essential component of the monastic cloister. The west cloister walk at Glastonbury cut through the earlier deposits of the monks' cemetery to the west, with no evidence of any

buildings along the western side of the cloister except at the south-west corner. The archaeological records from the 1930s, and additional evidence from Radford's excavations, indicate the presence of stone-built chambers adjacent to the south-west corner of the cloister (see fig 10.12). At least two substantial stone-built rooms were separated by a passage; these were identified previously as an early abbot's hall or, perhaps more likely, the chamber and chapel built by Abbot Robert (1171–8), which escaped the 1184 fire. Chambers in this position suggest accommodation for the abbot or religious guests who would have been granted access to the monastic refectory. For comparison, chambers in this position at Norwich Cathedral-Priory were reserved for visiting religious and were provided with direct physical access to the refectory.<sup>50</sup>

It is feasible that the twelfth-century remodelling of the cloister by Henry of Blois omitted the west range in favour of purpose-built accommodation for the abbot. Henry held the position of Abbot of Glastonbury (from 1126), simultaneously with his roles as Bishop of Winchester (1129–71) and Papal Legate (1139–43). John of Glastonbury reported that Henry rebuilt parts of the cloister and infirmary as well as 'a beautiful and spacious palace ... a great brewery and stables for many horses'.<sup>51</sup> Henry's personal status demanded the luxury enjoyed by a bishop; his successors as abbots of Glastonbury aspired to a similar standard of living. It has been suggested that Henry's palace may have comprised a 'proto-keep', comparable to the excavated structure at Thetford Priory (Norfolk) that was later incorporated into the prior's lodging attached to the west range.<sup>52</sup> No archaeological evidence for Henry's palace has been identified but it is likely to have been located in the vicinity of the early fourteenth-century abbot's hall, and possibly directly beneath it. Radford recorded possible evidence of an earlier structure beneath the southern part of the hall and extensive make-up layers sealing deposits relating to the 1184 fire; Wedlake observed possible evidence of substantial structures to the west and within the interior of the abbot's hall. A watching brief in the abbot's kitchen in 2013 recorded significant evidence for stone structures and a possible early timber structure, in addition to series of laminated floor deposits, all pre-dating 1184.<sup>53</sup> It is now apparent that the abbot's kitchen was constructed in the early fourteenth century directly on the site of its Norman precursor. A similar sequence may be postulated for the abbot's hall.

The lavish accommodation developed for the abbot was not solely for his own private use but was also devoted to hospitality for distinguished guests.

Benedictine monasteries were committed by the Rule of St Benedict to provide hospitality to travellers, pilgrims and guests. This was a substantial commitment at Glastonbury, a premier abbey with a renowned collection of relics that attracted large numbers of pilgrims. The financial resources dedicated to hospitality were significant: in 1186–7, the Pipe Rolls record that the abbey's total income from farms and rents was just over £233; nearly one-tenth of this sum was required to meet the costs of hospitality for only nineteen weeks during the year, while the Earl of Cornwall's son was staying at the abbey.<sup>54</sup> In the later Middle Ages, the revenues of the manor at Domerham (Wilts) were set aside for this purpose, valued at £139 in 1535.<sup>55</sup> Patrons and high-ranking guests would have been received in the abbot's household, with lesser pilgrims and travellers accommodated in a guest house or hostry. This is likely to have been located at a main gate to the abbey, as at Battle and Reading Abbeys.<sup>56</sup> Archaeological evidence suggests that a large hostry building may have been located to the west of the north gate into the precinct (see fig 3.13).

The excavated evidence confirms that the abbot's hall complex was completely remodelled from the early fourteenth century, providing a spacious and luxurious court c 70m square for the abbot and his guests (see fig 10.15). The new complex comprised a grand hall and a porch, which provided a waiting room for visitors, accommodation for the abbot and his guests, a chapel, kitchen and service range and walled garden. The impressive scale can be judged by the surviving kitchen. This iconic structure has a distinctive, vaulted octagonal roof and lantern. The central space contained four fireplaces, one of which was a specialist pastry oven (see fig 3.9). The complex was self-contained but backed onto the monks' kitchen and was easily accessible to guests arriving in the outer precinct. The abbot's complex at Bury St Edmunds may provide the closest parallel for Glastonbury in terms of scale and location. In the later thirteenth century, the abbots of Bury moved out of the west range of the cloister and created a palatial residence to the north of the conventual church and cloister. This included an enclosed garden bounded by the river to the east and the abbot's hall and chambers to the west and north. A large aisled hall was added that was known, due to the frequency of royal visits to the abbey, as the king's hall.<sup>57</sup>

The Glastonbury abbot's complex effectively formed a second cloister to the south west of the conventual cloister, as described by an account in the abbey's chartulary. The passage describes the visit of Edward III

and Queen Philippa in 1331, a four-day sojourn that cost the abbey £800. Philippa arrived in advance of the king and was received in the church, where she processed with the community to the choir. She later passed through the main cloister, which had been decorated throughout, and received precious gifts. Finally, she retired to the guest-chamber, entering the little cloister leading to the guest house. The king was provided with separate accommodation at the end of the infirmary cloister.<sup>58</sup>

The plan of the abbot's great hall at Glastonbury was conservative for its time: aisled halls were increasingly rare from the early fourteenth century, and it was more typical by this date to locate private accommodation in a cross-wing adjoining the hall.<sup>59</sup> The abbot's hall at Glastonbury follows earlier traditions in locating the private chamber at the upper end of an aisled hall. Programmes of new building at Glastonbury often emulated archaic architectural styles in order to emphasise the abbey's Christian heritage (see below). However, it is likely that the early fourteenth-century hall was rebuilt on the site of the earlier hall constructed by Henry of Blois, and the plan and form of the later hall may thus have been constrained by that of its predecessor. The abbot's hall was provided with a separate service range to the west, adjoining the detached abbot's kitchen. A porch to the south of the hall served as the formal entrance and reception space for guests. The dimensions of the hall, measuring  $c 16.23 \times 23.93\text{m}$  internally, compare closely with the great aisled halls of the twelfth and thirteenth centuries, including those at Leicester Castle, Clarendon Palace and the Bishop's Palace at Lincoln.<sup>60</sup> The abbey's chronicle records that John of Breynton (1334–42) 'completed the abbot's great hall, which had been begun and built as far as the tops of the windows, at the expense of one thousand pounds'.<sup>61</sup>

The abbot's hall was a ceremonial space, dedicated to the provision of hospitality and the elaborate etiquette that surrounded the serving of food: it was said that the last abbot of Glastonbury entertained up to 500 'persons of fashion' in the hall at one time.<sup>62</sup> Excavations in this area by Radford and Wedlake recovered a pottery assemblage that was dominated by later medieval jugs (over 90 per cent of the assemblage), reflecting an emphasis on the serving of drink (see Chapter 8: Post-Roman pottery). The floor was paved with ceramic tiles: none were recorded *in situ* but the bedding matrices were evident; late thirteenth- to early fourteenth-century grisaille was recovered, confirming that the windows were glazed with high-quality glass.

The abbot's complex at Glastonbury was sited on the western edge of the inner precinct, a permeable space that

was accessible to guests (see fig 3.11). The boundary wall between the inner court and the outer Broad Court appears to have incorporated the west wall of the abbot's kitchen. A substantial wall ran north and south from the west wall of the abbot's kitchen (see fig 10.15), confirmed by architectural, cartographic and geophysical evidence. Guests could approach from two possible entrances leading from Magdalene Street. One led to a gateway (shown on the 1784 Carter map) to the north of the abbot's kitchen, at the west end of the abbot's hall. A second possible entrance further south along Magdalene Street brought the visitor along the south side of the abbot's kitchen before turning northwards between the kitchen on the left and the walled abbot's garden on the right, providing direct access to the abbot's hall porch. The distinctive lantern of the abbot's kitchen could be seen from outside the precinct wall in Magdalene Street, a beacon for guests seeking the hospitality of the abbot's hall.

A second hall was added to the south-eastern area of the abbot's complex, forming the eastern side of the enclosed abbot's garden. The excavated remains known as the abbot's lodging have been reinterpreted as a substantial house of two or more storeys with cobbled walkways leading to the great hall. It may be suggested that this building originated as the 'king's lodging', constructed for Henry VII's visit in 1497. The king lodged in the quarters newly constructed by Abbot Beere, which Leland described as 'the new Lodging by the great Chambre caullid the kinge's lodging [in] the galery'.<sup>63</sup> This confirms the proximity of the king's lodging to the abbot's chamber and also suggests that the hall may have included a fashionable gallery – a two-storey corridor providing access to cellular lodgings at the upper levels. Though known as the 'king's lodging' up to the Dissolution, it seems likely that the abbot moved to the new accommodation following the monarch's visit in 1497. Excavations in this area produced a small group of eleven *arista* tiles from Seville (the location of nine of which are unknown at present). The date of production for the tiles is between  $c 1510$  and 1539, indicating further work on the lodging by Beere (1494–1525) or his successor, Whiting (1525–39) (see Chapter 8: Spanish and Portuguese wares).

### Monastic industry and craft-working

A distinctive characteristic of early medieval monastic sites is their strong craft-working component, a feature not matched by high-status secular sites of the period.<sup>64</sup> An extensive range of crafts has been demonstrated at

early monasteries such as Clonmacnoise and Portmahomack, including ferrous and non-ferrous metal-working, enamel and glass-working, bone and antler-working, stone-working and vellum production.<sup>65</sup> Recent excavations have shown that these activities were carefully zoned within the monastic precinct: craft-working was usually kept separate from the ritual core and was located in peripheral zones at Jarrow, Hartlepool, Hoddom, Whithorn, Ripon and Lurk Lane, Beverley. At Canterbury, excavations have revealed an area of intensive iron-smithing located extramurally, to the east of the walled town.<sup>66</sup> The Saxon craft-working evidence at Glastonbury is limited to glass-working and metal-working (ferrous and non-ferrous), with activity concentrated in the area of the later medieval cloister and in close proximity to the Saxon churches and domestic buildings. The excavated complex of five glass furnaces at Glastonbury represents amongst the earliest and most substantial evidence for glass-working in Saxon England. Bayesian analysis of the radiocarbon dates for five charcoal samples from the furnaces supports a date in the late seventh or early eighth centuries (Tables 1 and 2).

Chemical analysis confirms that glass production at Glastonbury fits with the broader compositional picture for early medieval glass in Britain from the sixth to ninth centuries, with glass-makers remelting old Roman material, possibly imported as cullet from the continent.<sup>67</sup> It has been suggested that continental craftsmen were employed in glass-working and other aspects of construction at the abbey (see Chapter 7: The Saxon glass furnaces and Chapter 8: Slag and metal residue samples). Materials for craft-working may have been imported with, or by, these specialist workers: the recovery of a glass block and copper-alloy ingots gives some indication of the form in which materials were transported to Glastonbury. Moulds for making non-ferrous metal ingots are known from monastic excavations at Hartlepool and Clonmacnoise.<sup>68</sup> The glass-working complex at Glastonbury is likely to represent a single phase of intense production linked with a major programme of building around AD 700, a proposal supported by the Bayesian analysis of the radiocarbon dates (see Chapter 5: The radiocarbon results for the glass furnaces). There is no evidence for large-scale industrial production or glass and metal workshops such as those excavated at Portmahomack, where copper, gold and silver were worked.<sup>69</sup> If there were permanent workshops at Glastonbury Abbey these are likely to have been located at the periphery of the precinct and not in close proximity to the churches, cemetery and domestic buildings.

Very little evidence of later medieval industry was recovered by the excavations. This is not surprising since the antiquarian excavations focused on the church and cloister. A furnace complex was recorded on the western side of the twelfth-century dormitory and beneath the twelfth-century floor (see fig 10.11). Charcoal from an *in situ* furnace layer provided a radiocarbon determination yielding a date of AD 1040–1160 at the lowest probability (at 1 sigma) and AD 1020–1190 at the highest probability (at 2 sigma) (Table 1). The spartan evidence indicates that the furnaces were used for iron- and possibly some bronze-working probably associated with eleventh- to mid-twelfth-century construction work.

The medieval pottery assemblage includes eight vessels associated with specialist scientific and technical activities (see Chapter 8: Post-Roman pottery; Wares associated with specialist scientific and technical activities).<sup>70</sup> There were two perforated jars for the production of white lead, the most important white pigment available to the medieval artist; four distilling bases, probably components of stills used for the production of medicines; and two crucibles employed in small-scale working with copper alloys, enamels or even precious metals. These unusual vessels reflect the specialist activities of a medieval monastery. Analysis of the painted plaster confirmed the use of red pigment composed of iron oxides such as red ochre / haematite and lead oxide minium. Unusually, there was no evidence of such expensive pigments as cinnabar / vermilion that would be expected on an ecclesiastical site of such high status (see Chapter 8: *Ex situ* painted wall-plaster).

### Burial practice

Only a fragmentary picture of burial practice can be reconstructed from the archive. The extensive excavations in the church and cemetery must have encountered medieval graves but these were of relatively little interest to early excavators. Archaeological study of later medieval burial has developed only in the last twenty years.<sup>71</sup> An additional factor at Glastonbury was Radford's reluctance to disturb the remains of the Christian dead: inhumations were recorded *in situ* and therefore only partial evidence was recovered. Approximately ninety medieval graves were excavated at Glastonbury Abbey in the nineteenth and twentieth centuries, confirming a variety of burial practices, including cist graves, wooden and stone coffins, double and multiple interments, translated remains and the provision of pillows and grave goods with some interments. To date, no charcoal burials have been recorded at Glastonbury, a funerary rite of purification

frequently associated with monastic contexts dating from the ninth to twelfth centuries.<sup>72</sup>

In the monks' cemetery, the closely packed, intercutting Late Saxon and medieval graves reflect several centuries of burial activity (fig 11.2). Between eleven and thirteen cist graves were recorded by Radford at depths between 0.76m and 1.83m below the modern turf. Generally, the skeletons within the cists were not fully exposed during excavations, although the photographic record shows one complete individual with the ulna and radius folded across the stomach, the left arm higher than the right. The cists were constructed of lias limestone set on edge and covered with further slabs, although the covers are not evident from the archaeological record. Two adjacent cist graves shared one edge, indicating a double interment.<sup>73</sup>

Radford interpreted the 'cist burials' as confirmation of a 'British' Christian cemetery pre-dating the foundation of the Anglo-Saxon monastery.<sup>74</sup> But the stratigraphic record confirms that these graves were all dug *through* the layer of redeposited clay that is believed to represent a Dunstan-period horizon; the cist graves at Glastonbury are therefore later than the mid-tenth century (see Chapter 10). The practice of cist burial was favoured by early Christian monasteries in the north of Britain,<sup>75</sup> and post-Roman burials in Somerset continued to employ slab-lined inhumations in the Roman manner; Cannington is just one of many sites in Somerset where the practice has been confirmed.<sup>76</sup> However, cists are not evidenced at Anglo-Saxon Christian cemeteries in the immediate locality of Glastonbury. The burials at Beckery included a stone-lined grave within the chapel and a cemetery of approximately sixty-three earth-cut graves arranged in rows. Graves in the Anglo-Saxon cemetery at Wells, dating from the seventh to the tenth centuries, were all earth-cut; a few had stones lining the edges, but there were no stone cists.<sup>77</sup>

Cists were adopted at Winchester from the eleventh century and were used in combination with other burial practices throughout the later medieval period.<sup>78</sup> This dating corresponds with the currency of cist graves at nearby Wells Cathedral, where two rows of stone-lined and stone-covered graves excavated to the north of St Mary's Chapel were dated to the later eleventh century.<sup>79</sup> John Blair has argued that this form of burial was adopted more widely in the eleventh century for high-status West Saxon burials.<sup>80</sup> The stratigraphic and comparative evidence suggests that the cist burials at Glastonbury date from the mid-tenth to eleventh centuries or later. The earliest date for burial practice at the abbey comes instead from fragments of *ex situ* grave

markers in the form of decorated stone cross shafts, dating from the eighth to the tenth centuries.<sup>81</sup>

Did Radford locate 'Arthur's grave', as he claimed, or at least the site of the 1191 exhumation? The excavation records confirm that the feature located in the monks' cemetery in 1962 was merely a pit and not a grave. The cist graves at the base of the pit are now regarded as eleventh-century or later and provide a *terminus post quem* (see Chapter 10). The pit cut into a cist burial and was cut by a feature interpreted as the robbing of one of the flanking pyramids; this contained fifteenth-century pottery. On this basis, we can conclude only that Radford excavated a pit in the cemetery and that this feature was likely to date between the eleventh and the fifteenth centuries. Finally, it is worth noting the testimony of one of Radford's site supervisors: Peter Poyntz-Wright recalls that the surface of the pit was clearly visible cutting through the 1184 fire layer.<sup>82</sup> This would indicate a date later than 1184 for the pit. We must conclude that there is no archaeological evidence to support Radford's claim that he located the 1191 exhumation site of the graves that were believed to be those of King Arthur and Queen Guinevere.

Approximately forty other burials were recorded by Radford cutting through 'Dunstan's clay' across the monks' cemetery, although grave cuts were not identifiable for twenty-seven of these. Skeletal remains were not recorded for five or six of the graves; therefore a total of thirty-five complete and fragmentary skeletons were found. Many of these had been disturbed, although the lack of consistency in recording and the narrow trenches make it impossible to evaluate the extent of previous disturbance. Radford stated that the later graves were in wooden coffins; however, evidence of wood was recorded in only four graves, all located at depths of between 0.9 and 1.37m below the ground surface (fig 11.2), and therefore a maximum of 0.47m above the deepest of the cist burials. The presence of coffin nails within one grave indicates the presence of a fifth wooden coffin. Radford assigned a fourteenth- to fifteenth-century date to the wooden coffins.<sup>83</sup> Only one grave with a wooden coffin could be closely dated from a now-lost token of c. 1320, although the location of this grave could not be pinpointed from the records. The only other datable find from a grave was a sherd of pottery dated 1250–1500. Three graves (two of which were intercutting) were located between the early fourteenth-century abbot's hall and the monks' cemetery. No further information was recorded, with the exception of a plan showing the graves; the location perhaps suggests that they pre-date the Late Saxon raising of the cemetery.



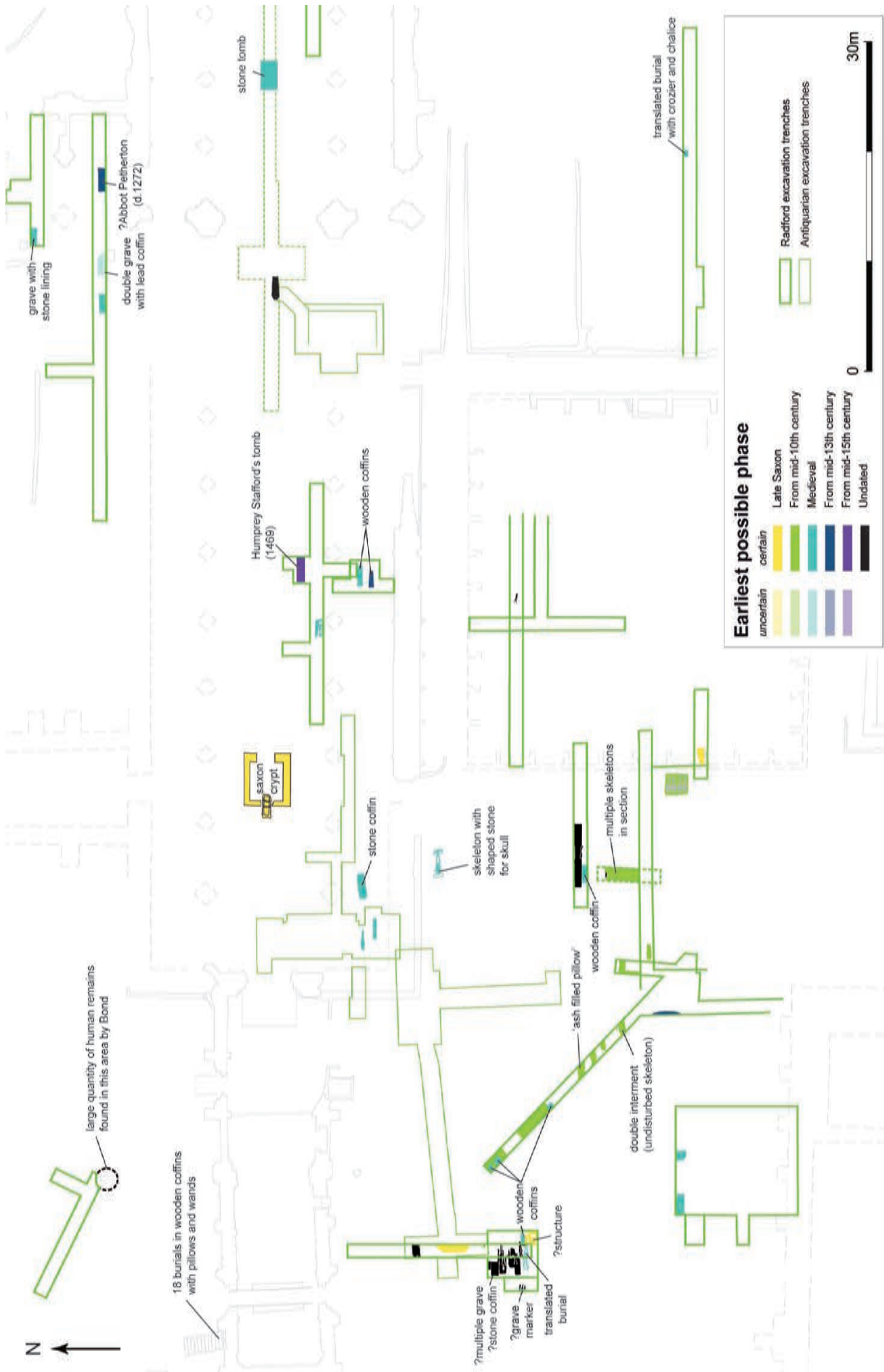


Fig 11.2 Burial practice (scale 1:500)

The medieval graves supposedly included 'pseudo' coffins made of blocks of stone, some with recesses for the head;<sup>84</sup> none were recorded in Radford's trenches but Bond excavated one in 1908 (fig 11.2).<sup>85</sup> This grave type was also recorded at Wells Cathedral and described as 'composite stone cist-coffins' simulating the form of a monolithic stone coffin. The examples at Wells also included head-recesses and their interiors were lime-washed. The possible date range ascribed at Wells covers the eleventh to thirteenth centuries.<sup>86</sup> Most of the graves recorded by Radford across the monks' cemetery were approximately rectangular in shape with sub-rounded corners. However, one empty grave with a precise rectangular shape may indicate the presence of a stone coffin that was later removed (fig 11.2). Alternatively, the larger size of this feature may suggest multiple interments.

In the nave, Radford found three graves in wooden coffins, including an adult male and a child in the south aisle, with fragments of floor tile in the grave fill providing a *terminus post quem* of 1280 for the child burial. Eight further burials were discovered in the nave during the antiquarian excavations. In 1926, two intact burials were noted at the west end of the nave; these may relate to burials shown on a later plan (A372) at the western end of the south aisle, with a stone coffin shown to the east and a later burial above. On the north side of the south arcade, Radford's excavations disclosed a stone-lined tomb attributed to Humphrey Stafford, Earl of Devon (d. 1469). The extensive nave excavations of 1926–9 no doubt saw the removal of other medieval burials but these are not recorded; Bond also recorded extensive human remains in the lay cemetery to the north of the Lady Chapel, which have not been explored further.

In 1931 a tomb was discovered at the western end of the choir, interpreted by the excavators as the tomb within which the exhumed remains of Arthur and Guinevere were placed (see fig 10.13). The final site of Arthur's tomb was further east, directly in front of the high altar, where Leland described it in the 1530s (see Chapter 3). However, an account of the translation that took place in 1368 describes how the tomb was moved 'from the lower part of the choir [to a position closer] towards the high altar'.<sup>87</sup> There is no specific evidence to identify the tomb discovered in 1931 as that which held the putative remains of Arthur and Guinevere. Its location is broadly consistent with the site of Arthur's tomb before 1368 but other tombs would also have been located in this vicinity. In particular, Leland records the tombs of Abbots John of Breynton (1334–42) and John

Selwood (1456–93) in the middle of the choir adjacent to the presbytery.<sup>88</sup> Walter of Monington (1342–75) was associated with the relocation of Arthur's tomb in 1368 and he had his own tomb sited nearby, perhaps to gain intercessory advantage from association with the legendary tomb (see Chapter 3).<sup>89</sup>

Several graves recorded within the north transept were aligned along the central axis of the eastern chapels. These included a grave with a stone lining and a double grave with the remains of a lead coffin (fig 11.2). A double grave with the remains of a lead coffin was contained within the late eleventh-century apse, although the shared alignment with the other graves perhaps suggests a later date. Further west, another grave was located beneath an area of *in situ* tile [C:3782]; it has been suggested that burials within monastic churches were marked and incorporated within areas of tiled floor as a deliberate strategy for commemoration.<sup>90</sup> A further grave contained a skeleton with buckles at the hips, recorded on the same alignment at the threshold to St Thomas's Chapel. A disturbed single grave recorded in the north-west corner of Trench 46 cut through the chord of the early twelfth-century apse. This grave had a stone lining and was sealed by the thirteenth-century mortar bedding, although a later insertion is possible. According to Leland, the tombs of several abbots were located in the north transept, including John of Taunton (1274–91), Michael of Amesbury (1235–52) and Robert Petherton (1261–74).<sup>91</sup> The mutilated effigy of Michael of Amesbury survives in the worked stone collection: the abbot is shown in mitre and mass vestments and shares similarities to the west-front statues at Wells Cathedral (see fig 9.14: 66).

A distinctive burial practice was observed in one grave within the monks' cemetery, with mention of an ashy layer under the skull (fig 11.2). This may relate to the practice of ash burials, recognised principally in the south east of England between the late thirteenth to fifteenth centuries, or perhaps to the blocking of the mouth with ash, as evidenced at Norwich Greyfriars.<sup>92</sup> Pillows were observed beneath the head and shoulders of the eighteen individuals in oak coffins that were excavated in 1825 to the north of the Lady Chapel. The pillows were stuffed with wood shavings,<sup>93</sup> consistent with the attested use of plant material inside medieval coffins.<sup>94</sup> In addition, a rod of thorn or hazel was placed beneath the right side of each skeleton.<sup>95</sup> Such staffs of coppiced wood regularly appeared in Christian graves from the eleventh to the fourteenth and fifteenth centuries and were perhaps associated symbolically with the journey through purgatory.<sup>96</sup>

Two 'translated' burials were recorded: this deliberate removal and reburial of one or more individuals implies more reverential treatment than the routine reburial of charnel.<sup>97</sup> Within the monks' cemetery, a skull and miscellaneous bones with coffin nails had been collected and placed in a small box among the other medieval graves (fig 11.2). The use of wooden boxes or caskets for translated burials has previously been recorded only within churches and other monastic buildings;<sup>98</sup> the example from Glastonbury confirms that this practice also extended to the cemetery. Within the eastern end of the chapter house, a small grave was discovered in 1957 containing the jumbled bones of an incomplete skeleton, an iron crozier and a lead chalice (both now lost). The remains were attributed previously to Abbot Vigor (1219–23); he is known to have been buried in the chapter house and his effigy survives in the worked stone collection (see fig 9.14: 65).<sup>99</sup> The large stone coffin excavated beneath the Saxon church in 1928–9 contained the bones of up to seventeen individuals, while a large quantity of stacked bones was found by Radford within the crypt of St Michael's Chapel (fig 11.2).

In addition to the grave goods already discussed, three pre-Conquest coins were recovered from the monks' cemetery but were not from primary grave fills (one dated 979 – c 985 and two dated c 1052–5). A papal bulla (L27) of Callistus III (1455–8) was found by Bond in 1911 from the topsoil over the monks' cemetery and a further bulla of Pope Honorius III (1216–27) is present among the finds assemblage (see Chapter 8: Small finds: Papal bullae). Although it is uncertain whether these particular bullae were employed as grave goods, bullae have been found with monastic burials elsewhere in Britain.<sup>100</sup> Two buckles dating from c 1270 recovered from a burial in the north transept confirm that the rite of clothed burial was practised at Glastonbury. Radford identified the remains as those of Abbot Seffrid (d. 1150–1); however, a more likely candidate is Abbot Petherton (1261–74), who was buried at the feet of Michael of Amesbury (1235–52), in front of the altar of St Thomas Becket (see fig 10.14).<sup>101</sup>

## Water management

The management of water resources is a perennial theme in monastic archaeology.<sup>102</sup> Water served both functional and spiritual purposes in monastic life; at Glastonbury, for example, St Joseph's Well was central to the pilgrimage experience at the Lady Chapel (see Chapter 3). Water technology was fundamental to the operation of the medieval cloister: water was needed for ritual purposes,

for cooking, for flushing away waste, for cultivating gardens, for keeping fishponds and for industrial use in the millhouse, laundry, bakehouse and brewhouse.<sup>103</sup>

Reassessment of the archive of excavations provides some further insight into the distribution of water and the drainage of waste. The primary requirements were threefold: the supply of water, its distribution to buildings in the cloister and courts, and the removal of waste. Evidence for water supply to the precinct is discussed in Chapter 3: the main supply to the abbey ran approximately north–south across the eastern end of the precinct, fed by the Chalice Well supply and, probably, by the Launder Stream. The monastic reredorter to the south of the dormitory must have been fed by a reliable and strong flow of water: a ditch running westwards from the main supply may represent this water-course, although this would require the channel to bend north-westwards as it approached the building (fig 11.3).

Adjacent stone-lined drains or culverts on the eastern side of the dormitory may have taken foul water or sewage from buildings further north; the earliest dates from c 1250. The main drain exited from the western side of the monks' reredorter and probably collected the waste from the latrine at the southern end of the late fifteenth-century king's lodging. Waste water from the monks' kitchen, refectory, abbot's hall and abbot's kitchen is likely to have followed the natural downward gradient towards the south west to feed into the main drain.

Another water-course must have been channelled from the main supply to carry water to the cloister and the abbot's range. A later medieval conduit has been located on the south side of the chapter house.<sup>104</sup> The conduit passes the south-east corner of the chapter house from north east to south west, possibly implying a source to the north east (see below). The conduit turns westwards, passing beneath the north end of the dormitory, crossing the southern end of the east cloister walk and entering the south side of the cloister garth. This may have supplied the possible octagonal *lavatorium* discovered in the cloister garth during the 1959 excavations (and not in the south-east corner of the cloister walk as proposed in previous publications). A further four stone-lined drains or culverts have been recorded in the east cloister walk, three identified by Bond (two of which are connected) and one by Radford, with some evidence for a continued course through the cloister garth. Some of these features were no doubt for draining rainwater away from the south transept of the church, but others may have belonged to the supply network. Certainly the twelfth-century stone-lined drain running along the west cloister walk is more likely to be for drainage rather than

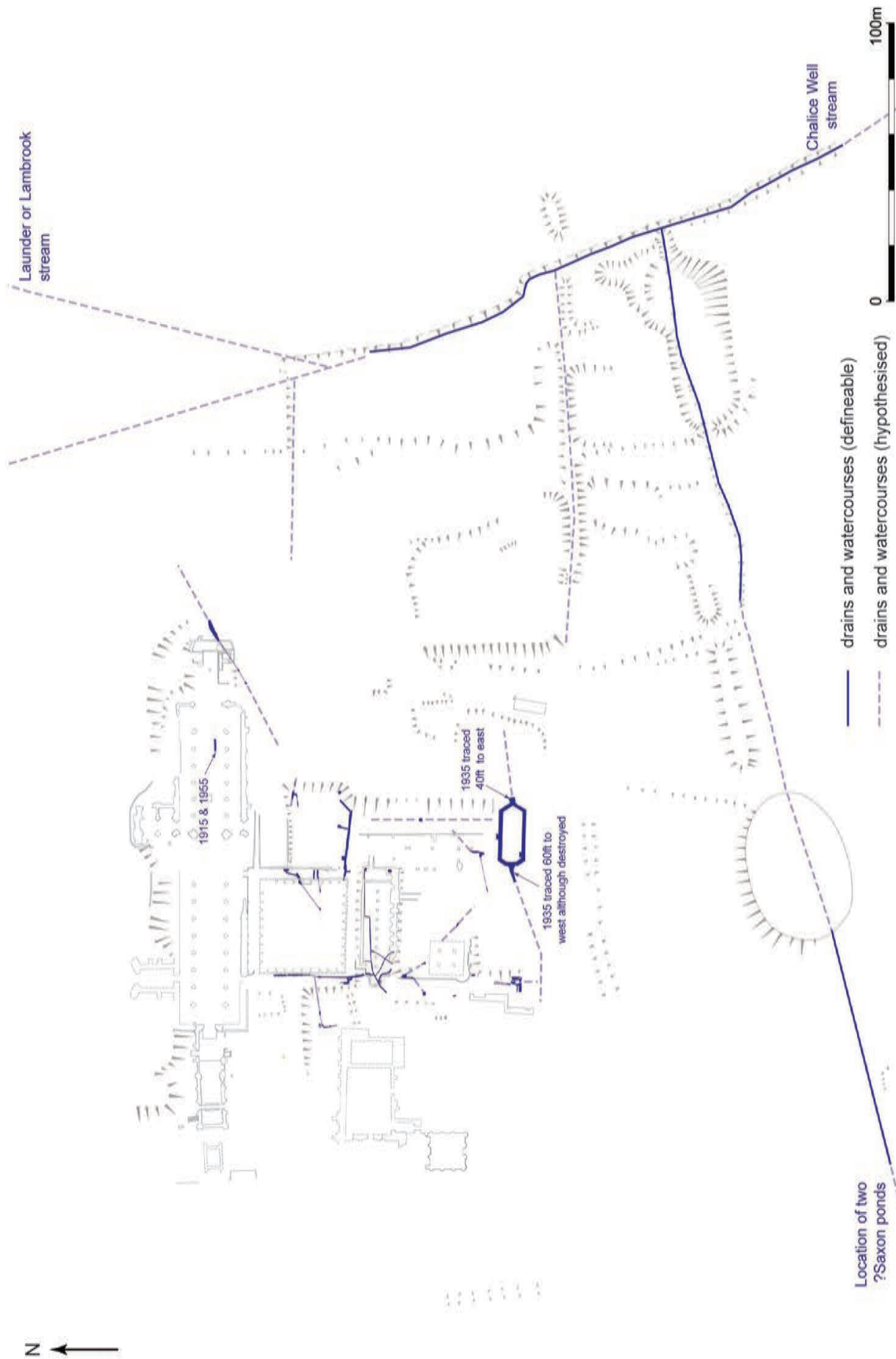


Fig 11.3 Drainage and water supply with earthworks (after Burrow 1982) (scale 1:12000)

supply; this may have continued around the northern end of the building to the south west of the cloister. A water-course appears to have run from east to west across the northern area of the cloister garth, suggested by map evidence and early archaeological observations.<sup>105</sup> This has not been verified, but if there is a water-course here it would coincide with the possible conduit house (see Chapter 10). The water source for the complex of lead pipes and stone-lined conduits and drains beneath the refectory must also have come from the north east or east. Spurs from this network fed the abbot's hall, which had its own sanitary arrangements at the southern end of the eastern chamber, and the king's lodging. The abbot's kitchen would have required a source of clean water separate from the drainage system.

To conclude, four, or possibly five, water-courses headed westwards from the main supply to provide water for the abbey's various needs. A water-course would also have been required for the northern side of the precinct. A diagonal drain or culvert immediately east of the church may be a spur from this postulated supply, although this could represent an additional water-course in its own right. This may have continued south-westwards to the east range, with a further water-course suggested by a ditch along the main supply heading directly west towards the east range. Further south again, a substantial ditch may indicate the water-course for the reredorter supply, becoming the main drain, with a ditch to the south indicating the water-course supplying the monastic ponds.

## Monastic material culture

### The Saxon monastery

A striking feature of the finds assemblage is the negative evidence for metal objects dating to the Mid and Late Saxon phases. Excavated monasteries such as Jarrow, Whitby, Hartlepool, Barking and Lyminge have produced copious evidence of high-status pins, dress-fastenings, tweezers, styli, coins, glass vessels and imported pottery.<sup>106</sup> Early medieval monastic sites have yielded diagnostic assemblages of high-quality metalwork, which is simply missing at Glastonbury. There are only three objects of copper alloy that may be associated with the Late Saxon monastery, but all are likely to date to the eleventh century: an incomplete mount in the form of a stylised animal head (B46), a hooked tag, probably a clothing fastener (B47), and a brooch pin with Romanesque dragon head (B145) (see Chapter 8: Small finds). Late Saxon monasteries were thriving markets and places of commercial exchange and yet only three Saxon

coins have been recovered, all dating to the late tenth and eleventh centuries.<sup>107</sup> Radford's method of excavating narrow trenches may have limited the potential for the recovery of artefacts, but we must also take regional patterning into account. The early medieval period in south-west Britain is characterised by a paucity of metal small finds; they are rarely recovered from excavations at urban, rural or cemetery sites. A national survey of metal-detected objects recorded by the Portable Antiquities Scheme observed that the south west registered the lowest number of early medieval artefacts in the country; nineteen coins are recorded in the Somerset Levels, for example, but no artefacts.<sup>108</sup>

It is thus inappropriate to compare the rich material culture of Saxon monasteries in Northumbria and Kent with those located in contemporary Wessex. John Maddicott observed that the monasticism of the south west contrasts starkly with that of Northumbria: 'no de luxe manuscripts, not many stone-built churches, little sculpture, few artefacts.'<sup>109</sup> Glastonbury is exceptional for its manuscripts, stone churches, sculpture and glass, but there is little evidence for precious metal in the form of coins or material culture. The paucity of gold and silver may reflect the relative economic austerity of Wessex in comparison with Northumbria, which possessed greater resources in the form of silver and cattle, and commercial opportunities for trade and tribute-collection. Maddicott argues that the south west was economically under-developed in the seventh century and remained so throughout the Late Saxon period. However, he also suggests that objects of precious metal may have been considered less significant to these communities – cultural value may have been expressed through other media.

The pottery assemblage from Glastonbury Abbey includes the largest collection of Anglo-Saxon ceramics from the county of Somerset, recovered from stratified contexts beneath the Norman cloister. However, the region was aceramic before *c* 930, and the Saxon pottery present probably dates later than *c* 950. There are five glazed vessels in Winchester ware, a rarity in the south-west region. The presence of this ware at Glastonbury confirms that connections were maintained between the two ecclesiastical centres, perhaps in the form of gifts or goods travelling with mobile households. Petrological analysis of the coarsewares indicates that at least 85 per cent of the Late Saxon ceramics used at the abbey came from potteries about 30km to the south. The vessel forms are dominated by cooking pots but among the unusual forms are two lamps (see Chapter 8: Post-Roman pottery).

## Monastic lifestyle and consumption

The policy of selective retention that was practised by successive excavators at Glastonbury has resulted in a collection that is biased towards decorative and high-status artefacts over quotidian objects and coarse pottery or plain tiles.

The small-finds assemblage dates principally from the fourteenth to sixteenth centuries and there is no clear regional patterning in the material. It contains a striking number of religious artefacts in comparison with the assemblage from the nearby village of Shapwick, a rural manor of Glastonbury Abbey.<sup>110</sup> Geoff Egan proposed twenty-one categories of object from excavated English monasteries that may be regarded as diagnostic of the monastic lifestyle.<sup>111</sup> The assemblage from Glastonbury scores higher on Egan's list of indicators than any other excavated monastery in England, with finds that include ornate metalwork, paternoster beads, papal bullae, grave goods, lead pipes and grilles, styli, pencils, writing tools, book mounts, seals, jettons, tuning pegs and curtain rings (see Chapter 8: Small finds). The monastic character of the assemblage is evidenced especially in the objects linked with music and literacy and the large number of items for personal devotional use that were owned by monks or secular guests and pilgrims (see Table 10). The affective piety that was characteristic of the later Middle Ages is demonstrated in several artefacts associated with veneration of the Virgin and the Passion of Christ, while the Glastonbury cult of St Benignus may be reflected in a gilt copper-alloy fragment of sprouting staff or rod. The assemblage includes a small number of personal items, such as dress accessories, but remarkably few objects associated with everyday activities, such as food preparation and consumption, industry and craft-working.

The large pottery assemblage is dominated by unstratified material (over 8,000 sherds) with approximately 2,000 stratified sherds deriving from Radford's excavations. The stratified material is principally Saxo-Norman in date, but the large unstratified collection permits patterns to be traced in the abbey's consumption of medieval pottery. The assemblage derives from residential buildings close to the cloister and may be taken as representing domestic occupation. Glastonbury has yielded the only large collection of pottery from any of the monastic houses of Somerset and is important for discerning trends in monastic consumption. The late twelfth- and thirteenth-century material reflects the well-attested taste in southern England for glazed tablewares imported from northern France. Locally made products

include roughly glazed, handmade coarseware pitchers or handmade jugs. Bristol was an important source of supply, with Ham Green ware jugs (c 1140–1300) well represented.

The pottery assemblage for the high medieval period, dating from the mid-thirteenth to fifteenth centuries, is unusual in the low number of imported wares. In particular, there are few everyday products from Saintonge, perhaps indicating that the products of the local Bristol kilns were regarded as equally desirable high-quality tablewares. Bristol Redcliffe wares dominate the high-medieval assemblage, including elaborate jugs decorated with human faces and birds. Local wares and Ham Green were eschewed in favour of Bristol Redcliffe wares, in contrast with the pattern of consumption at the nearby manor of Shapwick.<sup>112</sup> This preference reflects not only the high quality of the Bristol wares but also the abbey's strong commercial links to the city. The high status of the abbey is reflected in the presence of Spanish lustrewares and Italian maiolicas, which are rare finds in Britain (see Chapter 8: Spanish and Portuguese wares). Also noteworthy are the Seville-type olive jars, demonstrating the import of luxury food stuffs, and the Seville *arista* tiles, dating to the early sixteenth century.

The assemblage of 7,000 ceramic tiles represents a tiny fraction of those that were probably produced for the abbey. The wide range of motifs includes heraldic, geometric, architectural, stylised and naturalistic foliage, mounted riders and lettering. Chemical analysis of the clay used in the fabric of the tiles showed the majority of tiles in the assemblage were made at kilns close to Glastonbury (see Chapter 8: Medieval floor tiles). New building work in the fifteenth and sixteenth centuries employed tiles from further afield, from Donyatt, and later from east of the Quantocks, in the Nether Stowey area. Glastonbury products from a kiln site active in the mid-thirteenth century have stylistic connections to Clarendon Palace, while Glastonbury designs from a later thirteenth-century kiln were also used at Wells Cathedral, Bridgwater Friary, Cleeve Abbey, Gloucester Cathedral and several Welsh sites. A design unique to Glastonbury depicts stalks of wheat and may have been associated with Abbot Richard Beere (1493–1524), on the basis that beer was made from a combination of grains. This design was produced in large numbers and was part of a major building campaign, possibly the king's lodging constructed by Beere for the visit of Henry VII in 1497.

## Monastic patronage and memory

The excavated assemblages of worked stone, ceramic tile and stained glass provide new insights into the quality

and character of the abbey's buildings from the twelfth to the sixteenth centuries. There is evidence for stylistic and technological innovation and engagement with both regional workshops and the rich monastic culture of northern France. Glastonbury Abbey is consistent with the pattern of patronage detected for the larger Benedictine communities in the west of England: new building works continued to be commissioned into the later Middle Ages, but new commissions were undertaken principally by abbots rather than external patrons from c 1400 onwards.<sup>113</sup> The distinctive characteristic of architectural patronage at Glastonbury Abbey is the strong interest expressed in the theme of 'retrospection'. Architectural fabric was reused purposefully, and archaic styles were employed strategically in order to emphasise Glastonbury's antiquity and its pre-eminent status among England's religious houses.

The Romanesque abbey was shaped by the patronage of Abbot Henry of Blois (1126–71), brother of King Stephen, and directly influenced by his connections with court and monastic culture. The fifty-one fragments of blue lias carving from the Norman cloister at Glastonbury are amongst the finest examples of Romanesque sculpture produced in England, comparing favourably with better known corpora from Reading Abbey, Hyde Abbey and Norwich Cathedral (see Chapter 9: Romanesque carved stones). The petrology of the carvings confirms that they were made locally, but the artistic connections are not with English workshops in the south west; rather they are with work produced at sites controlled by Henry of Blois, in particular Wolvesey Palace, Winchester. The extensive use of chevron ornament in the surviving parts of the church and Lady Chapel may also be compared with St Cross, Winchester, founded by Henry of Blois.

The assemblage of nearly 1,500 fragments of Gothic sculpture confirms large-scale building activity following the fire of 1184 (see Chapter 9: Gothic sculpture and worked stone). Major work was undertaken from the 1180s into the 1250s but had slowed or ceased by the second half of the thirteenth century. The worked stone assemblage exhibits stylistic affinities with Wells but there are no obvious connections in the stained glass (see Chapter 9: Stained and painted window glass). Wells and Glastonbury were constant rivals for local stone and skilled masons. The use of advanced technology represented by hot mastic repairs is found several decades earlier at Glastonbury (c 1187) than at Wells, suggesting that the first years of rebuilding involved masons from London or even France, with technical knowledge ahead of the local workshops. Figural carvings from the north transept and Galilee demonstrate the outstanding quality

of the Early English abbey church, comprising white stone heads and drapery, recognised as 'the finest English sculpture', now considered to date to the first half of the thirteenth century (see Chapter 9: Gothic sculpture and worked stone).<sup>114</sup> Traces of gilding and painted decoration are evident in the worked stone assemblage, including red and white patterning and a rich polychromy on stiff-leaf foliage dating to the thirteenth century, combining orange, black and blue. In contrast, analysis of the excavated assemblage of painted plaster has revealed very basic decorative schemes of red line on white plaster, more typical of the standard of a parish church (see Chapter 9: *Ex situ* painted wall-plaster).

The campaign of reconstruction following the fire of 1184 focused first on the cloister and the replacement of the *vetusta ecclesia* with the Lady Chapel. The highly venerated early church was commemorated in the alignment of the new structure: the Lady Chapel retained the orientation of the Saxon churches, while the medieval nave was realigned. The fine carvings of the doorways of the Lady Chapel – representing the Life of the Virgin on the north portal and the Creation to the Fall on the south and executed 1185–9 – were advanced for their time. The polychromatic elevations of the interior were a spectacular contrast of decorative blue lias with limewashed and painted walls; the extant painted plaster dated c 1187 included expensive ultramarine pigment.<sup>115</sup> It has been suggested that the form and decoration of the Lady Chapel may have been deliberately archaic: the chapel with its tall angle turrets and distinctive elevations may have been intended to evoke the earlier timber church, the *vetusta ecclesia*, and was perhaps modelled to resemble the shape of contemporary reliquaries.<sup>116</sup> The connection between the Lady Chapel and the old church was made explicit to pilgrims visiting the abbey: a brass plaque mounted on a pillar, probably dating to the early sixteenth century, served as a signboard to explain its sacred archaeology.<sup>117</sup>

Many conservative or retrospective elements are evident in the medieval architecture of Glastonbury Abbey. The Lady Chapel combines round-headed arches and interlaced arcading with chevron-work and lias inserts, the latter probably in imitation of the destroyed buildings of Henry of Blois. The church also displays retrospective detailing – for example in the use of chevron ornament. The remodelling of the nave in the fourteenth century seems to have employed voussoirs that copied the double-roll forms of the Early English church. Retrospection is also evident in the choir extension built under Abbot Monington in the mid-fourteenth century: the late twelfth-century windows and masonry from the

twelfth-century east end were completely reused. Some degree of reuse or the copying of earlier elements may be explained by a desire to achieve integrity by uniting old and new in the decorative scheme; however, the tendency for retrospection seems to have been adopted consciously and systematically at Glastonbury.

Excavations at the abbey have recovered over 2,000 fragments of stained glass dating from the twelfth century onwards. The recognition of durable blue glass in the assemblage is highly significant (see Chapter 9: Stained and painted window glass), confirmed by compositional analysis to have a mixed soda potash composition. The durable blue glass was painted mostly with designs comparable to those used in twelfth-century manuscripts. It is likely to date to the twelfth century and confirms that Glastonbury's early glazing schemes were of the highest quality, comparing favourably with York, Winchester, Chartres and St-Denis. The spatial context for the blue glass is largely unknown but fragments were recovered from the Edgar Chapel at the east end of the church, which dates to the sixteenth century. This suggests that early glass may have been reused, a practice that would be in keeping with the abbey's deliberate use of archaic style for ideological purposes.<sup>118</sup>

Julian Luxford has argued that retrospection was a major theme in Benedictine art – for example in the popular use of biblical precedents such as the Tree of Jesse – to demonstrate ancient origins. He suggests that the deliberate retention of Saxon or Romanesque fabric was a strategy to demonstrate a monastery's antiquity and authority. Glastonbury was not unique in this respect; the trait is also evidenced at Winchester and Gloucester.<sup>119</sup> However, Glastonbury excelled above all others in the cultivation of its own history and ancient fabric as a form of political and spiritual propaganda. This is illustrated in the promotion of the former site of the *vetusta ecclesia* as an associative relic. Its rebuilding can be understood as a form of architectural hagiography, just as William of Malmesbury's history of Glastonbury, probably commissioned by Henry of Blois, was a form of institutional hagiography. A retrospective style of architecture was critical to Glastonbury's sustained campaign for recognition as the oldest religious foundation in Britain. This claim to primacy was accepted by contemporaries and successfully garnered royal favour: when Edward III visited in 1331, he declared his own belief that Glastonbury was indeed the tomb of saints, 'consecrated by the Lord himself'.<sup>120</sup> Retrospective architecture also served an important role in constructing the institutional memory and identity of the monastery: the active promotion of its ancient Christian heritage

provided the monks with a shared belief surrounding the pre-eminent place of Glastonbury in monastic history.<sup>121</sup>

### 11.3 Concluding remarks

Reassessment of the archive of antiquarian excavations has pushed back the earliest date for occupation evidenced at Glastonbury from the eighth century to the fifth or sixth centuries; however, the character of this early occupation, whether secular or religious, remains unproven. A major campaign of building in the late seventh to early eighth centuries has been demonstrated by the radiocarbon dates for the glass furnaces (Table 2); this ambitious programme of construction is likely to have drawn upon imported materials and specialist craftsmen. Recent study of the charter evidence confirms that the earliest documented evidence for the monastic foundation dates to the last three decades of the seventh century.<sup>122</sup>

The Roman evidence recovered at Glastonbury is insufficient to signal the presence of substantial Roman settlement within the area of the precinct. However, the Anglo-Saxon monastery at Glastonbury resonates with 'Romanitas' in its rectilinear layout, the use of *opus signinum* floors and the provision of a detached burial crypt to the east of the Saxon church. John Crook notes the Roman connotations of such crypts, which were already out of fashion in Francia by the late seventh century. He proposes that Anglo-Saxon crypts such as Glastonbury's may have been conceived as 'artificial Roman catacombs'.<sup>123</sup> The very name 'Glastonbury' reinforces this model of Roman alliance: John Blair argues that the 'burh' place name was used to signal 'Romanitas on new sites and in new regions'.<sup>124</sup>

Tenth-century sources suggest that an ancient church already existed at Glastonbury and that it was venerated by the Anglo-Saxon monastery. The legendary status of the old church was embellished until it was widely believed in the Middle Ages that a Christian church had been founded at Glastonbury in the first century by the Apostles of Christ (see Chapter 3). There is no archaeological evidence to substantiate this tradition of a very early Christian foundation on the site of Glastonbury Abbey. Instead, the evidence suggests that a monastery was established (or was refounded) in the late seventh century and that it marshalled Roman imagery in order to create the illusion of greater antiquity. The tradition of the old church, *vetusta ecclesia*, persisted into the Middle Ages in the orientation of the medieval Lady Chapel and its treatment as an associative relic. From



perhaps as early as the seventh century, medieval people believed that a very early Christian church had been established at Glastonbury. We may postulate that a chapel was constructed in the fifth or sixth century by the community at Glastonbury that is attested by the presence of imported Late Roman Amphora 1. We may even conjecture that the well in the crypt of the Lady Chapel was the focus of an early ritual centre at Glastonbury. The importance of wells and springs to late Roman and post-Roman cults is attested by the sequence of early churches at nearby Wells.<sup>125</sup> Is it possible that a late Roman cultic feature was appropriated by the early Christian church at Glastonbury and commemorated in the legend of the *vetusta ecclesia*? The substance of this story remains inscrutable and we can only speculate, since any potential archaeological evidence was destroyed by construction of the crypt to the Lady Chapel.

Analysis of the archive of excavations has revealed major gaps in our knowledge of the form and layout of the Late Saxon monastery and an absence of diagnostic material culture. The dearth of evidence dating from the seventh to the ninth centuries begs this question: has the early monastic core actually been located? Is it possible that the main domestic buildings of the Mid Saxon monastery were situated to the *north* of the church, in an area yet to be examined? The identification of early graves to the south of the church may support this hypothesis, on the basis that interments would not have been made in close proximity to the domestic accommodation. Excavations took place in 1987–93 to the north west of the church, on the site of the present visitors' centre; no material culture earlier than the tenth or eleventh century was found in the form of pottery or metal small finds.<sup>126</sup> However, given that Saxon Somerset was aceramic up to c 930, the identification of Saxon phases is particularly challenging.<sup>127</sup>

Radford's identification of a Dunstan-period cloister has been refuted, although the presence of free-standing stone buildings pre-dating the Norman cloister has been confirmed. Sadly, there is no evidence to support Radford's model of Glastonbury as an architectural innovator at the forefront of the tenth-century monastic reform. However, we have elucidated the exceptional quality of the twelfth-century cloister associated with Henry of Blois and the reconstructed church of the thirteenth century, in addition to the ambitious scale of the later medieval abbot's complex. The material culture assemblage illustrates the monastic lifestyle and the status of Glastonbury as a major patron and consumer of medieval architecture, arts and commodities. Above all,

the medieval abbey valued its claims to antiquity, revealed in a characteristic tendency to reuse sculpture and stained glass, to emulate earlier architectural styles and to signpost its Christian heritage to visitors through the use of pyramids, tablets and plaques (see Chapter 3).

New excavations are required if we are to establish the character, form and extent of the Saxon monastery at Glastonbury. Future work should aim to provide a better chronological framework for the Anglo-Saxon monastery through the re-excavation of burials and old trenches to recover organic material for dating. It would be desirable to establish the date of the *vallum* and to confirm whether or not the ditches observed to the north and west of the precinct form part of a contiguous enclosure boundary. The ditch recorded in Silver Street produced waterlogged deposits and preserved wood fragments; the excavators observed that it may have extended southwards.<sup>128</sup> There is clear potential for further excavation of the *vallum* ditch or a programme of coring in conjunction with radiocarbon dating.

Further investigation is also needed to trace the Late Saxon buildings: the GPR survey confirms that some buried deposits remain *in situ* in the vicinity of these structures. The areas with greatest potential for future excavation include the north and west sides of the cloister garth. The excavation notes record that three glass furnaces were left *in situ*, and there is also potential for the discovery of further timber buildings. New investigations in the area of the Saxon cemetery should be undertaken to establish its western extent and the sequence of early burials. Archaeological deposits may also survive to the north of the church: recent watching briefs in this area have recorded raised ground levels and evidence of post-medieval horticulture that may have sealed earlier medieval deposits.<sup>129</sup> This area should be a priority for future investigation to determine whether the core of the Mid Saxon monastery may have been located to the north of the medieval church.

The aim of the Glastonbury Abbey Archaeological Project was to set aside previous assumptions based on the historical framework and legendary tradition and to provide a rigorous reassessment of the archive of antiquarian excavations. This process has revealed that some of the best known archaeological 'facts' about Glastonbury are themselves myths perpetuated by the abbey's excavators. Despite the relative bias and limitations of the archive and excavated assemblages, new understanding has been brought to the abbey's archaeology and a series of fresh questions has been posed for future research at Glastonbury.

# Appendix 1

## Concordance of Radford's excavations

<b>New trench no.</b>	<b>Original trench name</b>	<b>Drawing refs</b>	<b>Photo refs</b>	<b>Notebook refs</b>	<b>New context no. range</b>	<b>New section no.</b>
1	1951, AH 1	NMR: LA114	-	NMR: GLA/Site/2/1	350-85	30
2	1951, AH 2	NMR: LA114	-	-	250-5	7
3	1951, Frater	NMR: LA112, LA92	NMR: GLA/Site/7 (33)	NMR: GLA/Site/2/1	-	-
4	1951, west cloister walk	-	NMR: GLA/Site/7 (32)	NMR: GLA/Site/2/1	900-4	-
5	1951, west of monks' kitchen	NMR: LA112, LA92	NMR: GLA/Site/3 (31)	NMR: GLA/Site/2/1	-	-
6	1952, cloister trench nearest church	NMR: LA124, LA51a, LA69	NMR: GLA/Site/7 (38, 39, 41, 46)	NMR: GLA/Site/2/1; GLA/Site/2/2	500-89	33, 34
7	1952, NE corner of AH	NMR: LA37	-	NMR: GLA/Site/2/1; GLA/Site/2/2	450-68	32
8	1952, SE corner of cloister	NMR: LA32	-	-	750-62	8
9	1952, St Michael's Chapel to cloister	NMR: LA51b	NMR: GLA/Site/7 (37, 42 and 45)	NMR: GLA/Site/2/1; GLA/Site/2/2	650-91	35
10	1952, west cloister walk	NMR: LA69	NMR: GLA/Site/7 (40, 43, 44)	NMR: GLA/Site/2/2	689	-
11	1954, CLS	NMR: LA103	GA: LAW (1)	-	2150-9	-
12	1954, CLSE	NMR: LA103	-	-	2180-5	-
13	1954, CLW	NMR: LA68	NMR: GLA/Site/7 (35a, 35b, 165) GA: LAW (2); Poyntz-Wright (5)	NMR: GLA/Site/3/1; GLA/Site/3/3; GLA/Site/3/22; GLA/Site/3/34; GLA/Site/4/1	2062, 2071-86	-
14	1954, CLW between 2nd and 3rd buttresses	NMR: LA30, LA68	-	NMR: GLA/Site/3/22; GLA/Site/3/26; GLA/Site/3/34; GLA/Site/4/1	1200-16	36
15	1954, CLW between 5th and 6th buttresses	NMR: LA68, LA70	-	NMR: GLA/Site/3/3;	1400-28	9
16	1954, north of Lady Chapel	NMR: LA54a, LA79	-	NMR: GLA/Site/2/1; GLA/Site/12/3	1000-8	25
17	1954, open area west of St Michael's Chapel	NMR: LA65	-	-	-	-
18	1954, SE corner of Edgar Chapel	NMR: LA77, LA78	-	NMR: GLA/Site/12/3	1550-3	22

<b>New trench no.</b>	<b>Original trench name</b>	<b>Drawing refs</b>	<b>Photo refs</b>	<b>Notebook refs</b>	<b>New context no. range</b>	<b>New section no.</b>
19	1954, south of Lady Chapel	NMR: LA56, LA68, LA104	NMR: GLA/Site/7 (36, 71, 72, 73, 74, 75) GA: Poyntz-Wright (6, 7, 15)	NMR: GLA/Site/2/1; GLA/Site/3/3; GLA/Site/3/22; GLA/Site/3/33; GLA/Site/3/34	1450–78	29
20	1954, south wall of cemetery east	NMR: LA54b	-	NMR: GLA/Site/2/1	1350–66	26
21	1954, south wall of cemetery west	NMR: LA54c, LA68, LA104	-	NMR: GLA/Site/2/1	1350–8	27
22	1954, St Michael's Chapel	NMR: LA52, LA68, LA104	NMR: GLA/Site/7 (36, 75); GLA/Site 10/3	NMR: GLA/Site/4/1	1300–28	28
23	1954, west of monks' kitchen	-	-	NMR: GLA/Site/2/1; GLA/Site/3/8; GLA/Site/3/34	-	-
24	1955, CLE-W	NMR: LA26, LA27, LA28a, LA28b, LA38, LA318, LA120a, LA120b, LA148, LA138, LA48	NMR: GLA/Site/7 (121); DBH01/1; DBH01/2; DBH01/3;	NMR: GLA/Site/2/3; GLA/Site/3/3; GLA/Site/3/4; GLA/Site/3/5; GLA/Site/3/6; GLA/Site/3/32; GLA/Site/3/33; GLA/Site/4/2; GLA/Site/12/2	2000–92, 2104	11, 12, 13, 14, 37, 47, 67
25	1955, CLE-W north extension	NMR: LA120a, LA120b, LA38, LA48	-	NMR: GLA/Site/4/2; GLA/Site/12/2	2014, 2100–7	10
26	1955, nave south aisle	NMR: LA127, LA45	NMR: GLA/Site/10/2	NMR: GLA/Site/2/1; GLA/Site/2/3; GLA/Site/3/2; GLA/Site/3/3; GLA/Site/3/5; GLA/Site/3/7; GLA/Site/12/3	2300–18	21
27	1955, Q1	NMR: LA40, LA61, LA83, LA119c, LA152, LA115, LA119b, LA84	-	NMR: GLA/Site/2/1; GLA/Site/3/2; GLA/Site/12/3	2353, 2450–71	42
28	1955, Q2	NMR: LA40, LA61, LA83, LA126, LA84	-	NMR: GLA/Site/2/1; GLA/Site/12/3	2550–75	44
29	1955, Q5	NMR: LA40, LA61, LA83, LA84	-	NMR: GLA/Site/2/1; GLA/Site/3/5; GLA/Site/12/3	2352–53, 2363–64, 2368, 2370–3	
30	1955, Q5 E Ext	NMR: LA40, LA61, LA83	-	NMR: GLA/Site/12/3	-	-
31	1955, Q5 W Ext	NMR: LA40, LA61, LA83, LA84	-	NMR: GLA/Site/2/1; GLA/Site/3/5; GLA/Site/12/3	2368, 2370, 2372	-
32	1955, Q6	NMR: LA40, LA61, LA83, LA84, LA115, LA119b	NMR: GLA/Site/7 (77)	NMR: GLA/Site/2/1; GLA/Site/2/3; GLA/Site/3/2; GLA/Site/3/3; GLA/Site/12/3	2350–67, 2400–11	39, 41
33	1955, Q6 E Ext	NMR: LA40, LA61 LA83, LA84, LA119a, LA125b	-	NMR: GLA/Site/2/1; GLA/Site/3/2; GLA/Site/12/3	2400–11	40, 43
34	1955, west cloister trench	NMR: LA38, LA48	NMR: GLA/Site/7 (76)	NMR: GLA/Site/2/1; GLA/Site/3/3; GLA/Site/3/33; GLA/Site/3/37	2042, 2055, 2057–70, 2084–6	-
35	1956, CL1	NMR: LA34a, LA34b, LA34c, LA35, LA38, LA102, LA24a, LA128, LA48	NMR: GLA/Site/7 (85)	NMR: GLA/Site/2/1; GLA/Site/3/3; GLA/Site/3/4; GLA/Site/3/6; GLA/Site/3/8; GLA/Site/3/13; GLA/Site/3/32	3100–54	18, 19, 20, 49, 51
36	1956, CL1 Ext 1	NMR: LA48, LA38, LA102	-	NMR: GLA/Site/2/1; GLA/Site/3/4	3112, 3122	-
37	1956, CL1 Ext 2	NMR: LA34a, LA34b, LA34c, LA48, LA38, LA102	-	NMR: GLA/Site/3/32	3146	18, 19, 20
38	1956, CL2	NMR: LA123, LA24b, LA153, LA48, LA38, LA102	NMR: GLA/Site/7 (80, 81, 82, 83, 124, 126, 127)	NMR: GLA/Site/2/1; GLA/Site/3/3; GLA/Site/3/4; GLA/Site/3/6; GLA/Site/3/3	3000–59	23, 50

<b>New trench no.</b>	<b>Original trench name</b>	<b>Drawing refs</b>	<b>Photo refs</b>	<b>Notebook refs</b>	<b>New context no. range</b>	<b>New section no.</b>
39	1956, CL2 Ext 1	NMR: LA38, LA48, LA102	NMR: GLA/Site/7 (80, 82, 127)	NMR: GLA/Site/3/3; GLA/Site/3/4	3019, 3038, 3045, 3050, 3051, 3059	-
40	1956, CL2 Ext 2	NMR: LA38, LA48, LA102	NMR: GLA/Site/7 (81)	NMR: GLA/Site/3/	3019, 3034, 3035, 3046, 3047	-
41	1956, CL3	NMR: LA23, LA38 LA48, LA102	NMR: GLA/Site/7 (85)	NMR: GLA/Site/2/1; GLA/Site/3/13	3137; 3200–26	52
41a	1956, CLE	NMR: LA38, LA48	-	-	3048, 3049, 3057, 3058	-
42	1956, CLE-W	NMR: LA38, LA48, LA102	-	-	3146	-
43	1956, Loretto cross trench, north end	-	-	NMR: GLA/Site/2/1; GLA/Site/3/5	3784, 3785	-
44	1956, Loretto cross trench, south end	NMR: LA113	-	NMR: GLA/Site/2/1; GLA/Site/3/5	3780, 3781	-
45	1956, north cloister walk trench	NMR: LA23	NMR: GLA/Site/7 (84)	NMR: GLA/Site/2/1; GLA/Site/3/4	3052–5	-
46	1956, north transept north trench	NMR: LA113, LA117, LA118b, LA143	-	NMR: GLA/Site/2/1; GLA/Site/3/3; GLA/Site/3/4; GLA/Site/3/5; GLA/Site/12/3	3500–28	54
47	1956, north transept south trench	NMR: LA25, LA113, LA118a, LA142	NMR: GLA/Site/7 (78, 163a, 163b); GLA/Site/10/15/3 GA: Poyntz-Wright (10, 12)	NMR: GLA/Site/2/1; GLA/Site/2/4; GLA/Site/3/5; GLA/Site/3/22; GLA/Site/12/3	3700–88	53, 55
48	1957, CH1	NMR: LA44, LA49	NMR: GLA/Site/7 (88); GLA/Pub/1/4 Radford 1981, plate XXIIIa GA: Poyntz-Wright (11)	NMR: GLA/Site/2/1; GLA/Site/3/16; GLA/Site/12/1	100–55	78
49	1957, CH1 ext	NMR: LA44, LA49	-	-	-	78
50	1957, CH2	NMR: LA20, LA44	-	NMR: GLA/Site/3/30; GLA/Site/12/1	200–33	79
51	1957, CH3	NMR: LA44, LA53	-	NMR: GLA/Site/2/1; GLA/Site/12/1	300–15	80
52	1957, CH4	NMR: LA44, LA53	-	NMR: GLA/Site/2/1; GLA/Site/12/1	400–14	81
53	1957, CH5	NMR: LA44	-	NMR: GLA/Site/2/1; GLA/Site/12/1	500–5	-
54	1957, CH6	NMR: LA44, LA53	-	NMR: GLA/Site/2/1; GLA/Site/3/16; GLA/Site/12/1	600–4	-
55	1957, CH7	NMR: LA44, LA53	-	NMR: GLA/Site/2/1; GLA/Site/3/16; GLA/Site/12/1	700–13	8
56	1957, CH8	NMR: LA44	-	NMR: GLA/Site/12/1	800–2	-
57	1957, CL1	NMR: LA31a, LA31b LA63	NMR: GLA/Site/7 (112, 113, 115, 116, 117, 118, 120); GLA/PUB/1/3; GLA/PUB/1/6; DBH01/06	NMR: DBH01/10; GLA/Site/2/1; GLA/Site/3/10; GLA/Site/3/11; GLA/Site/3/27	3100–19; 4100–21	57, 58
58	1957, CL1 Ext 1	NMR: LA33, LA63	-	NMR: GLA/Site/3/10; GLA/Site/3/11	3100, 3109, 3112, 3127, 4114–19	56
59	1957, CL1 Ext 3	NMR: LA34a, LA34b LA63	NMR: GLA/Site/7 (17, 18, 20); GLA/PUB/1/3; GLA/PUB/1/6; DBH01/06	NMR: DBH01/10; GLA/Site/3/11; GLA/Site/3/27	4122–4	15, 16

<b>New trench no.</b>	<b>Original trench name</b>	<b>Drawing refs</b>	<b>Photo refs</b>	<b>Notebook refs</b>	<b>New context no. range</b>	<b>New section no.</b>
60	1957, CL11	NMR: LA63	NMR: GLA/Pub/1/4	NMR: GLA/Site/3/12; GLA/Site/3/16; GLA/Site/3/27; GLA/Site/3/28; GLA/Site/3/30	-	-
61	1957, CL11 Ext E	NMR: LA63	-	-	-	-
62	1957, CL12	NMR: LA29, LA63	-	NMR: GLA/Site/2/1; GLA/Site/3/9	4000–12	24
63	1957, CLE	NMR: LA47, LA63	-	NMR: GLA/Site/2/1	-	-
64	1957, CLE1	NMR: LA116, LA53, LA47, LA84	NMR: GLA/Site/7 (114); DBH01/05 GLA/PUB/1/4 GA: Poyntz-Wright (11)	NMR: DBH01/10; GLA/Site/2/1; GLA/Site/3/27; GLA/Site/3/28; GLA/Site/12/2	4028–9; 4050–92	60, 83, 84
65	1957, CLE1 Ext S	NMR: LA22, LA47, LA63	NMR: GLA/Site/7 (114, 119); GLA/PUB/1/4 GA: Poyntz-Wright (11)	NMR: DBH01/10; GLA/Site/3/28	4050–80	17
66	1957, CLE2	NMR: LA53, LA63, LA155	-	NMR: GLA/Site/2/1; GLA/Site/3/28; GLA/Site/3/30; GLA/Site/12/2	4020–3	59, 85
67	1957, CLE3	NMR: LA63	-	NMR: GLA/Site/2/1; GLA/Site/3/30	4028, 4029, 4087, 4088	-
68	1957, CLE4	NMR: LA47, LA63	GA: Bayley 2000 (6)	NMR: DBH01/10; GLA/Site/3/11	4028, 4029, 4062, 4083–6	-
69	1959, CLS1	NMR: LA71, LA74	-	NMR: GLA/Site/2/1	4065, 5550–2	-
70	1959, CLS2	NMR: LA71, LA73, LA74	NMR: GLA/Site/7 (156)	NMR: GLA/Site/2/1; GLA/Site/3/15; GLA/Site/3/21	5600–23	62
71	1959, CLS3	NMR: LA72, LA74	-	NMR: GLA/Site/2/1; GLA/Site/3/28	5500–26; 5608	61
72	1959, D1	NMR: LA86, LA87, LA90	NMR: GLA/Site/7 (128, 130, 152, 153); GLA/Pub/1/5	NMR: DBH01/10; GLA/Site/2/1; GLA/Site/3/14; GLA/Site/3/16; GLA/Site/3/28; GLA/Site/3/35	5200–65	65
73	1959, D1 Ext	NMR: LA87	NMR: GLA/Site/7 (157)	NMR: DBH01/10; GLA/Site/2/1; GLA/Site/3/35	5255–63	-
74	1959, D2	NMR: LA87	-	NMR: ; GLA/Site/2/1	5002, 5027	-
75	1959, D3	NMR: LA87	-	NMR: GLA/Site/2/1	-	-
76	1959, D3 Ext E	NMR: LA87	-	NMR: GLA/Site/2/1	-	-
77	1959, D4	NMR: LA87	-	NMR: GLA/Site/2/1; GLA/Site/3/35	-	-
78	1959, D5	NMR: LA87	-	NMR: GLA/Site/2/1; GLA/Site/3/13	-	-
79	1959, D6	NMR: LA87	-	NMR: ; GLA/Site/2/1	5242, 5253	-
80	1959, D7	NMR: LA81b, LA87, LA88	-	NMR: GLA/Site/2/1; GLA/Site/3/15; GLA/Site/3/16	5000–1, 5006, 5010–24	64
81	1959, D7 East	NMR: LA89, LA87	-	NMR: GLA/Site/2/1	5000–10, 5025, 5026	66
82	1959, D8	NMR: LA80, LA87	-	NMR: ; GLA/Site/2/1	5209	-
83	1959, nave trench 1	NMR: LA46, LA82a	-	NMR: ; GLA/Site/2/1	5700–7	63
84	1959, TH1	NMR: LA87	-	NMR: ; GLA/Site/2/1	-	-
85	1959, TH2	NMR: LA87	-	NMR: ; GLA/Site/2/1	5029	-
86	1959, TH3	NMR: LA87	-	NMR: ; GLA/Site/2/1	-	-
87	1959, TH4	NMR: LA87	-	NMR: ; GLA/Site/2/1	-	-

<b>New trench no.</b>	<b>Original trench name</b>	<b>Drawing refs</b>	<b>Photo refs</b>	<b>Notebook refs</b>	<b>New context no. range</b>	<b>New section no.</b>
88	1962, AHCT	NMR: LA16, LA75, LA108		NMR: GLA/Site/2/1; GLA/Site/3/19; GLA/Site/3/20; GLA/Site/3/29	5505, 5800–28	71
89	1962, Lady Chapel south	NMR: LA55, LA55a, LA58	GA: Poyntz-Wright (16)	NMR: GLA/Site/2/1; GLA/Site/3/17; GLA/Site/3/18; GLA/Site/3/19	5900–42	72,73
90	1962, Lady Chapel south extension	NMR: LA55, LA55a LA66	-	NMR: GLA/Site/2/1; GLA/Site/3/18	5924, 5928–40	-
91	1962, nave trench 1	NMR: LA82a,	-	-	5700–07	69
92	1962, nave trench 2	NMR: LA82b	-	-	5750–60	70
93	1963, AHCT (1962) E Extension 1	NMR: LA76a, LA106	-	NMR: GLA/Site/2/1; GLA/Site/2/6; GLA/Site/3/14; GLA/Site/3/22	6050–59	76
94	1963, AHCT (1962) E Extension 2	NMR: LA59b, LA106, LA109	GA: Poyntz-Wright (8)	NMR: GLA/Site/2/1; GLA/Site/2/6; GLA/Site/3/21; GLA/Site/3/35	7000–22	75
95	1963, AHCT (1962) E Extension 2 S cut 1	NMR: LA59b, LA106	-	NMR: GLA/Site/2/6	7020	-
96	1963, AHCT (1962) E Extension 2 S cut 2	NMR: LA59b, LA106	-	NMR: GLA/Site/2/6	7021, 7022	-
97	1963, AHCT (1962) E Extension 3	NMR: LA76b, LA106	GA: Poyntz-Wright (32)	NMR: GLA/Site/2/1; GLA/Site/2/6; GLA/Site/3/14; GLA/Site/3/21	7050–62	77
98	1963, AHCT (1962) E Extension 3 S cut 1	NMR: LA106	GA: Poyntz-Wright (32)	NMR: GLA/Site/2/6; GLA/Site/3/14; GLA/Site/3/35	7057, 7063, 7066	-
99	1963, AHCT (1962) E Extension 3 S cut 2	NMR: LA106	GA: Poyntz-Wright (32)	NMR: GLA/Site/2/6; GLA/Site/3/35	7063, 7065, 7067	-
100	1963, AHCT (1962) E Extension 3 S cut 3	NMR: LA106	-	NMR: GLA/Site/2/6	7063, 7064	-
101	1963, AHCT (1962) E Extension 5	NMR: LA106	-	NMR: GLA/Site/2/6	7021, 7022	-
102	1963, AHCT (1962) E Extension 4	NMR: LA106	-	-	-	-
103	1963, AHCT (1962) E Extension 7	NMR: LA106	-	-	-	-
104	1963, Lady Chapel south	NMR: LA76a	-	NMR: GLA/Site/2/1; GLA/Site/2/6; GLA/Site/3/22	6000–8	74
105	1964, AH	-	GA: Poyntz-Wright (1, 2, 4, 5, 14, 15, 25, 30, 35)	NMR: GLA/Site/2/5; GLA/Site/3/14; GLA/Site/3/21; GLA/Site/3/22; GLA/Site/3/23; GLA/Site/3/24; GLA/Site/3/25; GLA/Site/3/35	-	-
106	1964, AH Ext W	-	-	NMR: GLA/Site/3/23	-	-

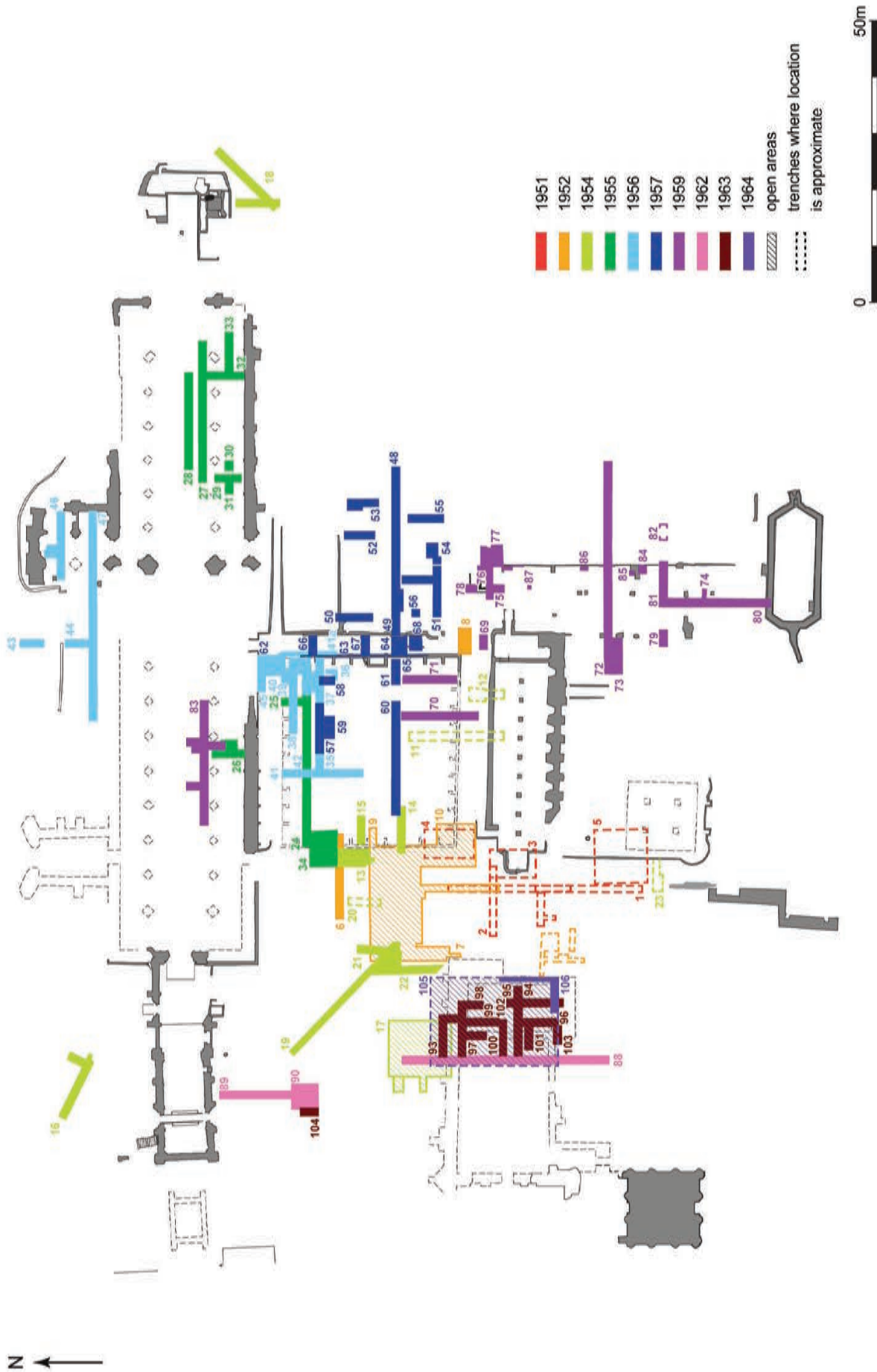


Fig App 1 Concordance of Radford's excavations

# Appendix 2

## Concordance of Wedlake's excavations

Original section title	Illustration refs	New section no.	Photo refs
1978, Cutting 1 across abbot's hall, east side	GLA: A108, A667b	96	
1978, NW corner of abbot's hall, north side	GLA: A108, A667e	100	GLA: A657_a, ?A657_f, A657_j, IA765_b
1978, Cutting 3 across abbot's hall, east side	GLA: A108, A667f	101	-
1978, Cutting 2 across abbot's hall, east side	GLA: A108, A667h	103	-
1979, Section A across abbot's hall, east side	GLA: A108, A345	89	GLA: ?A764_a, ?A758_b, ?A764_c, ?A764_e, ?A758_i, ?A758_k, ?A758_p, IA765_d
1979, Section B across abbot's hall, east side	GLA: A108, A346	90	-
1979, Section C across abbot's hall, south side	GLA: A108, A347	91	-
1979, Section D across abbot's hall, north side	GLA: A108, A348	92	-
1979, Reverberatory furnace in abbot's hall	GLA: A108, A351, A352	93, 94	GLA: IA769_a
1979, Cutting 3 across abbot's hall, south side	GLA: A108, A375	95	-
1979, Cutting 2 across abbot's hall, north side	GLA: A108, A667_a	97	-
1979, Cutting 1 across abbot's hall, south side	GLA: A108, A667_c	98	GLA: A660_a, A660_g, A766_b, A766_l, A766_m
1979, Cutting 1 Ext W across abbot's hall, west side	GLA: A108, A667_d	99	-
1979, Cutting 1 and 2, east side	GLA: A108, A667_g	102	-
1979, Across abbot's hall west wall, north side	GLA: A108, A667_i	104	-
1978-9 (general)	-	-	GLA: A657_i, A656_l, A766_c, A763_e, A760a, A766_h, A763_a, A763_e, A764_b, A766_r, IA765_c, A766_d
1979, Between abbot's hall and abbot's kitchen	-	-	GLA: A660_d, A660_c, IA766_a, IA766_b, A660_b, ? A660_e, ? A660_f, A660_e, A766_f,



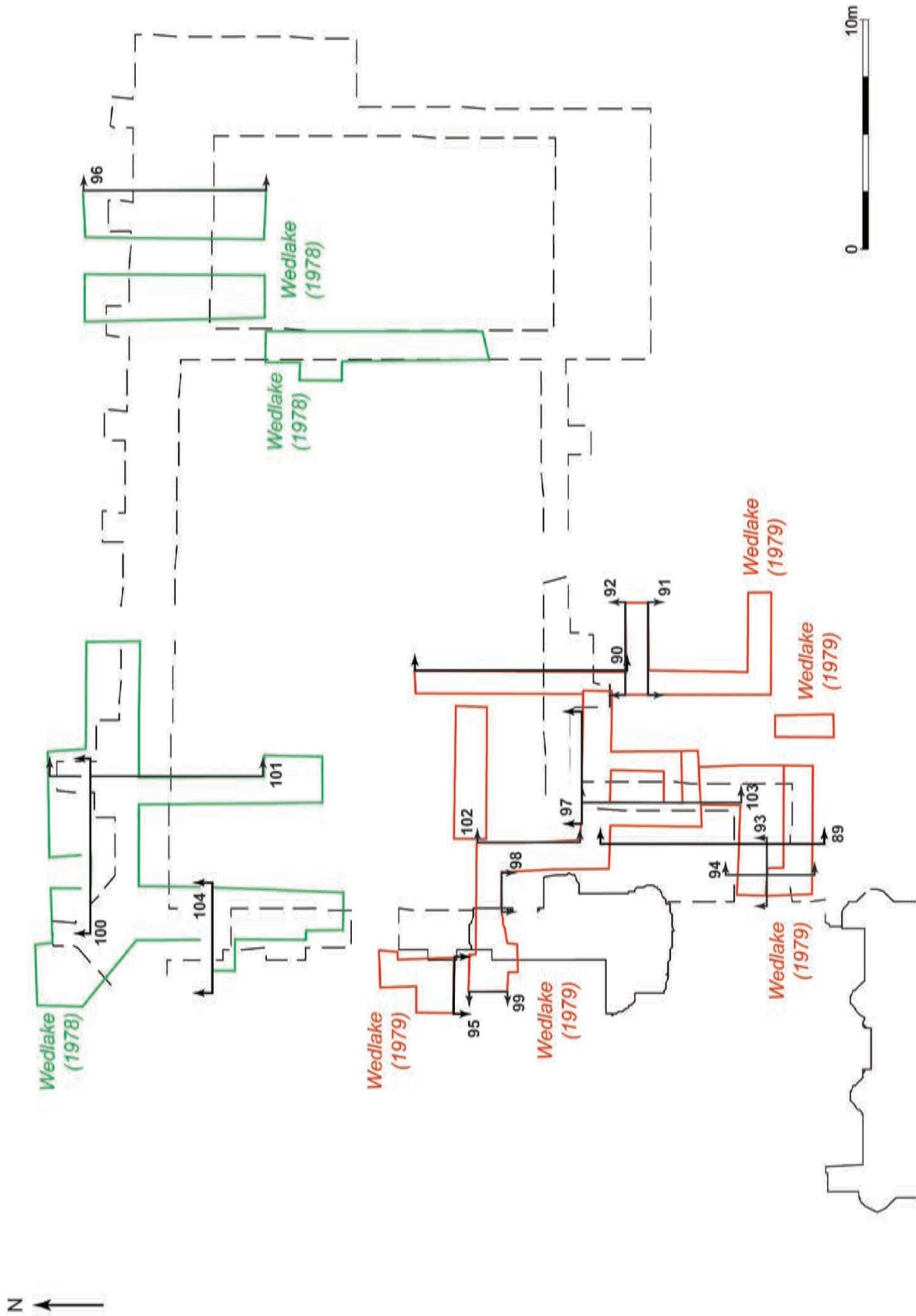


Fig App 2 Concordance of Wedlake's excavations

# Appendix 3

## Concordance of 1908–39 excavations

Date of excavations and area	Publication	Summary of results	Letter/label (where applicable) on Appendix 3 fig	Fig
<b>Bond</b>				
1908, monks' cemetery	Bond 1908	Burial 0.91m below modern turf. Elderly male with head placed in a circular recess within rectangular stone and feet covered by stone slab laid slightly obliquely. Stone placed on edge thought to mark end of grave. Other disturbed skeletal remains noted.	a	Fig 11.2
1908, crossing area of church	Bond 1908	Remains of foundations and lias paving beneath post-fire crossing. 45-degree angle of paving led Bond to suggest it may belong to one of apsidal terminations of the pre-fire churches. Radford's excavations disproved this. May relate to crossing area, although no depths provided to compare this to floor levels established from Radford's north transept sections.	b	Plan 3 Figs 4.3, 10.10
1908–9, east end of church	Bond 1915	Evidence for reredos wall behind altar with original trio of arches which Bond compared to Wells. Rectangular dais of high altar comprised clay platform surrounded by slight foundation wall for steps. Many fragments of black marble-like stone found in vicinity of high altar. One small fragment displayed part of arm in chain-mail and was suggested as being a relic from the tomb of Arthur.	c	Plan 4 Fig 10.14
	Bond 1908–9	Two surviving chapels at east end.	chapels	Plan 4 Fig 10.14
	Bond 1908	d) A 'first excavation trench' identified a robber trench interpreted as representing screen wall between the central chapel and the chapel to the south. Western end had rounded termination thought to indicate the foundation of a pier or engaged column, which aligned with respond on south aisle wall.	d	Plan 4 Fig 10.14
	Bond 1908	e) A 'second excavation trench' identified the north side of the central chapel.	e	
	Bond 1908	Trial shaft excavated just to east of Edgar Chapel revealing building stone at depth of 10ft (3.05m) above a deep clay fill. This overlay a deposit of interlaced twigs or small stakes, blackened from soil. Also one or two rib bones thought to be human. The deposit overlay natural soil. Suggested as evidence of early occupation but that further investigation required.	-	-
	Bond 1908–9	Sacristy or small chantry at south-east corner of the Edgar Chapel.	f	Plan 4 Fig 10.14
	Bond 1915	Explorations at east end of Monington's choir indicated that last bay on the south had been occupied by a screen wall perhaps indicating sanctuary location.	-	Plan 4 Fig 10.14
	Bond 1915	Remains of a room or building found on external south side of choir where string- and base-courses cut through. Foundations of structure indicated that it extended 2.74m from choir and, given narrowness of foundation, was probably late medieval.	g	Plan 4 Fig 10.14

Date of excavations and area	Publication	Summary of results	Letter/label (where applicable) on Appendix 3 fig	Fig
	Bond 1908–9	Diagonal wall ran north-eastwards from east end of the Edgar Chapel, containing a square drainage channel covered by thin stone slabs. The robbed north wall was 0.91m wide and extended south-eastwards from east end of Edgar Chapel. The two converging walls supposedly formed a theoretical three-sided apse, although no trace of an eastern wall connected them, and the drain within the south wall was recorded as continuing for a further 2.44m eastwards of the wall terminations. Bond's apse theory was not accepted and the SE–NW aligned remains are now accepted as a drain.	-	Plan 4 Fig 10.14
1909, south transept	Bond 1910, 63	West wall of south transept established together with wall-face.	south transept	Plan 4
1909, cloister	Bond 1910, 62	Paving slabs for north cloister walk and <i>in situ</i> bases of moulded piers of cloister (dated to Chinnock).	-	Plan 4
	Bond 1910, 63 and 69	Four stone water channels with some cover stones directly beneath level of latest cloister pavement. One channel exited into cloister garth on the north side of porch or small office found in the 6th bay from the north where a well was also identified.	-	Plan 4 Fig 10.15
	Bond 1910; Hollinrake and Hollinrake 2000	Stone-capped drain in south-east corner of cloister aligned approximately east–west and stone-lined drain heading south. East–west drain continued eastwards between chapter house and dormitory; however, the westward trajectory through the cloister garth was lost. Archaeological investigation in 2000 and 2007 located a water tank also shown on Bond's plan (Hollinrake and Hollinrake 2000).	-	Plan 4 Fig 10.15
	Bond 1910	Plan of chapter house mostly recovered including west entrance. Two phases found: late 12th century and a 14th-century rebuild comprising western half built by Monington, followed by eastern half built by Chinnock.	chapter house	Plans 3 and 4 Fig 10.15
1909–1910, cloister	Bond 1910	Plan of slype recovered.	slype	Plan 4
1910, east range	Bond 1910	Within chapter house, 20.8m from the east cloister wall, was a foundation projecting southwards from north wall by 0.61m, with remains of ashlar work above. Remnants of stone foundation to the east of this. At 23.67m from east cloister wall was a slight indication of a 2.44m wide cross-wall, identified as the east wall of the first-phase chapter house: reinterpreted in 1935 as the inner face of the later chapter house east wall.	chapter house	Plan 4
	Bond 1910	Drain aligned east–west to south of chapter house and a water-course located beneath dormitory vestibule; continued eastwards where it connected with a drain.	-	Plan 4 Fig 10.15
	Excavation Committee's report for 1914. Part i, 76–80	Masonry fragments adjacent to the drain described above were attributed to the infirmary, although the site has never been securely identified.	h	drain to S of chapter house recorded by Wedlake to S of chapter house, approx location of this trench on Fig 1.4
	Bond 1910	Identified north end of dormitory.	dormitory	Plan 4
	Bond 1911, 74; pl 2; 82–3	Refectory. Uncovered well-preserved undercroft. Bond's detailed observations noted presence of reused 12th-century stonework and a lead pipe in south-west corner. Bond suggested the thickness of the north-west corner indicated a tower possibly containing a flight of stairs connecting the vault and the refectory above.	refectory	Plan 4; postcard inset on Plan 5 Fig 10.15
	Bond 1911, 82	Refectory plan recovered. Traces of another building found on south side with evidence of an old kitchen midden with fragments of chicken bones, egg shells, pikes' bones and oyster shells indicating the presence of a kitchen midden.	refectory	Plan 4; postcard inset on Plan 5; Fig 10.15
1910, south transept	Bond 1910	West and south walls established. The foundations were noted as being 4.57m wide supporting a wall 3.96m wide, substantially thicker than the other walls recorded at the abbey. Bond suggested that the foundations may have been widened to include the breadth of the monks' night stairs from the dormitory.	south transept	Plan 4

Date of excavations and area	Publication	Summary of results	Letter/label (where applicable) on Appendix 3 fig	Fig
1910–11, cloister refectory	Bond 1911	Drain with remnants of stone capping running southwards along west cloister walk, continuing through north-west corner of the refectory where it met other drains shown in undercroft.	-	Plan 4 and Figs 10.15
	Bond 1911, 83	Stone-capped drain shown running westwards from above in west cloister walk with further short diagonal drain. Plan appears to show further drain extending northwards against outer wall of west cloister walk.	-	Plan 4 Figs 10.15
	Bond 1911, 83	East–west foundation measuring c 6m long and 0.9m wide, with southern return at eastern end. Bond interpreted this as possible remains of a <i>lavatorium</i> which he thought was corroborated by the presence of a high-level water-drain. Reinterpreted by Radford as Saxon walls.	i	Plan 1
	Bond 1911, pl 2	Older foundations between 2nd and 3rd inner buttresses from south end of west cloister walk.	i	Plan 1
1911–, chapel of St John the Baptist (otherwise known as St Dunstan's Chapel)	Bond 1913	Plan established from robbed foundations and <i>in situ</i> masonry. Aligned with <i>vetusta ecclesia</i> . Walls projected east and west by c 1.3m. In centre of west wall were two stones aligned east–west with c 0.1 grooves presumed to have held slabs forming side stones of an entrance. A wall extended northwards by 3–4m from approximate centre of chapel.	chapel of St John the Baptist	Plan 4
1913 or earlier, lodgings of the Clerks of our Lady	Bond 1913; Woods 1994	Southern end of a c 12m wide building situated to north of St Dunstan's Chapel. South-west corner is extant, comprising interior of a 14th-century vaulted undercroft with door jamb. Between the doorway and the north-west corner of the Lady Chapel the outline of a wall is indicated, captioned 'Site of boundary wall removed'. Northern end of this building excavated 1987–93 (Woods 1994). Interpreted as the 14th-century living quarters of the chaplains of the Galilee. Thought to have been demolished by 1475 and replaced by new buildings for secular priests and clerks.	lodgings of the Clerks of our Lady	Plan 4
1911, north porch	Bond 1908; Bond 1919	Footprint of a possible 14th-century building west of the north porch, with a small angle buttress abutting the first buttress on the west side of the north porch. Incorporating window tracery dated to c 1280 in the foundations.	j	-
	Bond 1912	To the north of the first buttress of the north porch, the surviving masonry, including vaulting ribs, was mostly 14th century indicating an extension.	north porch	Plan 4
	Bond 1919	In 1911, found a few broken mouldings including a window-mullion dated to the 15th or 16th century.	-	-
1911, to west of north transept	Bond 1915	3.81m wide wall running north from east bay of north nave aisle for a distance of c 5.5m. Initially interpreted as evidence for western aisle; subsequently Bond thought he had found the Loretto Chapel site and reinterpreted the wall as a passage or short cloister leading from the nave to the Loretto Chapel. West and north walls of north transept also established.	building	Plan 4 Fig 10.14
Pre-1915, monks' cemetery	Bond 1915	St Michael's Chapel located. Eastern side recorded in plan; foundations of south wall constructed of Tor burrs; west return established. Some upstanding walling noted at the south-east corner; oyster shells recovered from this area. A lead pipe protected by stone capping ran approximately east from this point. Presence of extensive tree-roots prevented further exploration.	St Michael's Chapel	Plan 4 Fig 10.15
1919, to west of north transept	Bond 1919	1919 – excavations carried to a greater depth (1.52m), exposing a south-west angle of solid foundations with short buttress on southern face. East return traced for short distance and entire west wall foundation establishing an external width of 6.1m. Robber trench for north wall had masonry at base and was traced for 9.75m. Bond suggested that an 1817 picture by Coney of a wall with four windows might represent south wall of the Loretto Chapel.	building	Plan 4 Fig 10.14
1921, north transept	Bond 1926	Small rectangular area of <i>in situ</i> tiles and remains of rough foundation continuing as far as robbed pier opposite dividing wall between two east chapels. Bond suggested tiles marked threshold perhaps to a chantry chapel with foundation possibly indicating an interior screen wall. The tiles have been re-set beneath a hatch (see Chapter 8). Captain Bowen's notebook records that a second small area of a tiled floor was exposed in 1938 (A39).	north transept	Plan 4

Date of excavations and area	Publication	Summary of results	Letter/label (where applicable) on Appendix 3 fig	Fig
1921, lay cemetery	Bond 1926	Substantial 1.52m wide foundation found running westwards for 9.14m from north-east corner of Lady Chapel, the eastern end resting on a series of projecting footings resembling a buttress. Truncated by 19 <sup>th</sup> -century steps for crypt. Aligned with church and not the Lady Chapel.		
		Interpreted by Bond as a protective stone enclosure for the <i>vetusta ecclesia</i> and therefore pre-fire. Radford identifies it as a retaining wall for the lay cemetery (Woods 1994, 11–12) and the alignment suggests a post-1184 date.	k	Plan 1
	Bond 1926	Circular platform identified as St David's Pillar. Constructed of small stones set in poor mortar and measuring 2.29m in diameter, the soft material in the centre of the platform was excavated to a depth of c 1.22m and contained 14 <sup>th</sup> -century moulding fragments. Bond suggested that the platform was a late reconstruction of an earlier monument thought to represent one of the pyramids erected to mark the eastward extension of the <i>vetusta ecclesia</i> . Excavations suspended at depth of 1.52m due to many interments encountered.	'St David's Pillar'	Plan 4
1921, to south west of nave	Bond 1926	A 'very old' square foundation of Tor burrs projected westwards below the 12 <sup>th</sup> -century foundation of the south-west nave tower. The results of the 1928 excavations meant these remains were reinterpreted as Saxon.	l	Plan 1 Fig 10.4
<b>Fyfe</b>				
1926, west end of nave	-	Two intact burials at western end of nave south aisle. Plan shows that one of these was removed in 1926 and the other was in a wooden coffin. The plan shows a stone coffin with a later burial above.	m	Fig 11.2
1926–7, west end of nave	Fyfe 1926a and 1926b; Fyfe 1927a and 1927b	Excavations of Saxon churches and Norman nave (see Chapter 4)	-	Plans 1, 2 and 3
<b>Peers, Clapham and Horne</b>				
1928–9, west end of nave	Peers <i>et al</i> 1928; Peers <i>et al</i> 1929; Radford 1981	Excavations of Saxon churches and Norman nave (see Chapter 4)	-	Plans 1, 2 and 3
1931, choir	Peers <i>et al</i> 1931	A trench along central axis of the choir identified substantial ashlar-built tomb in between third piers from west; it was postulated that this might be the tomb of King Arthur.	n	Fig 10.14
1932–4, dormitory	Peers <i>et al</i> 1932, 109–10; Peers <i>et al</i> 1934, 32	Side wall followed S in 1932. Longitudinal trench along centre dormitory exposed bases/ robber trench of central pillars. Reuse of Norman stone noted in later walls, including a plain capital.	dormitory	Plan 4
1933–4, reredorter	Peers <i>et al</i> 1933, 30; Peers <i>et al</i> 1934, 33–4	Large open sewer measuring 1.22m wide with high sloping sides made of stone slabs. In centre rectangular building measuring 24.38m by 12.19m externally. Lower level filled with solid clay within retaining wall. Floor of reredorter would have been located at same level as dormitory floor. Channels on either side of reredorter reunited to the west as a single stone-covered sewer intact for c 9.14m, subsequently passing near abbot's lodgings and abbot's kitchen.	reredorter	Plan 4
1935, chapter house	Peers <i>et al</i> 1935, 258	Excavations of east end of chapter house (see Chapter 5)	chapter house	Plans 3 and 4
1937, refectory	Peers <i>et al</i> 1937	Earlier explorations in area south of refectory indicated presence of two walls located 3.05m apart running south from refectory undercroft for distance of 7.62m. In between was solid slope 1.83m wide leading up to ground level which appears to have been one of the entrances to undercroft. The easternmost excavation trench was extended 33.53m to S, but only discoveries comprised a small and apparently unimportant lean-to building abutting west side of dormitory at its southern end.	o	Plan 4
1937, monks' kitchen	Peers <i>et al</i> 1937, 153–4	1937: E side of monks' kitchen thoroughly explored and traced to within 11m of the refectory. Identified an inner wall measuring 3m square; latter was situated beneath kitchen floor and was thought to have been sleeper for piers supporting a vaulted roof comparable to Ely.	monks' kitchen	Plan 4

<b>Date of excavations and area</b>	<b>Publication</b>	<b>Summary of results</b>	<b>Letter/label (where applicable) on Appendix 3 fig</b>	<b>Fig</b>
1938	Peers <i>et al</i> 1938	Supposed east wall of abbot's lodging connecting with south-west corner of monk's kitchen (now refuted: see Chapter 6)	abbot's lodging	Plan 4
1938	Peers <i>et al</i> 1938	South wall of extended abbot's lodging. Aligned with the southern boundary wall of the abbot's garden.	abbot's lodging	Plan 4
1938	Peers <i>et al</i> 1938	West wall of abbot's lodging (now refuted: see Chapter 6)	abbot's lodging	Plan 4
1938	-	Original southern wall of abbot's lodging thought to indicate a building measuring 38.1m long	abbot's lodging	Plan 4
1938	-	South-east extension of abbot's lodging	abbot's lodging	Plan 4
1938	-	Western projection at south end of abbot's lodging (now refuted: see chapter 6)	abbot's lodging	Plan 4
1938	Peers <i>et al</i> 1938	A circular tank at southern end of abbot's lodging measuring 1.22m diameter. Grooves for a sluice gate were noted.	abbot's lodging	Plan 4
1938	Peers <i>et al</i> 1938	'Cobbling' measuring 2.44m wide running along most of the western front of the building (now refuted: see chapter 6)	abbot's lodging	Plan 4
1938	Peers <i>et al</i> 1938	Narrower area in cobbling indicating location of front entranceway into lodging (now refuted: see chapter 6)	abbot's lodging	Plan 4
1938	Peers <i>et al</i> 1938	North-west and south-west corners of the abbot's garden.	abbot's garden	Plan 4
1939	-	Excavations in area to north of abbot's lodging and east of abbot's hall	p	Plans 1, 2 and 3

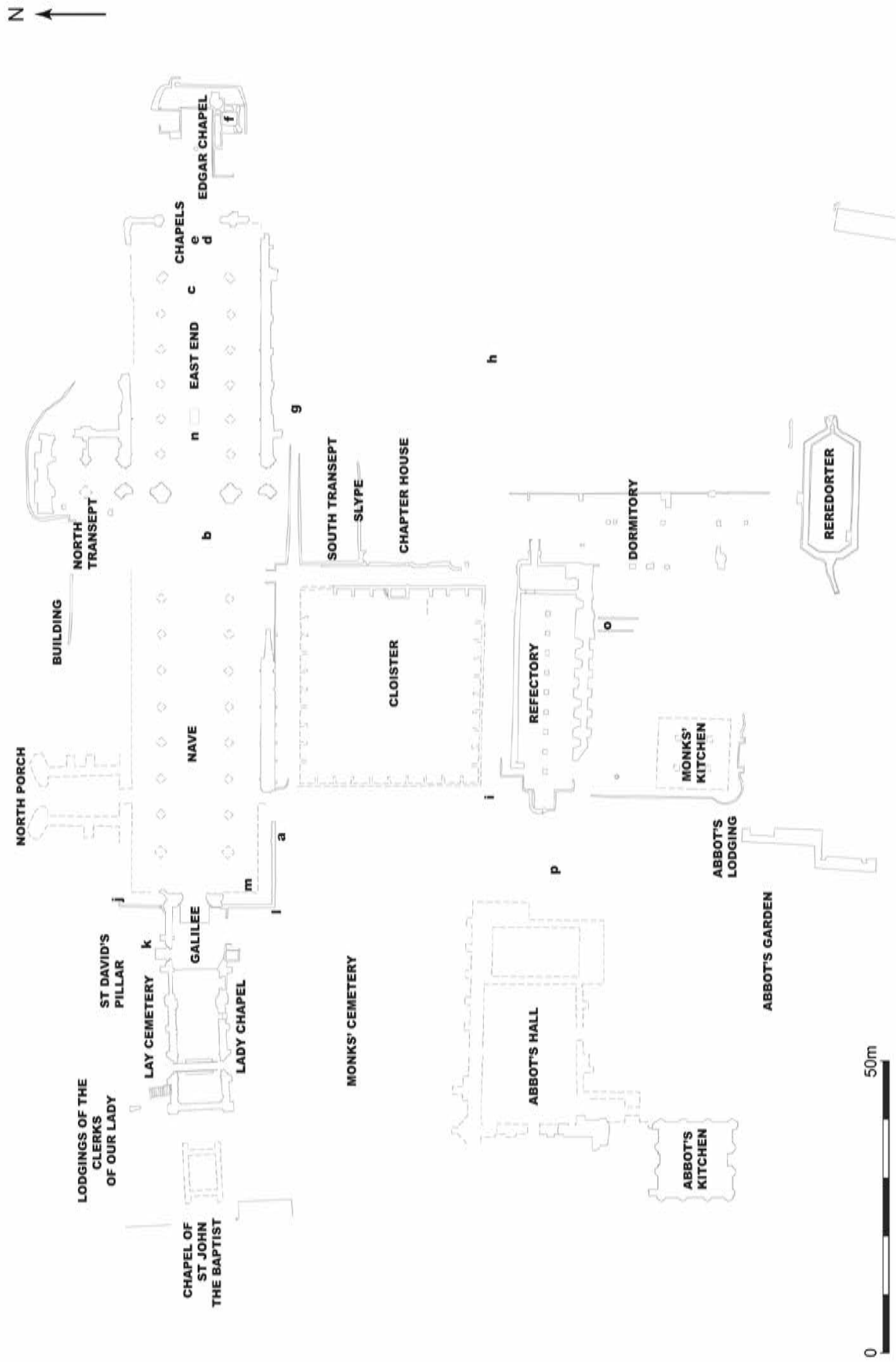


Fig App 3 Concordance of excavations 1908-39

# Notes

## Chapter 1

- 1 Carley 2001a.
- 2 Smith 1989.
- 3 Abrams 1996, 2.
- 4 Kelly 2012; Abrams 1996.
- 5 Carley 1985; Carley 1996; Dunning 1994.
- 6 Carley 2001b.
- 7 Abrams 1996, 4.
- 8 Robinson 1926; Robinson 1927.
- 9 Halsall 2013, 6.
- 10 Radford 1981, 115; Rahtz 1971; Rahtz and Hirst 1974.
- 11 Radford 1981.
- 12 Ramsay *et al* 1992; Carley 1996, 115.
- 13 Fernie 1983, 71; Hardy *et al* 2003, 489.
- 14 Cherry 1976.
- 15 Cramp 2009, 54; Peers and Radford 1943.
- 16 Rahtz 1993; Rahtz and Watts 2003.
- 17 Rahtz 1964; Rahtz 1971; Rahtz and Hirst 1974; Rahtz 1979; Rahtz *et al* 2000.
- 18 Rahtz 1991, 6.
- 19 NMR: GLA/Pub.
- 20 Gilchrist 2013.
- 21 Baker and Baker 1999.
- 22 Gilchrist 2008b.
- 23 <http://dx.doi.org/10.5284/1022585> (20 Nov 2014).
- 24 <http://dx.doi.org/10.5284/1022585> (20 Nov 2014).
- 25 Coppack 1990, 30.
- 26 Woods 1994; Ellis 1982; Burrow 1982; Leach 1988; Hollinrake and Hollinrake papers and unpublished reports 1989 to 2008.
- 27 [http://archaeologydataservice.ac.uk/archives/view/glastonbury\\_abbey\\_2007/](http://archaeologydataservice.ac.uk/archives/view/glastonbury_abbey_2007/) (20 Nov 2014).
- 28 Blain and Wallis 2004; Bowman 2009; Hutton 2003, 59–85.
- 29 After Meskell 2009.
- 30 Smith 2012; Bell and Smith 2012.
- 31 For example, Thomas *et al* 1997.
- 32 Hopkinson-Ball 2007; Hutton 2003, 64.
- 33 Gerrard 2003, 5; Rodwell 2005, 15–16.
- 34 Buckley *et al* 2013.
- 35 Stukeley 1724.
- 36 Warner 1826; Gilchrist and Sloane 2005, 125–6 and 171–2. The current location of the objects and skeletons is unknown.
- 37 Brown forthcoming.
- 38 Coppack 1990, 20.
- 39 Willis 1866.
- 40 Rodwell 2005, 23–4; Buchanan 2013.
- 41 Coppack 1990, 23.
- 42 Glastonbury Abbey Conservation Plan 2004, 113.
- 43 GLA: A628.
- 44 Bond 1908, 107.
- 45 NMR: GLA/PUB/6/3/1.
- 46 Rahtz and Watts 2003, 101.
- 47 Bond 1918.
- 48 Hopkinson-Ball 2007, 113.
- 49 Bond 1918; Hutton 2003, 64.
- 50 Ibid, 48, 52.
- 51 Ibid, 59.
- 52 Ibid, 128.
- 53 Ibid, 136.
- 54 Fyfe 1926b, 20.
- 55 *The Tablet*, 8 November 1952, 17.
- 56 GLA: A628.
- 57 GLA: A628.
- 58 Peers *et al* 1931, 83.
- 59 Gilchrist 2013.
- 60 Ibid; Edwards 2009a, 3–4.
- 61 Radford 1981.
- 62 Radford 1981, 127.
- 63 GLA: A507.
- 64 GLA: A508.
- 65 GLA: A508.
- 66 GLA: A508.
- 67 GLA: A508.
- 68 Radford 1968a, 114–7.
- 69 Radford and Swanton 1975, 45.
- 70 Radford 1981, 115.
- 71 GLA: A508; Radford 1968a, 114.
- 72 Radford 1968b, 235.
- 73 GLSGA 1995/103/233.
- 74 *Antiq J* 70 (1990), 527–8.
- 75 GLA: A628.
- 76 Bond 1908, 107–8.
- 77 Bond 1915, 140.
- 78 Hopkinson-Ball 2007, 159, 146, 177, 183.
- 79 GLA: A39.
- 80 GLA: A29.
- 81 NMR: GLA/Admin/1/2/8.
- 82 Radford 1981, 131.
- 83 Gilchrist 2013; Radford and Swanton 1975.

## Chapter 2

- 1 Dr Robert Dunning, *pers comm*.
- 2 Ibid.
- 3 Jane and Tony Harcourt, *pers comm*.
- 4 Rahtz and Watts 2003, 101.
- 5 Radford 1981, 131.



- 6 Professor Dame Rosemary Cramp, *pers comm*.  
 7 Barrowman, Batey and Morris 2007, 307.  
 8 Gilchrist 2013.  
 9 Gerrard 2009a, 41–2.  
 10 Gerrard 2009b, 97.  
 11 Professor Charles Thomas, *pers comm*.  
 12 Downland Partnership 2007–8.  
 13 Radford 1981, 116.  
 14 GLA: A624.  
 15 NMR:GLA/PUB/6/3/1.  
 16 GLA: A508.  
 17 All illustrations have been carried out to the standards set out in Adkins and Adkins 1989 and Steiner 2005.  
 18 Levels and levels data can be accessed on original section drawings and transcriptions of original site notebooks within the digital archive deposited with the Archaeology Data Service (ADS).  
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### Chapter 3

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 2 Everson and Stocker 2011, 10.  
 3 Austin 2013, 4.  
 4 For monastic memory and the use of antiquity see Luxford 2005, 145–7; Gilchrist 2005, 251–3; O’Carragáin 2010, 165.  
 5 Winterbottom and Lapidge 2012, 13.  
 6 Dunning 2006, 6.  
 7 Aston 2003; Rahtz and Watts 2003; Rippon 2004.  
 8 Blair 2005, 194, 196; Carver 2009; Loveluck 2007.  
 9 Semple 2011, 747–9.  
 10 Hollinrake and Hollinrake 2007b.  
 11 Rippon 2004.  
 12 Dunning 2006, 16.  
 13 Gathercole 2003, 36; Hollinrake 1992b.  
 14 Blair 2005, 266; Costen 1992, 36.  
 15 British Geological Survey: [http://www.bgs.ac.uk/discovering\\_Geology/GeologyOfBritain/viewer.html](http://www.bgs.ac.uk/discovering_Geology/GeologyOfBritain/viewer.html) (16.06.2015).  
 16 Rahtz and Watts 2003, 39.  
 17 Gathercole 2003, 6.  
 18 Rahtz and Watts 2003, 30.  
 19 Rahtz and Watts 2003, 42, 143; Dunning 2006, 6.  
 20 Creighton 2009, 74.  
 21 Rahtz and Watts 2003, 138–9.  
 22 Rahtz and Watts 2003, 30, 134–6; Rahtz 1964.  
 23 Hutton 2003, 63.  
 24 Aston 2003, 42; Rippon 2004, 101–2.  
 25 Rahtz 1971; Rahtz 1991; Rahtz and Watts 2003 71–84.  
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 28 Scott 1981.  
 29 Abrams 1996, 6.  
 30 Scott 1981.  
 31 Kelly 2012.  
 32 Kelly 2012, 17–18.  
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 34 Foot 1991; Hall 2003.  
 35 Kelly 2012, 26.  
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 37 Brooks 1992.  
 38 Kelly 2012, 49.  
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 41 Brooks 1992.  
 42 Kelly 2012, 74.  
 43 Winterbottom and Lapidge 2012, 13.  
 44 Foot 1991, 163.  
 45 Scott 1981, 67.  
 46 Scott 1981, 66–7.  
 47 Scott 1981, 49.  
 48 Luxford 2005, 145.  
 49 For example, the history of Selby Abbey, completed 1174, claimed its origins were divinely inspired by visions of St Germanus: Burton with Lockyer 2013.  
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 51 Hutton 2003, 72–4.  
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 53 Carley 1996, 177.  
 54 Radford 1968c; Radford 1981.  
 55 Gittos 2013, 62.  
 56 Kelly 2012, 74–7.  
 57 Watkin 1947–56.  
 58 Carley 1996; Hearne 1727.  
 59 Carley 1996, xix–xxv.  
 60 Gathercole 2003, 8.  
 61 Carley 1996.  
 62 Carley 1996, 80–3.  
 63 Austin 2013, 4.  
 64 Knowles and Hadcock 1971, 66.  
 65 Knowles and Hadcock 1971, 360.  
 66 Carley 1996, 71.  
 67 Keil 1964.  
 68 Carley 1996, 77.  
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 71 Carley 1996, 148, 158.  
 72 Rahtz and Watts 2003, 59.  
 73 Gilchrist and Sloane 2005, 90–1.  
 74 Rahtz and Watts 2003, 114.  
 75 Gransden 2001, 46.  
 76 Lagorio 2001, 57–8.  
 77 Hutton 2003, 68.  
 78 Hearne 1727, ii, 34; Carley 1985, 182.

- 79 Luxford 2012a, 42.  
80 *Ibid.*, 44.  
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83 *Ibid.*, 156.  
84 Carley 1985, 245.  
85 Lindley 2007, 146.  
86 Oxford, Bodleian Library, MS Ashmole 826, fol 107; quoted in Luxford 2012a, 49.  
87 Luxford 2012a, 47.  
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100 Krochalis 1997.  
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103 Hutton 2003, 69–70.  
104 Carley 2001a.  
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106 Rahtz and Watts 2003, 59–61.  
107 Mabey 1996, 213–14.  
108 Hearne 1727; Standen 2000; Carley 1985.  
109 Cambridge, Trinity College MS R16; Luxford 2012b.  
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112 Gathercole 2003, 8.  
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115 *Ibid.* 249, 253; Carley 1996, 37–9.  
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118 Luxford 2012a; Luxford 2012b.  
119 Wilson, 2008, 217.  
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121 Leland 1964, III, 289.  
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134 Sampson 2013.  
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136 Wilson 1980, 319–23, cited in Monckton 2006 and Luxford 2012a.  
137 *Ibid.*  
138 Sampson 2005.  
139 John Allan, pers comm.  
140 Carley 1985, 263.  
141 Brown forthcoming.  
142 Brown 2010.  
143 Creighton 2009, 193.  
144 Burrow 1982; Hollinrake and Hollinrake 1989; Rodwell 1984; Glastonbury Abbey Conservation Plan 2004.  
145 Rodwell 1984, fig 9.  
146 Aston and Leech 1977; Dunning 2006, 16.  
147 Woods 1994.  
148 Glastonbury Abbey Conservation Plan 2004, 4; Rahtz and Watts 2003, 119–20; Aston and Leech 1977, 588.  
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154 Bell 1998.  
155 Luxford 2012b, 253.  
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158 GLSGA: 1998/13 A834, hard-backed Minute Book of Glastonbury Abbey Trustees, part 1, 76–80.  
159 GLSGA 1995/103/233.  
160 Gilchrist 2008b, 363.  
161 As at Norwich, Chichester and Ely cathedrals: Gilchrist 2005, 191.  
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163 Stukeley 1724.  
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167 Hollinrake and Hollinrake 2008; Burrow 1982.  
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172 Glastonbury Abbey Conservation Plan 2004, 48.  
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- 189 Calendar of Patent Rolls I Edward VI, 124–33.
- 190 Howard M 2003.
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- 196 *Gulielmi Camdeni Elogia Anglorum*, cited in Glastonbury Abbey Conservation Plan 2004, 97.
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- 207 Dunning 2006.
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- 19 Ibid, 123.
- 20 Radford 1968a, 114.
- 21 Radford 1968b, 236; cf Rahtz and Watts 2003, figs 43 and 44.
- 22 Radford 1981, 123.
- 23 Radford 1955, 22; Radford 1981, 123.
- 24 Radford 1981, 123.
- 25 Rodwell 2001, 83.
- 26 Radford 1981, 115.
- 27 Ibid, fig 2.
- 28 Peers *et al* 1928, 2.
- 29 Radford 1968a, 115.
- 30 Ibid, 116.
- 31 Radford 1955, 22.
- 32 Radford 1981, 115.
- 33 Radford 1968, 114.
- 34 Bond 1908, fig 7, 130.
- 35 Gilchrist 2008a, 145.
- 36 Cramp 2006a, 153–8.
- 37 Radford 1981, 116.
- 38 Peter Poyntz-Wright, *pers comm*.
- 39 Bond 1926, 17.
- 40 Radford 1968a, 115.
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- 48 Peers *et al* 1928, 2.
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- 50 Peers *et al* 1929, 29.
- 51 Radford 1981, 118.
- 52 Peers *et al* 1929, 28.
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- 54 Cramp 2006a, 155 and 157; Peers *et al* 1928, 4.
- 55 Peers *et al* 1928, 3.
- 56 Radford 1981, 121, fig 4.
- 57 Peers *et al* 1928, 8.
- 58 Ibid, 3–4.
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- 69 Radford 1981, 130.
- 70 Radford 1960, 254.
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- 3 Aston and Leech 1977; Rahtz and Watts 2003, figs 43 and 44; Radford 1981, fig 4.
- 4 Rahtz and Watts 2003, figs 51, 52.
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- 6 Bond 1926, 16.
- 7 Woods 1994, 11–12.
- 8 Warner 1826.
- 9 Rahtz and Watts 2003, 105
- 10 Goodall 1986.
- 11 Goodall 1986; Bond 1926, 15.
- 12 Lindley 2007, 141.
- 13 NMR: GLA/Admin/1/2/8.
- 14 Bond 1926, 18.
- 15 Woods 1994, 11–12.
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 75 Carley 1996, 17; Radford 1958, 169.  
 76 Leland 1964, III, 290.  
 77 Bond 1919, 79.  
 78 Hopkinson-Ball unpublished, 9.  
 79 Radford 1981, 127.  
 80 Radford 1956b, 70.  
 81 Radford 1981, 127.  
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 83 Ibid, 127.  
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 85 Bond 1915, 132–3.  
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## Chapter 5

- 1 Radford 1955, 22; Radford 1956b, 69.  
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 3 Rahtz and Watts 2003, fig 43; after Aston and Leech 1977.  
 4 Radford 1955, 22.  
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 8 Ibid, 131.  
 9 Gilchrist 2005, 118.  
 10 Radford 1955, 21–2.  
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 12 Radford 1955, 23.  
 13 Rahtz and Watts 2003, fig 43; after Aston and Leech 1977.  
 14 See Section 9 of the archive deposited with the Archaeology Data Service.  
 15 NMR: GLA/Admin/1/2/13.  
 16 Radford 1955, 22.  
 17 Bond 1910, 75.  
 18 Radford 1958, 167.  
 19 Evison 2000, 193–4.  
 20 Radford 1958, 167; Radford 1981, 114.  
 21 Radford 1958, 167.  
 22 Radford 1960, 251.  
 23 The samples were pre-treated as described by Stenhouse and Baxter (1983) with CO<sub>2</sub> obtained from the pre-treated samples combusted in pre-cleaned sealed quartz tubes (Vandeputte *et al* 1996) and then converted to graphite (Slota *et al* 1987). The samples were dated by Accelerator Mass Spectrometry (AMS) as described by Freeman *et al* (2010). The laboratory maintains a continual programme of quality assurance procedures, and participates in international inter-comparisons (Scott 2003; Scott *et al* 2010). These tests indicate no significant offsets and demonstrate the validity of the precision quoted.  
 24 Stuiver and Polach 1977; Stuiver and Kra 1986.  
 25 Bronk Ramsey 1995; Bronk Ramsey 1998; Bronk Ramsey 2001; Bronk Ramsey 2009.  
 26 Stuiver and Reimer 1986; Stuiver and Reimer 1993.  
 27 Buck *et al* 1996.  
 28 Oxford Radiocarbon Accelerator Unit <<http://c14.arch.ox.ac.uk/>> (8 Feb 2015). Details of the algorithms employed by this program are available from the on-line manual or in Bronk Ramsey 1995; Bronk Ramsey 1998; Bronk Ramsey 2001; Bronk Ramsey 2009.  
 29 Ward and Wilson 1978.  
 30 Buck *et al* 1992.  
 31 Radford 1956b, 69.  
 32 Radford 1981, 124.  
 33 Bond 1911.  
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 35 Radford 1981, 124.  
 36 Ibid, pl 24a.  
 37 See Section 9 of the archive deposited with the Archaeology Data Service.  
 38 Radford 1981, pl 23c.  
 39 Depicted in Radford 1981, fig 5.  
 40 Ibid, fig 5.  
 41 Radford 1955, 21.  
 42 Bond 1911, pl 2.  
 43 Radford 1955, 21.  
 44 Radford 1960, 254.  
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 47 Radford 1981, fig 6.  
 48 Radford 1958, 168.  
 49 Bond 1910, 63.  
 50 Radford 1956b, 72.  
 51 Ibid, 72.  
 52 McAleer 2001, 77.  
 53 Gilchrist and Sloane 2005, 189–91.  
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 56 Bond 1910, 68 and 71.  
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 59 Carley 1996, 137.  
 60 Bond 1910, 69 and 78.  
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 65 Gilchrist and Sloane 2005, 197.  
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 67 Bond 1910, 72–5.

## Chapter 6

- 1 Hearne 1727, II, 334; Carley 1996, xxiii.  
 2 Radford 1981, 124.

- 3 Radford 1981, pl 24B.
- 4 Radford 1968a, 117.
- 5 Radford 1955, fig 1.
- 6 Radford 1981, 124.
- 7 Bond 1915, 136.
- 8 Radford 1968b, 236.
- 9 GLA: A623.
- 10 Hearne 1727, II, 334.
- 11 Radford 1968a, 117.
- 12 Radford 1968b, 236.
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- 14 GLA: A623.
- 15 Radford 1968b, 235.
- 16 Peers *et al* 1938, 135.
- 17 *Ibid*, 135.
- 18 *Ibid*, 135.
- 19 *Ibid*, 135.
- 20 Radford 1968a, 116.
- 21 GLA: A623.
- 22 Radford 1968a, 116.

## Chapter 7

- 1 NMR: DBH01/12, Letter 4.
- 2 NMR: DBH01/8–9.
- 3 Painter and Thompson 1994.
- 4 NMR: GLA/POST/1/14.
- 5 For example, an unspecified number were given to Professor W E S Turner for analysis in 1956; after being handed to Roy Newton their whereabouts is now unknown: NMR:GLA Admin 1/1. Ten samples, including later window glass, were also sent to the Corning Museum of Glass and it is possible that others were sent elsewhere: Brill 1999a, 118–19; Brill 1999b, 261–2; Brill and Stapleton 2012, 468–72.
- 6 NMR: GLA/POST/1.
- 7 Bayley 2000b, 161.
- 8 Evison 2000.
- 9 Outlined in Bayley 2000b, 183.
- 10 See <http://dx.doi.org/10.5284/1022585> (11 Feb 2015).
- 11 IADB PID: 18571.
- 12 IADB PID: 18571.
- 13 NMR: GLA/SITE/3–6, 8–11.
- 14 NMR: DBH01/12, Letter 8.
- 15 In notes entitled ‘Radford’s ideas’, he recorded a ‘mortar floor ... this belongs to glass works stage (glass in it and under it) and represents earlier oven (?)’ NMR: DBH01/12, Letter 8.
- 16 Bayley 2000b, 171.
- 17 IADB PID: 18563.
- 18 NMR: DHB01/10, 19 back.
- 19 IADB PID: 18562 and PID 18568.
- 20 BF4102.
- 21 NMR: DBH01/14 Letter 5.
- 22 Jope-Harden 24/08/55: NMR: GLA/Admin/1/2/3.
- 23 BF4101 and SF4107.
- 24 SF4106; Bayley 2000b, 166.
- 25 NMR:DBH01/10.
- 26 Harden in his notebook sketched three north–south sections across CLE1, although these are too vague to be of much value. NMR: DBH01/10, 17–18.
- 27 IADB PID: 18564 and PID: 18569.
- 28 NMR: DBH01/10.
- 29 NMR: DBH01/10, 12.
- 30 NMR: DBH01/10, 15.
- 31 This relationship can perhaps be mostly clearly seen in the photograph IADB PID: 18564.
- 32 NMR: DHB01/10, 12.
- 33 NMR: DHB01/10, 10.
- 34 IADB PID: 18569.
- 35 BF4070.
- 36 Lang and Price 1975; Clairmont 1976, 167.
- 37 SF4043.
- 38 Jope-Harden 24/08/55: NMR: GLA/Admin/1/2/3; NMR: DBH01/14 Letter 5.
- 39 Taylor and Hill 2008.
- 40 *Ibid*, 249.
- 41 *Ibid*, 260, fig 20.
- 42 BF3081 and SF3187.
- 43 Taylor and Hill 2008, 254–5.
- 44 *Ibid*, 259–60.
- 45 *Ibid*, 257–9.
- 46 IADB PID: 18571.
- 47 NMR: DBH01/12, letter 5.
- 48 Radford 1956b, 68–73.
- 49 NMR: GLA/POST/1/14.
- 50 NMR: DBH01/10, 14–15.
- 51 Cited in Bayley 2000b, 167.
- 52 NMR: DBH01/15, Letter 11.
- 53 Charleston 1984, 15; Rahtz 1993, 92.
- 54 Bayley 2000b, 175.
- 55 Evison 2000, 193–4.
- 56 *Ibid*.
- 57 To the Scottish Universities Environmental Research Centre (SUERC).
- 58 P Pettitt, pers comm.
- 59 NMR: DBH01/8, No 9.
- 60 Evison 2000, 193–4.
- 61 Garmonsway 1952, 40.
- 62 Cramp 1975, 93; Plummer 1896, v, 368.
- 63 Cramp 2000; a summary is provided in Willmott 2010, 5.
- 64 Wilson and Hurst 1962–3, 307–8.
- 65 Mills and Cramp 2006, 470–1.
- 66 Tite 2006.
- 67 MacGowan 1996.
- 68 BF3081 and SF3187.
- 69 MacGowan 1996, 178.
- 70 Evison 1991.
- 71 Evison 1991, 143–4; Jennings 2005; Hill 1997.
- 72 Cramp 2006b, 57.
- 73 *Ibid*, 78.

- 74 Foy and Bonifay 1984; Esquieu 1984.  
 75 Sablerolles 1999; Hodges 1991.  
 76 Leciejewicz *et al* 1977.  
 77 John Allan, pers comm.  
 78 Mills and Cramp 2006, 470–1.  
 79 Rahtz 1993, 76.  
 80 Bayley 2000b, 174. ‘Primary production’ refers to melting sand and ashes or natron. ‘Secondary production’ refers to the re-melting of cullet.  
 81 Bayley 2000, 172–3.  
 82 Using natron as the mineral alkali source combined with lime bearing sands, as discussed by Brill 2006; Freestone 2006; Hunter and Heyworth 1998.  
 83 Brill 1988; Gorin-Rosen 1995; Gorin-Rosen 2000; Freestone and Gorin-Rosen 1999; Nenna 2000; Nenna *et al* 2005; Tal *et al* 2004.  
 84 Degryse *et al* 2005; Degryse *et al* 2006; Degryse and Schneider 2008; Freestone 2005; Freestone 2006; Freestone *et al* 2000; Freestone, Greenwood and Gorin-Rosen 2002; Freestone, Ponting and Hughes 2002; Freestone *et al* 2003; Freestone *et al* 2009; Freestone and Hughes 2006; Henderson *et al* 2005; Leslie *et al* 2006; Ramadan 2010; Schibille 2011; Silvestri *et al* 2010; Wedepohl and Baumann 2000.  
 85 Freestone 2003; Jackson 1996; Mirti *et al* 2000; Whitehouse 2003; Wolf *et al* 2005.  
 86 Details of all methods and analytical data can be found in the online project archive.  
 87 The LMLK group, as per Sayer and Smith 1961.  
 88 The <sup>87/86</sup>Sr ratios reflect the inclusion in the base composition of the glass of modern marine shell (<sup>87/86</sup>Sr ~0.7092) from calcareous sands, and the <sup>143/144</sup>Nd ratios an eastern Mediterranean origin of the sand in the base composition; see Degryse *et al* 2010; Freestone *et al* 2009; Ganio *et al* 2012.  
 89 Heck and Hoffman 2000; Heck and Hoffman 2002; Henderson 1988.  
 90 Bayley 2000b. It has also been noted by Black (this volume) that there appears to be a close chemical relationship between the glass and slag and metal alloy samples from Area A.  
 91 Freestone 2006, 151–2.  
 92 Brill 2006.  
 93 Freestone 2003; Freestone 2006.  
 94 Foy *et al* 2000; Freestone *et al* 2002.  
 95 Freestone 2006.  
 96 This phenomenon has been observed in the waste material from the replica Roman glass furnace (Taylor and Hill 2008; Paynter 2008) and noted in other groups of glasses from this period (Jackson *et al* 2003).  
 97 Freestone *et al* 2003.  
 98 Evans *et al* 2010.  
 99 Ganio *et al* 2012.  
 100 Meek 2011, 125.  
 101 Taylor and Hill 2008.

## Chapter 8

- 1 Bond 2007, 694; Lewis 2005, 133.
- 2 Hollinrake and Hollinrake 2000; Hollinrake and Hollinrake 2007a.
- 3 Hollinrake and Hollinrake 2003.
- 4 Coles and Coles 1986, 16.
- 5 Gerrard 2007, 938.
- 6 Lewis 2005, 133.
- 7 Bond 2007, 722; Gerrard 2007, 942.
- 8 Rahtz 1964.
- 9 Morris 2007, 566.
- 10 Peacock 1969; Williams 1989.
- 11 Woodward 1990; Williams 1989; Morris 1987; Morris 2000.
- 12 Woodward 1990, fabric 481; Morris 1987, 33.
- 13 Cf Peacock 1969, 48.
- 14 Peacock 1969, 48–50, group 4.
- 15 Price and Watts 1980, 25.
- 16 Cf Cleal 1995, fig 16.2.
- 17 Morris 1987, fig 3, 36–9; Woodward 2000, fig 12, E 3B C–20.
- 18 Morris 1987, fig 3; Woodward 2000, fig 12, ceramic assemblages 5 and 6.
- 19 Morris 1987, types J1A–J1B, fig 3, 1–7; Woodward 2000, fig 12, E 3B C–4; Brown 2000, type JB1.2, JB2.1–2, figs 3.15–3.16; Lawson 2000, bowl type 3.3, jar type 32, figs 48, 30, 54, 60; Brown 2000, BA2, fig 3.29.
- 20 Brown 2000, type PA2.1, 90, fig 3.36.
- 21 Woodward and Blinkhorn 1997; Hancocks 2003, fig 17.1; Morris and Crosby 2007, 57–8, tables 4–6.
- 22 Timby 2007, 572; Allan 1998.
- 23 Thanks to Joanna Bird for identifying the East Gaulish samian.
- 24 Tomber and Dore 1998, 127.
- 25 Ibid, 129.
- 26 Ibid, 141; Fulford 1975.
- 27 Fulford 1975.
- 28 Tomber and Dore 1998, 176.
- 29 Young 1977.
- 30 Tomber and Dore 1998, 148–9.
- 31 Leach 1982, fig 73; Timby 2007, fig 13.22, R65.
- 32 Tomber and Dore 1998, 192.
- 33 Cf Timby 2007, 600.
- 34 Farwell 1998; Hollingrake & Hollinrake 1992; Rahtz 1991; Carr 1985.
- 35 Hartley 1991; Rahtz 1991.
- 36 Carr 1985.
- 37 Warry 2006.
- 38 Brodribb 1987, 63–83.
- 39 Rahtz and Hirst 1974, 66; Rahtz and Watts 2003, 32.
- 40 Williams 1971, 16–19.
- 41 Rahtz and Greenfield 1977, 52; Branigan 1977, 111.
- 42 Eaton 2000; Allan *et al* 2008; Smart 2008.
- 43 Rahtz and Greenfield 1977; Allan *et al* 2008.
- 44 Hill and Kent 1972, 205; Sutherland and Carson 1966, VII Lyons 267.

- 45 Reece and James 1986, 34.
- 46 Bayley and Butcher 2004, 66–9; Mackreth 2011, 130–3.
- 47 Eckardt and Crummy 2008, 141–2.
- 48 Eckardt and Crummy 2008, 146, fig 90, 39–40.
- 49 In preparing this paper we were greatly helped by Stephen Minnitt of Somerset County Museum, who arranged our access to post-Roman pottery from a number of sites in Somerset. Mike Ponsford inspected a number of the Bristol wares and made valuable comments on them. Thin-sections were prepared by Paul Hands of the University of Birmingham. Unless stated otherwise, the photographs are the work of Gary Young.
- 50 Letter dated 13 September 1991, site archive.
- 51 A detailed description of the state of the collection in 1991 and the reasons for concluding that all this material had been so muddled that it could only be treated as unstratified, are spelled out further in Kent 1991, 2–5. This also describes the reasoning behind the present accessioning of the collection.
- 52 Hollinrake and Hollinrake 2008.
- 53 Kent 1991, 2–3.
- 54 Letter dated 13 September 1991, Radford to V Dawson, site archive.
- 55 Unlike reliably excavated groups of the late twelfth and early thirteenth centuries, the pottery from the excavations of 1952–4 contains more glazed tripod pitchers than unglazed coarsewares (Table 6). Unless the abbey had a quite different pattern of usage from that seen elsewhere in the West Country, the coarsewares must have been discarded.
- 56 Letter dated 13 September 1991, Radford to V Dawson, site archive.
- 57 Rahtz 1979, 308–51.
- 58 Gutiérrez 2007.
- 59 Allan 1998.
- 60 Allan *et al* 2010.
- 61 Hughes 1998; Allan *et al* 2010.
- 62 RT thanks Dr David Williams for confirming the identification of these sherds.
- 63 Thomas 1981, 3; Tomber and Dore 1998, P&W AM 44.
- 64 Radford 1955, 21.
- 65 Arthur and Oren 1998, 203; Keay and Williams 2005.
- 66 Bidwell *et al* 2011, 93–100.
- 67 Van Alfen 1996, 208.
- 68 Most recently Rahtz 1993, 58.
- 69 Kent 1996, 75.
- 70 Rahtz 1971.
- 71 Carr 1985, who cites further examples from earlier excavations at the site.
- 72 Rahtz 1971.
- 73 Tomber and Williams 1986; Campbell 2007.
- 74 Rahtz 1974, 104; Rahtz 1979, 314–23.
- 75 Rahtz 1974, 114, no 33, and 116; Gutiérrez (2007, 602) came to the same conclusion.
- 76 Gutiérrez 2007, 602; Gutiérrez 2008, 112–13.
- 77 Rahtz 1979, 308.
- 78 Gloucester and Hereford: Vince 1984, ch 11, 10–11; Exeter: Allan 1984, 8–13.
- 79 Rahtz 1974, 116, dated late tenth and early eleventh century.
- 80 For the classic study of Winchester ware see Biddle and Barclay 1974. The sub-type is distinguished by its small sand temper (up to 0.5mm).
- 81 For Cheddar: Rahtz 1979, 118, MP 211; South Cadbury: Stevenson and Alcock 1995, 97, LSG 2; Ilchester: Pearson 1982, 181, no 575.
- 82 Vince 1984, ch 11, 9; for Bristol and Cirencester see Biddle and Barclay 1974, 151.
- 83 Allan 2003; Allan *et al* 2010.
- 84 Details in Allan *et al* 2010.
- 85 Rahtz 1974, 116.
- 86 Vince 1984, ch 11.
- 87 Allan *et al* 2010, 172–3.
- 88 Cf a vessel from Exeter: Allan 1984, no 309.
- 89 Rahtz 1974, 117, nos 67–8; Kent 1996, 76–8.
- 90 Kent 1996, 83, fig 4.
- 91 For finds up to 1980 see Allan 1983, 194. Further finds have emerged at Milton Abbey (Dorset County Museum acc. no. 1972.5), Corfe Castle (RCHME 1960, fig 15.8–9), and Sherborne Old Castle (Allan 2003, 75, fig 2.1).
- 92 Or ‘so-called Orléans-type ware’: McCutcheon 2006, 99–102. For the vessel see Allan 1984, 70, no 888.
- 93 Allan 1983, 202, from the Wool House; also a few sherds within the category ‘North French glazed wares’: Brown 2002, 22–3, 102–4.
- 94 McCutcheon 2006, 99–102.
- 95 Françoise Labune-Jean, pers comm June 2015.
- 96 Vince 1984, ch 11, 26–7.
- 97 For other sites where the figure is well below 10 per cent see Rahtz 1979, 333–9; Allan 1984, 39, 63, 70–8; Allan 2003, 76.
- 98 Ponsford 1991.
- 99 Saintonge wares are also known on other sites in the area, eg Chew Valley Lake (Dunning 1977) and Burrow Mump (Somerset County Museum, unpublished).
- 100 Ponsford (1983, 224) quotes between 1 and 8 per cent of sherd totals on sites in the town.
- 101 Bristol Pottery Type 118.
- 102 Gutiérrez 2007, 614.
- 103 References assembled in Le Patourel 1968, 120.
- 104 Clery 2003.
- 105 Hollinrake and Hollinrake 2005.
- 105 Hughes’s study will be presented as part of the publication of the kiln site.
- 107 Le Patourel 1968, 125; Gutiérrez 2007, 661, fig 13.76.
- 108 Murless 2000.
- 109 Le Patourel 1968, 125.
- 110 Wedlake 1935: acc no GLSGA:1989/4/1, P8.
- 111 Kent 1995.
- 112 Cleve Abbey: Allan 1998, 51–5; Moreton Mill, Chew Valley Lake: Rahtz and Greenfield 1977, 328–32; Ilchester: Pearson 1982.

- 113 Coleman-Smith and Pearson 1988.
- 114 Hughes 1998, 60–7.
- 115 Including the illustrated vessels 190–195.
- 116 Allan 1998.
- 117 Cowell 1923–9.
- 118 For a Montelupo tazza from Wrington, see Farnell 2011; for a Malling jug from Shapwick, see Gerrard 1999.
- 119 Allan *et al* 2010.
- 120 Hughes 1998; Allan 1999, 160, nos 1–6.
- 121 Hughes and Gaimster 1999.
- 122 *Ibid.*
- 123 *Ibid.*
- 124 *Ibid*, fig 3.8.
- 125 *Ibid*; data has been converted to be consistent with ICPS.
- 126 Schmidt 1929, cat no 33.
- 127 Ainaud de Lasarte 1952, figs 41, 45; González Martí 1944, fig 489; Martínez Caviro 1968, cat no 41.
- 128 Cora 1973, 131, pls 130a–b; Victoria and Albert Museum acc no 47-1907.
- 129 Berti 1997, figs 32–3; Ray 2000, cat no 96.
- 130 Cora 1973, 129–31, group VIIA.
- 131 Ray 2000, cat no 96; Berti 1997, fig. 33.
- 132 González Martí 1944, fig 489.
- 133 Blake 1999, 39, n 216.
- 134 Display label; Rackham 1940, cat no 393; acc no C.2509-1910.
- 135 Berti 1998, pls 99–102, 107–9, 112.
- 136 Displayed in room 8, case 49, central shelf to the right.
- 137 Berti 1998, 414–16.
- 138 Allan forthcoming, fig 3.1.
- 139 Berti 1998, 192–3, genus 56.2, pls 282, 284; Berti 2008, 333–4.
- 140 Eg Blake 1999, 25; Hurst 1991, 213, 216.
- 141 Hurst 1991, 213–14.
- 142 Blake 1999, n 224; Blake 2006.
- 143 Hurst 1991, 214; Blake 1999, n 151; Hughes and Gaimster 1999, 66; Blake and Hughes forthcoming.
- 144 Gerrard *et al* 1995a, 283.
- 145 Allan 1995.
- 146 Dectot 2007, 37, no 5.
- 147 Now in the Victoria and Albert Museum: Ray 2000, no 125.
- 148 Blake *et al* 1992.
- 149 Gutiérrez 2000, fig 2.20a.
- 150 Gerrard *et al* 1995a, 286–7.
- 151 Gutiérrez 2000, figs 2.27, 2.31.
- 152 Gutiérrez 2000, fig 2.37.
- 153 Gerrard *et al* 1995a, 285.
- 154 Pleguezuelo 1992, fig 6, no 34.
- 155 Williams 1995.
- 156 Although some were relaid in the 18th century: Brown and Hutchings 1996.
- 157 Carley 1996, 70.
- 158 Manco 2004, 22.
- 159 Williams 1995.
- 160 Carley 1996, 170–4.
- 161 Kent 1996; Kent 1997.
- 162 Moorhouse 1972; Moorhouse 1981, 117.
- 163 Moorhouse 1986, 112.
- 164 Kent 1996.
- 165 Carley 1996, 76.
- 166 At Exeter and Ilchester: Allan 1984, 43–65; Pearson 1982.
- 167 Glastonbury Abbey Gatehouse Archive, Box 21, Document A650.
- 168 Ellis 1981.
- 169 Lowe 2000; Rodwell 2001, II.
- 170 Harcourt 2000.
- 171 Group 9, Lewis 1999.
- 172 Dunning 2004.
- 173 Warner 1826; Gilchrist and Sloane 2005, 125–6, 171–2.
- 174 For the history of the Walloon weavers, see Cowell 1928; Dunning 1994, 38–40.
- 175 After Egan 1997; Boothroyd 2004.
- 176 See Bateman 1814 and Axon 1892 on a 15th-century manuscript and Dalton 1912, no 718, for the 15th-century Coventry ring, for linkage between wounds and well names.
- 177 Cf Blair 1987, fig 196; Kingsford 1929, 170 *sub* 1263.
- 178 On symbolism, see Scholem 1995; Jones 2004, 19; Davis 1938, 75, 78.
- 179 For Solomonic amulets in Britain see Griffiths *et al* 2007, 149 and pl 27: no 1811 (Meols); Spencer 1983 (Christchurch); Egan and Pritchard 1991, 203 and fig 127: no1094 (London).
- 180 Bagnoli *et al* 2011, figs 48, 52.
- 181 Egan and Pritchard 1991, fig 140.
- 182 Lanzi and Lanzi 2004, 42.
- 183 Carley 1996, 106, 181–4.
- 184 For Marian plant symbolism, see Hildburgh 1925; Kahn 2009; Fulton 2004.
- 185 O'Neill 1996, 254–5: no 71.
- 186 Spencer 1993, 7–8, fig 2:nos 13-18; Spencer 1998, 135–47 and no 151.
- 187 On portable reliquaries, see Robinson 2011.
- 188 These alternative interpretations have been suggested by John Cherry.
- 189 Kingsford 1929, 167, provides close parallels for the C from 16th-century seals but lacks comparable capital forms for the 15th century.
- 190 Blake *et al* 2003.
- 191 Winston-Allen 1997.
- 192 XRD analysis by Stuart Black, University of Reading.
- 193 Lawson 1985.
- 194 Orme 1991, 295.
- 195 Lawson 1990.
- 196 Gilchrist and Sloane 2005, 160–2.
- 197 Nicola Rogers, pers comm.
- 198 Gilchrist and Sloane 2005, 160.
- 199 *Ibid*, 94–6.
- 200 For other bulls of Callistus III, see 'Bull of Calistus III, to Culgaith', *Cumberland and Westmorland Transactions*, New Series 45 (1945), 193.



- 201 Bond 1914.
- 202 For background, see Szirmai 1999; Gullick and Hadgraft 2008; Gillespie 2011
- 203 Cf Egan 2001, 97–9 and fig 34: nos 77–82 (Salisbury); Biddle and Brown 1990, 741–6 and figs 211–212; nos 2290–2316 (Winchester); Margeson 1993, 69–71: fig 38: nos 435–444 (Norwich).
- 204 Egan 1998, 272–4 (London); Geddes 1985, 149–51 and fig 45: nos 6–20 (Battle Abbey); MacGregor *et al* 1999, 1975–6 and figs 930–1; Rogers 2005, 168 and fig 14.2: nos b–h (York).
- 205 Egan 1998, 272.
- 206 Cf Crummy 1988, 98 and fig 106: no 3637 (Colchester); Margeson 1993, 68–9 and fig 37: nos 430–34 (Norwich); Rogers 2005, 168 and fig 14.42: no i; MacGregor *et al* 1999, 1976 and fig 932: nos 7976 and 8059 (Vicars Choral: York). See also MacGregor 1985, 125–6 for arguments concerning function.
- 207 Williamson 2011, 104–5: cat 16; cf Geddes 1985, 164 and fig 54: no 100 for a possible parallel from Battle Abbey described as a stylus.
- 208 Goodall 1989, 228; Adler and Krauskopf 2010, 72–3: nos 4–5 to 4–8.
- 209 Egan and Pritchard 1991, 154–5 and fig 101: nos 720–726; cf Huddle 2007, 201 and fig 5.91: no 378 (Norwich Greyfriars); Clay 1981, 133 and fig 48: no 33 (Austin Friars, Leicester); Goodall 1989, 228 and fig 62: no. 96 (Greyfriars, St Ebbe's, Oxford) and Henig 1988, 181 and fig 54: nos 9–11 (St Augustine's Abbey, Canterbury).
- 210 Adler and Krauskopf 2010, 74 and nos 4–11.
- 211 Egan 1998, 277–80, cites an example on a 1457 girdle book: fig 214: nos 921, 922, 925.
- 212 Szirmai 1999, 254–7. Numerous parallels from monastic sites include Egan with Woodfield 2005, 344 and fig 162: nos 51–54 (Coventry Whitefriars) and Brennan 2001, 26–7: nos 32–42 (Carmarthen Greyfriars), while they are absent from the London waterfront deposits ending *c* 1450.
- 213 Peers *et al* 1938.
- 214 Tonnochy 1954: cat nos 711, 713, 712, 714 respectively.
- 215 Linenthal and Noel 2004.
- 216 Perry 1910, 131 and fig 31; Theuerkauff-Liederwald 1975, 181, pls 10–11; Theuerkauff-Liederwald 1988, 216–8, nos 421–424 and figs 108–112.
- 217 Theuerkauff-Liederwald 1975; Theuerkauff-Liederwald 1988; Lewis *et al* 1983; Redknap 2010.
- 218 Ibid.
- 219 Brownsword *et al* 1983: C63 and pl 4; Brownsword 1985, figs 3–4; Bangs 1995, 55 and 202: no 10; Egan with Woodfield 2005, 339 and fig 159: no 3.
- 220 Portable Antiquities Scheme database: Records WILT-17F491 and NARC-816905; Williams 1996, 184 and fig 15: no 141.
- 221 Grieg 1933, 158, 209 and figs 115 and 173; Drescher 1968, fig 7.2; Eberle 2005, 79–80: nos 152–156.
- 222 Cf Drescher 1968, figs 2–5; Goodall 1981, fig 63: no 4.
- 223 Cf Drescher 1968.
- 224 Goodall 1990a, 1024–36.
- 225 Bond 1911.
- 226 Cf star from Hulton Abbey: Boothroyd 2004, 162 and fig 6.8: no 4.
- 227 Keiley with Egan 2005, 151; James and Robinson 1988, 226–8.
- 228 Sampson 1995.
- 229 Brown 1990, 228–31.
- 230 Woodland 1990.
- 231 Goodall 1981, 54 and fig 54: 3–5.
- 232 Keil 1959, 96–8.
- 233 Reigniez 2002, 185–9; Pane 2006, 148–51; Postles 1989.
- 234 Hinton 1990; Margeson 1997, 56; Thomas 2009.
- 235 For symbolism, see Le Goff 1982, 174–6.
- 236 Lightbown 1992, 101–11; Wilson 1964, 160: no 60 and pl 64.
- 237 Cf Egan and Pritchard 1991, 140–6 (London).
- 238 Geddes 1985, 158 and fig 50: nos 24–8 (Battle Abbey).
- 239 Ward Perkins 1940, 167–71.
- 240 Egan and Pritchard 1991, 162–3.
- 241 Egan and Pritchard 1991.
- 242 Egan and Pritchard 1991, 248–54: nos. 1308–1333.
- 243 Russel Smith 1956; Gilchrist and Sloane 2005, 83–4 and Table 3.
- 244 Goodall 1981, 62; Egan and Pritchard 1991, 380–3, fig 253: nos 1772–1778.
- 245 Fuglesang 1980; Wilson and Klindt-Jensen 1966, 147–60; Margeson 1997, 31–9.
- 246 Egan and Prichard 1991, 162.
- 247 Williams 2007, 5–6 and fig 6f; for iron equivalents, cf Ottaway 2009, pt 3, 5 and fig 21a–b; Goodall 1990b, 1043–5, fig 334: nos 3885A and 3886.
- 248 Okeshott 2001a and Okeshott 2001b: type 10.
- 249 Ward Perkins 1940, 280–8; Egan 2005a, 192 and fig 180: nos 1071–1078.
- 250 Ibid.
- 251 Jessop 1996, 199–200.
- 252 Metcalfe and Minnitt 1981.
- 253 Egan 2005b, 206.
- 254 Viner 2007, 734.
- 255 Thomas *et al* 1997, 107–11 and Table 14.
- 256 For the thimble, cf Holmes 1988, fig 2.
- 257 Watts and Rahtz 1983, 179 and fig 178: no CA75.
- 258 For the identification of parchment holders (a specialist form of tweezer) see Biddle and Hinton 1990, 757 and fig 215: no 2326a.
- 259 Peers *et al* 1934, 35.
- 260 Bond 1915; Hopkinson-Ball 2007, 92.
- 261 Egan and Pritchard 2002, 317.
- 262 Williams 2004.
- 263 Thomas *et al* 1997, 33–4; Egan 1997, 202 and figs 26–7: S12–44.
- 264 Egan 2011, 248–9: S56–77.
- 265 Meischke and Dubbe 1980, 152: cat no 219; Ruempol and Van Dongen 1991, 152.

- 266 Egan 1997, 109.
- 267 For patens, see Gilchrist and Sloane 2005, 160–2.
- 268 Radford 1958, 169; Radford 1960.
- 269 Bond 1910, 75.
- 270 Carley 1996, 45; Hopkinson-Ball 2012.
- 271 Marks 2004.
- 272 Carley 1996, 181–2.
- 273 Pestell 2008.
- 274 Keil 1964, 117; Dugdale 1817–30, I, 8.
- 275 Woods 1994, 42–5.
- 276 Woods 1994, 7.
- 277 Calendar of Patent Rolls 1924, I, 129; L&P Hen VIII 1896, 279 (g613: 39); NA: PRO E117/8/23.
- 278 King 2012.
- 279 Margeson 1993, 236–7.
- 280 Butler and Green 2003.
- 281 For Dutch examples, cf Baart *et al* 1977, 380: no 726–31; Willemsen 2008, 77–9 and ill 75.
- 282 Read 2008, 121 (Netherlands); Baart *et al* 1977, 155–6: nos 165–8 (Amsterdam).
- 283 Cowell 1928.
- 284 Charleston 1984, 31.
- 285 Talbot 1967.
- 286 Willmott 2005, 60.
- 287 Willmott 2002, 45.
- 288 Willmott 2005, 72.
- 289 Daniels 1950, 11.
- 290 Lazar and Willmott 2006, 68–72.
- 291 Charleston 1985, 139–42.
- 292 Dunning 2006, 16.
- 293 Northover 1984; Northover 1999.
- 294 Blair and Blair 1991; Bayley *et al* 1993.
- 295 Northover 1995; Cagno *et al* 2012.
- 296 Mortimer *et al* 1986; Mortimer 1991; Arnold 1997.
- 297 Bayley 1992a.
- 298 Bayley 1992a; Bayley 1992b, Mortimer *et al* 1986; Mortimer 1991; Northover 1995.
- 299 Bayley 1984; Bayley 1992b; Budd *et al* 1992; Craddock and Craddock 1996; Arnold 1997; Dungworth 1997, Gliozzo *et al* 2011; König and Serneels 2012.
- 300 Ponting and Segal 1998; Ponting 2002.
- 301 Blair and Blair 1991; Northover 1984; Lechtman 1996; Gliozzo *et al* 2011; König and Serneels 2012.
- 302 Mortimer *et al* 1986; Mortimer 1991; Bayley 1991; Arnold 1997.
- 303 Blair and Blair 1991, Bayley *et al* 1993, Dungworth 1996, 1997.
- 304 Mortimer *et al* 1986; Mortimer 1991; Ponting and Segal 1998; Ponting 2002.
- 305 Craddock and Meeks 1987; Craddock and Craddock 1996; Weisgerber and Yule 2003.
- 306 Craddock 2003; Datta *et al* 2007; Rehren 2003.
- 307 Greer 2009.
- 308 Ponting and Segal 1998; Ponting 2002; Craddock and Meeks 1987; Craddock and Craddock 1996; Greer 2009.
- 309 Greer 2009.
- 310 Hedges and Salter 1979.
- 311 Park and Voyakin 2009.
- 312 Bayley 1984.
- 313 Eg Bond 1910; Fyfe 1926b; Peers, *et al* 1938.
- 314 An unpublished report produced for the Trustees of Glastonbury Abbey; the only published product of this work is Lewis 1997, which is extremely abbreviated.
- 315 Draper 1995.
- 316 Raguin 2003, 14; Petzold 1995, 64–5, fig 44.
- 317 Oakeshott 1945; Donovan 1993.
- 318 Kerr and Biddle 1990, 409–10, fig 100: 898.1, 898.4A and 898.4B.
- 319 Grodecki 1947, pl 1.
- 320 Stratford 1984, 254, cat no 260, described as a ‘trefoil foliage meander’.
- 321 See the Virgin’s robes in the ‘Commentary of Saint Jerome from Citeaux’ (c 1130), Dijon, Bibliothèque municipale, MS 129, fol 4v in Caviness 1986, 265, fig 8.
- 322 Kerr and Biddle 1990, 388.
- 323 Zarnecki, Holt and Holland 1984, 53: cat no 44, 55: cat no 61.
- 324 Caviness 1992, 191, fig 22.
- 325 Eg in the ‘Story of David’ from the Book of Samuel in the Winchester Bible, c 1160–80: see Zarnecki, Holt and Holland 1984, 57, pl 65.
- 326 ‘Doeg slaying the Priests’, initial to Psalm 52: Oakeshott 1945, pl 1; Donovan 1993, 21, pl 19.
- 327 Windows St Ila (type R.o.1) and Nt Ila (type R.o.2): Caviness 1992, 181: fig 4, 186: fig 12.
- 328 Oxford, Corpus Christi College, MS 157 in Alexander and Kauffmann 1984, cat no 33.
- 329 Oakeshott 1945.
- 330 Lewis 1991; 1997.
- 331 Two fragments from Cathedral Green and one from Wolvesey Palace: Biddle and Hunter 1990, 378, fig 90, nos 754, 755, 782; Kerr and Biddle 1990, 387, drapery Type 4.
- 332 Raguin 2003, 57.
- 333 Many finely grozed convex and concave curves, two mid-sized half vesicas, a very small half vesica, a small almost complete vesica, a mid-sized curved ‘horn’, six very much smaller ‘horns’, a bow or bracket shape, and a concave-sided triangle or spandrel shape in G14 alone; a half vesica with painted indented leaf in reserve, and a horn from G22; a partial bow and a mid-sized horn in G23; a vesica shape from G23, painted with acanthus curls; and a half vesica from the same.
- 334 Caviness 1986, 268, fig 14.
- 335 Ibid, 260, fig 2.
- 336 Caviness 1992.
- 337 Stratford 1984, 254.
- 338 Caviness 1986, 260.
- 339 Cox and Gillies 1986; Biddle and Hunter 1990.
- 340 Marks 1993, 129–32.
- 341 Marks 1993, 145; Ayers 2004, 458.
- 342 O’Connor and Haselock 1977, 334–41, pl 98; Marks 1993, 145–7; Newton 1979, 23.

- 343 Marks 1993, 148.
- 344 Woodforde 1946; Ayers 2004, xl-xli.
- 345 Kerr and Biddle 1990, 396, cat no 832, fig 92.
- 346 Ayers 2004, 586.
- 347 Ayres 2004, 480, fig V.18.
- 348 French 1995, pl 22 1g.
- 349 Marks 1993, 157; Ayers 2004.
- 350 Ayers 2004, 321–5.
- 351 Marks 1993, 154.
- 352 Ayers 2004, II, pls 25 and 30.
- 353 Ayers 2004, I, 57–8.
- 354 Cf Kerr and Biddle 1990, 406–7, fig 97.
- 355 Gerrard and Beaumont James forthcoming
- 356 Lewis 1991, 10.
- 357 Eg the Prophet Ezekiel with Christ and the Gospel Beasts, Cambridge, Corpus Christi College, MS 2 in Petzold 1995, 12, fig 6; Oakeshott 1945, pl xxxiv.
- 358 Alexander and Kauffmann 1984, 85–6, cat no 1.
- 359 Kunicki-Goldfinger *et al* 2014.
- 360 Ayers 2004, 116.
- 361 Marks 1993, 38; 154; Brown and O'Connor 1991, 61–2.
- 362 Marks 1993, 38.
- 363 Graves 1993.
- 364 Dungworth 2012.
- 365 Knight 1986.
- 366 Cox *et al* 1979; Cox and Gillies 1986; Gillies and Cox 1988.
- 367 Biddle and Hunter 1990, 358, nos 29–31.
- 368 Lillich 1984; Caviness 1986, 262; cf Gage 1982.
- 369 Caviness 1986, 262–5.
- 370 Bond 1909, 109.
- 371 Draper 1995.
- 372 Caviness 1973; Caviness 1986, 267–8.
- 373 Kerr 1983.
- 374 Draper 1995, 125.
- 375 Ayers 2004.
- 376 Draper 1995, 125.
- 377 Woodforde 1946; Kerr 1985; Ayers 2004.
- 378 Kerr and Biddle 1990, 398–400.
- 379 Woodforde 1946, 46.
- 380 Atkinson 1889, 339.
- 381 A term used by the purchaser of former monastic houses in Lincolnshire, cited in Knowles 1936, 249.
- 382 By Cox and Gillies 1986; Pollard 1990; Yates 1990; Heyworth and Warren 1990.
- 383 Henderson 2000, 30.
- 384 Howard H 2003, 29.
- 385 Caiger-Smith 1963.
- 386 Caiger-Smith 1963; Howard 1993.
- 387 Babington *et al* 1999, 15.
- 388 Howard 2003.
- 389 Rouse 1991.
- 390 Turner and Johnson 2006, 163.
- 391 Howard 1997, 44.
- 392 Following the method of Higgins and Davey 2004.
- 393 The pipes are shown life size, the mark details at twice life size. Burnished surfaces are shown with a light broken line and chipped sections with a stipple. Higgins die numbers for individual marks are taken from the national catalogue that is being compiled by the author. The die details with figures 3, 5, 9 and 10 are taken from the national catalogue to show the marks used on the pipes but are not drawn from the actual Glastonbury examples.
- 394 Atkinson and Oswald 1969, Bowl Types 1–3.
- 395 Lewcun 1985; Lewcun 2007.
- 396 M Lewcun, pers com 2012.
- 397 Payne 1992.
- 398 Serjeantson and Rees 2009; Serjeantson 2006, 137.
- 399 Serjeantson 2002, 42; Stone 2006, 152; Serjeantson 2006, 141.
- 400 Stone 2006, 151; Dyer 2006, 206.
- 401 Sykes 2007, 61–2.
- 402 Cosman 1976, 40–1; Harvey 1993, 52; Albarella and Thomas 2002.
- 403 Eg Biddick 1984.
- 404 Mandibular wear stage A, after Hambleton 1999, 63–4.
- 405 Sykes 2007, 45.
- 406 Mandibular wear stages D and E, after Payne 1973.
- 407 Sykes 2007, 76–80; Sykes 2010, 51–8.
- 408 Ervynck 1997, 71–3; Galik and Kunst 2004, 229–30; Serjeantson 2006, 131.
- 409 Carley 1996, 16–17.
- 410 Galik and Kunst 2004, 225; Noddle and Stallibrass 2007, 566.
- 411 Harvey 2006, 220–1; Woolgar 2006, 194.
- 412 Carley 1996, 76–7.
- 413 O'Connor 1993.
- 414 Eg Noddle and Stallibrass 2007, 550–52, 554.
- 415 Challinor 2010.
- 416 Challinor 2009.

## Chapter 9

- 1 Prudden 2002, 32–3.
- 2 Ibid, 34.
- 3 Warner 1826, lxxv.
- 4 Stalley 1971, 75.
- 5 Zarnecki, Holt and Holland 1984, 184.
- 6 Bond 1913, 63–4.
- 7 Fyfe 1927b, 324–5
- 8 Radford 1981.
- 9 Zarnecki 1986, 161; Turquet 1974, 20; Biddle 1966, 327.
- 10 Boase 1953; Zarnecki 1953.
- 11 Boase 1953, 118, pl 43b.
- 12 Zarnecki 1953, 17–18.
- 13 Bond 1913; Peers *et al* 1931; Turquet 1974.
- 14 Zarnecki, Holt and Holland 1984, 184–5.
- 15 Riall 1994.
- 16 Luard 1865, 51.
- 17 Biddle 1966.
- 18 London, BL Cotton Nero MS C.IV; Kauffmann 1975, III, 105–6.

- 19 Beckwith 1972, 137.
- 20 Anderson 1988, 4.
- 21 Zarnecki 1953, 17–18.
- 22 Turquet 1974, 10.
- 23 Baxter 2001.
- 24 Franklin 1983, 56–70; Harrison 2006, 111–16; Baxter and Harrison 2002, 302–12.
- 25 Tatton-Brown 2006, 93–102.
- 26 Skinner 1825–6, 30 April 1825.
- 27 Woods 1994, 47–55, reporting the discovery of ninety pieces of worked or moulded stone, of which twenty-one are described and fifteen illustrated.
- 28 Bond 1915, 133–4.
- 29 Gardner 1927, 41.
- 30 See the full version available on the ADS website, and in respect of the individual components of the stone corpus to the illustrated catalogue, which forms part of this project.
- 31 Where original core-work can be examined it largely comprises the local upper lias and marlstones.
- 32 Waterman 1970, 73; Hunt 1974, 239, cat no 271.
- 33 For a consideration of this phenomenon as observed on Wells Cathedral see Sampson 1998a, especially sections 1.1 to 1.5.
- 34 Also a few instances of Draycott marble; see below in the context of the first post-fire cloister.
- 35 Donovan and Reid 1963, 60.
- 36 Biddle and Kyølbye-Biddle 1995, 102–5, quoted in Bristow and Worssam 2006, 18b–19a. Of the 108 fragments of carved work found in excavation, over 80 per cent are Combe Down oolite: ‘so predominant was Combe Down Oolite, and in such large block size, that it could only be concluded that it was freshly quarried both in the seventh century and the tenth’; Worssam 1998, 28.
- 37 Salzman 1967, 132–3, noted the relatively restricted distribution of medieval Bath stone.
- 38 Translated in Stokes 1934, 19–20.
- 39 Fife, 1927, 87.
- 40 Peers *et al* 1930, 85.
- 41 The late twelfth-century cloister would have been demolished in the fifteenth century and survived only as reused material in the late medieval abbey.
- 42 Thurlby 1995; Burnt stiff-leaf fragments SS693 and S242 show that this style was current at the abbey immediately before the great fire.
- 43 Hope 1904 suggests that the abbey’s seal depicting *vetusta ecclesia* can be sufficiently trusted to indicate that the design was copied in the 1184 rebuilding.
- 44 See also Draper 2006, 66–7, quoting *Metrical Life of St Hugh* lines 870–80.
- 45 From c 2 to 6 inches (51–152mm), but centering on 4 inches (102mm), the standard lias shaft diameter at Wells.
- 46 Bond 1912, 43–4.
- 47 These could be position marks, since both the ball-flower voussoirs bear similar ‘x’ or ‘+’ marks, and these are also found elsewhere.
- 48 Retrieved by J T Irvine during the 1870–3 west front restoration and now stored in the south nave triforium: cat nos 55–7, 84, 86–103, 105–7 (catalogued in Sampson 1988).
- 49 Skinner 1825, falling between 23 and 31 March 1825.
- 50 Bond 1926, 13.
- 51 And possibly S119 and one unnumbered example, both of which lack the ball-flower ornament.
- 52 The simplicity of the plain mouldings, without decoration or cusping also suggests an origin in a screen or door, rather than an arched monument.
- 53 The mortar channel here cuts the banker mark, showing that the block was finished on the banker, but the fixer mason has subsequently cut the mortar channels as part of the process of construction.
- 54 Carley, 1985, 267.
- 55 Bond 1911, 79.
- 56 Photograph HRLA00322-n in the Glastonbury Abbey archive.
- 57 Compare the three south bays of the west cloister at Wells.
- 58 Leland 1964, I, 289; quoted in Leedy 1980, 166.
- 59 Harvey 1984, 277.
- 60 Sixteen of those holding office after 1184.
- 61 Unnumbered, having been recently removed from the Abbot’s Kitchen; see Fryer 1920.
- 62 Thomas (Norreys) the mason (*cementarius*) attests at Glastonbury (13 December 1249) a release from Ralph Page, son of Alwyn de vinea, of messuages and lands in Glastonbury to William son of Roger Bunetone, together with Nicholas de Lostehulle, then seneschal (steward) of Glastonbury, and others ‘(A H no 3): Church 1894, 395–6. The probable association of Norreys with the Bunetons suggests a trade connection.
- 63 Church 1894, 162. William de Bunetone, called ‘sculptor’ in Edward II’s time grants twelve houses ‘*in vico qui vocatur Boneton in villa Glaston*’ and lands to his son John de Boneton, charged with payment of two shillings to the abbot, and to heirs of William *aurifaber* (goldsmith) a pair of gloves (A H nos 11, 12): Church 1894, 395–6.
- 64 Does this suggest that the destruction of the abbey was delayed into the late 1540s or early 1550s? By 1539 the reformation of abused images was well underway, but the full scale of Reformation iconoclasm was not unleashed until Edward’s reign.
- 65 Prior and Gardner’s 1912 treatment of Glastonbury is restricted to the carvings of the Lady Chapel doors, and the roundels with the symbols of the Evangelists on the Abbey Barn; Gardner 1951 similarly only deals with the Lady Chapel carvings; cf Boase 1953; Zarnecki 1953, 50; Stone 1972. The most important modern material is Thurlby 1995 and Williamson 1995.
- 66 Fryer 1920, 35–6, 39. It is unclear how the effigy of Michael of Amesbury escaped Fryer’s attention; it was drawn in 1825: Skinner 1825–6.
- 67 Alexander and Binski 1987, cat no 296, 323; Doran 2009, cat nos 171, 174.

- 68 Stratford 1983.
- 69 Dated *c* 1325 by Stratford 1983, but found in the context of the refectory in 1910, a building from the abbacy of Chinnock and probably after 1407.
- 70 Though a later 15th-century date might be more appropriate: these fragments certainly do not approach the early 16th-century sculptures of the Henry VII Chapel at Westminster or Bath Abbey's west front in style or quality.
- 71 Collinson 1791, II, 260–1.
- 72 Salzman 1967, 153–4; Harris 1982; Sampson 1998b, 103–8.
- 73 Skinner 1825–6, 31 March 1826 (re: S731); Bond 1926, 14.
- 74 This tendency for architectural retrospection is apparent at Ottery St Mary, where windows previously dated to *c* 1250 can be shown on the basis of masons' marks to date to the refoundation of the church by Grandison in 1337–45. Jon Cannon has identified Romanesque motifs re-emerging on the tower at Gloucester Cathedral; the south nave aisle also has ball-flower on a window remodelled *c* 1400: Heighway 2012, 7.
- 75 Tudor-Craig 1987. The fourth, larger, and 'unnumbered' head (S791) included in this group for the exhibition is not stylistically part of this group, and is carved from Doultling stone not Beer.
- 76 Radford 1981, 131.
- 77 Sampson 2009.
- 78 Monckton 2006; Wilson 1980.
- 79 Aston (1988, 223–4, 232–3) discusses the shifting definitions of 'abused' images.
- 80 Parker 1880, 106.
- 24 Ó'Carragáin 2010, 57; Blair 2005, 199.
- 25 Rahtz and Watts 2003, 100; Rodwell 1984, 18–21.
- 26 Radford 1955; Radford 1981.
- 27 Radford 1955.
- 28 Radford 1981, 115.
- 29 Radford 1955, 22.
- 30 Rahtz and Watts 2003, 150; Rodwell 2001, I, 74; Blair 2011, 732.
- 31 Gransden 2001.
- 32 Radford 1968a; Radford 1981, 115.
- 33 Cramp 2006a, 153–8.
- 34 Winterbottom and Lapidge 2012, 50–1.
- 35 Radford 1958, 167.
- 36 Evison 2000, 193–4.
- 37 Bayley 2000a.
- 38 Freestone 2003; Jackson 1996; Mirti *et al* 2000; Whitehouse 2003; Wolf *et al* 2005.
- 39 Freestone and Hughes 2006.
- 40 Hinton 2011, 427.
- 41 Spall 2007a, 322.
- 42 Radford 1981, fig 5.
- 43 Radford 1981, fig 6.
- 44 Radford 1981, 131.
- 45 Carley 1996, 167.
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- 47 Radford 1981, 127.
- 48 Fernie 2000, figs 118, 81, 124 and 90 respectively.
- 49 Radford 1981, 127.
- 50 William of Malmesbury *De Antiquitate Glastoniensis Ecclesie*, published in Scott 1981, 117.
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- 66 Willis 1866.
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- 70 Gilchrist 2005, 167–8; Bell 1998, 211–13.
- 71 Luxford 2012b, 253.
- 72 Bond 1911, 74; 82–3.
- 73 Peers *et al* 1937, 153–4.
- 74 Hardy *et al* 2003, 499.

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- 10 Ellis 1982, 17.
- 11 Leach 1988, 231.
- 12 Woods 1994, 17.
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- 15 Carver 2009, 335.
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- 17 Cramp 2005, 352.
- 18 Peers *et al* 1928, 5–7.
- 19 Kelly 2012, 19.
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# Abbreviations and bibliography

## Abbreviations

ADS	Archaeology Data Service
AHRC	Arts and Humanities Research Council
BL	British Library, London
[C:]	Context; all contexts are in square brackets in accordance with the IADB
EHA	English Heritage Archive (formerly the National Monuments Record)
GA	Glastonbury Abbey
GPR	Ground Penetrating Radar
GLA	Glastonbury Abbey Assigned number (followed by: A = document; P = pottery; T = tile; S = stone; G = glass; B = most metal small finds; L = lead; I = iron; M = miscellaneous)
GLSGA	Glastonbury Abbey accession number
HER PRN	Historic Environmental Record Primary Record Number
IADB	Integrated Archaeological Database (York Archaeological Trust)
NGR	National Grid Reference
NMR	National Monuments Record (now the English Heritage Archive)
NMR: GLA	NMR accession numbers for Glastonbury Abbey
NMR: LA	New drawing references attributed to NMR loaned archive
OS	Ordnance Survey
SAM	Scheduled Monument
SANHS	Somerset Archaeological and Natural History Society
SoA	Society of Antiquaries of London
SRO	Somerset Record Office (now Somerset Heritage Centre)
TNA	The National Archives, Kew

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NMR: DBH01/1012  
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NMR: DBH01/12, letter 5  
NMR: DBH01/12, Letter 8  
NMR: DBH01/14 Letter 5  
NMR: DBH01/15, Letter 11  
NMR: DBH01/8, No 9  
NMR: DBH01/8–9  
NMR: DBH01/10  
NMR: DHB01/10, 10  
NMR: DHB01/10, 12  
NMR: DHB01/10, 19 back  
NMR: GLA/Admin/1/2/13  
NMR: GLA/Admin/1/2/8  
NMR: GLA/Admin/1/2/8  
NMR: GLA/POST/1  
NMR: GLA/POST/1/14  
NMR: GLA/POST/1/14  
NMR: GLA/Pub  
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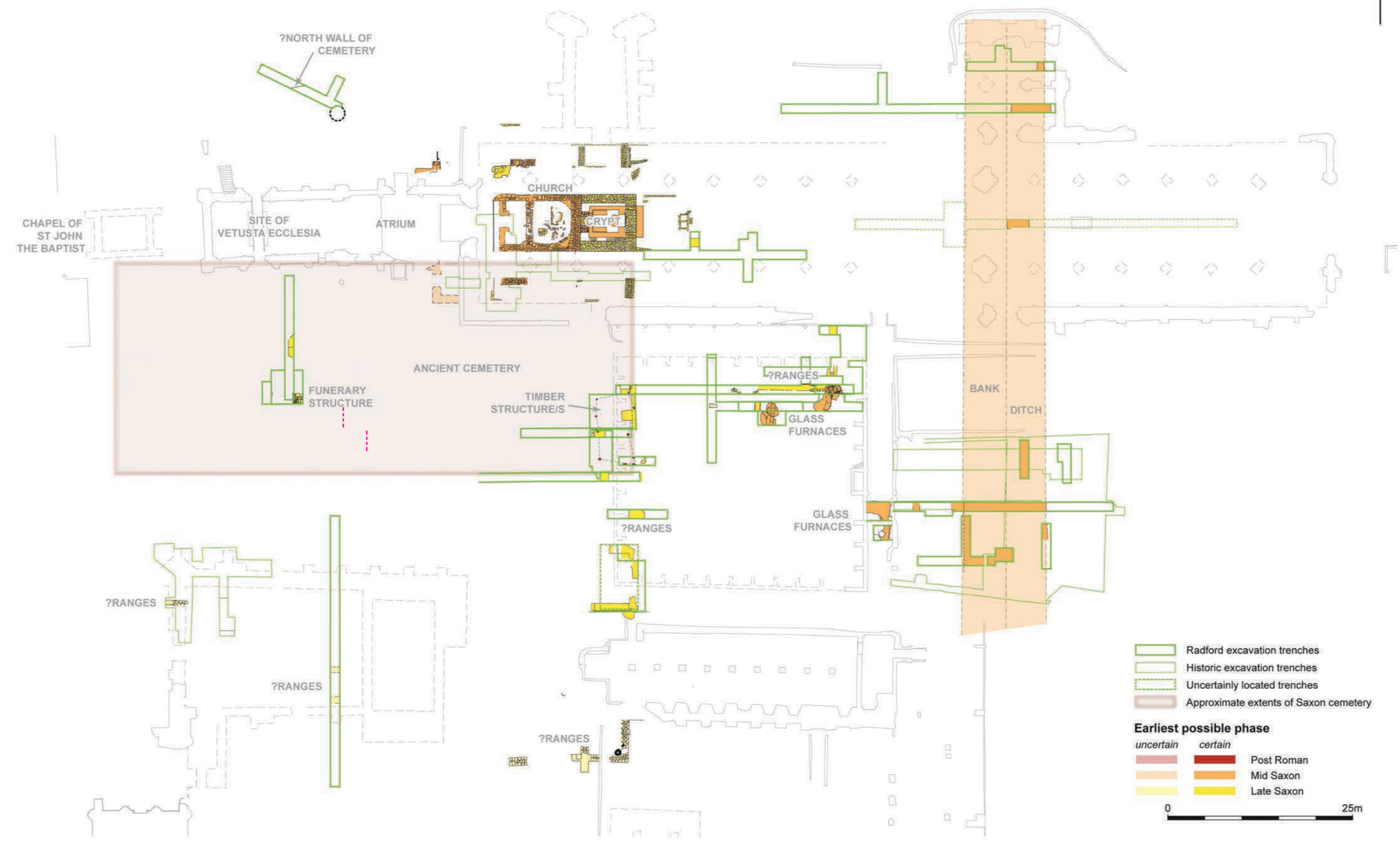
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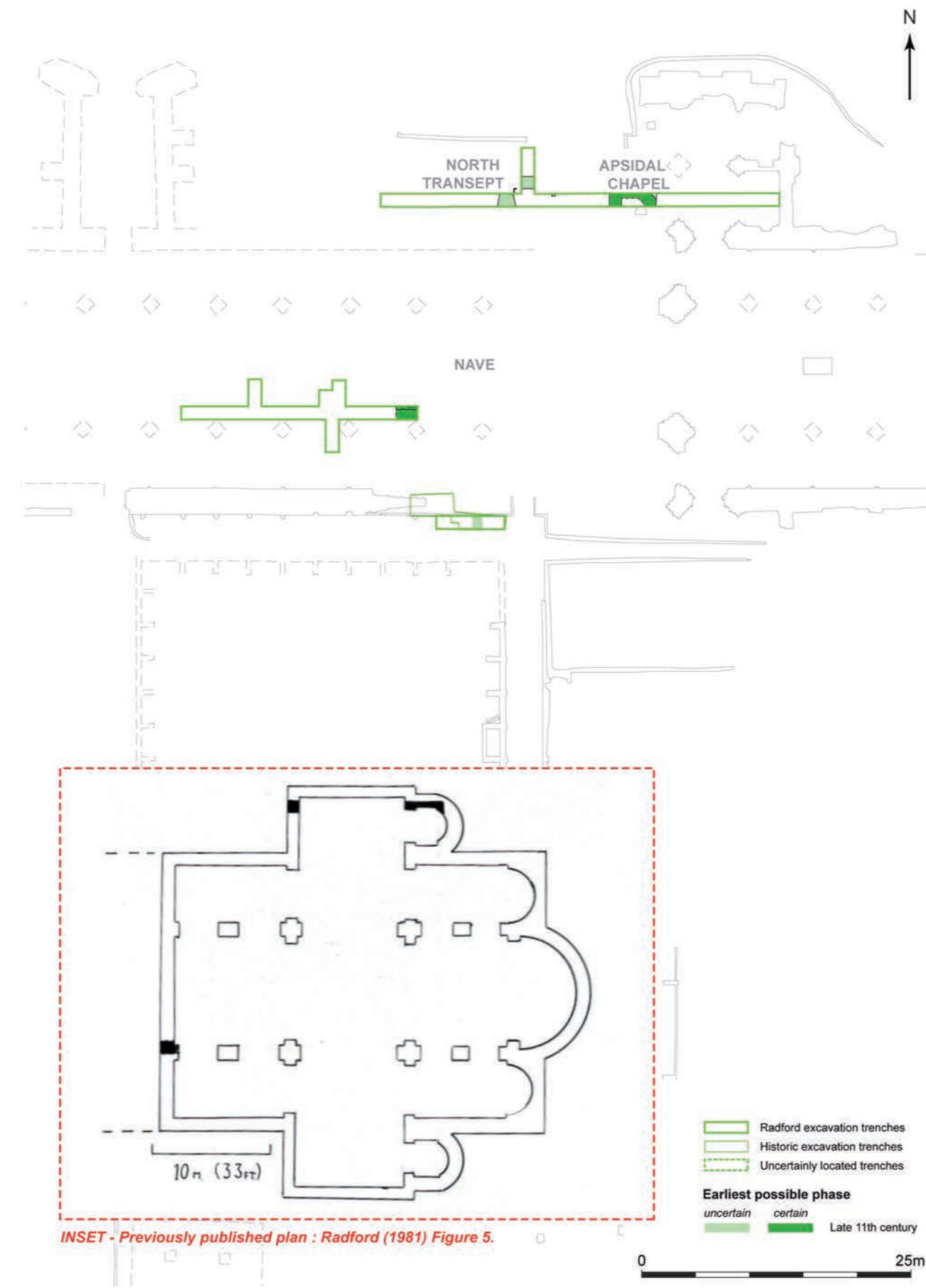
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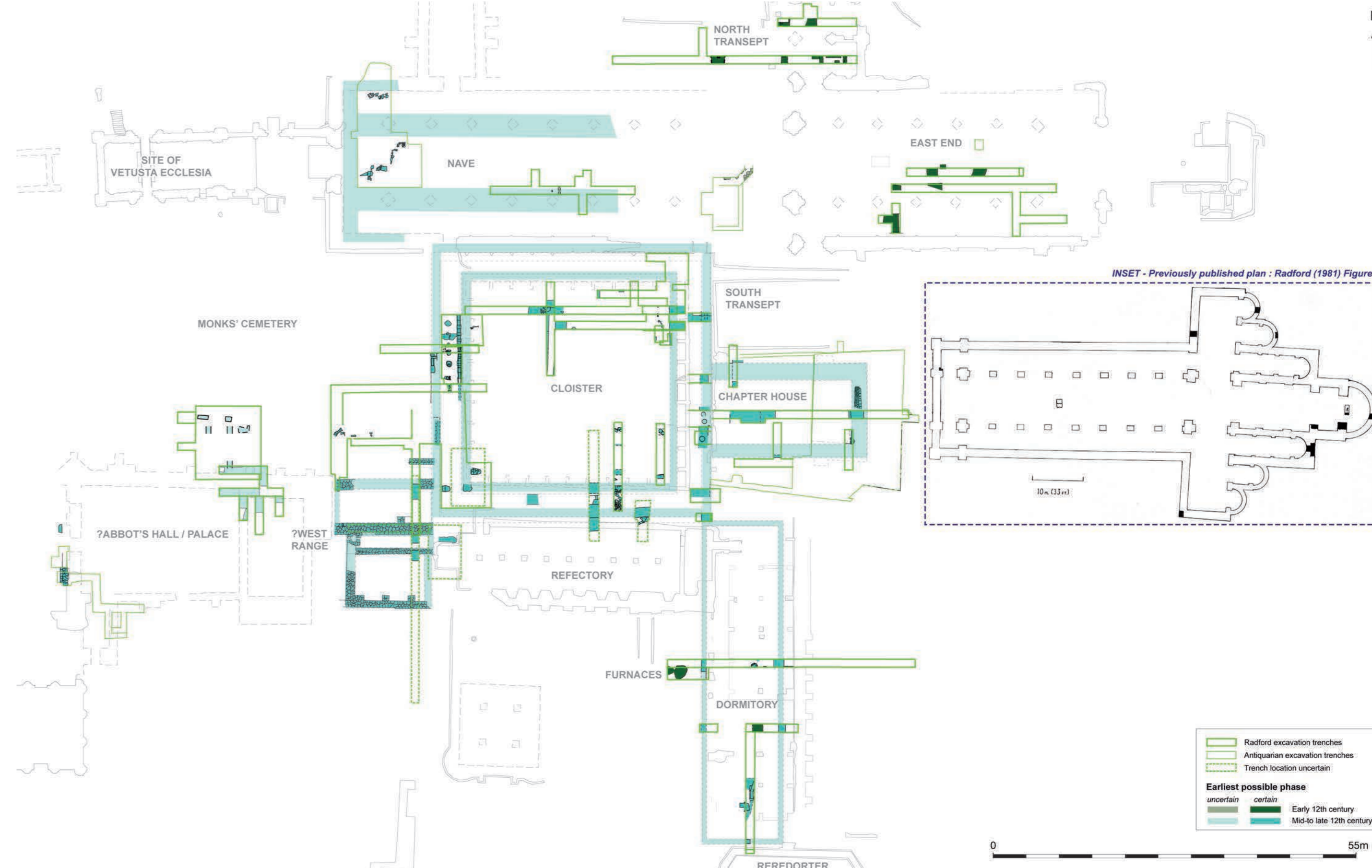
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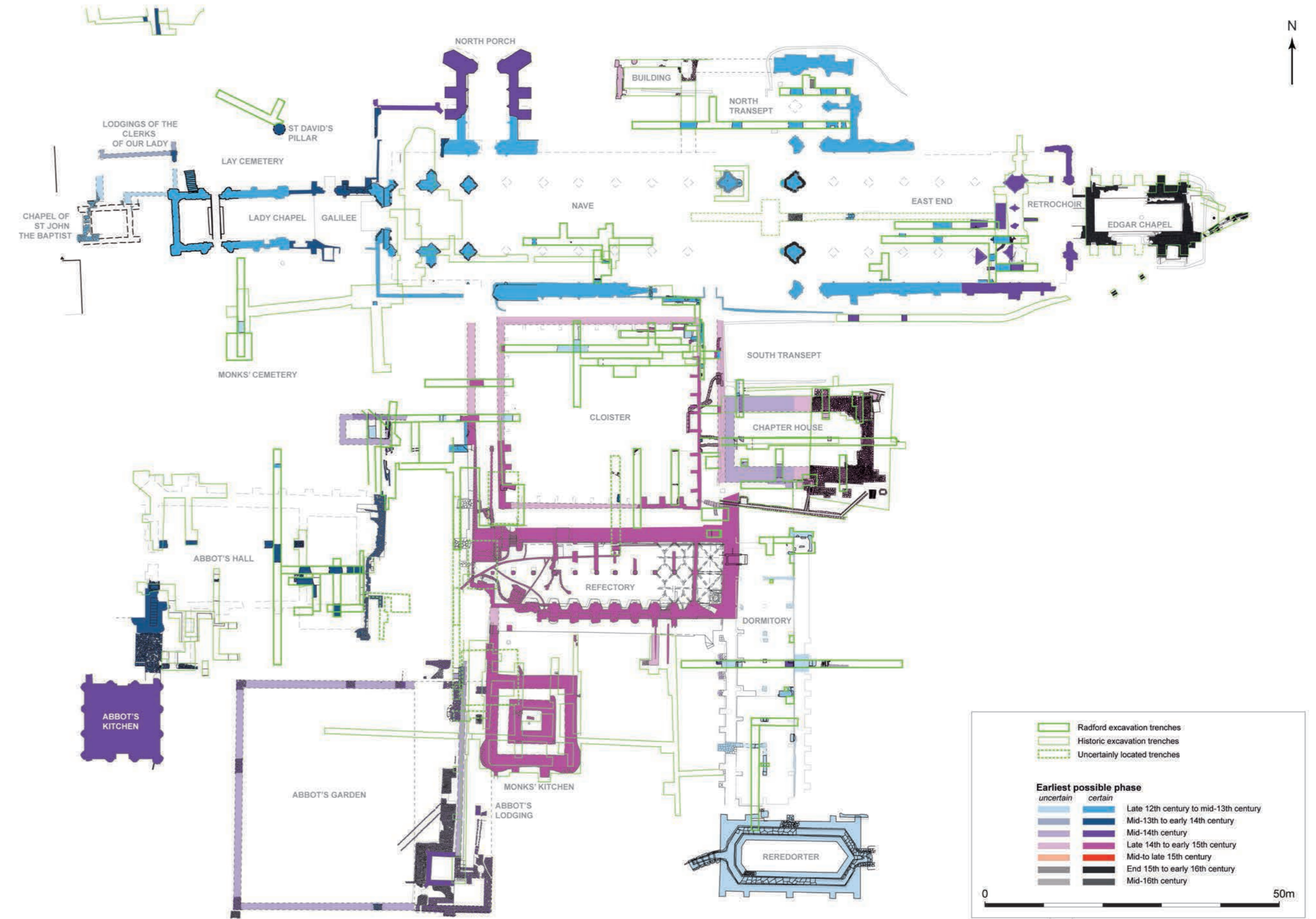
Plan 1 Phased Saxon plan (scale 1:500)



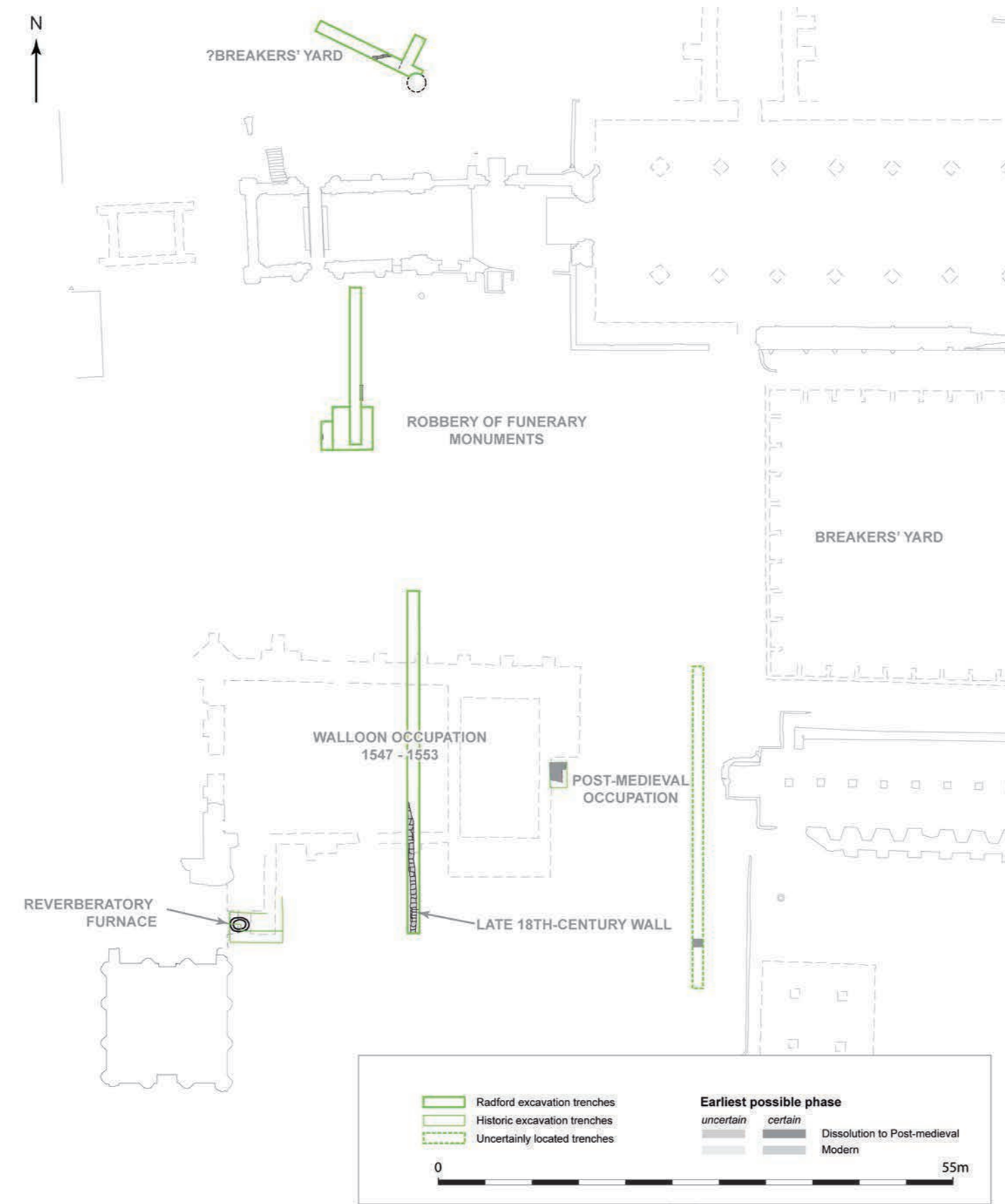
Plan 2 Late eleventh-century plan (scale 1:500)



Plan 3 Phased twelfth-century plan (scale 1:550)



Plan 4 Phased medieval phased plan (scale 1:650)



Plan 5 Phased post-Dissolution plan with early twentieth-century postcards (scale 1:550)



