Rhineland Lava in Norfolk Churches

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The results of a long-term survey of the occurrence of Rhineland lava querns and millstones in the fabric of Norfolk churches are presented here. The project was prompted by a map showing the distribution of this material in England, which gave Norfolk a meagre three dots, representing 'minor groups and individual finds': these were at Norwich, Great Yarmouth and Thetford, ie from major urban excavations. Not surprisingly the distribution of lava built into churches is very different, but is unexpectedly biased towards the east coast (Fig 1).

Fig 1
The distribution of Rhineland lava in Norfolk churches, with the positions of Norwich, King's Lynn, Great Yarmouth and Thetford indicated.

The survey began as the private venture of one of the authors (AR) in 1980, inspired by a map of Rhineland lava querns, published in Parkhouse (1976, fig 7) and used on a publicity leaflet for a conference on Quernstones and Archaeology (1978). This map showed three 'minor groups and individual finds' for Norfolk. Given the ubiquitous use of querns in everyday life (Curwen 1937 and 1941; Crawford 1960, 98-106), and the popularity of lava from the Roman to the post-medieval period, with a short gap in the fifth and sixth centuries (Watts 2006), this appeared to be a nearly-meaningless map, even shortly after its publication, showing only places where published lava-producing excavations had taken place. Since 1976, finds of lava querns from excavation and field survey on a number of Norfolk rural sites have been published, notably North Elmham (Wade-Martins 1980a, 492), Grenstein (Wade-Martins 1980b, 141), Barton Bendish (Rogerson and Ashley 1987, 32) and Thuxton (Butler and Wade-Martins 1989, 51-2). In addition to those in church walls, there is now evidence for lava querns and millstones from 671 other sites on the Norfolk Historic Environment Record (HER). No scientific analysis of the material recorded in the survey has been carried out, but it is reasonable to assume that it all derives from the Eifel region around the town of Mayen in the Rhineland. The term 'Rhineland' lava has been used to avoid any confusion over the precise source of the material (Crawford and Roder 1955, 68; Buckley 2007). A view of one quarry, near Niedermendig, can be seen in Fig 2.

The writers' acquaintance with Norfolk churches already indicated that – besides flint – many contained fragments of other material, probably whatever was to hand or could be obtained at the time of building. Most of the lava pieces were fragmentary and assumed to be from querns. Thus it was determined to start a survey of Norfolk churches – as circumstances permitted – and record all fragments of lava to be seen. This was not intended to be a study of querns and their use, but a study of their distribution beyond the edge of excavation, field survey and chance finds. It is hoped that these results will stimulate church archaeologists in other areas to look in detail at elevations of rubble walling with renewed interest.

The distribution of Rhineland lava over a much wider area has been revisited by Parkhouse (1997), who noted a bias to urban evidence and 'isolated finds', with no real study of marketing strategies, 'regular marketing or simple opportunism', although his study of the Dorestad assemblage indicates workshops and long-distance transit. Parkhouse raised the issue of 'market penetration', but, outside the emporia, his 'findspots' (now five for East Anglia) seem too few for robust analysis. This note may aid that analysis.

Method

This project involved a search of almost all the surviving medieval churches in Norfolk outside Norwich, and a count of the fragments of lava in each of the 684 buildings. 'At least 928 parish churches existed in Norfolk between the 11th century

Fig 2
A photograph of a lava quarry near Niedermendig, probably taken in the 1950s (Guy Knocker's Thetford archive, Norfolk Museums and Archaeology Service).

and the 16th century. Some 620 of these are still in use today…..Of the 308…..no longer in use, a total of fifty-four are fully intact but redundant, a further 101 are in ruins, and at least 153 have disappeared completely' (Batcock 1991, 1). Many ruined examples were too dangerous or too overgrown to be examined.

Lava quern cannot be identified by eye from a distance of more than *c.*12 feet (4m), and therefore the search was restricted to the lower part of each church, with the result that greater parts of towers and larger churches were not searched. The blackening of Norwich churches by pollution and the resultant difficulty of recognising lava meant that these churches were omitted from the search (although their typical rebuilding in knapped flint in the later medieval period had probably swept away irregular use of scavenged stone). Many churches were obscured in whole or in part by rendering or vegetation, and this has affected the count. Rather than introduce some complex scoring scheme, it was decided to be content with a raw score of recordable fragments. It is certain, therefore, that the overall counts are too low, although the large number of churches visited and their complete distribution across the county enhances the significance of the study.

Lava is quite easily identified. Survey and recording methods were very simple. The exteriors of all walls were examined by eye, without the use of binoculars. All non-rendered internal elevations, the normal state of ruined churches, were also scanned. Fragments were counted and given rough locations, such as 'south wall of chancel'. The measuring and description of individual pieces of lava was abandoned at an early stage for reasons of speed, but outstanding examples, such as complete cross-sections of querns, were noted. When a wall was covered by ivy or rendering, or was inaccessible because of a tree or some other obstruction, a note was made. Excessive lichen growth also posed a barrier to visibility, particularly on the shaded north sides.

A flexible attitude was taken to the criteria on which building merited inclusion. For example, a parish church completely rebuilt in brick during the 1950s but standing on its medieval site (Bawdeswell) was included, as a negative site. All Saints, Barton Bendish, an entirely below-ground monument totally demolished in 1789 and excavated in 1980-1, produced lava fragments from the fillings of foundation trenches, and was also included (Rogerson and Ashley 1987, 32). Monastic churches that also functioned as parish churches, such as Binham and Wymondham, were searched for lava, while others, for example Castle Acre and West Acre, which were used only by their communities, were excluded.

It should be stressed that although simple records were made of the location of each visible lava fragment within a church, there was from the start of the survey no intention to subject the results of the fieldwork to any level of architectural or chronological analysis. It was soon apparent that there was some potential for an assessment of the occurrences of lava in securely dated architectural contexts and in the various parts of churches (tower, porch aisle nave, chancel etc.), but time prevented this from being followed up. At the most basic level, however, it can be said that lava was present in the surfaces of church walls ranging in date from the mid to late 11th to the 15th century.

Results

425 (62%) of the 684 churches visited were seen to contain one or more lava fragments. Many of these fragments were certainly parts of querns, while others are so large as to be parts of millstones, lumps of ballast (Buckland and Sadler 1990, 116), or even pieces imported raw for dressing in this country. The prolific distribution of lava matches quite well the ubiquity of lava on Roman to medieval sites both in excavation and field survey.

The map (Fig 1) shows a simplified distribution of lava fragments in churches, with absence, 1 to 9, 10 to 19 and more than 20 being indicated. The record number at one church stands at 88 (Wickhampton in the lower Yare valley). One obvious trend in this map is the almost complete absence of '10+' churches in West Norfolk. Another is that overwhelming preponderance of '20+' churches lie within the drainage area of the rivers that flow out through Great Yarmouth on the east coast, with only one out of a total of twenty-nine falling elsewhere, namely Letheringsett in the Glaven valley.

At an early stage of the survey a great range in the numbers of visible pieces was apparent. It was also clear that more than half of the examined churches contained lava fragments. This pattern was maintained until completion.

Fig 3
The north-west quoins of the nave, the parish church of St Andrew, Colney, Norfolk (HER 9339).

The final results were:

Numbers of pieces(684)	Number of churches	% of total
20+	29	4
10+	39	6
1-9	357	52
0	259	38

All of the churches with 20+ pieces and all but two of those with 10+ lie in the eastern half of the county. A large majority of the 20+ group lies to the east of Norwich, with almost half (14 churches) falling between the Bure and Yare, two of the three rivers flowing into the North Sea at Great Yarmouth. The six churches with 47 or more recorded pieces lie in the same Broadland area. Apart from this very strong bias for lava-rich churches in the east of the county there are also a higher proportion of lava-free churches in the west. The north-eastern coastal belt also shows a marked scarcity of lava (perhaps because of the availability of beach cobbles), but elsewhere it is difficult to discern any meaningful patterning beyond inexplicable localised patches of scarcity and profusion.

The size and shape of the lava pieces varies considerably. Many fragments exhibit a curved edge and/or a dressed face and must derive from used and broken stones. Occasionally, substantial pieces of stone can be seen. At Buckenham, for example, half a millstone formed the threshold of the south door until building work in 1981. It now sits inside near the west end of the nave. Some pieces are truly huge; the north-western quoins of the 11th-century nave at Colney consist of flints, a lump of iron-bound conglomerate and eight pieces of lava, of which the two largest measure 365 x 305 x 140mm and 320 x 310 x 125mm (Fig 3). These are what Taylor and Taylor described as 'puddingstone' (1965, 167-8). Large pieces at, for example, West Somerton or South Walsham (*c.* 1m long), are probably from millstones.

Lava fragments sometimes form the sill or lintel of putlog holes, such as in the chancel at Tasburgh or the tower at Billockby, or even voussoirs around windows (Quidenham, Morning Thorpe). At the bottom end of the scale are small chips which may have resulted from the breakage of stones or possibly from the final dressing of imported blanks, although the excavated evidence for this practice is almost entirely urban. The evidence from major Anglo-Saxon ports indicates that lava was also imported as a raw material and worked up into the finished article in this country, and the same practice may have operated in the Roman and medieval periods (Freshwater 1996).

Discussion

What explanation is there for this extremely skewed distribution? Might lava have been used in the east as a substitute for some other building material which was more easily available in the west than the east? This was not the case. Norfolk's leading native building stone is flint, derived either directly or through glacial action from the chalk. Hard chalk (or clunch) can be found in the west, but rarely if ever in external elevations. Concreted gravel known as iron-bound conglomerate occurs in many areas and was used as rough blockwork, particularly in the Norman period. In addition, Carstone, an outcrop of coarse ferruginous sandstone, occurs in the north-west of the county; this cannot be used as ashlar and was employed quite sparingly by medieval builders both as rubble and as a facing stone. Limestone had to be imported from Lincolnshire and the East Midlands or from Normandy, yet problems of transport were overcome and no church is without some limestone.

Does the distribution reflect the existence of other quern sources, with stone from the Midlands being used in the west of the county? Stone suitable for querns and in use in the Saxon/medieval period was restricted in availability, with Millstone Grit from Derbyshire the nearest real alternative (King 1986, 114). It appears that, where available, lava was preferred to insular stones, which were either too soft (limestone or many sandstones) or too hard (granites) (Hinton 2005, 89), and querns of lava (and Millstone Grit) have been found in York (Rogers 1993, 1321-9; Mainman and Rogers 2000, 2552) and in many other places, some quite remote. Twelve churches have also produced pieces of Hertfordshire Puddingstone, which does not occur in the glacial drifts of Norfolk. These are almost certainly fragments of Romano-British querns (King 1986). Interestingly, no fragments of Millstone Grit were noted although querns in this material commonly occur in Romano-British contexts

within the county. The survey also failed to record any fragments of French quartzite from the Seine basin east of Paris, from which the highest quality millstones were made in the Middle Ages (Farmer 1992, 97).

Parkhouse saw a trade pattern which was 'particularly Frisian', correlated with the distribution of Anglo-Frisian sceattas (Hill 1981, 120-1), but this may be partly to do with the nature of the evidence. Hodges had noted close trade connections between Norwich and the Rhineland in the 11th and 12th century (Hodges with Jennings 1981). King's Lynn had strong medieval mercantile links with the Low Countries and Midland England, and it is worth noting that although few lava querns were reported from early excavations in King's Lynn (Clarke and Carter 1977, 70 and 93), a more recent excavation, in Norfolk Street, has now produced some 50 fragments of lava (HER 31393). Indeed there is documentary evidence for the importation of millstones from the Rhineland to King's Lynn (Rutledge 2005).

Norwich churches were omitted from this survey, although recent excavations there have produced lava querns of probable medieval date. This evidence was reviewed by Smith and Margeson (1993) who also noted the absence of other stone types from Norwich, such as Puddingstone and Millstone Grit, even in the larger excavations; they also noted the likely use of querns in grinding malt rather than corn, and its final use as building material. At Greyfriars, Norwich, finds of lava date from the beginnings of occupation there in the Late Saxon period (Buckley 2007), as was the case at Thetford: (Rogerson and Dallas 1984, 111; Andrews 1995, 98). Excavations in King Street at Dragon Hall, Norwich, produced fragments of lava, including six large fragments thought to derive from large circular blocks of building material, as well as fragments of probable querns (Buckley 2005).

There may be a chronological factor to consider in the availability of querns, with prohibitions against hand-querns in the 12th century; in Winchester, their use 'fell off sharply' in the 12th century (Biddle and Smith 1990, 882-3), with the result that querns were increasingly replaced by stone mortars from the 13th century. Buckley (2005) notes the use of lava blocks in Colney church (see Harris 1990, 212) and suggests their import as ballast from the Rhineland, though one may then presume some anticipated market or end use in Norfolk. A survey of the Town Wall, King's Lynn and its fabric pointed to the use of stored ballast, much from the Baltic and the north coast (Hoare *et al* 2002).

Could the high count for the east represent waste from the dressing of imported blanks, with a workshop(s) in the Norwich/Great Yarmouth area? Export from the quarries as undressed stone is now well-known, with examples from Dorestad and Hedeby (Parkhouse 1976; 1997), and two blanks from the Graveney boat, sunk in the 10th century (Fenwick 1978, 131 and 173). To this may be added the 235 quern stones, some fragments, some not dressed, found in a 10th-century waterfront in London, probably representing a workshop. Even with this last evidence, Freshwater noted 'little British evidence for the finishing of lava querns, due in part to the undistinguished nature of the archaeological material' (Freshwater 1996, 44). He sees lava chips as evidence for processing, taking place close to its end-use. Each of the churches with a very high count was revisited to investigate this point, but the recorded fragments appear to be from querns rather than waste.

Whatever may be the real explanation for the extreme eastern bias of the distribution, the overall spread of lava in Norfolk churches remains remarkable. A similar pattern should be sought in other areas where rubble masonry construction in the Middle Ages was the norm. If Norfolk proves to be the only county where lava was so frequently reused in church walls, then more difficult questions will need to be answered.

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