

Aspects of the Production, Evolution and Use of Ceramic Building Materials in the Middle Ages

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SUMMARY

The essential differences between the nature and use of pottery and ceramic building materials in the medieval period are considered, as a preliminary to an overview of evolving patterns of use of the latter in England. A 'century of innovation' for ceramic building materials, c. 1130–1230, is proposed, characterised by the emergence through experiment of a very wide range of forms, soon reduced to much smaller ranges, standardised within regions. The changing role of 'Flemish' brick in England through the remainder of the medieval period is considered. Until the late 14th century it was largely used as a concealed material; thereafter it was increasingly expressed in architecture, as a cultural statement.

INTRODUCTION

The steady growth in publication of dated ceramic building materials is providing the raw material for much greater understanding of their use in England in the medieval period. They have the potential to tell us more about what buildings looked like and how they were used, and to help to explore relationships between architectural style, cultural messages and construction materials. They shed light on how ideas were transmitted, for example through aristocratic and mercantile taste, the import of materials, or the import of skills. They also help us, with the documents, the better to understand models of manufacture, distribution, marketing and trade.

A comprehensive synthesis of progress over the past 25 years is impossible here. Rather, this paper, based on a contribution to the 2000 MPRG Conference, reflects on some aspects of the production, evolution and use of brick and tile in medieval England, selectively developing issues raised in the overview of the trade and its products set out in *Medieval Industry* (Drury 1981).

KEY DIFFERENCES BETWEEN POTTERY AND CERAMIC BUILDING MATERIALS

Technology and skills

Pottery and ceramic building materials are both made by firing clay, and both may be finished with lead glaze, but during the medieval period, pots were

normally thrown, whereas bricks and tiles were moulded. Pots were fired in small, round or oval kilns made of clay, whereas bricks and tiles were fired in large rectangular kilns made of bricks or tiles, or temporary clamps of similar form. Thus the skills required were and are very different, and the trades and enterprises were generally separate.

Components rather than finished products

Most pots are complete artefacts in themselves, used by consumers in the form in which they were manufactured (though sometimes as composites); whereas bricks and tiles are prefabricated components of much larger artefacts, i.e. buildings or other structures. They are *intermediate products*, used by other tradesmen or enterprises to make structures that are used by consumers. Similar components were and are used to form very different end products. In consequence, whilst the form of (particularly decorative) pottery tends to change and develop rapidly, to reflect changing fashion (and to a lesser extent function), regional forms of brick and tile, once established through a period and process of experiment and selection, could stay constant for centuries, although the style of artefacts fashioned from them might change dramatically. A good example is the flat roofing tile fixed by pegs or nails through two holes, which in the 13th century triumphed as the regional standard in south-east England, and remains in production today. Efficient

building, and later repair, produces strong pressure for standardisation, and by the 15th century legal measures were being taken to secure not just quality but uniformity (e.g. Drury 1981, 131 and n.18; Janssen 1986, 77).

This is a major limitation in terms of the information conveyed by the material itself. It is exacerbated by the ease of recycling, both in whole units and as rubble, underlining how very different artefacts can be made in sequence from the same components. Nor does the lack of previous mortar mean that bricks are new, for in and before the 16th century they were often laid in brickearth rather than mortar, even in courtier-level buildings like Hill Hall, Essex (Drury 1983b, 101). Another limitation is percentage survival. A single sherd commonly represents something in the range of a tenth to a hundredth of a pot. A brick might represent between a thousandth and a millionth of a structure. Even if it is a moulded, highly distinctive brick, the chances of reconstructing the whole from a part are somewhat limited.

Thus bricks and tiles need to be seen primarily as an aspect of the history of building and of architecture (in the sense of style and form in building, going beyond mere utility). But despite all the limitations, since ceramic building materials formed part of major investments, they have the potential to tell us much about the development and spread of innovation and influence in material culture.

Ceramic building materials are not ubiquitous

Ceramic building materials are much more limited than pottery in their distribution as a cultural trait. By the later Middle Ages at least, pottery was ubiquitous in England. Ceramic building materials, however, tend to be rare in the many areas of England and Europe that have locally-available building stones and slates that can fulfil the same functional roles in construction, generally more cheaply. Therefore when ceramic building materials are found in such areas, they clearly represent a conscious cultural choice. Nowhere in England is so far from a supply of stone that fired clay was the only viable hard material for major buildings. The widespread use of decorative ceramic floor tiles shows this very well, for they, and decorative ridge tiles, are often found as the only ceramic building materials on a medieval site, preferred over equally durable stone alternatives because of their appearance. It is important to remember that the use and the visible expression of ceramic building material, especially brick, was strongly influenced by architectural fashion and taste. Concealing brick behind a thin stone skin, or conversely using it as a skin facing to stone rubble, are primarily statements of style and cultural affinity.

Modes of production and trade

The very lack of distinctiveness of so much brick and tile — in form as well as petrology — makes it more difficult to understand patterns of trade and production than is the case with much medieval pottery. The greatest contribution to understanding patterns of production and trade has come from decorated floor tiles, which are relatively easily sourced to a core area, if not a kiln site, combined with documentary sources.

Stopford (1993) sets out two basic models:

1. *Itinerant production* — the producers move from supply site to supply site. This tends to be the norm early in the spread of ceramic building materials to new regions, and at any time for highly specialised material like terra cotta.
2. *Settled production* — customers are supplied with distinctive products from a single manufacturing site, either in continuous or intermittent use. Some sites were set up by large-scale consumers, particularly secular and ecclesiastical estates, who sold only the surplus; others were independent. The scale of distribution varies from local to international.

A third model can be added to these:

3. *Regional production* — many sites making functionally compatible, standardised products, which could easily be assimilated into a single structure. This could give rise to two scenarios:

- purchase still largely direct from producers
- purchase from intermediaries (i.e. merchants, middlemen), a fully developed regional market (for examples, see Drury 1981, 133).

Pottery is much more easily transportable than ceramic building materials in the quantities consumers require. Its production therefore generally followed only the two latter models, with production either from a settled site or, particularly in the later Middle Ages and beyond, by regional producers of more or less homogenous products (Cherry 1981, 204–8).

The nature of ceramic building materials being used in a particular region and the way their production was organised are thus closely interrelated. The remainder of this paper is concerned with changing patterns of use, and therefore production, of ceramic building materials during the Middle Ages, and particularly with their rapid evolution during the century following their introduction as materials of mass production.

include large bricks at the outset (*ibid.*, 79). Since production of 'Great Bricks' in eastern England is difficult to substantiate after about 1230, 'Flemish' bricks would reasonably be expected by or before then. However, the earliest clearly-dated examples, many certainly imported, so far seem to belong around the 1260s, for example in Norwich (Drury 1993, 164), where the largest size correlates with those at s'Hertogenbosch dated c.1250-1300. Smaller bricks may also be relatively early, on the evidence of those used at Little Wenham Hall c. 1265 (Drury 1981, 127; Moore 1991, 226).

Roof tiles (Drury 1981, 130-1)

Roof tiles took a variety of forms. Glazed *tegulae* and *imbrices* in the Roman tradition were used in Scarborough in the mid-12th century and in Southampton before c. 1200 (*ibid.*, 127). At Reading Abbey and in London (Betts 1990) they occur before the middle of the 12th century, and had probably gone out of use by the end of the century. Their use at Battle Abbey by c. 1100 has been suggested, but is not certain (Streeten 1985, 95). These tiles could have a striking appearance, especially if, as at Southampton, the *imbrices* were glazed green, and the *tegulae* red-brown. They suggest an association with low-pitch roofs (Schofield *et al.* 1990, 170) and thus a southern French influence; but there is no reason why they should not have been used on the steeper roofs common to northern Romanesque buildings.

Tegulae and *imbrices* were but one of three types of ceramic roof tile in use in London by 1150 (Smith 1998-99), the general use of less combustible roof coverings probably prompted by a serious fire in 1135 (Betts 1990, 220). The others were variants of the flat tile, essentially a skeuomorph of the north European oak shingle — shouldered peg and flat peg. Shouldered peg tiles (with the upper third diminished in width) are rare, and went out of use in London around 1200, leaving rectangular peg tiles as the local/regional standard (Betts 1990, 223; Smith 1998-99, 70). Hill Hall and Chipping Ongar church have large nibbed tiles, 300mm wide, associated with Great Bricks. At Hill Hall they are related to an early 13th-century stone chamber over an undercroft (Drury in prep). Nibbed tiles were widely used by the early 13th century, from Yorkshire through Warwickshire to Sussex (Streeten 1985, 96-7), but in the south-east they too gave way to flat tiles with two peg holes, which quickly reached a more or less standard size, c. 160 × 270 × 15 mm, for example at Danbury, Essex, in the late 13th century (Drury and Pratt 1975, 111), which was confirmed by statute in 1477 (Cherry 1991, 195). It is significant that two kilns in Surrey, at Farnham and Guildford, producing 'a surprisingly

complex sequence of roof tiles', went out of use before 1220 and 1230 respectively (Riall 1998-99, 159).

Decorated floor tiles (Drury 1981, 129-30)

These also appear in the same period, and a magisterial article by Norton (1986) has elucidated their development. The most obviously 'early-looking' tiles, with compass-incised patterns, about 170mm square, are closely dated to 1165-67 at Orford Castle, and there associated with glazed peg tiles (350 × 200 mm). The floor tiles find slightly later parallels at French Cistercian abbeys, with outliers from Hungary to Belgium, c. 1190-1220; but like 'Great Bricks', they were clearly not a Cistercian invention (Drury and Norton 1985; Norton 1986, 261-3). Counter-relief tiles were used in St Albans Chapter House c. 1165, and find contemporary parallels in, for example, Alsace and Denmark (*ibid.*, 261). Tile mosaic floors, a skeuomorph of *opus sectile*, were common in France in the 12th century, and appeared in Yorkshire from the early 13th century onwards. Two-colour floor tiles were probably invented in Normandy in or by the 1230s, were soon taken up at royal level in England, and become hugely and rapidly popular. The manufacturing skill came to England fully-developed, thus the experimental techniques, so typical of this period, are confined to Normandy (*ibid.*, 270-3).

The evolving use of 'Flemish' brick in England: material and cultural statement

By the end of the 13th century, 'Flemish' brick was widespread in southern and eastern England (Drury 1981, 127). It is clear that early material was often a mixture of imports and local production. However, identifying the two groups, and thus their relative importance, remains problematic, despite some pointers to differences between them (Drury 1993, 164; Ryan 1996, 44-5). These bricks were not normally used in England to form brickwork, to create brick buildings, but as the backing to stone facing, an ingredient of rubble walls, and sometimes for infilling vaulting cells, or other specialised purposes such as flues (for example at Hartlepool: Vyner 1986). It is not clear whether they were used in this way because the supply consisted of small quantities of varied sizes from varied sources, or whether such a supply pattern was tolerable because of the way they were utilised. However, the fact that buildings were faced in stone, even where large-scale, uniform brick supplies were available, suggests the latter. The 243,000 *quavellarum de Flandria* used at the Tower of London in 1281 to build the Beauchamp Tower (Drury 1993, 164) provide a clear example. Indeed, it seems to amount to a

cultural statement that the building was not designed to express an 'alien' material. Except perhaps for Holy Trinity, Hull (c. 1300–20), real brickwork and the architectural expression of brick only appear around the end of the 14th century, with buildings like the Cow Tower in Norwich of 1398–9. There the situation at the Beauchamp Tower is reversed, skins of brick facing a rubble core, indicating that resemblance to a tower on the city wall at Utrecht was not only acceptable but desirable (Ayers *et al.* 1988, especially n. 57).

In the 15th century, after 1410 at Stonor in Oxfordshire, in the contemporary North Bar at Beverley in Yorkshire, and especially from the 1430s and 1440s onwards, high quality decorative brickwork of distinctively North European derivation appears. Smith (1985, 19) has identified a group of such elaborately decorated buildings in eastern England, using moulded bricks, as the work of German craftsmen. Germans and Flemings were still much involved in England throughout the 15th century, for example at Kirby Muxloe, Leicestershire (Drury 1981, 129). Thus the links between eastern England and the north European brick building tradition became strengthened through innovation in high status architecture. Associated with this period of innovation is a shift in technology, to bricks made from brickearth, with orange to deep red, rather soft, sandy fabrics, which became universal by the early 16th century (Drury 1993, 165). Given the quantities used, Smith (1985, 26) is surely right to conclude that most were now made in their region of use.

By the end of the 15th century, brick had become a high-quality, high-status, decorative building material, confidently handled by English designers and craftsmen (Moore 1991, 216). Renaissance influence from the early 16th century onwards embraced materials as well as style, particularly the idea of making buildings not wholly from moulded brick (where all the units are formed within the standard brick size), but including *terra cotta*, pre-fabricating units on the scale of stone. The best-known examples in England belong to the 1520s, for example at Sutton Place in Surrey, Hampton Court in Middlesex and Layer Marney in Essex (Baggs 1968; Moore 1991, 218). There are also some instances from later in the century, notably Hill Hall, Essex in 1572–3, which includes glazed *terra cotta*, and elaborate mosaic floor tiles (Drury 1983a, b). The links are with Italy via France rather than northern Europe. In the case of Hill Hall these were very personal ones, through Sir Thomas Smith's role as ambassador to the French court.

ENDNOTE

The frequent domination of site assemblages by 'standard' architectural ceramics poses major problems of selection, quantification and study. Sometimes a massive effort can be made, for example with the material from the Norwich Survey excavations (Drury 1993), yet yield few substantial conclusions, certainly compared with the results of studying material in surviving buildings. For commonplace ceramic building materials, quantification of what are in effect very small samples of the final artefact, the building, with high levels of recycling, is most unlikely to be cost-effective; nor are very fine levels of classification, given the variation in a single kiln or clamp firing. But all this is no excuse for ignoring ceramic building material. Of the two excavation reports on Castle Acre, a potentially crucial site for dating the introduction of ceramic building materials, since the keep was abandoned c. 1200, the first (Coad and Streeten 1982) makes no mention of them, whilst the second (Coad *et al.* 1987, 286) states that 'ceramic building materials . . . are deposited with the finds but are not described'. Progress of sorts?

We need to try to draw out conclusions at site level and regional level about what suites of material were used, when, how, and the hints as to why. As specialists, we need to use and see this information in its wider contexts: geographical (European), architectural and cultural, as well as technical and economic, for in England the use of bricks and tiles to make or finish structures was always a cultural as much as a practical choice.

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Résumé

Les différences essentielles entre nature et emploi de la poterie et des matériaux de construction en terre cuite pendant la période médiévale sont examinées. Ceci est un préliminaire à une étude de l'évolution des types d'emploi de ces céramiques en Angleterre. Un 'siècle d'innovation', vers 1130 à 1230, est proposé, car il est caractérisé par l'émergence à travers l'expérimentation d'une gamme très large de formes, bientôt réduite à de beaucoup plus petites gammes, standardisées dans les régions. Le rôle changeant des briques de type dit 'Flamand' ('Flemish bricks') en Angleterre à travers le reste de l'époque médiévale est considéré: jusqu'au XIV^e siècle tardif principalement utilisées comme matériaux dissimulés, et par la suite exprimant de plus en plus une identité culturelle.

Zusammenfassung

Die wesentlichen Unterschiede in der Art und Verwendung von Töpferware und keramischem Baumaterial im Mittelalter werden einem Überblick über die sich entwickelnden Gebrauchsstrukturen der Baukeramik in England vorangestellt. Vorgeschlagen wird ein 'Jahrhundert der Neuerungen' von etwa 1130–1230, für welches das Entstehen einer experimentell gewonnenen weiten Palette an Formen charakteristisch ist, deren Breite sich allerdings bald verengte und innerhalb der einzelnen Regionen standardisiert wurde. Weiterhin wird die wechselnde Rolle des 'flämischen' Ziegels in England während des restlichen Mittelalters diskutiert: wie er bis ins späte 14. Jahrhundert weitgehend verdeckt, danach dann zunehmend als kulturelle Aussage verwendet wird.