

MEDIEVAL PAVINGTILES IN  
BUCKINGHAMSHIRE

BY

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This paper has three purposes: to publish all the designs found in or recorded from Buckinghamshire<sup>1</sup>; to throw the work of Haberly<sup>2</sup> into perspective; and to bring out the importance of the tileworks at Penn. There are many aspects of these questions which I would gladly have studied, but which present circumstances have put beyond my reach, and I hope that I may forestall some criticism by saying at once that in general I am only acquainted personally with the tiles in Buckinghamshire, Oxfordshire and London. I also wish to express my gratitude to the Rev. W. Davis of Little Missenden and the Rev. A. Parr of Pitstone for help, encouragement and hospitality; to J. B. Ward-Perkins for assistance of every kind; and to W. Peckham and C. V. Woodman for information from unpublished sources regarding the churches of Appledram (Sussex) and Wing (Bucks.). Otherwise I have drawn only on documents already in print.

The study of tile distributions suffers under the serious limitation that it is usually impossible to say when tiles on a given site reached it, and consequently how far the present distribution corresponds to the medieval. There were plenty of second-hand tiles on the market in the 1540's; there is ample evidence to prove it<sup>3</sup>, and in the case of Merton College Library we know that they were still available as late as 1623<sup>4</sup>. In more recent times too there have been confusing movements of tiles; those in the Vestry of St. George's chapel, Windsor, came from Tintern Abbey in Monmouthshire, while those in Great Missenden church came there from Missenden Abbey at the last restoration. These cases are innocuous, for the facts are known; but we can only surmise that it was during the last century that a charming border-tile (infra no. S/11) with the design of a squirrel,

otherwise known only from Malmesbury Abbey, reached Bletchley in time to be recorded as from the last-named place when it found its way into the Bucks County Museum, Aylesbury, in 1860. More troublesome is the occurrence of tiles of the magnificent and justly famous Chertsey series (nos. S/1-10) in the church of Little Kimble. It is stated that these were "laid in the chancel floor" in 1872<sup>5</sup>: but this is of slight assistance, for a further couple of small fragments have been found in a nearby garden. It is, however, all but inconceivable that these tiles were laid at Little Kimble in the 13th century: they are the trappings of a cathedral, not of an aisleless village church: and they were doubtless filched from Chertsey by an early 19th century antiquarian, who lost two bits in his garden before giving them to the incumbent.

With these very serious reservations, however, there is no good reason to doubt that as a rule tiles are still to be found in the places where they were laid in the middle ages. In the first place they occur on sites they could scarcely have reached subsequently: the site of the chapel of Broughton-by-Bierton (Bucks.), last mentioned in 1530<sup>6</sup>; that of the Church of Woodperry (Oxon.), a village that on pottery evidence was probably deserted during the 15th century<sup>7</sup>; or that of the Chapel of St. Catherine of the Rock, Eckington (Worcs.), ruinous by the time of James I<sup>8</sup>: not to mention numerous private chapels such as Ditton and Grove (Bucks.), or Holton and Broughton Castle (Oxon.). In the second place tiles in parish churches are usually of not more than two dates, whereas the tiles which reached Merton College Library in 1623 are a jumble of all dates and designs. In the third place these tiles can be found, as at East Hagbourne (Berks.), built into apparently medieval walling in parish churches.

There is indeed no good reason for supposing that pavingtiles were any more monastic, or even ecclesiastical, than stained glass or bells, the distribution of which is quite as liable to be misleading. The origin of the legend that tiling was a monastic eccentricity is due to a single document of the year

1210<sup>o</sup>, which is certainly most remarkable, but which, even if it refers to tiling which it need not, may well give only part of the picture for the early period to which alone it relates. For in 14th century France at any rate the makers of tiles were laymen<sup>10</sup>, and there is every reason to suppose that the same is true of this country also. Moreover it is clear that the industry was in humble hands from the almost universally uninspired nature of the patterns. There were only three occasions when the designs were from the hands of a respectable artist, and there is a great gulf fixed between the general run of floor tiles on the one hand and the magnificent wheel patterns of Jervaulx (Yorks.) and western France, the Chertsey romance tiles, and the 15th century products of the Malvern and related West Country kilns on the other.

The methods of manufacture are dealt with fully by Haberly<sup>11</sup>, and need not detain us here. It is worth remarking however that in Buckinghamshire and Oxfordshire on worn specimens of the earliest tiles the background falls away, leaving the inlay in relief; on the latest tiles it is the inlay that wears off; and in the intervening period both clays appear to have the same durability.

The earliest tiles indigenous to Buckinghamshire belong to the style at present known as "Wessex", of which they are probably rather late examples. The tiles themselves are about  $5\frac{1}{2}$  inches square (sometimes as much as  $6\frac{1}{2}$  inches square),  $\frac{3}{4}$  inch thick, with a number of small pits in the back, and have a dark, usually brittle and overbaked fabric. The designs, which are quite deeply inlaid, consist of rather elaborate foliate patterns and of more or less heraldic beasts set in formal frames. There is no such *horror vacui* as is noticeable in later tiles and there is a grace of line about them which never reappears. The origins of the style are wrapped up in the thorny problems which surround the birth of patterned tiling, and the study of its development in England is rendered difficult by inadequate publication, and the vast area over which these designs are found. I have collected from published or easily accessible sources a

provisional distribution list of closely related designs which probably gives a fair idea of the style's extension. But it will be impossible to draw any useful conclusions until much more work has been done, and in particular until the Clarendon Palace tiles are published<sup>12</sup>. The "Wessex" tiles are manifestly the work of travelling tilers, though the only kiln sites known to me are the one at Clarendon and one whose existence is indicated by wasters at Chetwode Priory. This style of flooring was common in monasteries, and has certainly been commoner in parish churches than the rather haphazard survival of isolated tiles, due probably to their brittleness, might at first seem to suggest: for Woodperry, never more than a miserable little church, was exclusively floored with this kind of paving. Churches in the immediate neighbourhood of Oxford were, however, obviously in a favoured position, as the numerous large monasteries made it a particularly suitable centre for the manufacture of floortiles: it was also, for the same reason, unfortunately a particularly prolific source of second-hand tiles in the 16th century. But as the church of Woodperry was by that time probably already in ruins the general argument holds good. In date the Buckinghamshire examples are likely to belong to the years around 1300, as the dragons with foliated tails on nos. W/25-26 seem to show the influence of the border tile from Chertsey no. S/6 of about 1290. But there is some reason to suppose that in Oxfordshire tiles of the same type continued to be made throughout the greater part of the 14th century, for the later styles do not appear in any quantity before the construction of New College. I would place the tiles from Great Haseley and Broughton Castle (Oxon.), and consequently those from Hanslope and Bledlow (Bucks) in this 14th century group, to which some (published by Haberly as "printed") from Ewelme also, I think, belong. Wessex tiles in their original setting survive in the pavement of Notley Abbey cloister arranged as in the illustration.

The whole question of these tiles will manifestly soon have to be gone into afresh. For, if the Clarendon

examples are early 13th century with French associations, it is quite as certain that those in Winchester College are late 14th century imports from Flanders; while the wasters at Chetwode Priory provide equally convincing proof that the varieties current in Buckinghamshire and Oxfordshire, whatever their date, were produced on the spot<sup>12a</sup>. Where and why and how the tradition was carried on for so long is at the moment quite mysterious; though the solution is probably not to be found on English soil.

The 14th century is marked by the invention, probably at Penn in Buckinghamshire, of a new technique for obtaining a two-colour tile. Whereas in the Wessex series the red clay tile was stamped and the hollows filled in with pipeclay as two separate operations, these processes were now combined and the design "block-printed" from a shallow-cut stamp smeared with white slip. The consequent smudging and the slight depression of the pattern below the tile-surface on certain specimens led Haberly<sup>13</sup> to this conclusion when studying the tiles from Notley Abbey. But he supposed that the process had too wide an extension. I feel extremely doubtful if the 15th and 16th century tiles were all made in the same way even in Buckinghamshire and Oxfordshire, and this peculiarity has not been noted in other areas at all. Concurrently with this discovery came a new style of design. This was certainly not unheralded, and a number of links with the Wessex style are perceptible. But the new style was more geometric, less graceful and obsessed by a *horror vacui* which found expression in a liberal use of rather futile dots and leaves.

In connexion with these tiles two points may be made at once. The first is that the characteristic designs of the Thames valley with which we are here concerned have a limited if wide distribution. In Chatwin's admirable publication of the tiles of Warwickshire<sup>14</sup> there is not a single tile that recalls the Thames except those on Fig. 10, the work of a travelling tiler who has left his mark at Lesnes in Kent, in St. Faith's chapel, Westminster Abbey and other London sites, at Bengoe in Hertfordshire, at

Edlesborough in Buckinghamshire, and in the Warwickshire group around Coventry. A small similar but apparently unconnected group is found at Pitstone (Bucks.) and Berkhamsted Castle (Herts.). These tiles are undateable, but they are carried out in the inlay technique, while exhibiting a clumsy simplicity that belies all connexion with the Wessex designs; they are presumably thirteenth-early fourteenth century. Apart from these, considering only the "printed" designs, a distribution will be found which is confined to the counties touching the Thames with a highly remarkable outlying group around Winchester.

The second point is that throughout the greater part of the 14th century there was a vast tile works at Penn. This phenomenon is apparently quite unique, and it is desirable to collect the evidence bearing upon it. An early reference to Penn as a centre for tilemaking occurs in the Subsidy Roll for 1332<sup>15</sup> which gives the names of three separate tilers and the amount and value of their stock. More instructive, however, are specific mentions of Penn in connexion with building activities. Rooftiles from this factory cost about 2s. a thousand, and they were brought in vast quantities by road and water to Windsor Castle between 1344 and 1357<sup>16</sup>. In the last mentioned year 11,500 tiles at 2s. 8d. a thousand were taken by road to Salden between Aylesbury and Bletchley, a distance of over thirty miles.<sup>17</sup> Such facts, especially in view of the distances covered and the constant mention of the factory by name, argue that both clay and workmanship at Penn must have been of unusual excellence. That it was the workmanship as well as the clay is proved by the fact that messengers were sent to Penn in 1350 to impress tilers for work on the Palace of Westminster<sup>18</sup>. Specific mentions of floortiles are, inevitably rarer, and are at the moment known only from the Windsor building accounts and their summaries in the Pipe Rolls; but they are no less definite. In August, 1352, for instance, 10,000 floortiles for the Warden's Hall at St. George's, Windsor, were bought in Penn at 6s. a thousand, and other entries show that there were

different qualities of pavingtile, the prices ranging from 4s. to 8s. a thousand<sup>19</sup>. As a result of a series of such purchases, when William of Wykeham became Clerk of the Works in 1356 he received 11,000 floortiles from his predecessor, Robert of Burnham, and in his account at the end of his first year of office he states that he has bought 41,000 (!) more himself and has laid 45,000 out of the total<sup>20</sup>. The predominance of Penn in the tile industry is best attested by the reference to it and it alone in public documents such as the Pipe Rolls; for the Windsor accounts mention purchases of rooftiles in Chalfont and Hedgerley as well. The source of floortiles is not always entered; but Hedsor occasionally appears as a seeming rival to Penn<sup>21</sup>. Hedsor, however, lies on the Thames and possessed a wharf, so that it need not have been more than an entrepôt. The indisputable and unparalleled fame of Penn is only explicable on the supposition that its tilers industrialised their business, and in particular that they were the first to invent or exploit the process of printing floortiles with its attendant advantages in the saving of the men's time. In support of this is the archeological evidence, which has received important additions from the invaluable labours of Miss M. Whitley, J. G. Jenkins, and E. Clive Rouse, in the search for sites in Penn itself. A kiln site was at length discovered early in September, 1939, but investigations have under present circumstances had to be of a very restricted kind. Nevertheless we now have a sizeable corpus of indisputable Penn designs, all printed, drawn from the floor of the Erery in Windsor Castle, laid in 1354; from the tiles out of Penn church now strayed into the Herts County Museum, St. Albans; and from the various discoveries in Penn gardens, now divided between the London Museum and the Bucks County Museum, Aylesbury. And these include not only patterns common in Buckinghamshire, but ones apparently unknown in the county. There is no ground for doubting that as a general rule the tiles left the hands of their makers in Penn and were carried as finished products at least as far afield as London and

St. Albans. And although tilers from Penn had to move in obedience to Royal Command in 1350, a number of tiles recovered from Brook's Wharf, Queenhithe, in 1867 and bearing designs otherwise known only upstream and chiefly in Buckinghamshire are evidence of river-borne traffic. And although it might have seemed tempting to suppose that London was the manufacturing centre, the evidence is so conclusive the other way that this hypothesis may be excluded. In particular it should be observed that the very peculiar tile no. P/117 is known only from the City of London, and from the site of a kiln in Penn itself.

With these facts in mind it is possible to attempt to disentangle the various series of designs in the Thames valley and to consider their distribution. With the exception of the tiles made at Penn, such groups of designs as can be distinguished by size, style, or method of manufacture are all quite small, and their distributions are of two kinds, scattered and compact. It will make things clearer if a list of the chief of those that found a market in Buckinghamshire and Oxfordshire in the period extending from the late 13th to the early 15th century is given at once—

- (A) A series of fine large tiles, probably not printed. Haberly nos. clxxv & b; clxxvii.  
*Berks.* Winkfield<sup>22</sup>.  
*Herts.* Flaunden.  
*Oxon.* Chinnor.
- (B) A set of tiles  $4\frac{3}{4}$ " square, with a predilection for enclosing the designs in narrow borders. Nos. P/23, 24, 25, 26, 27, 29, 30, 31, 45, 47, 74 var., 77, 99 var., 148, 157 var., 163, 170, 171a & b; Haberly clxxii; Hurley 49.  
*Berks.* Hurley Priory; Greyfriars, Reading.  
*Bucks.* Chilton; Long Crendon; Notley Abbey, Wyrardisbury.  
*London.* St. Bartholomew-the-Great, Smithfield (?); St. Anthony's Hospital, Threadneedle St.; Blomfield St.; Brook's Wharf.



*Oxon.* Checkendon; Chinnor; Combe; Harpsden; Marston; St. Frideswide's Priory and Merton College Library, Oxford; Thame church.

*Sussex.* St. Mary's, Horsham.

(C) The tiles certainly made at Penn, about  $4\frac{1}{2}$ " square.

Nos. P/44, 50, 51, 58, 60a, 62, 64, 66, 67, 68, 74, 76, 85, 88, 101, 110, 117, 121, 137, 141, 145, 153, 155, 156, 158.

*Bucks.* Amersham; Bierton; Bledlow; Dinton; Edlesborough; Great Hampden; Iver; Great Kimble; Langley Marish; Ludgershall; Little Marlow Priory and church; Marsworth; Milton Keynes: Missenden Abbey; Little Missenden; Maids' Moreton; Moulsoe; Penn Kiln Site & Church; Pitstone; Monks' Risborough; Princes Risborough; Saunderton; Slapton; Stone; Weston Turville; Wexham; Whitchurch.

*Beds.* Blackfriars, Dunstable; Elstow.

*Berks.* Binfield; Hurley Priory; Reading Abbey; Wallingford; Windsor Castle.

*Hants.* Basing House; St. Cross Hospital, Winchester (both dubious).

*Herts.* Aldbury; King's Langley; Northchurch; St. Albans Abbey; Sandridge; Bushey Hall, Watford.

*Kent.* Barham; Cobham; Langdon Abbey; Lesnes Abbey; Southfleet.

*London.* St. Bartholomew-the-Great, Smithfield; Crutched Friars; St. Helen's, Bishopsgate; Christ's Hospital; St. Mary's Hospital, Spital Square; Allhallows', Lombard St.; St. Giles', Cripplegate; St. Matthew, Friday Street; St. Michael, Wood St.; Savoy Palace; Blomfield St.; Brook's Wharf; Cannon St.; Crosby Square; Fetter Lane; Finsbury Circus; Ironmongers'

Hall; Old Swan Lane; Tenter St.;  
West St.

*Northants.* Croughton.

*Oxon.* Chinnor; Rycote; Thame Abbey.

*Somerset.* Muchelney Abbey (dubious).

*Surrey.* Chertsey Abbey.

*Sussex.* Lewes Priory; Shulbrede Priory.

- (D) A set including the arms of William of Wykeham, made in the first instance for New College, Oxford.

See List VI.

*Oxon.* Blewbury; Brightwell Baldwin; Cholsey; Cumnor; Dorchester Abbey; Godstow Nunnery; Mapledurham; North Moreton; Northmoor; Nuffield; Osney Abbey; St. Fridewide's Priory, NEW COLLEGE, Merton College Library, and St. Peter-le-Bailey, Oxford; Sutton Courtenay.

*Hants.* Appledram; Bosham; and perhaps St. Cross Hospital, Winchester.

- (E) A set derived from the last.

Nos. D/1, 4, 6.

*Bucks.* Cuddington; Haddenham.

*Oxon.* Drayton St. Leonard's; Eynsham Abbey; Godstow Nunnery; Newington; Osney Abbey; St. Fridewide's Priory and Merton College Library, Oxford.

- (F) Another set of degenerate New College patterns.

Nos. D/2, 3, 5, 7.

*Bucks.* Haddenham; Nether Winchendon.

*Oxon.* Brightwell Baldwin; Osney Abbey (?); Merton College Library, Oxford.

- (G) A set including the arms of Henry Chichele, made in the first instance for All Souls' College, Oxford.

Haberley nos. cxxi: cxxii: cxxiii: clxxxvii: clxxxix.

*Oxon.* Harpsden; Lewknor; Mapledurham; Marston; St. Frideswide's Priory, All Souls' College, Magdalen

College, and St. Martin, Carfax,  
Oxford; Pyrton.

*Berks.* Long Wittenham.

*Herts.* Offley.

Most of these groups are linked up by designs which with slight variations are common to two or more. Thus P/18, probably of group C, is a derivative of Haberley clxxvii of group A; and Haberly clxxva of the same group is the ancestor of the successive degenerations P/90, P/90a, P/89 and P/88, the last certainly in group -C. The designs P/74, P/99 and P/157 occur in group B as well as in group C, and indeed these two groups are so alike, in style, fabric and colouring, as to be exceedingly confusing. Group D contains a number of designs drawn from group C, which are noted in List VI, and groups E and F in List VII are by definition derived from group D.

In estimating the significance of these interrelations it is necessary to decide in one's own mind whether similarity of design indicates a direct relationship or an indirect one through the medium of pattern-books. I incline to assume the first, as it would otherwise be hard to account for the extreme conservatism and local conservatism at that, which distinguishes the patterns employed, and for the absence of echoes of changing fashions, the first sign of which appears in the All Soul's tiles (group G) of about 1445.

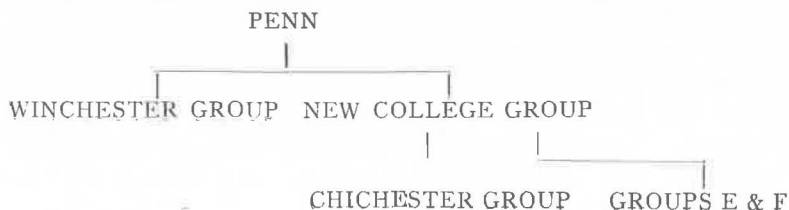
Next it is the distributions that call for comment. That of group A is scattered and the tiles are presumably the work of a travelling tiler like the tiles of list III mentioned before. The designs of group B are appreciably commoner, and it is interesting to note that they are usually found on or close to the Thames. Neither of these series can be assigned to a precise date; but on typological grounds group A is earlier than the Penn series. Group B is possibly an early product of Penn itself; early because (in spite of the appearance of P/26 in Combe church which was rebuilt about 1395) it was not employed in Oxford, while P/28 is apparently an inferior design in the same style belonging to group C.

With group C, the tiles from Penn, we reach firmer ground; for these are the tiles bought for Windsor Castle. They have a wide and massive distribution, the findspots being usually within striking distance either of the factory or of the Thames; London and St. Alban's were evidently particularly profitable markets. The examples of this set in Hampshire, however, require further consideration with relation to the tiles laid in New College, Oxford.

These (see list VI) are immediately noticeable on account of their indifferent style. By comparison with the Penn tiles they are definitely poor specimens; and this is the more remarkable as William of Wykeham was perfectly well acquainted with the Penn tiles from his work at Windsor, and no man was ever less likely to use an inferior substitute if it could possibly be avoided. Allowance could certainly be made for the idiosyncracies of Warden Nicholas de Wykeham, but the natural conclusion is that tiles from Penn were no longer available; and this we know from other sources to be true<sup>23</sup>. It is evident that in the course of half a century the market for tiles within reach of Penn must have become exhausted. A tile does not wear out easily, and, once the local monasteries, churches and chapels had received their floors, an industry on the scale of that of Penn must have faced the prospect of a very serious slump. If the point needed illustration it would only be necessary to consider the state of affairs in Oxfordshire where the later groups D and G, and the tiles from the old chapel of the Queen's College<sup>24</sup> were each made for a particular building; and, between these big orders, once the surplus tiles had been disposed of locally production must have been almost at a standstill. Tiles of an intermediate type (groups E and F) are on the whole rare. The Penn tilers, however, had shewn great enterprise. They had increased the market for tiles by making them cheaply and on a large scale. They had supplied tiling to most places within reach of the works and of the navigable parts of the Thames. They had attracted Royal notice and had secured something like a monopoly. It is hardly probable, therefore, that

they were unequal to the crisis when it came. All the signs point to their having dispersed, each workman taking his own stamps with him; and one body of tilers must have gone to Winchester to work for the Hospital of St. Cross. The church of this foundation is still floored almost entirely with medieval tiles of different dates including designs nos. P/44; 61; 74; 129; 150; 162 as in Buckinghamshire and nos. P/44; 110; 128; 162 in slightly variant forms, all suggesting the work of a man connected with the factory at Penn. This, however, is by no means all there is to be said about the printed tiles in St. Cross: the group also includes one design, no. NC/10 as at New College, and no. NC/4 in a variant form with dots in the cusps; besides another design (in two forms) which recurs in the churches of Appledram and Bosham near Chichester. These facts form the basis of a great puzzle in the history of tiling in the late 14th century. I still incline to think that the St. Cross tiles are intermediate between the printed tiles of the Lower Thames and the New College series, but there are immense difficulties in maintaining this or any other consistent theory.

The New College designs include several designs derived from Penn patterns (nos. NC/7; 8; 9; 11; 12); of these none occurs at St. Cross, and only one, possibly, at Bosham. Of the designs new to the Thames Valley found in the New College series nos. NC/3; 4; 16; 18 occur at Bosham, Appledram, and (possibly) Chichester Cathedral. Furthermore, apart from nos. P/74 and 162 recorded from Winchester Cathedral, as well as St. Cross, printed tiles seem to be unknown in Hampshire or the South of England. Graphically, in fact, we have the following situation:—



The group around Chichester seems to be an offshoot of the New College group; but how? and why? The Prebend of Appledram in the collegiate church of Bosham was, certainly, one of the canonries held by William of Wykeham in the years following 1363<sup>25</sup>; but he had exchanged it long before the building of New College had begun. And if the New College tiler was worth calling to Chichester, why should Warden Morys of Winchester College import totally different tiles from Flanders at about the same time? These Flemish tiles are even found in St. Cross. However that may be, the New College designs proved the starting point of a long-lived tradition in the Oxford district, and produced in the process of time the tiles of groups E and F, and ultimately the deplorable tiles (notably Haberly ccxlv) from the kiln in Bagley Wood.

In the same way that the Penn tiles and those of group B had left Oxfordshire almost untouched, the New College tiles and their derivatives made little headway in Buckinghamshire. Indeed the tile history of Buckinghamshire during the 15th century is to all intents a blank. But it should be remembered that during this century falls the great period of tiling in the West, with the two dated Malvern series and Abbot Sebrok's pavement at Gloucester, the dateable tiles at Malmesbury, and the floor of Richard Canynges' house at Bristol, with their sixteen-tile patterns, their black-letter inscriptions, and their very "yellow" appearance due to the generous use of large areas of slip. The sudden revelation in districts previously all but bare of tiles of the fullest possibilities of this form of decoration had the widest repercussions. Blackletter appears on one of the tiles of the All Souls' College series (Haberly clxxxix of group G), and a version of Abbot Sebrok's crowned Sacred Monogram cf. Chatwin fig. 33 no. 4) is found on a tile (not in Haberly) from Holton House near Oxford. Less directly, but no less certainly, this new influence was responsible for the final flicker of the industry in Buckinghamshire in the early 16th century.

The tiles LB/1-23 in list VIII<sup>26</sup> are found on a number of sites in N.E. Buckinghamshire, in Northamptonshire, and in Bedfordshire, usually on or in close proximity to the Watling Street; and the discovery of wasters of at least one of these types in the remains of two superimposed kilns at Little Brickhill makes it probable that most, at least, of the others were made there also<sup>27</sup>. The purchase of tiles from Little Brickhill is mentioned under the years 1527 and 1530 in the Churchwardens' accounts of Wing where examples of this group have been found<sup>28</sup>; and most of the series exist in Hillesden church which was entirely rebuilt in the thirty odd years following 1494<sup>29</sup>. The design of these tiles is atrocious, and their manufacture little better, for in the vast majority of specimens the pipeclay has fallen away, so that they are nearly impossible to draw. They are, nevertheless, a remarkable lot. LB/17 is the death-rattle of a design (W/38-9) common in the Wessex tiles two centuries before. LB/15 is a quite respectable version of a Penn design P/151-3, LB/5 and LB/18 also have their counterparts in P/97 and P/167. LB/22-3 suggest W/35 or NC/20. But, although the Little Brickhill workmen would imitate anything, the characteristic features of the group: the inscriptions, the narrow red bands outlining the design, and the marks of general incompetence are not of local origin. The outlying group of four tiles of this series (nos. LB/1, 7, 10, 22), recorded only from Lillingstone Dayrell points the way to their source. Chatwin fig. 43 nos. 4 and 7 are tiles, respectively from Maxstoke and Stoneleigh Abbeys in Warwickshire, which might pass unremarked among the Little Brickhill tiles. The type of sixteen tile design to which LB/7 belongs is otherwise unknown in Buckinghamshire; but it will be found in Chatwin fig. 42 nos. 6 and 7, fig. 18, and fig. 13 nos. 11 and 12, from various Warwickshire sites, while Chatwin fig. 33 nos. 1-3 shew that the ultimate origin was Malvern.

## LISTS OF DESIGNS.

The following lists aim at recording all the designs known from Buckinghamshire, though they include a few from outside the county. Designs of the printed class that occur both in London and in Oxfordshire have been listed, partly because such a distribution suggests that their absence from Buckinghamshire sites is accidental, and partly because they often differ so slightly from designs that would in any case figure in the list that it is desirable to record them if only to emphasise the distinctions. The New College tiles are listed (but not illustrated) as representing an important link in the development of designs in Buckinghamshire. Nos. P/87 and LB/6 have been inserted in lists V and VIII for convenience; their true connexions are not clear.

In the distributions I have not troubled to distinguish the minor varieties of the Wessex designs. Thus, apart from the Oxfordshire example, the tiles from non-Buckinghamshire sites referred to under W/18 all have a mullet in place of the annulets in the centre of the design. In the other lists, however, I have never intentionally done this without indication; and for the designs in Buckinghamshire I have only listed variants under the same number when the differences were ones of size or proportions and not of shape or arrangement.

The majority of tiles from Buckinghamshire have been drawn by me in situ in the various churches, with the following exceptions:—

- (1) The Aylesbury Museum contains the tiles from Aylesbury; Bletchley; Broughton chapel (near Bierton); Grove chapel (near Chesham); The Mount and Hillcrest, Prince's Risborough; Whaddon; and most of the tiles from the Penn kiln site.
- (2) The Herts County Museum, St. Alban's, contains the tiles from Penn Church.
- (3) The British Museum contains no. P/1 from Drayton Beauchamp.
- (4) The London Museum contains the rest of the tiles from the Penn kiln.



- (5) The Maidenhead Museum contains some of the Burnham Abbey tiles.
- (6) The rest of the tiles from Burnham Abbey and those from Little Marlow Priory are in the Duke of Rutland's Collection. Some of the former are, however, published in the Catalogue of the Burlington Fine Arts Club Exhibition of English Earthenware (1914), and of the latter a few are illustrated in *The Archaeological Journal*, vol. LIX, p. 318.
- (7) The tiles from Notley Abbey are at the moment in my own collection.
- (8) No. W/1 from Chetwood Priory is lost, but is published in *Records of Buckinghamshire*, vol. III, p. 374.
- (9) The tiles from Prince's Risborough church; Weston Turville; and Wyrardisbury have fallen victim to the "restorer", but were fortunately drawn by Lord Alwyne Compton, Bishop of Ely, whose tracings are in the library of the Society of Antiquaries. He also drew more tiles at Great Kimble and Pitstone (Pigglessthorpe) than seem to have survived.
- (10) The tile from Snelshall Priory is recorded by Dr. Lee in his MS collections in the Bodleian Library, Oxford. He was a very bad draughtsman and his other records of tiles from Drayton Beauchamp, North Crawley, Linslade and Olney are useless<sup>30</sup>.
- (11) The tiles from Missenden Abbey are laid in the floor of Great Missenden Church.

For material in other counties I am indebted to the bibliography in Loyd Habely; *English Medieval Pavingtiles*, to the sources mentioned in which should be added:—

I. GENERAL.

*Flemish Imports.* J. B. Ward-Perkins: Late medieval Flemish inlaid tiles in England; *Antiquaries' Journal*, vol. XVII, p. 442.

*Catalogues.* R. L. Hobson: *Catalogue of the English pottery in the British Museum.*

- A. Lane: Victoria & Albert Museum, Guide to the collection of tiles (1939).
- T. Borenius: Review of the above in *Burlington Magazine*.
- Burlington Fine Arts Club, Catalogue of the Exhibition of English Earthenware (1914).
- Victoria & Albert Museum, Catalogue of the loan exhibition of Medieval Art (1930).
- III. MOSAIC TILES.
- Fountains Abbey, Yorks.* Coll. Arch. vol. II, pl. XLVI.
- Greyfriars, Lichfield.* J. Birmingham A.S., vol. LVIII, p. 55.
- VII. EMBOSSED TILES.
- J. B. Ward-Perkins: English Medieval Embossed Tiles, Arch. Journ., vol. XCIV, p. 128 ff.
- XIV. BERKSHIRE.
- Hurley Priory.* J. B. Ward-Perkins & P. D. R. Williams-Hunt: Medieval Floor Tiles at St. Mary's Priory, Hurley; Berks Arch. Journ. vol. XLII, p. 117 ff.
- HERTFORDSHIRE.
- Bengeo.* Herts & St. Alban's A. & A. Soc. Trans. 1887, p. 91.
- St. Alban's Abbey.* Ibid. 1924, p. 35 ff.
- HAMPSHIRE.
- Netley Abbey.* Coll. Arch. vol. II, pl. 7.
- Winchester.* J. B. Ward-Perkins: Medieval Tiles found beneath the Broadway, Winchester; Proc. Hants. Field Club & Arch. Soc. vol. IV, p. 41.
- LONDON.
- See appropriate catalogues of the British, Guildhall, and London Museums. Only the last is adequate.
- WARWICKSHIRE.
- P. B. Chatwin: The Medieval Patterned Tiles of Warwickshire; Trans. Birm. Arch. Soc., vol. LX, p. 1 ff.
- MONMOUTHSHIRE.
- Monmouth Priory.* Coll. Arch., vol. I, pl. XVII.

P. D. R. Williams-Hunt has tracings covering most of Berkshire; J. B. Ward-Perkins has extensive tracings of tiles in Hertfordshire and Kent; Lord Alwyne Compton's tracings cover all southern England; there are numerous drawings also in the Dryden Collection in the Northampton City Library. In addition I have visited the various sites in Oxford; the churches of Charlton-on-Otmoor, Checkendon, Drayton St. Leonard's, Great Hazeley, Mapledurham and Nuffield; the Abbey of Dorchester; and the houses of Holton and Rycote in Oxfordshire: Chichester cathedral and the churches of Bosham (tiles now lost) and Appledram in Sussex; the various sites in Winchester; and the Guildhall Museum and the churches of St. Bartholomew-the-Great, Smithfield; St. Giles', Cripplegate; and St. Saviour, Southwark in London, and traced all the relevant tiles.

(*To be continued*).

[NOTE.—In the next number of the *Records*, it is proposed to print the eight detailed lists showing the distribution of tiles referred to in the closing paragraph of Mr. Hohler's most valuable article, together with a concordance of references.—*Editor*].

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NOTES.

<sup>1</sup> Embossed tiles are omitted, as these have been fully dealt with in J. B. Ward-Perkins : "English Medieval Embossed Tiles," published in vol. XCIV of the *Archaeological Journal*. In any case they are rare in Buckinghamshire, being known only from Lillingstone Dayrell, Waddesdon, and Missenden Abbey. The last-mentioned specimen, in the private collection of the owner of the site, was unknown to Ward-Perkins, as was also a specimen in the Lady Chapel of Chichester Cathedral. The same writer is studying line-impressed tiles, found in Buckinghamshire only at Lillingstone Dayrell and Milton Keynes, which are likewise left out of account.

<sup>2</sup> Loyd Haberly: "English Medieval Pavingtiles" (1937) An indispensable and infuriating book. Besides those noted on p. 324 and on the erratum slip, the following errors and misprints have escaped correction:—

p. 75. St. Aldate's should be in small type.

p. 76. There is no reason to doubt that Cadmerend is Cadmore End in the Chilterns, and I can find no reference to tiles from there in Lee: "History . . . of Thame."

- p. 93. No. XXI exists in Oxford Cathedral and Dorchester Abbey.  
 p. 105. No. XXXIV does not exist.  
 p. 108. All the flowers on design No. XXXVIII should be the same.  
 p. 138. Nos. LXXV and LXXVI are identical, the second being the true form.  
 p. 173. Nos. CXX and CXXa are embossed tiles.  
 p. 174. The tile from Manchester College is not No. CXXII, but part of the four tile designs of William of Wykeham's arms of which fragment S is also a portion.  
 p. 186. No. CXXXVII does not exist.  
 p. 212. No. CLXIX is an inaccurate drawing of No. CLXXXII.  
 p. 219. No. CLXXVI is an accurate drawing of the tile from Stone, but not of the tile from Godstow which is totally different.  
 p. 248. No. CCIX is an inlaid and keyed tile.  
 p. 253. No. CCXIV is likewise an inlaid and keyed tile.  
 p. 295. *Super capellam* refers manifestly to the chapel roof, not floor.  
 p. 310. For Hitchin read Hitcham.  
 p. 311. Tring is in Hertfordshire, not Buckinghamshire.  
 p. 325. Delete St. Aldate's church. No. XVII should figure under "Post Office site."

ADDENDA.—Comparison with the findspots given in Manning's MS in the Bodleian shows that the labels on the tiles from his collection, now in the Ashmolean Museum, have at some time got mixed up. The MS is probably the more reliable guide, necessitating the following additions and corrections:—

- p. 78. No. I also found at Osney Abbey. P. 79. No. III also at Osney Abbey and Oxford Cathedral. P. 97. No. XXV also at Rewley Abbey. P. 98. No. XXVI at Osney and Rewley Abbeys and the Post Office site, and therefore probably not at Carfax church. P. 99. No. XXVII apparently also at Carfax church. P. 103. No. XXXI at Osney Abbey, and therefore probably not at Godstow. P. 107. Nos. XXXVI-XXXVII at Godstow, and therefore probably not at Osney. P. 109. No. XXXIX at Rewley and Carfax church, and therefore not at Godstow or Osney. P. 120. No. LIII at Osney Abbey. P. 121. No. LIV at the Post Office site. P. 122. No. LVI at Osney Abbey. P. 123. No. LVIII at Carfax church. P. 124. No. LIX at Osney, and therefore probably not at the Post Office site. P. 167. No. CXII at Harpsden and Thame church. P. 213. No. CLXX at Godstow, and therefore probably not at Osney Abbey. P. 221. No. CLXXIX at the Post Office site. P. 230. No. CLXXXIX at Harpsden. P. 284. No. CCXLVII at Osney. P. 304. Fragment V at Carfax, and therefore not at Osney.

Besides these additional or corrected findspots drawn from Manning's MS, there are various more or less excusable omissions to record:—

*Beaumont Palace.* Nos. XXV and XXVI (preserved in the garden of No. 302 Woodstock Road).

*Oxford Cathedral.* Nos. XXI: XXVIII: XXXVIII: XL: XLI: and five entirely new designs including my W/18 and an eagle recorded from Catesby Priory. (From the excavations on the site of Meadow Buildings, Christ Church, in 1863; and now preserved in the upper storey of the S. transept of the Cathedral).

*Oxford Cathedral.* Nos. CXVIII: CXXI: CLXXIX: Fragment S. (From the investigations of 1889 in the tomb under the Watching Chamber; now preserved with the last-mentioned series).

*Holton House.* A fifteenth century design of a crowned Sacred Monogram, (Preserved in the modern house).

*Rycote House.* No. CCLI and a large 16th century design recalling no. CCLVII. These, with no. CVII may well have formed part of the pavement of the existing chapel. The other tiles in the house, which should include no. CXXVIII are appreciably earlier.

*Swyncombe.* Nos. CLXXXVIII:CCVI:CCXLVI. All published in Napier: *History of Swyncombe and Ewelme* (noted in the bibliography but not used).

*Great Hazleley.* A design resembling no. XLIV and one resembling no. LXV.

3 Cf. Thame Churchwardens' Accounts sub ann. 1551:—

Item pd for the carriage of a load of pavyngte tyle ffrom Mr. Dormer's ...ijd (Lee: *History of the Church ... of Thame*, p. 70); or the entry for 1540 in the Churchwardens' Accounts of Wing cited in note 29.

4 Haberly op. cit. p. 68. Newman pro duobus millibus et trecentis laterculorum ad sternendam bibliothecam iuxta viij d. pro singulis duodenis .....vj li. vj s. vj d.

5 R. S. Loomis: University of Illinois studies in Language and Literature, vol. II, no. 2.

6 V. C. H. Bucks.

7 Arch. Journ., vol. III, p. 116.

8 Fletcher: *Story of a Worcestershire parish*, 1933: Eckington.

9 E. Martène & V. Durand: *Thesaurus Anecdotorum*, vol. IV, p. 1308. Abbas de Belbec qui monachum suum personis quae non sunt de ordine, ad construenda paviments quae levitatem et curiositttem praeferunt, longo tempore concessit, tribus diebus sit in levi culpa, uno eorum in pane et qua, et monachus infra festum Omnium Sanctorum revocetur et nonnisi personis ordinis nostri de cetero commodandus, apud quas non praesumat construere pavimenta quae maturitatem ordinis non praetendant.

10 See Le Clerc: *Note sur des carreaux . . . au Musée de Troyes*, Bulletin Archéologique, 1890. An admirable article from every point of view.

11 Haberly op. cit. p. 44ff.

12 Provisional report by T. Borenius & J. Charlton in *Antiquaries' Journal*, vol. xvi, p. 55 ff.

12a Kirby: *History of Winchester College*, p. 145.

Accounts, 1397-1398.

In solut. pro xlv M ccc pavyngtiel empt. de Flandre, per M vjs vjd.....xvi vs iiijd.

Et in solut. pro M pavyngtiel majoris quantitatis.....xvijs iiijd.

Et in solut. pro portacione earundem de navi in quendam domum.....iiijs xd.

Et in solut. pro pdictis pavyngtiel cariandis. (*From St. Denis' Priory, Southampton*).....lxs vjd.

Et in solut. pro xxviiij M pavyngtiel ponend' in claustro; iij M in introitu versus capellam et claustum ponend'; et MMccclxxx in iij cameris thesaurarij; et Mccx in panetria ponendis, per M ijs .....lxixs xjd.

The surviving tiles in Winchester College are (apart from a few tiles in the cloister with the inscription HAVE MYNDE, apparently early 16th century; and some plain black and yellow chequers in the Muniment Room, known to be 15th century. Cf. Kirby, op. cit. p. 60), a perfectly homogeneous collection. The only possible exceptions, the tiles published by Lord Ponsonby in *Suss. Arch. Colls.* vol. LXXV, p. 55, nos. 18 & 19, and p. 57, no. 23, occur in the same late Wessex surroundings in the Treasury (Audit Room) and Cloisters of the College, in William of Wykeham's Chantry in the Cathedral, and at St. Cross Hospital, and are undoubtedly of a piece with the rest. In consequence the whole group, found as it is in a large number of churches and monasteries in Hampshire and Wiltshire, and founded as it is on designs current at Clarendon in the first half of the thirteenth century, must be dated to the years around 1400 on the strength of its survival in the floors of the cloisters and treasury of Winchester College where these tiles were laid in 1397-8. And also the whole group is of Flemish manufacture.

13 Op. cit. 21 & 53.

14 P. Chatwin: *The Medieval Patterned Tiles of Warwickshire*, in *Trans. Birmingham Arch. Soc.* vol. LX, p. 1 ff.

15 J. G. Jenkins: *History of the Parish of Penn*, p. 53.

Henry Tyler had 1 cow at 8/- and 1 qr of mixed grain at 3/4 and 3 qrs of oats at 5/- and 7,000 tiles at 6/- and 5 qrs of lime at 20d. Total 24/- Fifteenth 19½d.

Symon the payyer had 1 farm horse at 5/- and 1 cow at 8/- and 2 pigs at 4/- and 1 qr of wheat at 4/- and 1 qr of mixed grain at 3/4 and 3 qrs of oats at 5/- and 4,000 tiles at 8/- and 4 qrs of lime at 16d. Total 39/8 (38/8) Fifteenth 2/7½.

John the tyler had 1 farm horse at 5/- and 1 cow at 6/8 and 2 pigs at 4/- and 1 qr of wheat at 4/- and 1 qr of mixed grain at 3/4 and 4,000 tiles at 8/- and 2 qrs of lime at 8d. Total 31/8. Fifteenth 2/1½.

16 W. St. John Hope: *History of Windsor Castle*, vol. I, p. 100 ff. (In unindexed notes).

Pipe Roll 18 E 3.

Et in tegulis lathis Tylepinnes lathenales pro dictis operacionibus ibidem emptis una cum cariagio dictarum tegularum del penne usque castrum ibidem.....viijli vjs viijd.

Accounts, 18 E 3.

Pro xl ml Tegulis emptis pro coopertura murorum Tabule Rotunde et pro coopertura petrarum ibidem precij millenijs .....iiiijli.

Pro cariagio earundem del Penne usque Wyndesore.....xs. Accounts, 1853.

Eidem (*Roberto Tillare de la Penne*) pro xx ml tegulis emptis pro domo pistoris & braciatoris precij millene ijs iiijd: xlvjs viijd.

Eidem pro ecc rugtil emptis pro eadem domo.....vijs. In cariagio earundem de la Penne usque Wyndesore.....iiijs.

17 Information from R. A. Pelham, F.S.A.

Exchequer K.R. Rolls 550/35. 31 E 3.

"Payment for 100,000 tiles at 2/8 a thousand and carriage of the same in 200 carts over 15 leagues from la Penne to Salden...£13:6:8.

Payment for 11,500 tiles at 2/8 a thousand.....£1:10:8. Salden was manor belonging to Isabel countess of Bedford, and daughter of Edward III. It is about 30 miles distant from Penn.

18 Jenkins, op. cit. p. 55.

Cal. Rot. Pat. 24 E 3, p. 531.

"May 22nd, 1350.

"Appointment of John de Alkeshull, Richard Gregory and Ralph "Hikebidde to take tilers for some works in Westminster Palace and "the Tower of London, and carriage for bringing tiles from la Penne, "payment for the same to be made at the Exchequer."

19 W. St. John Hope: op. cit. p. 161 ff. (In unindexed notes).

Accounts, Aug. 1352.

In x ml tegulis emptis pro pavimento Aule Custodis collegij precij Mille vj s.....lx s

In cariagio earundem de la Penne usque Wyndesore.....iiij s.

Accounts, Feb. 1352.

In vml Tegulis emptis pro pavimento ejusdem vestiarij.....xl s.

Accounts, June 1352.

Pro x Ml tegulis emptis pro pavimento domus Capituli precij Mille vj s. vj d.....lxv s.

20 St. John Hope: op. cit. p. 213.

Accounts, 1356-1357.

Tegule

Idem reddit compotum de xli mill. tegulis pro pavimentis..... xvj mill. tegulis pro coopertura et xxxvij cavatis tegulis receptis de empcone ut supra. Et de xj mill. tegulis pro pavimentis et Deccc tegulis pro coopertura receptis de predicto Roberto per Indenturam. De quibus computat expendisse in pavimentis vj camerarum in alta turri et aliis locis in eodem castro de novo paviandis per dictum tempus xlv mill. tegulas pro pavimentis et pro coopertura domorum xvj mill. Deccc tegulas pro coopertura et xxxvij tegulas cavatas. Et remanent vj mill. tegule pro pavimentis.

21 St. John Hope: op. cit.

Accounts, 1344.

.....pro cariagio tegularum de la Penne et Hogle.....

Accounts, Sept. 1353.

Johanni Bithewood pro xvij Ml tegulis emptis pro reparacione cooperture domus pistoris precij Millene iij s. vj d..... lxiv s. ix d.

Symoni Moldere de Chalfhonte pro x Ml tegulis emptis pro eadem precij mill. ij s. iiij d.....xxiiij s.

In cariagio earundem de Chalfhonte usque Wyndesore.....xiiij s. iiiij.

Roberto Tillare de la Penne pro m/ml/ml tegulis emptis pro eisdem domibus.....vij s.

In cariagio earundem de la Penne usque Wyndesore.....iiij s.

Accounts, June 1352 (see note 19).

In cariagio earundem de Hedensore usque Wyndesore.....v s. Pipe Roll 30 E 3.

.....et in xvj millibus pavyngtil v millibus l tegulis emptis et provisio pro diversis operibus infra dictum Castrum faciendis et reparandis infra tempus predictum iiij li. ix s, iij d. qa una cum cariagio et batillagio earundem tegularum de la Penne usque Wyndesore.

22 Now lost; recorded in Lord Alwyne Compton's tracings in the library of the Society of Antiquaries.

23 Jenkins: *op. cit.* p. 56.

24 Haberly nos. CVII: CCLI: CCLVII: CCLVIII: CCLIX, dated by the rebus of Robert Langton, on no. CCLIX, to the early 16th century. The whole group is to be republished in connexion with the recent excavations of the Oxford University Arch. Soc. at Godstow.

25 Information from W. Peckham of Appledram.

26 Omitting LB/6 whose associations are obscure.

27 The kiln sites were excavated in 1930 by the Duke of Rutland, and the finds are in his collection.

28 References communicated by C. V. Woodman of Wing.

1527. paid for a m tulle at brykehyll.....v s.

paid for a qr of lyme at brykehyll.....xvj d.

1530. payde for tulle & lyme & carryge from brykehyll...vj s. iiij d.

These are unfortunately roofing tiles; and the entries:—

1540. paid for caryage of pament tulle.....iiij s. iiij d.

paid to Wylam Sawnder for vij deyse warke he and hys man  
for pamentyng of the chyrche.....vij s.

suggest that any paving tiles in the church are monastic spoils. On the other hand the tiles from Wing were discovered in the filling of the western portion of the Saxon crypt which must have been blocked when the rood screen was erected in the early 16th century. So that these existing examples are presumably not those acquired in 1540.

29 V. C. H. Bucks vol. IV, p. 176 gives the year 1494 on the authority of Browne Willis. A will of about 1520 leaves money for the building of the church, according to C. V. Woodman; so that the work must have still been unfinished at that time.

30 These tiles are:—

A bird, probably of a Hertfordshire type.

*Bucks.* Linslade.

A fish in a vesica, presumably inlaid.

*Bucks.* North Crawley.

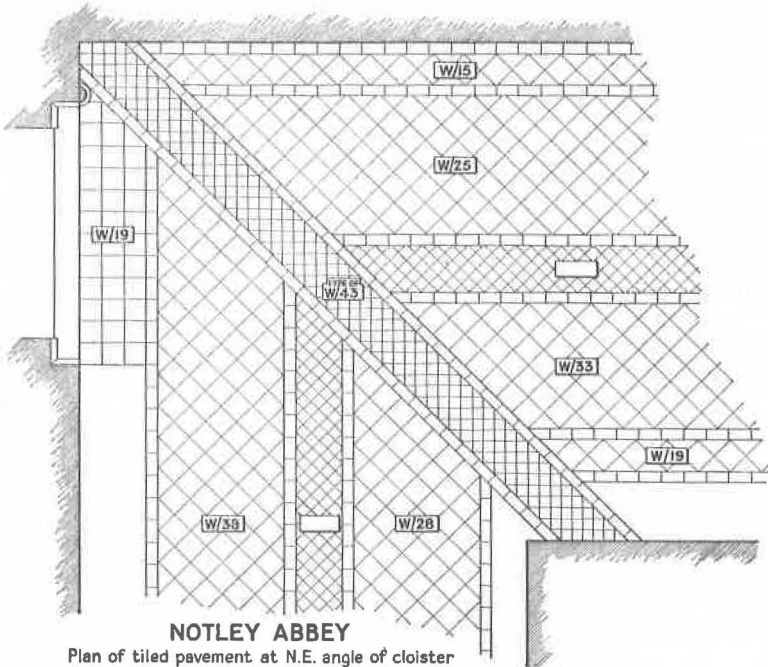
One corner of the tile marked off by two double lines at right angles, the opposite corner by a double quadrant; five pellets in the centre of the design.

*Bucks.* Olney; North Crawley.

None of these is known from any other Buckinghamshire site, and the tiles themselves are lost. Drayton Beauchamp had normal printed tiles, but Lee's drawings are inexplicable and probably owe much to his imagination.



KEY PLAN

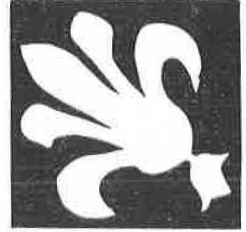


**NOTLEY ABBEY**  
Plan of tiled pavement at N.E. angle of cloister

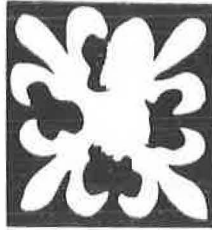
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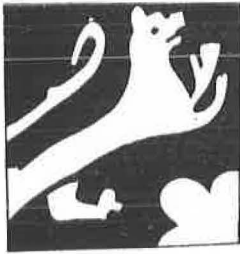
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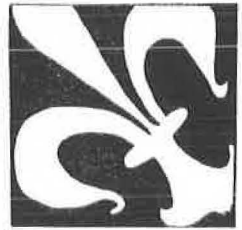
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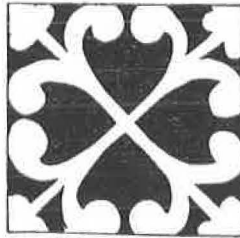
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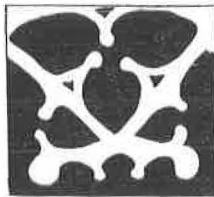
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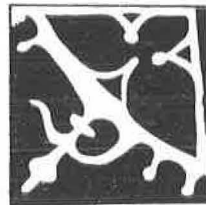
H 2



H 3

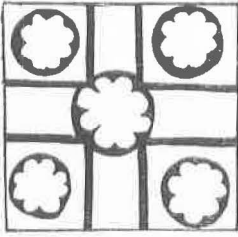


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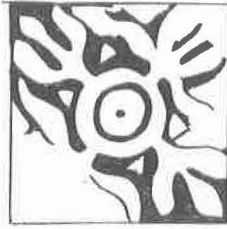


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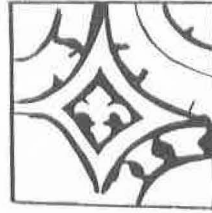
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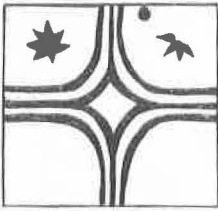
LB 1



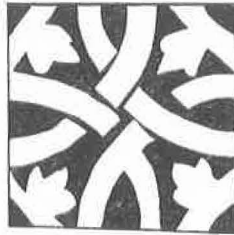
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LB 3



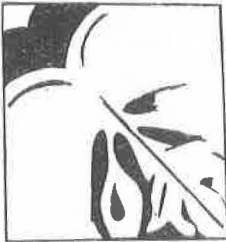
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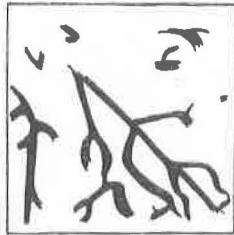
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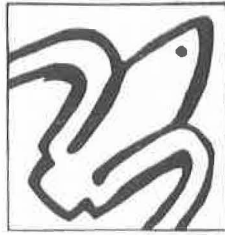
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LB 7



LB 8



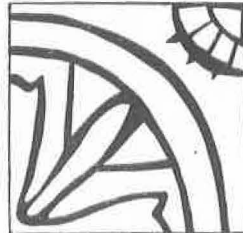
LB 9



LB 10

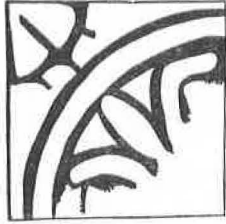


LB 11

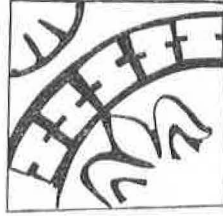


LB 12

Scale  $\frac{1}{4}$



LB 13



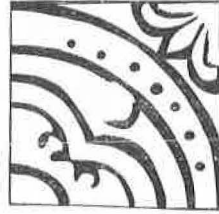
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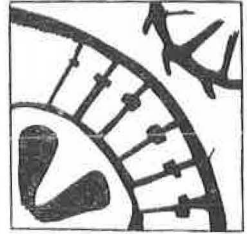
LB 15



LB 16



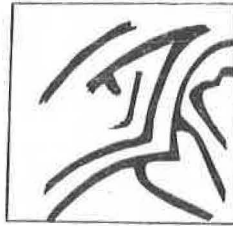
LB 17



LB 18



LB 19



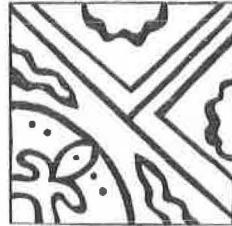
LB 20



LB 21



LB 22



LB 23

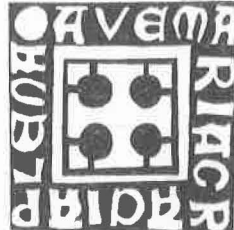
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P 1



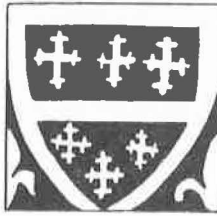
P 2



P 3



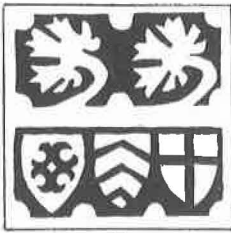
P 4



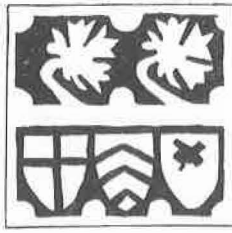
P 5



P 6



P 7



P 8



P 9



P 10



P 12



P 13

Scale  $\frac{1}{4}$



P 14



P 15



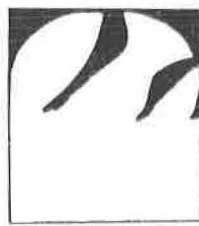
P 16



P 17



P 18



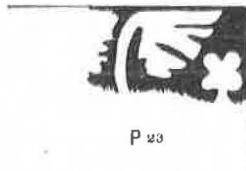
P 19



P 21



P 22



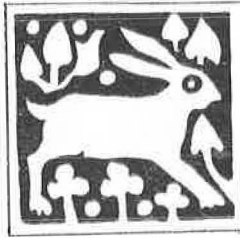
P 23



P 24



P 25



P 26

Scale  $\frac{1}{4}$



P 27



P 28



P 29



P 30



P 31



P 32



P 33



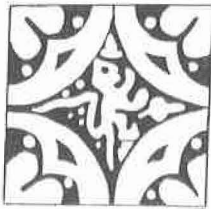
P 34



P 35



P 36



P 37



P 38

Scale  $\frac{1}{4}$



P 40



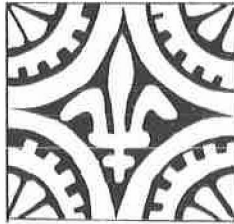
P 41



P 42



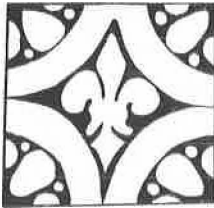
P 43



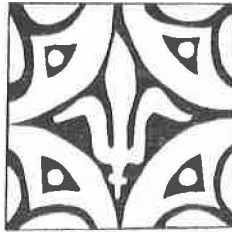
P 44



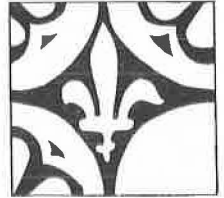
P 45



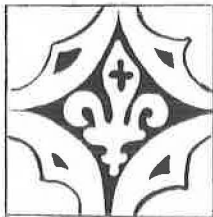
P 46



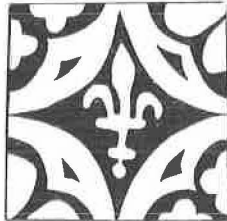
P 47



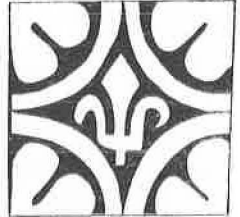
P 48



P 49



P 50



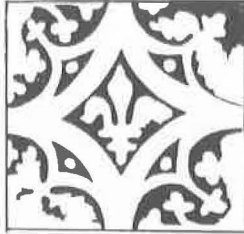
P 51

Scale  $\frac{1}{4}$





P 62



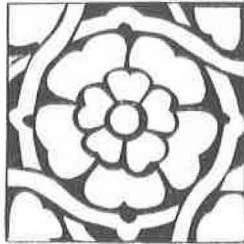
P 64



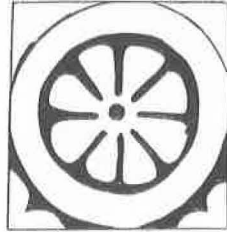
P 65



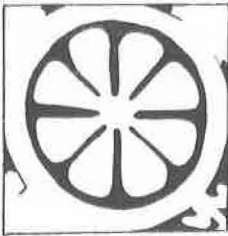
P 66



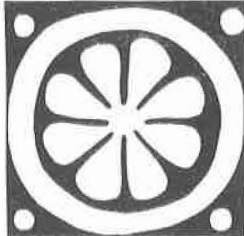
P 67



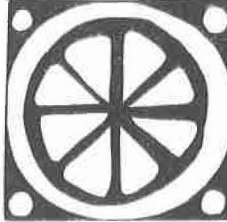
P 68



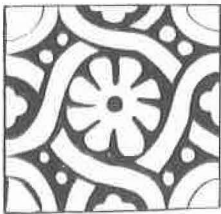
P 69



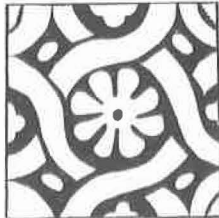
P 69



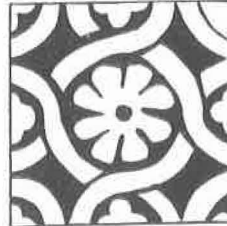
P 69A



P 62



P 63



P 64

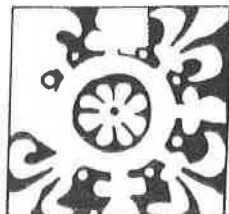
Scale  $\frac{1}{4}$



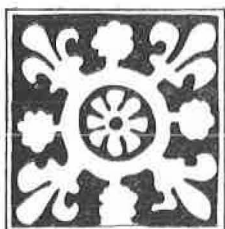
P 65



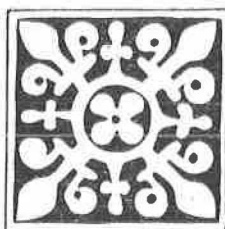
P 66



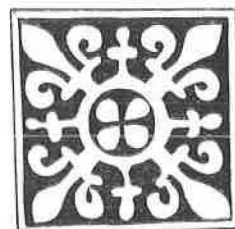
P 67



P 68



P 69



P 70



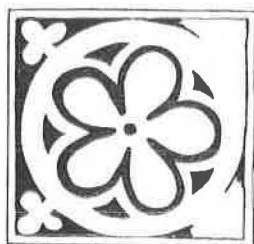
P 71



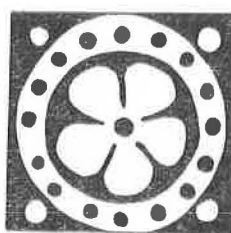
P 72A



P 73



P 74

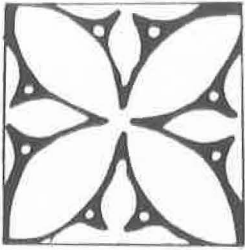


P 75

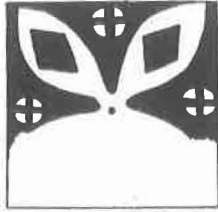


P 76

Scale  $\frac{1}{4}$



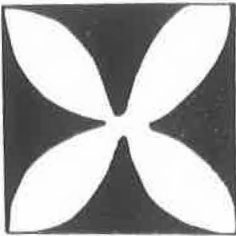
P 77



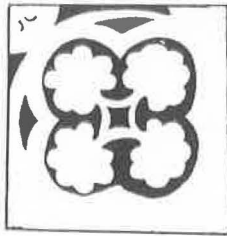
P 78



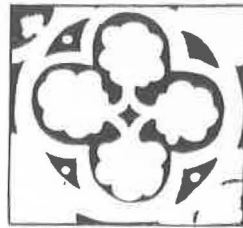
P 79



P 80



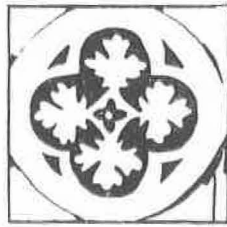
P 81



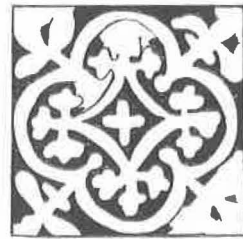
P 82



P 84



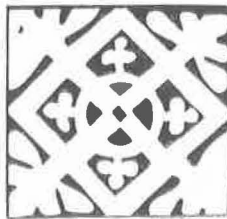
P 86



P 88



P 87



P 88

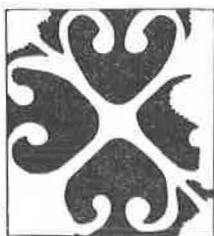


P 89

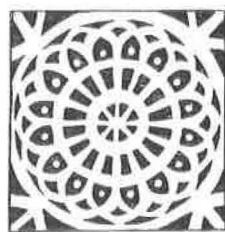
Scale  $\frac{1}{4}$



P 90



P 91



P 92



P 93



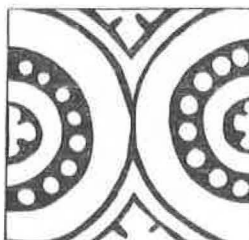
P 94



P 95



P 98



P 99



P 101



P 102

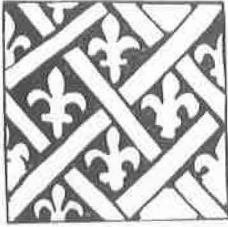


P 103

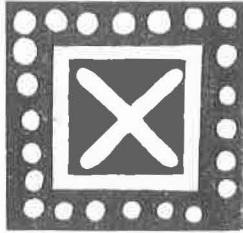


P 104

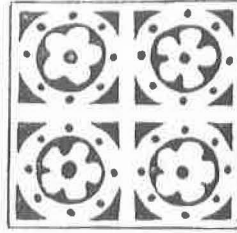
Scale  $\frac{1}{4}$



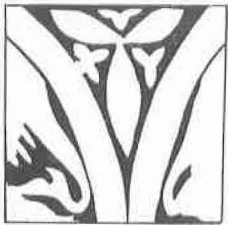
P105



P106



P107



P108



P109



P110



P111



P112



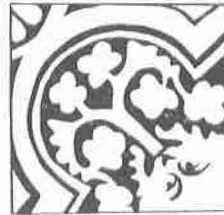
P113



P114



P115

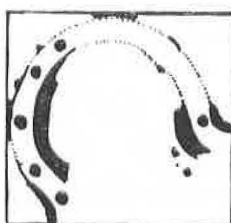


P116

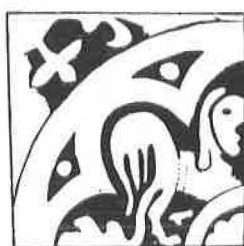
Scale  $\frac{1}{3-8}$



P117



P118



P119



P120



P121



P122



P123



P124



P125



P126

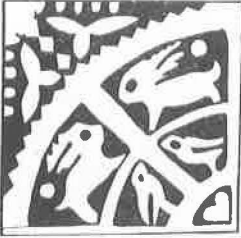


P127



P128

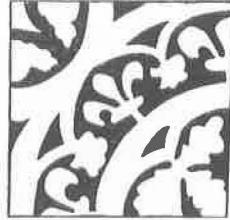
Scale  $\frac{1}{4}$



P129



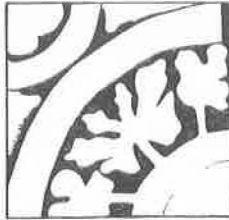
P130



P131



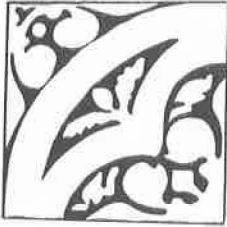
P134



P136



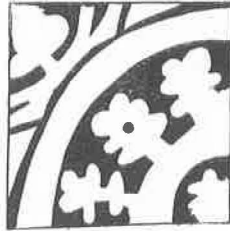
P138



P137



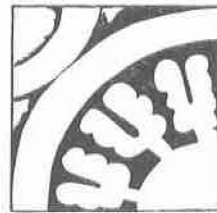
P139



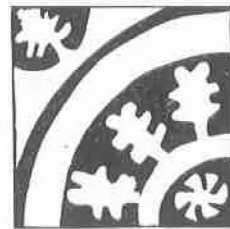
P139



P140



P141



P142

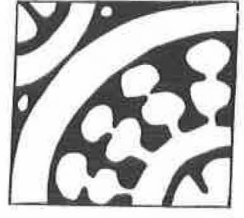
Scale  $\frac{1}{4}$



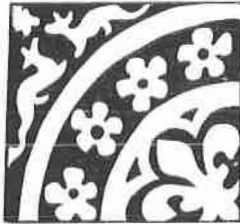
P143



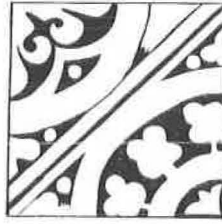
P144



P145



P146



P147



P148



P150



P151



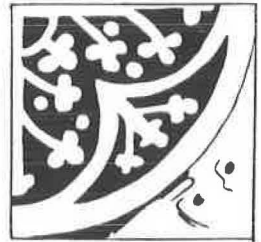
P152



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P155



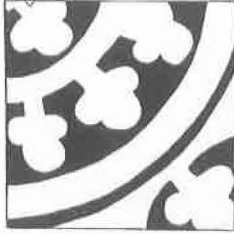
P157

Scale  $\frac{1}{3.9}$





P158



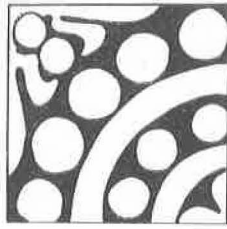
P160



P161



P162



P163



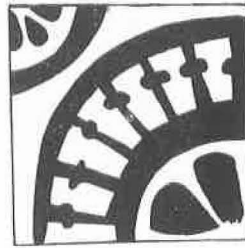
P164



P165



P166



P167



P168

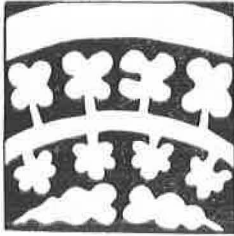


P170

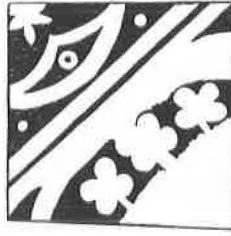


P171A

Scale  $\frac{1}{3.8}$



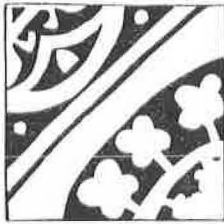
P 171



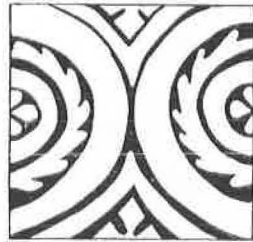
P 172A



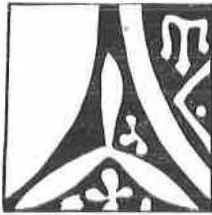
P 172B



P 173A



D 1



D 2



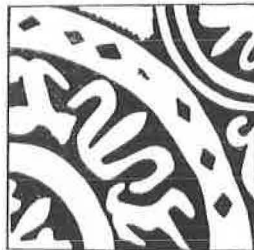
D 3



D 4



D 5



D 6



D 7

Scale  $\frac{1}{4}$



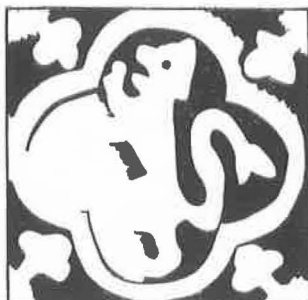
W 1



W 2



W 3



W 4



W 5



W 6

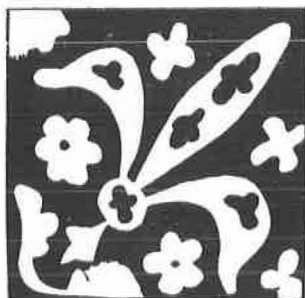
Scale  $\frac{1}{3.6}$



W 7



W 8



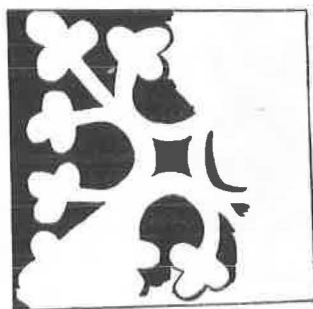
W 9



W 10

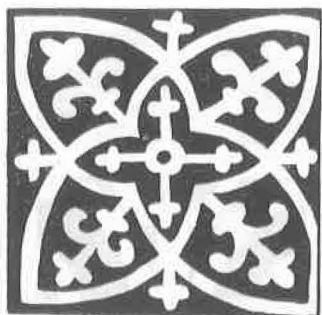


W 11

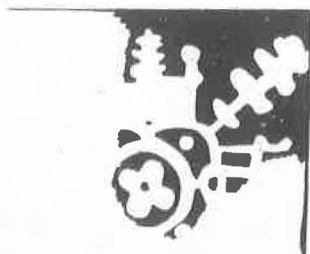


W 12

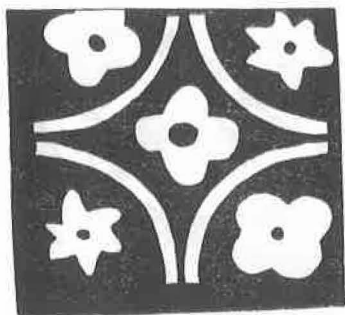
Scale  $\frac{1}{3.75}$



W 13



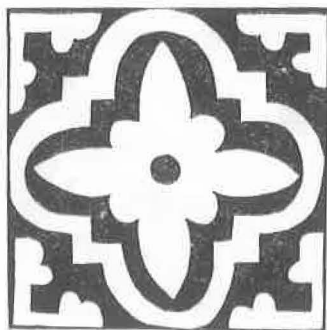
W 14



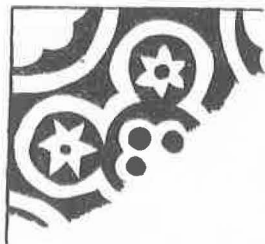
W 15



W 16



W 17



W 18

Scale  $\frac{1}{3.75}$



W 19



W 20



W 21



W 22



W 23



W 24

Scale  $\frac{1}{3.75}$



W 25



W 26



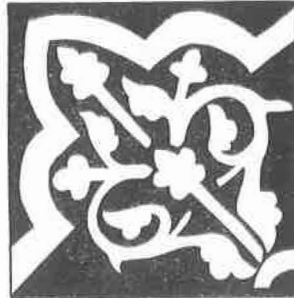
W 27



W 28

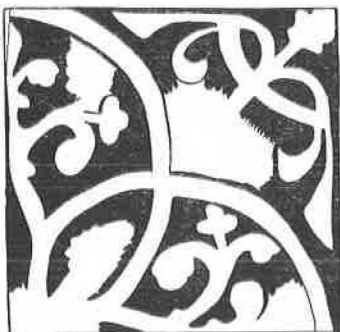


W 29



W 30

Scale  $\frac{1}{3.75}$



W 31



W 32



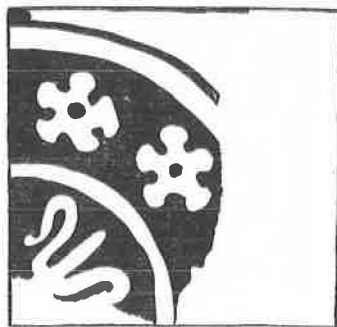
W 33



W 34



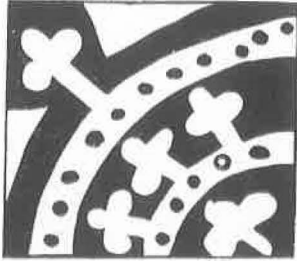
W 35



W 36

Scale  $\frac{1}{3.75}$

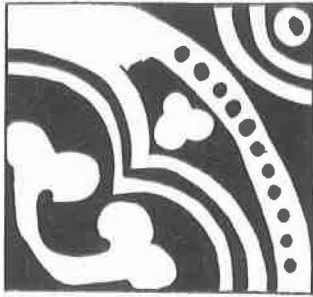




W 37



W 38



W 39



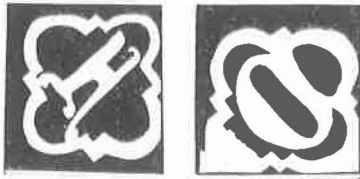
W 40



W 41



W 42



W 43

Scale  $\frac{1}{3.75}$