# The Introduction and Use of Masons' Marks in Romanesque Buildings in England

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### *For Eric Fernie*

*MASONS' MARKS can be found on stone buildings where the stone is taken to a high degree of finish, but the date of the introduction of this practice into England has yet to be established. Buildings from the Anglo-Norman Period display marks, but it is not clear whether the Normans introduced the concept or it was present in the Anglo-Saxon Period. The fabric of buildings from both sides of the Conquest, and from Roman sites, is therefore analysed to determine the date of introduction, drawing comparisons with early 11th-century buildings in Europe. Since the degree of finish of the stonework closely connects to the use of marks, the treatment of stonework in the 11th century and in the earlier Anglo-Saxon Period is considered, and comments made on the organisation of the building and stone-supply industries of the mid-11th century.*

The study of masons' marks, described as marks made on the blocks of walling stone and on moulded stone as part of the construction process, has advanced considerably in the last half century. Pragmatic studies in which we record and analyse marks within the context of single buildings have replaced collection of marks by antiquarians who hoped to trace the work of itinerant masons from building to building across medieval Europe. Researchers now routinely record masons' marks in studies of individual buildings, such as Bradford Cathedral (W. Yorkshire) or Rievaulx Abbey (N. Yorkshire), or use them to demonstrate building progress at buildings like Tewkesbury Abbey (Gloucestershire), Southwell Minster (Nottinghamshire) and Carlisle Cathedral (Cumbria).[1] Regional studies have also appeared, such as that for the Republic

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[1] I. Roberts, 'Medieval masons' marks from Bradford Cathedral', *Church Archaeol.*, 1 (1997), 42–3; P. Fergusson and S. Harrison, *Rievaulx Abbey: Community, Architecture, Memory* (New Haven, 1999), 161; N. Birdsall and R. K. Morris, 'Recent architectural works & archaeology', 257–74 in R. K. Morris and R. Shoesmith (eds.), *Tewkesbury Abbey: History, Art, & Architecture* (Logaston, 2003); J. S. Alexander, 'Southwell Minster choir: the evidence of the masons' marks', 44–59 in J. S. Alexander (ed.), *Southwell and Nottinghamshire: Medieval Art, Architecture, and Industry* (Leeds, Brit. Archaeol. Assoc. Conf. Trans. 21, 1998); J. S. Alexander, 'The construction the Gothic choir of Carlisle Cathedral, and the evidence of the masons' marks', 106–26 in M. McCarthy and D. Weston (eds.), *Carlisle and Cumbria: Roman and Medieval Architecture, Art, and Archaeology* (Leeds, Brit. Archaeol. Assoc. Conf. Trans. 27, 2004).

of Ireland, and masons' marks regularly feature in general architectural surveys.[2]

## THE USE OF MARKS IN ENGLAND

Records exist for marks on buildings in England from most periods in which they used stone dressed to ashlar. Marks are not just restricted to ashlar: they are also found on coursed rubble when the masons roughly squared the blocks. There are two basic types of mark: assembly marks that enabled builders to join sectional masonry without written instruction; and the banker marks that seem to indicate authorship. There is no documentation for the use of either type of mark and so the processes at work have to be determined from study of the buildings in which they occur. It is clear that the systems were not monolithic but varied from site to site according to workshop practice, although some features recur at different sites.[3] Assembly marks usually consist of a numeric sequence, loosely based on Roman numerals, and are often cut across the joint faces of adjacent stones, showing that the piece was dry-assembled to check the fit. Timber-framed buildings, and indeed many other sectional assemblies, including medieval altarpieces and machine bearings on 19th-century engines, employ similar systems.

Banker marks are more varied, and stone cutters seemingly used them to identify works as their own. The question of authorship is a difficult one. It seems very unlikely that similar marks at different sites provide evidence that the same mason was at work; coincidences arise frequently and are inevitable when following simple design ideas. Simple marks, and even more complex ones, recur at sites of widely differing dates and cannot belong to specific masons: Bronze-age Knossos (Greece), 13th-century Southwell Minster and 16th-century Hardwick Hall (Derbyshire) share a common vocabulary of saltire crosses, triangular shapes and intersecting-line marks. It is safer to treat these marks, for which the term 'banker' mark is preferred, as site-specific and to use the information that they embody to demonstrate phases of construction, to estimate the size of the workforce, or to comment on the significance of building breaks.

It is evident that the decision to use, or not use, marks lay in the hands of the men controlling the works departments, not the masons themselves, but the allocation mechanisms are not clear. The evidence from the later Middle Ages is that the marks informed the paymaster of the output of the individual masons, and it seems likely that a similar system was in use in the Anglo-Norman Period.[4] Marks are found when masons were set to task work rather than paid regular

[2] C. Hourihane, *The Mason and His Mark: Masons' Marks in the Medieval Irish Archbishoprics of Cashel and Dublin* (Oxford, Brit. Archaeol. Rep., Brit. Ser. 294, 2000). See, for example, R. Stalley, *Early Medieval Architecture* (Oxford, 1999), 106–7, or E. C. Fernie, *The Architecture of Norman England* (Oxford, 2000), 72.

[3] For a detailed discussion of masons' marks, see J. S. Alexander, 'Masons' marks and stone bonding', 219–36 in T. Tatton-Brown and J. Munby (eds.), *The Archaeology of Cathedrals* (Oxford, Oxford Uni. Comm. Archaeol. Monogr. 42, 1996).

[4] Alexander, op. cit. in note 3, 219. The question of allocation of marks at Edward I's castles in Wales has been considered by L. Butler, 'Masons' marks in castles: a key to building practices', *Château Gaillard*, 18 (1998), 23–6.

wages, and the responsibility for deciding which scheme to use must have been taken by a senior person with the authority to allocate funds, possibly the clerk of works. If using a task-work system then it would then have been down to the foreman, or overseer of a group of masons, to ensure that each mason was paid for the work done. On small projects, involving only a few masons, then an *ad hoc* system would have been sufficient but, where the size of the masons' team was larger, then a marking scheme controlled by the foreman would have been most efficient. It is also clear from the Late Middle Ages and Early Modern Period, when marks can more confidently be associated with named masons, that they belong to masons working at the bench to produce the blocks of walling stone, or sections of moulding, and not the master mason.[5]

Stone building in which stone is laid in courses and mortar is used, has been a tradition in Britain since the re-conversion to Christianity in the early 7th century, and the Romans had used stone for structures before that, but the question of when marks were first used in this country has not been addressed. Close examination of the masonry of English post-Conquest buildings reveals that Anglo-Norman builders used banker marks, but more frequently in the 12th century than in the 11th. There are two main possibilities here: the Normans introduced the marks, or they were already been in use by Anglo-Saxon masons and the traditions continued after the Conquest. Analysis of the fabric of buildings from Pre- and Post-Conquest Periods is therefore required to establish which the case is.

The situation is made complicated by a number of factors. Few great churches from the Romanesque period, either pre- or post-Conquest, have remained unaltered. Widespread 11th- and 12th-century rebuilding programmes spared few large-scale pre-Conquest buildings. In two cases, Canterbury (Kent) and Winchester (Hampshire), assessment of the walling stone of the excavated Anglo-Saxon churches was impossible because of their thorough destruction. At Canterbury the walls had been taken down below ground, to foundation level, so that the block sizes of the stonework of the western apse had to be estimated from the imprints left by their removal, and at Winchester even the foundations of the Old Minster had been robbed out.[6]

Evidence from post-Conquest buildings is also partial, whole sections of churches have been remodelled and subsequent restoration campaigns have further altered the fabric, leaving evidence from the early periods fragmentary. For example, very few 11th-century E. ends survive intact and, in the case of many of the monastic churches retained as parish churches, such as Blyth (Nottinghamshire), the E. end has been completely lost. Although this limits an assessment of the stonework management of the Romanesque builders, certain trends are discernible when the buildings or their archaeological records are examined.

[5] See, for example, B. Tyson, 'Identifying and classifying masons' marks', *Vernacular Architect.*, 25 (1994), 4–15.

[6] K. Blockley, M. Sparks and T. Tatton-Brown, *Canterbury Cathedral Nave: Archaeology, History and Architecture* (Canterbury, Archaeology Canterbury new ser., 1, 1997), 21; B. Kjølbye-Biddle, 'Old Minster, St Swithun's Day 1093', 13–20 in J. Crook (ed.), *Winchester Cathedral: Nine Hundred Years 1093–1993* (Chichester, 1993).

## ANGLO-NORMAN STONEWORK

The first-generation, pre-1090 Norman buildings in England share the same method of building using coursed but irregular blocks of stone, roughly squared and dressed with tools that left a deeply striated surface on the face. Little attempt was made to regularise the height of the courses and the mortar joints are wide, as for example, on the stonework of the W. front of Lincoln (Lincolnshire) from c. 1072–92, seen particularly in the sections protected from weathering and restoration. Most writers note the quality of the stonework in this period. For example, Eric Fernie has recently commented that the masonry at Winchester from the decades after 1079 is no better than that of the 1050s and 1060s at Jumièges in Normandy (France). By contrast, the later masonry was the equal of any in Romanesque Europe.[7] Some buildings have more precisely cut stone than others have: the side walls of Worcester's crypt (Hereford and Worcester), for example, are built of much more regularly sized blocks than Winchester's transepts, although they are both work of the 1080s. Techniques for cutting stone certainly improved after c. 1090 when they began to use fully squared ashlar blocks with very fine mortar joints. This new approach was sufficiently noteworthy for William of Malmesbury to comment on it in the 12th century, describing the stonework of Bishop Roger's building work of after 1107 at Old Sarum (Wiltshire) as looking as if it had been made of a single stone, clearly a reference to fine-jointed ashlar masonry.[8]

## EARLY ANGLO-NORMAN BUILDINGS

One building that would have been informative here is William's own abbey at Battle (E. Sussex), raised on the site of the battlefield. It was one of the first buildings constructed by the Normans; the high altar was in use by 1076 and consecrated in 1094. The E. end was rebuilt in the 13th century and the site largely cleared after the Reformation. Excavation in the 1920s uncovered the apse, and further work in 1978–80 recovered stone from the first period of construction in the S. transept. The excavators identified the characteristic striated tooling and broad mortar joints of early Norman masonry, but the recovered masonry was a small amount and they saw no marks.[9]

However, sufficient masonry survives at a number of other sites to provide evidence for the use of marks in first-generation Anglo-Norman buildings. Recent detailed analysis at Canterbury has revealed fragments of Lanfranc's 1070 building preserved in the later remodelling. The stone is from Caen and dates to this period because of the tooling and mortar joints. On ten courses of stone found in the NE. corner of the crossing tower, described as ashlar, are two

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[7] Fernie, op. cit. in note 2, 292.
[8] William of Malmesbury, *Gesta Regum Anglorum*, 1, ed. and trans. R. A. B. Mynors, R. Thompson and M. Winterbottom, *Oxford Medieval Texts* (Oxford, 1998), 738–9.
[9] H. Brakspear, 'Battle Abbey', *Antiq. J.*, 11 (1931), 166–8; J. N. Hare, *Battle Abbey: The Eastern Range and the Excavations of 1978–80* (London, 1985).

occurrences of the same mark. A larger number of marks was recorded on masonry from the period 1096–c. 1120, from Anselm's expansion of the choir.[10] York Minster's first post-Conquest building (N. Yorkshire), constructed for Thomas of Bayeux I after 1080 and before 1100, contains a great deal of re-used Roman material in the late 11th-century fabric. But newly quarried stone, probably from Tadcaster (N. Yorkshire) was used at a higher level and preserved *in situ* in the SE. newel stair between the choir and the transept apse. Few of the stones were marked, however, and there is some doubt about their date since stoneworking techniques at York appear not to have changed much between the 11th and 12th centuries, but the stair is probably from the period of Thomas of Bayeux.[11]

Two other cathedral sites present considerably larger areas for study: Lincoln's W. front and Winchester's crypt and transept. Although both contain 12th-century work, the stone-treatment is sufficiently different to identify the earlier work. Remigius (d. 1092) began the early work at Lincoln after 1072, when the *cathedra* was moved from Dorchester on Thames (Oxfordshire).[12] Unweathered masonry from this period can be seen on the return N. and S. walls of the W. front. The stone surfaces are in excellent condition because they have been inside the building since the screen facade was added in the 13th century (Fig. 1). Stone taken to a higher degree of finish was reserved for arches and openings and it is here that the masons' marks are found (none is on the main walling stone). On the arch to the large niche on the SW. corner, and on the arched openings to the wall passages in the W. block, every arch stone is marked. The marks on the SW. niche are all the same, a simple saltire cross placed on the outer edge of the moulding, and may be assembly marks, used to indicate the arch on the W. front to which the stones belong.[13]

Winchester's crypt and transepts belong to the building phase started in 1079, for which William Rufus granted permission to extract stone from Quarr (Isle of Wight). A quantity of Bath stone is also visible with the Quarr in the early fabric used, for example, for the crypt cushion capitals.[14] Bath stone was also used by the builders of the Old Minster and the cathedral may have retained rights over the Bath quarries (Avon), although new leases must have been taken out since the main construction of the Old Minster had ceased by the end of the 10th century. Eight or nine different marks can be seen on the stonework of the crypt and transepts, but only in isolated occurrences.

Observers often cite the stonework at Blyth as an example of the roughness characteristic of the Early Romanesque Period in England; Pevsner has called

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[10] Blockley et al., op. cit. in note 6, 26–32.

[11] D. Phillips, *Excavations at York Minster. Vol. II. The Cathedral of Archbishop Thomas of Bayeux* (London, 1985), 117. The 11th- and 12th-century fabric of York is currently under investigation by Dr Christopher Norton and Stuart Harrison, with preliminary results presented in a lecture to the British Archaeol. Assoc. in December 2006.

[12] R. Gem, 'Lincoln Minster: Ecclesia Pulchra, Ecclesia Fortis', 9–28 in T. A. Heslop and V. A. Sekules (eds.), *Medieval Art and Architecture at Lincoln Cathedral* (Leeds, Brit. Archaeol. Assoc. Conf. Trans. 8, 1986).

[13] The NW. niche does not seem to have marks on its arch and they cannot be seen on the W.-facing niches, where they would be unlikely to have survived the weathering and restoration of this part of the building.

[14] T. Tatton-Brown, 'Building stones of Winchester Cathedral', 37–46 in Crook, op. cit. in note 6.

FIG. 1
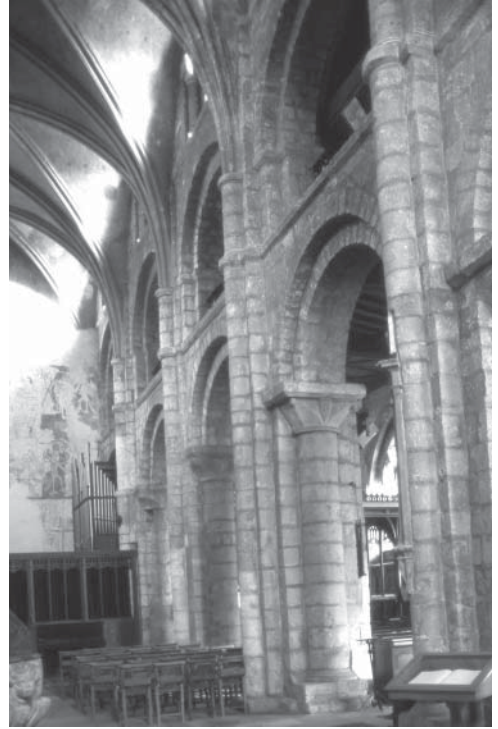Lincoln Cathedral NW. front, detail of N. niche.
*Photograph: J. S. Alexander.*



FIG. 2
Blyth Priory, nave S. arcade from the W.
*Photograph: J. S. Alexander.*

it a case of 'early Norman grimness' (Fig. 2).[15] Founded in 1088, building work on the priory seems to have started immediately. Since the only surviving parts are the nave and fragments of the S. transept, work must have progressed rapidly for the nave still to be a late 11th-century construction.[16] Masons' banker marks are present on the nave piers, to a lesser extent on the outside walls, and in the upper parts of the walls above the later vault (Fig. 3). Numbers of marks are not large: about 20% of the walling stone above the nave vault is marked, a slightly higher proportion than we see in other early Norman buildings.

Other early buildings provide a different sort of evidence: the crypt at Lastingham (N. Yorkshire), from 1078x86, has lining-up marks on the transverse arch stones of the vault but no banker marks; and there are no marks visible in

[15] N. Pevsner and E. Williamson, *The Buildings of England. Nottinghamshire* (Harmondsworth, 2nd edn., 1979), 77. It might be argued that the finish of the stonework was unimportant since the surface was intended to be painted with a *faux* masonry pattern, as can still be seen above the later vault at Blyth, but highly finished stonework was also covered with the same sort of scheme, as at Norwich.

[16] P. Coffman and M. Thurlby, 'The early Romanesque churches of Nottinghamshire, part one: Blyth Priory', *Trans. Thoroton Soc.*, 105 (2001), 53–72.

either the crypt or the early transepts at Worcester, although the 12th-century stair turrets have a large number. Worcester's crypt was started in 1084 and the transepts were presumably either complete or nearing completion when the move into the new church occurred in 1089.[17] Hereford's Romanesque choir and S. transept (Hereford and Worcester) are now accepted as being work of between 1107–48, and not that of its first Norman bishop, Robert of Lorraine (1079–95), as described in the older literature.[18] The masonry is well cut, although the mortar joints are still fairly large, but, more importantly, there is a large number of banker marks on the walls of the choir, with a high proportion of stones marked. Durham (County Durham), in building from 1093, demonstrates the more precise cutting and sizing of stone blocks that would become the norm after 1100 and marks are clearly visible in the nave and S. transept.[19] Tewkesbury has highly finished stonework in both the choir and nave, although the mortar joints are still wide in the eastern parts of the building, and while there are banker marks on both sections of the building (Fig. 4) it is evident that there are considerably more marks on the nave piers than on the choir piers. This is also the situation at Gloucester (Gloucestershire).

Secular buildings provide similar evidence. The White Tower (Greater London), started in the 1070s with rubble walls and Caen stone dressings, shows very few marks, even on the well-cut stone of St John's Chapel. Bishop Gundulf of Rochester (Kent) supervised the works. There are also no marks on his contemporary western crypt of his own cathedral. By contrast, the masonry of William Rufus's Westminster Hall (Greater London) from 1097 has had marks recorded from the exterior of the N. wall in large quantities.[20]

A picture is emerging from this survey of the late 11th-century buildings of masons' banker marks being in use both for the roughly squared walling stone and for the better-finished stone of architectural features, but the numbers of marks in all these cases is small and not all buildings show them. We need to examine the wider context. Perhaps surprisingly in light of the reputation of Normans as great builders, the first two decades after the Conquest saw only a modest number of new building campaigns started with the majority of new works undertaken during the 12th century. The year 1090 appears to be the watershed, according to Richard Morris's analysis, with six projects started in 1070, seven in 1080, and fourteen in 1090.[21] Equally, with the notable exceptions of the White Tower, Chepstow (Monmouthshire) and Colchester (Essex) castles,

[17] For Lastingham, see R. Gem and M. Thurlby, 'The early monastic church of Lastingham', 31–9 in L. Hoey (ed.), *Yorkshire Monasticism* (Leeds, Brit. Archaeol. Assoc. Conf. Trans. 16, 1995); for Worcester, see R. Gem, 'Bishop Wulfstan II and the Romanesque cathedral church of Worcester', 15–37 in *Medieval Art and Architecture at Worcester Cathedral* (Leeds, Brit. Archaeol. Assoc. Conf. Trans. 1, 1978).

[18] R. K. Morris, 'The architectural history of the medieval cathedral church', 203–40 in G. Aylmer and J. Tiller (eds.), *Hereford Cathedral* (London, 2000).

[19] J. Bony, 'The stonework planning of the first Durham Master', 19–34 in E. Fernie and P. Crossley (eds.), *Medieval Architecture in its Intellectual Context. Studies in Honour of Peter Kidson* (London, 1990). Recording the masons' marks would be a considerable undertaking in a building of this scale but would doubtless be very rewarding.

[20] E. Freshfield, 'Masons' marks at Westminster Hall', *Archaeologia*, 50 (1887), 1–4.

[21] R. Morris, *Cathedrals and Abbeys in England and Wales* (London, 1979), 179.

the majority of stone castles date from the end of the 11th century onwards, with the 12th century the period of greatest activity.[22] Castle masonry also shows that masons' marks were in greater use after the end of the century.

The improvement in stone cutting after c. 1090, noted above, coincides with the increase in building activity and with the more widespread use of banker marks. Two buildings sited near the Nottinghamshire/Yorkshire border illustrate this point; Blyth from after 1088 and Roche (S. Yorkshire) from the 1170s.[23] The remaining lower four courses of the N. aisle wall of Roche's nave are built of precisely squared ashlar blocks and have a high proportion — around three-quarters — of blocks marked (Fig. 5). In both the proportion of marked stones and in the accuracy of block cutting, this is in marked contrast to the stonework at Blyth from nearly 100 years earlier, although the stone tooling is similar at both sites, and their building stone type is the same. Two factors will have been important, the costs of carrying the work to a higher degree of finish, and the availability of masons skilled in the techniques.

Taking the economic aspect first, both Fernie and Derek Phillips rightly draw attention to how the amount of money expended on stonework was a determining factor in its final appearance, with the implication that less-finished stone would have been cheaper.[24] Fernie has pointed out that this is not a simple developmental matter, with early buildings like Aachen palace chapel (Germany) or St-Etienne in Caen achieving levels of stone cutting equal to those of late Romanesque Peterborough (Cambridgeshire), but we should note that neither example is in Britain. From the evidence of the surviving buildings, it would seem that building solely with ashlar was not a realistic proposition in Britain during the third quarter of the 11th century, but it is not possible to assess whether this was a problem of finance or whether ashlar was unavailable for other reasons. It is possible, however, to comment on the overall cost of building with less-expensively prepared stone by looking at the process of construction more closely.

C. N. L. Brooke has noted that there would have been no shortage of labour in 11th-century England: at certain times of the year farmworkers were available to undertake building projects for their new Norman lords.[25] The use of semi-skilled labour may explain the competently built but poorly finished nature of the sophisticated grillage systems of York's early foundations. Phillips notes that there were some masons of a high degree of skill employed from the start of work, but that these did not make up the bulk of the workforce.[26] John Crook has also observed that the building method of using wide mortar joints

[22] M. Morris, *Castle* (London, 2003), 55.

[23] For the dates of Roche, see P. Fergusson, *Roche Abbey* (London, English Heritage Handbook, 1990), 28.

[24] Fernie, op. cit. in note 2, 292; Phillips, op. cit. in note 11, 117.

[25] C. N. L. Brooke, *The Normans as Cathedral Builders*, text of a lecture given in Winchester 1979, published with R. Willis, *The Architectural History of Winchester Cathedral* (Winchester, 1980). However, as Gem points out (pers. comm.), this was a practice more commonly encountered in parish church maintenance, rather than cathedral or abbey church building, but individuals did sometimes give their services *gratis*, as an act of piety.

[26] Phillips op. cit. in note 11, 192.

FIG. 3
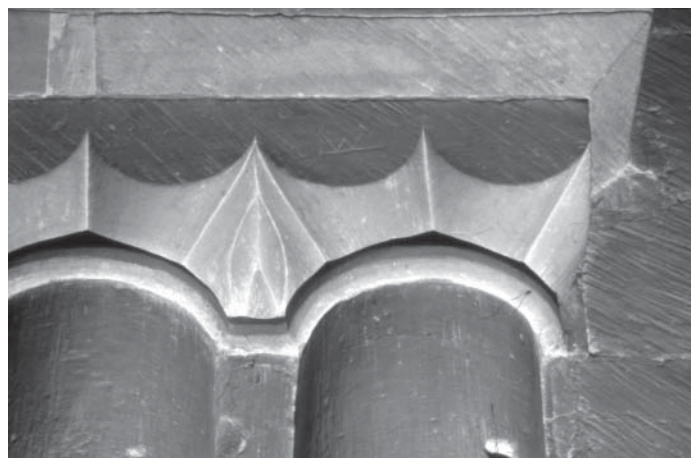Blyth Priory, mason's mark on stone above later nave vault. *Photograph: J. S. Alexander.*



FIG. 4
Tewkesbury Abbey, choir S. aisle respond with mason's mark on capital. *Photograph: J. S. Alexander.*



FIG. 5
Roche Abbey, mason's mark on nave N. aisle wall. *Photograph: J. S. Alexander.*

with irregular blocks would have been more appropriate for a largely unskilled labour force.[27]

We need to draw a distinction between the two skills of stone cutting and stone building. Laying courses of regularly squared blocks is actually easier, and faster, than building with irregular stones where the material for each course has to be selected for size and there is more work involved in levelling up each course. The greater skill lies in cutting the blocks and producing perfectly squared faces. This is evident in later medieval building accounts where stone cutters, who by this stage would have been cutting ashlar, are invariably paid more than stone layers.[28] While the production of the walling stones for the early-Norman buildings may have been less costly, the work of laying the blocks will have been in the hands of masons with more skill and hence able to command higher wages. The question of cost is clearly less straightforward than it would seem, and the final bill for constructing an early-Norman building may have been little different to one from the later Norman Period.[29]

One factor is relevant here. There seems to have been a shortage of skilled stone cutters in the third quarter of the 11th century, attributable to the reduction of recorded building activity in the first few decades of the 11th century, described by Richard Gem as a period of decline after the building works that accompanied the monastic reforms of the late 10th century.[30] Without the work, cathedral and major church works departments would run down, training fewer masons and disbanding teams. Quarrying and the provision of other materials, timber, iron and lead, would also scale down. So, starting major building campaigns after the middle of the century would have needed the rapid re-establishment of large parts of the whole industry across the country. Since we find banker marks more frequently on ashlar than on less-finished stonework, there is clearly a correlation between the situation in the stone-building industry and the use of masons' marks.

## ANGLO-SAXON QUARRYING

Evidence for Anglo-Saxon quarrying is hard to obtain from the documentary sources or by assessing the stone used in the fabric of dated buildings, for the reasons outlined above. E. M. Jope's detailed survey of the south of England, however, produced evidence for an organised system of quarrying by at least the Late Saxon Period, although it was not possible to determine what form these operations took.[31] His evidence largely came from a geological analysis of the

[27] J. Crook, 'Bishop Walkelin's cathedral', 21–36 in Crook (ed.), op. cit. in note 6, 29.
[28] D. Knoop and G. P. Jones, *The Medieval Mason* (Manchester, 3rd edn., 1967), 98–100.
[29] A modern parallel for this is in the use of reclaimed bricks in house construction. While bricklaying is a rapidly acquired skill, only more skilled bricklayers can build with reclaimed materials because there is a greater irregularity in the size and condition of the bricks.
[30] R. Gem, 'A recession in English architecture during the early eleventh century and its effect on the development of Romanesque style', *J. Brit. Archaeol. Assoc.*, 38 (1975), 28–49. Allowing for discoveries made since Gem compiled his paper, his basic thesis remains tenable: that major works on the scale of those carried out in continental Europe did not take place in England between c. 1010–40, which instead witnessed a slow-down in work until the revival in the early 1050s.
[31] E. M. Jope, 'The Saxon building-stone industry in southern and midland England', *Medieval Archaeol.*, 8 (1964), 91–118. See also the comments of Morris, op. cit. in note 21, 302.

stone used in surviving buildings for doorways, windows and pilaster strips, and from sculptural evidence. He perhaps underestimated the extent of re-use of stone from Roman sites for architectural materials, but the evidence for the use of freshly quarried stone for sculpture is stronger. Recent studies have found evidence for late Saxon quarrying at Raunds (Northamptonshire), with the extraction sites traced,[32] but these were small-scale pits opened for particular projects and not exploited further. The Anglo-Saxons also exploited the Kent stonefields, with evidence of use in the earliest stone buildings, such as St Martin's Canterbury as well as in later Saxon churches in the city.[33]

## ANGLO-NORMAN QUARRYING

There is a little more information from the Post-Conquest Period, but it is for quarrying in northern France. Vitalis, a Norman follower of Odo of Bayeux, was involved in transporting stone from Caen for the new royal palace at Westminster, also acting for the monks at St Augustine's Canterbury.[34] For Abbot Scolland's rebuilding of 1071, a monk from the abbey supervised quarrymen at Marquise near Boulogne (France) to cut stone for architectural elements as well as for walling blocks, ready for transport. Equally, the quarries at Caen delivered stone in a prepared state.[35] The Normans had to import stone since Kent has little suitable for ashlar, and its situation made sea-transport feasible. Caen stone was brought in after the Conquest from Normandy, Quarr stone from the Isle of Wight and Marquise from the area around Boulogne, although Marquise had been brought into Kent much earlier by the Romans and Anglo-Saxons.

Domesday Book shows that the quarrying industry had not expanded sufficiently to become an economic force even as late as 1086 since very few building stone quarries are included in it. Barnack (Cambridgeshire), for instance, has none recorded although the stone was widely used in both pre- and post-Conquest structures, and Taynton (Oxfordshire) is the only quarry in the Cotswold region to be included. It lists none of the Lincolnshire limestone quarries that supplied the major buildings in the Middle Ages. This absence from Domesday perhaps suggests an *ad hoc* system of quarrying still continued, with pits opened as the need arose for specific local building works and, that by 1086, even this had not recovered from scaling down in the first half of the century with the decline in building. The situation discovered by the excavators at Winchester, and to a lesser extent at Canterbury, in which the Anglo-Saxon buildings were not just demolished to ground level but had their foundations robbed out, strongly suggests that the Norman builders wanted to extract as much re-usable material as possible for their new buildings.

[32] G. Cadman and M. Audouy, 'Recent excavations on Saxon and medieval quarries in Raunds, Northamptonshire', 187–206 in D. Parsons (ed.), *Stone Quarrying and Building in England AD 43–1525* (Chichester, 1990).

[33] B. C. Worssam and T. Tatton-Brown, 'Kentish Rag and other Kent building stones', *Archaeol. Cantiana*, 92 (1993), 93–125.

[34] A. Williams, 'The Anglo-Norman abbey', 50–66 in R. Gem (ed.) *St Augustine's Abbey Canterbury* (London, 1997), 60.

[35] R. Gem, 'The Anglo-Saxon and Norman churches', 90–122 in Gem, op. cit. in note 34.

The French quarries were clearly operating fully during the third quarter of the 11th century and were able to cope with the demands of the Anglo-Norman patrons. This may have been as important to the patrons in the areas that used them, mostly East Anglia and the South-East, as the ease of transport. It would be logical then to suggest that the system of marking stones would have been in use in northern France, that masons at the quarries used banker marks to aid the local paymaster, and that their import into England provided an incentive for English masons to adopt the process. Unfortunately, examination of buildings with marks does not support this idea. We certainly find marks on the Caen stone of a number of 11th-century buildings in England, such as the E. end of Norwich (Norfolk), but, as noted above, marks do not occur on all the Caen-stone early buildings. Conversely, we can find marks on buildings of the same period built of more local stone. Winchester's stone from Bath and the Isle of Wight has banker marks, as does Lincoln's, where the quarry sites were closer still, situated in the area of the hill top on which the cathedral stands.[36]

It is still reasonable to suggest that masons applied banker marks to stone fully prepared at quarries, but it is unlikely that English masons adopted the scheme directly from their Normandy colleagues. The situation at St Augustine's may perhaps offer an explanation. Here the quarrymen were paid weekly wages at the Marquise quarry, and in the later Middle Ages we have evidence that masons who were paid regular wages did not mark their output. Marks were part of the piece-work system that enabled output to be assessed by the paymaster. Perhaps this was also the case in the 11th century.


## LATE SAXON BUILDINGS

We now need to consider the use of banker marks by Anglo-Saxon masons. Despite the Norman rebuilding there are several larger churches from the Pre-Conquest Period, such as Brixworth (Northamptonshire) or Stow (Lincolnshire), and there is Anglo-Saxon fabric preserved at a number of other sites. The materials used were mostly not ashlar: Brixworth, constructed of brick and rubble, re-used materials; and Stow is largely rubble.[37] Stow has large blocks of dressed stone used for the giant half-shafts of the crossing but none of these is marked. The building has a complex history with most phases dated to the first half of the 11th century.[38] Rubble stone walling with dressed stone detailing is the principal building method observable in these later buildings at, for example, Barnack from the early 10th century, or Earl's Barton (Northamptonshire) and Barton-upon-Humber (Humberside), towers from the late 10th century. In no case has banker marks been identified on the dressed stone of these buildings but this is to be expected. The proportion of dressed stone to rubble is mostly small and, because a very small group within the masons' team is likely to have

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[36] J. S. Alexander, 'Building stone from the East Midlands quarries: sources, transportation and usage', *Medieval Archaeol.*, 39 (1995), 107–35, 111.
[37] Brixworth has been dated to the 8th and 9th centuries with 11th-century work at the W. end: D. S. Sutherland, 'Burnt stone in a Saxon church and its implications', 102–13 in Parsons, op. cit. in note 32.
[38] E. C. Fernie, *The Architecture of the Anglo-Saxons* (London, 1983), 124–7.

done the work, they could use a simpler means of identifying output. In the case of Barton-upon-Humber, the Rodwells identify dressed stone for the pilaster strips and other architectural features as re-use, probably taken from a nearby Roman building.[39] The method of using mostly irregular-sized blocks for openings also does not seem to have needed an assembly mark system, unless used exclusively on the joint-beds.

The major late Saxon building of the period just before the Conquest was Edward the Confessor's Westminster Abbey, started sometime after 1051 and nearing completion of the monastic part of the church by 1066.[40] Although Henry III's rebuilding swept the church away, excavation has recovered fragments of the building and Tim Tatton-Brown's recent work reveals that parts of the claustral buildings still embody Saxon masonry: the rear wall of the S. cloister is from the 1050s building. The stone used was Reigate (from Surrey), a fine-grained sandstone, newly quarried from sites specially opened for the project.[41] Unfortunately the stone has poor weathering qualities and insufficient of the face of the blocks survives to see whether any masons' marks were present.

Masons' banker marks are, however, present on the one surviving ashlar church from the Pre-Conquest Period, St Lawrence's, Bradford on Avon (Wiltshire), now accepted as being a work of the very early 11th century. Its building relates to a grant to the nuns of Shaftsbury to provide a refuge from the Vikings in 1001.[42] The stone cutting is of a very high standard and the presence of two large-scale angel sculptures on the interior emphasises the building's high status. The stone is Ancliff Oolite, quarried locally.[43] Several of the ashlar blocks on both the interior and exterior are marked, some recorded by J. T. Irvine in 1869 on measured drawings done before the building's restoration.[44] Remarkably, the marks that Irvine recorded on the exterior are mostly still visible, although one block at the E. end of the chancel N. wall has spalled and the surface detail is no longer clear. The marks are simple two-line crosses and occur in seven locations on the upper parts of the N. walls of the nave and chancel. Most marks are on the plain stonework but one is centrally placed on the blind arcading, and a second, shaped like an inverted 'T' is immediately above on the spandrel of the chancel W. bay (Fig. 6).

Two of Irvine's drawings of the interior indicate the presence of banker marks by notes in the margins of the drawings but do not place the marks on

[39] W. Rodwell and K. Rodwell, 'St Peter's Church, Barton-upon-Humber: excavation and structural study 1978–1981', *Antiq. J.*, 62 (1982), 283–315.

[40] Fernie, op. cit. in note 2, 96–8.

[41] A. W. Clapham and L. Tanner, 'Recent discoveries in the nave of Westminster Abbey', *Archaeologia*, 83 (1933), 227-36; T. Tatton-Brown, 'The quarrying and distribution of Reigate Stone in the Middle Ages', *Medieval Archaeol.*, 45 (2001), 189–201.

[42] R. Gem, 'Architecture', 221–45 in B. Ford (ed.), *Early Britain* (Cambridge, Cambridge Cult. Hist., 1, 1988), 238.

[43] B. C. Worssam, 'Anglo-Saxon building stone and stone sculpture in Wessex', 27–32 in T. Tatton-Brown (ed.), *Building with Stone in Wessex over 4000 years. The Hatcher Review*, 5:42 (1998).

[44] These drawings are in the Bath Reference Library, Box 14. They were published, without any comment on the marks, by H. M. Taylor, 'J. T. Irvine's work at Bradford-on-Avon', *Archaeol. J.*, 129 (1972), 89–118.
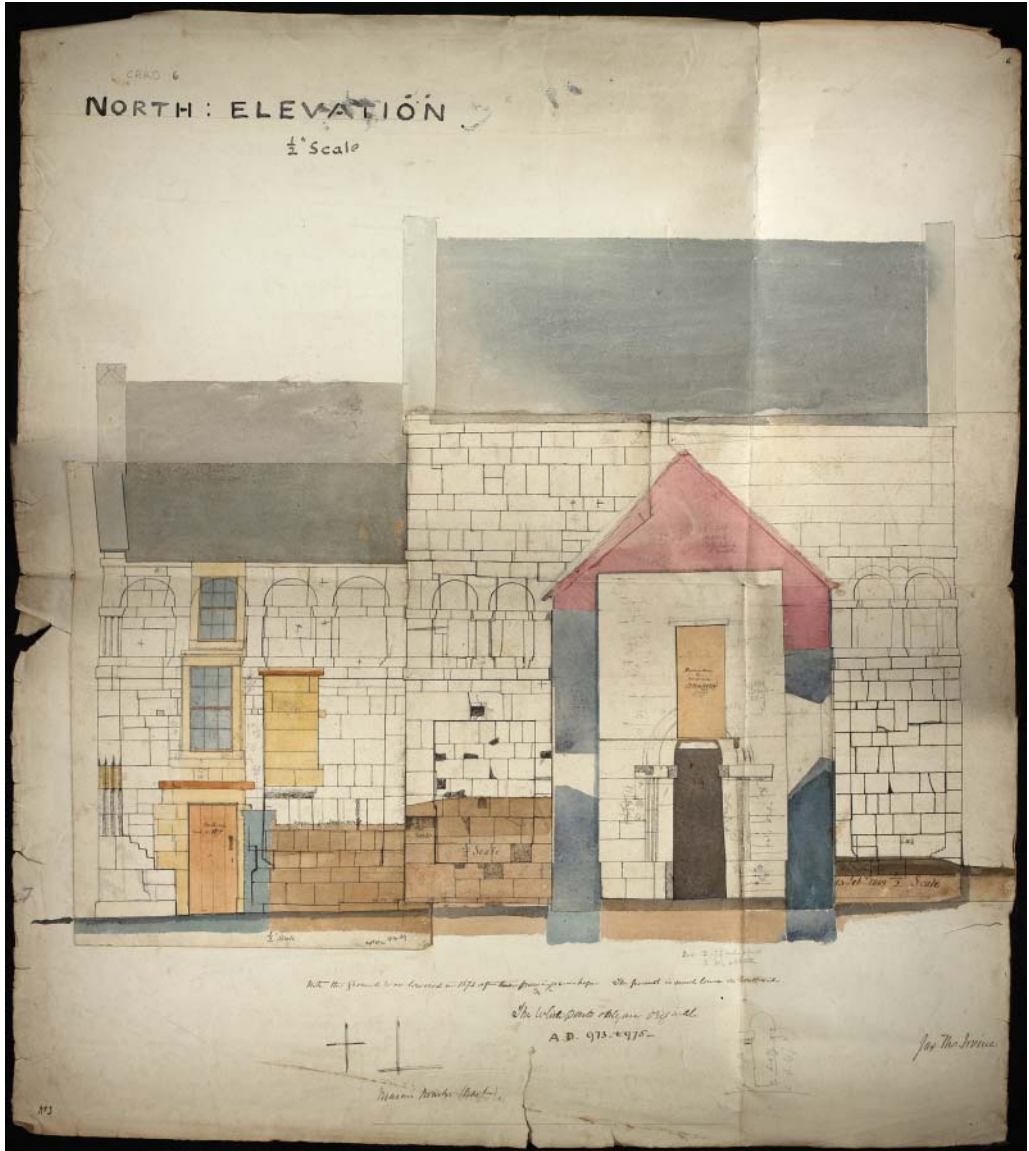
FIG. 6

Bradford on Avon St Lawrence, scale drawing by J. T. Irvine of the N. side of the church before restoration, 1869. *Photograph: Bathintime, reproduced by permission of the Trustees of the National Museums Scotland.*

the walls. These are the same crosses shown on the exterior, located on the W. and N. interior walls of the N. porticus. They are also present, together with some lightly inscribed saltire crosses, on the interior of the nave N. wall. The depth of cutting of the marks varies; some are quite shallow and it is possible that weathering has destroyed others. Irvine recorded no marks on the doorways

or windows of the building, and none is visible now, so there is no evidence of use of assembly marks.

Systems of using masons' banker marks in construction were therefore in place before the Conquest. The single example of Bradford on Avon does not allow us to draw any broad conclusions, but it does establish that such systems were available, for ashlar buildings at least, in the Late Saxon Period. It is noticeable that, as with the early post-Conquest buildings, the proportion of marked to unmarked stone is small.

## MIDDLE ANGLO-SAXON BUILDINGS

Examples exist from the earlier Anglo-Saxon Period of stone taken to a high degree of finish that is not ashlar but laid in regular courses, such as at Jarrow (Tyne and Wear) or Escomb (County Durham). These buildings may therefore provide evidence for the use of marks before the early 11th century. Jarrow, from perhaps the late 8th century, appears to re-use Roman stone. Monkwearmouth (Tyne and Wear), where the earliest part of its W. tower belongs to the late 7th century, also seems to have employed re-used Roman stone. According to Bede, specially introduced masons from northern France constructed Jarrow and Monkwearmouth to the '*mos romanorum*'.[45] The precise meaning of this is uncertain, but it suggests builders familiar with building in stone. Neither building has any banker marks visible.

The undated church at Escomb also re-uses Roman stone, with tooling characteristic of Roman work visible on many of the regularly sized blocks. Several inscribed stones built into the walls either are upside down or set on the side so that the lettering is meaningless. We might anticipate the voussoirs of the chancel arch would have had some form of assembly mark inscribed on the joint faces since this arch may be a dismantled and re-erected Roman arch.[46] Only disassembly would reveal this. The 7th-century crypt at Ripon (N. Yorkshire) also contains re-used stone, dated to the slightly later Romano-British Period, but there are no records of marked stones.[47] Equally, the 7th-century crypt at Hexham (Northumberland) has in its construction large blocks of Roman stone, including inscribed and monumental stone; the crypt at Repton (Derbyshire) probably also includes large Roman blocks. Marks have not been found at any of these sites.

When stone was reused it can be assumed that the sources were standing, or decayed, buildings which were dismantled for the purpose of acquiring the stone, and that the intention was to do little re-cutting of the blocks. This means there would not have been the same need for masons to mark the stone. While it is probably an overstatement to claim that between the late 6th and late 10th

[45] Bede, *Lives of the Holy Abbots*, v, ed. and trans. V. D. Scudder (London, 1910).
[46] G. Baldwin Brown, *The Arts in Early England. Anglo-Saxon Architecture* (London, 1925), 53. For Roman methods of recording output of stonework, see below.
[47] R. A. Hall, 'Antiquaries and archaeology in and around Ripon Minster', 12–30 in L. Hoey (ed.), op. cit. in note 17.

centuries the source of stone for major buildings was exclusively Roman *spolia*,[48] it clearly played an important part. What is probably more significant for our purposes is that the majority of Anglo-Saxon churches used a rubble construction and they did not use banker marks on rubble. Squared stone, roughly shaped for use as quoins, occurs on a number of these buildings but, whereas post-Conquest buildings constructed this way have marked quoins (such as the little 12th-century church at Heath Chapel, Shropshire), none has been recorded from the Pre-Conquest Period.

## ROMAN STONE

The re-use of Roman stone does have implications for the early use of masons' marks of all types. Roman builders used stone-marking systems similar to medieval ones and, in theory, if sufficient masonry with marks had remained at Roman sites then the Anglo-Saxon builders would have had the opportunity to study the systems in use. In practice this does not seem to have been the case; firstly, not all Roman buildings in England were of ashlar — rubble stone with brick binding courses was frequently used; secondly, the Romans used several different systems for recording masons' work which the medieval builders did not use. Some Roman systems required a literate workforce that was largely unavailable in medieval times.

In the case of Hadrian's Wall in northern England, certain of the stones are marked with the names of the military units responsible for building lengths of the wall. These 'centurial stones' were placed at the beginning and end of the stretch of wall built by the group of men, and carried inscriptions naming the century, its cohort and its legion. Their purpose was to record the achievement of the soldiers as builders and had a celebratory role. Military sites such as Caerleon (Newport) have produced similar stones.[49] When the Antonine Wall was built in southern Scotland more elaborate slabs were used that were highly decorated with figure sculpture, such as that from Bridgeness (Falkirk) which shows the sacrifice made at the end of a successful campaign, as well as an inscription.[50] The informative nature of these inscriptions clearly demonstrates that they did not function as part of the day-to-day organisation of the construction process. The system is also entirely literate and there is similar evidence of literate, rather than coded, instructions from the quarries for Hadrian's Wall. A stone now in the Chesters site museum (Northumberland), which came from the quarry at Fallowfield Fell, has [P]ETRA FLAVI CARANTINI loosely inscribed on it to record that this block of stone was reserved for Flavius Carantinus. Other sites in Britain and in the Empire record inscriptions of this type.[51]

The Roman methods of using marks require detailed study, and there is no published corpus of marks that can be referred to, but it is clear from sites

[48] T. Easton, *Plundering the Past. Roman Stonework in Medieval Britain* (Stroud, 2000), 133.
[49] G. C. Boon, *Isca, the Roman Legionary Fortress at Caerleon, Mon.* (Cardiff, 1987), 29, 34–8.
[50] D. J. Breeze and B. Dobson, *Hadrian's Wall* (Harmondsworth, 1987), 72, 95.
[51] G. de la Bédoyère, *The Buildings of Roman Britain* (Stroud, 2001), 24.

overseas that the Romans did also use marks in ways later practised by medieval builders. Ruined structures on some sites reveal quarry marks, or assembly marks, on the bedding planes of stone blocks. Numeric schemes carried coded instructions for assembly of columns, capitals and bases prepared in the quarry and transported to site. Other marks inscribed at the quarries identified the destination of the blocks and, in the case of the marble quarries at Tripolitania (Libya), a whole series of letters was used to provide a record of each block of stone.[52] Marks on the face of stone blocks have also been reported but their function has not been discussed, except to suggest, in a rather general way, that these resemble medieval banker marks, that is that they had some function in assessing the output of individual stone cutters.[53]

The fragmentary nature of the evidence makes evaluation difficult but it seems that Romans used similar systems in Britain. The Roman basilica and forum excavated in the cathedral close at Exeter (Devon) had stones with marks that have the same form as medieval marks, as had stones from the massive foundations of a building close to the Temple of Sulis Minerva at Bath. Some of these marks were assembly marks, made up of sequences of lines, as revealed in the excavation of the Roman spring under the King's Bath at Bath.[54] Another site appeared to show assembly marks in use, but the evidence is ambiguous. In 1907, excavation of the 2nd-century Roman bath-house at Corbridge (Northumberland) found a large number of disassembled voussoirs, probably from two arches, neatly stacked as if for reuse. The excavators described some of the stones as having marks made by the masons to show their position in the arch. Bishop recently re-examined the excavation archive and studied the marks but, rather alarmingly, it is not clear whether these marks are part of the original assembly of the arch, its dismantling in the Post-Roman Period, or even if they had been made by the excavators of the early 20th century who had reassembled the arch.[55]

Although Roman builders clearly did use systems of marking stone, the current state of research does not make it possible to assess the ways in which they used marks in Britain. The absence of any marks on the re-used stone found in Anglo-Saxon and later buildings may perhaps indicate that the permanent marking of stones was not common in this country. There is no evidence that Anglo-Saxon masons adopted any Roman systems that used masons' marks, or that they, or later medieval builders, followed the Roman literate systems.

## EARLY EUROPEAN EXAMPLES

A second, and probably more fruitful, line of inquiry is to examine the practices of builders in Europe in the period before the Conquest. Nôtre Dame

[52] J. Ward Perkins, 'Tripolitania and the Marble Trade', *J. Roman Stud.*, 41 (1951), 89–104.

[53] J.-P. Adam, *La Construction Romaine, Materiaux et Technique* (Paris, 1984), 42. Published in English as *Roman Building Materials and Techniques* (London, 1994).

[54] P. T. Bidwell, *The Legionary Bath-house and Basilica and Forum at Exeter* (Exeter, 1979), 148; B. Cunliffe, 'The Excavation of the Roman Spring at Bath 1979, a preliminary description', *Antiq. J.*, 60 (1980), 187–206, pl. xvi(a).

[55] M. C. Bishop, 'An old Corbridge bath-house revisited', *Archaeol. Aeliana*, 5 ser., 26 (1998), 39–47.

at Jumièges (France), in building from 1040, has a type of masons' mark used to align certain sections of stone still visible in the nave. These consist of lines cut into the joint bed to allow the next block to be correctly sited. Other marks, described as arrows, crosses, diamonds and the letters 'C' and 'X', seem to be banker marks.[56] French masons' use of marks have been recorded at 11th- and 12th-century sites in other regions and ateliers of masons identified from their marks in Burgundy, for example, from the late 11th century.[57] No one has yet identified the first appearance of the use of marks, but it is described as stretching back into antiquity.[58] As with the English examples, we encounter considerably greater use of marks in the 12th than in the 11th century, as also observed in Spanish Romanesque buildings where the date of 1090 again marks the turning point.[59] Studies of masons' marks from the Low Countries reveal no evidence for mark use before c. 1100, although they are common in the later Middle Ages.[60] More generally, there is no evidence for marks on European buildings between the 6th and 10th centuries but that they exist widely after this date.[61] In each case, the widespread use of masons' marks relates to the use of ashlar, or more regularly squared stone. The introduction of this type of stone for mass-walling involved changes to the organisation of work, and this required the use of masons' marks. It is therefore more likely to be the case that early builders in England derived their methods of using marks in buildings from contact with European masons during the late Saxon Period.

## CONCLUSION

Anglo-Norman builders of the major churches in England worked within a tradition of stoneworking in which masons used marks, whether they trained in the Anglo-Saxon or European workshops. Anglo-Norman masons used marks whether they were building exclusively in ashlar, or restricting its use to specific features. Anglo-Saxon masons, from the vital evidence of the one ashlar building that survives, also used a scheme of marks, but did not seem to have used it when using cut stone with rubble walling. The absence of the major late Saxon buildings makes testing this theory further impossible, but it moves the date for the early use of marks back before the Conquest. The difference in the extent of the use of marks between the 11th and 12th centuries in England and beyond appears to relate to the development of techniques of cutting stone to ashlar. The re-use of stone from Roman buildings does not seem to have been

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[56] J. Morganstern, 'Jumièges, église Nôtre-Dame', *Congrès Archéologique de France: Rouen et pays de Caux* (2003), 79–96, 88.
[57] C. E. Armi, *Masons and Sculptors in Romanesque Burgundy* (Pennsylvania, 1983).
[58] P. du Colombier, *Les Chantiers des Cathédrales* (Paris, 1973), 136.
[59] T. Martin, 'Reading the walls: masons' marks and the archaeology of architecture at San Isidoro, León', 373-412 in T. Martin and J. A. Harris (eds.), *Church, State, Vellum, and Stone: Essays on Medieval Spain in honor of John Williams* (Leiden, 2005).
[60] H. Janse and D. de Vries, *Werk en Merk van de Steenhouwer* (Zwolle, 1991).
[61] E. Nicolas, 'Les signes lapidaires: approche méthodologique', 185–95 in O. Chapelot and P. Benoit (eds.), *Pierre et Métal dans le bâtiment au Moyen Âge* (Paris, 1985).

important as a means of introducing Anglo-Saxon masons to stone-marking schemes, but it is likely that the concept of marking stones to inform paymasters and provide assembly instructions reached England through contacts with Europe in the later Anglo-Saxon Period.

The late Saxon recession in the building industry and its effects on the supply of men and materials meant that large numbers of workers wanted training to meet the demands of new patrons after the Conquest, masons and quarrymen alike. They needed methods for recording output of work and it seems that they revived the use of banker marks and assembly marks after a period when these things had fallen out of use, but not out of memory.