ABSTRACT

FACULTY OF ARTS

ARCHAEOLOGY

Doctor of Philosophy

THE MEDIEVAL CERAMIC INDUSTRY OF THE SEVERN VALLEY

by Alan George Vince

The subject of this thesis is the medieval ceramic industry of the Severn Valley. A large proportion of the ceramic artefacts used in the study region has been characterised by petrological analysis. This has involved the manufacture and study of over 1,200 thin-sections.

Using principally archaeological stratigraphy in the two main cities of the region, a chronological framework of pottery types has been constructed. In certain areas this sequence is tied to an absolute chronology whilst in others the result is a 'floating' relative sequence.

The distribution of many distinctive ceramic types has been plotted, enabling the methods of distribution used for different classes of products to be compared, both through time and synchronously.

The thesis uses these data to group ceramic industries by the size of the distribution areas of their products. Changes in the character of ceramic industries through time are noted and the factors governing these changes discussed.

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LIST OF ILLUSTRATIONS

(N.B. Except where noted all illustrations are in Volume III)

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CHAPTER ONE

INTRODUCTION

THE POTENTIAL OF POTTERY STUDIES FOR MEDIEVAL ARCHAEOLOGY

Pottery can be very useful in the study of medieval archaeology. This is not because of the importance of the material in the society, indeed the dearth of documentary references to its manufacture and use in comparison with, for example, iron or cloth show that it had relatively little economic or social importance (Hodges, 1974). The advantages that it presents to the archaeologist over other materials are principally that it can be characterised with relative ease and once broken can only be recycled with difficulty.

The medieval potsherds on a site may represent a substantial proportion of the pottery ever used on it (compared with the minute fraction of the 'total population' represented by metal artefacts). It is likely that a similarly high proportion of these sherds came from vessels which had a short period of use, probably a few years on average (see Vince, 1977c). Therefore it is possible to reconstruct aspects of use for pottery which are not available for other types of artefact.

There are other medieval artefacts which can be characterised, for example hone stones (Ellis, 1969) and stone mortars (Dunning, 1977). It is however extremely rare to find more than half a dozen examples of either type on one site and therefore impossible to chart changes in source for such objects from one site and compare these with other sites.

Dunning examined the whole Kings Lynn collection of stone mortars and was able to show that several distinct sources were represented but even here, and this town was exceptional in the number of mortars known, there was no stratigraphic control and therefore no indication as to the relative date of the mortars.

AIMS.

The aims of this study are firstly to present evidence for pottery production and distribution during the medieval period and secondly to examine how data relate to the economies in which the pottery was used. The study uses the evidence of the potsherds themselves and especially the evidence of pottery fabrics, rather than kiln or workshop excavations or documentary sources.

The reasons for this limitation are not that kilns and workshops have not been excavated in the area (there are in fact several 13th century and later kiln sites known from excavation) but that for this study the presence of an excavated kiln site is not so much of an advantage as may at first be thought. Kiln sites provide a skewed detail of the production of the kiln, biased in favour of those forms which are less easy to fire or where a blemish is a serious disadvantage in selling the item. For example, the level of waste from tile production will be much lower than for pottery vessels and it is not possible by examining the ratio of pottery types to tile waste at a kiln to say in what proportion the products were manufactured. Similarly documentary evidence for production and distribution of pottery, although interesting for the light it sheds on

archaeological evidence, is too piecemeal to produce the type of picture available from archaeology (Le Patourel, 1968; Moorhouse, 1981).

There are two specific problems posed by data. Firstly, how did the medieval pottery industry develop from what appeared to be the domestic production of the early to mid-Saxon period and secondly, were there changes in scale or organisation of the industry during the medieval period to mirror those seen in, for example, the cloth industry? The exact scope of the study was therefore determined by the need to acquire enough data for any patterns in the production or distribution of pottery to be recognised.

CHOICE OF REGION.

Throughout this study the term 'Severn Valley' is used to denote the modern Counties of Avon, Hereford and Worcester, Gloucestershire and Gwent. The Severn Valley was chosen as the study area mainly because a preliminary survey of the medieval cooking pottery of the area had shown that considerable petrological variability existed. Therefore, it is possible to characterise a high proportion of the pottery found using simple petrological techniques (Vince, 1974).

The study is not strictly limited to county boundaries. Collections from Somerset, Salop, Staffordshire, Warwickshire and Oxfordshire were examined although no attempt was made to characterise the local wares unless they were also found in the Severn Valley.

In order to chart the coastal trade in pottery, collections in Wales were examined, but only the English wares and some distinctive South Welsh wares are described in this thesis. The pottery of Wiltshire, Berkshire and the northern part of Hampshire was examined as part of the post-excavation research for the 1979 excavation at Bartholomew Street, Newbury (Vince, 1980) and the results are incorporated here since they usefully extend the range of topography and geology within the survey area and show that several of the conclusions reached on the basis of the Severn Valley study have a wider validity.

The study area forms a heterogeneous region varying in geology, topography, and medieval land use and so it includes most of the geographical variation present in lowland England. In addition there is an east-west contrast between Wales, which experienced considerable political upheaval and movement of people during the medieval period and the heartland of Wessex where social and political movements were more gradual and less severe. In between the two is the main study area, much of which was in the Saxon Kingdom of Mercia at the beginning of the late Saxon period.

The study region therefore is Lowland Britain in microcosm. Nevertheless, one of the striking characteristics of material culture in the medieval period is its regional variability (Jope, 1963) and we should not necessarily expect to find exactly similar processes and developments in the pottery industries of other regions even when the factors underlying these changes are the same. Less comparison with other regions is included in

this thesis than the author would have liked because while the fieldwork for this thesis was being undertaken there was no comparable published survey of other areas. This has restricted interpretation of the results of this survey.

The chronological limits to the study were chosen in order to give a clear picture of the development of the industry. At the end of the Roman period the pottery industry collapsed. The archaeological evidence for the following centuries in western Britain is characterised by an extremely elusive material culture, in which locally produced pottery (when used) was handmade, with a restricted range of forms and decorations, made in a limited range of fabrics (predominantly chaff-tempered) and was quite probably domestically produced. This 5th- to 9th-century pottery is briefly included in this thesis, but there is very little of it and to interpret it correctly would require a survey of all the domestic pottery of the British Isles of the post-Roman period. There is a sharp break between this pottery and that of the late Saxon period, but no break at all between the late Saxon pottery industry and that of the post-conquest period. It is in fact impossible to distinguish pre-conquest from post-conquest pottery by fabric and form alone.

There is more difficulty in finding a suitable cut-off point to end the study. The change-over from medieval to post-medieval wares is obscured because the Malvern Chase was responsible for supplying much of the pottery in both periods. It is convenient therefore to end this study in the early 17th century with the demise of the Malvern Chase

pottery industry. The study therefore ends before the influx of Staffordshire and Bristol slipwares into the region and the beginnings of factory production.

HISTORY OF MEDIEVAL POTTERY RESEARCH IN THE REGION

With the exception of purely descriptive reports, such as that on the collection of pottery from the Pithay, Bristol (Pritchard, 1926), medieval pottery studies in the region began in the 1930's. Notable early reports are those on Lydney Castle and a pit group from Old Sarum, associated with a coin of William the Conqueror (Casey, 1931; Stone and Charlton, 1935).

From then on, and especially in the 1940's and 1950's, E. M. Jope and G. C. Dunning studied much of the pottery included here, together with material not now available for study, and produced a series of distribution maps for medieval pottery types in Southern England (for example those included as appendices to the Selsley Common report, Dunning 1949, and the Ascot Doilly report, Jope 1959). Interpretation of these maps was limited because it was not then possible to characterise the pottery by fabric analysis and therefore a plotted type might be the product of one or several centres. In fact, there was no way of telling whether a distribution resulted from the movement of pottery or from the transmission of ideas. Another problem was that their maps did not indicate how common a type of pottery was at the marked findspot although Jope did use a symbol on his maps to show 'negative evidence', sites which ought to have produced that type if it were in common use. The culmination of Jope's work on pottery

distribution was an essay in Culture and Environment (1963), where medieval pottery style distributions were compared with those found in church architecture, place-names and other artefacts to show the amount of regional variation in material culture. These are some of the few studies of their time in medieval archaeology which use archaeological data as a source of information independant of medieval history.

Barton's study of Ham Green ware was published in the same year (Barton, 1963). This paper, together with a study of the medieval jugs of Worcester published by the same author, marked the beginning of detailed ware studies in the area (Barton, 1967b). The Ham Green report contained a statistical table of the typological characteristics found on wasters from the kiln site and these, plus the visual appearance of the pottery, were used to plot the distribution of the ware. Dating was based on the stratigraphic association of Ham Green pottery at Bristol and Cheddar.

In the late 1960's and early 1970's there was a dramatic increase in the number of medieval sites excavated as well as in their size and the complexity of stratigraphy discovered. Gloucester Museum appointed a Field Officer in 1968 (H. R. Hurst) whilst P. A. Rahtz initiated a series of excavations on the defenses of Hereford in the same year (Victoria Street, the Brewery Site, see Shoesmith, 1982). Excavations on Bristol Castle by the Field Officer of Bristol City Museum also began in 1968. Perhaps the largest exacavation in the region has been on the Gloucester Telephone Exchange Site (Site 77/69). This site produced an

extremely complicated sequence of buildings dating from the 10th/11th centuries to the late 13th/14th centuries with isolated features of later medieval date. Excavation continued into the late 1970's on a reduced scale but, writing in 1983, it now appears that this phase in the development of medieval archaeology is over and that much of the potential of pottery studies for medieval archaeology in the region will not be realised.

Further developments in the potential of the study of medieval pottery in the region came as a result of the work of D. P. S. Peacock on Neolithic, Iron Age and Romano-British pottery (1969, 1968 and 1967a). Peacock demonstrated that undecorated, coarse pottery was not always produced in the immediate locality of the site (itself an unexpected conclusion) and that it could be characterised without recourse to typology. Henceforth it was possible to study distribution and typology separately, and to make much more sense of both. Once petrological groupings had been made Peacock found that there were indeed typological differences as well, although there was less than perfect agreement between the two. It was therefore possible to use typological characteristics in certain cases as an aid to source identification. The same phenomenon has been noted and used in this study.

In the early 1970's Hodder published a series of studies of Romano-British pottery distribution using various methods of quantification to illustrate the rate at which frequency declined with distance from the source (Hodder, 1974a, 1974b). This work suggested that three

factors influenced the distribution of Romano-British pottery, namely, the road network, the use of waterways and the influence of the marketing system. The distribution of Rowland's Castle ware jars was skewed to the north. Hodder showed that this was probably due to the use of a road for transport of pottery. The rate of fall-off in frequency of Oxfordshire wares could be divided into two; on sites with access to the Oxfordshire kilns by water, the fall-off was markedly less steep than on sites not situated near waterways. The distribution of Savernake Ware showed that the fall-off in frequency was not regular around the kilns but was instead centred on the nearby town of Mildenhall. These studies showed that in the Romano-British period considerable information about the mechanics of local trade could be obtained through a study of the coarseware pottery industries.

More recent developments have included the use of textural analysis to characterise sands (the methods are described in Shackley, 1975), the application of Heavy Mineral Analysis , notably Williams' study of Black Burnished Ware (1977), and the application of Neutron Activation Analysis to characterise Stamford Ware and medieval floor tiles (Kilmurry, 1980, and Hughes et al., 1982). These methods would enable petrologically 'bland' quartz-sand tempered wares and untempered 'fine' wares to be characterised. Unfortunately none of these methods has the 'feedback' of the petrological approach, which enables inclusions to be reliably identified by eye once their identity has been verified in a sample using thin-section analysis.

The research climate has altered beyond recognition from the early 1960's, when the lack of suitable analytical tools produced an impasse in interpretation and little stratigraphic data existed, to the 1980's when the archaeologist is faced with a plethora of characterisation methods and techniques of distribution analysis and a large body of excavated data. The methods chosen for this study, and the reasons for their choice, are described below.

METHODS

The theory underlying the methods used by the author assumes that whenever a vessel was broken a similar replacement was obtained, although of course if this was literally true there would be no change at all in the types of pottery used. It follows from this theory that the relative frequency of vessel types and sources found in an assemblage will be directly proportional to their relative frequency of purchase. This assumption underlies all the work in this study and it is neccessary to point out that the work of Schiffer (1972 and 1976) suggests that it is only one possible interpretation of the relationship, and that other factors, such as disposal patterns and functional variation within and between sites, may affect the composition of an assemblage. These factors, and their relevance to medieval pottery studies are discussed below.

In order to interpret the statistical analysis of an assemblage in economic terms only those groups deposited over a very short period of time containing no residual pottery in them should be used. If such a selection policy was carried out rigorously then the number of usable

assemblages would be very small. Therefore, poorly stratified and even unstratified collections have been used in this part of the study. The results of their analysis have been interpreted using the better stratified collections as a guide.

CHARACTERISATION.

Wares were characterised by a combination of thin-section analysis, examination of sherds with a x20 binocular microscope and a certain amount of study of the local clay sources. An attempt was made to study at least one thin-section of every fabric (see Appendix 1) and in the case of wares distributed over long distances (ie. over 40 miles from their supposed source) thin-sections of samples from both the centre and extremities of the distribution were examined.

Textural sub-divisions of fabrics were not made unless the pottery naturally split into such groups (a subjective assessment was made in these cases). Therefore the fabric groups used here probably vary more in texture (grain-size and quantity of inclusions) and in colour than is normal practice in medieval pottery reports (Robinson, 1979).

Conversely, the identity of the inclusions was considered of paramount importance. For example, the pottery of the Malvern Chase encompasses a wide range of textures and colours but it all contains igneous rock fragments and is treated as only four distinct fabrics. A sample of 40 thin-sections was analysed by point-counting and the results are plotted as a ternary diagram (Vince,

1977a, fig.1). This shows that the relative proportions of quartz silt to quartz sand to Malvernian rock can be used to define the fabrics. With practice this is possible visually.

The only wares which could not be characterised by the presence or absence of inclusion types, or by their relative proportions, were those containing solely quartz sand temper or those with practically no inclusions. In the study region these wares were not as ubiquitous as they appear to be elsewhere and their exclusion is not too serious. At both Hereford and Gloucester exclusively sand-tempered wares formed less than 10% of all pottery whilst in London, for instance, the proportion is closer to 90%.

The use of the binocular microscope was invaluable. No useful results would have emerged without it, whilst with its use thin-sectioning was often redundant, revealing no further information. The binocular microscope in fact revealed some types of data lost in thin-section, for example the surface features of quartz grains and details of iron ore inclusions, which are opaque in thin-section. The binocular microscope is also much quicker to use than thin-sectioning and this is an important consideration when analysing pottery in bulk. The ideal sequence of analysis would be as follows: the first site to be examined (of its date) in an area would be processed slowly, examining a fresh edge of each sherd to identify and describe the inclusions. On the basis of this a type fabric series would be prepared and examined in thin-section. This would result in a modified type fabric series which would be used to classify the original pottery, and any other collections of

similar date from the same region. Eventually it should be possible to identify the majority of fabrics by eye, using the binocular microscope on groups of wares where it is known that visual analysis alone is misleading. This is approximately the proc edure followed at Gloucester, Hereford, Bath, Chepstow and Newbury and consequently the results from these towns are the most reliable in the region. Elsewhere modifications were made through lack of equipment or restrictions on time.

Clay analysis was carried out on a random basis, except in the Malvern Chase where an attempt was made to define the potential clay sources for the wares by sampling clays throughout the parish of Hanley Castle. All of these clays were essentially Keuper Marl which had been weathered and mixed with overlying sands and gravels or had been re-deposited in stream banks. It was revealing that many of the samples when fired were not similar to any Malvern Chase wares known. Only one good match was found, between samples from Hanley Swan and the Malvern Chase 'pink' fabric (see Ch.2). The amount of local variation in the clay sources in their weathered and contaminated state was very high and the composition of clays between the sampled points could not therefore be extrapolated. However, when a good match was found it was likely to be a reliable indication that the clay source used by the potters was close by.

This should mean that pin-pointing of the clay sources for known kilns is possible although other areas showed much less variation in their clay sources (see

Ch.2). For example, clays from the Lower Lias in the Severn Valley and the Cotswolds contained virtually no visible inclusions and fired to the same colour, similarly the Devonian Marl of the Welsh Border and the glacial till derived from it produced very similar fabrics from widely spaced localities.

VARIABILITY.

Since the mid-1960's, when New Perspectives in Archaeology and Analytical Archaeology were published (Binford and Binford, 1968; Clarke 1968), numerous artefact studies have been published examining factors other than date and 'culture' which may affect the composition of archaeological assemblages. Few of these studies have dealt with the Saxon or medieval periods in the British Isles but there is no reason why such studies should not be relevant here. The possible factors suggested for other cultures should be examined to see whether they may affect the results of this thesis.

It has been proposed that the variety of artefact types available in a society is related to the social differentiation, since artefacts are used to express social differences. This undoubtedly applies to the medieval period. It is known that dress, for example, was used as an indicator of status and there were at times sumptuary laws to restrict the wearing of particular types of dress except by people of the appropiate rank.

It is possible that cooking and storage vessels would be affected by this attitude but it is more likely to have influenced the choice of pottery types used for serving,

drinking and display. Of these, the obvious types to examine are the decorated jugs of the 12th to 14th centuries and the decorated tableware of the late 13th to 17th centuries. The earliest highly decorated jugs found are of late 12th century date (for example, some tubular-spouted pitchers) but these are so rare within the region that it is not possible to make deductions from their occurrence. In the 13th century highly decorated wares are found, for example Ham Green ware and Worcester-type jugs. No relationship between their occurrence and the type of site has been noted, nor any significant variation in the relative frequency of the plainer forms to the 'highly decorated' vessels. Highly decorated Ham Green jugs are found on deserted medieval village sites, although they might have been used in the Manor House rather than the peasant tofts.

In the later 13th and 14th centuries the quantity of highly decorated jugs in use was at its peak and included some of the highest quality pottery of the medieval period. One such type was Saintonge ware, and especially the polychrome decorated jugs. It has often been stated that the distribution of Saintonge polychrome ware is strongly correlated with that of seigneurial sites, such as abbeys and castles. The distribution within the region is examined in Chapter 11 but it seems that here the most significant factor is distance from the coast (not distance from navigable waterways). This suggests that the vessels were transported on sea-going ships which could not travel up rivers like the Severn and that Saintonge polychrome ware was not considered valuable enough to be transshipped.

The apparent seigneurial distribution is, in the writer's opinion, merely a reflection of the concentration on castle and abbey excavation in the region.

The distribution of other fine tablewares in the medieval period is more promising. Andalusian lustreware is absent from the region but a single bowl is known from Devizes Castle. Valencian lustreware is uncommon and the few sherds from Gloucester and Worcester (Morris, 1980) might actually date from the 16th century, by which time the quality of the ware, and its contemporary value were probably lower than in the medieval period. A set of 15th-century Valencian lustreware vessels was found at the Pithay in Bristol and this surely must have been the property of a wealthy or high status person (Hurst,1977a, nos. 18-19, 23-24, 27). Later decorated tableware can be divided into five groups;

1) Imported continental earthenware (for example Beauvais sgraffito, North Italian, Weser and Werra slipwares)

2) English copies of these wares (for example South Somerset slipware)

3) Chinese porcelain

4) Italian maiolica

5) Dutch and English copies of these wares.

Before the mid-17th century groups 1, 3 and 4 are extremely rare in the region but the few examples of group 1 come predominantly from sites close to the coast, navigable rivers or from sites in towns with known trading connections. A single example of Italian maiolica is known, from Hailes Abbey (and associated with the house built on

the site of the Abbey at the dissolution). No 17th century Chinese porcelain is known from the region and late 16th to 17th century Dutch or English tin-glazed ware is also rare (examples are known from Cirencester Abbey, another site where a large country house was built after the dissolution).

The conclusion of this survey is that pottery was probably used to express social differences in the post-medieval period and to a lesser extent in the medieval period or to be more exact there is a greater range of 'finewares' in the post-medieval period. However, most of the sites examined have a very similar range of 'fine wares'. These sites range in status from castles and abbeys to deserted medieval villages. The relative frequency of jugs to other vessels differs between sites but the absence of stratification on most rural sites makes this difficult to quantify. However, it is likely that if this does represent a social difference it is not in the ability to purchase glazed jugs but in the use by the richer members of society of metal cooking vessels, so giving rise to lower quantities of cooking pot sherds on their occupation sites.

Pottery was used for a variety of purposes (see chapter 7) and one might expect assemblages to vary in the relative proportion of vessels of different function. However, most assemblages contain a mixture of functional types many of which would probably not have been used together. Therefore the relationship between area of use and type of vessel has been lost. This must be due to the methods of rubbish disposal. It has recently been claimed that spatial

differentiation exists in the medieval pottery from a site in Southampton (M. Brisbane, pers. comm.). In this case the ratio of cooking pots to others increased with distance from the living quarters. Some well-groups have been found in the region which likewise show functional grouping - presumably these vessels were lost whilst being filled with water (for example, a mid-13th century well group from site 53/69 in Gloucester is composed almost entirely of jugs, as is the Bristol Castle well group, Barton 1959). The excavation of the hall and chapel of Holm Castle, Tewkesbury , produced assemblages dominated by glazed jugs with very few cooking pots. Although this might be due to the wealth of the inhabitants, who might have been able to use metal instead of ceramic cooking pots, it might also be that the kitchen area of the castle was not excavated and if found would have redressed the balance and proved that intra-site variation in the distribution of pottery exists.

These examples are rare and emphasise how similar the remaining assemblages are. There are differences in function between groups but these are mainly explicable as country-wide changes through time and do not lead to any greater understanding of individual sites. If this is so, then it is likely that they do not severely affect the results of this thesis.

The influence of disposal patterns on the variability in medieval pottery assemblages has already been alluded to above. The observation there was that the contents of a medieval archaeological assemblage do not reflect the activities of the immediately surrounding area. We must

therefore postulate some intermediate stages which rubbish passed through after breakage but before burial. This has been noted by Biddle at Seacourt D.M.V. where sherds from one vessel were recovered from all the layers within a pit (Biddle, 1961-2). Similar conclusions must be drawn from attempts to reconstruct the vessels from quite large excavations where recovery of finds was good. It is rare to find all of the sherds of a vessel and quite common to find joining sherds in quite distant parts of the site. The most likely explanation is that above-ground middens existed, which were periodically removed for burial or disposal off the site. On a rural settlement this off-site disposal might give rise to so-called 'manuring scatters'. This is an explanation by field archaeologists for the presence of isolated sherds of medieval pottery in areas known to have been ploughed in the medieval period (Taylor, C. C., 1974). However, it is also possible that some of these scatters represent pre-ploughing occupation on the site, such as has been demonstrated at Goltho (Beresford, 1975, 7) and within the study region on the Frocester Court Estate by E. Price (see appendix 1).

It is suggested therefore that the disposal of rubbish in the medieval period gives rise mainly to a 'randomising' process which masks much possible variation in the composition of pottery assemblages.

The position of the site in relation to the marketing hierarchy may also be a source of variability in assemblages. If the system of distribution of goods was totally efficient then the position of the site should have had no effect on the availability of a pottery type

but it is unlikely that the medieval market and fair network was so effective and sites with restricted access to markets or fairs might be expected to produce fewer imported or non-local goods, for example, than sites of equivalent status in a market town. It is a measure of the efficiency of medieval marketing that there are very few examples of this process, unless the distribution of imported pottery is interpreted in this way, so that at the coastal ports imported types were available to all but that the status of the receiving sites rises with distance from the coast.

QUANTIFICATION METHODS.

Several methods of quantififying pottery assemblages exist and all give rise to some problems. It has therefore been suggested that a minimum of two methods should be used in order to counteract the biases of the individual methods (Young, 1980). The methods are:

1) Weight
2) Sherd Count
3) Volume
4) Minimum vessel count
5) Estimated vessel equivalents (EVEs).

Weighing is the simplest method and was used for certain assemblages in Gloucester and Berkshire. However, a set of portable scales was not available for use in the fieldwork and therefore weighing could not be used as a standard measure. The method is biased in favour of heavy types, such as storage jars and against light types such as cups. Since it is usual for a particular ware consistently

to produce the same type of vessels this gives rise to a systematic error, which can therefore be corrected by introducing a weighting constant based on the average weight of a complete example of the type. In practice this could not have been done for more than a handful of types in the region due to the absence of complete vessels but it would have been possible to estimate the constant by dividing the weight of a group of sherds of one type by their EVEs.

Sherd counts are subject to much more variablility than weight since sherd size depends on many factors. In practice the discrepancy between relative frequencies based on sherd count and those based on weight are not as great as might be expected (Hinton, 1977, 232-235). This is probably due to the fact that many factors (such as whether the pottery is crushed under foot or thrown into a feature) apply equally to all of the pottery in an assemblage.

The use of the volume displaced by sherds to quantify pottery assemblages was an attempt by Hinton to allow for differences in density between wares. It is unlikely to have any practical application and proved to have no advantages over weight and sherd count methods (Hinton, 1977, 233).

The minimum number of vessels in an assemblage is calculated by laying out all of the sherds and attempting to group them into individual vessels. The results of this exercise vary between groups and depend on a number of factors which affect the dispersal of sherds of a vessel after breakage. This method was used on some Gloucester

assemblages and it is clear that where the sherds come from a small number of vessels the groups have to be larger than normal to produce 'reasonable' results. A systematic error will occur if the minimum vessel count is based on analysis of sherds by context when the results are later grouped together into assemblages. This is because vessels found wholly in one context will be counted once whilst those present in more than one context will be counted once for each context. Another source of error with this method is that it is possible to identify sherds of distinctive, decorated vessel when it is impossible to recognise sherds of the same coarseware vessel. Occasionally the difference between vessel counts and sherd counts is given in the gazetteer (Appendix 2). The presence of complete or smashed vessels in the Newbury Bartholomew Street sequence resulted in some anomalies in the frequency of wares, calculated by weight (fig. 1.2).

Estimated Vessel Equivalents are calculated by counting those parts of a vessel whose frequency on the vessel is known. This could be rim percentage, each vessel having 100% of rim, base percentage or perhaps applied features, such as bung-holes, feet, spouts or handles. The use of basal percentages is difficult with medieval material since in many cases the basal angle is indistinct and the percentage present is difficult to measure. Similarly, the use of applied features is only useful for specific tasks, for example to check whether a vessel type always has three feet one could calculate the rim EVEs and the number of feet. The number of feet could then be divided by three to give the foot EVEs and the two figures should then be of

the same order of magnitude. However, no groups of sufficient size to use this method of analysis were encountered in the fieldwork. The use of EVEs avoids the bias introduced by using the minimum vessel count but in the process information is lost. As with weight and sherd counts it is not possible to say how many vessels are represented by the figures. This should make no difference when only relative frequencies are being compared but the minimum vessel count does give a measure of the reliablility of the data. Another method of ensuring the reliability of the data is used in the Department of Urban Archaeology, Museum of London, where only groups of over 25 EVEs or 10kg are accepted as sufficiently large for quantification. This test would exclude virtually all of the data in this thesis and has therefore been ignored. It does however point out just how little reliance should be placed on minor differences between assemblages.

RESIDUALITY.

One constantly recurring problem with the interpretation of stratified assemblages is that of residuality and intrusion.

A sherd is said to be residual if it is present in a context after having been previously buried. Other examples of old vessels being present in a context are excluded from this category and are often known collectively as 'heirlooms' although there may be many reasons for their great age at burial. There is always a certain lapse in time between manufacture and burial, even if it is too short to be detectable by archaeological methods. A

calculation of the average age at burial of Roman samian ware vessels has been published by Orton and Orton (1975). Their estimates for two sites in the London area are c.18 years and c.29 years. The difference between the two dates is thought to reflect the speed of deposition. Similar data are available for post-medieval artefacts from the City of London (Vince, 1982a). Both estimates are probably much too high for the coarse pottery of the medieval period and lead one to suspect that if a difference in date between vessels in a group can be detected it is more likely to be due to residuality than to the use of the pottery over a long period.

An intrusive sherd is one which is present in an assemblage predating the manufacture of the sherd. Intrusion into sealed deposits can only be the result of poor excavation technique whereas there are many ways of residual pottery being incorporated into a perfectly excavated assemblage.

Most urban sites consist of a mixture of horizontal layers and features, mainly robber trenches and pits. The earth displaced by digging these features usually contains potsherds and if it is deposited on the site will result in that pottery being 'out of sequence'. Pit fills normally contain a mixture of contemporary rubbish, soil derived from the decomposition of organic refuse and earth thrown into the pit to cover the deposit. This earth will probably contain residual pottery. Large scale earth-moving, for example cellaring and terracing result in large quantities of residual pottery being dumped somewhere, usually at some distance from the site where the pottery was originally

discarded.

On a smaller scale the techniques of excavation can give rise to residual pottery. For example, excavation of a horizontal layer often causes sherds in the exposed surface below to be dislodged. These are incorporated into the later assemblage. When excavating pits it is almost impossible not to over-excavate the edges of the feature, causing pottery to be dislodged from the strata through which the pit was dug. It is quite common to find stratified sites where the apparent sequence through time consists of more and more types being present but little decline in the relative frequency of earlier types. On some sites the relative frequency curve of a type can have two peaks, one for the actual lifespan of the type and another for the residual appearance of the type. Detailed analysis of residuality can be very useful in the analysis of excavation sequences but has hopefully been recognised and excluded from discussion in this study. However, when a site is the only one available in an area, or is the first site to be analysed then residuality may not be noticed, for example highly mixed groups are published from one of the first excavations in Abingdon (Parrington and Balkwill, 1976).

Sometimes there are objective differences between residual and contemporary pottery (see Ch.6) but often residual potsherds can be as large and unworn as the contemporary pottery in a group. In these cases it is only possible to divide a group into its constituents by reference to other assemblages, where it can be shown that

certain types cannot be contemporary. Unless this can be proven the groups cannot be used for quantitative analysis.

Intrusive pottery normally enters an assemblage by one of three processes: intrusive features are not noticed during excavation; pottery falls back into the excavation area from a section and is mistakenly placed in the finds tray or there is a mistake in the recording of the finds context number. All these processes are symptoms of poor excavation technique but examples occur in most excavations. Urban excavations rarely proceed at a slow enough pace to ensure completely reliable results. Rural excavations suffer from having no stratified groups at all, due to the mixture of pottery through soil formation processes and agriculture. It will be clear that selection of contemporary assemblages for analysis is a complicated process and that suitable assemblages are rare.

DATING.

A rigorous method was adopted to produce the pottery chronology (see Ch. 6). The sequence of introduction of types was independently derived from several sites where one or more stratified sequence was available. Close attention was paid to both the quality of the archaeological evidence and to the quantity of pottery being examined. In this way a series of chronological markers was found for each site (so that a group could be given a relative date of the form "after the introduction of type x but before the introduction of type y"). Further precision was given by quantitative analysis of stratified groups. The difference in the nature of assemblages (for

example the time-span represented, the amount of residual pottery and random variation) means that too much emphasis on differences in relative frequency is misleading.

Nevertheless, it is possible with most wares to identify a point in time at which they first appear, a period in which they are most common and, more tentatively, a point at which the ware ceases to be used. The number of wares found in a sequence and the amount of variation between successive groups will determine how precisely the pottery found can be dated in other, stratigraphically unconnected contexts.

The same frequency curve used to describe the date of a ware can be used to describe its marketing at that site. One can illustrate the growth and decline of production centres and even sometimes marketing policy by comparing frequency curves for the same ware at different sites. For example, where a growth in one area is marked by decline in another it cannot be explained as a variation in the output of the industry and must therefore be due to a change in the marketing of the ware.

Sequences were available for study at: Hereford (Shoesmith, 1980, 1982 and forthcoming a), Worcester, Sidbury (Carver, 1980), Droitwich (Hunt, unpublished), Gloucester (Hurst, H., 1972, 1974; Heighway et al., 1979, forthcoming), Winchcombe (Saville, forthcoming), Chepstow (Shoesmith, forthcoming b), Cheddar Palace (Rahtz, 1979), Bath, Citizen House (Greene, 1979), Trowbridge Castle (Smith, forthcoming), Newbury, Bartholomew Street (Vince, forthcoming b), Cirencester (Leech, forthcoming, and

Wilkinson, forthcoming).

The crucial sequences at Bristol and Ludgershall Castle, with the exception of one group sealed below the motte of Bristol Castle (Ponsford, 1974), were not available for study. These sites form an interconnecting framework into which isolated assemblages can be slotted (see fig.1.1), assuming that they contain wares present in one or more of the sequences. There are nevertheless areas where no stratigraphic control is possible, notably N. Herefordshire/Shropshire and East Gloucestershire.

Detailed comparisons between the sequences found at these sites can be made, although they are too few and far between to give an accurate indication of distribution patterns. Since most of the extensively excavated sites are towns and thus the centres of marketing and transport networks it is possible that they may have received pottery from further afield than sites in the surrounding countryside. For this reason, data from poorly or completely unstratified sites have been used to fill in the gaps. Obviously in these cases the dangers of misinterpretation are greater than in the well-stratified sequences.

DISTRIBUTION ANALYSIS.

To analyse the distribution of a pottery 'ware' the procedure followed was to divide the sherds in each characterised ware into two functional classes; serving vessels (eg. Jugs, Bottles and Tripod Pitchers) and cooking vessels (eg. Cooking Pots, Bowls and Dripping Pans) and to try and assign the sherds to one of the following periods:-

10th Century

11th Century

Early to mid-12th Century

Late 12th to mid-13th Century

Late 13th to mid-14th Century

Late 14th to mid-15th Century

Late 15th to mid-16th Century

Late 16th to Early 17th Century.

If the ware had a short life-span (ie. within one of the periods defined above) then it was plotted onto one map showing all of the sites of that period with collections over 100 sherds. If the ware had a long life-span (as most late medieval wares did) then it was included on more than one map, making judgements on a case-by-case basis on the likely spread of occupation on the site and the evidence of nearby stratified sites of the same date. Collections producing more than 10% of the ware would be distinguished from those with less and a line drawn encompassing all these sites and excluding all others. This contour was then re-plotted onto a master map which was used for interpretation of the pattern of production and distribution.

The information represented by those collections with less than 10% of the ware was only analysed visually. If these sites formed a regular halo around the 10% frequency contour no further action was taken. If the sites formed a very diffuse halo this was noted for comment and similarly if the sites were irregularly distributed. A more objective analysis was not permitted because of the nature of the data.

The reliability of the contouring varies from period to period depending on the number of collections known and their location. From the 13th century onwards the contours overlap to such an extent that it is unlikely that further major wares remain to be found and the number and shape of the frequency contours is probably accurate. Before this date the data are much less reliable. Virtually every new area examined produces unpredictable results and probably only a fraction of the wares used in the study region is known. The distributions of the wares that are known are probably accurate in terms of scale but not in detail.

CERAMIC BUILDING MATERIALS

For comparison with the pottery evidence, a study of the manufacture and distribution of ceramic building materials was undertaken (Chapters 3 and 9). The methods of characterisation are the same as those used for pottery but quantification methods and data collection are different. Unlike pottery, brick and tile are usually obtained from one source for one building operation and therefore recording the frequency of different types of tile and brick at a site probably reflects specific site conditions

in a way that pottery frequencies do not. To obtain comparably quantified results would require excavation on a much wider scale than has been achieved at any sites except those towns with Urban Excavation Units. The distribution of tile types is therefore best analysed by studying the presence or absence of that type at a site.

Another problem is that bricks and tiles are difficult to date by archaeological means since they tended to be re-used time and again and usually only entered the archaeological record after the destruction of the building of which they were a part. Furthermore, ceramic building materials vary much more than pottery in their regional use and are more responsive to social differences than pots (because of their higher value). Ridge tiles of clay are first found in the late 12th to early 13th centuries but only become common in late 13th century and later contexts. Flat roof tiles, both peg tiles and nibbed tiles, are found in some areas of the country during the 12th century. Apart from Newbury no sites in the region produced these tiles until the late 16th to early 17th centuries. Brick similarly was introduced to the study region in the late 16th century. Floor tiles were a very specialised product and are best treated separately from other types of building material and pottery, even though they were sometimes made in the same centres (Chapter 3).

CHAPTER TWO.

THE POTTERY INDUSTRIES

This chapter is arranged as a catalogue of each characterised ware. The entries, with the exception of early to mid-Saxon pottery are approximately ordered by their County of origin (post-1974) although many pottery sources are not precisely known. Within each county the industries are described in alphabetical order of 'common name'. Since many wares are known by several names it may be neccessary to use appendix 4, a cross-index of ware names and codes.

Pottery types are grouped together into Wares. A ware consists either of pottery of a single fabric or sometimes several fabrics which can be shown, either by petrology or by archaeological evidence, to have been produced in the same Industry.

Only characterised wares are included in this chapter. The proportion of characterised to uncharacterised pottery varies from area to area, site to site and period to period.

FORMAT

Each ware entry is of the same format, although sometimes not all of the characteristics are recorded.

COMMON NAME:

The names given to the wares are mainly the invention of the author. Few rules have been applied in assigning names: if the kiln site is known and the ware is characterised then it is given the kiln site name, for

example Ham Green ware. If the ware is not assignable to a single kiln site, but is still definable as a regionalised group then it is given the name of the region as in South Somerset Ware. If the source of the ware is not certain then the original fabric coding has been kept, for example, Gloucester TF41B. The end result is that there are numerous temporary common names given when the fieldwork was in progress. It is quite common for a single ware to be known in the archaeological literature by a number of names; for example Minety ware is known in the Bristol region as 'Selsley Common' type ware, a term coined by Rahtz after Dunning (1949) whilst in Ireland it is apparently known as the Severn Valley type (pers. comm. P. Wallace) because it was first identified there by the author. At intervals the author has fluctuated between giving a broad regional name, North Wiltshire limstone-tempered ware and a more precise name, Minety ware, the latter gradually taking over from the former as research progressed. Names, therefore can be more misleading than helpful and for this reason it is important to define terms when publishing pottery reports. Ham Green ware, for example is a term which can have a strict definition (see below) but has been used in the west of England and the western seaboard as a catch-all term for light-bodied pottery decorated with plastic ornament. The alternative to exhaustive published description is to deposit examples of the ware in a reference collection but the curating of such a collection is probably beyond the capabilities of most local museums whilst excavation units

are transitory bodies and cannot be relied upon to exist in, say, five or ten years time.

Hardness: The hardness of a fabric was defined on a three-point scale. Soft is defined as a fabric which can be scratched by the fingernail, hard is a fabric which cannot be scratched by the fingernail but which can be scratched with a steel blade and very hard as a fabric which cannot be scratched with a steel blade. Hardness depends on the texture of the clay, extremely silty clays are easily scratched because they crumble. It also depends on firing temperature, although the exact temperature at which the boundaries are reached varies from fabric to fabric. Malvern Chase clay becomes very hard, with an associated change in colour between 900 and 1000 degrees centigrade.

Colour: Ideally this should record the colour of the core, the colour of the interior and exterior margins and the colour of the interior and exterior surfaces, since all of these characteristics can be distinctive of the method of firing. The colour should also be based on the study of a large sample of sherds and should be recorded using the standard Munsell colour chart. In practice, colour was often badly recorded, because of the amount of time taken to make a full record.

Principal Inclusions: These are listed in the following order: type; frequency; size range and sorting; roundness; and description. Inclusions were identified visually using the binocular microscope and further detail was added after thin-section analysis, for example of limestones and sedimentary rock fragments which have detail too fine to

examine by eye.

Clay Matrix: This section applies mainly to thin-sectioned wares and describes the fine sand and silt sized inclusions, which are not visible by eye and whether or not the clay matrix is anisotropic. An anisotropic clay matrix is one through which polarised light can pass. Clays loose this property when they enter a glassy state on heating. The exact time/temperature needed to produce an isotropic clay varies with the chemical composition.

Thin-sections: A full list of thin-sections can be found in appendix one. The entries here therefore are merely a cross-index. Where appropiate the provenance of the sample and the type of vessel are also recorded here.

Source: All evidence for the source of a ware is included here, even if it is inconclusive. This leaves a class of information without a natural position in the thesis, evidence for pottery production for which no archaeological evidence exists. This is mainly in the form of documentary references and place-names. For convenience this information is inserted into this chapter under the appropriate county heading.

Forms: In this section all forms found in a ware are listed, with reference to the collection(s) where they are found if this is significant. Discussion of the vessel types and how those in different fabrics compare with one another can be found in Chapter Seven. For those wares made within the study region, illustrations of the forms produced are provided, if the typology of the ware has not

been fully published elsewhere.

Dating and distribution: A discussion of the evidence for dating is to be found in Chapter Six and the distribution evidence is discussed in Chapter Eleven. This section summarises the evidence for a single ware. Distribution maps showing the distribution of each class of vessel in each period are included here, together with a brief list of findspots. Full details of the assemblages in which the wares were found and if relevant their relative proportions can be found in appendix two.

Bibliography: All works which publish descriptions of the ware, or illustrate substantial examples are included here. References to the publications of sites where the ware was found but which do not describe or illustrate it will be found in Appendix two, the gazetteer of sites.

COMMON NAME: Chaff-tempered Wares.

Although undoubtedly made in several counties in the study region chaff-tempered and other early to mid-Saxon wares are best described in one section.

Hardness: Soft to hard.

Colour: Black, sometimes with patches of oxidation on the surfaces.

Principal Inclusions: All chaff-tempered pottery contains abundant chaff tempering (not examined botanically) but examples differ in the quantity of chaff, its probable identity (a neutral term, vegetable-tempered ware has been proposed), the presence of other inclusion types and in the character of the clay matrix (Russel, 1980).

There are a few vessels known in which the chaff-tempering may not be abundant. In some instances, as at Hatton Rock, Warwickshire, there is a continuum of textures between fabrics with almost pure chaff-tempering and those with sand-tempering (see Other early to mid- Saxon wares, below). The characteristics of individual groups of chaff-tempered pottery are described below.

Gloucester, Gloucestershire.

Fragments of chaff-tempered pottery from St. Oswald's Priory occur in two fabrics:

i) Abundant rounded and subangular quartz up to 0.5mm and a fine clay matrix containing a little fine white mica.

ii) Sparse quartz (as (i)) and abundant quartz and mica silt.

Frocester Court Roman Villa, Gloucestershire.

At Frocester the sherds contained few inclusions other than chaff, except for sparse rounded quartz and limestone fragments. There was no evidence for any real division in fabric amongst this collection.

The Frocester vessels contain iron ore, angular quartz and white mica up to 0. 1mm.

Wycomb, Andoversford, Gloucestershire.

Sherds from Wycomb, near Andoversford, include examples with a quartz-free micaceous fabric (Rawes, 1980).

Trowbridge Castle, Wiltshire.

Chaff-tempered pottery from Trowbridge Castle contains abundant very fine quartz sand (Smith, R. forthcoming a).

Others.

'Large' collections of chaff-tempered pottery, in excess of two or three sherds, are also known from Ogbourne, Ramsbury, Swindon, and Westbury in Wiltshire. Smaller collections are known from sites in Somerset and Gloucestershire. The fabrics of the Ramsbury and Swindon vessels have been compared but the remaining types have not been petrologically examined, except for one thin-section of Cheddar fabric A (Timby, forthcoming; Russel, 1980; Peacock, 1979).

Thin-sections: Gloucester; None (too little material available), Frocester; M700, Trowbridge; M1218.

Source: There is no evidence for any trade in these vessels but conversely, because of the absence of diagnostic inclusions there is little evidence for local production. The petrology of the Gloucester and Frocester sherds shows that they are from different sources and the appearance of the Wycombe sherds suggests that they too are from a separate source. However, these sites are over 10 miles apart. Russel concludes that one of the Ramsbury fabrics is indistinguishable from the Swindon fabric, but given a probable difference in date and the undiagnostic nature of the fabrics this cannot be used as positive proof that the two sites obtained pottery from a single source. Peacock concludes that the Cheddar ware was probably not locally produced.

Forms: (Fig.2.1)

Cooking pots. Handmade bag-shaped vessels with short, slightly everted rims and rounded or flattened bases. The

Wycombe sherds include a small lug, and a pedestal base.

Bowls. The Wycomb and Bourton-on-the-Water collections include poorly finished bowls with slightly everted rims.

Dating and Distribution: (fig.2.2) It is difficult to put a precise date on any Chaff-tempered pottery from the study region, although sherds from Barnsley Park and Wycomb could belong to the late 4th to 5th centuries since they occur in association with Romano-British pottery.

Several hypotheses can, however, be put for ward for testing:

a) The pottery is of late to sub-Roman date, that is, late 4th to late 6th century.

b) The pottery is of Saxon type and therefore post-dates the conquest of the Kingdoms of Gloucester, Cirencester and Bath in the late 6th century.

c) The pottery is of Saxon type but predates the Battle of Deorham.

d) The pottery is of mid or late Saxon date, predating the use of other late Saxon wares.

e) The pottery is of late Saxon date, used alongside other late Saxon wares.

Although it is important for the archaeology of the region to distinguish between hypotheses (a), (b) and (c), the latter two hypothese are most important for this study (see Ch.11). At Old Town, Swindon, the sequence of structures and finds suggests a date-range of 5th-6th to 8th century for chaff-tempered ware, but both ends of this range are the result of absence of dated contexts rather

than definite evidence that the ware was not in use. Evidence from Cricklade suggests that chaff-tempered ware was in use before the construction of the defenses in the late 9th century but this pottery may have been associated with a much earlier occupation, in which case the constructors of the defenses left no pottery at all. Chaff-tempered pottery in the construction levels of a 10th century Church at Trowbridge was probably residual from an earlier occupation on the site, which is undated. At Ramsbury, chaff-tempered pottery was associated with iron-working of late 8th and 9th century date, and in this instance cannot be residual since the sherds occur in an occupation deposit overlying an accumulation of hill-wash which itself is of mid-Saxon date.

These then are the latest stratigraphic occurrences of the ware in the region. Outside the region, in Warwickshire, a chaff and sand-tempered ware was in use at Hatton Rock in the Mid-Saxon period, associated with a radio-carbon date of ad 906±88. This determination is unlikely to result from a real date earlier than the 9th century. Evidence for an early date for the ware is easier to come by, and it is easy to show that chaff-tempered pottery was at one time the only ware used in Wiltshire. This does not, in itself, prove that the ware was not also used in the mid-late Saxon period and indeed the evidence increasingly points to chaff-tempering having been used as a potting technique into the 10th century.

If, however, we compare the archaeological and documentary evidence for occupation at Hereford and Gloucester in the 9th century it seems clear that no chaff-tempered pottery was in use in either settlement.

Bibliography: Dunning (1932), Ireland (forthcoming a), Fowler (1966, 1970), Rawes (1980), Russel (1980), Timby (forthcoming).

OTHER EARLY-MID SAXON WARES

Vessels of early to mid-Saxon date in fabrics which are not chaff-tempered are extremely rare. Sherds of stamped pagan Saxon jars, mainly cremation urns, from Berkshire have been examined visually and samples of cremation urns from Beckford and Burn Ground, Hampnett, and domestic vessels from Signet Fields, Kidderminster, Maiden's Bower, Solihull, and Fladbury have been thin-sectioned. In no case is it likely that a pair of samples come from the same source but two samples from Burn Ground, Hampnett, contain a sandstone and quartz sand which is petrologically identical to those found in the Maidens Bower, Hatton Rock and Signet Fields samples. The same sandstone and quartz sand was identified visually amongst a small collection of Saxon pottery from the Cirencester bypass in the possession of R. Reece. The Beckford and Fladbury samples have moderate inclusions of ill-sorted subangular and rounded quartz.

Hardness: Hard.

Colour: Black.

Principal Inclusions:

Burn Ground, Hampnett, Gloucestershire.

Medium-grained sandstone fragments, composed of quartz grains up to 0.3mm across, subangular quartz fragments and variable quantities of chaff. Thin-sections M625-8.

Signet Fields, Kidderminster, Hereford & Worcester.

Moderate quantities of angular quartz grains, some overgrown, up to 0.3mm across. Unusually for the West Midlands, there is no quartzite and no chert present. The clay matrix contains scattered angular quartz but was fine-textured. Some brown clay pellets are present. Thin-section M635.

Fladbury, Hereford & Worcester.

Rounded fragments of quartz, quartzite and chert up to 1.0mm across and subangular quartz fragments up to 0.1mm across. A fine-textured, anisotropic clay matrix containing a few brown iron or clay pellets. Thin-section M735. The rounded quartzose sand in this sample is very similar to those of other wares and clay samples from the Severn Valley.

Beckford, Hereford & Worcester.

Rounded fragments of quartz, metaquartzite, quartzite and chert up to 0.3mm across, some with a brown coating. Sparse organic inclusions and limestone fragments up to 1.0mm across. The limestone is stained brown and contains grains of quartz in a sparry calcite matrix. Angular quartz and white mica, brown clay pellets and limestone fragments are present in the clay matrix. Thin-Section M636. Probably a Lower Lias clay with added Severn Valley sand. No evidence, therefore, for a non-local source.

Source: The petrology of the Cirencester and Burn Ground

sandstone and quartz tempered sherds indicates a non-local source, probably in Warwickshire or Worcestershire, although the inclusions are not sufficiently distinctive to show that the vessels were made at the same site.

Forms: (fig.2.1)

Cremation urns.

Jars.

Dating and Distribution: (fig.2.2). The Beckford and Burn Ground urns must be of 6th or 7th century date since they are in a pagan context. Some of the Cirencester bypass sherds are stamped, which should date the collection also to the 6th or 7th century. The Fladbury vessel is probably of 8th or 9th century date and the Signet Fields and Maiden's Bower vessels are undated.

Bibliography: Grimes (1960, 113-125), Hirst & Rahtz (1973), Meaney (1964), Peacock (1967 b).

AVON WARES

COMMON NAME: Bath Fabric B/D

Hardness: Hard.

Colour: Black.

Principal Inclusions: The main inclusions are fossiliferous limestone fragments, c.0.01mm to 2.0mm. Less common are inclusions of rounded quartz, c.0.1mm to 0.7mm and scattered fragments of oolitic limestone, angular chert, up to c.0.6mm across, fine and coarse-grained sandstones, including ferruginous fragments with white mica and quartz inclusions, flint and rounded pellets of silty clay with a

high iron content.

Clay Matrix: Anisotropic.

Thin-sections: Bath; M356, M360, M363.

Source: Unknown. The petrology is very similar to that of Glos. TF41A (Gloucester Late Saxon ware) which is tempered with a Severn Valley sand derived from the Worcestershire basin and the Cotswold scarp. A similar source would not fit the distribution of the ware as it is now known.

Forms: (fig.2.3)

Cooking Pots. Handmade globular vessels with sagging bases. The rims are all everted but vary from small types in which the rims curve out from the body to larger types with a sharp neck angle. The first type varies from 100mm to 220mm diameter and the second type from 140mm to 440mm diameter.

Spouted Pitchers. Forms very similar to those of the larger cooking pots but with rectangular or rod-sectioned handles with stamped decoration.

Bowl? One sherd from Bath, Citizen House, may be from a straight-sided spouted bowl (No.255).

Dating and Distribution (fig.2.4) Found at Bath, Citizen House in the earliest medieval levels, associated with Cheddar fabric E. Therefore, likely to have a 10th century origin. Some of the forms, the larger cooking pots , the spouted pitchers and bowl should be 11th or 12th century, and the ware is common in 11th and 12th century pits at that site. By the early 13th century the ware accounted for a minute proportion of the pottery found. Also found at Saltford, Barrow Mead and (possibly) Chewton Keynsham.

Bibliography: Published description in Vince, (1979 b).

Illustrated examples in Greene (1979) and Cunliffe (1979).

COMMON NAME: Bristol Fabrics A & B

Hardness: Hard.

Colour: Dark grey or black (10YR 4/0) with oxidized dark brown to yellowish red surfaces (7.5YR 4/2 to 5YR 4/6). Refires to red (2.5YR 4/6).

Principal Inclusions: Well rounded and sorted inclusions of quartz and quartzite (some with possible mica inclusions), fine-grained limestone with angular quartz and brown amorphous inclusions, poorly sorted sandstone with some mica and a brown-stained cement and chert (subangular with brown inclusions except for one fragment of black angular chert with numerous pores filled with quartz). Single fragments of mudstone (a broken rounded grain with quartz and brown inclusions) and fine-grained sandstone with silica cement and brown veins were seen in thin-section. The distinction between fabrics A and B is one of grain size, A being coarser. There is no evidence for any difference in date, distribution or typology between the two fabrics, which are therefore treated as one ware here.

Clay Matrix: finely divided limestone, quartz and a little white mica except for one sample from Chepstow with a coarser quartz and white mica up to 0.1mm long.

Thin-sections: Bristol; M292, M293, M294, M417. Chepstow; M846-8, M850. Dublin; M367-8.

Source: A few crinoid fragments were seen, suggesting that the sand tempering was partially derived from Carboniferous rocks. The roundness of the inclusions and the variety of

rock types found suggests a river or beach sand. Similar sands (without carboniferous rock fragments) were found at Severn Beach (Thin-sections: M672, M673). The distribution evidence suggests a source close to Bristol.

Forms: (fig.2.5)

Cooking pots. All handmade, squat vessels with sagging bases. The rims show evidence for rotary finishing. There is little variety in rim forms, which are either vertical and rounded or everted stubby rounded, angular or sharply everted (rare). The Chepstow examples have rim diameters ranging from 150mm to 320mm with a mean of 230mm.

Spouted pitchers. Vessel forms similar to those of the cooking pots, stubby everted rims and taller everted rims. Grooved wavy lines on the shoulder and tubular spouts. Handle form unknown

Lamps. Single shell types with a flat pedestal base.

Dating and Distribution: (fig.2.6) Found below the Castle Mound at Bristol associated with 3 phases of timber buildings. Therefore probably mid-late 11th century. Earlier evidence in Bristol is elusive, in keeping with the historical evidence for the main growth of Bristol in the early 11th century. Found in early-mid-11th century contexts at Dublin and in post-conquest contexts in Chepstow. Although unseen by the author, it it likely from the published description that some of the pottery from Castle Tower, Penmaen, is of this fabric or Bristol A/B (Talbot, 1966). Possibly in use throughout 12th century at Chepstow but in reduced quantities. The spouted pitchers

have been found at Bristol and Dublin and the lamps only at Bristol.

Bibliography: Ponsford (1974) illustrates the Bristol Castle material.

COMMON NAME: Bristol Fabric C

Hardness: Soft to hard.

Colour: Dark grey (7.5YR 4/0) with oxidized light yellowish brown surfaces (10YR 6/4). Refires red (2.5YR 4/6)

Principal Inclusions: Angular fragments of limestone and sandstone. The limestone fragments contain both crystalline and brown-stained, fine-grained calcite. Several fragments are brown-stained around the edges and in veins. One fragment contains pellets of calcite in a brown-stained, fine-grained matrix and another contains muddy limestone intergrown with silica and cut by a quartz vein (?). Red iron-replaced crinoid fragments were visible in some samples under the binocular microscope.

Rounded quartz up to c.0.5mm was present together with clay pellets with the same texture as the clay matrix up to c.0.6mm across.

The sandstone contains interlocking grains of quartz, mica and amorphous brown material. A few voids are present in the sandstone fragments, surrounded by brown staining.

A distinct variant of this fabric contains little or no limestone and a higher proportion of rounded quartz. Firing and typology are identical with the limestone-tempered ware.

Clay Matrix: A high quantity of white mica and some angular

quartz up to c.0.1mm

Thin-sections: Chepstow; M842-4, M853. Bristol; M298, M419, M420. Dublin; M370, M375.

Source: The limestone is matched closely by Carboniferous limestone, which however outcrops to the west of Bristol, around Chepstow as well as further afield in the Forest of Dean and the Mendip Hills. A source around Bristol is most likely. The petrology suggests that the clay and tempering might be derived from the weathering of carboniferous limestone with little transportation of the material by water.

Forms: (fig.2.7).

Cooking Pots. All handmade, squat vessels with sagging bases. There is little variety in rim forms, which are either everted with external thickening (rarely having a triangular section), everted with thickening inside and out or vertical. Most of the vertical rims have an internal groove and external thickening. In some cases this becomes a distinct bead which is sometimes thumbed.

Spouted pitchers. The same form as the cooking pots with 'wheel' or 'grid' stamps on the shoulder, sometimes combined with incised wavy, zig-zag or cross-hatched lines. Free-standing tubular spouts on the shoulder of the vessel, rod-handles, sometimes stamped.

Socketed bowl. One example from Bristol, stamped on the top of the socket with a 'grid' stamp.

Lamps. Examples from Bristol, rims only (so unclassifiable).

Lid? One vessel with a 'wheel' stamp from Gloucester.

Dating and Distribution (fig.2.8) Found at Bristol, Chepstow, Dublin and rarely at Gloucester and Bath (the latter two sites not examined in thin-section). Cooking pots were found at all sites but spouted pitchers only at Chepstow (one vessel) and Bristol. The only stratigraphic information available to the author is from Chepstow, where the cooking pots had a similar occurrence to Bristol A and B vessels, ie. late 11th century and 12th century but probably residual by the early 13th century. A similar fabric is present at Cheddar (fabric C) but given the lack of Bristol A/B vessels at Cheddar it is likely that Cheddar C ware is tempered with Mendip limestone and Bristol C ware with Clifton limestone.

Bibliography: Vince (forthcoming h) describes the petrology of the ware, as does Vince (forthcoming e). Both reports include illustrations of the cooking pots, whilst the spouted pitchers and bowl are illustrated by Watts (forthcoming b). The lid? is illustrated in Vince (forthcoming f).

COMMON NAME: Bristol Redcliffe ware

Hardness: Hard.

Colour: Either completely oxidized pale yellow (2.5YR 8/4) or oxidized pink (7.5YR 7 to 8/4) with a light grey core (7.5YR 7/0). Refires yellow (10YR 8/6) to reddish yellow (5YR 7/6 to 7.5YR 7/6).

Principal Inclusions: The quantity of inclusions varies considerably from vessel to vessel but the following inclusion types can usually be seen if enough of the broken

sherd edges are examined. Rounded quartz and quartzite, mainly less than c.0.3mm but up to 1.2mm, rounded light-coloured clay pellets up to 1.0mm, rarer sandstone with a dark brown matrix, silicious sandstone (quartzite with brown inclusions), fragments of fine-grained sandstone with a silica matrix (grains up to c.0.2mm) up to 0.7mm. Small iron ore fragments c.0.2mm across were found, surrounded by a halo of brown staining.

Rounded, decomposed limestone up to c.0.3mm and possible fragments of wood (present only in reduced areas of the fabric) are much rarer.

Two roof tile wasters from Bristol Redcliffe were examined in thin-section. One has a temper similar to that of the hollow wares but much more abundant and with more limestone (T-S154) whilst the other contained numerous large clay pellets and sandstone fragments. Some of these inclusions were very coarse, the sandstones sometimes reaching 3.0mm across and the clay pellets 10.0mm. Little rounded quartz or quartzite is present and the clay matrix contains abundant angular quartz up to 0.04mm across. This variant is not found at comsumer sites.

Clay Matrix: Remarkably pure, contains a few white mica fragments and sparse fine angular quartz.

Thin-sections: Bristol Redcliffe wasters; M153, M155, M156, M159, Chepstow: M162, M827-9. Caerleon; M207. Grosmont; M215, M256. White Castle; M240. Llantwit Major; M250. Laugharne (Dyfed); M268. Hereford; M570.

Roof tiles. Bristol Redcliffe wasters; 152, 154. Woodspring

Priory; 160. Cardiff; 254. Chepstow; 758-760.

Source: Bristol/Redcliffe ware is a typical coal-measure light-firing fabric and shares many characteristics with post-medieval Staffordshire light-firing wares and other medieval light-firing wares, eg. fine angular quartz in a relatively clean matrix, light-coloured clay pellets, quartz, quartzite and sandstone inclusions and some iron ore or iron staining. All of the sectioned samples had these characteristics, but so do samples of wares which on typological or distribution evidence could not be Bristol Products. Thus, Ham Green ware is reliably characterised but Bristol ware is not.

Both Ham Green and Bristol/Redcliffe wares utilise a coal-measure clay. Neither site is situated on the coal-measures, although outcrops are not far away, to the north and north-east of Bristol, the clay must therefore have been transported to the kiln sites.

Forms: (fig.2.9)

Jugs. All wheelthrown vessels varying in size, shape and decoration. Most are large jugs similar to Ham Green B jugs, either with flat rims with a cordon or moulding just below the rim or plain flat topped rims (measured diameters between 100mm and 140mm). Distinctive types have applied heads around the rim or an applied thumbed strip. Both sagging, frilled bases and plain flat bases are found with diameters between 140mm and 160mm. All examples have strap handles, which are either plain or decorated with knife slashes. A distinctive type found at Bristol St. Peters has diagonal slashing between two vertical slashed lines.

Bridge spouts and pulled spouts are found. A distinctive type of bridge spout is moulded into a face shape and decorated with applied red-firing and plain clay. Decoration varies considerably. Some vessels are plain but applied clay strips, of plain or red-firing clay are common. These can form curvilinear patterns, often horse-shoes, or ocassionally figurative scenes. The face-jugs are sometimes made more anthropomorphic by the addition of hands and elements of dress. Turned grooves are found, usually not combined with applied decoration (unlike Ham Green ware). Square-toothed roller-stamping is found but is rare. Clear external lead glaze is the norm but copper-flecked glazes are found as are internally glazed jugs.

Cooking pots. Wheelthrown globular vessels with flat-topped rims, sagging bases and a patchy internal glaze are found but are not common.

Bottles. Small internally glazed, flat based vessels.

Bowls? Some sherds from Chepstow were thought to be from a bowl with curving walls and an internal glaze.

Aquamaniles. A vessel from Bristol in the form of a knight on horseback.

Inkwell. A possible inkwell from St. Peters, Bristol is part of a double vessel, decorated with stabbing and incised lines.

Dating and Distribution: (fig.2.10) Bristol ware occurs in mid-late 13th century contexts and later at Bristol,Chepstow and Gloucester. The industry survived into the 15th century but by the 16th century was extinct (since Bristol was supplied solely by Malvern Chase). A sequence

of jug forms has been obtained by M. Ponsford which enables two groups to be distinguished : 'early' and 'late' Bristol jugs. The early jugs (late 13th to early 14th century) are often highly decorated, have thumbed bases and have a cordon or moulding below the rim. Bridge spouts, including the face-spouts, are early. Late jugs (later 14th to 15th century) are often plain with flat topped rims, sometimes with applied thumbed strips below the rim and have flat bases. At Chepstow and Gloucester both early and late jugs are found and there is unlikely to be any major change in distribution between the two periods.

Bibliography: Dawson et al. (1972) describe a collection of wasters from the foundations of St. Peters church, Bristol. It is now thought that these were imported to the site as make-up and could come from the Redcliffe potteries. They date from the later 14th century. The Redcliffe site itself is not yet published. Bristol vessels published by Barton (1959) and the face jugs are published by Ponsford (1979).

COMMON NAME: Chew Valley Lake sandstone-tempered ware

N.B. Not fully described.

Hardness: Soft to hard.

Colour: -

Principal Inclusions: Large fragments of white sandstone

Clay Matrix: -

Thin-sections: -

Source: Unknown, but somewhere in South Avon on distribution evidence.

Forms: (fig.2.11)

Cooking Pots. Handmade, squat vessels with curving walls, sagging bases and everted rims.

Tripod Pitchers. Glazed, handmade vessels.

Dating and Distribution: (fig.2.12) Dated by Rahtz to the 11th to 12th centuries. An eleventh century date would be unusual for the tripod pitchers and indeed in the absence of relative stratigraphy on the Chew Valley Lake sites this ware could be of late 12th to 13th century date, contemporary with the Ham Green and Minety wares found. A compromise 12th century date is most likely.

Bibliography: Rahtz and Greenfield (1977) illustrate the vessels but do not define them as a ware, nor give useful fabric descriptions.

COMMON NAME: Cistercian ware (including Falfield ware).

Hardness: Hard to very hard.

Colour: Oxidized dusky red (2.5YR 3/2) to dark grayish brown (10YR 4/2). Glaze mottled dusky red to reddish black (10R 3/2 to 10r 2/1).

Principal Inclusions: Moderate to sparse inclusions of rounded quartz and quartzite up to 1.0mm and rounded iron ore up to 0.4mm.

Clay Matrix: Sparse specks of angular quartz up to c.0.06mm.

Thin-sections: Chepstow; M957. Gloucester; M317-322a. Hereford; M605-6. Newbury; M1157. Worcester; M698, M737-740.

Source: The quartz and quartzite sand is similar to that found in the Severn Valley terrace sands and in pottery

tempered with this sand (for example Worcester-type ware, Glos. TF43 and Droitwich and Canynges-type floor tiles). The ulitmate origin of this sand is the Triassic of the West Midlands. The texture of the clay matrix is more similar to lias clay than to Keuper marl or alluvial clay samples from the Severn Valley. Thin-sections of samples from Worcester, Hereford, Gloucester and Chepstow share the same characteristics and could all be from the same source. Waste from a kiln producing this type of ware has been found at Falfield, Avon and it is suggested by Bennett that the kilns may have been at Tortworth. However, the Falfield ware has not yet been examined petrologically.

Forms: (fig.2.13)

Cups. Two or three handled cups are the only products known in this fabric. Three distinct forms are recognised:

a) a globular body and tall flaring rim.

b) a globular body with a short vertical neck and rim.

c) a ribbed cylindrical body with a cordon below the rim.

All forms have a thick glaze inside and out, sometimes omiting the base, which is invariably of foot-ring type and wire-drawn. Some vessels, of the globular forms, have white clay pads around the girth.

Dating and Distribution: (fig.2.14) Found first in the early 16th century. The Falfield waste is dated by Bennett to the mid-16th century by comparison with Bristol. At Chepstow one vessel was found in a pre-dissolution context

(site XI phase 4) and at Gloucester examples were found in the construction levels of the Horsepool at the Eastgate, dated by documents to pre-1540. At Hereford this ware is most common in the late 16th century and may be replaced by Herefordshire cups in the 17th century. At Gloucester however the ware is certainly present in a group of the 1st quarter of the 17th century and is regularly associated with early to mid-17th century clay pipes.

Bibliography: The Falfield kiln waste is published by Bennett (Fowler and Bennett,1974, 123). Examples from Hereford and Gloucester are to be published in Vince (forthcoming a and f). The Worcester vessels are published by Morris (1980) together with a petrological report by the author (Vince, 1978b).

COMMON NAME: Ham Green wares

Three wares are included under this heading; 'proto-Ham Green ware', Ham Green cooking pot ware and Ham Green ware (jugs).

'Proto-Ham Green ware'

Hardness: Hard.

Colour: Black to grey (5YR 2/1 to 10YR 4/1) sometimes with an oxidized yellowish red skin (5YR 4/6). Refires dark red (2.5YR 3/6).

Principal Inclusions: Abundant medium to coarse sand, mainly up to 0.7mm across but with sandstone fragments up to 1.0mm across. Subangular and a little rounded quartz, often cloudy with brown veins, some plagioclase felspar, fragments of coarse-grained sandstone with overgrown quartz

or quartzite grains (up to 0.7mm across), brown chert, often varying in colour within one fragment and crossed with quartz veins. Silicious sandstone with brown inclusions, opaque iron ore (smaller than the other inclusions, up to 0.3mm), and dark brown inclusionless clay pellets.

Clay Matrix: Porous, with sparse angular quartz.

Thin-sections: Chepstow; M838-841, M877-8.

Source: Unknown. In appearance and typology there is a strong similarity to Ham Green cooking pot ware but the fabric differs in three ways. Firstly, in grain-size and sorting (Ham Green vessels are better sorted and have a finer sand), secondly the grains are more angular and thirdly there is less limestone. Ponsford has suggested a source at Long Ashton on the basis of possible wasters found there. Petrology suggests that the tempering may be derived from a medium to coarse sandstone.

Forms: (fig.2.15)

Cooking pots. Handmade, squat vessels with sagging bases, curving walls and everted or vertical rims, often with an external thickening. Some vessels have thumbing along the top of the rim. Horizontal or wavy combing is sometimes found on the shoulders and the exterior of the rim. Rim diameters at Chepstow vary from 120mm to 290mm with a mean of 230mm.

Spouted pitcher. One tubular spout was found at Chepstow, probably from a spouted pitcher but possibly from a socketed bowl.

Bowls. Two sherds from Chepstow may come from shallow

bowls. Both have wavy combing on the exterior and one has stabbed combing on the top of the rim.

Dating and Distribution: (fig.2.16) Found at Chepstow in 12th century contexts and the most common ware there at that time (between 45% and 83% of all sherds) but may have been superceded by Chepstow fabric HA in the early 13th century, although still found in contexts of that date. Found at Bristol. Similar vessels found all along the south Welsh coast but have not been petrologically examined, for example Ware A at Castle Tower, Penmaen (Talbot, 1966).

Bibliography: Talbot (1966), Vince (forthcoming e) describes the ware at Chepstow.

Ham Green Cooking Pot ware.

Hardness: Hard.

Colour: Oxidized yellowish red (5YR 4/6) sometimes with a dark grey core (5YR 4/1). Refires dark red (2.5YR 3/6).

Principal Inclusions: Abundant inclusions of subangular and rounded quartz and sparse sandstone fragments (poorly sorted grains of quartz in a brown-stained silica cement), chert (some brown-stained), fine-grained micaceous sandstone (with a silica cement) and limestone. The sand is well sorted and rarely larger than 0.3mm across, except for the rare sandstone fragments up to 0.5mm.

Clay Matrix: Sparse angular quartz and white mica up to 0.1mm. A curious feature of this fabric is the presence of lenses of vitrified clay, always reduced light grey, highly vesicular and optically isotropic. Each lens contains a

void at its centre, probably where some inclusion which has acted as a fluxing agent existed.

Thin-sections: Chepstow; M836-7, M845, M875-6.

Source: The Ham Green kiln site. Many vessels from settlement sites have a thin glaze, but this is probably an ash glaze rather than accidental lead glaze. A comparison with the jug fabric shows that different clay bodies were used but the same sand tempering.

Forms: (fig.2.15)

Cooking pots. Handmade, squat vessels with curving walls, sagging bases and everted or rolled out rims. Horizontal or wavy coming is often found on the shoulder or exterior of the rim and vertical thumbed strips are found on the body. Rim diameters at Chepstow vary from 180mm to 250mm with a mean of 220mm.

Dating and Distribution: (fig.2.16) At Chepstow Ham Green cooking pots do not occur until the arrival of the glazed wares. In the earliest contexts they are as common as the jugs (1% and 4%) but in later contexts are outnumbered (5% against 15%, 1% against 16%, and 1% against 6%). This may be a reflection of output or possibly a reflection of the marketing strategy. The overall distribution of Ham Green cooking pots is much more restricted than that of the jugs. In any quantity the vessels are limited to the Bristol Avon valley as far inland as Keynsham and sites along the South Welsh coast, such as Chepstow.

Bibliography: Barton (1963) illustrates the range of vessels found on the Ham Green kiln site, including some

decorated with roller-stamping, and therefore contemporary with the type A jugs.

Ham Green ware

Hardness: Hard.

Colour: Reduced light grey (7.5YR 5/0 to 7/0) usually with an oxidized light yellowish brown , very pale brown or sometimes pink interior surface (10YR 6/4 to 7/4 & 7.5YR 7/4). Refires pink to reddish yellow (7.4YR 7/4 to 5YR 6/6 to 6/8). One sample has a thin light grey slip on the interior which refires red (2.5YR 5/6).

Principal Inclusions: Varying proportions of a well-sorted, predominantly quartz and limestone sand and angular to rounded clay pellets. This is presumably the basis of a division into A and B fabrics by Barton (1963,96-7), A fabrics having high proportions of clay pellets and limestone and B fabrics having high proportions of quartz. In practice there appear to be more indeterminate sherds than ones which fit into these two groups. Few of the sand inclusions are larger than 0.3mm but the clay pellets are often several millimetres across. Subangular and rounded quartz, angular to rounded clay pellets (the same colour as the clay matrix but sometimes denser and almost opaque in thin-section, some may be indurated), rounded limestone (often decomposed), rare rounded iron ore and colourless chert (or possibly flint or silicious sandstone).

Clay Matrix: very sparse angular quartz and white mica up to 0.1mm across.

Thin-sections: Aberystwyth; M277-8. Barry Island; M236. Box; M77. Caerleon; M206. Chepstow; M162, M830-2, M834,

M893. Dublin; M371, M374. Gloucester; M78-80, M82-3, M174, M329. Hereford; M569. Kidwelly; M274. Rumney Castle; M1132. St. Justinians; M203.

Source: Ham Green, near Pill. Comparison with the cooking pot fabric shows that the quartz and limestone sand is common to both but that the light-coloured clay and clay pellets are found only in the jug fabric. A similar clay is used for the Bristol jugs and is probably a coal-measure clay from the north or north-east of Bristol.

Forms: (fig.2.17)

Tripod Pitcher. Four sherds of possible tripod pitcher were found at Chepstow (site XI, phase 2) ; one is part of a cylindrical necked vessel with a flat topped rim 150mm diameter and decorated with roller-stamping. Two further sherds come from a wide sagging base with a patchy external glaze. Other sherds of the same type are ocassionally found, for example a combed vessel from Lydney with a rod-handle, a rod handle from Gloucester and a tripod foot from Bristol. These are however extremely rare.

Type 'A' Jugs. The majority of vessels fit into Bartons scheme of 'A' and 'B' styles. 'A' style jugs usually have wide sagging bases without a thumbed frill and wide, rolled out rims. The necks are often rilled and the vessel can be decorated with combing or diamond roller-stamping. Handles are rectangular and sometimes stabbed with a circular tool.

Type 'B' Jugs. 'B' style jugs are taller and have narrower bases, decorated with a thumbed frill. This is sometimes an added feature. The rims are flat topped with a moulding

below the rim. Bridge spouts are the norm and rectangular handles, either stabbed or slashed. The vessels are usually decorated, firstly with rotary applied combing or grooving, which can be combined with vertical combed or grooved lines. Over this in some cases applied decoration is found. This is usually figurative and is best represented by a complete jug from St. Peters, Bristol which is decorated with a hunting scene of a man with bow and arrow, a deer and a dog. An almost identical deer was found at the kiln site.

Dating and Distribution: (fig.2.18) At Chepstow the four sherds of possible tripod pitcher described above were found in the construction levels of the priory buildings on site XI and formed 1% of the assemblage. 'A' style jugs were found alone in the earliest occupation levels (phase 3a) and formed 4% of the pottery found and subsequent occupation in the Priory buildings contained both A and B style vessels, as did the construction debris at site 1 (the Priory Barn) and later 13th century pits at site 2 (15%, 16%, and 6% respectively). This is the only stratigraphic evidence available to the author of a chronological sequence of styles in Ham Green ware. At Gloucester, Ham Green A and B jugs are contemporary. There is also no evidence that the highly decorated jugs are later than the simpler, combed and grooved jugs, although such a sequence is likely. The dating of Ham Green ware is difficult but in chapter 6 it is suggested that the tripod pitcher phase is late 12th century, the A style only phase is late 12th to early 13th century and the A and B style

phase is mid-to-late 13th century. Ponsford claims that Ham Green ware is no longer found in Bristol by c.1300 but that the kiln site may have still been distributing wares coastally after that. The distribution of Ham Green jugs is extensive but in quantitative terms the ware is unimportant outside of the Severn Valley, the Bristol Avon valley, the Wye valley as far north as Monmouth and the South Welsh coast and South-East Ireland. All of these areas are directly accessible by boat. Outlying finds spots can however be well inland, for example Avebury and Highworth in east and north-east Wiltshire respectively.

Bibliography: Barton (1963 and 1967a) describes the discovery of the kiln site and gives a very thorough description of the vessels found there.

COMMON NAME: Hillesley-type ware.

Not fully described.

Hardness: hard.

Colour: -

Principal Inclusions: Includes coarse quartz and limestone fragments.

Clay Matrix: -

Thin-sections: Not sectioned.

Source: Unknown, but must be in North Avon on distribution evidence.

Forms: (Not illustrated)

Cooking Pots. Squat, hand made vessels with sagging bases and vertical or everted rims, wich have a slight groove on the inside.

Dating and Distribution: (Distribution not plotted) Found at Hillesley, a Manor House complex, possibly fortified in the 11th or 12th centuries. The ware is not stratified (?) and is dated to the 11th or 12th centuries by typological comparison with Bristol A/B, and C wares (B. Williams, pers. comm.).

Bibliography: Ponsford and Williams (forthcoming).

COMMON NAME: Wanstrow ware.

Hardness: Soft to hard.

Colour: Oxidized with a light grey core.

Principal Inclusions: Sparse red iron ore or clay pellets and limestone fragments up to 1.0mm across. The limestone is heat-altered.

Clay Matrix: Abundant fine angular quartz and some microcline and plagioclase felspar and rare white mica up to 0.1mm across.

Thin-sections: Kiln waste; M1072-83.

Source: Wanstrow, Near Frome.

Forms: Both slipwares and kitchen wares (bowls and jars) were found in fieldwork at the kiln site but the only definite wasters seen were of kitchen ware. It is from these that the thin-section samples were taken.

Dating and Distribution: probably 16th and 17th centuries. The distribution is unknown since the ware is visually identical in fabric to South Somerset wares. Thus 'South Somerset ware' found in the Bristol Avon valley, for example at Bath and Newton St. Loe might be Wanstrow ware, carried overland from the kiln site, South Somerset ware

carried by ship to Bristol and redistributed from there or South Somerset ware carried overland from the kiln site up the Fosse way.

Bibliography: -

GLOUCESTERSHIRE WARES.

Coaley, Potgastons Field (N.G.R. SO/75750355).

A field name on the Tithe Map of Coaley suggests pottery manufacture but there is no archaeological evidence (Fowler and Bennett 1973, 30).

COMMON NAME: Forest of Dean Sandstone-tempered ware

Hardness: Hard.

Colour: Reduced dark grey or black with oxidized dark brown surfaces (7.5YR 4/2)

Principal Inclusions: Coarse fragments of subangular and rounded quartz and quartzite, fragments of red and white medium-grained sandstones and rounded red and black iron ore, all up to 2.0mm across. Limestone fragments of the same size may be present but are rare.

Clay Matrix: Laminated and fine textured, little or no angular quartz or mica.

Thin-sections: Chepstow; M811-4, M838(?), M858, M872(?). Gloucester; M981. Grosmont; M214. Wallingstones; M9.

Source: The Forest of Dean. Exact source or sources unknown. The temper used is almost all derived from sandstones. Sandstone hills which might yield deposits of subangular sandstone and quartz sand are present both in the Forest of Dean and to the west of the Wye at Wentwood.

Forms: (fig.2.19)

Cooking Pots. Handmade cylindrical squat cooking pots often with a rolled-out and inturned rim.

Bowls. One definite example, from Gloucester, has a similar profile to the cooking pots but is much wider and internally glazed. (published in error as Malvern Chase ware, Vince 1977 a).

Jugs. Handmade vessels with a patchy glaze, found only at Awre.

Dating and Distribution: (fig.2.20) This ware is absent from the earliest levels at Chepstow (site XI phase 1), which must imply, at the earliest, an early to mid-12th century starting date and it is certainly not found at Gloucester in late 11th century contexts.

It is first found on 12th century sites in the Forest of Dean, such as Chepstow, Lydney Castle, Bledisloe Tump (Awre), Little Dean Camp and St. Briavel's Castle. Similar wares, but probably not from the same source, are found in the middle Wye valley (Monmouth, Tretire, Wallingstones).

It is uncertain how many production sites are involved in the manufacture of this ware. At Chepstow, even though only a fraction of the 12th to 13th century pottery was of this type, four quite distinct groups of cooking pots could be identified.

The glazed jugs at Awre occur in a general occupation spread overlying the beacon and cannot be dated by their context. A late 12th to early 13th century date would be appropriate.

Bibliography: Casey (1931), Talbot (1966), Scott-Garrett (1958), Vince (forthcoming e).

COMMON NAME: Gloucester TF41A, Late Saxon Ware

Hardness: Hard.

Colour: Usually black or grey (7.5YR 3 to 4/0 or 2) but sometimes light brown surfaces (7.5YR 6/4).

Principal Inclusions: Abundant ill-sorted fragments of limestone and iron ore, mainly rounded and up to 1.0mm across but sometimes up to 4.0mm across. The limestone is mainly composed of fragments of brown-stained fossils in a fine crystalline calcite matrix but calcite and sparry oolite also occur. Rounded quartz grains, c.0.1mm to 0.5mm, brown micaceous mudstone up to 2.0mm, White sandstone and dark angular chert fragments are found but are much rarer.

Clay Matrix: slightly micaceous.

Thin-sections: Gloucester; M31, M376-380, M388, M438-443, M448, M454-5, M748-9. Hereford; M127, M131, M397, M502-8. Worcester; M694-5.

Source: Gloucester. A pit containing waster vessels was found at 1 Westgate Street. If the potting took place close by then clay would probably have had to be imported to the site, since none of the excavated late Saxon features in that area were cut into natural clay.

Forms: (fig.2.21)

Cooking pots. Three quite distinct types of cooking pot were produced. The first is a bag-shaped, handmade vessel with uneven walls, probably produced from a single lump of clay. The rim is added and gives a very thick neck. The

rims in this type are everted and sometimes flat topped.

The second type is wheelthrown and is globular with a dished-out base. The rims are everted sharply and sometimes have a vertical neck.

The third type is similar to the second but has a lid-seated rim.

Other types are found but are not common, for example straight-sided club-rimmed cooking pots were found at 1 Westgate Street, Gloucester.

Crucibles. Glass-making crucibles were found at 1 Westgate Street, Gloucester.

Dating and Distribution: (fig.2.22) Found in the earliest pottery-producing levels at Hereford, which are either late ninth or early 10th century. In 10th century levels at Hereford the ware forms c.10% of all pottery, rising in the 11th century to c.23%. There is then a gap in the Hereford sequence and by the late 11th century there was no Gloucester Late Saxon ware in use.

At Gloucester the ware forms up to 100% of the pottery used in the 10th century and is replaced during the early 11th century. 'Transitional' vessels in this fabric but in squat cooking pot forms are tentatively recognised at Gloucester and dated to the early-mid 11th century.

The only other findspots of this ware are Worcester, Frampton-on-Severn and Winchcombe. At Frampton it was the only type present (but in a small group) while at Worcester and Winchcombe the ware was a small proportion of the contemporary pottery.

Bibliography: Vince (1978 a, 1979a, and forthcoming a, d & f), Morris (1978, 1980).

COMMON NAME: Gloucester TF41B

Hardness: Hard.

Colour: Light grey core (7.5YR 4,5 or 6/0) with oxidized yellowish red to brown surfaces (5YR 5/6 to 7.5YR 5 to 6/2 to4, 10YR 5/4) Spouted pitchers are noticably higher fired than the cooking pots but still have a reduced core.

Principal Inclusions: Rounded inclusions of oolitic limestone with a fine-grained calcite cement, some sparry calcite and shell fragments, some tabular red iron ore. A coarse, well-sorted sand up to 4.0mm across.

Clay Matrix: sparce fine angular quartz, some rounded quartz, up to 0.2mm and possibly the cores of ooliths, brown iron ore, white mica and limestone. The matrix is variagated in colour and texture.

Thin-sections: Dublin; M369. Chepstow; M881-2. Droitwich; M689. Gloucester; M179, M389. Hereford; M132, M509-515.

Source: Probably Haresfield. The characteristics of the clay matrix are closely matched by samples of Upper Lias clay from Haresfield and there is a reference in the Domesday Book to potters there.

Forms: (fig.2.23)

Cooking pots. Handmade, squat vessels. mainly with curving walls and everted or club rims. Several rim forms are found:

i) tall everted rims,

ii) stubby everted rims,

iii) flat topped everted rims,

iv) infolded everted rims and

v) variations on the club rim, some of which have a groove running along the top. Sometimes the tip of the club rim is higher than the neck and sometimes lower.

Spouted Pitchers. Body forms as cooking pots but with a rectangular handle and tubular spout. Unlike the Bristol area vessels stamping and other decoration, although sometimes present, is rare. The most common stamps are 'wheel' patterns.

Socketed Bowl. One vessel from Gloucester is a straight-sided socketed bowl.

'West country vessels' with a stubby everted rim. Only one example known.

Tripod Pitchers. Covered with a thin lead glaze. Only three examples known.

Dating and Distribution: (fig.2.24) It is thought that this ware first occurs in the early to mid-11th century, although evidence is sparce before the Norman Conquest outside of Gloucester. Even there, the only demonstrably pre-conquest examples are from the Berkeley Street site (a group of pottery from contexts cut by a pit containing a coin of William I) and St. Oswalds Priory (pottery stratified in a sequence of floors, the latest of which is cut by the foundations of a Norman arcade dated c.1120). These early contexts contain stubby everted rimmed cooking pots. Late 11th century contexts are more common and contain both cooking pots and spouted pitchers. One of the tripod pitchers was stratified in a late 11th century

context. A variety of rims forms is found by this time, including club rims. 12th century contexts contain a very similar range of forms with the addition of inturned everted rim and flat topped everted rim types. The 'west country vessel' is also from a 12th century context. Spouted pitchers are probably not used by the late 12th century and are definitely absent from early 13th century contexts.

Except in rare circumstances, it is not possible to give a close date to unstratified examples of this ware. It is also not possible to distinguish it from other limestone-tempered wares if, as on many Cotswold sites, the inclusions are leached out. Thus the evidence for distribution to the east may be understated and the evidence for the dating of this distribution has to be taken solely from stratified contexts. In the early-mid 11th century only two definite findspots are known; Gloucester and Dublin (Christchurch Place). By the late 11th century the ware is found at Gloucester , Chepstow, Hereford, and Droitwich and by the 12th century is found at Gloucester, Chepstow, Hereford, Pershore and Worcester. In the late 12th century, the ware is found only at Hereford and Gloucester and is probably absent from early 13th century contexts at Hereford. The exact end of the industry is not known but it is unlikely to be far into the 13th century.

However, the everted, inturned rim cooking pots and internally glazed cooking pots, although rare, occur only in contexts containing Worcester-type jugs or other pottery of c.1220 or later.

Bibliography: Vince (1978a, 1979a and forthcoming a, d, e & f).

COMMON NAME: Gloucester TF43

Hardness: Hard.

Colour: Black, sometimes with an oxidized dark brown outer surface (5YR 3/4).

Principal Inclusions: Abundant inclusions of rounded clear and milky quartz sand, well sorted (av. c.0.5mm across) and moderate inclusions of rounded limestone (including fine-grained , muddy, oolitic and fossiliferous types) up to 2.0mm across and rounded and angular iron ore fragments up to 1.0mm across. Two thin-sections revealed fayalite slag inclusions. Both were of atypical and possibly Late Saxon vessels.

Clay Matrix: Small specks of limestone, angular quartz and rounded iron ore specks.

Thin-sections: Gloucester; M190-2, M392, M978.

Source: Gloucester. The fabric of the kiln wall fragments from 1 Westgate Street was identical to this ware and similar inclusions were seen in a sample of sand from Kingsholm, Gloucester.

Forms: (fig.2.25)

Cooking Pots. Handmade, cylindrical squat vessels with everted infolded and/or outfolded rims.

Two other cooking pot types are represented by single examples; a small globular handmade pot with everted, flat topped rim and a globular wheelthrown vessel with an everted rim with a distinct ledge inside at the neck. The exterior of the pot is covered by close-set rilling.

'west country vessel' one example found (base only)

Dating and Distribution: (fig.2.26) Found exclusively at Gloucester. The earliest examples are the globular handmade vessel, which comes from St. Oswalds Priory in what should be a primary, 10th century context (the backfill of the bell-casting pit) and a similar rim sherd from the late 11th century robbing of the Roman East Gate. The Wheelthrown vessel, although definitely of local manufacture, is very similar to late Saxon wheelthrown cooking pots at Cheddar and Portchester. A similar 10th to 11th century date is therefore suggested, although the Gloucester vessel was not stratified.

The cylindrical form is found only in 12th century contexts but is not common.

Bibliography: Vince (1978 a and forthcoming f).

COMMON NAME: Gloucester TF46, Bronze-casting mould.

Hardness: Soft.

Colour: Variable from black to reddish yellow (5YR 6/6)

Principal Inclusions: Sparse limestone (including oolite) and brown iron ore or clay pellets up to 1. 0mm. Abundant voids from finely-divided organic temper (dung?)

Clay Matrix: Abundant fine angular quartz and white mica up

to 0.1mm.

Thin-sections: Not sectioned.

Source: Gloucester. Probably the same 'pink alluvial clay' used in the manufacture of brick and tile (TF88). Gloucester had a thriving Bell Foundry from the 14th century to the 18th century and mid 13th century references to potters in Archdeacon Lane and Neweland may refer to bronze founders rather than ceramic potters. (Stevenson, 1893, 159 no. 336 and 171 no. 372).

Forms: Moulds. Cope and core mould fragments are found but it is rarely possible to determine the type of object produced. At St. Oswalds Priory a bell mould was found whilst at Northgate Street (74/68) cauldrons were almost certainly the product.

Dating and Distribution: The St. Oswalds bell-mould is dated to the 10th century by lettering. The Northgate Street pit group is dated to the 13th century (?) and isolated fragments are sometimes found in later medieval and post-medieval contexts in Gloucester. Mould fragments from Hereford were in a different fabric.

Bibliography: Vince (forthcoming f) and Heighway (1978).

COMMON NAME: Gloucester TF79.

Hardness: Hard to very hard.

Colour: Oxidized very pale brown to reddish yellow (10YR 7/3 to 7. 5YR6/6).

Principal Inclusions: Sparse inclusions of subangular to rounded clear and milky quartz up to 0.5mm. (rarely up to 1. 0mm). Rare inclusions of red clay or iron ore (1mm),

red sandstone (rounded quartz grains c. 0.1mm cemented by haematite) and larger angular limestone (heat-altered, up to 4mm).

Clay Matrix: White mica and sparse quartz and red clay pellets up to c. 0.06mm.

Thin-sections: Gloucester; M176, M197, M963.

Source: Unknown.

Forms: (fig.2.27)

Jugs. Wheelthrown vessels with squared rims, flat bases and oval handles. Decoration is rare but turned grooves and a thumbed band around the girth are found. A clear or copper-flecked glaze is found, normally a bib below the spout.

Dating and Distribution: (fig.2.28) Recognised only at Gloucester and rare there. The best dated contexts in which it is found are Northgate Street (74/68) period D (late 14th to 15th century?) and Northgate Street (26/73) pre-building levels (mid to late 15th century?). The other occurrences of the fabric could all be 15th century.

Bibliography: Vince (forthcoming f)

COMMON NAME: Gloucester TF88, Brick and tile fabric

Hardness: Hard.

Colour: Oxidized red (2. 5YR 5/8).

Principal Inclusions: Sparse black clay pellets, 2-3mm across, and rounded clear quartz grains up to 1. 0mm. The tiles have sand on the undersides which consists mainly of rounded clear and milky quartz grains c. 0.5mm with rare black iron ore up to 1.0mm and rounded limestone or shell fragments up to 5mm.

Clay Matrix: Abundant angular quartz and white mica.

Thin-sections: Not sectioned.

Source: Gloucester. Documentary evidence shows that brick-making on the flood-plain of the Severn was common in the 17th century and remains of hand-made brick manufacture have been found on the route of the Northern By-pass by G. A. D. A. R. G. Petrologically, the fabric is made from the 'pink alluvial clay' which, for example, fills the Roman eastern river channel at Gloucester. The sand is similar to the tempering of Glos. TF43 and to a sand sample from the northern river terrace at Kingsholm.

Forms: Bricks. Hand-made in a sanded mould. Late 16th to 17th century dimensions unknown but later dimensions range from 235 to 255mm (length), 95 to 122mm (width) and 27mm to 66mm (thickness).

Flat tiles. Hand-made in a sanded mould. Both nibs and peg-holes are present. One example (in an early 18th century context) is stamped with what might be a monogram.

Dating and Distribution: Found in two late 16th century contexts (Northgate Street, 26/73 I layer 154, and Eastgate period 10C) at Gloucester.

Bibliography: Vince (forthcoming f).

COMMON NAME: Gloucester TF89, Early Roof Tile fabric.

Hardness: hard.

Colour: Oxidized red (2. 5YR 5/6) with a light grey core.

Principal Inclusions: Abundant thin shell fragments over 10mm long and c. 0.5mm thick. Moderate angular red iron

ore and rounded limestone (heat-altered) up to 3.0mm. Sparse subangular to rounded, clear and milky quartz up to 0.5mm. Rare red sandstone fragments up to 4. 0mm.

Clay Matrix: -

Thin-sections: Not sectioned.

Source: Unknown.

Forms: Ridge tiles. Thick curved tiles, 18mm to 20mm. No crests or other decoration seen.

Shouldered Peg tiles. One definite example.

Dating and Distribution: Gloucester only. Found at 1 Westgate Street (49/75) in a late 12th century context. The shouldered peg tile is from a late 12th century context at the Eastgate site.

Bibliography: Vince (1979 a and forthcoming f).

COMMON NAME: Gloucester TF110

Hardness: Hard.

Colour: Black-cored with brown to pale brown oxidized surfaces (10YR 5/3 to 6/3).

Principal Inclusions: Subangular quartz and quartzite (mainly up to 0.4mm rarely up to 0.7mm), angular fragments of limestone up to 0.3mm containing rounded quartz inclusions in a sparry calcite cement (often c. 2/3 of the rock volume) with brown-staining along veins and around the quartz, rounded fragments of grey micaceous fine-grained sandstone mainly up to 0.4mm but one fragment several mm. across and angular.

Clay Matrix: Sparse white mica and angular quartz up to 0.1mm.

Thin-sections: M982, M993.

Source: Unknown.

Forms: (fig.2.29)

Cooking Pots. Wheelthrown vessels with a roughly cylindrical form and everted rims.

Dating and Distribution: (fig.2.30) Recognised only at Gloucester. Very rare there; two unstratified examples from the Eastgate and possible examples from Northgate Street (74/68) in a mid-13th century context.

Bibliography: Vince, forthcoming f.

COMMON NAME: North Cotswolds 1.
(Winchcombe Limestone-tempered ware)

Hardness: Hard.

Colour:

Principal Inclusions: Rounded limestone fragments (including Colite) and sparse rounded quartz and red iron ore.

Clay Matrix:

Thin-sections: Solihull; M631-3. Winchcombe; M907, M909.

Source: Unknown. The distribution suggests a source or sources in North Gloucestershire.

Forms: (fig.2.31)

Cooking Pots. Cylindrical handmade vessels with club rims. Also curving walled vessels with rolled-out or everted rims.

Pitchers. One hand-made, unglazed pitcher from Winchcombe.

Bowls.

Dating and Distribution: (fig.2.32) Found in pits at the Winchcombe Co-op site. One pit containing club-rimmed vessels was cut by another containing the same types plus Glos. TF41A and could therefore date to the 10th or early 11th centuries. The curving walled cooking pots were associated with 12th century wares. Other find spots include Upton D.M.V. , sites in the Stow region and possibly Cirencester, where they are rare in comparison with Cirencester-type ware. They form the most common ware found at Whichford Castle, in S. E. Warwickshire, and thus the distribution extends out of the survey area (Whittingham, forthcoming).

Bibliography: Vince (forthcoming d) describes the petrology of the Winchcombe vessels and illustrates a range of forms. Further examples are published by Rahtz (1969) and Hilton & Rahtz (1966). see also Whittingham (forthcoming).

COMMON NAME: North Cotswolds 2.

Hardness: Hard.

Colour: Usually oxidized with a light grey core.

Principal Inclusions: Rounded limestone (including oolite), sparse rounded quartz and red iron ore.

Clay Matrix: Fine.

Thin-sections: Not sectioned.

Source: Unknown. Probably North Gloucestershire. The range of inclusions is similar to North Cotswolds 1. The main differences are in the proportion of inclusions present, the firing and the presence of glaze . If all these vessels are from one source, they probably come from

a potting centre similar to that at Minety. The North Cotswolds 2 forms are very similar to those of Minety.

Similar vessels, for example wheelthrown jugs and bowls, have been published by Jope from a kiln site at Ascot Doilly (Jope, 1959). This ware has not been examined by the author but the published fabric description is very similar to that of North Cotswolds 2.

Forms: (fig.2.33)

Cooking Pots. Wheelthrown with a thin glaze around the inside of the rim.

Jugs. Wheelthrown with slashed strap handles.

Bowls. Curving walled, wheelthrown vessels. internal clear glaze.

Dripping Pans. Slab-built vessels. Internal clear glaze.

Dating and Distribution: (fig.2.34) Found at Upton D.M.V. with 13th and 14th century wares. Also noted at Whichford Castle, in S. E. Warwickshire, but absent from Winchcombe. However, later medieval pottery from Winchcombe is rare.

Bibliography: Hilton & Rahtz (1966), Rahtz (1969) and Whittingham (forthcoming).

COMMON NAME: Stroat Ware

(Glos. TF97)

Hardness: hard.

Colour: Oxidized reddish yellow to red (5YR 6/8 to 2. 5YR 5/8) often with a darker reddish brown skin (2. 5YR 4/4).

Principal Inclusions: There is a wide variation in the quantity of temper and in the grain-size distribution. Sparse to moderate angular and subangular quartz up to

0.5mm and a little felspar of similar size. Sparse larger inclusions of rounded red clay pellets (some tinged with black), rounded quartz and quartzite and rounded sandstones (containing quartz grains up to 0.3mm across and some interstitial amorphous brown material) all up to 2.0mm.

Clay Matrix: Optically anisotropic and isotropic examples. Angular quartz and a variable quantity of white mica up to 0.1mm across.

Thin-sections: Chepstow; M816-7. Gloucester; M976-7. Stroat kiln; M1054-7.

Source: Stroat, near Tidenham. A kiln was destroyed by road-widening in 1957 and two samples of kiln waste were obtained by Gloucester City Museum (25/1961 and 25/1966). Examination of a soil profile at Woolaston, close to Tidenham, showed a red micaceous clay overlain and partially mixed with rounded sands and gravels. These larger inclusions are very similar to those found in the pottery.

Forms: (fig.2.35)

Conical Bowls. Large bowls with moulded rims. Large horizontal handles fastened to the body with double thumb impressions. Wide, pulled out spouts. Some vessels are white slipped and all are knife-trimmed.

Jars. Wide-mouthed jars some with a thumbed band around the neck. Internally glazed.

Rectangular Dripping Pans. Slab-built with horizontal handles and a pouring lip at the corner. Internally

glazed.

Chafing dishes. Two examples from Gloucester. White slipped interior. Applied supports around the rim. A base (Lower Quay Street, 28/79 I (355)) has an acute angle and large triangular holes cut out of it. A base sherd from the Eastgate site may be from a Collander or possibly a chafing dish.

Ridge tiles. Crested tiles, on which the crest is hand-moulded with three thumb impressions at the trough, one on either side and one on top.

Dating and Distribution: (fig.2.36) Found at Chepstow (unstratified), and at Gloucester. The earliest stratified examples are from a late 16th century group but it is first common in a group of the early 17th century. Found in early to mid 17th century groups and probably no longer produced by c.1680. Found at Hailes Abbey (unstratified) and Tewkesbury Holm Castle (unstratified) suggesting a river-borne trade. Documentary evidence for potting at Stroat is of late 16th and early 17th century date, c.1599 and c.1608 (VCH GLOS X, 1972, 72, 195-6).

Bibliography: Vince (forthcoming f). The kiln waste is unpublished.

HEREFORDSHIRE AND WORCESTERSHIRE WARES

The Petrology of Herefordshire Wares

In thin-section many of the wares made in Herefordshire and the neighbouring areas of the Welsh borderland have a similar petrology. It is therefore economical to describe the general characteristics of these wares once and only describe the most important and distinguishing

characteristics in the individual descriptions.

Out of a sample of 50 thin-sections of Herefordshire wares from Hereford only one had an isotropic clay matrix (a black-glazed tankard). In general therefore the wares are not high fired. Most of the inclusions present are less than 0.7mm across and are angular. Larger inclusions are all less than 2.0mm across and are mainly less than 0.5 mm. They are poorly sorted within these size limits with the exception of Hereford A5 which has a well-sorted sand temper, av. diameter 0.3 mm. In four clay samples taken from different areas of Herefordshire large sandstone fragments are present but in the pottery fabrics these are only found in the brick and tile fabric (Hereford A10). It is likely therefore that some preparation of the clay took place but scattered large inclusions which are unlikely to be added deliberately to the clay are found in most fabrics. It does not therefore seem likely that the clay of the medieval wares was levigated, since this would remove all large inclusions. However, the fabrics of the Herefordshire post-medieval wares are so fine that levigation is likely to have been practiced.

The major clay source in Herefordshire is the Devonian Marl, part of the Old Red Sandstone measures, and glacial till derived almost exclusively from this marl. These clays contain abundant angular quartz, which is poorly sorted and less than 0.7mm across. White mica is also very common and is often larger than the quartz. Other larger and often rounded inclusions are found, mainly rounded quartz and fragments of various sedimentary rocks,

principally greywackes and a few coarser-grained sandstones. Siltstones and mudstones occur (and are particularly characteristic of Hereford A4). Concretionary limestone is present in Hereford A2 and Bredon-type floor tiles (which include fragments with a mixture of sparry calcite and quartz silt). Fossiliferous limestone is only present in one section of Hereford A4. Other inclusions are black mica (Hereford A4), small rounded fragments of felspar, fine-grained intermediate or basic igneous rocks (found in fabrics Hereford A2, A3, A5 and A8 but only common in Hereford A4), brown almost opaque chert (Hereford A2, A3 and A4) and iron ore. In fabrics Hereford A2, A6 the iron ore was irregular in shape but in fabrics A7a and Bredon-type tiles they were rounded particles less than 0.2mm in diameter. Accessory minerals were garnet (Hereford A3), tourmaline (Hereford A3 and A5, zircon (A7b) and a fragment of rhyolite (Hereford A6). The clay texture is usually fine, but several fabrics contain pellets of clay. These are characteristic of the Hereford brick and tile fabric and have the same structure as the matrix. In Hereford A7b dark brown pellets with a spherical structure are found. They often contain a higher quartz content than the clay matrix. White clay pellets, sometimes with quartz and mica inclusions, are found in Hereford A4.

Only one medieval pottery source is known from archaeological evidence, the kiln at Weobley. It is unlikely that this kiln was producing all of the ware of this type, Hereford A7b, on the basis of the differences in typology. It is impossible to characterise this fabric by

thin-section, nor the brick and tile fabric, Hereford A10, or a minor medieval jug fabric, Hereford A6. The remaining Herefordshire wares contain sand-tempering which can be characterised, although the approximate source of only two of these wares, Hereford A2 and Hereford A4, is known. Hereford A2 has a temper which compares well with the gravel and sand underlying the town itself, whilst the mudstones and basic igneous rock fragments in Hereford A4 suggest that the tempering comes from a river gravel derived from North Hereforeshire or South Shropshire, probably either in the Teme or the Lugg valley.

Common Name: Hereford Fabric A2

Hardness: Hard

Colour: Grey or black core with oxidized surfaces. Some vessels are completely reduced. Olive glaze (5YR 4/4).

Principal inclusions: Limestone, sandstone and quartz sand. A few fragments over 2.0mm across but mainly under 1.0 mm with quartz being smaller than sandstone or limestone.

Clay matrix: Quartz and mica silt up to 0.1 mm.

Thin-sections: Hollow wares Grosmont Castle; M211-2. Hereford; M128-9, M457-467, M516. White Castle; M239. roof tile. Hereford; M613.

Source: Probably Hereford or its immediate surroundings.

Forms: (fig.2.37)

Cooking pots. Mainly handmade squat, cylindrical vessels with slightly sagging bases and rim diameters ranging from 150 mm to 350 mm. Most pots show signs of rotary smoothing around the rim and have a distinct neck and everted rim. There is some thickening of the lip but the

precise shape varies. A distinct type is wheelthrown with an inturned rim Most vessels are undecorated but a few have wavy combing on the exterior. Some have glaze spots but this is not a deliberate glaze.

Tripod Pitchers. The most complete example is only the top half of a vessel, but they are likely to be of globular profile with a slightly sagging base and three round-sectioned feet The rims are either cylindrical or everted. Handles join the rim near the lip and on the body on the shoulder. Rim profiles are usually either plain rounded or squared and thickened. Handles are rectangular-sectioned and mainly without decoration. One has two ridges on the top surface, decorated with thumb impressions. Spouts are usually pulled. Decoration is restricted to the top half of the body and is either incised with a round-ended tool or a comb. The internal limestone inclusions are often heavily leached.

Jugs. Only a few examples have been recognised. Both handmade and wheelthrown vessels are known. They differ in profile from the tripod pitchers in being much thinner. No distinctive rim forms were found and therefore jug rims probably look much like tripod pitcher rims. Two strap handles are known, both stabbed. One was added over horizontal bands of combing. Other body decoration consists of crudely applied roller-stamping. Bases are either thumb frilled or have thumb impressions.

Storage jar. One rim from a large cooking pot or storage jar with thumbing around the rim.

Roof tile. One fragment of a flanged tile. Either a flat tile of flanged and curved tile roof or perhaps a

decorative flange on a ridge tile.

Dating and distribution: (fig.2.38) The ware is only stratified at Hereford. It first occurs in the soil levels of the Brewery site (period 2, layers 7 and 15). These are thought to be sealed by the Northern Rampart but other pre-rampart collections do not contain any of this fabric, although it is common in immediately post-rampart soils. The highest proportion found is in the Berrington Street site 1 pits (period 4a), 20% by sherd count. These late 12th to early 13th century contexts contain only handmade examples of cooking pots, tripod pitchers and the storage jar rim. Later contexts produced smaller quantities of the ware, but included handmade and wheelthrown jugs. A pre- c. 1320 context at Hereford Blackfriars produced 4 sherds, 3% of the total pottery.

The flanged tile is from a mid-13th century context at Bewell House. Other findspots are few, 6 in all.

Bibliography: Vince forthcoming a.

COMMON NAME: Hereford Fabric A3

Hardness: Hard

Colour: Reduced grey or black with oxidized surfaces (10YR 6/1 and 7.5YR 5/4). Glaze is olive (5Y 4/4,, 5Y 5/6).

Principal inclusions: Rounded inclusions of sandstone and quartz, more common in cooking pots than tripod pitchers or jugs. Few inclusions exceed 1.0mm across.

Clay Matrix: Angular quartz and white mica silt up to 0.1 mm.

Thin-sections: Hereford; M468-471

Source: Unknown Herefordshire.

Forms: (fig.2.39)

Cooking Pots. Squat, handmade cylindrical vessels.

Tripod Pitchers. Globular vessels, handmade with cylindrical or everted rims. Rectangular handles decorated with stabbing or slashing. Pulled spouts are the norm but one free-standing tubular spout is known. Decoration is restricted to the upper part of the body and handle. It consists of bands of shallow grooves, incised wavy lines and bands of combing and wavy combing. Rectangular-toothed roller-stamping is also found but is less common.

Jugs. Wheelthrown vessels, sometimes completely oxidized (5YR 4/6).

Dating and distribution. (fig.2.40) First found in Hereford in early 13th century contexts (slightly later than Hereford A2). Usually forms less than 4% of assemblages by sherd count, but a maximum of 31% occurs in a pit at the City Arms (cooking pots 14%, tripod pitchers 17%). Jugs are found in later 13th century contexts but form less than 2% of assemblages. The only findspots are Hereford and Breinton.

Bibliography: Vince forthcoming a.

COMMON NAME: Hereford Fabric A4.

Hardness: Hard

Colour: Oxidized surfaces and reduced core. Clear glaze appears patchy green and orange due to incomplete oxidation; copper-flecked glaze also occurs.

Principal Inclusions: Rounded grains of sandstones, siltstones, mudstones and white clay pellets, all between 1.0 mm and 2.0 mm. Rounded quartz less than 1.0 mm

occurs. Sparse black mica flakes up to 1.0 mm.

Clay Matrix: Angular quartz and white mica silt up to 0.1 mm.

Thin-sections: Hereford; M472-476.

Source: A North Herefordshire source is likely on distribution evidence. Fragments of basic or intermediate igneous rocks seen in thin-section could come from the Clee Hills and are probably detrital grains from a north to south draining river terrace, such as the Lugg or the Teme.

Forms: (fig.2.41)

Cooking Pots. A single wheelthrown cooking pot is known.

Tripod Pitchers. Handmade vessels. The lower part of the body is straighter than Hereford A2 or A3 vessels. Rolled-out rims often decorated with thumbed bands. One handle is known, decorated with grooved lines and impressions from a pointed tool. Decoration in the upper part of the body consists of horizontal grooves, applied strips, wavy combing and stabbed comb impressions. Feet would have been circular in cross-section (no spouts found).

Dating and Distribution: (fig.2.42) Two sherds only in early 13th century contexts in Hereford. Both are thicker than average and are clear glazed. The remaining sherds are found in later 13th and 14th century contexts, but form less than 1% of assemblages. Common at Richards Castle.

Bibliography: Vince (forthcoming a) and Barker (1970).

COMMON NAME: Hereford Fabric A5

Hardness: Hard

Colour: Oxidized light brown

Principal Inclusions: Well-sorted sandstone and quartz sand, c. 0.3 mm. Maximum grain size c. 0.7 mm.

Clay Matrix: Angular quartz and white mica silt up to 0.1 mm.

Thin-sections: Hollow wares. Hereford; M477-8.

Roof tile. Hereford; M614.

Source: Unknown Herefordshire.

Forms: (fig.2.43)

Jugs. Wheelthrown vessels. Some decorated with rollerstamping or horizontal incised grooves. Sagging thumbed bases and probable white-slipped rims. Clear or copper-flecked glaze.

Possible cooking pot. One internally glazed base (Berrington Street site 2, Pit 117).

Ridge tiles.

Dating and Distribution: (fig.2.44) Found first at Hereford in mid- or late 13th century contents and present throughout the late medieval period (i.e. up to the late 14th or early 15th century ?). Forms 1% to 2% of assemblages. This ware has only been found at Hereford and Hampton Wafer.

Bibliography: Vince (forthcoming a).

COMMON NAME: Hereford Fabric A6

Hardness: Hard

Colour: Oxidized light brown, often with a grey core

Principal Inclusions: Sparse rounded quartz grains.

Clay Matrix: Angular quartz and white mica silt up to 0.1 mm.

Thin-sections: Hereford; M479

Source: Unknown Herefordshire

Forms: (not illustrated)

Jugs. Wheelthrown vessels decorated with roller-stamping or self-coloured and white strips.

Costrel. A single clear glazed upright costrel with two lug handles.

Dating and Distribution: Found in Hereford in early 13th to 14th century contexts, forming a maximum of 4% of assemblages. The costrel is the only post-medieval vessel known and is dated to the 17th century.

Similar jug sherds occur at Hampton Wafer, but this fabric could be produced from the local clay simply by removing coarse grit.

Bibliography: Vince (forthcoming a)

COMMON NAME: Hereford Late Saxon Glazed Ware

Hardness: Hard

Colour: Oxidized, reddish yellow, strong brown or light brown (5YR 6/6, 7.5YR 5/6 and 6/4). Rarely a reduced core (10YR 5/1).

Principal Inclusions: Sparse mudstone fragments up to 2.5 mm across and small rounded iron ore inclusions.

Clay Matrix: Angular quartz and white mica silt up to 0.1 mm.

Thin-sections: Gloucester; M932. Hereford; 480-483

Source: Unknown. Given the small quantity of sherds known it is not even certain that the source is in Herefordshire.

Forms: (fig.2.45)

Pitchers. Wheelthrown with a rolled-out rim. Strap handles, joined to the rim at the lip and joining the girth with two thumb impressions. The only decoration consists of wheelthrown grooves at the shoulder. Clear glaze, often immatured, found all over the exterior or the vessels and found as drips on the inside of the vessel.

Dating and Distribution: (fig.2.46) Only nine examples from Hereford, two from Gloucester and one from Winchcombe. The earliest association is at Hereford, where one sherd was found with Chester-type ware and Glos. TF41a (and therefore probably early 11th century at the latest). The other Hereford sherds were found in a later 11th century context (one sherd), pre-12th century but otherwise not dated contexts (2 sherds) and unstratified. The Gloucester sherds were found in 12th and later 11th to 12th century contexts.

Bibliography: Vince (forthcoming a and d).

COMMON NAME: Hereford Fabric A7b

Hardness: Hard

Colour: Usually oxidized red (2.5YR 5/6) or reduced dark grey (10YR 4/1) with an oxidized exterior.

Principal Inclusions: Very sparse rounded qurtx grains, generally less than 0.3 mm. Rare red or black micaceous sandstone fragments and rounded brown clay pellets, 1.0mm to 3.0 mm. The painted white slip contains angular quartz

and white sandstone fragments but no mica, whilst the brown slip often contains crushed iron ore fragments.

Clay Matrix: Angular quartz and white mica silt up to 0.1 mm.

Thin-sections: Hollow wares Hereford; M562-3. Similar fine micaceous fabrics. Gloucester; M310, Grosmont Castle; M217, M258. Llangibby; M223-4. Weobley kiln site; M116-7. White Castle; M241.

Ridge tile. Hereford; M675. Similar fine micaceous fabrics Chepstow; M761-5.

Louver. Hereford; M618.

Source: One kiln known, at Weobley, H. & W., a likely kiln spacer was found in the River Wye below Victoria Bridge, Hereford. Similar wares are common over much of Herefordshire and Northern Gwent and a single source is possible (the resulting distribution would be little bigger than that of Malvern Chase jugs) but this hypothesis cannot be tested unless more powerful methods of characterisation than petrology are used.

Forms: (fig.2.47)

Jugs. All wheelthrown. These vessels vary considerably in size and shape and decoration. Rims are usually rounded or squared off, sometimes with a slight thickening. Bridge spouts and pulled spouts and a single free-standing tubular spout are found, while some vessels are definitely spoutless. Strap handles and rod handles are equally common, strap handles are usually decorated with slashing or stabbing, while rod handles can be plain, stabbed or have a central knife-cut groove. Decoration is often present, although plain jugs are probably more common.

Most decoration is applied. Brown firing strips, either of a redder clay or with iron ore inclusions are most common. White slip is usually painted on. Where apparent the patterns are usually very simple, repeating geometric designs, such as horseshoes, although more complex patterns, such as flowers and anthropomorphic jugs are found. Roller-stamping is found but is not common (although a majority of the Weobley jugs are roller-stamped). Sagging thumbed bases are most common but recessed bases are also found. Flat bases are also found, usually with acute base angles. Some jugs have a white slip around the rim, dripping down the interior. Both clear and copper-flecked glaze is found, covering the exterior.

Cooking Pots. All wheelthrown, with cylindrical bodies, inturned rims and internal clear or copper-flecked glaze. The bases are dished-out after throwing.

Dishes. Wheelthrown vessels with simple rounded rims and flat bases, glazed on the inside of the base.

Dripping Pans. Handmade vessels with internally glazed, thick bases and short walls. Usually knife-trimmed and caked with soot.

Aquamaniles. One leg from an aquamanile (from Hereford), knife-trimmed.

Cups. Globular bodied with flat base, and acute base angle. A wide flaring rounded rim. Three oval-sectioned handles.

Other types. One large base with internal glaze and a rectangular foot.

Ridge tiles. Usually knife-cut crests, stabbed. Some with

applied knobs.

Finials. Wheelthrown globular finials, fitting into a flange in the ridge tile.

Dating and Distribution: (fig.2.48) The best stratified examples come from Hereford and Gloucester. At both sites the earliest occurrence is during the 13th century. At Hereford the earliest examples are associated with handmade Malvern Chase cooking pots and Worcester jugs (i.e. mid-late 13th century), whilst at Gloucester the earliest examples are associated with Malvern Chase jugs and Glos. TF99 (i.e. late 13th-14th century). At both sites the main period of use is the 14th century, when at Hereford it forms up to 70% of the pottery found and at Gloucester it forms up to 30%. At both sites the ware is in decline in the later 14th to 15th centuries, but may still be in production. A mid-16th century group from Hereford contains one complete cup, probably the only contemporary vessel in this ware and forming less than 1% of the pottery in use.

Bibliography: Vince (forthcoming a)

COMMON NAME: **Hereford A7d**

(Post-Medieval Welsh Borderland wares)

Hardness: Hard (tygs, very hard or hard).

Colour: Oxidized yellowish red to reddish brown (5YR 5/6 to 5/3). Tygs, reddish brown to black.

Principal Inclusions: Sparse rounded quartz and fragments of sandstone.

Clay Matrix: Abundant quartz and white mica silt up to 0.1 mm.

Thin-sections: Lingen area; M705-7. Upton Bishop; M708-710.

Bacton; 713-4.

Source: There are several sources known, mostly in remote wooded areas, such as the Deerfold Forest on the border of Herefordshire and Shropshire, Bacton in south-west Herefordshire, Queens Wood, Upton Bishop in the south of the county and Haind Park Wood , Dymock across the border in Gloucestershire. Further kilns are known in Powys (Whole House, Talgarth) and Gwent (several kilns, for example St. James House, Monmouth and Trefaldu). A programme of petrological analysis was carried out on these wares but no significant differences were found between the products of different centres. Neither are there diagnostic characteristics in the typology of the wares produced.

Forms: (fig.2.49) Jars. Some vessels of the same form as late 16th to 17th century Malvern Chase jars, lid-seated with a wash of glaze around the inside of the rim.

Jars. Cylindrical, internally glazed vessels.

Conical Bowls. With flanged rims and internal glaze.

Conical Bowls. With 'T' rims and internal glaze. Often with a wide pulled spout.

Slip-trailed Bowls. A rare product of the North Herefordshire kilns.

Black-glazed tygs. Cylindrical vessels with 2 or 3 handles, bands of turned grooves and often a foot-ring base.

Drinking Jugs. Copies of the Frechen stoneware form.

Lids

Chamber Pots

Cups. With horizontal loop handles.

Pipkins. Globular bodied, footed vessels with everted rims and handles. Some without trace of soot or feet may be wide-mouthed jars or jugs. Ridge tiles. Thick, plain examples.

Skillets. illustrated by Marshall (1948).

Dripping dishes. Sub-rectangular forms (Marshall, 1948).

Floor Tiles. Inlaid tile wasters found at Queens Wood, Upton Bishop. Possibly produced to repair medieval tile floors.

Dating and Distribution: (fig.2.50) At Hereford and Gloucester the earliest occurence of this ware is in the late 16th to 17th century. Both sites have produced assemblages with Frechen Stoneware and no examples of this ware, so that its beginnings can be tied down archaeologically to the years either side of c. 1600. The cup in Hereford A7b (see above) is the only evidence for any continuity in the industry and is of a form not found in the later industry. It also has a copper-flecked glaze, not found on the later ware. Documentary evidence shows that the Deerfold Forest potters were working c. 1600 but that they were evicted early in the 17th century. Archaeological evidence from Wigmore Abbey suggests that if this is the case they were replaced by potters producing the same fabric, but that this ware was replaced by c. 1710 by Staffordshire coarseware. Evidence from Hereford shows that this ware was the most common in the early to mid 17th century but was replaced by c. 1670 by slip-decorated ware and a new range of coarseware forms in the same fabric. (Whitney-on-Wye and Newent Glasshouse wares). At Gloucester this ware forms only c. one-third of early to

mid 17th century groups, despite the proximity of two of the kilns (Upton Bishop and Dymock). Here too, the ware is replaced by c. 1670 by Newent Glasshouse ware.

Bibliography: Vince (1977d, forthcoming a & f): Marshall (1948): Watkins (1924, 1928).

COMMON NAME: Malvern Chase Wares

One of the most prolific potteries in the medieval and post-medieval period in the study area is that in the Malvern Chase (Vince 1977). All of the wares produced there contain at least some fragments of angular acid igneous rock, which in this region can only come from the spine of the Malvern Hills. Occasional erratics from the Lake District are found in the fluvio-glacial deposits of the West Midlands, but these are the same size as the quartz sand and rounded.

Analysis of 40 samples of Malvernian ware from various sites in the region showed that these are significant variations in the petrology of the ware and six fabrics are recognised; cooking pot fabric, early tripod pitchers, late tripod pitchers, later medieval wheelthrown ware, late 'pink' fabric and floor tile fabric. In addition to these fabric distinctions there are differences in firing and surface treatment which enable the cooking pot fabric to be split into three groups, corresponding to the 12th, late 12th and 13th, and late 13th to 14th centuries and the later medieval wheelthrown ware to be split into three groups, corresponding to the late 13th to 14th centuries, the 14th to early 16th centuries and the mid- to late 16th century.

These factors help to make this ware one of the most useful chronological indicators in the region.

Clay samples have been taken from a series of localities within the area of Malvern Chase, the documented centre of the potting industry, and compared with the pottery thin-sections. Comparison of the two enables some conclusions to be made about the preparation of clay and the location of clay pits.

The clay samples in general contain a lower quantity of inclusions than the early medieval fabrics but a similar quantity to that of the later medieval and later fabrics. The comparison between some of the unprepared clay samples and some of the late and post-medieval pottery was impressive and shows that much of the later pottery was made from untempered, uncleaned clay. Most of the clay samples and pottery contained fragments of angular Malvernian rock. Scattered angular quartz was also present in the matrix of all the clay samples and pottery but was much rarer than, for example, in the matrix of Herefordshire Wares. White mica was very rare, and was found only in one clay sample but black mica and other ferromagnesian minerals were present in small quantities in several of the clay samples. These would be derived from the breakdown of Malvernian rock. Two types of sandstone fragments are found in clay samples and pottery, small rounded fragments with a silicious matrix and larger angular fragments without visible cement. These often decomposed on firing leaving a partially quartz grain filled void. Rounded quartz was scattered in the clay samples with the exception of samples from the alluvial

clay in the Poolbrook valley, which contained a high quantity of rounded quartz and quartz silt.

Only two geological deposits including clay occur in the area of the Malvern Chase; Keuper Marl and alluvial clay alongside the River Severn (and to a lesser extent the small valleys leading into the river). The alluvial clay contains abundant quartz silt and is not similar to any of the pottery fabrics found, although it has been used for brickmaking. Parts of Hanley Castle Church were rebuilt in brick in the late 17th century (a plaque marked 1674 is set into the rebuilt nave). The Keuper Marl in many exposures is dense, blocky and slightly calcareous and could not have been used in this state for potting. Only where this clay has been weathered or re-deposited does it make a good potting clay. The presence of burnt-out roots and other organic material in the pottery fabrics shows that superficial clay deposits have been utilised. Over much of the Chase theKeuper Marl is covered with a capping of gravel. At the foot of the Malvern Hills this gravel is almost totally composed of Malvernian rock, whilst at the edge of the terrace closest to the river Severn the gravel is almost totally composed of rounded quartz sand, with some sandstone fragments. In the area in between a mixture of the two materials is found. The cooking pot fabric contains the least rounded quartz and the tripod pitcher fabrics the most. The later wheelthrown, glazed wares also contain a high proportion of rounded quartz to Malvernian rock. This would suggest that the clay and/or tempering for the early cooking pots was obtained from

closer to the Malvern Hills than that of the other fabrics.

Two areas of pottery production are known archaeologically. Both are situated on gravel, midway between the Malvern Hills and the Severn.

It is likely that both sites would have obtained clay from the sides of valleys cutting through the gravel and exposing the underlying clay to the elements, rather than digging the clay on the sites. Both sites produced later medieval glazed ware, one of late 13th to 14th century date and the other of 16th century date, neither ware was tempered deliberately.

Cooking Pot Fabric

Hardness: Soft to hard

Colour: Early vessels are usually black, late 12th to 13th century vessels are black to grey (10YR 3/1) sometimes with oxidized surfaces of dark reddish grey, reddish brown or light yellowish brown (5YR 4/2, 4/4, or 10YR 6/4). Later vessels are usually reduced light grey or reduced with an oxidized surface.

Principal Inclusions: Large angular fragments of acid igneous rock, up to 4.0mm across, rounded quartz up to 1.4mm and rare rounded sandstones and metamorphic rock fragments. Smaller rounded chert, clay pellets, black mica and horneblende occur.

Clay Matrix: Sparse opaque iron ore and angular quartz up to 0.1 mm.

Thin-sections: Cooking pots: 10, 12-4, 16-30, 41, 45, 138, 172-3, 484-6, 691, 855-6.

Forms: (fig.2.51) Early handmade cooking pots. These vessels are squat, cylindrical and have everted, thickened

rims. A rare variant is completely cylindrical with a cordon just below the rim. They are mainly completely black and the walls are often of uneven thickness with little or no evidence for rotary smoothing.

Later handmade cooking pots. These vessels are squat, or sometimes very squat, cylindrical with rotary smoothing. The rim forms are more rounded than those of the early vessels and include infolded types. Firing is also different. Light grey vessels are common, some with partially oxidized surfaces.

Curfews. Large handmade vessels with applied thumbed strips and thick flat-topped rims. One example has a strap handle, and this was probably a universal feature.

'West Country Vessels'. A few examples of this form are known, all are in a coarse, poorly finished ware similar to that of the early handmade cooking pots. Their rim forms are also similar. An example from Pershore may be soot blackened on the inside, but on a vessel which was fired black it is difficult to be certain.

Early Tripod Pitcher Fabric

Hardness: Soft or hard

Colour: Dark grey or black with oxidized surfaces (7.5YR 6/2, 10YR 3/2).

Principal Inclusions: Rounded quartz up to 0.7 mm, mainly c. 0.4 mm. Sparse acid igneous rock fragments up to 2.0mm and rounded clay pellets. Rare chert and rounded sandstone fragments.

Clay Matrix: Sparse angular quartz and opaque iron ore up to 0.1 mm.

Thin-sections: Tripod Pitchers: 81, 326-7 (?), 347, 487-494, 972.

Forms: (fig.2.56)

Tripod Pitchers. Handmade vessels with a globular body and cylindrical or slightly flaring neck. The rim is usually flat-topped and thickened. Rod handles are universal and there maysometimes be two per pot. Tubular spouts. Sagging bases and circular feet. Roller-stamped decoration is the most common and four different designs are known; chevrons, smaller chevrons, small diamonds and small rectangles. At Hereford two vessels were impressed with the same stamp. Roller-stamping occurs over the top half of the body, the top of the rim and the handle. It is sometimes combined with applied strips. Thin clear glaze is present.

Late Tripod Pitcher Fabric

Hardness: Hard but friable

Colour: Dark grey core with oxidized brown surfaces (7.5YR 5/4). Refires to red (2.5YR 5/6).

Principal Inclusions: Abundant rounded quartz and sparse chert and sandstones up to 0.7 mm. Possible mudstone and igneous rocks up to 2.0 mm.

Clay Matrix: Sparse angular quartz and rounded iron ore fragments up to 0.2 mm.

Forms: (fig.2.56)

Tripod pitchers. Similar to the early vessels but with rolled-out rims and the lower part of the body is straight-sided. Both pulled and bridge spouts occur. Strap handles are decorated with raised strips and incised with

stabbing and slashing. Decoration, on the top half of the body, consists of combing, applied strips and horizontal grooves. The exterior of the vessels is clear glazed. The glaze is often thinly applied and on some vessels can be seen to be brushed or painted on.

Jugs. A few thumbed sagging bases are known and it is therefore possible that some 'late tripod pitcher' sherds are actually from jugs. The thumbing consists of individual thumb impressions rather than a frill. The size and shape of these jugs is probably similar to that of the tripod pitchers.

Later Medieval and Post-medieval Ware

Hardness: Hard to very hard

Colour: Late 13th to 14th century vessels often reduced light grey with oxidized surfaces and clear or copper-flecked glaze. 14th to 15th century vessels usually oxidized throughout (except for the thickest parts of rims or bases) with clear or copper-flecked glaze. Mid-late 16th century and 17th century vessels usually higher fired (oxidized 2.5YR 5/8) with clear glaze 'fried' at the edges.

Principal Inclusions: Sparse rounded quartz, acid igneous rock fragments and sandstones, ill-sorted c. 0.1mm to 0.7 mm. Rare large angular acid igneous rock fragments up to 4.0 mm. Roof tiles have the same basic fabric but sometimes contain larger and more frequent acid igneous rock fragments.

Clay Matrix: Sparse angular quartz up to 0.1mm and rounded iron ore fragments up to 0.4 mm.

Thin-sections: Late and post-medieval wares: 43, 163 (?), 168-171, 205, 216, 220-1, 252-3, 260, 271-2, 279-90, 305-9,

322b, 323-5, 518-523, 696.

Roof tiles: 184, 186, 243, 251, 259, 291, 617, 619.

Forms: (fig.2.59)

Cooking Pots. The form of these vessels is similar to that of the later handmade vessels, but inturned rims are more common. They are almost always reduced light grey with oxidized surfaces.

Cooking Pots or Bowls. This form is always internally glazed and the walls slope outwards. Rims are rounded with a wide groove on the inside (i.e. they are similar to late cooking pot rims but at a different orientation). The bases are dished out.

Dripping Pans. Possibly slab-built vessels. The 16th century examples are oval in plan with spouts at either end but the medieval examples may be rectangular. Both types have a loop handle, internal glaze and are extensively knife-trimmed. The bases often have traces of gravel. Some medieval examples have feet.

Conical Bowls. Two distinct forms occur. Small, straight-sided and flat based vessels with squared-off rims, normally internally glazed (copper-flecked) and large straight-sided vessels with infolded rims, sometimes two lugs and a patchy clear internal glaze.

Skillets. These vessels are like the smaller conical bowls with added rectangular feet and horizontal, oval-sectioned handles. The rims are either squared-off or infolded. Pulled spouts are found. On one example the spout is set to the left of the handle (i.e. it is a right-handed vessel).

Chafing Dishes. These vessels are made in two parts; the top is a small bowl with simple squared-off or infolded rim and the bottom is a pedestal with an acute base angle. The two are luted together, often leaving a cordon or ridge at the join. Round holes are stabbed through the sides and base of the top section and the sides of the bottom section. Two opposed oval-sectioned handles are added and three or more knobs arranged around the rim. The vessels are internally glazed, with either a clear or copper-flecked glaze.

An example from Worcester has pottery rings within the handles and is decorated with applied white slip blobs.

Lobed Cups. Thrown as hemispherical cups with pedestal bases. The rim is then pinched into six or seven lobes. A copper-flecked glaze covers the interior and exterior of the vessel, sometimes over a white slip. A rod handle joins the cup at the rim.

Handled cups. Globular bodied vessels with an acute base angle, flat base and one, two or three oval-sectioned handles. The rim is flaring and often wider than the body. Copper-flecked internal and external glaze.

Dishes. Small, shallow straight-sided vessels with flat bases and internal copper-flecked glaze.

Rounded jugs. Large jugs with strap handles, usually with slashed decoration, and a sagging base with a continuous thumbed frill. Simple or slightly thickened, squared-off rims. Decoration is rare. The body is often reduced with oxidized exterior and copper-flecked external glaze.

Baluster jugs. Tall jugs with strap handles, usually slashed. Acute base angles and external copper-flecked glaze. The handles are usually no bigger than those of the globular jugs. One complete example from Gloucester is known and others are inferred only from base sherds.

Bulbous jugs. Smaller than the globular jugs with thickened squared-off rims, rod or strap handles (often undecorated) and either a recessed sagging base, sometimes thumbed, or a flat undecorated base. Pulled spouts are found but some vessels are unspouted. A copper-flecked 'bib' glaze is usual. A small number of bulbous jugs have white and brown slip decoration. The brown slip contains added iron ore and is squeezed on (giving a triangular section) whilst the white slip is painted on. Patterns include shields with mock heraldry.

16th century bulbous jugs often have an infolded rim, like that of the late large jars. They can be decorated with nicked cordons or wheelthrown grooves and have a glossy clear glaze.

Pipkins. Globular pots with rectangular tripod feet and an everted rim. Horizontal handles on the shoulder are found but some vessels have strap or rod handles. Pulled spouts occur. Glaze is restricted to the interior base and the inside of the rim and is usually copper-flecked. There is a range of sizes within this type and late 15th to 16th century examples are often large with thumbed strips around the neck. Two types of thumbing occur; individual impressions and overlapping, diagonal impressions. The exterior is usually sooted.

Cisterns. Tall vessels with rims and bases like the pipkins

and a bung- or spigot hole jug above the base. An example from Worcester has two strap handles.

Large Jars. Ovoid profiled vessels with a flat base and rolled-out rim. They often have a thumbed strip around the neck, usually with intermittent thumb impressions. The rims are infolded and may have a thin clear glaze on the inside. Glaze is used very sparingly on these jars and often occurs as streaks on the inside only.

Lids. Straight-sided conical lids with flat tops. Made to fit pipkins, cisterns or large jars.

Ridge tiles. with knife-cut and stabbed crests. Copper-flecked glaze.

Ridge tiles with applied knobs. No more than two knobs per tile. Mainly copper-flecked glaze, some clear glazed. The glaze on these tiles is often a mere strip along the crest.

Finials. Wheelthrown finials with applied spikes, copper-flecked glaze. These fit into a flanged socket in the ridge tile (at least two finials are still to be seen on roofs in Hanley Castle, one on a building in the square next to the church and the other on a cottage next to the quay. Both buildings are timber-framed and probably 16th century).

Flat roof tiles. Made in a sanded mould. Nibbed at one end. Some glazed at one end, others completely unglazed. 15-20mm thick.

Bricks. Handmade bricks made in a sanded mould. 27-47mm thick.

LATE 'PINK' FABRIC.

Hardness: Hard

Colour: Oxidized yellow or reddish yellow (7.5YR 7/4) often with a brown slip.

Principal Inclusions: Sparse visible inclusions. Rare large angular fragments of acid igneous rock.

Clay Matrix: Sparse angular quartz and some rounded iron ore.

All vessels in this fabric can have a brown slip under a clear glaze.

Bowls. These vessels have a flat base and a carinated body. The upper part being straight-sided and vertical and the lower part conical. Externally thicken rims occur.

Large jars. Similar to those in the later wheelthrown fabric but without applied strip at the neck. The rim is either simple and rolled-out or can be infolded with an external cordon below the rim.

FLOOR TILE FABRIC

See Ch. 3.

Thin-sections: Floor tiles: 182-3, 349, 743, 1006-7.

Source: Malvern Chase. The Chase extended from Great Malvern in the north to Birtsmorton and Castlemorton in the south and was administered originally from Hanley Castle. The Chase was divided into three 'Walks', Cliffey and the Link to the north and Bruerne and Southwood Walk in the south. Documentary evidence for the industry normally does not distinguish the different areas but in the 16th century it is clear that the southern walk was the main centre of the industry. By the 16th century it is clear that it is the Manor of Hanley Castle that is the centre of the industry and it underwent a brief name-change to

'Potters Hanley' in the middle of the century. Archaeological evidence for the industry consists of two areas of potting waste; one at Gilberts End, and the other in a field just to the south of the road leading from Hanley Castle to Hanley Swan. The waste from the first site is mainly large globular jugs, of late 13th or 14th century date, whilst that from the second site is of 16th century date.

Dating and Distribution: The earliest context to produce early handmade cooking pots is at St. Johns Lane, Gloucester, where one rim was stratified in the construction trench of the precinct wall of St. Peters Abbey, c. 1107-14. The ware remains rare at Gloucester until the late 12th century but is more common at Stoke Orchard, Gloucestershire. At Hereford it forms c. 10% of early 12th century assemblages rising to c. 20% in the later 12th century (fig.2.52).

Early tripod pitchers are found in early 12th century contexts at Hereford, forming 2-3% of assemblages and are slightly more common in late 12th groups there. At Gloucester they are rare until the late 12th century. Other findspots of 12th Century Malvern Chase wares are Breinton and sites in South West Worcestershire, for example Worcester, Droitwich and Pershore (fig.2.57). At these sites, however, although the tripod pitchers are relatively common, the cooking pots are rarely found and instead Worcester vessels occur. It is not clear whether the tripod pitchers have a later starting date than the cooking pots, since sequences in S. W. Worcestershire are not closely datable and at both Hereford and Gloucester one would

expect to find more evidence for an early date for the cooking pots than the tripod pitchers because these vessels are more frequent.

'West country vessels' are rare and all examples have been found close to the Chase, for example Kempsey and Pershore. The Pershore vessel is stratified in a 12th century context and this is likely to be the date range of the type. The differential distribution of this type may help to elucidate the function of this form.

Later 12th and especially early to mid-13th century handmade cooking pots have a much wider distribution (fig.2.53) and are more common at Hereford and Gloucester than their 12th century predecessors. They are even found regularly at Chepstow (only one sherd was stratified but over 60 were found. All the rims found were of 13th century type, but including only one wheelthrown example) and Shrewsbury, where, again, although never forming a large proportion of the cooking pots used they occur in small quantities on several sites. Here too, mainly early to mid-13th century rims forms were most common.

Late tripod pitchers (and jugs) are found at this time, always associated with or later than Ham Green jugs. Some of the features of these vessels may be borrowed from Ham Green ware, for example bridge spouts and stabbed and slashed strap handles. They have the same rounded rectangular cross-section as the Ham Green handles, rather than the wide 'U' shape of contemporary Minety tripod pitcher handles. Three late tripod pitcher sherds were found at Chepstow but they are not yet recognised on other

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sites producing late handmade cooking pots. The type was not recognised when the collections of Hereford, Worcester, Hartlebury and Shrewsbury Museums were examined for this study (fig.2.58).

There is a definite decline in the distribution and frequency of Malvern Chase wares in the late 13th to 14th centuries, due partly to the decline in the number of cooking pots being used and the presence of several other glazed ware industries (figs.2.54, 2.60). In Herefordshire, wheelthrown cooking pots are found at Bredwardine in the upper Wye valley and on the kiln site at Weobley. (the latter vessels are definitely not Weobley products, although some have been refired and glaze-splashed in the kiln). The globular jugs however are not found in Hereford at all. At Gloucester both globular jugs and wheelthrown cooking pots are found. Dishes are rare but may be of late 13th or 14th century date.

Bulbous jugs probably started production in the 14th century, together with wheelthrown cooking pots or bowls and are found at Hereford and Gloucester but the overall quantity of Malvern Chase wares at Hereford is little different to that in the late 13th to 14th century, since there was a decline in the quantity of cooking pots used (25% to 13%).

Slip-decorated bulbous jugs are probably solely 14th century and are found at Broadway, Upton D.M.V., Hereford and Gloucester, where they may predate wheelthrown Minety wares, which start in the late 14th or 15th centuries.

The number of late 14th to 15th century groups from the region is very small but at Gloucester there is little difference in the frequency of Malvern Chase wares from the 14th century. The only difference in typology is the presence of simple everted rimmed pipkins, alongside wheelthrown cooking pots or bowl and bulbous jugs (figs.2.55, 2.61).

In the 15th century, post-dating the arrival of Tudor Green ware, again there are very few closed groups. At Gloucester it appears that bulbous jugs may have been replaced by Minety vessels but pipkins, skillets, cisterns, and conical bowls (with squared-off rims) are found. Malvern Chase wares form 39% of this assemblage (but include 34 possibly residual jug sherds).

Other forms are probably also 15th century, for example lobed cups although no stratified examples are known. The Wyre Piddle Hoard, deposited c.1470, was found in the base of a small Malvern Chase jug or bottle (Archibald, 1970).

An early 16th century group from Gloucester is very similar to those of the 15th century, except that all of the pipkin rims had thumbed necks. Copper-flecked glaze was still in use. The proportion of Malvern Chase wares was slightly higher, c. 40%. Chafing dishes have also been found in early 16th century contexts.

One other late 15th to early 16th century group containing mainly Malvern Chase coarsewares is at Bristol Greyfriars (c. 1500-1530's).

By the mid- 16th century (associated with Cologne and Frechen stoneware) copper-flecked glaze was out of use. Vessels of this date are often fired to a higher

temperature (giving a 'fried' glaze appearing yellow and brown). There are two large groups of this date at Gloucester and one at Hereford. In all three the main forms found are large jars, late bulbous jugs and conical bowls with inturned rims. Chafing dishes, small jugs or bottles and oval dripping pans are also found. The proportion of Malvern Chase wares in these groups is very high. They are virtually the only coarseware found alongside Tudor Green ware, Cistercian wares and imported stoneware.

Conical bowls and large jars are characteristic of many of the less well stratified groups of Malvern Chase ware. They range from as far north as Birmingham to the South Welsh coast. The South Welsh trade may have started in the late 15th or early 16th century since some vessels are stratified at Chepstow in pre-dissolution contexts including a conical bowl or skillet rim and the base of a cup (fig.2.62).

Vessels in the late 'pink' fabric first occur in the very late 16th or early 17th century. A large group from Lower Quay Street, Gloucester appears to be a merchants stock of unused vessels and includes 'pink' fabric bowls and large jars together with late bulbous jugs, conical bowls and large jars in the 'standard' fabric. It is very likely therefore that the 'pink' fabric is contemporary with the latest use of the 'standard' fabric, rather than superseding it. Elsewhere, at Gloucester and at Hereford, the proportion of Malvern Chase wares found in assemblages is much lower than in the late 16th century and the distribution of 'pink' fabric vessels suggests that the

market area of Malvern Chase ware had shrunk back to South-West Worcestershire and the neighbouring parts of Herefordshire and Gloucestershire (fig.2.63).

Bibliography: Vince (1977a, 1977b, 1979a, and forthcoming a, d, e, f) and Morris (1980). Vince (1977a) has a full gazetteer and bibliography up to c. 1975.

COMMON NAME: Worcester-type Wares.

Hardness: Soft to hard

Colour: Club rimmed cooking pots black. Everted rimmed cooking pots have black or grey cores with reduced (7.5YR 4/2) or oxidized surfaces (10YR 5/4), jugs reduced light grey with an oxidized brown or reddish yellow interior surface (7.5YR 5/4 or 5YR 6/6). Refires red (2. 5YR4/6 to 5/6).

Principal Inclusions: A medium-grained sand, moderate to abundant inclusions of rounded and subangular quartz, rounded brown chert and silicious sandstone with amorphous inclusions, all up to 1. 0mm. The quantity of inclusions varies from type to type. Club rimmed cooking pots often have abundant inclusions whilst everted rimmed cooking pots and some jugs have moderate inclusions and some jugs have sparse to moderate inclusions. Sparse rounded sandstone inclusions, rarely up to 4.0mm across are found in cooking pots more frequently than jugs.

Clay Matrix: Sparse angular quartz and white mica up to 0.1mm.

Thin-sections: Cooking pots Droitwich; M686-7. Gloucester; M195, M328, M980. Hereford; M495-9. Solihull; M630, Worcester; M1-4. Jugs Chepstow; M819, Gloucester; M175.

Hereford; M500-1. Shrewsbury; M539. Weoley Castle: M624. Worcester; M167.

Ridge tiles. Gloucester; M185. Worcester; M1084-6, M1089.

Flat roof tiles. Worcester; M1087-8.

Source: Worcester. Distribution evidence points to the Worcester area for both the cooking pot and jug sources and late 12th century documentary evidence indicates potters working in the suburbs and paying rent in pots to the Bishop of Worcester, c.1187 (Hollings, 1950, 32 and 37). The only archaeological evidence is a single jug waster from Broad Street, Worcester which consists of the handles and parts of the bodies of two jugs stuck together with glaze. A single waster could easily have come into the town with packing and does not indicate the location of the kilns.

Forms: (fig.2.64) Club rimmed cooking pots. Cylindrical squat handmade vessels with sagging bases.

Everted -rimmed cooking pots. Similar form to the club-rimmed vessels but often thinner. Everted rims are always thickened, and are usually flat-topped. Most examples have rotary smoothing.

Wheelthrown everted-rimmed cooking pots. A similar profile to the handmade examples but sometimes with an internal glaze and roller-stamped decoration.

Jugs. Wheelthrown vessels with sagging bases with thumbed frills. The rims are either plain flat-topped or have a slight moulding below the rim. Externally thickened rims are found but are not common. Thin strap handles are usual (rounded rectangular cross-section) and have stabbed decoration. Rod handles are found but are uncommon. Bridge

spouts are typical and can be stabbed at the body join. Most vessels are roller-stamped and a large number of stamps is known. The most common patterns are chevrons, squares, rectangles and diamonds whilst more complex patterns occur infrequently, for example raised circles, alternating shields or fleur-de-lys. Applied decoration, either simple lines or more complex flowers or figures, is rare but does occur over roller-stamping. White slip is often found around the inside of the rim and the vessels have a thick glossy copper-flecked green glaze.

Globular cooking pots. Wheelthrown, thin-walled vessels with a small flat-topped or lid-seated rim. Decorated externally with roller-stamping and copper-flecked glaze.

Dripping Dishes. Slab-built vessels with knife-trimmed exteriors and copper-flecked glaze. Probably, but not definitely, oval in plan. Coated externally with soot.

Water pipe. One wheelthrown example from Hereford with an external copper-flecked glaze and an unglazed flange.

Ridge tiles. Copper-flecked glaze decorated with tall curving knobs. These knobs are pushed well into the body of the tile, unlike those of Malvern Chase tiles, which are much smaller.

Dating and Distribution: Club rimmed and everted rimmed cooking pots first occur in late 11th to early 12th century contexts at Hereford, Worcester and Droitwich and at both Hereford and Droitwich form small proportions of the assemblages. At Hampton Wafer, club-rimmed cooking pots were the only type found in the earliest phase of occupation and were present in an assemblage sealed by the

village bank at Richards Castle. The club-rimmed form probably di sappeared early in the 12th century and is not, for example, found at Gloucester. The proportion of Worcester type cooking pots increased at all sites during the 12th century and at Worcester several large assemblages contained only Worcester-type cooking pots and Malvern Chase early tripod pitchers (fig.2.65). At Hereford, the cooking pots formed c. 12% of early and late 12th century assemblages but declined in frequency early in the 13th century. At Gloucester, the cooking pots are infrequent 12th and early 13th century finds but wheelthrown everted rimmed cooking pots are perhaps slightly more common in the mid-late 13th century, contemporary with the jugs (fig.2.66).

The glazed wares are used in this study to define the begining of the mid-13th century (perhaps c. 1220) and consistently occur later than Ham Green 'B' jugs (although probably not much later). Their greatest frequency is found at the same time as the floruit of Ham Green Ware, probably the mid- to late 13th century, although they are still found at both Hereford and Gloucester associated with late 13th to 14th century glazed wares. Morris suggests that the industry continued well into the 14th century but it had clearly ceased to market pottery outside of Worcester by that date (Morris, 1980).

Of the glazed wares, only the jugs are common. These are found over much of Herefordshire and Worcestershire as far north as Weoley Castle (now in a suburb of Birmingham). At that site there was only one Worcester jug sherd in a sample of over 200 sherds. Elsewhere on the borders of the

distribution the relative frequency of the ware is not known, since it is not known how many of the other wares at the sites are contemporary. Worcester jugs are found in Shrewsbury, the only site in Shropshire to produce them, and, like the contemporary Malvern Chase imports, form a small but regular element in assemblages.

To the south, Worcester wares are found at sites in the middle Wye Valley, between Monmouth and Ross-on-wye, where Malvern Chase vessels are rare. Jugs from Hen Gwrt in northern Gwent probably arrived via Monmouth. In the Severn Valley, south of Gloucester there are few findspots, probably because of competition from Ham Green Wares, although four jug sherds and one wheelthrown, everted rimmed cooking pot were found at Chepstow. These form a very small proportion of the contemporary pottery. One jug sherd was stratified (site XI phase 2). Another jug was found at Loughor Castle in the same deposit as a complete Minety late tripod pitcher. To the south-east, Worcester ware (both cooking pots and jugs) is common at Upton D.M.V. (frequency unknown) but is absent from Cirencester and other sites east of the Cotswold scarp. The ridge tiles have a more restricted distribution and are common at Worcester, Droitwich (possibly in the late 12th century) and Pershore. They are found at Gloucester, where they are probably the second type used, after Gloucester TF89 but before the introduction of Malvern Chase and Hereford A7b ridge tiles. By the 15th century there is documentary evidence that Worcester was a major tile-making centre but from this evidence it seems that the ridge tiles, like the

pottery, are essentially only of 13th century date. The later industry was probably producing flat unglazed tiles to be used with Malvern Chase ridge tiles.

Bibliography: Barton (1967b), Morris (1980), Vince (1977b, 1979a, forthcoming a, d, e & f).

COMMON NAME: Late Worcester Sandy Ware.

Hardness: Hard

Colour: Oxidized with a dark green glaze.

Principal Inclusions: Abundant fine rounded quartz and larger fragments of sandstone.

Clay Matrix: -

Thin-sections: Hereford; M521. Worcester; M699.

Source: Unknown.
Forms: (fig.2.64)

Tygs. A flat based vessel with acute base angle and flaring body. Three oval handles. Wheelthrown grooves below the rim. Internal and External glaze.

Tankards. Cylindrical vessels with oval handle and wheelthrown grooves below the rim. Internal and external glaze.

Dating and Distribution: (fig.2.68) Found in an early 17th century context at Worcester, Sidbury. One unstratified tyg from Hereford.

Bibliography: Morris (1980), Vince (forthcoming a)

COMMON NAME: Kidderminster-type Ware

Hardness: hard

Colour: Oxidized red

Principal Inclusions: Rounded and subangular quartz sand and white mica flakes.

Clay Matrix: -

Thin-sections: Not sectioned.

Source: Unknown. Kidderminster area. Sand and clay samples from Kidderminster produced a very similar looking fabric (thin-sections: M692-3).

Forms: (not illustrated)

Conical bowls. Wheelthrown, clear glazed vessels with inturned rims.

Dating and Distribution: (fig.2.69) Found only at Caldwell Hall, Kidderminster (unstratified?). On analogy with Malvern Chase ware these vessels should be 16th Century.

Bibliography: -

WILTSHIRE WARES

Common Name: Ashton Keynes Ware.

Hardness: Hard

Colour: Oxidized red (5YR 5/8)

Principal Inclusions: Sparse red sandstone and iron ore and white, heat-altered limestone, all up to 10mm.

Clay Matrix: Abundant angular or subangular quartz and sparse chert or flint and plagioclase felspar 0.1 to 0.2mm across. Smaller than 0.1mm there are few inclusions except sparse quartz and white mica c. 0.02mm.

Thin-sections: Hollow wares. Ashton Keynes kiln waste; M794-7. Cirencester; M754. Gloucester; M301, M304.

Ridge tiles. Ashton Keynes; M798.

Source: Ashton Keynes. Waste heaps and kiln bases have been found at Kent End. Potters are documented in the village during the 18th century, including members of the Champlin family, one of whom, Giles, was also a pipemaker and had a brother who was also a pipemaker in Malmesbury (pers. comm.

A. Peacey).

Forms: (fig.2.70)

Jugs. Wheelthrown, externally clear glazed vessels with wheelthrown combing.

The jugs are the only externally glazed form. The remainder all have a glossy internal lead glaze.

Large conical bowls. These bowls have wide flanges, a wide pulled spout and knife-trimmed bases.

Conical bowls. Moulded rims and straight sides.

Flanged Bowls. with flat topped rims.

Jars. Wide mouths, everted rims and oval handles. Wheelthrown lines on the outside of the rims and shoulder. Some have a foot-ring base.

Deep bowls. with moulded rims.

Large deep bowls. with thumbed strip below the rim.

Small curved wall bowls. with moulded rims.

Tankards. Cylindrical with external glaze and oval handle and moulded foot-ring base.

Ridge tiles. Thick, glazed with no crests.

The following Forms are probably all eighteenth century or later but are recorded here for completeness:

Tall straight-sided bowls. With wheelthrown grooves below the rim, vertical sides.

Shallow Straight-sided bowls. The side of these vessels are outward sloping.

Curved wall bowls. Oval handles, wheelthrown grooves below the rim.

Skillets. Curved wall bowls with added feet, horizontal handle and pulled spout.

Large Plates. These vessels have a wide flat flange, often roller-stamped.

Flowerpots. Unglazed with holes at the base angle. Hooked over rims.

Collander.

Wide mouthed jug. Oval handle and pulled spout, internal glaze.

Lid. Externally glazed with a flange and horizontal loop handle.

Bipartite bowl. A flanged bowl with a central division.

Stove tiles. Glazed tiles with wire-made holes and knife-cut scops on the underside.

Dating and Distribution: (fig.2.71) First found at Gloucester in the early to mid-16th century (pre-1540's, a flat based jug). Late 16th century groups at Gloucester contain both jugs and large conical bowls but there is a change in both typology and frequency c. 1600 after which the ware forms an almost constant c. 10% of the pottery found in the town. Virtually all of the forms listed above occur in early to mid-17th century contexts, for example at the Northgate and Eastgate sites.

The only 16th century Ashton Keynes ware recognised is from Gloucester and Cirencester. The remaining findspots are of undifferentiated 17th and 18th century material (since few sherds can be readily assigned to a century). There is probably little difference in the distribution of the ware between the two centuries. Only the North-western part of the distribution pattern is clearly defined and there is a sharp fall-off along the Cotswold scarp.

Gloucestershire: Broadway, Cirencester, Cheltenham,

Frocester, Gloucester, Hailes Abbey, Stanton, Stow-on-the-Wold, Tewkesbury, Winchcombe.

Hereford and Worcester : Pershore.

Wiltshire: Blunsden, Highworth, Inglsham, Lydiard Tregoze, Swindon.

Bibliography: Vince (forthcoming f), Musty, A. (forthcoming).

COMMON NAME: Bath Fabric A.

Hardness: Soft to hard

Colour: Light grey to black (10YR 7/1 to 3/1) often varying within the sherd. Sometimes oxidized surfaces. Refires red (2. 5YR 4/6)

Principal Inclusions: Moderate rounded clear, milky and red-stained quartz, often with a polished surface, up to 2.0mm across. Sparse rounded red iron ore, rounded limestone, possibly chalk, (and voids of the same shape) and rounded clay pellets, all up to 2.0mm. Angular fragments of white chert or sometimes flint occur and are sometimes moderate. Rare burnt-out organic temper voids surrounded by a black stain.

Clay Matrix: Abundant angular quartz and a variable quantity of white mica up to 0.1mm.

Thin-sections: Barry Island; M234-5. Bath?; M70. Bath; M358. Box; M71, M76. Bristol; M295. Chalcombe; M49. Chepstow; M151, M854, M880. Droitwich; M684-5. Gloucester; M387, M984. Laugharne; M255. Merthyr Mawr; M675. Silbury Hill; M1189, M1192-3.

Source: Within this fabric group there are numerous variations in the relative frequencies of inclusions. Some

of these are undoubtedly chronological differences; for example the earliest sherds from Bath Citizen House were much coarser and with more frequent limestone inclusions than the later ones, which often had no limestone at all. Other variations may well reflect different sources. The 'core area' of the distribution is along the Somerset, Avon and Wiltshire border and it is in this area that the source or sources must lie. The fabric does not contain any petrologically unusual minerals or rocks but could be derived from the Gault clay which is described in this area as " a silty micaceous clay, yellowish near the base, lilac coloured higher up and grey and sandy at the top" (Chatwin, 1960, 52). A clay sample from the 'head' overlying the Gault at Crockerton, Wilts. produced a fabric quite similar to Bath Fabric A but with a higher proportion of quartz silt and more chert fragments. The distinctive polished rounded quartz seems to be characteristic of the greensand, which outcrops in the same area as the gault clay. A narrow band running north-south through Wiltshire must therefore be the source of the clays used in these wares.

The fabric of post-medieval Crockerton ware is similar to the matrix of Bath Fabric A but contains a higher proportion of rounded iron ore (probably altered glauconite). Medieval pottery production is documented at Crockerton during the early 13th century and, by implication, the late 12th century (Le Patourel 1968). The name of the hamlet at Crockerton, which is in the parish of Longbridge Deverill, is first recorded in 1249 (Gower et

al., 1939, 166). There is abundant evidence for continuation of the industry into the second half of the 13th century such as the potter surnames Richard le Poter, 1252, John Le Crocker, 1268, and Stephen Le Crokker, 1282 (Gower et al., 1939, 166). There is also documentary evidence for pottery production in Westbury in the late 11th century (Domesday Book) and place-name evidence for the production of pottery at Potterne, the first element of which is apparently derived from 'Building for pots or where pots were made' (Gower et al., 1939, 244). Pottery was produced at Nash Hill, Lacock in the late 13th century and the cooking pots produced there have a general similarity to Bath Fabric A, although they contain more quartz sand and little or no chert.

Forms: (fig.2.72)

Cooking Pots. Squat, handmade vessels with curving walls and everted rims. The top halves of the vessels have been rotary smoothed. Rim forms vary from rounded vertical or everted types to everted forms with flattened tops and external thickening. The lower parts of the exterior are often knife-trimmed.

Spouted pitchers. Similar form to the cooking pots, mainly with simple rounded rims. The vessels are stamped on the shoulder. The most common stamps being a 'grid' and a 'wheel'. Tubular spouts are found and rectangular handles. These vessels are usually in a limestone-tempered fabric, from which the internal inclusions have been leached.

'West country vessels'

Bowls. Curving walls and an everted rim.

Lamp. Single shell lamp.

Dating and Distribution: Bath Fabric A cooking pot sherds have been found in 10th to 11th century contexts at Citizen House, Bath, and at Trowbridge Castle. They have been found in early 11th century contexts at Bath and Silbury Hill. The latter vessels have the same form and appearance as those dating to the 11th to 12th century (fig.2.73).

Late 11th or early 12th century examples come from Bath, Chepstow, Gloucester, Ewen and Droitwich. It is likely that most of the other Severn Valley finds are of this date whilst those along the South Welsh Coast are mainly late 12th to 13th century. At Bath and at Trowbridge Castle, the relative frequency of Bath Fabric A vessels increased in the 12th century, at the expense of what were probably more local wares. The ware first reached Cheddar in the early 12th century, Cheddar Fabric J, and a distinctly micaceous variant first appears in the Salisbury area in the mid-12th century (Musty et al. 1969, 189). In the Avon valley, Bath Fabric A is the most common cooking pot ware as far west as Keynsham and Saltford but is not common in Bristol (fig.2.74).

A large area of western Wiltshire and Somerset was supplied during the 12th to 13th centuries by one source or several sources producing similar wares. One of these sources should be Crockerton, near Warminster (see below, Crockerton Wares).

The spouted pitchers, 'west country vessels' and lamp have all been found in 11th and 12th century contexts, and only the 'west country vessels' have been found on South Welsh sites and may therefore continue later, into the late

12th to 13th centuries (fig.2.75).

At Cheddar in the early 13th century Bath Fabric A cooking pots are the most common type while at Barrow Mead on a site occupied throughout the late 13th to 14th centuries Bath Fabric A cooking pots were almost the only cooking pot type present (fig.2.76).

The end of production of Bath Fabric A ware is difficult to establish in the absence of stratified groups of late medieval date. At Barrow Mead a late 14th century token was found in a hearth of a building from which large quantities of Bath Fabric A was recovered.

At Cheddar Palace, Chew Valley Lake and Budbury, in Bradford-on-Avon, wheelthrown micaceous bowls are found which might have been made in the same area of west Wiltshire. These bowls, however, are quite distinct in fabric from Bath Fabric A and have much less quartz sand temper.

Bibliography: Vince (1979b), Musty et al. (1969), Rahtz (1979), Woodhouse (1976).

COMMON NAME: Box Fabric B

Hardness: hard

Colour: reduced with oxidized reddish yellow surfaces (5YR 6/6) refires to red (2.5YR 5/8).

Principal Inclusions: Two distinct fabrics are found; one used to make cooking pots and the other tripod pitchers. In the glazed ware the main inclusions are limestone and oolitic iron ore. The limestone includes fossiliferous

fragments, oolitic limestone with a sparry matrix, white microfossils and calcite. The iron ore is mainly oolitic but includes some fragments with quartz inclusions. The limestone fragments can be up to 3.0mm across whilst the iron ore is usually less than 1.0mm.

The cooking pot fabric contains the same inclusions with added quartz sand. Clear and red, polished quartz grains up to 1.0mm across are moderate and larger grains up to 2.0mm are sparse. Sparse inclusions of red chert and red sandstone (containing quartz, felspar, and white mica) are also found.

Clay Matrix: Sparse angular quartz and white mica.

Thin-sections: Bath; M361-2. Box; M72-3. Chepstow; M884-6.

Source: The cooking pots and tripod pitchers probably come from the same source and the differences between the two are probably due to the addition of sand tempering to the cooking pots. The limestone and iron ore are of Jurassic origin (the limestone, for example is similar to that in Minety-type ware) whereas polished quartz tends to come from the Greensand or other cretaceous measures. Distribution evidence points to a source in central West Wiltshire.

Forms: (fig.2.77)

Cooking Pots. Handmade squat pots with curving walls and slightly sagging bases. Two rim forms found at Box, plain everted and '[illegible]' shaped, thickened inside and out.

Tripod Pitchers. Handmade vessels very similar to Minety examples. Features found include tubular spouts, with a thumbed strip at the neck, and handles made from two twisted strands of clay with a third wrapped around them

(in the Minety examples the handles usually have untwisted strands).

'West country vessel' One example from Great Somerford with an everted, thickened rim.

Date and Distribution: (fig.2.78) Although not the most common fabric at any site yet found, the highest proportion of Box B comes from Box itself. Some of the vessels found were stratified in a probably 12th century group. The remaining find spots for the cooking pots are Bath (very rare), Bradford-on-Avon, Potterne, Lacock and Great Somerford (much less frequent than Gt. Somerford type ware). The tripod pitchers have been found at Bath (fabric H, in 12th century contexts), Box and Chepstow (fabric LE, only four sherds found, one in a 12th century context and one in an early 13th century context).

Bibliography: Vince (1979b and forthcoming e)

COMMON NAME: Cheddar Fabric E

Hardness: Soft to hard

Colour: Reduced core with oxidized reddish-yellow margins and surfaces (5YR 6/6)

Principal Inclusions: Moderate ill-sorted rounded inclusions of clear, milky and red quartz up to 2.0mm across, red iron ore and rounded voids (limestone?) up to 1.0mm across. Sparse inclusions of white and red sandstone up to 01.0mm and a silicified sandstone with clear quartz and opaque (iron or glauconite?) inclusions in a microcrystalline silica matrix.

Clay Matrix: Very fine. A little white mica but very little quartz.

Thin-sections: Bath?; M69. Bath; M357. Boreham; M732, M733. Cheddar; see Peacock (1979). Trowbridge; M1217.

Source: Unknown. The most distinctive inclusion type is the sandstone with a microcrystalline silicious matrix. This could be formed by induration of a cretaceous glauconitic sandstone. Distribution evidence suggests that Trowbridge and Avebury are on the northern borders of the distribution area but insufficient sites are present to locate the source any more precisely at present.

Forms: (fig.2.79)

Cooking pots. Small wheelthrown or rotary smoothed vessels, probably with a squat profile. The method of manufacture may accord with that suggested for Ipswich ware, handforming with a finishing stage on a tournette. Steeply sagging bases and curved walls, which are often quite thick, c.6-7mm. Rims are rounded and everted.

Date and Distribution: (fig.2.80) Dated from the mid-10th to early 11th century at Cheddar on coin evidence. No better dating evidence is found at the other findspots. At Cheddar the ware is found alone but at Bath, Trowbridge and possibly at Avebury it is associated with other wares, to which a 10th to 11th century date has therefore been applied (see Ch. 6). The remaining occurrences are all unstratified. Avon; Bath, Saltford. Somerset; Cheddar. Wiltshire; Avebury, Box, Boreham, Potterne, Marten, Stonehenge, Trowbridge, Wilton.

Bibliography: Peacock (1979), Rahtz (1974, 1979)

COMMON NAME: Chepstow Fabric LF

Hardness: Hard

Colour: Reduced light grey with an oxidized light yellowish brown outer surface (10YR 6/4). Refires to red (2.5YR 5/8).

Principal Inclusions: Moderate angular and subangular quartz up to 0.7mm across, porous brown-stained chert with very irregular outlines, angular fragments of sandstone with subangular quartz grains up to 0.3mm in a brown silica matrix and dense red clay pellets.

Clay Matrix: Sparse very fine angular quartz up to 0.02mm.

Thin-sections: Chepstow; M887, M925.

Source: Unknown but probably West Country rather than S. Wales. This may, in fact, be the same ware as the tripod pitchers found in Ilchester and the S. W. to Exeter, but the fabrics have not been compared.

Forms: (not illustrated)

Tripod Pitchers. Only clear glazed, handmade body sherds are known.

Date and Distribution: (fig.2.81) Two sherds from Chepstow site VI (F2 and L2) and some recognised from Bath (after their publication as 'Glazed Bath Fabric A').

Bibliography: Vince (forthcoming e)

COMMON NAME: Cirencester-type Ware

Hardness: Soft to hard

Colour: Usually yellowish red (5YR 5/6) to red (2.5YR 5/6) with a grey or brown core.

Principal Inclusions: Moderate to abundant rounded limestone fragments, mainly up to 2.0mm across but sometimes up to 8.0mm. In thin-section the limestone

sometimes up to 8.0mm. In thin-section the limestone consists of shell and algal or oolitic pellets in a sparry calcite matrix. Few fragments under 0.1mm occur. Rounded red iron ore fragments up to 3.0mm across are sparse.

Clay Matrix: Anisotropic, moderate angular quartz up to 0.1mm.

Thin-sections: Cirencester; M744-747.

Source: The ware is quite similar to that of Minety-type ware but has a higher iron content in the clay and has a different matrix (no small limestone fragments but angular quartz). Iron ore is also not common in Minety ware. However, a source in the same area is likely since the two sites with large quantities of this ware are at Cirencester and Ewen.

Forms: (fig.2.82)

Cooking Pots. Globular vessels. Handmade but rotary finished, sagging bases with an obtuse base angle. A few examples have glaze on the inside of the rim.

Large Bowl. Curving walled, handmade vessel with everted rim.

'West country vessel'. Handmade.

Tripod Pitcher. Handmade, clear glazed.

Dripping Dish. Slab-built with a rectangular plan, and soot-coated exterior.

Jugs. Wheelthrown, clear glazed vessels.

Date and Distribution: (fig.2.83) At Ewen this ware is associated with Bath Fabric A cooking pots and no glazed wares. A late 11th or early 12th century date is therefore likely. At St. Johns Hospital, Cirencester, it is the most frequent ware in a small group stratified in the

construction levels of the 12th century Hospital (including a pitcher sherd) and likewise is the most common ware in the construction levels of Cirencester Abbey (C. Ireland and D. Wilkinson, pers. comm.). Of the minor forms, none are stratified but the large bowl and 'west country vessel' should be 12th or 13th century whilst the dripping pan and jug should be at least early 13th century, and on analogy with Minety ware probably late 13th century or later. By this date most of the pottery found in Cirencester is Minety ware.

Cirencester-type ware has been tentatively identified at Alton Barnes, Blunsden, Cricklade, Great Somerford, Highworth, Swindon, and Wooton Bassett, all of which are in north Wiltshire.

Bibliography: Vince (forthcoming c), Ireland (forthcoming b).

COMMON NAME: Crockerton wares

Crockerton is known to be a potting community from the late 12th century to the late 13th century, and there is archaeological evidence for post-medieval pottery production. There is, however, great difficulty in isolating any Medieval Crockerton wares (which presumably include vessels treated here as 'Bath Fabric A'). A Late Medieval glazed ware is tentatively identified as a Crockerton product and the post-medieval redware is known from a sample collected from Crockerton personally. No examples of the ?late 16th century kiln waste found by Algar have been examined.

Medieval Glazed ware.

Hardness: Hard.

Colour: Oxidized with a reduced core.

Principal Inclusions: Sparse fragments of chert.

Clay Matrix: Abundant, ill-sorted angular to subangular quartz fragments, white mica and iron ore in an anisotropic clay matrix.

Thin-sections: Warminster; M1208, Newbury (Newbury fabric 47); M1175.

Source: Probably Crockerton. The ware is the most common glazed ware in a late medieval assemblage from Warminster.

Forms: (not illustrated)

Jugs. Wheelthrown, clear glazed.

Date and Distribution: Possible examples from the Orange Grove site in Bath, Warminster, Salisbury, Newbury (one sherd only), and Trowbridge Castle. The description of some of the late 14th to 15th century vessels from Budbury suggests that it may be a common ware at that site. At Trowbridge the ware was stratified in a late 15th to early 16th century assemblage, associated with Raeren Stoneware.

Bibliography: Smith, R. (forthcoming a).

Post-Medieval Crockerton ware.

Hardness: Hard

Colour: Oxidized

Principal Inclusions: Sparse rounded iron ore fragments (altered glauconite?) up to 0.4mm.

Clay Matrix: Abundant poorly sorted angular and subangular quartz, white mica flakes and partially altered glauconite (mainly brown, isotropic but some completely opaque) all up to 0.2mm.

Thin-sections: Crockerton waste; M1034-1038.

Source: Crockerton. The samples were taken from a deposit of broken pot sherds, including obvious pot waste, revealed in the side of a path in the present village. Algar excavated the site of a kiln in 1967, which he dated to the late 16th century. This was a single-flued circular structure with a central sandstone plinth. Fire-bars bridged the gap between the plinth and the kiln walls.

Forms: (not illustrated)

Algar lists the following products of the 1967 kiln - large pans, wide-mouthed jugs, rectangular 'meat dishes', floor and ridge tiles.

Date and Distribution: No attempt has been made to plot the distribution of this ware, which, although distinctive in thin-section because of the the high quantity of rounded iron ore, is easily confused visually with South Somerset and Wanstrow wares.

Bibliography: Hurst (ed. 1968), 187 fig.61

COMMON NAME: Langley Burrell ware.

Hardness: Soft to hard.

Colour: Mainly reduced with oxidized surfaces but some completely oxidized reddish yellow (5YR 6/6).

Principal Inclusions: Sparse rounded quartz c.0.2mm to 0.4mm or more rarely up to 0.6mm across, angular iron ore up to 1.0mm and dark brown clay pellets up to 1.2mm.

Clay Matrix: Abundant angular grains and sparse white mica up to 0.1mm.

Thin-sections: Langley Burrell; M799-803.

Source: Langley Burrell, near Chippenham. Two kilns have

been found at the site by R. Wilcox.

Forms: (not illustrated)

Cisterns. Wheelthrown vessels with sparse glaze and bung holes.

Jugs. Wheelthrown, strap-handled vessels with plain, sagging bases.

Conical Bowls. With flanged rims.

Date and Distribution: (fig.2.84) On analogy with the near-by industry at Minety, a late 15th to early 16th century date might be suggested for Langley Burrell. All the forms present at Langley Burrell were, however, being made in Coarse Border ware by the late 14th century and a mid-late 14th century archaeomagnetic date has been obtained from the earlier kiln (A. Musty, pers. comm.). Only one late 15th to 16th century group has been excavated in Wiltshire, at Trowbridge Castle, and no Langley Burrell wares were present. An unstratified bung-hole from a Langley Burrell cistern was found at Wooton Bassett but no other unstratified examples have been seen.

Bibliography: Wilcox (forthcoming).

COMMON NAME: Minety ware.

Hardness: Hard

Colour: The tripod pitchers are either oxidized very pale brown (10YR 7/4) with a dark grey core (10YR 4/1) or have reduced light grey surfaces (7.5YR 5/0). Later wheelthrown wares are similar but the core is usually light grey and the oxidized margins thicker. Refires yellowish red and red (5YR 5/6 and 2.5YR 5/8)

Principal Inclusions: Abundant angular and rounded

fragments of limestone, often with a brown-stained surface. The limestone consists of fine-grained limestone, sometimes with brown-stained microfossils. Calcite and Oolitic limestone with a sparry matrix, angular chert or flint, burnt-out organic inclusions and shell fragments are rare. All inclusions are ill-sorted and mainly less than 1.0mm, although fragments up to 2.0mm occur. Sparse rounded quartz up to 0.4mm is found.

A variant fabric, found at the kiln site but not definitely produced there, contains a fine quartz and limestone temper and has not been examined in thin-section.

Clay Matrix: Moderate specks of limestone, sparse angular quartz and rounded iron ore up to 0.2mm.

Thin-sections: Barry Island; M230-3. Bath; M364-5. Bristol; M158, M296. Caerleon; M204, M208-9. Chepstow; M851-2. Dublin; M373. Flat Holm; M262. Gloucester; M177-8, M193. Hereford; M517. Kenfig; M227. Kidwelly; M269. Laugharne; M264. Llantwit Major; M246-7. Minety waste; M62-5. Winchcombe; M906, M908.

Source: Minety. A waste heap was excavated by Musty (1974) but collection of waste from this site began in the 1930's and is still continuing. Most material is housed at Swindon Museum. Further waste heaps have been identified by M. Stone of Swindon Museum. All of this waste is of wheelthrown wares, probably of late 15th century to early 16th century date, but the similarity in forms and fabric allows us to take the origin of the industry back to the late 13th to early 14th century, when the first wheelthrown wares are found. It is possible that the 12th to mid-13th century tripod pitchers are from another source but the

fabric is so similar that this source can only be a few miles, at the most, from Minety. Clay samples from Minety and Somerford Keynes produce an untempered fabric with very little quartz silt in the matrix and sparse inclusions of red iron ore, limestone and subangular quartz, all probably intrusive from the overlying soil. A sample from a stream bed at Ashton Keynes was heavily limestone-tempered, although the limestone was much coarser than that found in the pottery.

Musty states that Minety was at one time at the heart of the Forest of Braydon and that other production sites have been found elsewhere within the bounds of the Forest. The evidence for these sites being production sites is dubious. The collection in Devizes Museum from a 'kiln' at Hunts Mill, Wooton Bassett, contains examples of several different wares, including Minety ware. The bounds of the Forest of Braydon are shown in the Victoria County History (V.C.H. WILTS IV, 445).

Forms: (fig.2.85)

Tripod Pitchers. Handmade, probably by coiling, with a globular body and sagging base. Four distinct types are known, differing mainly in their spouts and handles.

The earliest type is best typified by an example from Winchcombe and is very large with two or three rod handles. Applied thumbed strips are found at the neck, the girth and form triangles in between. The base of this example is flat with a series of triangular sectioned strips radiating from the centre. The spout is tubular. No other large fragments of this form are known but applied thumbed strips and rod

handles may be characteristic of this form only.

The second type is smaller and has one handle, formed from two strips of clay wrapped around by a third strip and stabbed (abbreviated to 'complex handle'). A narrow tubular spout is found often secured to the rim by a strip of clay. Decoration consists of wide grooves around the neck, which were possibly added as part of the construction process, combing and applied triangular sectioned strips on the body. One common design consists of horizontal bands of straight and wavy combing on the shoulder and diagonal combed lines on the girth. There is no complete vessel on which to see the way that the applied strips were arranged, but they probably formed a diamond grid, in which the spaces between the strips were filled with combing.

The third type differs only in the handle, which is a wide, 'U' sectioned strap handle decorated with diagonal slashing.

The fourth type has the same handle as the third type but a simple pulled spout.

Handmade jugs. One complete profile is known of a jug with the same features as the type 4 tripod pitchers but with a thumbed base taking the place of the three feet. One bridge spout is known and may come from a similar vessel.

Storage jars. Two vessels are known with the same profile as the later tripod pitchers but with two opposed strap handles and no spout. One example, from Gloucester, is sufficiently complete to be certain that there was not a spout at right angles to the handles. This vessel is decorated with vertical combing.

Baluster Jugs. Wheelthrown with a flat base and acute base

angle. One example from Cirencester has a very wide base and a deep pulled spout (pulling out the whole rim of the vessel rather than making a pouring lip). Other Cirencester examples have applied strips decorated with nicking. Squared-off rims and strap handles are found.

Standard Jugs. These vessels have a cylindrical rim and a bulbous body. The neck angle is often quite sharp and emphasised by a cordon. Bases are either sagging with intermittent thumbing (on large vessels) or flat, sometimes with a foot-ring (on small vessels). Rims are squared-off and can have a cordon or thumbed band just below the rim. Slashed strap handles are the norm. Decoration is rare but can consist of horizontal bands of straight and wavy grooves. The clear glaze is often applied only as a bib.

Cooking Pots. There are two main types of cooking pot; handmade vessels and wheelthrown ones.

The handmade cooking pots have rotary smoothed rims, often sharply everted and a hook or undercut on the outside. They are globular with sagging bases and usually combed on the shoulder and sometimes on the inside of the rim. A thin glaze is often found on the inside of the rim, and more rarely the inside of the base and the external shoulder. This form was first described by Dunning in the Selsley Common report and it often known as 'Selsley Common ware'.

The wheelthrown vessels have a similar profile to the handmade ones but sometimes have a distinct ridge around the girth and are almost straight-sided below this. The typical rim form is sharply everted and quite short. Other

forms, for example everted with an internal bevel or everted, squared and lid-seated, are most common in the late 15th to 16th century and occur with wheelthrown straight and wavy grooving. Glaze is usually restricted to the inside of the rim.

One wheelthrown cooking pot from Cirencester has two opposed strap handles and applied thumbed strips, both vertically and around the girth.

Bowls. Wheelthrown curving walled vessels, somtimes with one or two strap handles. Internally glazed.

Flanged Bowls. These wheelthrown vessels have straight sides and a flat-topped flange, sometimes decorated with wavy combing. They are internally glazed.

Dripping Pans. Oval slab-built vessels with a pulled spout and internal glaze.

Cisterns. Wheelthrown vessels with a similar rim and shoulder to the later cooking pots, two opposed strap handles, a sagging base, three oval-sectioned feet and a bung hole. A complete example from Cirencester has a cordon around the girth. Some examples are lid-seated.

Curfews. Wheelthrown vessels with applied thumbed strips and strap handles. Both Glazed and unglazed examples are known.

Lids. Usually unglazed, flat-topped with flaring walls.

Chafing dish. One example, from Cirencester Abbey, internally and externally clear glazed, similar to Malvern Chase examples.

Double-shell lamp. One wheelthrown example from Gloucester.

Ridge tile. Clear glazed, sometimes combed with hand-formed crests with thumb impressions on either side. Some if not

all have an oval hole along the ridge.

Finial. Globular finial, possibly wheelthrown and luted on to a ridge tile. The finial has a hole in the side.

Date and Distribution: The earliest context to produce this ware is at Bristol Castle, where sherds of a tripod pitcher (probably type 2) were found in the filling of the Castle Ditch. This filling is thought to be deliberate prior to the construction of a stone keep over the ditch in c.1125 (M. Ponsford, pers. comm.). Elsewhere an early to mid-12th century starting date agrees with the evidence from Gloucester and Cirencester. It is possible that type 1 tripod pitchers are earlier, perhaps late 11th or early 12th century. Examples have been found at Winchcombe, Gloucester and Chepstow but not in well-dated contexts (fig.2.86). Type 3 and 4 tripod pitchers are probably early 13th century in origin and the majority of finds are of these types (especially type 4). This type reaches a maximum popularity in the mid-late 13th century, (ie. associated with Worcester jugs). Other forms of similar date are the handmade cooking pots, the two-handled storage jars and the dripping pans. Handmade jugs are uncommon but both the complete example and the bridge spout were found in Gloucester in mid-13th century contexts.

The early to mid- 13th century is probably the high point in the distribution of Minety ware (fig.2.87). The distribution map of tripod pitchers does not distinguish 12th from 13th century examples but where it is possible to check stratigraphically then examples west of the Severn are in 13th century contexts (with the exception of one

sherd from Chepstow). The distribution of contemporary handmade cooking pots is more limited. They are found only in North Wiltshire and the Stroud and Cirencester areas of Gloucestershire (fig.2.88).

The late 13th to early 14th centuries saw a retraction of the distribution area. Wheelthrown cooking pots were undoubtedly made at this time but are not found at all at Gloucester. They do occur at Bristol and at other sites in the Bristol area and this must be partly due to the absence of cooking pots as a regular part of the Bristol ware range of products (fig.2.90). Baluster jugs must be of this date but have only been noted at Cirencester (fig.2.89).

In the later 14th to 15th centuries the distribution of Minety ware increases again (figs.2.91, 2.92). Most unstratified wheelthrown jugs and wheelthrown cooking pots are probably of this date. With the exception of a single jug from Newport Castle, Gwent, all of the finds are from Wiltshire, Gloucestershire and Avon and the extreme south-west of Oxfordshire. All these are areas which could only be reached by land from Minety.

Most late 15th century to early 16th century forms are the same as those found in the late 14th to 15th centuries (fig.2.93). There are three exceptions: cisterns, which only occur at Gloucester in association with Tudor Green ware; flanged bowls, which do not occur at Gloucester at all, and the chafing dish. The distribution of these types differs. The cisterns occur over a similar area to the cooking pots and jugs and include one example from Wallingstones in S. W. Herefordshire. The flanged bowls on the other hand are found mainly in the immediate area

around Minety, for example Ashton Keynes, Oaksey, Cricklade and Highworth. There is one exception, from Devizes. The chafing dish is from Cirencester.

The evidence from Gloucester shows wheelthrown Minety wares first occurring in the late 14th to early 15th centuries and remaining at a fairly constant 30-40% of the pottery used until the early 16th century, which was presumably the end of the industry. The distribution of flanged bowls might show that this type was later except that Ashton Keynes ware probably began production in the early to mid-16th century and there is unlikely to have been much overlap between two industries so close together.
Bibliography: Musty (1973), Dunning (1949), Barton (1969a).

COMMON NAME: Nash Hill Ware

Hardness: Hard.

Colour: Reduced grey core with oxidized inner surfaces.

Principal inclusions: Abundant inclusions of clear and milky quartz, up to 1.0mm across. Many grains have polished surfaces and most retain a red haematite coating. Moderate angular and rounded fragments of iron ore. In thin-section many of these have quartz inclusions and therefore merge into a ferruginous sandstone, others have an oolitic structure. Large ferruginous sandstone fragments up to 3.0mm long are rare. They contain quartz grains up to 0.1mm across. Organic inclusions are rare and usually burnt out. Rounded clay pellets are visible by eye but not seen in thin-section. Chert is present as rare fragments up to 0.3mm across with brown mottling.

Mc Carthy identified two fabrics at Nash Hill, fabric A contains inclusions up to 1.0mm across while fabric B is smoother textured with inclusions up to 0.4mm across. The range of inclusions found, however, is identical.

The white slip used as a general cover on most jugs was not thin-sectioned but contains abundant quartz and sparse white mica.

Clay Matrix: Abundant quartz silt, mainly less than 0.02mm across.

Thin-sections: Nash Hill kilns; M118-120 (fabric A), M121-6 (fabric B). Bath; M359. Box; M79?

Source: The Nash Hill kilns were situated east of the River Avon between Lacock and Sandy Lane. There is documentary evidence for potters in the area in the late 13th century (Mc Carthy, 1974, 100-101). Excavations by M. Mc Carthy revealed four stratigraphically related kilns, phases 1 to 4. Phase 1 was a tile kiln, phases 2 and 3 pottery kilns and phase 4 another tile kiln. On stratigraphic evidence the phase 3 and 4 kilns could be contemporary.

Fieldwork by the Trowbridge Library and Museum Archaeology Department has shown that the area of potting activity is extensive and possibly covered a longer period of time than that represented in the excavation.

Forms: (all described in detail in Mc Carthy, 1974).

Bowls. Curved wall vessels with everted rims. Some internally glazed.

Wide Shallow Dishes. Internally glazed vessels.

Frying pans. Internally glazed with horizontal handles.

West Country vessels. Unglazed.

Bung-hole pitchers

Cooking pots. Squat vessels with a globular body, sagging base and everted or cylindrical rims, usually with some moulding.

Tripod vessels.

Jugs. These vessels vary from squat shaped to taller forms. The bases are flat or slightly sagging with thumb impressions. The handles are straps, rods or even of triangular section. Stamping and slashing are common decorative techniques. White slip was used extensively, for applied strips and pads, as painted lines or as an overall slip through which rough designs were scratched.

Lobed cups. Two examples were found at the kiln site, neither stratified. They are in an unusually fine fabric.

Ridge tiles.

Roof finials.

Decorated and plain floor tiles.

Dating and distribution: The date of the excavated kilns and their products is given by their relationship with the inlaid tile production. This is dated by Eames to the late 13th century. However, there is no reason why the industry should not have a much longer life. Evidence for an earlier origin is difficult to find. Nash Hill ware is not found, for example, at Bath, Citizen House, where early 13th century contexts were excavated. There is better evidence for the Nash Hill industry still being in operation at a much later date, notably the presence of bung-hole pitchers and lobed cups amongst the unstratified pottery found in the excavation. This should indicate that the Nash Hill industry survived at least into the late 14th century,

possibly into the late 15th to 16th century. Smith is of the opinion that a Nash Hill jug from Trowbridge Castle is contemporary with Raeren stoneware and other types of the early 16th century (Smith, R., forthcoming a).

The distribution of Nash Hill ware varies from type to type. The unglazed wares have only been identified at sites within 15 miles of the kiln site (fig.2.94). The internally glazed wheelthrown bowls and cooking pots have a similar distribution (fig.2.97) while the jugs and ridge tiles are found over a much wider area (figs.2.95, 2.96). Even these vessels do not travel as far as the floor tiles, some of which have been recognised as far away as Tintern Abbey and Gloucester, Blackfriars (see Ch.3).

Bibliography: Mc Carthy (1974), Eames (1974).

COMMON NAME: Newbury Group A

Hardness: Hard.

Colour: Very dark brown with black surfaces.

Principal inclusions: Moderate inclusions of angular light brown flint up to 3.0mm across. Subangular and rounded clear and milky quartz grains up to 1.0mm and sparse fine-grained limestone fragments up to 0.5mm.

Clay Matrix: Fine textured with sparse iron ore pellets, angular quartz and, rarely, white mica larger than 0.02mm across.

Thin-sections: Newbury; M1150-2, M1157, M1160. Silbury Hill; M1185-7, M1205.

Source: Unknown. Distribution evidence points to the Upper Kennet Valley and the apparent continuity of forms with Newbury group B may indicate a source on the northern

borders of Savernake Forest, the suggested source for the latter ware.

Forms: (fig.2.98)

Cooking Pots.

Dishes. Wide shallow handmade vessels.

Storage jars. Thick walled handmade vessels, some decorated with combed swags.

Dating and distribution: (fig.2.99) Newbury A cooking pots have been found at both Netherton (Netherton Fabric A7) and Silbury Hill in early 11th century contexts. At both sites the vessels were not common and these sites were peripheral to the 11th century distribution area. At Netherton the ware first appeared later than c.990 (J. Fairbrother, pers. comm.).

At Newbury, Bartholomew Street, Newbury A cooking pots and a few dishes were the main pottery types in use prior to the construction of the first houses on the site (period 1, pre-c.1080's). Newbury A remained the most common ware at Newbury throughout the early 12th century (period 2 phases a and b). The vessels in these periods were small everted rim cooking pots, some of which had thumbed decoration on the rim. In the mid-12th century there was a typological development in the ware, the cooking pots were larger and have thickened rims, also sometimes thumb-decorated, while storage jar sherds were found for the first time (period 2 phase c).

This is the latest phase at Newbury in which it is certain that Newbury A ware was current. From the late 12th century onwards there was a change from Newbury A to Newbury B vessels. Observation of this change is hampered

by some definitely residual pottery. Newbury A lamps are found in this phase, as are crude, handled cooking pots (period 3, phase a).

It is therefore possible to distinguish two phases in the typology of Newbury A vessels, the first lasting from the early 11th to the mid-12th century and the second being a brief phase in the mid-late 12th century. Most pottery cannot even be this closely dated, since it consists of body sherds.

Newbury A wares are present on sites in the Upper Kennet and Lambourn Valleys. The latter sites are represented by field scatters only and the total quantity of 12th century or earlier pottery from each is therefore small. However, Newbury A vessels form most of the 12th century pottery known. They are not present however at Reading and surrounding sites and are present but rare on sites in north Hampshire, although at Netherton the later types of Newbury A ware are the most common types in the early 12th century (Netherton Fabric P; J. Fairbrother, pers. comm.). A large fragment of a late cooking pot is present in a collection from Devizes Castle and a single sherd is known from a 12th century context at Gloucester North Gate (period 8A).

Bibliography: Vince (forthcoming b).

COMMON NAME: Newbury Group B

Hardness: Hard.

Colour: Usually reduced light grey, sometimes with oxidized surfaces. Sometimes black throughout.

Principal inclusions: Abundant inclusions of rounded clear

quartz, mainly up to 1.0mm across with a few fragments up to 3.0mm across. Moderate red and white angular flint fragments up to 4.0mm across. Rounded fragments of fine-grained limestone uo to 4.0mm across and sparse angular iron ore fragments up to 2.0mm across.

Clay Matrix: Anisotropic with sparse rounded iron ore fragments up to 0.1mm across.

Thin-sections: Cirencester; M742. Newbury; M1153, M1159, M1167.

Source: The distribution of this ware, although exceptionally large, is centred in east Wiltshire and west Berkshire, where some collections are found in which all of the pottery was of this fabric.

Within this area there is one reference to medieval pottery production, the placename of a locality just to the east of Marlborough. This was called 'Crockerestrope' (Thorp or hamlet of the crocker or maker of pots) in c.1257 (Gover et al.,1939, 301). A small hamlet of this name is shown on a 16th century copy of an early 14th century map of Savernake Forest (Cardigan, 1949, 54).

Forms: (fig.2.100)

Cooking Pots. Curved walled handmade vessels, typically with the widest point at the base. A series of complete profiles of this form shows that as the vessel increased in size the body became proportionally larger than the rim, so that estimation of vessel size from rim diameter would have been misleading. Rims are usually everted and thickened, some with thumbed decoration. A moderately common form of decoration is a row of 'dimples' around the shoulder.

Unglazed jugs. Handmade vessels with rounded bodies and a flaring rim. Most vessels are decorated on the upper half of the body and on the neck with combing and stabbed combing. Broad strap handles are found, most of which are heavily decorated by combing and stabbed combing. Some plainer examples are known.

Dishes. Wide shallow handmade dishes are common, usually undecorated. Some examples have decorated socketed handles.

Bowls. Large handmade bowls with everted rims. Most are decorated with combing. Examples of this form from Netherton appear to have been used as curfews (Fairbrother, pers. comm.).

Curfew. One thick-walled body sherd from Newbury has external decoration covering a change of angle. It may be part of a curfew.

'Chimneys'. Two examples of cylindrical handmade vessels pierced with holes, c.10mm diameter. Dunning has published them as chimneys but one at least seems too narrow and neither has any internal sooting or traces of mortar (Dunning, 1961 b).

Cisterns. Bung holes are rare in Newbury B ware and yet two complete cisterns have been found, one at Churchill, Oxfordshire, and the other at Netherton, Hampshire. Both vessels have the same shape body as the cooking pots, with combed decoration but are much larger than any cooking pot. They do not have handles, feet or a lid-seated rim and are therefore not typologically very similar to the late medieval to Tudor cisterns in Malvern Chase, Minety or Coarse Border ware.

Dating and distribution: (fig.2.101) Newbury B vessels were

first found at Netherton c.1160 (Netherton Fabric D). They quickly became the most common coarseware type at that site. A similar development is shown at Newbury. Apart from a small quantity of glazed wares at both sites, all of the 13th and early 14th century pottery was of this ware, with very little development either in the forms present or in their typology and method of manufacture. Similarly high proportions of Newbury B vessels are found at Popham, near Basingstoke and at sites in the Vale of Pewsey. Outside of these sites was an area in which Newbury B vessels were used alongside other cooking wares, for example in northern Wiltshire at sites in and around Swindon and Cricklade. The latter sites are very close to Minety and it may be that Newbury B ware had a more limited period of use in that area, being replaced by Minety cooking pots in 13th century. However, there is no stratigraphic proof for this suggestion and the ware is found at sites in Oxford and south Oxfordshire (the Vale of the White Horse) even though there were pottery sources much closer to Oxford. At Seacourt D.M.V., the excavators recognised a rise in the relative frequency of Newbury B ware in the late 13th to 14th centuries.

Even further afield Newbury B vessels occur as sparse 'strays', including sites throughout Oxfordshire, eastern Berkshire, southern Hampshire and south-east Wiltshire. A single vessel is known from Cirencester but no examples are known from the Avon or Severn valleys.

The presence of cisterns in this ware might suggest a late 14th century or later date, since they have not been found in the Hampshire-Surrey border industry until this date. However, the Netherton example is definitely present before 1356 and the excavator would date its context to the late 13th century (J. Fairbrother, pers. comm.). It is therefore more likely that these cooking-pot shaped cisterns are earlier than the jar or jug shaped examples.

The end of the Newbury B industry is later than the mid-14th century, since the ware was in use later than the deposition of two coins of this date from Newbury. At Netherton the ware was still being used when the site was abandoned in c.1356 but was no longer in use when the site was re-occupied in the early 15th century, c.1418 (Fairbrother, forthcoming). At Oxford, a smashed unglazed jug of Newbury B ware was found in a well associated with a late 14th to early 15th century Oxford AM jug (Haldon & Mellor, 1977; Fabric AQ).

Bibliography: Jope (1947), Haldon & Mellor (1977), Ivens (forthcoming), Vince (forthcoming b), Hinton (1973).

Great Somerford-type ware

Hardness: Hard.

Colour: Oxidized with s grey core.

Principal Inclusions: Moderate fragments of rounded oolitic limestone up to 2.0mm across.

Clay Matrix: A fine-textured matrix with no quartz or white mica inclusions.

Thin-sections: Silbury Hill; M1180.

Source: The precise source is unknown. Distribution

evidence suggests a source in north-west Wiltshire or north Avon. The petrology of the fabric is very similar to that of Gloucester TF41b, although Great Somerford-type ware does not have the micaceous clay matrix of the Gloucester fabric.

Forms: (fig.2.102)

Cooking pots. Handmade vessels with curving walls and cylindrical rims.

Jugs. Handmade, unglazed vessels with strap handles.

Date and distribution: (fig.2.103)A single cooking pot of Great Somerford-type ware was found at Silbury Hill, in association with other wares thought to be of early 11th century date. A pit group from Great Somerford contains mainly Great Somerford-type cooking pots, a 'west country vessel' in Box fabric B and a Minety-type tripod pitcher. The latter types date the deposition of this group to the 12th century (Thompson, 1970).

Other collections containing Great Somerford-type ware are unstratified, nor are there any stratified later medieval assemblages from the area in which Great Somerford-type ware is found to provide a terminus ante quem for the end of the industry.

Unglazed, handmade jugs of the type made in this industry are found in Penhow ware and Newbury Group B from the late 12th century into the 14th century. It is most likely that the ware disappeared during the 13th century but a much later end date would not be surprising.

Bibliography: Thompson (1970).

COMMON NAME: South-east Wiltshire wares

Four distinct fabrics are found, the cooking pot fabric is a red-firing clay, although usually incompletely oxidized; the tripod pitcher fabric, early jug fabric and Salisbury-Laverstock jug fabric are all made from light-firing clays but differ in the texture of the predominantly quartz sand tempering.

Cooking Pot fabric

Hardness: Hard.

Colour: Variable from black to grey and oxidized reddish brown (5YR 5/3).

Principal inclusions: Subangular and rounded milky quartz, including a few grains with a red coating, up to 1.0mm. Rare rounded fine-grained limestone fragments and angular flint up to 1.0mm.

Clay Matrix: Anisotropic, fine-textured and laminated.

Thin-sections: Laverstock kilns; M66-7.

Tripod Pitcher Fabric.

Hardness: Hard.

Colour: Reduced black or oxidized white core (10YR 8/2) with pink or light brown surfaces.

Principal Inclusions: Angular or subangular quartz, up to 1.3mm. Sparse light brown angular cloudy chert or flint, rounded iron ore, up to 0.2mm across. These inclusions form a well-sorted coarse sand temper which gives the interior surface of the vessels a 'goose-flesh' appearance.

Clay Matrix: Sparse angular quartz and white mica. The clay is anisotropic and variegated with yellowish red spots and streaks in a lighter coloured matrix.

Thin-sections: Bristol; M297. Chepstow; M835, M883, M905.

Devizes; M50-5. Dublin; M372.

Early jug fabric

Hardness: Hard.

Colour: Oxidized light brown.

Pricipal Inclusions: As for the tripod pitchers but finer.

Clay Matrix: -

Thin-sections: Newbury; M1163.

Salisbury/Laverstock fabric.

Hardness: Hard.

Principal Inclusions: No visible inclusions.

Clay Matrix: Fine angular quartz up to 0.1mm.

Thin-sections: Laverstock; M68. Salisbury M56-7.

Source: Some vessels in the cooking pot fabric were made at Laverstock, to the east of Salisbury. However, the start of the industry must predate the excavated kilns at Laverstock by over 150 years, and also predates the foundation of the present town. A general south-east Wiltshire source is certain. The main product of the Laverstock kilns were made in the fine fabric and samples from a kiln found at Salisbury were thin-sectioned and were identical to the Laverstock ware. If the two can be distinguished it is only by typology, and, since the Salisbury material is not yet published, it is only possible to identify vessels as Salisbury/Laverstock type.

Forms:

Cooking pots. Handmade vessels with a rounded base and thickened, added rim, normally of rolled-out form. The exterior of the vessels is covered with rough fettling (fig.2.104).

Tripod pitchers. Clear glazed, handmade vessels with a rounded base and three circular sectioned feet. The rim is cylindrical and between one and three rectangular-sectioned handles is typical. The vessels are either decorated with vertical combing or rectangular-toothed roller-stamping. Applied thumbed strips occur with either type of decoration. Tubular spouts are the rule (fig.2.105).

Rounded jugs. Wheelthrown vessels, often with combed decoration and a clear glaze (fig.2.106).

Baluster jugs. Wheelthrown vessels often highly decorated with applied strips and stamping (fig.2.107).

Dating and distribution: (figs.2.108-110) A late 11th century date or earlier for the start of the south-east Wiltshire industry is undoubted, since a pit group was excavated at Old Sarum which contained a barely worn penny of William I together with south-east Wiltshire cooking pots and tripod pitchers. At Winchester, much earlier dates are suggested for the inception of tripod pitcher production, in the late 10th century (Biddle & Barclay, 1974). Most of the vessels identified by Biddle as his TPW (tripod pitcher ware) are in fact south-east Wiltshire vessels. However, the author has not examined any of the supposed pre-conquest tripod pitchers, which may therefore be made in a different fabric. Biddle and Quirk have published a typical south-east Wiltshire tripod pitcher from a context dated pre-1100 and in more recent excavations in Winchester south-east Wiltshire tripod pitchers appear in the late 11th century, distinguishing post- from pre- conquest groups (Biddle & Quirk, 1962). It should also be possible to date the inception of this ware

at Southampton, since south-east Wiltshire vessels have been seen there by the author. However, the type has not been distinguished by Platt and Coleman-Smith (1977).

Therefore, the possibility exists that this was the earliest centre producing tripod pitchers in the country, but conclusive evidence for a pre-conquest origin has not yet been published. Biddle and Barclay argue that this ware co-existed with Winchester ware, giving rise to 'hybrid' vessels in which techniques and forms more common in one fabric are found in the other (Biddle and Barclay, 1974). Even if this is so, the interchange of styles could have taken place in the late 11th century.

Stratified examples of south-east Wiltshire cooking pots and tripod pitchers are not present in the study region until the 12th century, possibly not until the second half of the century, and are never common (fig.2.108). A distribution route can be traced from the Salisbury area to the north-west, through Warminster to Bath (where the tripod pitchers are found in 12th century contexts), Bristol and Chepstow. No other examples are known from south Wales but the ware is relatively common in Dublin, including a complete tripod pitcher. A single vessel has been seen from Lady Lane, Waterford (fig.2.109).

Distribution to the north and north-west of Salisbury is surprisingly limited in the 12th to 13th centuries. The ware is found at Devizes, Ludgershall and Netherton but is not common at any of these sites. At Newbury a single vessel in the early jug fabric has been found in an early to mid-13th century level. Rare examples are known from

collections in Salisbury.

Salisbury/Laverstock ware vessels are probably not as widely distributed as the tripod pitchers, although since they have no distinctive inclusions only typological features can be used to indentify them (fig.2.110). These features are mainly those found on the highly decorated jugs from the Laverstock kiln site and many plainer products might go unnoticed. However, the quantity of light coloured green-glazed jug sherds of any kind in west or east Wiltshire is minimal so that it is certain that little south-east Wiltshire glazed ware was reaching those areas. The Salisbury/Laverstock potteries may have had a larger market to the south-east since there are documentary records of pottery being transported from Laverstock to Winchester (Musty et al., 1969).

Bibliography: Biddle & Quirk (1962), Stone and Charlton (1935), Musty et al. (1969).

NON-LOCAL WARES

The industries described below were situated outside of the study region but their wares are either mentioned in this thesis as comparanda or else their wares are found within the study region.

BERKSHIRE WARES

In eastern Berkshire a wide variety of wares is found in the period before c.1350. After this date all assemblages in the area contain large quantities of Coarse Border ware and it is doubtful if any other coarsewares were in use.

Since none of these East Berkshire types is found in the study region they are not included here. There remains only one survey of the pottery of Berkshire, that of Jope (1947) and the area has both sufficient collections and enough potential interest to make a revision of this survey long overdue.

COMMON NAME: Newbury Group C

Hardness: Hard

Colour: Usually a light grey core with oxidized surfaces (5YR to 7.5YR 5 to 6/4 to 8). A variant fabric has very light brown surfaces (10YR 7/4) and a grey core.

Principal Inclusions: All fabrics in this group contain medium-grained quartz sand tempering. The largest grains are between 0.5mm and 1.0mm across. In thin-section quartz is the most common constituent of the sand but quartzite and iron ore are also found. Chert, flint, fine-grained sandstones and felspar are sparse and not present in every

thin-section. A mixture of rounded, subangular and angular grains is found. There are three sub-groups recognised at Newbury but thought not to represent different sources.

i) Abundant quartz sand tempering and rare chert fragments up to 2.0mm across.

ii) Moderate quartz sand and sparse white mica.

iii) A coarse quartz sand with some grains up to 2.0mm across.

Clay Matrix: (i) little or no silt-sized inclusions.

(ii) moderate silt-sized quartz.

(iii) moderate silt-sized quartz and white mica.

Thin-sections: Newbury; M1154, M1156, M1158, M1161-2, M1203. Oxford; see D. F. Williams (report submitted to Oxfordshire Archaeological Unit, fabric AG).

Source: The higher proportion of this ware at Reading than at Newbury suggests a source in Eastern Berkshire or possibly southern Oxfordshire or Buckinghamshire. The sand-tempering of pottery from the Camley Garden Kilns at Maidenhead is similar in thin-section but the typology of the products of the excavated kilns is different to that of Newbury Group C. A collection from Ashamstead, near Reading consists of oxdized unglazed cooking pots in a sandy fabric similar to some vessels from Newbury. The lack of sooting suggests that this might be production waste but there are no definite wasters.

Forms: (fig.2.111)

Cooking pots. Squat, handmade curving walled vessels, including some very large examples with applied thumbed strips.

Cooking pots. Squat wheelthrown vessels with everted or flat-topped everted rims, curving walls and usually an internal clear green or brown glaze.

Bowls or frying pans. Handmade vessels with flat-topped infolded rims, often decorated with 'nicking', possibly applied with a roller.

Bowls. One wheelthrown vessel with curving walls, an internally bevelled rim and external sooting.

Pan. One wheelthrown pan with an externally thickened rim and internal glaze.

Storage jar? One large body sherd from a handmade vessel with an applied band, probably running diagonally, on the outside.

Tripod Pitchers. Two types are found, both are handmade.

(i) Globular bodied, sagging based vessel with cylindrical neck. No handles or spouts found at Newbury. Decoration of apl ied thumbed strips, rectangular-toothed roller-stamping and combing. The combing occurs as horizontal bands on the upper part of the body and vertical lines on the lower part.

(ii) Similar to (i) but flaring rims and the lower part of the body is more vertical. The handles are made of plaited strips of clay and consist either of two strips surrounded by a third or two plaited strips with plain strips on either side surrounded by a fifth. The handles were attatched to the body by being pushed through a hole in the side. The edges of the handles and rims are decorated with 'nicking'. Body decoration consists of horizontal bands of straight, wavy or zig-zag combing on the upper half and vertical lines on the lower half. Horizontal grooves also

occur, often combined with applied strips. Tubular spouts are found.

Early Standard Jugs. At Newbury several sherds of a wheelthrown jug or jugs were found in late 12th century contexts. Their date and the fact that they have a ribbed neck suggests that they are from Early Standard jugs, similar to the earliest wheelthrown glazed wares made in the London area.

Plain jugs. Definitely plain jugs are rare but one plain, clear glazed vessel was found at Newbury with a rod handle.

Slip-decorated jugs. Although these vessels mainly have tripod feet, they are different in shape to the tripod pitchers (see above). They are smaller and whilst the bodies are handmade the rims appear to be wheelthrown. It is possible that the rims and necks were thrown separately and added to the handmade body. Some vessels are noticeably thicker around the shoulder where such a join might occur. Both rod and strap handles are found, both added to the body by being pushed through a hole in the wall. Pulled spouts are normal but one tubular spout was found. This was decorated with applied white clay strips rather than a white paint and is probably better classed as a true tripod pitcher. The bases are sagging, usually with three feet but sometimes thumbed. One example has both feet and thumbing. The distinctive feature of these jugs is their decoration of white and dark brown slip, sometimes used over applied, self-coloured clay strips. The normal decorative scheme is very simple, consisting of panels divided by vertical and horizontal lines. A common motif is the circle, used

randomly to fill a panel. More elaborate designs include vesicas filled with dots of white slip. One sherd is part of a highly decorated jug bearing an animal in self-coloured applied clay decorated with strips of white and dark brown slip. The fur of the creature is represented by combing and the feet by slashed lines.

White-slipped jugs. Wheelthrown vessels with an overall cover of white slip, usually under a copper-flecked glaze. Decoration consists of ring and dot stamps and applied strips. The vessels are usually grey throughout and the slip is a very pale brown (10YR 7/4). One vessel has a total white slip and is decorated with applied iron-rich clay pellets under a clear glaze.

Dating and distribution: (figs.2.112-5) At Bartholomew Street 1979, Newbury, a clear sequence of forms and fabrics within this ware was found. From the late 11th century a few handmade cooking pot sherds were found, but formed a small proportion of the total pottery.

In the early to mid-12th century there is little change, although the one storage jar sherd was of this date. In the late 12th century tripod pitchers appear, mainly of the cylindrical rimmed type, together with a few sherds of wheelthrown, early standard jugs. Slip-decorated pitchers first occur in the early 13th century (their absence from Netherton suggests a date after c.1210 for their arrival, see Ch.6) and reach a peak in the mid-13th century. White-slipped jugs are found first in the late 13th century and are present by c.1280 at Netherton, together with white slip decorated wheelthrown jugs. This form was not recognised at Newbury but may well have been

present. The continuation of this ware into the early 14th century is probable but most of the later finds at Newbury were probably residual. If the ware did cease production in the 14th century this would make sense, since it is likely that Eastern Berkshire was supplied mainly with Coarse Border Ware by this time.

The distribution of Newbury Group C is imperfectly known, since few stratified collections are present in Eastern Berkshire or Northern Hampshire. Since the ware is quartz-sand tempered it is difficult to identify body sherds or cooking pots reliably (since their typology is indistinct) but one possible cooking pot sherd was found at Silbury Hill in loose association with early 11th century material. However, the ware is not common anywhere, including Reading, until the late 12th century (Reading Fabrics 6 and 7). It appears that there was in the late 12th and early 13th centuries an extensive trade in the tripod pitchers and slip-decorated pitchers, which are found regularly in Oxford and Winchester and rarely much further afield. At least one sherd has been found at Gloucester and the ware is also known from Banbury in Northern Oxfordshire. The white-slipped jugs on the other hand have a limited distribution, being found mainly in the Kennet Valley and on sites in the Berkshire Downs (fig.2.115).

Bibliography: Vince (forthcoming b), Haldon and Mellor (1977) fabric AG.

COMMON NAME: Reading Fabric 1

Hardness: Hard.

Colour: Black.

Principal inclusions: Rounded quartz, up to 0.5mm across with rare, larger waterworn fragments. Angular limestone up to 1.0mm across. White or grey angular flint up to 3.0mm across, angular red iron ore up to 4.0mm across.

Clay Matrix: Fine-textured.

Thin-sections: Reading: M1137

Source: Unknown.

Forms: (not illustrated)

Cooking pots. Small globular vessels with everted rim and sagging base.

Dating and distribution: Found in unstratified collections from Reading in Reading Museum.

Bibliography: -

COMMON NAME: Reading Fabric 2.

('M40 Ware')

Hardness: Hard.

Colour: Reduced or oxidized.

Principal inclusions: Abundant rounded quartz, clear, white or red grains up to 1.0mm across. Sparse red iron ore fragments up to 2.0mm across.

Clay Matrix: Fine textured clay matrix.

Thin-sections: Reading; M1138.

Source: The distribution evidence suggests a source in Buckinghamshire or south-eastern Oxfordshire.

Forms: (not illustrated)

Cooking pots. Handmade vessels with globular body and everted rim. The distinctive characteristic of the ware is the presence of vertical combing on the body.

Dating and distribution: The distribution of M40 ware has been plotted by Hinton (1973 b). To this can be added West Draycott in Greater London (C. Orton, pers. comm.).

Bibliography: Hinton (1973 b).

COMMON NAME: Reading Fabric 3

Hardness: Hard.

Colour: Reduced or oxidized, usually with a grey core.

Principal inclusions: Abundant quartz sand, clear, white or red grains, subangular to rounded up to 0.5mm across. Sparse angular red iron ore fragments up to 4.0mm across.

Clay Matrix: Fine-textured.

Thin-sections: Reading; M1139.

Source: Unknown.

Forms: (not illustrated)

Cooking Pots. Wheelthrown vessels with a globular body and sagging base, everted rims with thumbed decoration.

Bowls. Wheelthrown vessels with 'T' rims with thumbed decoration.

Dating and distribution: Found at Reading.

Bibliography: -

COMMON NAME: Reading Fabric 4

Hardness: Hard.

Colour: Reduced or oxidized, usually with a light grey core.

Principal inclusions: Rounded waterworn quartz, some red or white with red staining, up to 1.0mm across. Angular white flint up to 5.0mm across. rounded red iron ore up to 1.0mm across.

Clay Matrix: Fine-textured matrix.

Thin-sections: Reading; M1140.

Source: Unknown.

Forms: (not illustrated)

Cooking Pots. Large wheel-finished vessels with thick walls and pimply surfaces, sooted exterior and 'kettle fur' deposits on the interior.

Bowls. Large pan-shaped vessels.

Dating and distribution: Found at Reading.

Bibliography: -

COMMON NAME: Reading Fabric 5

Hardness: Hard.

Colour: Reduced or oxidized with a grey core.

Principal inclusions: Rounded waterworn quartz, clear white or red grains up to 1.0mm across. Angular white flint up to 3.0mm across, Grey limestone and shell fragments up to 2.0mm across.

Clay Matrix: Fine-textured.

Thin-sections: - Reading; M1141.

Source: Unknown.

Forms: (not illustrated)

Cooking Pot. Handmade.

Dating and distribution: -

Bibliography: -

OTHER READING FABRICS.

A fabric series was constructed for L. Cram of Reading Museum in 1979. Apart from the five types described above, all of the fabrics were well-known wares not local to Reading.

Reading Fabric 6 = Newbury Group C. Thin-section M1142.

Reading Fabric 7 = Newbury Group C. Thin-section M1143.

Reading Fabric 8 = A non-local jug fabric. Thin-section M1144.

Reading Fabric 9 = A non-local jug fabric. Thin-section M1145.

Reading Fabric 10 = Rouen ware. Thin-section M1146.

Reading Fabric 11 = Red Border ware? (forms include shallow dish, carinated bowl, chamber pot and pipkin).

Reading Fabric 12 = Glazed medieval roof tile, ?local.

Reading Fabric 13 = English or Dutch tin-glazed ware.

Reading Fabric 14 = Border ware.

Reading Fabric 15 = Raeren stoneware.

Reading Fabric 16 = Border ware.

Reading Fabric 17 = Oxford AM ware.

Reading Fabric 18 = Red Basalt ware.

Reading Fabric 19 = Frechen Stoneware.

Reading Fabric 20 = Local? Post-medieval redware.

Reading Fabric 21 = Local? Post-medieval redware.

Reading Fabric 22 = Westerwald stoneware.

Reading Fabric 23 = Local? post-medieval Agate ware.

Reading Fabric 24 = Coarse Border ware.

HAMPSHIRE AND SURREY WARES

The county of Hampshire has been better served by medieval archaeologists than any in the study region and yet there has been no synthesis of the work of the Winchester Research Unit, the Southampton Archaeological Research Committee or the work of Cunliffe at Portchester (1976). Substantial collections also exist from the smaller towns of the County, for example Alton and Romsey. The pottery of the northern part of the county has been surveyed in 1979 by the author to compare with the material from Newbury. It is to be hoped that the forthcoming publication of the Netherton pottery by J. Fairbrother will provide the necessary framework for a synthesis of the considerable amount of pottery from the northern parts of the county to be prepared.

Only those wares which are present in the study region or whose distribution appears to be limited to the northern part of the county are included here.

COMMON NAME: East Hampshire Micaceous Sandy ware

Hardness: Hard.

Colour: Partially oxidized with a light grey core or sometimes reduced light grey with dark grey or black surfaces.

Principal inclusions: Few visible by eye. Clay Matrix: This fabric has few large inclusions and is probably 'naturally tempered' with quartz and white mica.

Thin-sections: None.

Source: The distribution of this ware suggests a source in eastern Hampshire or possibly western Surrey.

Forms: (not illustrated)

Cooking pots. Wheelthrown globular vessels with everted flat-topped rims with internal moulding and curved necks.

Jugs. Wheelthrown vessels.

Dating and distribution: (figs.2.116, 2.117) This ware is apparently found at Netherton only in contexts associated with the re-occupation of the site in the early 15th century. This would make the ware contemporary with the Coarse Border ware industry and their production sites must also be relatively close. Other finds are not stratified and occur predominantly in North-East Hampshire. The absence of this ware from Newbury, Silchester and Aldershot shows the northern extent of the distribution area.

Bibliography: Fairbrother (forthcoming).

COMMON NAME: Hampshire Saxon Chalk-tempered ware

Hardness: Hard.

Colour: Black or sometimes grey core and black surfaces.

Principal inclusions: Abundant voids and sparse flint fragments.

Clay Matrix: Fine-textured.

Thin-sections: Not sectioned.

Source: Unknown.

Forms: (not illustrated)

Cooking pots. Handmade vessels similar to Gloucester TF41A.

Dating and distribution: (fig.2.118) Found at Hamwih in the 8th to 9th centuries but similar vessels are found at Brown Candover in a pit with wheelthrown, ribbed cooking pots of Portchester ware type. The same form in a similar fabric is known from Avebury, associated with Cheddar E cooking pots

(and therefore a mid- to late 10th century date).

Bibliography: -

COMMON NAME: Michelmersh - type ware

Hardness: Hard.

Colour: Oxidized, light brown to red.

Principal inclusions: Abundant subangular to angular quartz sand, Sparse iron ore.

Clay Matrix: -

Thin-sections: Swindon; M949.

Source: A kiln site is known at Michelmersh, near Romsey in south Hampshire. Some of the products of this kiln have been published by Addyman et al. (1972). K. Barclay (Winchester Research Unit) is of the opinion that wares of this general type found at Winchester are not all from this source and prefers the term 'Michelmersh - type ware' for wheelthrown, sand-tempered vessels which have applied strips decorated with individual stamps.

Forms: (fig.2.119)

Cooking Pots. Wheelthrown globular vessels with everted rims, often with thumbing on the rim. Sagging bases.

Spouted pitchers. Wheelthrown vessels with tubular spouts, on the shoulder of the vessel, and rectangular-sectioned handles. Decorated with applied strips impressed with individual stamps.

Dating and distribution: (fig.2.120) Sherds of Michelmersh - type storage jars have been found in the study region at Old Town, Swindon and at Avebury, neither in a stratified context.

In southern Hampshire wares of this type are found at Winchester, in late 10th or 11th century contexts (Barclay, pers. comm.) and, rarely, at Southampton (including a rim sherd found with a hoard of French coins deposited c.1130, Platt & Coleman-Smith, 1975) and at Portchester, where the use of the ware 'clearly centres upon the first half of the eleventh century but may have begun earlier (Cunliffe, 1976, 192).

The scarcity of Michelmersh - type vessels on late Saxon sites in southern Hampshire is remarkable, especially in comparison with their presence at a much greater distance from Michelmersh in north and east Wiltshire. It is possible that the ware had less competition from good quality products in Wiltshire than it did along the south coast, where Portchester ware and northern French wares were readily available.

Bibliography: Addyman et al. (1972), Cunliffe (1976), Platt & Coleman-Smith, 1975).

COMMON NAME: North Hampshire Chalky ware

Hardness: Hard.

Colour: Grey with black surfaces.

Principal inclusions: Abundant voids and chalk temper.

Clay Matrix: Slightly micaceous.

Thin-sections: Not sectioned.

Source: Northern Hampshire?

Forms: (not illustrated)

Cooking pots. Thick-walled handmade vessels.

Dating and distribution: (fig.2.121) Probably 11th or 12th century.

Bibliography: -

COMMON NAME: North Hampshire Flint-tempered ware

Hardness: Hard.

Colour: Light grey with light coloured or reduced surfaces, possible a low iron content?

Principal inclusions: Large angular fragments of flint and no quartz.

Clay Matrix: Extremely fine-textured.

Thin-sections: Not sectioned.

Source: From the distribution evidence a source in northern Hampshire is certain. The precise source is unknown nor, without thin-section evidence, it is known from which clay deposit the clay was obtained.

Forms: (not illustrated)

Cooking pots handmade vessels with cylindrical rims and external thickening. The vessels have sagging bases and the lower walls are vertical.

Dating and distribution: (fig.2.122) This ware is dated at Netherton to the pre-conquest 11th century but was absent from a context containing a coin lost c.990 (Netherton Fabric I). It is found on a number of sites in northern Hampshire and is distinguished from the contemporary Newbury Group A ware by the absence of quartz sand in the matrix. With the exception of Netherton none of the findspots is from a stratified excavation. During the late 11th to early 12th century North Hampshire Flinty ware was replaced at Netherton by Newbury Group A vessels.

Bibliography: Fairbrother, forthcoming.

COMMON NAME: Silchester Pink ware

Hardness: Soft to hard.

Colour: Oxidized a distinctive pink colour.

Principal inclusions: Sparse light coloured clay pellets.

Clay Matrix: Quartz silt?

Thin-sections: Not sectioned.

Source: Northern Hampshire or southern Berkshire.

Forms: (not illustrated)

Cooking pots. Wheelthrown vessels.

Jugs. Wheelthrown vessels with a clear light green lead glaze.

Bowls. Wheelthrown vessels with an internal glaze. Possibly skillets.

Dating and distribution: (fig.2.123) These vessels occur at West Woodhay, which was abandoned before the advent of Coarse Border ware. They may also occur at Netherton (J. Fairbrother, pers. comm.). The ware is therefore likely to be pre-c.1400 but could be substantially earlier.

Silchester Pink vessels are not found at Reading, Newbury, Alton or Basingstoke and therefore were probably distributed outside of the market system, although there were rural markets and small towns within the distribution area.

Bibliography: -

COMMON NAME: Winchester-type ware

Hardness: Hard.

Colour: Oxidized very pale brown (10YR 7/4 to 7/3) or reduced light grey (10YR 7/4 to 7/3).

Principal inclusions: Abundant angular to subangular clear and milky quartz up to 0.4mm. Sparse rounded quartz up to

1.0mm. Sparse rounded red iron ore up to 0.3mm.

Clay Matrix: Sparse white mica and abundant angular quartz.

Thin-sections: Gloucester; M674. Hereford; M589. Silbury Hill; M1179.

Source: Probably Hampshire. Investigation by K. Barclay had not by 1974 revealed the source of this ware. Petrologically the ware is similar to that of Michelmersh-type ware, some of which was made at Michelmersh, near Romsey. This site is within six miles of Winchester and a similar location may be expected for Winchester-type ware. There is no evidence for manufacture of this ware within the city itself but given contemporary parallels it would not be surprising.

There is a probable link between the manufacture of glazed polychrome wall tiles from Winchester Cathedral and that of Winchester ware.

Forms: (fig.2.124)

Pitchers

Dating and distribution: (fig.2.125) At Winchester the earliest datable context in which Winchester ware is found is dated c.980 but the majority of finds are of late 11th to early 12th century date. A similar starting date for the industry is given by its context at Netherton. Biddle and Barclay suggest that the ware had ceased production by c.1100 but Kilmurry, using their data, suggests that production continued into the 12th century (Biddle and Barclay,1974; Kilmurry, 1980).

In Gloucester a sherd of highly decorated pitcher has been found at the Bell Hotel site (85/68) but was unfortunately lost before the present study began. It was identified by J. G. Hurst and was drawn. From its context a late 10th century date is likely. The ware is otherwise rare in Gloucester but one sherd was found in the robbing of the Roman East Gate, probably in the late 11th century.

A sherd of Winchester-type ware was found at Silbury Hill, for which an early 11th century date is likely. A similar or slightly later date is probable for the finds from Bath, the only site in the region where Winchester-type ware is relatively common. At Citizen House, Bath, the use of Winchester-type ware preceded that of tripod pitchers and post-dated the first use of Cheddar E ware.

Winchester-type ware has also been found at Hereford (a single handle sherd from the site of the Castle), Netherton, Oxford, Gloucester and London.

The evidence confirms a fall-off from the Winchester region but the relative proportions of Winchester and Stamford wares at Bath, Gloucester and Oxford suggest that distance from the source was not the sole factor governing distribution.

Bibliography: Biddle and Barclay (1974)

HAMPSHIRE - SURREY BORDER WARES

COMMON NAME: Coarse Border ware

Coarse Border ware is the most widespread of the Surrey whitewares, the others being Kingston ware, from Kingston-on-Thames, Cheam ware, and probably a little-known industry on the south bank of the Thames, from which a dump of

wasters was found in 1982 (Orton, 1982). None of these other industries was supplying the study region.

Hardness: Hard.

Colour: Very pale brown. Normally completely oxidized.

Principal inclusions: Large rounded quartz fragments. Some of these are coated with a reddish deposit, probably haematite, and are noticable free from strain and inclusions.

Clay Matrix: Sparse quartz and white mica fragments.

Thin-sections: Newbury; M1155, M1157.

Source: Three production sites are known; Farnham, Farnborough Hill and Ash, the latter only by waste rather than a structure.

Forms: (fig.2.126)

Jugs.

Cooking Pots.

Bowls.

Cisterns.

Lids.

Lobed Cups. These vessels have a lesser quantity of inclusions than most forms. An example from Newbury is reliably paralleled with an example from London which has a free-standing stag in the centre of the vessel surrounded by trees. Both light-firing and red-firing clays were used for this decoration, under a copper-flecked green glaze.

Dating and distribution: The earliest secure date for the production of Coarse Border ware comes from Trig Lane, London. Here, the ware first appears in a group of c.1340 (G7) but is absent from a group of c.1290 (G3). At Guildford and other sites in Surrey jugs in a heavily

tempered version of this fabric occur which have forms which suggest a late 13th to early 14th century starting date for the Coarse Border ware industry. One of the distinctive characteristics of this early ware is the extensive use of combing and a substantial glaze cover. Both these features are absent on the Coarse Border ware from both Trig Lane and sites in the study region. A late 13th to 14th century starting date is earlier, perhaps considerably earlier, than the earliest occurrence at Bartholomew Street, Newbury, where contexts associated with and later than two coins lost in the mid-14th century were completely free from Coarse Border ware.

At both London and Newbury, once Coarse Border ware appears it rapidly becomes the dominant pottery type in the area (figs.2.127, 2.128). At Newbury, the late and post-medieval sequence is poorly dated but it does appear that Coarse Border ware was still in use in Newbury in the 16th century, although in London there is apparently a tailing-off in the late 15th century (fig.2.129).

Bibliography: Vince (forthcoming b).

COMMON NAME: Tudor Green ware

Tudor Green ware was for some time thought to be of French origin and the establishment of the Surrey-Hampshire border as the source of this ware is a recent development (Hurst, 1964; Holling, 1977). Other whiteware industries producing similar finewares are thought to exist in the midlands, presumably utilising coal measure white-firing clays. However, there is little doubt that the majority of the Tudor Green ware found in the study region is of Surrey-

Hampshire origin, both from the similarity in fabric with Border ware and from the techniques of manufacture.

Hardness: Hard.

Colour: Oxidized or reduced blue-white.

Principal inclusions: Rare subangular or rounded quartz grains, some of which have red staining, up to 0.5mm across.

Clay Matrix: Angular quartz and sparse white mica.

Thin-sections: Hereford; M603.

Source: Tudor Green ware wasters have been found at Farnborough Hill, Surrey (Holling, 1977).

Forms: (fig.2.130)

A classification of Tudor Green ware has been published by Brears (1971, 24-26). However, for most of the sherd material in the study region it was impossible to divide the vessels into more than broad classes.

Lobed cups. Thin-walled vessels with internal and external copper-flecked glaze.

Cups. Two-handled vessels, taller than the lobed cups.

Jugs. Thin-walled vessels, copper-flecked glaze externally and around the inside of the rim.

Date and distribution: (fig.2.131) Lobed cups in Tudor Green ware are known from early to mid- 15th century contexts, at Trig Lane, London, and at Westbury College, Westbury-on-Trym. However, the main range of cups and jugs is thought to be predominantly late 15th to 16th century in date. Vessels of this type occur in late 15th to 16th century contexts throughout the study region, for example Hereford, Berrington Street site 4 pit 730, Worcester Nudix

Court (Barton, 1966), Gloucester Eastgate, Newbury, Bartholomew Street 1979 period 6 phase a) and Newport Castle, Gwent. There is no apparent decline in frequency of these wares with distance away from Surrey. It is possible that there is a decline or cessation of production in the late 16th century, coinciding with the start of Border ware production, for example at Gloucester, Eastgate period 10c).

Bibliography: Brears (1971), Holling (1977), Moorhouse (1979).

COMMON NAME: Border ware.

Border ware is coarser in texture than Tudor Green ware but both have the same range of inclusions.

Hardness: Hard.

Colour: Oxidized very pale brown or occasionally light brown.

Principal Inclusions: Sparse rounded quartz, sometimes milky and sometimes red-stained, up to 0.5mm.

Clay Matrix: Abundant angular quartz and sparse white mica. Small rounded red inclusions visible in thin-section are probably an iron ore, up to 0.1mm across.

Thin-sections: Hereford; M574.

Source: There are numerous production sites known for this ware, all of which produce indistinguishable fabrics and forms.

Dating and distribution: (fig.2.132) The earliest evidence for the use of Border ware is from London, where it is found with mid-to-late 16th century German stonewares in groups which do not have clay pipes (Museum of London ER. Groups). Around 1600 the ware makes its appearance in small quantities over the whole region, although it is only

numerically important in North Hampshire, the Kennet Valley and East Berkshire. The ware is most common in the south and east of the region and becomes rarer the further west and north one goes. Hereford produced a small handful of sherds whilst Gloucester produced in the order of 1-2%.

Bibliography: Haslam (1975), Holling (1969, 1971), Mynard (1969).

WARWICKSHIRE - WEST MIDLANDS WARES

COMMON NAME: Deritend Greyware

Hardness: Hard.

Colour: Usually reduced grey surfaces with a grey core but sometimes brown margins.

Principal inclusions: Moderate ill-sorted subangular to rounded quartz and quartzite up to 1.0mm across.

Clay Matrix: Sparse angular quartz and white mica.

Thin-sections: Hereford: M600.

Source: The source of this ware must be very close to Deritend, where a series of pits containing wasters was found.

Forms: (fig.2.133)

Unglazed jugs. Handmade, decorated with combing.

Cooking pots.

Dating and distribution: (fig.2.134) Deritend Greyware has a local distribution in the Birmingham area, although even at Weoley Castle the ware was not the most common in the kitchen sequence. The presence of Deritend greyware in the Weoley Castle sequence must date its introduction of the ware to the early to mid-13th century at the latest. Rare outliers of this distribution are known from Hereford (the

Weoley Castle sequence must date its introduction of the ware to the early to mid-13th century at the latest. Rare outliers of this distribution are known from Hereford (the almost complete profile of a jug from an early 13th century context at Berrington Street site 1) and Upton D.M.V., where cooking pots have been recognised by Rahtz (1969).

Bibliography: Sherlock (1955), Rahtz (1969).

COMMON NAME: Deritend Slipware.

Not fully described.

Hardness: Soft to hard.

Colour: Oxidized

Principal inclusions: -

Clay Matrix: -

Thin-sections: none.

Source: close to Deritend, where wasters were found associated with the greyware (see above).

Forms: (fig.2.135)

Jugs. Wheelthrown vessels with white slip decoration under a clear lead glaze.

Dating and distribution: (fig.2.134) Found in Weoley Castle kitchen sequence and therefore datable to the early to mid-13th century. No other stratified examples are known.

Bibliography: Sherlock (1955).

COMMON NAME: Midlands Yellow ware.

Hardness: Hard.

Colour: Very pale brown to cream.

Principal inclusions: Few visible inclusions.

Clay matrix: Rounded white clay pellets and sparse to

moderate angular quartz.

Thin-sections: Hereford; M575

Source: Unknown. Possibly made in the Nuneaton kilns or Staffordshire.

Forms: (not illustrated)

Midlands yellow ware forms can be distinguished from later Staffordshire light-bodied slipwares only by their range of forms, the more extensive use of slip on the later vessels and the tendency for the glaze on Midlands Yellow ware vessels to be ill-fitting.

Bowls

Jars

Date and distribution: (fig.2.136) Midlands Yellow ware is found in very small quantities in late 16th to early 17th century contexts at Worcester, Hereford and Gloucester. The presence of the ware at these sites but not in rural collections of post-medieval pottery is probably due mainly to the smaller size of the rural assemblages.

Although never found in large quantities in the study region, it is the impression of the author that Midlands Yellow ware is more common at Worcester than at Hereford or Gloucester.

Bibliography: Brears (1971), Woodfield (1966)

COMMON NAME: Nuneaton Wares.

Hardness: Hard to very hard.

Colour: White, with a light grey core.

Principal inclusions: Sparse inclusions of angular to rounded clear and milky quartz up to 1.0mm and rounded dark sandstone inclusions up to 2.0mm.

Clay Matrix: Fine-textured.

Thin-sections: Gloucester (TF99); M959-60, M967, M969. Hereford (fabric G7); M604. Winchcombe; M911-3.

Source: Identification of Nuneaton wares is hampered by two factors; firstly, the extensive excavations at the kiln sites at Chilvers Coton are unpublished so that the range of forms and techniques is poorly known and, secondly, it is clear that the ware is made from the light-coloured coal measure clays which abound in the West Midlands and North-West of England. Thus, thin-section analysis alone is of no use in the characterisation of the ware. There are particular difficulties in the Severn Valley because of the similarity in fabric between Nuneaton-type ware and Bristol Redcliffe ware. Similarly there is a ware which on typological grounds is distinct from both Nuneaton-type ware and Bristol Redcliffe ware which is known from both Gloucester and Hereford (Gloucester TF99, Hereford G7). R. G. Thompson (Southampton Museums) suggests that this too comes from Nuneaton but it is quite different from the copper-green glazed ware termed Nuneaton Ware here (which is also accepted by Thompson as of Nuneaton origin).

Forms: (fig.2.137)

Jugs. Wheelthrown vessels with a copper-green glaze.

Dating and distribution: (fig.2.138) First found in the region in late 13th to 14th century contexts (for example Gloucester Eastgate period 7). The ware is found rarely in the region, mainly to the east of the Cotswolds Scarp and mainly in the north of this area.

The ware is much more common in the Birmingham region, and is the major glazed ware at Birmingham Moat, for example. The absense of the ware from Worcestershire may be due either to the Forest of Arden forming a barrier to pottery trade, or to the competition supplied by the Malvern Chase and other Worcestershire potteries.

Bibliography: Watts (forthcoming a).

COMMON NAME: Shrewsbury-type Ware

Hardness: Hard.

Colour: Light grey with an oxidized reddish yellow (5YR 6/6) inner zone.

Principal inclusions: Rounded and subangular quartz, which have clear, milky or red grains, chert with opaque and brown inclusions, both mainly ranging from 0.2mm to 0.4mm across but with some fragments up to 1.0mm across.

Clay Matrix: Sparse angular quartz and white mica up to 0.1mm across.

Thin-sections: Gloucester; M931, M970.

Source: The sand inclusions in this fabric are similar to those of Worcester-type ware and other West Midlands sand-tempered wares. They are matched exactly by samples from an occupation site at Pride Hill, Shrewsbury. The exact source is unknown.

Forms: (fig.2.139)

Jugs or tripod pitchers. Handmade vessels with a straight-sided lower half, a brown streaked lead glaze and sagging bases. Pulled spouts are found. The vessels are usually decorated on the upper half of the body with incised lines,

either as zones of closely spaced grooves or as lattice work.

Dating and distribution: (fig.2.140) Only rarely found in Gloucester, but consistently in mid-13th century contexts alongside Worcester-type ware. Found at sites around Shrewsbury, for example at Shrewsbury itself and at Haughmond Abbey. Within the study region found only at Worcester and Gloucester, suggesting a river-bo rne trade.

Bibliography: Barker (1970), Vince (1979),

COMMON NAME: Chester-type (Stafford) ware

Hardness: Hard.

Colour: Oxidized red.

Principal inclusions: Abundant to moderate subangular to rounded fragments of quartz and quartzite.

Clay Matrix: Sparse to moderate angular quartz and white mica fragments up to 0.1mm across.

Thin-sections: Hereford; M350-3, M395-6, Chester; M394, Dublin; M366

Source: The petrology of Chester-type (Stafford) ware indicates a West Midlands source, since the sand temper includes fragments of metamorphosed siltstones found, for example, in Worcester-type wares. However, it is likely that similar sands could be found over most of the area in which Chester-type ware is distributed. Two excavations in Stafford have produced evidence that a ware of this Chester-ware type was produced at Stafford. In the first, a dump of waste was found infilling a marsh prior to occupation on the site. In the second a kiln was found. In both cases the fabric and forms of the pottery included

some sherds which are identical to those found on occupation sites at Hereford and elsewhere (E. Morris, pers. comm.). However, some of the vessels were of forms not yet represented on occupation sites and some of the vessels had a higher quantity of quartz sand temper, including iron ore fragments. These differences may be due solely to the much larger sample size of the Stafford collections.

Forms: (fig.2.141)

Cooking Pots. Wheelthrown vessels with sagging bases, formed by pushing out the base. Only a small range of rim forms is found, the most common of which is vertical with a slight external thickening and flattened top. A lid-seated form is also found, although no lids have been found in the fabric. The shoulder of the vessel is usually but not invariably decorated with a single band of roller-stamping. The most common design is diamond cross-hatching but square or rectangular grids are also found. No rollers have been found with sufficiently diagnostic patterns for the die to be characterised.

Storage jars. A few body sherds have been found which are must come from very large vessels. Unlike storage jars in Thetford-type or Exeter Bedford Garage wares no applied, thumbed strips have been found, nor thick, beaded rims.

Bowls. Bowl rims have been recognised at Chester, decorated with roller-stamping.

Spouted pitchers. Sherds of unglazed pitchers with strap handles have been found at Stafford.

Dating and distribution: (fig.2.142) The introduction of

Chester-type ware in Hereford is dated by a single coin of Alfred to c.930 or later. The ware is always found in contexts secondary to the construction of the stone facing wall to the Hereford defences, which is thought to date to the early 10th century. The only evidence which may indicate a 10th rather than 11th century date for the production of the ware is the association at Victoria Street, Hereford, with sherds of a Stamford ware red-painted pitcher, produced, according to Kilmurry in the early years of the 10th century (Kilmurry, 1977 b).

Berrington Street site 4, Hereford, has produced contexts dated to the early 11th century by the presence of a Stamford glazed storage jar (see Ch.6). Chester-type ware is less common in these contexts than in the earlier ones.

Only one large assemblage at Hereford can be dated to the late 11th century and, although a few Chester-type ware sherds are present, they are very rare. The Hereford stratigraphy therefore suggests that Chester-type ware was at its height in the late 10th century, was still in use but in decline in the early 11th century and was not in use by the late 11th century. It is not known whether this is a general pattern or typical only of Hereford.

Only one sherd of Chester-type ware has been found in Gloucester, found stratified below sherds of Gloucester TF41a. This would suggest a mid-late 10th century context for the sherd.

At Worcester, Chester-type ware is found in association with other 10th to 11th century wares at Sidbury (Morris, 1978 a). Chester-type ware was not the dominant fabric at

this site.

Outside of the study region sherds of Chester-type ware have been found at Chester itself, including a vessel containing a hoard of coins and bullion datable to the 980's (Carrington, 1977), Shrewsbury and Barton Blount, Derbyshire.

Bibliography: Beresford (1975), Carrington (1977), Morris (1978 a), Vince (forthcoming a).

COMMON NAME: Staffordshire Medieval ware

Hardness: Hard.

Colour: Oxidized very pale brown (10YR 7/4).

Principal inclusions: Abundant inclusions of angular to subangular milky quartz from 0.5mm to 1.0mm. Sparse red and white clay pellets.

Clay Matrix: Sparse angular quartz and red clay pellets.

Thin-sections:

Source: Probably Staffordshire.

Forms: Jugs. Wheelthrown vessels, sometimes with red painted decoration.

Cooking pots. Wheelthrown globular vessels.

Dating and distribution: (fig.2.143) No stratified examples known to the author, probably late medieval.

Within the study region, the ware is scarce. There are a few examples from Gloucester (TF100) but the majority of examples come from sites in north Worcestershire and the Birmingham area. This is probably only the southern tip of a distribution covering parts of Staffordshire and Shropshire. Examples are known, for example, from excavations at Shrewsbury (Pride Hill) and Stafford (E.

Morris, pers. comm.).

Bibliography: -

COMMON NAME: Staffordshire Coarseware

Hardness: Hard to very hard.

Colour: Red to purple, often variagated with lenses of light-firing clay.

Pricipal inclusions: Sparse to moderate rounded quartz sand up to 0.5mm across, rounded red and white clay pellets up to 10mm across.

Clay matrix: Anisotropic to isotropic, few inclusions.

Source: Staffordshire. The precise sources are not known. Similar coarsewares were produced at Buckley in north Wales and probably also at other centres in the north-west of England. The petrology of the vessels is unlikely to allow sources to be distinguished, since they all utilised the Coal Measure white and red-firing clays.

Forms: Bowls. Three forms of bowl are found: a straight-sided form with a thickened rim; a conical form with a thickened or flanged rim and a large straight-sided form with lug handles. All types have a black internal glaze and an underglazed red slip.

Butter pots. Cylindrical vessels with flat bases and thickened rims. Butter pots are usually overfired and have no glaze.

Date and distribution: (fig.2.144) A single cooking pot from a mid-late 16th century context at the Tesco's site, Gloucester, is probably of this ware. Sites in north Worcestershire, Staffordshire, Salop, and Cheshire were probably supplied with Staffordshire coarsewares in the

16th century, for example Runcorn Priory, Cheshire (Greene, 1977).

In south Worcestershire, Staffordshire coarseware probably first arrived in the early 17th century, at the time of the decline in production of Malvern Chase ware. At Sidbury, Worcester, assemblages of early 17th century date were found which contain a high proportion of Staffordshire coarseware (Morris, 1980). In Herefordshire and Gloucestershire, however, Staffordshire coarsewares do not appear in any quantity until the 18th century and are thus outside the scope of this thesis.

COMMON NAME: Staffordshire Redwares.

Hardness: Hard.

Colour: Red.

Principal inclusions: Sparse to moderate rounded quartz up to 0.5mm across.

Clay matrix: Isotropic with few inclusions.

Forms: Cups. One- or more- handled vessels, usually of cylindrical or flaring form. covered with a thick, black glaze.

Plates. Wheelthrown vessels with knife-trimmed bases. Decorated with slip trailing.

Date and distribution: In Staffordshire and the surrounding counties the use of Staffordshire Redware cups probably started in the 16th century but with the exception of a single vessel from the Eastgate, Gloucester, there does not appear to be any use of this ware in the study region until the mid-17th century, outside the scope of this thesis.

Staffordshire Redware slip-trailed plates occur in Gloucester in association with clay pipes of c.1660-80 (Vince, forthcoming f).

Bibliography:

EAST MIDLANDS WARES

COMMON NAME: St. Neots-type ware.

Hardness: Soft to hard.

Colour: Usually reduced grey, always with a grey core but sometimes with brown margins and surfaces.

Principal inclusions: Abundant, ill-sorted fragments of shell. In thin-section fragments of limestone, bryozoa and other microfossils are visible. There are probable differences between the jugs and cooking pots in the type of microfossils present.

Clay Matrix: Fine-textured with no quartz inclusions. Moderate fragments of shell/limestone and red clay pellets.

Thin-sections: Cooking pots. Droitwich; M682-3. Hereford; M599.

Jugs. Hereford; M597-8.

Source: The East Midlands.

Forms: (fig.2.145)

Cooking pots. Wheelthrown jar-shaped vessels with sagging bases.

Bowls.

Jugs. Wheelthrown vessels sometimes with horizontal rectangular-toothed roller-stamping on the shoulder and body. Strap handles. Sagging bases.

Dating and distribution: (fig.2.146) This ware has a limited distribution within the region, although there is reason to suspect that on certain sites the similarity in fabric may have le d to the misidentification of St. Neots-type ware as Late Roman Shelly ware. At Hereford, where Roman pottery is scarce, several St. Neots type sherds have been identified, both cooking pots and jugs, whereas at Gloucester there is no authenticated identification of the ware.

St. Neots-type ware cooking pots and bowls are common at Oxford in the 11th century, when for a short time St. Neots-type ware takes over from Oxford AC as the most commonly used coarseware (Mellor, 1980). St. Neots-type cooking pots and bowls have been found in late 11th century contexts at Friar Street, Droitwich. They have also been found at Sidbury, Worcester (Morris, 1980).

The roller-stamped unglazed jugs probably have a separate source (see above) and are certainly later than most of the St. Neots-type ware cooking pots and bowls. At Hereford two jug sherds have been found in late 12th to early 13th century contexts, whilst fragments of one jug are present in the N.M.W. Dyserth Castle collection (Hewitt and Morgan, 1977, Nos. 19, 30). This vessel must have arrived at Dyserth between 1241 and 1263, the short period of use of the Castle. A single sherd of St. Neots-type jug was found at Saltford, Avon.

Bibliography: Hewitt & Morgan (1977), Hurst (1976), Hurst (1976).

COMMON NAME: Stamford ware.

Hardness: Hard.

Colour: Very pale brown, pink or cream.

Principal inclusions: Few visible inclusions.

Clay Matrix: Abundant angular quartz grains. Analysis of the grain-size distribution of the quartz inclusions has enabled Kilmurry to classify Stamford ware into several fabric groups.

Thin-sections: Cooking pots. Hereford; M568.

Glazed wares. Hereford; M567.

Source: Stamford, Lincs.

Forms: (not illustrated) Although a wide range of forms were produced in Stamford ware few of these are found in the region.

Cooking Pots.

Red-painted pitchers. One example, from Hereford.

Spouted pitchers. Wheelthrown vessels with a jar-shaped body, sagging base, strap handle and applied tubular spout. They mostly have a drab light green to pale yellow glaze However, spouted pitchers with glossy yellow glaze are also found.

Jugs. Green glazed vessels with sagging bases, strap handles and abundant use of combing on the body and on handles.

Storage jars. A single example from Hereford with a glossy yellow glaze and vertical applied thumbed strip.

Dating and distribution: In no case, with the exception of the Hereford red-painted jug (see below), does a site in the region provide dating evidence for Stamford ware.

Instead the ware has been used to provide or confirm a chronology for the 10th to 12th century pottery of the region.

Late 9th to 10th centuries. A few of the Stamford ware sherds from Gloucester and Worcester have been dated by Kilmurry to the period c.900. These are very rare and come from two sites only; Sidbury in Worcester and the Bell Hotel site, Gloucester. The latter example is a flat-based glazed vessel.

Early 10th century. The Hereford red-painted jug was found in 1967 by Rahtz at Victoria Street. The context in which it was found post-dated the construction and re-walling of the town rampart which, historically, is probaby early 10th century in date. The sherds of the jug were found over a wide area indicating in situ smashing of the vessel otherwise it would have been possible that the sherds were incorporated in the original rampart and then weathered out.

Late 10th to 11th centuries. A few glazed pitcher sherds from Worcester, Gloucester, Hereford and Winchcombe were dated by Kilmurry to the late 10th or early 11th century (fig.2.149). These are associated with unglazed wheelthrown greyware cooking pots which Kilmurry is reluctant to accept as Stamford ware. They are said however to have a similar East Midlands source (fig.2.148).

Late 11th to early 12th century. The majority of the glazed pitchers found in the region belong to this period and the list of sites where they are found includes Gloucester, Hereford, Worcester, Droitwich, Winchcombe,

Bath and Swindon (fig.2.150). In no case, except Droitwich, is Stamford ware more than a rare find although it forms the majority of contemporary glazed vessels at each site, except Bath.

Late 12th to 13th century. Developed Stamford ware is rare in the region but has been found at Gloucester (fig.2.151).

Bibliography: Kilmurry (1977a, 1977b, 1980), Vince (1979 a, No.139)

COMMON NAME: Oxford Fabric AC.

Hardness: Hard.

Colour: Reddish brown to grey to brown (5YR 5/3 to 7.5YR 4/0 to 5/2) with a grey core (10YR 4.5 to 5/1).

Principal Inclusions: Fine to coarse oolite and other limestone, sparse quartz.

Clay matrix: not examined.

Thin-sections: Not sectioned.

Source: Unknown. Oxfordshire.

Forms: (not illustrated)

Cooking pots. Handmade vessels, including cylindrical vessels with club rims.

Dating and distribution: (fig.2.152). The distribution of Oxford fabric AC has been plotted by Mellor (1980 a, fig.1). The ware is first found in Oxford in the early 11th century and rapidly becomes the most common ware in use in the town. Evidence from the Hamil site, Oxford, suggests that the ware was still in use in the late 12th century but was not in use in the early 13th century (Mellor, 1980 b).

Bibliography: Haldon and Mellor (1977), Mellor (1980a, 1980b).

COMMON NAME: Oxford Fabric Y.

Hardness: Hard.

Colour: Light grey to light brown (7.5YR 6/1 to 10YR 5 to 6/2 to 3) with a light grey core (10YR 5.5 to 6/1).

Principal inclusions: Abundant well sorted grey and white quartz. Sparse red iron ore.

Clay matrix: Fine-textured.

Thin-sections: not sectioned.

Source: Unknown. Oxfordshire.

Forms: (not illustrated)

Cooking pots. Handmade vessels (wheelthrown according to Haldon and Mellor, 1977, Table 1).

Tripod pitchers. Handmade vessels with a clear lead glaze (wheelthrown according to Haldon and Mellor, 1977, Table 1).

Date and distribution: (fig.2.153) The distribution of Oxford Y vessels in Oxfordshire has been plotted by Mellor (1980 a, fig.1). Cooking pots in Oxford Fabric Y are present at Oxford by the late 11th century while the glazed tripod pitchers have a mid-12th century or earlier starting date. The ware is present in increasing quantities in Oxford throughout the 12th century and into the 13th century. It was replaced by Oxford Fabric AM during the mid-late 13th century.

Oxford Y tripod pitchers have been found at sites in eastern Gloucestershire and northern Wiltshire but in general the distribution of this ware approximates to that of the modern county of Oxfordshire and in Newbury, for example, no tripod pitchers were in use before the late

12th century introduction of Newbury Group C vessels.

Bibliography: Haldon and Mellor (1977), Mellor (1980 a, 1980 b).

COMMON NAME: Oxford Fabric AM

Hardness: Hard

Colour: Reddish yellow (7.5YR 7/5) with a grey to pink core (10YR 7/0 to 7.5YR 7/5).

Principal inclusions: Sparse to abundant subangular quartz, up to 0.3mm across, and sparse red iron ore (possibly heat-altered glauconite?).

Clay matrix: Fine textured.

Thin-sections: Hereford; M571.

Source: Kiln sites and wasters of vessels of this form have been found at Brill and Boarstall, both on the western border of Buckinghamshire. Documentary evidence suggests that later medieval potters were also active in Woodstock, to the north of Oxford, and the main ware found in salvage excavations there was also of Oxford Fabric AM type. There is no evidence that this ware was being produced at Woodstock but there is a strong possibility that it was.

Forms: (fig.2.154)

Jugs. Wheelthrown vessels. The two main forms are tall baluster jugs and short biconical jugs. Both these types have decoration of vertical strips sometimes decorated with roller-stamped small squares. Highly decorated jugs are also found.

Bottles. Wheelthrown vessels with internal glaze.

Date and distribution: (fig.2.155). Highly decorated Oxford Fabric AM jugs occur in mid-13th century contexts at the Hamil site, Oxford but the more standardised baluster and

biconical jugs are of late 13th to early 15th century date.

These later forms are the ones most commonly found on sites in the study region, where they occur alongside other later 13th to 14th century and later wares.

The frequency of Oxford Fabric AM jugs in the study region declines regularly from the Oxfordshire border into Gloucestershire, Wiltshire and Berkshire. Examples of Oxford Fabric AM jugs are uncommon finds on sites in the cities of Hereford and Worcester and two sherds have even been found at Chepstow.

Oxford Fabric AM is the most widely travelled ware of the later middle ages in the study region. It is therefore remarkable that finds of the ware are rare in the extreme to the east of Buckinghamshire. Sites in Hertfordshire once thought to be receiving Oxford Fabric AM vessels are now known to be supplied by a local ware (Jenner & Vince, forthcoming) while a single baluster jug of Oxford Fabric AM is present in the Museum of London reserve collection and no examples are known from recent excavations in the city.

Bibliograhy: Haldon & Mellor (1977), Hinton (1973 a), Rackham (1972).

COMMON NAME: London-type ware

Hardness: Hard.

Colour: Light brown or more rarely red with a grey core.

Principal inclusions: Two distinct fabrics are found. The first, finer fabric is characterised by abundant ill-sorted subangular to rounded quartz mainly up to 0.5mm across with sparse fragments up to 1.0mm across. Sparse to moderate

angular flint, rounded black iron ore and rounded red iron ore (heat-altered glauconite) up to 1.0mm across.

The second, coarser fabric contains well-sorted moderate to abundant rounded quartz, black iron ore and red iron ore together with sparse shell and flint inclusions, c.1.0mm across.

Clay matrix: An anisotropic clay matrix containing moderate angular quartz but little white mica. The matrix of the coarser fabric contains less angular quartz than than of the finer fabric.

Thin-sections: None of examples from the study region have been thin-sectioned.

Source: The London area. Distribution evidence shows that the ware was produced closer to London than to any other examined site in the lower Thames valley. A comparison of the fabric with samples of London brickearth shows that the fabric could have been produced without additional preparation using a local brickearth.

Forms: (fig.2.156).

Early Rounded Jugs. Wheelthrown vessels with a ribbed neck, similar to that found on type 'A' Ham Green jugs, a distinctly sagging base and a collar rim. Both rod and rectangular-sectioned handles are found. Glaze is usually a splashed clear glaze but copper green glaze also occurs, sometimes over a total white slip.

Other forms. Numerous other forms were produced in London-type ware but none have been found in the study region.

Date and distribution: (fig.2.157) Early Rounded jugs occur in a mid-12th century deposit at Seal House, London, dated by dendrochronology to c.1140 (waterfront I). However, this

deposit includes small quantities of recognisable intrusive pottery of early 13th century date and therefore there must be some doubt over the remaining types present in this deposit, especially if they are types which are more common in overlying deposits on the site.

The second waterfront revetment deposit at Seal House is large, well-sealed and dated c.1170 by dendrochronology. It contains a very high proportion of London-type Early Rounded jugs in both coarse and fine fabrics. The third waterfront deposit is dated c.1210 and contains hardly any London-type Early Rounded jugs.

The period of use of the London-type early Rounded jugs definitely ended before the begining of the 13th century but the date of the begining of production is unknown. On analogy with Stamford ware, a date around the middle of the 12th century would be appropiate, since Developed Stamford ware jugs with many features in common with the London-type vessels were definitely just starting to be produced at that time (Killmurry, 1980).

Within the study region London-type ware vessels have been tentatively identified at Newbury (a clear glazed jug in a fine fabric in a period 2 pit dated to the late 12th century), at Gloucester (a clear glazed jug in the coarse fabric, from a site in Southgate Street, 85/68 XX) and at Hereford (two vessels, one in the coarse fabric and the other in the fine fabric, both from the Trinity Almshouse site, He82A). These vessels were all identified after 1980, when the author first saw London-type ware Early Rounded jugs. It is likely that examples are present in other

collections examined for this thesis but were not recognised at the time. However, the Gloucester, Hereford, Newbury and Chepstow collections were examined in such detail that it is unlikely that further examples of London-type ware remain to be identified at those sites.

No examples of the more distinctive Rouen-style jugs made in London-type ware have been recognised in the study region. These vessels are sufficiently unusual as sherds for their presence to have been noted. It can therefore be assumed that whereas most or all of the study region would have been receiving small quantities of London-type ware in the late 12th century no similar trade occurred in the early 13th century.

The extensive distribution of London-type ware in the late 12th century was not just to sites in the study region. Examples of Early Rounded jugs have been found at Exeter and are common in late 12th century contexts in eastern Scotland.

Bibliography: Pearce et al. (forthcoming).

WELSH WARES

COMMON NAME: Dyfed Gravel-tempered ware

Hardness: Hard.

Colour: Not examined.

Principal inclusions: Large rounded fragments of slate and other metamorphic rocks.

Clay Matrix: Not examined.

Thin-sections: None.

Source: One kiln site is known, at Newtown, Dyfed.

Forms: (not illustrated)

Cooking pots. Both handmade and wheelthrown vessels are known. The Handmade vessels contain a coarser temper than other vessels.

Jugs. Wheelthrown glazed vessels.

Dating and distribution: Only one stratified collection of Dyfed Gravel-tempered ware has been published, from Gwbert. This contained only handmade cooking pots (fig.2.158). Wheelthrown cooking pots and jugs have been found at sites throughout Dyfed and occur at sites on the west coast of Wales (figs.2.159, 2.160). They occur at Castell-y-Bere, the main occupation of which began in the 1280's and finished c.1296 (Butler, 1974). Wheelthrown production must therefore have started in the late 13th century but no date can be given to the handmade cooking pots, except that they are most likely to be early 13th century or earlier. The Newtown kiln is thought to be 15th century, showing that this ware had a long life. Production seems to have ceased by the 17th century, when most pottery collections from Dyfed contain North Devon wares of mid-17th century or earlier types.

Bibliography: Jones (1978).

COMMON NAME: Llanstefan-type Ware.

Hardness: Hard.

Colour: Reduced light grey core and very pale brown surfaces.

Principal inclusions: Sparse micaceous sandstone fragments. Few other visible inclusions.

Clay Matrix: Abundant euhedral crystals of calcite, little quartz but some white mica up to 0.2mm across.

Thin-sections: Caldicot Castle; M210, Laugharne; M265, M266, NMW 11.55; M261.

Source: This ware is found principally on sites surrounding Cardigan Bay and a source in this area cannot be doubted but the exact source is not known. The light colour of the clay, and the calcite inclusions suggest an estuarine clay source, but whether this is of recent origin or a geological deposit, such as the Lower Lias clay, is unknown.

Forms: (not illustrated)

Jugs.

Dating and distribution: (fig.2.161) The best examples of Llanstefan-type jugs come from a pit-group at Llanstefan Castle, associated with Saintonge Polychrome jugs of the late 13th or early 14th century (J. Knight, pers. comm.).

Bibliography: -

COMMON NAME: Chepstow NR

Hardness: Hard.

Colour: Reduced grey, but refires red (2.5YR 5/8) at 1000 degrees C.

Principal inclusions: Sparse angular silicified sandstone with brown and opaque inclusions (grains up to 0.1mm in sandstone fragments up to 0.7mm across),

Clay Matrix: Abundant angular to subangular quartz, mainly less than 0.2mm but some up to 0.4mm, sparse white mica up to 0.1mm, felspar up to 0.2mm, rounded red chert up to 0.2mm and unidentified heavy minerals up to 0.1mm.

Thin-sections: Chepstow M903.

Source: Petrologically similar to Hereford A7b.

Forms: (fig.2.162)

Jugs. A strap handle with stabbed decoration and a body sherd with traces of roller-stamping.

Dating and distribution: Found at Chepstow in loose association with 13th century pottery. Only two vessels from sites I, VI, and XI combined.

Bibliography: Vince (forthcoming, e).

COMMON NAME: Chepstow NN

Hardness: hard.

Colour: Oxidized pink (7.5YR 7/4) with a light grey core. Refires red (2.5YR 5/8) at 1000 degrees C.

Principal inclusions: Sparse fragments of angular and subangular quartz, silicious sandstone and angular red chert, both up to 0.7mm across.

Clay Matrix: Sparse fine quartz and unidentified heavy minerals up to 0.04mm across. Rare white mica up to 0.1mm.

Thin-sections: Chepstow M896.

Source: Unknown. The texture of the clay matrix is similar to that of many Lower Lias clay samples. A Severn Valley source is possible.

Forms: (not illustrated)

Jug. Wheelthrown vessels.

Dating and distribution: Two unstratified sherds, one from Winchcombe Abbey and the other from Chepstow.

Bibliography: Vince (forthcoming e).

COMMON NAME: Chepstow NO

Hardness: Hard to very hard.

Colour: Reduced with oxidized brown surfaces where not glazed (7.5YR 5/4). Refires red (2.5YR 4/6) at 1000 degrees C.

Principal inclusions: Abundant rounded and subangular quartz, up to 0.8mmm across, often cloudy with brown inclusions. Rounded chert with red-staining along veins, sparse sandstone fragments, up to 0.7mm across, containing quartz grains up to 0.3mm across in a silica matrix containing a high quantity of brown inclusions.

Clay Matrix: Sparse angular quartz and white mica, vesicular.

Thin-sections: Chepstow M897-8.

Source: Unknown. The sand temper is derived from an area of sedimentary rocks.

Forms: (fig.2.163)

Jugs. Handmade vessels decorated with roller-stamping or applied strips. A single handle is known with two vertical grooves and central stabbing. The grooves were overlain by roller-stamping. Two roller-stamp patterns are represented; a chevron design and a raised zig-zag. The vessels are covered externally in a clear olive to brown glaze.

Dating and distribution: Found only at Chepstow, one sherd comes from a 12th century pit (site VI, F12) and five from an early to mid-13th century context (site XI, period 3).

Bibliography: Vince (forthcoming e).

COMMON NAME: Glamorgan-type Wares

At Chepstow four distinct fabrics were found but with a distinct petrological similarity. It is suggested that they might all come from the same production source, two being early 13th century coarse handmade wares, one a later medieval wheelthrown ware and the last a ridge tile fabric. It should be noted that this is probably not Vyner's 'Vale fabric', which Ponsford has claimed as Proto-Ham Green ware (Vyner and Wrathmell, 1978; M. Ponsford, pers. comm.).

Chepstow HH

Hardness: Soft to hard.

Colour: Oxidized reddish yellow (5YR 6/6) with a light or dark red core. Refires to red (2.5YR 4/6 to 5/8) at 1000 degrees C.

Principal inclusions: Inclusions of angular and subangular quartz, up to 0.7mm across. Sparse rounded quartz and quartzite up to 2.0mm across. Fine-grained silicious sandstone, sometimes stained brown, up to 0.5mm across. Sparse coarser grained sandstone, fragments up to 0.8mm across, with some brown staining around interlocking quartz grains which are up to 0.3mm across. Sparse clay pellets up to 2.0mm across. Sparse subangular or rounded iron ore up to 0.4mm across. Sparse limestone, sometimes decomposed and sometimes fragments of crystalline calcite, up to 0.8mm across.

Clay Matrix: Highly birefringent (and therefore low firing temperature). Moderate angular quartz and white mica up to 0.1mm long. Rounded pellets of clay with the same texture as the clay matrix.

Thin-sections: Chepstow; M823.

Source: Originally this fabric was divided into four groups on the basis of the relative proportions of the large inclusions but these inclusions were only a small proportion of the fabric and the similarity in thin-section suggests a single source. The fabric is very similar to Glamorgan-type wheelthrown ware but contains larger, rounded inclusions such as quartzite, micaceous clay pellets and small limestone fragments. A source in Glamorgan is probable.

Forms: (not illustrated)

Jugs. Handmade vessels with an external glaze and a sagging base. They could therefore either be handmade jugs similar to Ham Green 'A' vessels or tripod pitchers.

Dating and distribution: Found, but rare, at Chepstow in 12th and early 13th century contexts. Absence from sites in Glamorgan could easily be due to the lack of appropriate collections there.

Bibliography: Vince (forthcoming e)

Chepstow HU

Hardness: Hard.

Colour: Grey with yellowish red interior surface (5YR 5/6)

Principal inclusions: Well-sorted inclusions of quartz quartzite and sandstone, which contains brown and opaque inclusions, between 0.1mm and 0.3mm across. Sparse larger rounded mudstones and quartzite (not in thin-section). Sparse opaque iron ore up to 0.2mm across.

Clay Matrix: Moderate angular quartz and white mica up to 0.1mm across.

Thin-sections: Chepstow; M928.

Source: The clay matrix is similar to those of Chepstow HH and Glamorgan-type wheelthrown ware but the quantity and size-range of inclusions distinguishes it.

Forms: (not illustrated)

Jug. Handmade vessel decorated with horizontal roller-stamped bands, external green glaze (brown in places).

Dating and distribution: Only one sherd found, from Chepstow site VI, F4. Probably 12th or 13th century.

Bibliography: Vince (forthcoming e)

Glamorgan-type Ware (Chepstow HG)

Hardness: Hard.

Colour: Oxidized brown (7.5YR 5/4) with a grey core. A variant has a very dark grey core and dark greyish brown surfaces (10YR 4/2). Refires to red (2.5YR 4/6 to 5/8).

Principal inclusions: Moderate angular to subangular inclusions of quartz, up to 0.5mm across. Moderate angular fragments of sandstone, which contain quartz grains up to 0.3mm across and have some brown staining around grains, up to 1.0mm across. Sparse rounded clay pellets up to 1.0mm across, rounded and angular iron ore up to 0.4mm across and rarer grains of plagioclase and microcline felspar and tourmaline, up to 0.4mm across.

Clay Matrix: Abundant angular quartz and white mica up to 0.1mm across.

Thin-sections: M219, M225, M226, M228, M237, M242, M248, M249. Cardiff; M237. Chepstow; M820-2, M859. Coity Castle; M242. Kenfig; M226. Llangibby; M219. Llantwit Major; M248-9. Newcastle - Bridgend; M225. Ogmore; M228. Rumney Castle; M1135. St. Davids; M201.

Source: Thin-section analysis of a number of samples from

south Wales shows no geographical variation in this common fabric and, together with similarity in typology and firing, this suggests a single source. Using distribution evidence a source in Glamorgan is certain and Lewis has suggested a Cardiff source for some jugs in this fabric (Lewis, 1964-6, fig.2 nos. 5, 6, and 9). During the 14th century the eastern suburb of Cardiff was known as Crockerton, in 1348, and Crockerstrete, in 1399 (Charles, 1938, 162). Ridge tiles sent to Newport Castle are known to have been made in Cardiff and ridge tiles are found in a more heavily tempered version of the Glamorgan-type fabric at Chepstow.

Another possible source is Ewenny, which was a large post-medieval pottery. Production is attested from 1427 by a placename, 'Potterislond'.

Forms: (fig.2.164)

Jugs. Wheelthrown vessels with thumbed bases, simple rims, some of which have applied thumbed strips running around the vessel. Decoration takes the form of horizontal grooves, applied strips (tempered with iron ore) or thumbing around the girth.

Cooking Pots. Wheelthrown vessels with internal glaze.

Ridge tiles.

Dating and distribution: (fig.2.165) Found at Chepstow in early to mid-13th century contexts but forming only c.1% of assemblages. Common in later contexts at Chepstow, few of which are well-stratified. The ware is common at sites in Glamorgan, it formed, for example, 97 out of 103 sherds from Kenfig, and is found all along the south Welsh coast

to Pembrokeshire. A single complete jug is known from Gloucester.

Bibliography: Vince (forthcoming e), Lewis (1964-6)

COMMON NAME: Chepstow HA (Penhow Ware)

Hardness: hard.

Colour: Oxidized red (2.5YR 5/6) or more commonly reddish yellow (5YR 6/6) with a light grey core or sometimes a dark reddish brown (5YR 3/2) core. Refires to red (2.5YR 4/6) at 1000 degrees C.

Principal inclusions: Moderate, subangular inclusions up to 1.0mm across. These are mainly quartz, some of which has opaque inclusions, dense red clay pellets, which possibly include some mudstone with white mica inclusions, rounded opaque iron ore, sandstones, some with a silica cement, which is overgrown so that the original grain boundaries are unclear, and some containing grains of quartz from 0.1mm to 0.2mm across in a silica cement with slight iron staining around the grains. Sparse micro-crystalline limestone up to 2.0mm. A large angular fragment of sandstone, 2.0mm long, was present in one thin-section of a glazed vessel. It had a high quantity of brown inclusions and a silica cement.

Clay Matrix: Moderate angular quartz and white mica up to 2.0mm across and rare tourmaline. The clay is laminated and the laminae 'flow' around the inclusions.

Thin-sections: Chepstow; M807-810, M901-2. Penhow kiln and clay samples; Museum of London thin-section collection.

Source: The distribution of this ware indicates a south Gwent source and a kiln producing the ware has been found at Penhow by Wrathmell (1981). The kiln has a central spine

which, like the walls of the kiln, has a clay lining. There is no evidence for a raised floor. Parallels for the construction of the kiln are found in Northamptonshire and Hertfordshire (Wrathmell, 1981, 2).

Forms: (fig.2.166)

Cooking pots. Handmade globular-bodied vessels with a rolled-out rim, often with some moulding at the lip. The whole of the outer surface of the pot is usually wiped and that nearest the rim is smoothed horizontally, perhaps on a turntable. The base is knife-cut and sagging. A wide variety of rim diameters was found at Chepstow, from 155mm to 340mm.

Rectangular-toothed roller-stamping is found as a horizontal band on the shoulder of a large number of vessels while wavy combing in the same position is less common.

Unglazed Jugs. Handmade, globular bodied vessels with a cylindrical neck and simple rim, between 140mm and 170m diameter. The vessels have a pulled spout and rectangular-sectioned handle. Bases and surface treatment are identical to the cooking pots but decoration is more common. Again, rectangular-toothed roller-stamping is most common, followed by wavy combing. One example with a geometric roller-stamped band 25mm wide is known (Chepstow site VI, L4).

Partially glazed Jugs. A few vessels from Chepstow have a very similar typology to the unglazed jugs but have a poor lead glaze, containing fragments of tabular iron ore.

Jugs. Handmade vessels with a thick external green glaze,

probably coloured by copper since the fabric is oxidized. The features of this type are similar to those found on Ham Green 'B' jugs, for example the rim form, closely spaced horizontal grooving and a strap handle, 45mm wide and 10mm thick, decorated with stabbing.

Dating and distribution: (fig.2.167) Chepstow HA ware was found in every 12th century context at Chepstow but was absent from late 11th to 12th century contexts (site XI, period 1). Similar unglazed jugs are known from the mid-12th century onwards in Newbury B ware and in the Lower Thames basin. The relative frequency of Chepstow HA vessels is higher in the early 13th century contexts at Chepstow and the ware probably continued production into the late 13th to early 14th centuries. The partially glazed and glazed jugs are rare but occur in late 13th century contexts at Chepstow site VI. The end date for production is not known since no stratified groups of later 14th to 15th century date are known from south Gwent.

Chepstow HA vessels have only been found on three sites. At Penhow, the kiln was stratified earlier than a castle building of early 13th century date and the ware was common on the site. At Caerwent the frequency of Chepstow HA vessels is unknown but they are common finds (J. Knight, pers. comm.).

Bibliography: Vince (forthcoming e), Wrathmell (1981).

COMMON NAME: Chepstow HAiii

The petrology of this fabric is very similar to that of Chepstow HA but the inclusions are larger and well-rounded.

Hardness: Hard.

Colour: Oxidized reddish yellow (5YR 6/6) or oxidized with a grey core.

Principal inclusions: Subrounded to well-rounded inclusions of quartz, iron ore, some of which has mica inclusions, coarse-grained, iron-stained sandstone, containing quartz grains up to 0.2mm across. Sparse, angular fragments of brown indurated mudstone and rare limestone (not seen in thin-section).

Clay Matrix: Abundant white mica and angular quartz up to 0.1mm, but mainly much smaller.

Thin-sections: -

Source: South Gwent. Possibly the same source as Chepstow HA, some of which is made at Penhow.

Forms: (fig.2.168)

Cooking Pots. Handmade vessels with everted infolded rims. Very irregularly made in comparison with Chepstow HA.

Dating and distribution: Found in small quantities in contexts also containing 12th and 13th century wares at Chepstow but no usefully stratified examples. The use of an oxidized firing distinguishes this ware from the majority of Forest of Dean sandstone-tempered wares, as does the petrology, but in typology this ware belongs to the Forest of Dean group.

Bibliography: Vince (forthcoming e).

COMMON NAME: Chepstow HK

Hardness: Soft to hard.

Colour: Oxidized reddish yellow with a brown or grey core. Refires to red (2.5YR 4/6) at 1000 degrees C.

Principal inclusions: Sparse inclusions of rounded and subangular quartz up to 0.4mm across, fragments of fine-grained white or light brown micaceous sandstone, which contains grains of quartz up to 0.1mm across, up to 0.7mm across, rounded and subangular fragments of coarser-grained sandstone, which contain grains up to 0.4mm across in fragments up to 0.9mm across, rounded fragments of silicified sandstone or chert up to 0.2mm across and fine opaque iron ore, up to 0.02mm across. One sherd contains a large tabular iron ore fragment.

Clay Matrix: Abundant flakes of white mica, up to 0.2mm long and angular quartz up to 0.1mm across.

Thin-sections: M815, M826.

Source: Probably south Gwent. The micaceous sandstone could be of Old Red Sandstone origin as could the remaining inclusions. This highly micaceous fabric is quite distinctive.

Forms: (fig.2.169)

Jugs. Wheelthrown vessels with an external clear glaze. Simple thickened rims and flat or recessed bases. Strap handles, either plain or slashed and grooved (as on some Bristol jugs, such as those found at St. Peter's Church, Bristol). Decoration consists of widely spaced horizontal grooves, between 10mm and 20mm apart.

Dating and distribution: A few sherds were found at Chepstow in an early 13th century context but the ware is

most common in late medieval contexts, possibly becoming more common during this period although insufficient stratified material is present to prove this point.

Chepstow HK ware has not been positively identified outside of Chepstow, although some of the glazed jug sherds from Lydney are also soft and highly micaceous. The ware is not found at sites in the middle Wye or northern Gwent.

Bibliography: Vince (forthcoming e).

COMMON NAME: Chepstow HS

Hardness: Hard.

Colour: Oxidized very pale brown (10YR 7/3). Refires to red (2.5YR 5/6).

Principal inclusions: A coarse, well-sorted sand consisting of rounded and subangular grains of quartz and quartzite, including some overgrown grains and sparse rounded clay pellets, up to 1.0mm across.

Clay Matrix: Sparse angular quartz and white mica, up to 0.2mm across but mainly less than 0.04mm across.

Thin-sections: Chepstow; M871.

Source: The typology and tempering of this ware is distinctive and is found mainly on sites in northern Gwent, where the source is presumed to lie.

Forms: (fig.2.170)

Cooking pots. Handmade cylindrical vessels with a horizontally flanged rim and thickened lip, diameter c.250mm.

Dating and distribution: (fig.2.171) Probably 12th to early 13th century, none stratified. Found rarely in Chepstow. Examples noted from Castell Taliorium, in Llanhilleth, and

Monmouth.

Bibliography: Vince (forthcoming e).

COMMON NAME: Chepstow HT

The pale colour and general absense of inclusions distinguishes this ware from other Devonian marl based fabrics.

Hardness: Hard.

Colour: Light grey core and exterior surface (10YR 6/1) and pale brown interior surface (10YR 6/3). Refires to red (2.5YR 5/8).

Principal inclusions: Sparse angular inclusions of quartz, silicious sandstone, a poorly sorted sandstone with a silica matrix, brown stained chert, one fragment of which included a vein of quartz and rounded dark brown clay pellets, all up to 0.5mm maximum but mainly much smaller.

Clay Matrix: Sparse white mica and abundant angular quartz up to 0.1mm.

Thin-sections: Chepstow; M873-4. M929.

Source: Gwent or Welsh borderland.

Forms: (fig.2.172)

Jugs. Wheelthrown vessels with an external green glaze. Simple rims. Strap handles with stabbing. Thumbed bases. The jugs are usually undecorated.

Dating and distribution: Found at Chepstow in late 13th century contexts (site VI).

Bibliography: Vince (forthcoming e).

IMPORTED WARES

Imported wares are conspicuous in the study region by their almost total absence until the late 16th century.

FRENCH WARES

COMMON NAME: N.French Greyware

Hardness: Hard

Colour: Reduced grey.

Principal Inclusions: Abundant poorly-sorted angular quartz and sparse, colourless, angular chert or flint all less than 0.5mm across.

Clay Matrix: ^^

Thin-sections: Gloucester: M452-3 (same vessel).

Source: Greywares similar in appearance and fabric to the Gloucester example have been found in Saxon Southampton (Hamwih) and have been assigned to Northern France by Hodges (1981, class ^^). The Gloucester example has a rim-form paralleled precisely by published vessels from Saran (Hurst, 1976, Fig.7.13).

Forms: (fig.2.173)

Cooking pots. Wheelthrown with undercut rim.

Date and distribution: A single example is known from the study region, from 1 Westgate Street, Gloucester.

Bibliography: Vince (1979 a) No.68.

COMMON NAME: N.French Monochrome

Hardness: Hard.

Colour: White to pale brown.

Principal Inclusions: Moderate to abundant illsorted subangular quartz sand and sparse white mica.

Clay Matrix: -

Thin-sections: Not sectioned.

Source: This name is given to a series of green glazed, decorated jugs having their origin somewhere in Northern France. Those from the South-West and West of England appear to have a different fabric and source from those found on the East coast. They are quite distinct from the green glazed jugs of the South West of France in fabric and typology, whereas those on the East coast often have an extremely fine fabric indistinguishable from that of Stamford ware or Saintonge ware. No analysis of material in Northern France has been made but on typological grounds there may well be a number of sources scattered over Northern France.

Forms: (not illustrated)

Jugs. Two distinctive traits are; the use of rod or hollow handles and the use of applied strips with diamond roller-stamping.

Dating and distribution: (fig.2.174) A group of three sherds from Gloucester are definitely of North French Monochrome ware. They come from an early to mid-13th century context containing also an unglazed Normandy Gritty jug handle (Site Number: 67/73). A few sherds were also found in early 13th century contexts at Chepstow, site XI and similar finds have been reported verbally by M. Ponsford from Bristol and J. Allen from Exeter.

In comparison with the North French Monochrome from London these western finds have a coarser, more micaceous and more iron-rich fabric, perhaps suggesting a more north-

westerly source than for the London finds (some of which occur in an identical fabric to Rouen ware).

Bibliography: The term was first introduced by Carter for finds from Kings Lynn (Clarke and Carter, 1977, 225-7. Fig.101).

COMMON NAME: Normandy Gritty ware

Hardness: Hard

Colour: Light brownish grey (10YR 6/2)

Principal Inclusions: Moderate subangular fragments of ill-sorted quartz. Sparse subangular red and black iron ore fragments and sparse limestone fragments.

Clay Matrix: Fine angular quartz.

Thin-sections: Not sectioned.

Source: Normandy.

Forms: (not illustrated)

Cooking pots. Wheelthrown vessels with a collar rim and often diamond roller-stamping on the shoulder. The body is often covered with deliberate corrugations, known as Décor Annelé.

Storage jars. Large wheelthrown vessels with strap handles and applied thumbed strips.

Date and distribution: (fig.2.175) First found in this country in late 11th to 12th century contexts along the south and south-east coast (Davison, 1972). None recognised in the study region in such early contexts.

A single storage jar is known from Gloucester from an early 13th century context.

Bibliography: Davison (1972) describes the typology of the ware and illustrates both English and Northern French finds.

COMMON NAME: Beauvais Sgraffitto

Hardness: Very hard.

Colour: White to very pale brown (10YR 8/3).

Principal Inclusions: Sparse fragments of ill-sorted medium-sized angular quartz and red iron ore.

Clay Matrix: -

Thin-sections: Not sectioned.

Source: Beauvais on the northern coast of France.

Forms: (not illustrated)

Bowls wheelthrown vessels with sgraffitto decoration cut through a brown slip. Heavily knife-trimmed bases.

Date and distribution: (fig.2.176) A single fragment has been found at Lydney and two at the Trinity Almshouse site, Hereford (He82A). Bibliography: -

COMMON NAME: Martincamp Flasks

Hardness: Very Hard

Colour: Variable from a very light brown to red to purplish grey, often within the same vessel.

Principal Inclusions: No visible inclusions.

Clay Matrix: Fine angular quartz up to 0.1mm across.

Thin-sections: Hereford: M591

Source: Imported, unglazed flasks were first classified by Hurst (1966) at Kirkstall Abbey. Three fabrics were distinguished: a white-firing earthenware (Hurst Type I), a stoneware (Hurst Type II) and a redfiring earthenware (Hurst Type III). All types have since been established as being made at Martincamp in Northern France (Hurst, 1977

b). It is possible that the difference between type II and type III flasks is purely one of firing while type I flasks must be made from a different clay.

Forms: (fig.2.177)

Flasks. These vessels are thrown as a sphere and are removed from the wheel with a wire. The 'base' of the sphere is then heavily knife-trimmed so that two-thirds of the surface has distinct corrugations caused by the throwing and the other third has knife-trimming marks. A separately thrown neck is added to the 'girth' of the sphere. They have no base and could only stand up if encased in a wicker holder. Remains of the organic covering of one of these flasks has been found at Nonsuch Palace (Hurst, 1977).

Date and distribution: These vessels are rare in the region, although only recognised during the latter part of the fieldwork. Examples of type I flasks are known only from Gloucester and Tewkesbury, the latter in a group containing a high proportion of imported wares of 16th to 17th century date (fig.2.178).

Sherds of type II/III flasks are more widespread and have been found for example at Hereford and Wigmore Abbey (in a 17th century context), both land-locked sites not normally well-served by imported pottery (fig.2.179).

In London these vessels are common and occur mainly, if not exclusively, in 17th century contexts. The relative sparsity of findspots in counties bordering the Bristol Channel is probably due to the vessels not having been identified during fieldwork.

It would seem that Martincamp flasks have a more extensive distribution than most post-medieval imported pottery types, with the exception of Frechen stoneware. It is likely that this is due to their being imported as wine containers.

Bibliography: Hurst (1977b)

COMMON NAME: Saintonge ware

Hardness: Hard.

Colour: Typically very pale brown (7.5YR 7/6 to 10YR 7/2) but a distinctive pink version is sometimes found.

Principal Inclusions: Few visible inclusions, mainly sparse red iron ore fragments, up to 1.0mm across. A very coarse rounded quartz sand temper is also found in some examples.

Clay Matrix: Fine angular quartz and white mica.

Thin-sections: Hereford: M590 (mottled green glaze).

Source: The Saintonge region of south-west France. Excavations have taken place on the site of one pottery, at La Chapelle des Pots (Barton, 1963b).

Forms: (fig.2.180)

Jugs. A standardised range of jug forms was produced and several features occur on all forms of jug. The handles are thin straps, often with a slight 'S' cross-section, and spouts are normally of the 'Parrot beak' variety. The range of possible forms is shown by the finds from Southampton (Platt and Coleman-Smith, 1975). Platt and Coleman-Smith recognise one form in particular as being earlier than the rest, a tall form with a mottled green glaze, splayed base and vertical applied thumbed strips. In the very late 13th to early 14th centuries, a good-quality green glaze is found, often on the interior as well as exterior of the

vessel. Polychrome decoration in brown, yellow and green is found under a very clear lead glaze. The designs on polychrome jugs are limited to three or four patterns, for example the 'birds and shields' and 'vine and scroll' types. Many later medieval jugs have very little or no glaze.

Mortars. Thick vessels with an added coarse quartz temper. They have the strengthening ribs found on stone vessels and are often decorated. A example was found at Castel-y-Bere but none are known from the study region (Butler, 1974).

Pegaux. These vessels are of squat form with a wide rim , three strap handles and a bridge spout. They have flat bases with no elaboration of the base. A complete example is published from Worcester (Dunning, 1965-7 b).

Chafing dishes. The range of forms and decoration on Saintonge chafing dishes is very wide. They are described and illustrated by Hurst (1974). The distinctive features are a wheethrown base, thrown 'upside down', to which the bowl is attached. The handles are also added in the inverted state so that base fragments are often initially identified as jug rims. Applied and moulded decoration is found, together with the use of polychrome glaze (yellow and green).

Date and distribution: The Saintonge industry is likely to have started in the mid-late 13th century. At Dyserth Castle, Clwyd, sherds of mottled green glazed jugs with applied strips were found. The Castle was abandoned by 1263.

The mottled green-glazed jug is the main form found in the region, occurring at Newbury, Gloucester, Hereford and Chepstow (fig.2.181). Good-quality green-glazed jugs and polychrome-decorated jugs, and sherds with polychrome decoration on the exterior and good-quality green glaze on the interior, make a later appearance. They are present in London in groups of early 14th century date, post-1290 and pre-1340 and a polychrome jug was found at Castel-y-Bere, abandoned c.1294-5 (Butler, 1974). In the study region these types occur only at Bristol, Chepstow and on sites along the Welsh coast (fig.2.182). The distribution in Wales has been plotted by Butler (1974) and revised by Evans (1978). Occasional sherds of mottled green glazed and sparse glazed jugs are found in late medieval contexts at Gloucester and from the London evidence these are as likely to be of 14th to 15th century date as they are to be residual late 13th to 14th century. One vessel was found at the late 15th to early 16th century kiln site at Minety (Musty, 1973).

Saintonge jugs and pegaux often have marks scratched onto the vessel post-firing. One example from Chepstow has such a mark. The rareity of such marks on English wares suggests that the marking took place either at the kiln-site or while the vessels were in transit. Examples of scratched marks are known from Southampton, Hull and London.

Chafing dishes appear in late 16th century contexts at sites in the Severn Valley, for example at Gloucester, Tewkesbury and Worcester and examples are known from coastal sites such as Bristol, Cardiff and Chepstow

(fig.2.183). The series from Bristol is exceptionally large, perhaps reflecting the importance of continental trade in the town in the late 16th century.

Bibliography: Dunning (1965-7), Hurst, J. G. (1974), Fox et al. (1933), Butler (1974), Evans (1978), Musty (1973).

SPANISH WARES

COMMON NAME: Andalusian Lustreware

Hardness: Hard.

Colour: Typically a cream-to yellow colour (due to salt-reaction) with areas of pink (2.5Y 9/4 to 7.5YR 7/8 - 8/4).

Principal Inclusions: Sparse to moderate fragments of reddish metamorphic rock fragments, and red iron ore fragments up to 2.0mm across. Moderate to abundant ill-sorted angular to subangular quartz. Sparse white mica fragments.

Clay Matrix: Highly calcareous, except where isotropic, in which case the carbonate has reacted completely with the body and salt to produce a distinctive yellow ceramic.

Thin-sections: None sectioned from the study region but see Vince (1982 b).

Source: Malaga in southern Spain.

Forms: (not illustrated)

Bowls.

Albarellos.

Vases.

Jars.

Date and distribution: (fig.2.184) Only three Andalusian Lustreware vessels are known from the study region, a bowl from Devizes Castle (Hurst, 1977 a, No.30), a jug found

near Cirencester and a jar from Netherton. The former was published by Hurst as an albarello but a rim sherd was found amongst unstratified material from the site. The latter vessel is virtually complete and extremely suspect as a contemporary import. Andalusian Lustreware from London has been found in contexts ranging in date from the late 13th century, c.1260's, to the early 15th century.

Sherds of one albarello were found at Bartholomew Street, Newbury in 15th/16th century levels. It is not known whether this vessel was ever decorated. It may either be a contemporary plain vessel or a residual late medieval decorated vessel.

Bibliography: Hurst, J. G. (1977 a), Dunning (1961 a).

COMMON NAME: Valencian Lustreware

Hardness: Hard.

Colour: Pink to very pale brown (5YR 8/4 to 10YR 8/4)

Principal Inclusions: Abundant illsorted subangular quartz grains, mainly up to 0.3mm but occasionally up to 0.5mm across. Sparse red iron ore fragments up to 1.0mm across.

Clay Matrix: Highly calcareous. In thin-section parts of the matrix are often isotropic and non-calcareous.

Thin-sections: None sectioned from the study region but see Vince (1982 b).

Source: Valencia in eastern Spain. The main production centre was Manises, although other less centres are known (Frothingham, 1951).

Forms: (not illustrated)

Bowls.

Dishes.

Date and distribution: The Valencian lustreware industry is

believed to have been started by potters from Malaga in the late 14th century, c.1380. The earliest occurrences of the ware in London are dated c.1440 and it is found there into the early 17th century. The 15th century forms are illustrated by Hurst (1977 a). These include a set of vessels from the Pithay in Bristol. Finds from the study region include three vessels from Gloucester, all probably bowls with horizontal moulded handles (fig.2.185). These Gloucester vessels were discarded in the late 15th or 16th century.

Bibliography: Hurst, J. G. (1977 a)

COMMON NAME: Iberian Red Micaceous ware

Hardness: Hard.

Colour: Red to Brown (2.5YR 6/8 to 5YR 7/8, 7.5YR 5/4).

Principal Inclusions: Abundant illsorted subangular quartz up to 2.0mm across, moderate large flakes of white mica, up to 2.0mm long and sparse fragments of black and red iron ore fragments up to 1.0mm across.

Clay Matrix: Laminated with very few inclusions, anisotropic.

Thin-sections: Chepstow; M891(?). Hereford; M595. Gloucester; M968.

Source: The source of this ware is thought to be in south-west Iberia, probably in southern Portugal. Martin has shown that those wrecks from the Spanish Armada that provisioned at Lisbon contain this ware while those that provisioned at Cadiz or elsewhere do not (Martin, 1979).

Forms: (not illustrated)

Costrels Narrow-necked wheelthrown vessels with two small

handles on either side of the rim. Flat bases are found, normally coated in a coarse micaceous gravel.

Date and distribution: (fig.2.186) Iberian Red micaceous vessels are known from medieval sites in England but none of the examples from the study region need be earlier than the late 16th to 17th centuries. A few examples have been found inland, at sites such as Hereford and Cirencester Abbey. They occur with the same rareity at sites in the Severn Valley, for example Worcester and Gloucester, where one sherd has been found in a late 16th century context.

Vessels are much more common at coastal sites, for example Chepstow and various sites along the south Welsh coast, although only 7 sherds were found at Chepstow all of which were unstratified but found with 17th century pottery. A complete example was recovered from the main drain at Tintern Abbey, with a post-firing incised owners mark. The ware therefore does not appear to travel far from its initial landing place.

Bibliography: Hurst, J. G. (1977a)

COMMON NAME: Spanish Olive Jars

Hardness: Hard.

Colour: Oxidized reddish yellow (5YR 6/6, 7.5YR 7/4) sometimes with a light grey core and interior. The exterior surface of the vessels is usually 'salt-surfaced', ie. a light coloured ceramic has been formed by the reaction of salt, limestone and iron. This surface is usually white to pale yellow (2.5Y 7/4, 2.5Y 8/2).

Principal Inclusions: Abundant rounded inclusions of limestone, medium-grained metamorphic rock, and quartz up to 1.0mm. The limestone includes both sparry calcite and

fossiliferous fragments. Moderate to sparse biotite, clay pellets, felspar and foramenifera casts are present.

Clay Matrix: Abundant fine white mica or coarse clay minerals up to 0.02mm long. Very little fine angular quartz is present.

Thin-sections: Hereford: M594, Chepstow: M955-6.

Source: The petrology of this ware indicates that the temper is a detrital sand from a river system draining an area of varied geology, including granites, metamorphic rocks and limestones. The same mixture of inclusions is found in thin-sections of Dressel 20 amphorae of early Roman date (Peacock, 1971). A source in the Guadalquivir Valley is therefore suggested here. Historically this probably means that production took place in or around Seville.

Forms: (not illustrated)

Three types of non-handled amphorae are found in this fabric, the last two of which were initially classified by Goggin on the basis of examples from the New World.

Medieval Amphorae in precisely this fabric are known from Southampton (Platt and Coleman-Smith, 1977, Nos.1291, 1308).

Goggin Early Style amphorae were wheelthrown in two halves, luted together and the rim and neck added at the seam. Both the curvature of the body sherds and the form of the rim will distinguish this type.

Goggin Middle Style Amphorae vary considerably in shape and the two most common forms are respectively ovoid and tapering. Examples often, but certainly not always, have an internal semi-opaque light green glaze.

Date and distribution: The medieval amphorae from Southampton are from 14th century contexts. With the exception of a single example from Chepstow, examples are not known from the study region. Goggin Early Style vessels are dated in the New World to the very late 15th and early 16th centuries and a single example is known in the study region, from an unstratified context at Hailes Abbey.

The Goggin Middle Style vessels are found in the New World and in Spanish Armada wrecks of the late 16th century and are found in 17th century and later contexts at a few sites in the study region (fig.2.187). A single vessel is known from Hereford, from a salvage collection of probable early to mid-17th century date. A few sherds are known from Gloucester while a complete example has been published from Moreton Valence, in the Severn Valley. At Chepstow two sherds were recovered from unstratified contexts and several vessels are known from Bristol, including a complete ovoid example.

Bibliography: Goggin (1960), Martin (1979).

GERMAN WARES

Thin-section analysis of examples of Rhenish stonewares from Gloucester showed that it is possible to distinguish the fabrics of vessels of 'Raeren', 'Cologne' and 'Frechen' types by the grain size of the quartz grains. In practice this is not neccessary for the majority of finds, which are easy to distinguish on form but there are occasions when this fabric difference may be useful.

COMMON NAME: Raeren Stoneware

Hardness: Very hard.

Colour: Grey.

Principal Inclusions: No visible inclusions.

Clay Matrix: Abundant angular to subangular quartz, c.0.02mm to 0.2mm across with a peak at c.0.06mm.

Thin-sections: Gloucester: M1040-1041

Source: the Middle Rhine.

Forms: (not illustrated)

Drinking Jugs. Wheelthrown vessels with pronounced throwing marks. Small rectangular-sectioned handles and thumb-frilled bases. Decoration, in the form of roller-stamping, is sometimes present on the shoulder of the vessel, as on a sherd from Gloucester Eastgate (period 10A3).

Date and distribution: (fig.2.188) The dating of Raeren stoneware is presented by Hurst (1967). It is evident from this study that the floruit of the type was in the first half of the 16th century, although examples were still in use throughout the century. It is now thought that the type was first imported c.1480. Examples are known from several sites in the study region and are stratified in early 16th century contexts at the East Gate, Gloucester, and Greyfriars, Bristol. A looser association is present at Trowbridge Castle. Raeren stoneware is uncommon in the 16th century assemblages of the study region, although its distribution is fairly even, without a concentration either at the coast or at sites closest to London.

Bibliography: Reineking-Von Bock (1971)

COMMON NAME: Cologne Stoneware

Hardness: Very hard.

Colour: Grey.

Principal Inclusions: Some vessels of this type have a fabric identical in appearance to that of Raeren stoneware, whereas most have a well-sorted quartz sand temper, c.0.3mm across, identical to that of Frechen stoneware.

Clay Matrix: Moderate angular quartz c.0.02mm across.

Thin-sections: Gloucester: M1042.

Source: The Cologne area of the middle Rhine.

Forms: (not illustrated)

Drinking Jugs. It is usual to term saltglazed Rhenish stoneware without a brown wash but with sprigging 'Cologne'. The most common form is a small mug with cylindrical neck, globular body and a moulded base. Examples usually have delicate applied sprigging, usually in the form of foliage, and particularly acorns. One example from Gloucester Eastgate is similar to a vessel in the Cologne Museum (Gloucester Eastgate period 11c3; Reineking-Von Boch, 1971, No.267). Such drinking jugs can have naturalistic sprigged faces.

Date and distribution: (fig.2.189) Examples of this form are known with silver mounts and copies are also known in metal. These show that this type is essentially mid-16th century in date and is a specific product of the same industry which produced 'Frechen' stoneware drinking jugs and bottles.

Stratified examples from the study region are uncommon, although unstratified finds are present throughout the region. A Cologne stoneware drinking jug was found at the

Tesco's site (26/73 I (154), Gloucester, in a group dated to the late 16th century. There appears to be a concentration of findspots in south Wales and the Bristol Channel coast, but this may be due to differential fieldwork or recording by the author.

Bibliography: Reineking-Von Bock (1971),

COMMON NAME: Frechen stoneware

Hardness: Very hard.

Colour: Grey.

Principal Inclusions: Abundant well-sorted subangular quartz, c.0.02mm to 0.3mm across.

Clay Matrix: Moderate angular quartz c.0.04mm across.

Thin-sections: Hereford: M592, Gloucester: M1043.

Source: The Cologne area of the middle Rhine. Frechen is today an industrial centre about 10 miles to the west of Cologne.

Forms: (not illustrated)

Drinking jugs.

Bottles. Wheelthrown, narrow-necked vessels with a handle, either a plain flat base or a moulded base, both with wire-marks on the underside. Both sprigged medallions and faces occur. There is a rough sequence of development of the faces, so that the earlier faces are more naturalistic and the latest ones very rough. The medallions can also be roughly dated. The earliest types, some of which incorporate dates, are often heraldic whilst the later examples are often debased patterns, originating as flowers or, for example, the arms of Amsterdam. The vessels usually have a brown wash over the upper two thirds of the vessel.

Date and distribution: (fig.2.190) Frechen stoneware drinking jugs are present in the study region but, like Cologne and Raeren vessels, are not common. Stratified examples occur at the East Gate site, Gloucester, and at Berrington Street, site 4, Hereford. Unstratified examples are present throughout the region. They date from the late 16th century through to the late 17th century.

The bottles, on the other hand, are more common. Stratified examples are known from the East Gate and North Gate sites, Gloucester, and from Berrington Street site 4, Hereford. Unstratified examples are very common in the museum collections of the region. This may be because their compact shape and hardness ensures that they survive intact more often than the drinking jugs. The earliest bottles belong to the first quarter of the 17th century, and are found in pre-clay pipe contexts, for example at the North Gate, Gloucester (unfortunately, no face or medallion survives from this example).

Bibliography: Reineking-Von Bock (1971), Holmes (1951), Noel Hume (1970).

MEDITERRANEAN AND NEAR EASTERN WARES

COMMON NAME: Mediterranean Maiolica

Hardness: Hard

Colour: Brown to red

Principal Inclusions: no inclusions visible by eye

Clay Matrix: Not examined.

Thin-sections: Not sectioned.

Source: probably mainly Italy (Archaic Maiolica)

Forms: (fig.2.191)

Jars or Jugs (usually too fragmentary to identify)

Date and distribution: (fig.2.192) Only two examples from the region, one from Cirencester Abbey (context unknown) and the other from the Trinity Almshouse site, Hereford (He82A). Probably of late 13th to 14th century date.

Bibliography: Hurst, J. G. (1968).

COMMON NAME: Alkaline Glazed ware

Hardness: Usually soft and crumbly.

Colour: Very pale brown or sometimes pink

Principal Inclusions: few visible large inclusions, some rare iron ore.

Clay Matrix: -

Thin-sections: -

Source: Syria or Egypt is the most likely source for Late Medieval examples found in this country. There is little or no fabric difference between vessels said or known to have been made in these three areas (Dr. O. Watson, Victoria and Albert Museum, pers. comm.).

Forms: (fig.2.193)

Jars. Globular bodied vessels with cylindrical necks. Decorated with black and blue under-glaze paint.

Date and distribution: (fig.2.194) Within the study area Alkaline Glazed ware jars occur as isolated vessels, for example from Tewkesbury, Holm Castle (a small scrap found amongst unstratified post-medieval pottery), Abdon in Shropshire and Bewell House, Hereford (in a post-medieval context). There is, surprisingly, no record of any Alkaline Glazed ware from either Gloucester or Bristol. This lack of concentration at the coast suggests that the vessels were either imported as containers, for example for spices or

medicines, or were brought into the country as souvenirs. Neither the Abdon nor the Hereford examples, however, were found at the sort of high status site where either explanation would be appropiate.

At London the earliest stratified examples are from late 13th to 15th century contexts and three vessels were found in a context dated c.1440 so that the ware was probably imported throughout the late Medieval period.

Bibliography: Hurst, J. G. (1968)

CHAPTER THREE

THE FLOOR TILE INDUSTRIES OF THE SEVERN VALLEY

The format for description of the floor tile industries is similar to that adopted for the pottery industries in Chapter 2. No illustrations of the floor tile designs are presented here since no complete corpus of the designs used in an industry has been prepared while the range of designs used is shown in many cases by Eames (1980).

KEYNSHAM TYPE 1 TILES.

Fabric: Hard, mainly reduced very dark grey (10YR 3/1) with inclusions of poorly sorted quartz grains, mainly subangular up to 0.6mm across. Rare fragments of iron ore and a large number of round vesicles caused either by the decomposition of limestone or organic inclusions (probably the former) up to 0.3mm across. The clay matrix is laminated and contains sparse very fine quartz.

Thin-sections: Keynsham; M38, M557.

Source: Tile waste in this fabric has been found at Keynsham Abbey although no kiln has been discovered (Lowe, 1978, 18-20). The clay is very similar to samples of Lias Clay from the area (for example M558).

Description: The tiles are mainly c.135mm square or are subdivisions of this quarry size. They average 27mm thick and have partially trimmed sanded bases and usually have no keying. The sides have a slight bevel.

Plain and white slipped tiles were made and used mainly as scored and snapped shapes, either quarter tile squares or eighth of a tile triangles. The tiles have a clear lead glaze.

Square Decorated Tiles

All these tiles are decorated with deep inlay. Eight designs are known on the 135mm square tiles of which one, 33, is commonly scored for snapping into four.

Four tiles are half the size of the square tiles - 65mm by 135mm. They are used as borders. These may have been fired as scored square tiles (one, 31, certainly was).

One tile, 32, was a quarter square, probably formed from tile 33.

Three border tiles are 135mm wide but are longer, either 175mm (two examples) or 190mm (one example) or 265mm (one example), this stamp is also found on a 265mm by 160mm tile.

Two other sizes of decorated tiles were found, 90mm square and 155mm by 225mm.

The Designs: These are without exception 13th century Wessex types, including several which are very close to the designs used at Clarendon Palace, Wiltshire. Design 2 might be made with the same stamp as one used at Clarendon but the Lion has lost its lower jaw. Other very similar designs are 4, 6, 10 and 11 (compare with Eames, 1957-8, plate XXXIV).

Dating: At least one of the dies used on the Keynsham tiles is grouped by Eames with those used in the earliest tile kiln at Clarendon Palace, dated between 1240 and 1244 (BM design 1271). Other dies were used on the Queen's Chamber pavement at Clarendon Palace, Wiltshire, dated by documentary evidence to 1250-2 (BM design 1967) whilst others still were used at Salisbury Cathedral Chapter House

in c.1284 (BM design 2610). The majority of the Keynsham dies are similar but not identical to those used in the Salisbury area which might be an argument for a later date for the Keynsham tiles. The absence of keying, which is present on most 'Wessex' tiles is not a dating factor, since unkeyed tiles occur at Clarendon in c.1250-2 (Eames, 1980). A date in the mid- to late 13th century is likely for the Keynsham tiles but precise dating will not be possible without detailed comparison of the dies used at Keynsham and other sites to establish their relative date.

Distribution: (fig.3.1) Die-links exist between the Keynsham type I tiles and those at Clarendon Palace, Salisbury Cathedral Chapter House and Shaftesbury Abbey (BM designs 1967, 2610). There are no examples of tiles in Keynsham type I fabric from any sites except Keynsham Abbey and a possible example from Bitton Church. The collection of floor tiles from Keynsham Abbey is predominantly of type I tiles.

ST. BARTHOLOMEW'S, GLOUCESTER - CLEEVE ABBEY TILES

Fabric: Hard, oxidized reddish brown (2.5YR 5/4) with rare angular red iron ore, rounded micaceous sandstones and mudstones up to 2.0mm. The sandstones contain quartz silt up to 0.04mm across, black mica up to 0.2mm and a high quantity of brown amorphous material. The clay matrix is isotropic and contains angular quartz and some black mica up to 0.2mm and rounded grains of opaque iron ore up to 0.1mm.

Thin-sections: Gloucester Eastgate; M1046.

Source: The characteristics of this fabric are very similar to those of clays from the Devonian Marls and the sedimentary rocks could be of Old Red Sandstone age. The presence of what appears to be black mica both in the sandstones and in the matrix is distinctive. A Somerset source is more likely than one in Gloucester or its environs on the grounds that more sites with similar tiles have been found there than in Gloucestershire.

Description: The tiles have a sharply bevelled edge and knife-trimmed base with usually four shell keys. The designs are deeply inlaid and covered with a clear lead glaze.

The tiles are based on a 135mm square quarry (with examples 120mm and 145mm square). A larger series 200-210 mm square is also found. Rectangular tiles formed by scoring and snapping larger tiles occur in two sizes, 45mm by 135mm and 75-80mm by 140mm. The latter type is sometimes inlaid with a border pattern.

The Designs: The square tiles are inlaid with heraldic shields, bearing the Arms of England, De Clare and the Arms of Richard, King of the Romans, as Earl of Poitou and Cornwall (Ward Perkins, 1941 b, 41). Others bear the double-headed eagle (borne by Richard, King of the Romans and his son, Edmund), designs of tracery and one repeating pattern of interlocking circles containing four fleurs-de-lys. A few tiles are decorated with painted slip lines.

Dating: The heraldic shields must be later than 1252, when Richard Plantagenet became King of the Romans. However, they may be considerably later since the same arms are used at Worcester at the end of the 14th century. L J. Keen

states (pers. comm.) that the Blackfriars, Gloucester, examples, if primary to the building date to the period 1260 to 1270 while Ward-Perkins and Eames believe that the most likely terminus post quem for the heraldic tiles is c.1272, the date of marriage of Edmund, son of Richard, King of the Romans, to Margaret de Clare (Eames, 1980, 195). A terminus post quem for the tiles found at the Carmelite Friary, Bristol, is 1267, the date of foundation of the Friary but the presence of vine leaf decoration in some of the designs suggests to Eames that they actually date to the 1280's or later (Eames, 1980, 194-5). An end date to the industry is probably provided by their presence at so many sites in Gloucester. Gloucester was supplied with tiles from the Bredon-type industry by the 1320's.

Distribution: Tiles of this group have been found at several sites in Gloucester, notably at St. Bartholomew's Hospital and Gloucester Blackfriars. Smaller numbers of tiles have also been found at Gloucester Cathedral and at Gloucester Greyfriars. Excavations in the town have also produced fragments of tile from domestic contexts, unfortunately not in stratified medieval contexts. There can be little doubt that this tile group was extremely common in Medieval Gloucester. No other examples are known from Gloucestershire, however, although tiles in a visually identical fabric have been seen at Tintern Abbey and Bath Abbey (fig.3.2). The die used on one of the Bath tiles is the same as one used on the Gloucester tiles. There is no doubt that the Gloucester, Bath and Tintern tiles were made in the same tilery.

Ward Perkins (1941 b) has show that the Cleeve Abbey tiles (which are die-linked to Gloucester) can also be die-

linked to tiles from a number of sites in Somerset and Avon, as well to tiles at Tintern. The two closest stamps to the Gloucester examples come from Glastonbury Abbey. Three other sites have produced die-linked tiles, although no examples of tiles stamped with these dies have yet been found at Gloucester; St. Ewen's Church, Bristol; Margam Abbey and Neath Abbey (fig. 3.3).

The history of this group of tilers will not be clear until petrological analysis of the various tiles is undertaken and a corpus of dies assembled.

NASH HILL-TYPE TILES

Fabric: Hard, usually incompletely oxidized with a grey core and oxidized sides and base. The fabric is tempered with rounded and angular quartz up to 0.5mm across and larger fragments of rounded and angular iron ore, a sandstone with an opaque iron-rich cement and a white sandstone with quartz and opaque inclusions (rare). The clay matrix contains a high quantity of fine angular quartz.

Thin-sections: Newton St. Loe; M354-355.

Source: Nash Hill, near Lacock, Wiltshire. Two successive kilns were excavated in 1971 by M. R. McCarthy (McCarthy, 1974). Salvage work by the staff of Trowbridge Museum Service has shown that the area of pottery production was extensive and this may also be true for the tilery. The two were in fact closely related at Nash Hill since the two phases of tile kiln were separated by a pottery kiln.

Description: The tiles are of four sizes: c.110mm square; 125-145mm square; 160-165mm square and 200-210mm square. In addition some rectangular tiles were made (Eames, 1974, group III). Three of these tiles have the shorter side

the same length as the 125-145mm tiles while a fourth has the long side the same length as the 200-210mm tiles. All have bevelled edges and between one and five shell keys.

Small border tiles, formed by scoring and snapping tiles of the four sizes, are found but in most cases it is difficult to be certain from which tile size they were formed. Oblong tiles made by dividing 133mm and 200-210mm tiles into three are found and square tiles made by dividing 130-145mm tiles into four and nine. Some of these were scored for division into triangles. Two tiles, also formed from larger tiles and scored for division into triangles were 50mm by 54mm and 46mm by 51mm. These may have been formed from 200mm tiles divided into sixteen squares.

110mm square tile designs

Three found at Nash Hill (Eames 1974, 50 to 52).

125-145mm square tile designs

Twenty five found at Nash Hill and many not found at the kiln site but found at Cirencester Abbey, Bath Abbey, Newton St. Loe and elsewhere.

160-165mm square tile designs

Two found at Nash Hill (Eames, 1974, 22 and 46).

200-210mm square tile designs

Eight designs found at Nash Hill (1 to 6 and 12 to 13). Others are known from Cirencester Abbey (Eames, 1974).

Dating: Mrs. Eames dates the latest kiln waste at Nash Hill to the first half (and probably first quarter) of the 14th century. By inference the first kiln must be late 13th century and this kiln contains decorated floor tile in its

construction. The heraldic tiles, made in 160mm and 200-210mm square sizes, are datable to the late 13th century or later, and probably post-1280. One of these tiles was found in the phase 1 kiln wall. The tiles from Newton St. Loe include one design probably commissioned for the Castle, the Arms of the St. Loe family with a label of five points. Two possible owners of this crest exist: Sir John de St. Loe (mentioned 1313/4) or his namesake (mentioned 1375). Although the earlier date would fit well with the dating of the kiln site none of the four stamps used at Newton St. Loe are found amongst the kiln waste. There are few tiles of demonstrable later 14th century date in Wiltshire but there is the possibility that the Nash Hill tilery continued in production throughout the century. Eames has shown that the Nash Hill dies include some used first in the Clarendon Palace kiln of c.1240-4 and that in both method and style of decoration the tiles are closely related to other 'Wessex' tile groups (Eames, 1980, 196-9).

Distribution: (fig.3.4) The distribution of tiles with Nash Hill stamps in Wiltshire is discussed by Eames (1974). The largest collections are from Stanley Abbey and Lacock Abbey. Both sites are very close to Nash Hill and were certainly supplied from the kiln site. Amesbury is reported to have one tile with the same stamp as Nash Hill and three with the same designs but from different stamps (not examined in this thesis). In north Wiltshire, Gloucester (Blackfriars), Cirencester, the Bristol Avon valley and at Tintern Abbey tiles of Nash Hill fabric have been examined, including a large number of designs previously unreported and tiles with designs found at Nash

Hill but not from the same stamps. There is an apparent lack of Nash Hill tiles in the south of Wiltshire, probably due to the presence of a tile factory in the vicinity of Salisbury.

MOYNES COURT-TYPE TILES

Fabric: Soft to hard, either completely oxidized red (2.5YR 4/6), or oxidized with a reduced grey core and upper surface. Inclusions of rounded and subangular quartz, poorly sorted up to 1.0mm across, milky and red in hand specimen. Larger inclusions also common, mainly red sandstone, iron ore and quartzite (milky rounded fragments), sparse grey micaceous sandstone and coarse-grained white sandstone. These inclusions are mainly less than 2.0mm across but fragments up to 10mm across (mainly red iron ore) are also found The clay matrix contains fine white mica. The white slip contains few visible inclusions apart from white mica (and was not examined in thin-section).

Thin-sections: Moynes Court; M933 (white slip only, the body was too crumbly).

Source: Clays with similar inclusions were seen at Chepstow Park Wood and are probably boulder clays. Large pebble of quartzite and red sandstone were visible. A south Welsh source is certain but precisely where is not yet known. No pottery or roof tiles are known with the same fabric.

Description: 115mm to 135mm square and 20mm to 29mm thick. All the tiles were trimmed with a knife after decoration and have four conical keys in the sanded bases. They have a

clear lead glaze.

Five methods of treatment or decoration are found:

(1) Division into rectangles (45mm by 135mm) by scoring and snapping. Plain and white slipped examples known.

(2) Division into eight triangular tiles (sides of 68mm, 68mm, and 93mm) white slipped.

(3) Divided into sixteen triangular tiles (sides of 46mm, 46mm, and 68mm) white slipped.

(4) Decorated with inlaid designs.

(5) Decorated with inlaid designs and scored and snapped diagonally.

Designs: Five 'Wessex' designs found at Moynes Court while a tile with the Arms of England set diagonally with fleurs-de-lys in the corners was found at St. Mary's Chapel, Newport.

Dating: Probably late 13th or early 14th century.

Distribution: (fig.3.5) Found at Moynes Court, St. Mary's Chapel in Newport and at Llandaff.

HALESOWEN-CHERTSEY-TYPE TILES

Fabric: Not examined in detail.

Thin-sections: Not sectioned.

Source: Unknown. Some tiles were produced at Chertsey Abbey (Eames, 1980, Chapter 8) and other tiles were specially commissioned for Halesowen, but there is no evidence that they were made on the site.

Description: Thick square tiles with deep inlay and clear glaze.

Designs: Well-cut stamps of the Chertsey-Halesowen 'school'.

Dating: Late 13th to early 14th century.

Distribution: (fig.3.6) Die-links exist between Hailes Abbey, Bredon Church, Evesham Abbey, Bordesley Abbey, Tanworth-in-Arden and Kenilworth Abbey. No fabric analysis has been undertaken nor has any extensive search been made for this type.

BREDON-TYPE TILES

Fabric: Hard, oxidized reddish-yellow (5YR 6/6) with a reduced light grey core, the fabric contains scattered angular and subangular quartz grains and red clay pellets up to 0.4mm across and a variable quantity of rounded sandstone and limestone fragments up to 2mm across. The sandstone has a high proportion of brown grains and a brown-stained matrix, the quartz grains in the sandstone range up to 0.1mm across. The limestone is rarer and consists either of fine-grained crystalline or micro-crystalline calcite with fine angular quartz inclusions The clay matrix contains a high quantity of angular quartz and white mica up to 0.04mm across.

Thin-sections: Hereford Berrington Street site 4; M620-621. Gloucester St. Oswald's Priory; M1050

Source: The sandstone and limestone inclusions are matched exactly with those found in Hereford Fabric A2 and in gravel samples from Bewell House, Hereford. The remaining inclusions are found in pottery and clay samples from a wider area of Herefordshire and beyond, although the inclusions in the clay matrix are finer than in many other fabrics of this group, where grains up to 0.1mm across are

common. The distribution of the tiles is centred on Herefordshire and a source close to Hereford is reasonable on these grounds. However, no archaeological or historical evidence for a source in Hereford is known.

Description: Six shapes of tile are found, three of which are based on a quarry size of 160mm square. All have a slight bevel and knife-trimmed bases, sometimes trimmed at an angle to the top of the tile. The tiles vary from 21mm to 25mm thick. The bases are normally stabbed with a square-sectioned tool with sides not more than 5mm wide.

Border Tiles

Only one decorated border tile design has actually been found on a border tile, 80mm by 160mm. The design is based on a Chertsey pattern of alternating castles and fleurs-de-lys.

Two tiles from Ludlow show the probable method of manufacture of these tiles since they bear two impressions of the same stamps, one of two quatrefoils containing five-petalled flowers and the other a design of foliage. Therefore these tiles were either intended to be scored and snapped or the stamps were meant to be used on 80mm by 160 mm tiles and were reused on larger tiles.

160mm-square tiles

The majority of Bredon-type tiles are of this size Designs found include single patterns; four-tile patterns; one tile which may be from a sixteen-tile pattern and a large series of heraldic tiles with the coats of Arms set straight on the tiles.

Single tile patterns. There are even designs of this type, which could be used individually or laid together to form repeating patterns. Four designs are included within a lobed border which appear to have been direct copies from the Chertsey school of the West Midlands (see Halesowen-Chertsey-type tiles) examples of which are published from Kenilworth Abbey (Chatwin, 1936, plate II). Two tiles have patterns composed of smaller units, nine in one case (five-petalled flowers in circles) and sixteen in the other (three patterns; a white four-petalled flower against a plain ground, a plain four petalled flower against a white background and crossed vesicas against a white background, there being six examples of the first two patterns and four of the last on each tile). These tiles have very ungainly patterns and again it may be that the tiles should have been scored and snapped to form small border tiles of sides 53mm and 40mm respectively One example of the second stamp at Bredon Church is scored into sixteen but not snapped.

Four-tile patterns Five designs are from four-tile patterns. The centres of the designs are filled mainly with animal representations,such a lion's head, a stag or in one case a frieze of devolved grotesques (BM design 1396). Two designs make up a pattern with a quatrefoil at the centre within a diagonally set square with half circles at the corners bearing in one case a sexfoil and in the other a rabbit beneath a bush, possibly a vine.

Heraldic tiles. Three types of heraldic designs are found, which are all set straight to the tile In the first and most common the bottom corners are plain. In the second

they have floral sprays and in the third they have circles filled with flowers. Large collections of these tiles occur at Bredon; Abbey Dore; St. Oswald's Priory, Gloucester, Tewkesbury Abbey and Ludlow and possibly significant differences exist between the distribution of the stamps at these sites. Abbey Dore appears to be the earliest pavement, while St. Oswald's Priory, Gloucester; Tewkesbury and Bredon contain a similar range of stamps. Recent work by A. R. Wilmott (Vince and Wilmott, forthcoming) on the identification of the heraldry casts doubt on some of the previous identifications (Porter, 1887, Holland-Martin, 1933).

Sixteen-tile designs. Two designs could form the centre tiles for sixteen-tile patterns although no examples of the outer designs have been found.

The Labours of the Months At Bredon (H. & W.) the pavement when complete must have contained twelve roundels in situ of diameter 180mm each set in a border of four 160mm tiles. The corners of the border tiles have been cut away in a quarter circle before firing. Only six roundels now exist at Bredon, none of which retains the inlaid design. However, a single circular tile at Colwall Church (H. & W.) of a man digging must be from a similar pavement. Several of the Malvern Chase tiles from Little Malvern are square tiles stamped with designs more appropriate to these roundels. One tile has the same design as the Colwall tile, but with a crack across the centre. This crack is visible at Colwall but is more pronounced at Little Malvern.

The border tiles at Bredon still retain a little of the original design, enough to show that the name of the month in crude Lombardic lettering was present with a motif in the corner. Two of the surviving roundels are surrounded by the same stamp border, suggesting that the paviours who laid the pavement could not read or were not supplied with the right tiles.

190mm-square tiles.

Hereford and Leominster have produced square tiles bearing more elaborate versions of the designs found on the 160mm square tiles. Four designs are known, one of which bears three letters in Lombardic script.

240mm-square tiles

One tile at Leominster is 240mm square, it bears a lion surrounded by a circular border with fleurs-de-lys in the corners.

Dating: The heraldic tiles at Bredon are dated by Wilmott to c.1300 to 1320, a dating confirmed by the architectural dating of the Chancel (Keyser, 1912, 4). Several of the 160 mm square tiles have patterns almost certainly copying the Chertsey school tiles found for example at Hailes Abbey and Evesham but not yet closer to Herefordshire (except for a single very worn example from Bredon itself). The prototype tiles do not survive at any of these sites but are well represented at Kenilworth Abbey (Chatwin, 1936). There is little evidence for any stylistic progression, although two or more stamps of some designs are known. This does not have to imply a long-lived industry however since at the Danbury tile factory several versions of the same design were in use at the same time (Drury and Pratt,

1975, fig.48).

A large number of the Bredon-type stamps were later used at Malvern Chase (see below) but the larger tiles have not been found in that fabric. This suggests that they either went out of use before the movement of stamps to Malvern Chase or came into use afterwards.

There is no evidence that the Bredon-type tilery continued to exist after the movement of stamps to Malvern Chase and it is reasonable to see the larger and better-cut stamps used on the 190mm and 240mm square tiles as earlier tiles.

Distribution: (fig.3.7) All of the sites with Bredon-type tiles are easily accessible from Hereford. It is difficult to quantify the frequency of Bredon-type tiles since we do not know which other tile groups were contemporary. The absence of Bredon-type tiles from Evesham Abbey and Hailes Abbey is probably significant negative evidence, whilst the only site to produce them in Gloucester is St. Oswald's Priory, where all of the tiles come from the area of a single chapel.

Hereford has produced these tiles from four sites, one of which, Berrington Street IV, is a recent dump of tiles from an unknown source. To the west of Hereford the distribution is obscure because of lack of data.

MALVERN CHASE TILES

Fabric: Hard, usually only partially oxidized, although completely oxidized tiles are found. The fabric is tempered with rounded quartz up to 0.3mm across with rarer clay pellets up to 0.4mm and chert up to 0.8mm. Malvernian rock fragments are rare but can be up to 10mm across. The clay matrix contains a high quantity of angular quartz up to 0.1mm across. This is coarser than that found in Great Malvern tiles (see below), although within the same size range. One tile from Bristol Greyfriars has a thick slip of fine micaceous clay over a typical body fabric. The tiles are inlaid with a white slip (not petrologically examined).

Thin-sections: Cirencester; M743. Ewenny Priory; M1006. Gloucester Cathedral; M1007. Gloucester St. Bartholomew's Hospital; M182-3. Hereford Blackfriars; M349.

Source: Samples of Malvern Chase tiles from Gloucester Southgate Street, Gloucester Cathedral (B.M. 11,459) Hereford, and Cirencester have been thin-sectioned and all have a similar fabric. This is quite different from that of most Malvern Chase hollow-wares (see Chapter 2). These have a higher quantity of rounded quartz sand and a lower quantity of angular quartz in the matrix. Until a kiln site is excavated it is not possible to say whether this fabric difference is due to the tiles being made at a separate site within the Chase or whether quartz-rich clays were being chosen deliberately at an establishment where both pottery and tiles were being produced. Waste tiles have been found at both the Gilbert's End and Hanley Swan sites (see chapter 2, p.101) but not in sufficient quantities

to show that they were being produced there. A sample of floor tile from Ewenny Priory (M1006) has a very different fabric to that of the other floor tiles (which are all probably 14th century), but is similar to that of the 16th century pottery from Malvern Chase. No Malvernian rock fragments were present in the thin-section examined. No samples of tiles from Abbot Parker's monument were available for analysis and the origin of these 16th century tiles remains in doubt.

Description: Malvern Chase tiles are found in five sizes; 120-130mm, 130-140mm, 165mm, 190mm and 205mm. All tiles have a slightly bevelled edge and a knife-trimmed base. Square-sectioned stabbing occurs rarely on the bases. The glaze can be clear or green-flecked. Undecorated tiles can be either plain or have a brushed-on white slip under a plain or green glaze.

120-130mm square tiles. Only three designs are known on this size of tile. One, found on an unprovenanced tile in the Gloucester City Museum is based on a Great Malvern design bearing the arms of the De Clare family. This must date to the second half of the 15th century or later. Another, with a pattern of interlocking circles is a copy of a design found on Droitwich-type tiles.

130-140mm square tiles. Six designs and plain tiles with a white slip are found on this tile size. Four of the designs are made with Great Malvern stamps (GM11, 78, 81 and 82). Three of these designs are used in the Gloucester Cathedral Lady Chapel pavement. The remaining two are not Great Malvern stamps and include the corner of a 16-tile pattern and an incomplete design of foliage.

165mm square tiles. At least 20 designs are known of this size of tile and many more fragments probably are from similar sized tiles. Seven single and 4-tile pattern designs are made with Bredon-type stamps. In one case it can be shown that the Malvern Chase tiles are later because a crack has developed across the stamp. Several heraldic designs are also shared with the Bredon-type tiles, also made with the same stamps. Finally five of the Bredon 'labours of the months' roundel stamps are re-used on Malvern Chase tiles. Here too one of the stamps has developed a crack after its use on the roundels. Of the remaining tiles, several of the designs are very similar to surviving Bredon-type tiles and may also be Bredon-type tile stamps reused on Malvern Chase tiles. This implies that the Bredon-type tile prototypes still have to be discovered.

The Gloucester Greyfriars pavement and loose tiles from the same site bear a number of designs which are close to the Bredon-type designs but not made with the same stamps. These may be a later series of stamps made solely for Malvern Chase after the original Bredon-type stamps had worn out. In three cases these degenerate copies can be linked with their prototypes. In the process of copying the Arms of Bishop Trilleck of Hereford, they have been reversed.

190mm square tiles. Plain and white slipped tiles are known in this size of tile. Some are scored for snapping diagonally.

205mm square tiles. Ten designs can be recognised on tiles of this size but most are represented only by small fragments. Unlike all of the preceding groups no tiles are known in other fabrics and it therefore appears that the stamps were cut at Malvern Chase. One of the designs is loosely based on a Great Malvern design. Two others are diagonally set shields bearing in one case the Arms of St. Peter and St. Paul and in the other the Arms of Malmesbury Abbey, possibly bearing the initials of Abbot Thomas Bristol, 1436-1456 (see Malmesbury-type tiles). Three tiles are from four-tile patterns with a design of twisted stalks. In one case the centre of the pattern is composed of a chained bear climbing a tree trunk. All these designs have similarities and are probably the work of one craftsman. The use of Great Malvern motifs must date the series to the 1450's or later.

Dating: Only three medieval pavements containing Malvern Chase tiles have been found. The Gloucester Cathedral Locutorium (Treasury) pavement contains 190mm square plain and white slipped tiles set parallel to the walls of the passage. It can be dated to the late 14th or early 15th century or later since it lies in a passage extended at the time of the construction of the Singing School and Library above. The Gloucester Greyfriars pavement was excavated in 1974 and only small patches survived. All the tiles were 165mm square inlaid tiles and were set diagonally with bands of tiles set parallel to the walls to separate the panels. This pavement can only be dated stylistically, except that it was earlier than the surviving early 16th century structure and was also cut by a series of graves.

Comparison with the Bredon-type tiles shows that the pavement must be of early to mid-14th century date. The third pavement is that surrounding the Monument to Abbot Parker in Gloucester Cathedral. This must date to the early 16th century. Abbot Parker died c.1539 but his Monument may well have been under construction during his lifetime.

Another two fixed points in the chronology of the Malvern Chase tiles are the re-use of the Bredon-type tile stamps, some time after c.1327, and the re-use of stamps from the Great Malvern tilery probably in the 1480's.

The following chronology is most likely-

i) c.1330 or later. Start of industry (by Herefordshire tilers?).

ii) c.1350. Gloucester Greyfriars pavement and other new stamps replacing Bredon-type originals.

iii) c.1350-c.1450. Gap in industry or a switch to plain tile production (eg. Gloucester Locutorium pavement). Possibly some 120mm square tiles with designs copying Droitwich-type tiles.

iv) c.1450-c.1540. Copying of Great Malvern pattern on 120mm square tile.

v) c.1480+. Re-use of Great Malvern stamps on 130-140mm tiles. 205mm square tiles made. Abbot Parker's monument pavement (and Ewenny Priory pavement?).

There is no evidence that the production of decorated tiles survived the dissolution of the Monasteries.

Distribution: (fig.3.8) The distribution of Malvern Chase tiles is heavily biased in favour of archaeological collections. This may be due to the poor quality of the

tiles, both artistically and technically. The Gloucester Cathedral pavement was in a passage which for many years had been blocked at its western end but which was unblocked in the mid-19th century. In the century in which the passage was reopened considerable wear took place. The absence of Malvern Chase tiles in South Worcestershire is almost certainly due to the absence of archaeological collections in the area. The same is probably true of Herefordshire. Where the tiles are found, for example Little Malvern, Worcester, Hereford, Breinton and Much Marcle, they are in archaeological contexts rather than relaid in church floors. Too few findspots are present to plot any changes in the distribution with time.

DROITWICH-TYPE TILES

Fabric: Hard, oxidized reddish yellow to red (5YR 6/6 to 2.5YR 5/6) or sometimes overfired. The fabric is tempered with a variable quantity of sand, consisting of rounded grains of quartz, brown chert, silicified sandstone and micaceous sandstones and siltstones. These inclusions are mainly up to 0.6mm across with some much larger rounded fragments sometimes present.

The clay matrix contains angular and subangular quartz up to 0.2mm across and some white and black mica up to 0.1mm across.

Thin-sections: Keynsham Abbey; M40, M561. Gloucester Telephone Exchange site; M42. Tewkesbury Holm Castle; M381-3. Gloucester St. Oswald's Priory; M1047. Hereford Berrington Street site 4; M1131.

Source: The composition of the rounded sand in Droitwich-type tiles is very similar to that found in Worcester-type jugs and Canynges-type tiles. Both of these fabrics are thought to have a south Worcestershire source.

Subdivisions of the Droitwich-type tile group on fabric grounds have been attempted at Gloucester, where the tiles were divided into two type fabrics, Gloucester TF86 and Gloucester TF114. The latter fabric had a much higher quantity of sand and in consequence a poorer quality impression of the design. At Keynsham Abbey the Droitwich-type tiles were divided into seven sub-groups (Lowe, 1978, 30-35, Types IVa to VIII). Despite these differences in appearance and quantity of inclusions the similarity in inclusions and in the designs used probably indicates that a single 'factory' was responsible for the manufacture of all the Droitwich-type tiles.

One kiln has been found in which tiles of this type have been found, that excavated in the 1830's at St. Mary Witton, Droitwich. However, as will be shown below, there is some doubt about the attribution of the surviving tiles to the kiln.

The tile kiln was discovered in 1837 in the graveyard of St. Mary Witton. This land had then only recently been consecrated and may have had no ecclesiastical connections in the medieval period. Soon after its discovery the site was re-excavated by Jabez Allies..

> The kiln consisted of two parallel rows of circular arches. 'The arches were rather flattened, and there were several of them in each row, and each was two feet six inches high, two feet four inches broad, and

six and a half inches deep; that is the depth of the bricks of which they were built; these bricks are five and a half inches broad, and one inch and three quarters thick, and are squared at the corners on the one side. The intervening space between each arch was five inches; that is the diameter of the encaustic tiles which filled up the sides between the arches to the bend of them, and which tiles were cemented horizontally upon one another with red cement. The whole resembled the skeleton of the back of a horse or an ox' (Allies, 1856, 103-5).

Allies goes on to state that he and his companions had originally thought that the structure was used for boiling brine and that its true nature was pointed out to them by Albert Way, Director of the Society of Antiquaries. He also lists a number of the designs found, examples of which were donated by the rector to the Worcestershire Museum.

'... one of them contains the representation of an archer with a long bow, dog, trees, and something like an owl; another has two birds with their backs towards, but looking at each other; another has a lion; another has the first half of the alphabet in Longobardic characters; another has fleur-de-lis; and another has the ancient symbol of the Christian faith, viz., a fish enveloped in its own bladder, like an oval ring, styled by antiquarians "vesica piscis"..'

From this description there can be little doubt that a small collection present in the Worcester City Museum is that donated by the Rev. Mr. Topham (Worcs. City Museum

Acc. No.1977/504a to f). However, these tiles are complete and not unduly warped or blistered. They may therefore have been tiles incorporated into the structure of the kiln. A tile in the Victoria and Albert Museum is recorded as being from the Droitwich kiln (Acc. No.5660-1901). Two tiles in the British Museum collection were also recorded as being from the Droitwich kiln. One of these tiles is now lost while the other is a Canynges-type tile (BM cat 11431, design 2953). Both the Victoria and Albert and British Museum tiles are in good condition and not obviously wasters. While it is fairly certain that the Worcester City Museum tiles were found on the site even these cannot be used as conclusive evidence for the products of the kiln.

No documentary evidence for medieval tilers operating in Droitwich has been found, although tilers were operating at the right date, the late 14th to 15th centuries, in Worcester (see Canynges-type tiles, below).

Description: The Droitwich-type tiles vary from c.110mm square to c.155mm square but all are made by the same methods. The tiles have sanded bases and slightly bevelled sides. The sides are often covered in excess glaze and white slip runnels, often with traces of other tiles stuck on to the sides. The tiles are either plain lead glazed (appearing black or brown), plain glazed over a white slip (appearing yellow) or decorated with various patterns, probably applied by the stamp-on-slip method.

In many cases the method used is not discernible. All that can be said is that a very thin inlay, often no lower than the surrounding body, was used. A possible chronology for the use of the various sizes and shapes of tiles has

been worked out but the tiles are described below by type of design and shape.

Plain tiles. Most of the plain tiles found are between 115mm and 125mm square or were produced by scoring a tile of this size before firing and then snapping the tile into the required shape after firing.

A: Snapped into two oblong tiles, c.120mm by 60mm.

B: Snapped into four square tiles, c.60mm.

C: Snapped into nine square tiles, c.40mm.

D: Snapped into three oblong tiles, c.120mm by c.40mm.

E: Snapped into two oblong tiles, c.120mm by c.40mm and c.120mm by c.80mm.

F: Snapped into six rectangular tiles, c.60mm by c.40mm.

G: Snapped into eighteen triangular tiles with sides of c.40mm, c.40mm and c.55mm.

H: Snapped into two triangular tiles, along one diagonal. Sides c.120mm, c.120mm and c.170mm.

I: Snapped into four triangular tiles, along both diagonals. Sides c.85mm, c.85mm and c.120mm.

J: Snapped into eight triangular tiles. Sides c.670mm, c.60mm and c.85mm.

White slipped tiles. Tiles covered with a white slip and clear glaze can be found in all the shapes described above but are less common than plain brown or black glazed tiles.

Green glazed tiles. Tiles with an overall white slip but a green glaze, due to the presence of copper, have been found but are rare.

Mosaic tiles.

Table showing the incidence of decoration on the Holm Castle, Tewkesbury, tile mosaic.

Shape No.	a	b	c	d	e	Total
M1	3	3				6
M2		5	1	3		9
M3		2	1			3
M4		1	2		3	6
M5		1			1	2
M6		1	2	2	1	6
M7			1		1	2
M8		1				1
M9	2		3			5
Total	5	14	10	5	6	40

a: plain lead glaze

b: green glaze over a white slip

c: plain glaze over a white slip

d: plain glaze over a stamp-on-slip fleur-de-lys

e: uncertain

One group of mo saic tiles has been found in this fabric, at Holm Castle, Tewkesbury. Nine different shapes were found, of which two were decorated with stamp-on-slip fleurs-de-lys.

M1. A equilateral triangle.

M2. A diamond.

M3. A triangular tile with the shortest side concave.

M4. A segment from a circular band.

M5. A shape with two parallel or slightly tapering sides and one short concave side.

M6. A shape with two concave and one convex side.

M7. An identical shape to M6 but with a central hole.

M8. A shape with one straight side, possibly snapped along a pre-firing scored line, two concave sides and probably

two straight sides.

M9. A shape very similar to M8 but smaller. This shape has not been snapped along the scored line, which is present on all examples but one.

Two dies were used on these tiles, both fleur-de-lys. Neither is found on a square tile. No other examples of tile mosaic have been found in this fabric.

Decorated tiles. Three large collections of Droitwich-type tyiles have been examined and all the designs recorded. They are the collections at St. Oswald's Priory, Gloucester, Little Malvern Court (from the site of the Priory) and Holm Castle, Tewkesbury. Smaller collections from Evesham Abbey and various sites in Gloucester have been examined. The information on the Worcester Cathedral pavements, Hailes Abbey and Keynsham Abbey is derived mainly from published or forthcoming series of tracings, although the fabric of some Hailes and Keynsham tiles has been examined (Sassoon, forthcoming; Lowe, 1978). Many more collections of Droitwich-type tiles exist but I have not been able to catalogue them in detail. This includes a number of collections relaid in parish churches, where there is the possibility that the tiles were not made with the same clay. Where it has been possible to examine and compare tracings and tiles it is clear that several designs are represented by more than one die. However, there is a large amount of subjectivity involved in deciding whether or not the designs on a pair of tiles decorated by the stamp-on-slip method were made using the same die.

100mm tiles. These tiles mainly have single or repeating patterns, although some 4-tile patterns are known. Many of these designs occur on 120mm tiles but made with different, larger dies. 100mm square tiles vary from 22mm to 33mm thick. 17 designs have been recorded, including BM designs 2479, 2397, 2316, 2303, 2243, 2284, 2289, 2209, 2186, 2036 and 2126.

Many of these designs, quite possibly made with the same dies, are found in the London area on 'Westminster' tiles and in Warwickshire on Stoke (Coventry) or Chilvers Coton tiles (Eames, 1980, catalogue). The 'Westminster' tiles are unlikely to be later than the early 14th century since the London market in the late 14th century was flooded by Penn products.

120mm tiles.

120mm square tiles are the most common type found and include the widest range of designs.

i) Lombardic characters. Made on square tiles with four letters to a tile, snapped after firing. Four separate designs have been recorded, all from Evesham Abbey.

ii) Animals and figures within a circle having fleurs-de-lys in the corners. Designs include a lion facing left, a lion facing right, two lions back to back, a knight on horseback and a griffin. This type of design is typical of the 'Wessex' school and was in use at Clarendon Palace in the mid-13th century but dies of this type were still being used in the late 14th century at Worcester Cathedral.

iii) Designs set within a diagonally placed square, the corners of the tile being formed of a contrasting colour. The central designs of this type are either flowers or

fleurs-de-lys. Six dies have been recorded.

iv) Other single and repeating patterns. The remaining single and repeating designs include a fish in a diagonal vesica (two dies known, one from the Droitwich tile kiln), two birds facing a tree with their heads turned away (three dies known, BM design 1961), interlocking arcs from circles (three dies known, BM design 2291), interlocking vesicas (two dies known), two birds set diagonally on the tile with their heads facing (two dies known, one from the Droitwich tile kiln), single fleurs-de-lys (seven dies known) and four fleurs-de-lys separated by a white cross (similar to BM design 2205, found snapped into four squares at Fladbury church, Hereford and Worcester).

v) Heraldic designs with a shield set square to the tile and parallel lines in the bottom corners. Arms represented include De Clare (three dies known), the Arms of England (2 dies known) and six others.

vi) Heraldic designs, as (v) but with other patterns, mainly floral, in the bottom corners. Arms known include those of Beauchamp (three dies known), St. Peter and St. Paul (two dies known, probably used for Gloucester Abbey), Berkeley (two dies known), Despencer, Beauchamp of Holt, the impaled arms of Beauchamp and Ferrers, the dimidiated arms of Beauchamp and Mortimer, Mortimer, Cantilupe and the See of Worcester.

vii) 4-tile patterns needing four different dies to make up the design. Four designs are known; the Arms and badge of Richard, King of the Romans, the Arms of Robert Fitzhamon, the founder of Tewkesbury Abbey (still laid in the

Founder's Chapel, Tewkesbury Abbey) and the Arms of Sir John Talbot, 1st Earl of Shrewsbury, quartering his first wife (Furnival) and impaling his second wife (Beauchamp). A complete set of the last design is in the British Museum collection (BM designs 1711-4).

viii) 4-tile patterns made by repeating one die four times. Eighteen dies are recorded including BM designs 2647, 2676, 2710, 2752, 2762, 2799 and 3000. Some of the plainer designs are very similar to those used in the late 13th to early 14th century on tiles of the 'stabbed Wessex' type.

ix) 9-tile patterns. One 9-tile pattern is found but at least three sets of dies were used to produce the outer tiles, each consisting of two dies. The centre of the design would be made of a single tile. Only one tile has actually been found used with this pattern.

x) 16-tile patterns. A number of 16-tile patterns are found. The most common incorporates the arms of Beauchamp. Other designs include a quatrefoil within a circle (two sets of dies known). Dies represented on tiles in the British Museum collection include designs 2162, 2916, 2982, 3003-4, 3006, 3010, 3035 and 3041-2.

135mm tiles.

Although there is some degree of variation in the size of the quarries of the 120mm tiles there is a series of tiles with a slightly larger quarry, between 130mm and 140mm square. The tiles include single, 4-tile and 16-tile patterns, many of which are larger versions of dies used on 120mm tiles. Tiles in the British Museum collection of this size are decorated with designs 1844, 1886, 2260, 2668, 2683, 2770, 2811, 2908-10, 2931-4 and 2986 but the largest

published collection is that from Keynsham Abbey (Lowe, 1978). None of the simple patterns found on the 100mm tiles occurs on a 135mm tile, neither is there much overlap with the late 14th century 120mm designs used at Worcester Cathedral Singing School.

155mm tiles.

Three designs are known on 155mm square tiles: a fleur-de-lys, a 4-tile pattern and the corner tile from a 16-tile pattern. All three are larger versions of designs found on 135mm tiles.

Dating: The earliest sound dating evidence for Droitwich-type tiles is provided by the Worcester Cathedral Singing School pavements. Documentary evidence for the construction of the buildings in which the tiles were laid dates the pavements to c.1377 or later. The tiles from these pavements include both 100mm and 120mm tiles decorated with dies which are stylistically identical to those of the late 13th to 14th century 'Westminster' and 'Wessex' schools. Any earlier tiles made in the same tilery are therefore unlikely to have stylistically earlier designs and therefore the only evidence which can be used to date the inception of the industry is provided by archaeological evidence alone.

The Holm Castle tiles have two claims to be earlier than the Worcester Cathedral pavements. Firstly, they include a collection of mosaic tiles, which are unlikely to be later than c.1350, since tile mosaic is exceptionally rare after the first half of the 14th century (Eames, 1980). Secondly, the site of Holm Castle was apparently

abandoned in the early 14th century and certainly declined in status. Holm Castle, Tewkesbury, and St. Oswald's Priory, Gloucester have both produced quantities of small snapped tiles, of rectangular and triangular shape. The use of these small border tiles is also thought to be predominantly an early 14th century and earlier feature.

Conversely, it is unlikely that the Droitwich-type tiles would have been made at the same time as decorated tiles were being produced in Bredon-type and Malvern Chase fabrics, since these tiles had a wide distribution over exactly the same area covered by Droitwich-type tiles. It is known that the shift from Bredon-type to Malvern Chase fabric must be later than c.1330 and the Malvern Chase tiles were probably not made for less than 10 years, otherwise they would probably have a limited distribution. Therefore a date late in the 1330s is the earliest at which one may suggest that Droitwich-type tiles were made.

Although some of the designs, and possibly the actual dies, used on Droitwich-type tiles were probably made in the late 13th century this cannot be used as evidence for such an early date for the industry since dies could have a long life.

The two lines of evidence therefore combine to indicate a date c.1340 for the start of the Droitwich-type tilery. Since the Holm Castle, Tewkesbury, and Worcester Cathedral Singing School designs are very similar only close study of dies is likely to distinguish tiles of the mid-14th century from those of the late 14th century. One important group of tiles of this general date is that found at Gloucester Cathedral, both relaid in the eastern chapels (St. Edmund's

Chapel, St. Edward's Chapel and St. Stephen's Chapel) and in situ surrounding the monument to Edward II. Although all of these tiles must be later than c.1327 their exact date is not known. Reconstruction of the east end of the Abbey church was in full swing in the mid- to late 14th century.

Late 14th to mid-15th century pavements are illustrated by those in the Founder's and Beauchamp chapels at Tewkesbury Abbey. These pavements are dated c.1395 and c.1437 respectively and both consist of 120mm tiles laid diagonally to the walls of the chapel. Only five dies each occur on tiles in these pavements, a 4-tile pattern of the founder's arms and a fleur-de-lys in the former pavement and a 16-tile pattern and a rose in a garter in the latter.

The latest collections appear to be those found at Hailes Abbey, Keynsham Abbey and Fladbury church. None of these tiles are stratigraphically associated but the absence of such early features as small border tiles or dies used in the Worcester Cathedral Singing School pavements is sufficient to indicate that most of the tiles in these groups are later than those at Worcester. Only the 9-tile and one 16-tile pattern at Keynsham have any parallels at Worcester and even there different dies were probably used. These tiles were in fact slightly smaller than the average Droitwich-type tiles at Keynsham which are 135mm square. Hailes, Fladbury and Keynsham are linked together by die-links and the use of the same designs but made with different dies. Although there are no die-links between this group and the tiles at Evesham Abbey and Little Malvern Priory both sites have produced 135mm tiles,

which seem to be a late feature. The latter site also produced 155mm tiles, which on the evidence of their dies must also be 'late'.

It is not known quite how late the Droitwich-type industry may be. The Beauchamp chapel pavement at Tewkesbury is the latest dated collection but some of the 16-tile patterns may have been the prototypes for the Canynges-type 16-tile patterns and it is possible that these two industries were sucessive or even slightly overlapped in date. However, the date of the inception of the Canynges-type industry itself is in doubt. If the dubious evidence for a commission for the Hungerfords in the mid-15th century is omitted then the earliest dated tiles may be later than c.1480. It is perhaps more economical to imagine a succession of industries in south Worcestershire with the Droitwich-type tilery in decline or having ceased production by c.1450 when the Great Malvern tilery started and the Canynges-type tilery taking over from Great Malvern in the 1480's.

Distribution: Roughly speaking, the 100mm square tiles are early, and the 135mm and 155mm square tiles are late while the 120mm square tiles occur throughout the operation of the tilery. Therefore a study of the distribution of tiles by their size may reveal differences in distribution between the mid-late 14th century and the early to mid-15th century.

Two features are revealed by this study (figs.3.9 to 3.11). Firstly, the distribution in south Shropshire, Hereford and Worcester and Gloucestershire is not significantly different between the two periods. However,

the tiles found in the lower Avon, in Gwent, Avon and beyond are consistently 'late'. This suggests firstly that the industry increased in scale during the late 14th to early 15th century and secondly that Bristol and the lower Avon must have been supplied by another tilery at this time. One possible candidate for this late industry is that at Nash Hill, Lacock.

MALMESBURY-TYPE TILES

Fabric: Not described in detail, fine sandy.

Thin-sections: None.

Source: Unknown. The method of decoration and the style of decoration suggests a connection with the Droitwich-type tiles or the 'Newbury' tiles of west Berkshire.

Description: Stamp-on-slip decorated tiles, including examples with the arms of Berkeley, Beauchamp and Despencer (BM designs 1609, 1594, 1696) and the griffin, the arms of Malmesbury Abbey flanked by initials identified by Brak spear as those of the Abbots and Abbey or Malmesbury (BM designs 1474-6), also a border tile with a monkey examining a glass urinal (BM design 1329). A 9-tile pattern was found (BM design 2856) and a 16-tile foliage pattern (BM designs 2914-5).

Dating: The heraldry apparently dates this group to the late 14th and early 15th centuries (Brak spear, 1913 & 1914).

Distribution: (fig.3.12) Malmesbury-type tiles have a limited distribution. They occur at Malmesbury Abbey and a small number are present in the Corinium Museum, Cirencester, where they are recorded as being found at

Cirencester Abbey.

GREAT MALVERN TILES

Fabric: Hard, Oxidized red (2.5YR 5/6). Rounded clay pellets with few inclusions up to 0.6mm across. Sparse angular Malvernian rock fragments (orthoclase felspar, often altered, quartz, hornblende) up to 2.0mm across and rare rounded quartz grains up to 0.4mm across.

The clay matrix contains abundant quartz fragments, between 0.02mm and 0.1mm across.

Source: Great Malvern tiles were made in a tilery situated to the east of Great Malvern Priory church. A kiln was discovered there in 1833, about 200 yards east of the church and a description was immediately published (Eginton, 1833). The structure was set into the hill-side and consisted of a long chamber with a flue underneath it. The chamber had a removable floor. A discussion of the technical aspects of the kiln was published in 1887 (Anon, 1887). Amongst the tiles found in 1833 in or around the kiln was one tile whose die can be identified (GM36). The remaining tiles were simply said to correspond with those in Great and Little Malvern churches. The identification of this structure as a kiln has been doubted, notably by Haberley (1937).

An overfired tile now in the British Museum has been thin-sectioned and has a similar petrology to that of tiles from Great Malvern church, Abbot Sebroke's pavement in Gloucester Cathedral and elsewhere.

Thin-sections: Gloucester; Gloucester Cathedral; Great Malvern Priory; Bristol Horsefair; Hailes Abbey;

Description: The British Museum collection includes large

numbers of Great Malvern tiles and tiles of other fabrics stamped with Great Malvern dies. Each die recognised on the British Museum collection tile has been given a BM design number while the tiles themselves have BM catalogue numbers. However, the British Museum collection includes only a half of the dies encountered by the author, who did not have the facilities to draw all of them. Instead, black and white photographs were used to compare dies. It is to be hoped that the Census of Medieval Tiles for Hereford and Worcester and for Gloucester will provide the vehicle for the publication of a single corpus of Great Malvern tiles. In the interim, this thesis uses an unpublished series of numbers, prefixed GM, except where a BM design number has been assigned to the die.

All the Great Malvern tiles have a slight bevelled edge and untrimmed bases, coated in quartz sand (not Malvernian gravel). Clear glaze covers the top and often the sides of the tiles and is often found as dribbles on the base of the tiles. Several distinct series of tiles can be recognised, both on the basis of size or shape and on the basis of design.

The Large Rectangular Series. (GM1-4, 40-1). Six dies are known which were used on large wall tiles. The only examples known now surround the altar at Great Malvern Priory but none are apparently in their original position. The top tile of the series is inscribed 'Anno d m cccc liii' (1453AD). The bottom tile of the design was formed by two alternative dies, GM3 and GM40. The remaining tiles could fit anywhere in the design, although as reproduced by

Shaw the tip of the crown on GM41 is present on GM1. This detail is not clear on the surviving tiles. Four of the designs bear shields, whose heraldry is described by Porter (1890, 155-6). The shields bear the arms of England; the coat of Edward the Confessor (later the Arms of Westminster); the Arms of Bohun, Earl of Hereford; the Arms of Mortimer of Kyre Wyard; Le Despencer; Beauchamp of Powyke; De Clare, Earl of Gloucester; Beachamp, Earl of Warwick; Skull of Wichenford and Stafford of Grafton.

No plain or white-slipped tiles are known in this series.

The Sebroke Pavement Series.

The pavement commissioned by Abbot Sebroke of Gloucester Abbey was laid in the presbytery and choir of the Abbey church. An area of this pavement, in front of the high altar survives intact but much was removed during alterations to the choir. Examples of Sebroke Pavement tiles in the British Museum and from Northgate Street, Gloucester (site 74/68 Tr.IV layer 2), probably derive from this lost portion of the pavement.

The surviving portion contains tiles laid diagonally with single, 4-tile, 9-tile and 16-tile patterns separated by bands of plain tiles. Four sets of tiles incorporate either inscriptions or heraldry which show that their dies were made specially for this pavement.

The first of these is a nine-tile pattern bearing an inscription which includes the date 1455. A transcription of this inscription reads "Ecce qua bonu et quam iocundum habitare fratres in unum fiat amen. R. Brugg, J. Appl'bi, W.Farlei, R.Hullei, nefact'hui' loci A D M CCCC L V.

Dompnus Thomas Sebrok Abbas G." This set dates the commissioning of the pavement to c.1455. (BM design 1473 is the centre of this pattern, other tiles are GM50-3).

The second set is a nine-tile pattern bearing the Arms of Gloucester Abbey and Westminster. (British Museum designs 2565, 2859-60). The third set is a 16-tile pattern bearing the Arms of Westminster (GM74-77; British Museum designs 2897-9) and the fourth set is a repeating 4-tile pattern bearing the arms and motto of Abbot Sebroke "Fiat voluntas dei". (GM68). In addition, there are two dies which may have been used on other parts of the Sebroke pavement but which do not appear on the surviving part of it. One is a repeating 4-tile pattern similar to GM68 but bearing the Royal Arms (GM21; BM design 1480) and the other is a 4-tile pattern similar in design to the 9-tile pattern of GM65-7.

A number of tiles are found with designs incorporating a quarter of a quatrefoil in each corner, or on the edge tiles of the design, in two of the four corners. There are six designs in the series, but one has a variant used on a rectangular tile (GM15, BM design 2578; GM15a, BM design 2579). One die is used in a cracked and uncracked condition (GM16 and GM17; BM designs 1241, 1243). Three dies include flowers in the corners and could be an early stage in the use of the dies in this series, rather than separate stamps (if this is so then GM47 would have become GM16, GM48 would have become GM18 and GM49 would have become GM27). Only one of the stamps with flowers in the corners remains in the Sebroke Pavement, GM49, which is used as a 4-tile pattern.

Two of the remaining dies were not used on the surviving pavement, GM20 (British Museum design 1519) and GM55 (BM design 1693), and the remainder were used to form a 16-tile pattern in the centre of the surviving pavement (GM18, BM design 1418; GM27, BM design 27; GM19, British Museum design 1551). The rectangular die, GM15a, is not found on tiles in the pavement but is used on a tile from Gloucester Cathedral and now in the Victoria and Albert Museum (Lane, 1939, Pl.21a). A variant die of BM1418 was used on the Monmouth-type tiles at Monmouth and Llangattock-nigh-Usk but has not been found on a Great Malvern fabric tile (Rushforth, 1924; Griffinhoofe, 1894, No.8). A four-tile pattern which might also be used as a corner tile in this series occurs on Monmouth-type tile fabric, Great Malvern fabric and at the Lenton Priory tile kiln (British Museum design 1425).

There are several other designs which have no special connection with Gloucester and may have been in use before 1455. GM24 is a 4-tile tracery pattern (BM design 2689), GM26 is a 4-tile pattern bearing the Arms of De Clare (BM design 1656) and GM59 is a 4-tile pattern bearing the Arms of Beauchamp (BM design 1601).

The Square wall-tile series.

The 5 dies of this series were used on tiles now surrounding the high altar at Great Malvern Priory Church. There is a top tile to the design, GM10, but no bottom tile (GM10-14; BM designs 2577, 1420, 1718, 2576, 2575). With the exception of the top tile all the tiles could as easily be used to form borders.

The Rectangular Wall-tile series.

The tiles of this series are the most famous of the Great Malvern tiles (GM 5-9, BM designs 1321, 1322, 1324, 1323 and 1325; GM83). All except GM83 are represented in the surround of the altar at Great Malvern. GM83, which shows the resurrection, is only found on a single tile, now in the Ashmolean Museum but thought to come from Great Malvern Priory Church. A set in the British Museum is illustrated in colour by Eames (1968, Pl.D). The top tile of the series has an inscription, transcribed "Anno r r h vi xxxvi" (36 Henry VI, or 1457-8).

The Gloucester Lady Chapel Series.

The Gloucester Lady Chapel was constructed between 1460 and 1480 and would probably not have been ready for paving until late in this date braket.

The pavement of Gloucester Cathedral Lady Chapel survives in places at the west end of the chapel, in one of the two side chapels, where it is cut by a 17th century monument and at the east end, where a repair patch can be seen that corresponds to the position of the original altar. There is no doubt that this is the original late 15th century pavement.

The pavement is laid diagonally with 4-tile and 16-tile patterns separated by plain tiles. GM69 is a 4-tile pattern with the black-letter inscription "Ave Maria gr[atias] pl[ena]" and GM78 has a similar pattern with the inscription "Dme jsu miserere" (BM design 1441). Another 4-tile pattern, present in one area near the altar, carried the inscription "Orate pro anima Johannis Hertlond" (GM82).

Two 16-tile patterns are found, GM70-73 and GM79-81. The former has an untranscribed inscription and the latter has an inscription "Domine (jesu) miserere".

The sombre nature of these patterns in comparison to the earlier tiles is quite notable, although the dies are as well-cut as the earlier ones. It is likely that they were commissioned for the Lady Chapel, although John Hertlond, who may have been the benefactor, has not been identified.

Black-letter tiles.

Six tiles are linked only by the substantial use of black-letter inscriptions. One tile carries a text which was apparently used as a talisman against fire "Mentem sanctem spontanem honorem deo at patrie liberacionem" (Nichols, 1845, viii, and No.75, BM design 1429). A 4-tile pattern bears an inscription "Pax Christi inter nos sit semper. Amen" (Nichols, 1845, No.74 and pviii; GM56; British Museum design 1469). Another 4-tile pattern bears the inscription "MARC : MATHE : LUCAS : JOH. A : D: MCCCCLVI MISEREMINI : MEI : MISEREMINI : MEI : SALTEM : VOS AMICI. MEI : QUIA : MANUS. DNI. TETEGIT : ME". This tile incorporates the date 1456 (GM63, BM design 1468). A 4-tile pattern, GM64, is inscribed "BENEDICTUS DEUS IN DONIS SUIS" (Blessed is God in his gifts). This tile also depicts two shields showing various implements and what might be antlers (Nichols, 1845, xiv). A fragment from St. Oswald's Priory, Gloucester, has not been transcribed (GM58) and a single tile with an inscription in English is known, the 'Executors tile', GM36, which has eight lines of verse (Nichols, 1845, No.72).

Other tiles.

The remaining patterns cannot be easily divided into sets made at one time and are described below by type of pattern.

Heraldic designs. One tile bears two unidentified coats of arms (GM22, BM design 22) and one tile bears the arms of Newburg and Despencer (GM42, BM design 1723). Both are 4-tile patterns.

Two tiles, bearing the same type of border, have heraldic badges. One depicts the nave of a wheel with the Stafford knot (GM37, BM design 1739) and the other a collared and chained swan (GM38). Both badges also occur on the Thornbury Castle tiles made for the Duke of Stafford in Canynges-type fabric in the early 16th century.

4-tile patterns. One tile has a tracery and foliage design (GM23, BM design 2687) one includes two birds and flowers (GM25, BM design 2688) and a third incorporates a crowned 'M' (GM43, BM design 2686).

Several single-tile patterns are known, mainly using foliage and tracery (GM28-34, 45-6, BM design 2439, -, 2462, -, 2435, 2533, 2543, - and -).

Two tiles are linked only by their comparative crudity of die-cutting. One bears the name "WHILLAR" (GM39, Nichols, 1845, xiv) and the other has a coat of arms, said to be that of the Russell family (GM57).

Dating: Four Great Malvern tiles incorporate a date in their design. It is assumed here that this dates the initial die-cutting, both of that die and those in the same set, although the dies may have continued in use for a long time. The large rectangular tiles therefore date to 1453, the Sebroke tiles date to 1455, an isolated black-letter tile dates to 1456 and the small rectangular wall tiles date to 1457-8. Documentary evidence for the construction of the Lady Chapel at Gloucester Cathedral may be used to give a date of c.1460 to 1480 for the construction of that pavement and possibly for the cutting of the dies used.

Cracked dies can be used to discover the relative dating of various pavements but very few cracked dies were used, nor have duplicate dies of the same pattern been noted. The best example of a cracked die is that used to make GM16 (the uncracked version) and GM17 (the cracked version). The crack was obviously developing whilst the Sebroke pavement tiles were being made, although much worse cracking is visible on some of the tiles at Great Malvern Priory. Since tiles made with the uncracked die are found at both sites it is clear that the two sites were being supplied simultaneously. The uncracked stamp was used on the White Lion, Bristol, collection which includes other Sebroke tiles. The cracked stamp is used at Bath Abbey in a collection which also includes Gloucester Cathedral Lady Chapel tiles. GM27 is uncracked at the White Lion, Bristol; Great Malvern and Gloucester but cracked at Little Malvern Court. GM59 is uncracked at Little Malvern and Gloucester but cracked at Bath Abbey. GM21, a Sebroke pavement style design not found in the surviving pavement, is found

uncracked at the White Lion, Bristol, Great Malvern and Stratford-on-Avon (not checked personally). Cracked examples are found at Bath Abbey and Llangattock-nigh-Usk. At the latter site it is possible that the stamps were used on Monmouth-type tiles. The tile fabric has not been examined. Cracks have also been noted on the dies used for GM51 (a Sebroke pavement tile, from a 9-tile set) on a Gloucester example and GM63, the black-letter apostle tile bearing the date 1456, for a tile found at Bayham Abbey. The evidence of cracked dies shows the Bath Abbey collection to be the latest collection known, a conclusion confirmed by the presence of the Gloucester Cathedral Lady Chapel tiles. Some of the Little Malvern tiles have been shown to be earlier than those at Bath Abbey but later than the White Lion, Bristol, Great Malvern and Sebroke tiles.

Both the Bath Abbey and Little Malvern collections include tiles from the Gloucester Cathedral Lady Chapel series and at Bath at least there is no reason to believe that tiles from more than one pavement were present. Therefore dies in use c.1455 were still in use, but showing signs of wear, closer to c.1480.

The evidence of dies and cracks can also be used to show that the Monmouth-type tiles were probably made in a short-lived tilery, later than c.1456 but earlier than the Gloucester Cathedral Lady Chapel pavement and the Bath Abbey tiles.

The only other documented movements of dies are from Great Malvern to Lenton Priory, Nottinghamshire and from Great Malvern to an unknown centre supplying Cirencester

Abbey (dies GM17 and GM18). GM18 is also found on a Monmouth-type tile showing that this die, and possibly others also, had a long and complicated use.

The Lenton Priory Kiln site produced tiles made with dies used at Gloucester in Abbot Sebroke's pavement, but none of the dies used need have been specifically made for that pavement, so that they could date earlier than 1455. Some of the Lenton tile dies were also used on Monmouth-type tiles and one was used on both Monmouth-type tiles and Malvern chase tiles (GM11, BM1420). Two of the Lenton Priory dies are found on Great Malvern tiles with cracks in 'late' collections (Bath Abbey and Little Malvern Priory). The cracks have not been noted on the Lenton tiles and it is likely therefore that the Lenton Priory Kiln and the Monmouth-type tiles were both the work of Great Malvern tilers in the 1460's to 70's in the lull between the first series of Great Malvern pavements in the 1450's and the construction of the Lady Chapel pavement for Gloucester Cathedral in the 1470's or 1480's.

Four Great Malvern dies to date have been recognised on Malvern Chase tiles; GM11, GM78, GM81 and GM82. These dies were used in the construction of the Gloucester Cathedral Lady Chapel pavement and therefore the movement of dies to Malvern Chase must post-date this pavement. It is likely therefore that the use of Great Malvern tile dies at Malvern Chase occurred at the end of the Great Malvern industry. It may be significant that these Malvern Chase tiles were made with knife-trimmed bases, probably by Malvern Chase tilers rather than Great Malvern ones.

At present the following scheme for the chronology of the products of the Great Malvern 'school' of tilers seems likely:

c.1453. Start of production at Great Malvern, large rectangular wall-tiles.

c.1455. Production of Abbot Sebroke's Pavement for Gloucester Cathedral at Great Malvern.

c.1457-8. Production of small rectangular wall-tiles for Great Malvern.

c.1460-70. Production of Lenton Priory and Monmouth-type tiles.

c.1470-80. Production of Gloucester Cathedral Lady Chapel pavement and pavements at Little Malvern Priory and Bath Abbey.

c.1480+. Movement of dies from Great Malvern to Malvern Chase. Possible movement of tilers from Great Malvern to Canynges-type industry.

Distribution: The distribution of Great Malvern tiles proved by thin-section analysis includes nine sites, three of which are in Gloucester (fig.3.13). With the exception of Bayham Abbey and Raglan Castle all are in the Severn Valley to the south of Great Malvern.

The distribution of tiles stamped with Great Malvern dies is much wider and would repay petrological investigation (fig.3.14).

MONMOUTH-TYPE TILES

Fabric: Hard, oxidized with inclusions of sparse rounded and angular clay pellets and rare micaceous sandstone up to 1.0mm across. Sparse subangular quartz grains and sandstone fragments up to 0.3mm also occur. The sandstone contains quartz grains up to 0.1mm across with interstitial brown amorphous material. The clay matrix is isotropic and contains numerous fragments of angular quartz and white mica up to 0.1mm across.

Thin-sections: Monmouth; M995-998. Llanthony Prima; M1124.

Source: The Welsh borderland, probably Gwent or Herefordshire. Petrologically the fabric is part of a group that includes wares made in the Forest of Deerfold in North Herefordshire, the Upper Wye valley, the Usk valley and the Lower Wye valley (including Monmouth itself).

Description: The tiles vary from 24mm to 33mm thick and were probably all c.135mm square. They are decorated with shallow inlay.

Some of the stamps used are identical to those used on Great Malvern tiles (including GM18 and GM63) whilst others might be the same (the tile fragments being either worn or too incomplete to tell). One die however is not known amongst surviving Great Malvern tiles. That die was used to produce an oblong tile with a memorial inscription to Thomas Coke and his wife Alice (BM design 1326, cat 11470). Despite the fact that the approximate date of death is known, c.1450 to c.1480, and that the tile has been published since 1908 no attempts to identify Thomas Coke have been sucessful.

Dating: The Monmouth-type tiles must post-date 1456, since this date is incorporated into GM63, found in Monmouth-type Fabric at Llanthony Prima. Since some of the dies used on Monmouth-type tiles occur in 'late' Great Malvern tile assemblages such as that at Bath Abbey, and since only one die may have been cut in the Welsh Borderland, it is likely that the industry was short-lived, probably during the 1460's to 70's.

Distribution: (fig.3.15) Only two sites have produced Monmouth-type tiles (which can only be distinguished from Great Malvern tiles by fabric analysis); Monmouth (salvage excavation WCC) and Llanthony Prima. It is however quite likely that the tiles from Monmouth Priory relaid on the tower wall at Monmouth Church are of the same fabric (Griffinhoofe, 1894) as well as the rectangular memorial tile now in the British Museum (Eames, 1980, 250).

Many of the other instances of Great Malvern stamped tiles in the area may be from this tilery rather than that at Great Malvern (for example, Llangattock-nigh-Usk (Rushford, 1924), Stretton Sugwas, Hereford All Saints, Croft, and Newland).

TINTERN-TYPE TILES

Fabric: Hard, grey core with brown surfaces. Abundant angular and rounded quartz up to 0.5mm across, abundant rounded iron ore up to 0.5mm across and rare rounded possible white clay pellets up to 2.0mm across.

Thin-sections: Only one example, not thin-sectioned.

Description: A square tile 126mm by 126mm by 28mm with no bevel and a sanded base. The tile has a shallow inlay design under a clear glaze, which is opaque in places.

Design: is very close to those on Great Malvern tiles (compare with GM28, 31 and 77) but cannot be precisely paralleled.

Dating: Probably mid-15th century or later.

Distribution: (fig.3.16) Only one tile in this fabric is known, from Tintern Abbey and now in the British Museum (cat. no.7655, design 2792)

CANYNGES-TYPE TILES

Fabric: Hard, oxidized red (2.5YR 5/6). Inclusions are sparse in the hand specimen and the overall texture of the clay is smooth. The clay is poorly mixed and lenses of different texture are visible in thin-section. The most common inclusions are subangular and rounded quartz grains, mainly less than 0.5mm across with some up to 1.0mm across. Grains of felspar, light brown chert and quartzite of similar size are sometimes seen. Large rounded and angular clay pellets of different types are common. The most frequently found type is dense, with few inclusions. A less common variant of this type is stained black, possibly by manganese. Rarer types contain a high proportion of carbonate in the form of small crystals, less than 0.02mm across and mostly fired or leached out or a mixture of carbonate, clay minerals and angular quartz grains up to 0.1mm across. Other inclusions are rare and include red micaceous sandstone fragments, chert or quartzite fragments, usually rounded and up to 5.0mm across and opaque black iron ore up to 0.4mm across. The clay matrix is optically isotropic and contains sparse angular quartz grains from 0.02mm upwards, and variable quantities of

carbonate and white mica. The quantity of carbonate varies, but without recognisable pattern whereas the quantity of white mica varies regularly. None of the samples of 'stock' late 15th century tiles had a high white mica content but samples of the St. Augustine's Abbey series, the Carew series, the Llanthony series and the Melton series all had a high white mica content.

Thin-sections: Bristol Canynges Pavement; M1005. Cardiff; M1012-3. Carew; M1014-5. Gloucester St. Oswald's Priory; M999, M1048-9. Gloucester Eastgate; M187, M1125-30. Hailes Abbey; M1028-33. Neen Savage; M1002-4. Slebech; M1011. St. David's; M1001, M1008-10.

Source: The characteristics of this fabric can all be matched in the Keuper Marl. A sample of post-medieval brick from a brick kiln at Droitwich (M934) was similar in the presence of carbonate in the clay matrix and in the presence of marl pellets. It contains a lower quantity of rounded quartz and a higher quantity of angular quartz in the matrix than any Canynges-type sample. The Keuper Marl has a wide outcrop. The Great Malvern tilery, for example, used clays derived from the Keuper Marl. Distribution evidence however confines the search for a source to South Worcestershire, whilst the Great Malvern area can be excluded since none of the clays used there are calcareous.

Droitwich is an obvious possibility since a tile kiln is known there and it is thought that a tile-making industry was based on the town from at least the late 14th century until at least the mid-15th century. It is possible that the Canynges-type tiles represent a change in technique and fabric at the Droitwich tilery. This is

however unlikely since certain tiles found at Halesowen Abbey and Hailes Abbey and decorated with stamp-on-slip designs are made in the Droitwich-type fabric and are dated by Mrs. Eames to the early 16th century (1980, Late Worcestershire Group).

The other possibility is Worcester itself. Tilers are recorded in the town from the late 13th century. In 1299 tilers were recorded at both Northwich and Whitestones, where one is named as Johannes Tegulator, (Hollings, 1950, 7). There were still tilers active in the town in the 16th century. Dyer records wills and inventories of part-time tilers in 1560 and 1611 (Dyer, 1973, 132). This was no doubt mainly a roof tile and later also a brick-making industry. The 1467 Ordinances of Worcester deal with the tilers in some detail. No Guild could be formed, every tiler was free to come and go as he liked and no meeting in a union or parliament was allowed under pain of loss of franchise and a fine of 20s. Every tiler was to mark his tiles (Smith, 1870). These rules were reinforced in 1497 (quoted in V.C.H. WORCS II, 275). The meaning of the last rule is unclear, since neither floor nor roof tiles in the area bear recognised makers marks. In 1641 Habington recorded that the clay pits of Losemore, owned by the Bishop, had been used to make brick and tile from the reign of Henry IV. Habington also recorded that a house outside St. Martin's Gate was anciently called the Tilehouse (Habington, ed. Amphlett, 1899, 45). The known products of the Worcester pottery industry; cooking pots, jugs, and ridge tiles, are made in a fabric with no carbonate

inclusions and few clay pellets. They do however contain a similar quartz sand, although in much larger quantities. It seems therefore that petrological analysis will not be able to pin-point the Canynges-type industry more precisely and that final proof of the source of the tiles will have to wait for further documentary or archaeological information.

Description: The tiles are made to four sizes; 120mm square, 120mm by 165mm, 150mm square and 160mm square. They are between 23mm and 34mm thick and have sanded bases. They have a slight bevelled edge and a clear glaze, often found on the sides and bases of the tiles. The glaze of the Canynges pavement has a relatively high tin content, rendering it opaque in patches (Eames, 1972 a). Decoration is produced by a shallow inlay (possibly the slip-over-impression method).

120mm square tiles. Plain and white slipped tiles are found, but their incidence, except in the Canynges pavement, is difficult to determine since in most of the relaid pavements only the decorated tiles have been kept.

Single tile patterns can be divided into abstract patterns, those with heraldic significance and shields, set diagonally. Abstract designs include Canynges XII (BM design 2008), XX, XXI (BM design 2490), and XXVII (BM design 2366). Those with heraldic significance include Canynges XXVIII (BM design 1523), which is apparently one half of the Arms of Henry, Prince of Wales 1405-1413 (Porter, 1887), Canynges XXIII (BM design 1737) which is a badge of the Hungerfords (Brakespear, 1894, no.4), a crest in the form of an elephant's head (BM design 1727) and tiles 85 (based on the Arms of Bishop Carpenter of

Worcester, Porter, 1887, 158), 87 (based on the Beauchamp Arms), 88 (BM design 1993), 92, 93, and 102 (the last three of which have connections with the Hungerford Family, Brakespear, 1894, nos.3, 7, and 9). Two tiles

are based on the Arms of Evesham Abbey. Shields include the Beauchamp Arms (Canynges XVI, BM design 1606, and another stamp), Wyatt of Tewkesbury (no.81), Craddock (no.89) and Hungerford (Canynges XIV). An unusual set is made up of four stamps (nos. 94 to 97, BM designs 2580, 2581, 1417 and one other) and makes a cross with the sacred monogram at its centre.

Four-tile patterns can be divided into purely ornamental patterns, heraldic patterns and a series with black letter inscriptions. The ornamental designs include Canynges XIII (BM design 2249), XV (BM design 2697), XVII (BM design 2796), XXII (BM design 2809), XXV (BM design 2011), XXVI (BM design 45), and XXX (BM design 2698, together with a variant of XXX, BM design 2700). The heraldic designs include Canynges X (BM design 1440), which has the inscription "fidelium defunctorum" with two mullets and the letter 'A' in the corner, XVIII (BM design 1716) and XXIV (BM design 1464), which has the inscription "Sir John Talbot" with a talbot. The black-letter tiles have the inscriptions "Domine Jesu misere" (Canynges XI, BM design 1442) and "Ave Maria g. p." (No.86). These two designs are based on the 4-tile patterns used in the Great Malvern tile pavement at Gloucester Cathedral Lady Chapel (GM69 and 78). Canynges XI is an accurate copy whilst no.86 takes the inscription from one tile and the design from the

other.

The Canynges pavement contains nine 16-tile patterns (Canygnes I to IX), many of which have variant stamps. One design, Canynges VII, is present in two versions in the Canynges pavement itself. In several cases the centre tiles can be altered or used on their own as 4-tile patterns. One pattern, Canynges IX, is based on the 16-tile pattern used in Abbot Sebroke's pavement which was made at the Great Malvern tilery. Five 16-tile patterns are not represented in the Canynges Pavement, although some are variants of patterns which do occur (BM designs 2980-3, 2991-4 and 2886). (Canynges I = BM designs 2295-8; Canynges II = BM design 2878; Canynges III = BM designs 2919-22; Canynges IV = BM designs 2969-71; Canynges V = 2953-6; Canynges VI = 2973-6; Canynges VII = BM designs 2987-90 and a second series of dies, BM design Nos.2991-4; Canynges VIII = BM designs 2900-3; Canynges IX = BM designs 2893-6).

The St. Augustine's Abbey series. At least fourteen stamps incorporate the initials 'R.E.' or 'I.N.' together with heraldry which links the tiles to St. Augustine's Abbey, Bristol (Eames, 1980, 247-8). 'I.N.' stands for John Nailheart, Abbot from 1481 to 1515 and 'R.E.' stands for Robert Elyot, Hosteller at the Abbey during the Abbacy of Nailheart and later Abbot himself. Eames has suggested that this series dates from the Abbacy of Nailheart rather than Elyot since Elyot acquired a crozier and mitre in his Arms when he became Abbot. There were probably at least four sets of 4-tile patterns, each one composed of four separate stamps. A complete set from Gloucester Cathedral is in the British Museum and has either the initals 'R' or 'E' in the

corners. These tiles bear coats of Arms of the Berkeleys, the rebus of John Nailheart, the Arms of Robert Elyot (actually the R.E. monogram with the mullets of St. John) and the mullets of St. John (BM designs 1499-1502). Two similar sets must have existed and are represented by one design each. They have the initials 'I' or 'N' in the corners but similar shields to the Gloucester Cathedral set. It is evident that the designs come from different sets because the black-letter inscriptions are from different sentences (Nos. 74 and 102). The fourth set has the monogram R.E. in the centre and the initials 'R' or 'E' in each corner with a black-letter inscription "In te d[omi]ne s/peravi non / confundar / in eternum". One tile of this series is found in the Canynges pavement (Canynges XXIX, BM design 1467). Two single tile patterns have the monograms of Robert Elyot or John Nailheart in the centre and a black-letter inscription around the edge (nos. 78, BM design 1427, and 103, Nichols, 1845, xiv). A final tile is possibly from this series since it has the initial 'R' in the corner. It is probably part of a commemorative tile set, similar to the Lygon tiles described below (no.82, BM design 1481).

The Lygon tiles. These tiles are closer to 130mm square than 120mm square. Two tiles in Great Malvern Church go to make up a 4-tile pattern with the inscriptions "Orate pro aia Th/ome Lygon mil" (Pray for the soul of Thomas Lygon, Knight, BM design 1463).

A Thomas Lygon of Madresfield Court died in 1507 and is very probably the person commemorated by these tiles.

Madresfield is very close to Great Malvern and is quite likely to be the burial place of the Lygon family.

The Carew tiles. Three rectangular tiles, 120mm by 165mm, have the coats of Arms of Pembrokeshire dignitaries (Eames, 1980, 249). These include Sir Thomas Lloyd, Precentor of St. David's between 1534 and 1547, and Sir Rhys Ap Thomas, who was prominent at Carew Castle between 1485 and 1528 (BM design 1547).

The Llanthony Priory tiles. At least forty-one stamps are used on a series of 150mm square tiles found at various sites in Gloucester but probably made for the Priory of Llanthony, just outside the town to the south. Three 16-tile patterns are made with 'stock' 120mm tile stamps to which 30mm wide strips have been added. These utilise Canynges I (BM designs 2010 and 2999) and variant stamps of Canynges III (BM designs 2924-6) and the less common version of Canynges VII (ie. BM designs 2991-4). The remaining stamps were probably made at one time for this series. Two 16-tile patterns are known, with outer tiles only which suggests that they might have formed a border around any of the 4-tile patterns (BM designs 2882-3 and 2884-5). Five 4-tile patterns are known, all but one of which were made using four separate dies (BM designs 1706, 1704-5 and 1496-7). Four single-tile patterns are known, all shields (BM designs 1561, 1559, 1553-4). Two of these shields show the same heraldry but one is a red design against a white slip background and the other is a white slip design against a red background (BM designs 1553-4).

The series is dated by its heraldry to the early 16th century and includes the Arms of Prior Forrest (1501 onwards) and Archbishop Henry Dean of Canterbury, 1501-3, who was Prior at Llanthony until 1494 (Eames, 1980, 255-7).

The Melton tiles. The Melton tiles, now mostly in the British Museum, were found at Hailes Abbey and, relaid, at Southam De La Bere (Eames, 1980, 257-263). They were made for Hailes Abbey during the Abbacy of Abbot Melton, between 1509 and 1527. The tiles are 160mm square and include single, 4-tile and 16-tile patterns.

The Thornbury series. The Thornbury tiles were made of the Duke of Stafford between 1510 and 1520 for his castle at Thornbury. The tiles are larger than any other Canynges-type tiles and the designs used are not found on any other group of tiles. However, two of the 4-tile patterns are stock designs with no connection with the Duke of Stafford, one of these is a fleur-de-lys within a quarter-circle (BM design 2251) and the other is the same design as BM 2249, one of the Canynges pavement designs.

The remaining designs include a 4-tile shield within a circular band bearing the motto "HONYSOIT * / QUI * MAL * Y / PENSE *" (BM designs 1482-5), three single-tile shields and three single-tile badges, showing the antelope (BM design 1726), the chained swan and the nave of a wheel with the Stafford knot (Eames, 1980, 257).

Dating: The tiles at Heytesbury (Wiltshire, Brakespear, 1894) may be part of a commissioned pavement for the Hungerfords (whose seat was at Heytesbury). This series should therefore date from 1421 or later, since it incorporates a badge only adopted by Lord Walter Hungerford

in that year (Eames, 1980, 242). Since Lord Walter Hungerford died in 1449 it is suggested by Eames that the Heytesbury tiles should date from between 1421 and 1449.

Canynges IX must be later than c.1455 since it is based on a design from Abbot Sebroke's pavement (see above, Great Malvern tiles). Two designs, Canynges XI and no.86, copy Gloucester Cathedral Lady Chapel tiles and must date from the 1470's at the earliest and probably from the 1480's (see above, Great Malvern tiles). Eames suggests that the Canynges pavement dates to c.1481 or later, since it incorporates one of the St. Augustine's Abbey series tiles, which must date from the Abbacy of John Nailheart, 1481 to 1515 (Eames, 1980, 247).

Only two pavements have survived in their original position long enough to be recorded; the Canynges Pavement from a house in Bristol known as Canynges House (This pavement is now in the British Museum, Eames, 1951, 1980) and the St. David's Abbey pavement at St. David's Cathedral, Dyfed (Fryer, 1903). Both are useful in giving 'assemblages' of stamps known to have been used at one time. It is also fairly certain that the commissioned series tiles would all be produced at one time. Certain other collections of Canynges-type tiles have the appearance of being cohesive sets, for example those at Acton Court, Bath Abbey, Ledbury and Rudford Church (Glos.). Other collections may contain tiles from earlier pavements or later replacements and the dating of one tile in such a collection cannot be used to date the others.

The Canynges pavement contains stamps used on the Heytesbury tiles as well as tiles from the St. Augustine's Abbey series (Canynges XXIX) which must date after 1481. Other tiles in the pavement must date to c.1455 or later (Canynges IX) and to the 1470's or 80's (Canynges XI). On two counts, therefore, it is likely that the pavement was laid down in the 1480's at the earliest.

The St. David's pavement, although perhaps repaired and relaid in places is essentially in its original position and is laid up to the Throne of Bishop John Morgan, 1496-1504 (Fryer, 1903, 177-8). Of the 43 stamps found in the St. David's pavement 27 are also found at Canynges pavement (including Canynges XI but not Canynges XXIX). Some of the same patterns are present with variant stamps and two of the variant stamps are the same as those used in the Llanthony series post-1501 to make the enlarged patterns. This evidence shows that the St. David's Pavement is later than 1496 and that it is later than the Canynges pavement. Therefore where other variant stamps are found it is probably the St. David's rather than the Canynges versions which are later. Thus we find that Canynges V and VIII are replaced by variants. Wherever the Canynges versions are found tiles from the St. Augustine's series are also found, confirming that the St. Augustine's series tiles are contemporary and earlier than the Canynges pavement, rather than Canynges XXIX being a replacement tile.

Only two stamps with cracks have been seen, and in neither case is a variant stamp known. These are Canynges I (uncracked at Canynges and in the Llanthony series but cracked at Strencham) and Canynges XX (BM design 2166,

cracked at Strencham and Bath Abbey). The evidence of the Canynges I stamp also shows that the stamps were re-used on 120mm square tiles after being used on the larger Llanthony series tiles, so that the St. David's pavement is not necessarily earlier than the Llanthony series.

The evidence accumulated to date suggests that none of the collections of Canynges-type tiles found can date before the 1470's and that the Canynges pavement dates to c.1481 or later, whilst the St. David's pavement is later and dates to c.1496 or later. The commissioned tiles are dated as follows:

Hungerford tiles- c.1421 to 1449

St. Augustine's series- 1481 to 1515 (but probably earlier in this bracket than later)

The Lygon tiles- c.1507

The Carew Tiles- c.1485 to 1528

The Llanthony series- c.1501 to 1539

The Melton tiles- c.1509 to 1527

The Thornbury tiles- c.1510 to 1521.

On this basis, it would be possible, but for the Hungerford tiles, to erect a short chronology for the industry, from c.1480 to c.1510, encompassing all of the available evidence. It is worth considering therefore whether the Hungerford tiles might not have been made for a descendant of Lord Walter Hungerford, for example Sir Walter Hungerford who was active in Wiltshire from the 1470's until his death in 1516 (D.N.B., 1908, X, 257).

Similarly a long chronology might be erected. The industry may have preceded that at Great Malvern and have been contemporary for a time with that postulated at Droitwich. There is no reason why the industry should have disappeared at the dissolution and pavements such as that at Strencham Church might therefore date to the mid-16th century if, for example, the Llanthony series was actually constructed immediately before the dissolution of the Monasteries. A long chronology would also enable tilers from this industry to use their dies for the Lacock Abbey tiles in the 1550's.

Distribution: The distribution of Canynges-type tiles may be considered series by series. The 'stock' patterns are found over the widest area, with a cluster of sites in South Worcestershire and a scatter of sites in the Severn Valley with two strings of sites leading off from there along the South Welsh coast and along the Bristol Avon into Wiltshire (fig.3.17). The south Welsh finds actually form two clusters, one around Cardiff and the other in Dyfed. This sort of pattern certainly suggests that the tiles were transported by water, while the clustering of the outlying finds is probably due to the tilers gaining orders whilst laying an initial floor.

The distribution of St. Augustine's Abbey series tiles is very similar to that of the 'stock' patterns, including Carew in Pembrokeshire (fig.3.18). The tiles probably entered the 'stock' of designs available to any buyer because they are of the same 120mm square size.

The remaining commissioned series were of a different size. The Carew tiles are found at Carew and Bath Abbey, the Lygon tiles only at Great Malvern (and an unprovenanced find in the British Museum) and the Melton tiles only at Hailes Abbey. A similar sized tile with decoration in the same style but not paralleled at Hailes was found at Gloucester Blackfriars.

The Llanthony series, including the enlarged 'stock' patterns, is found at several sites in Gloucester (fig.3.19) with an outlier at Caerleon (an unprovenanced Museum find), while the Thornbury series tiles are found at a number of sites in the Lower Severn valley with an outlier in Gloucester (fig.3.20). It might be argued that both series represent the dispersal of tiles after the original buyer has for some reason been unable to complete the purchase, in one case because the Priory of Llanthony was dissolved before the general dissolution (I am indebted to L. J. Keen for this suggestion) and in the other because the Duke of Buckingham was beheaded in 1521 and his Castle forfeited to the Crown (Jeffcoat, 1932). It is also possible however that both series represent the same pattern of supply as the Pembrokeshire sites - the tilers arrived in the area with more than enough tiles for the job and sold off the excess to neighbouring establishments. The interpretation is important not only for the light it sheds on the organisation of the industry but also because if the first hypothesis is correct then the tiles must be dated to the end of their date brackets, c.1521 and c.1539, but if the second hypothesis is correct they could be 10 to 30 years older.

FORDINGTON-TYPE TILES

Fabric: Not described, fine sandy usually with a light grey core.

Thin-sections: None

Source: Unknown. Fragments with the surface in perfect condition and a few possible wasters were found at St. George's Church, Fordington, in 1907 (Eames, 1980, 264-6). It is, however, quite common to find tile waste at a site in small quantities since it could be present in the batch sent to the site.

Description: Shallow inlaid designs, with inlay c.1mm thick, and a stabbed base. The designs include a Great Malvern style crowned 'M' (BM design 1422), a 4-tile pattern with parallels in the Canynges-type tiles (BM design 1465) and a fragment of a tile which appears to copy the large tiles found at Ewenny Priory and possibly made at Malvern Chase (BM design 1479). The remaining tiles are derived from late 13th to 14th century types.

Dating: The use of a 'Malvern School' design must date this group to the mid-15th century or later. The presence of designs which appear to copy tiles of the Canynges-type and the large Malvern Chase groups suggests an even later date, probably in the early 16th century (Eames, 1980, 264).

WIGMORE ABBEY-TYPE TILES

Fabric: Soft to very hard, oxidized light brown to red (7.5YR 6/4 to 2.5YR 4/6). Inclusions of fine-grained sandstone up to 6.0mm across in a micaceous clay matrix. Identical sandstone fragments form the sand on the bases of the tiles and the tempering of the white mortar clinging onto some of the specimens.

Thin-sections: None. Examined in detail under the binocular microscope.

Source: The same fabric was used to make Tudor bricks at Wigmore and this, together with the petrological similarity of the sand used in the mortar indicates a very local origin.

Description: Tiles. The tiles average 130mm square and 24mm thick. Most are plain glazed or covered with brushed white slip. Five counter-relief tiles were found, of which three were plain lead glazed and two had a white slip brushed-on before stamping (including BM design 391). A few small scraps of inlaid tile were found but these were not necessarily made in the same fabric. The counter-relief tiles were of two designs. One was a 4-tile pattern of intertwining foliage and the other possibly the centre of a 16-tile pattern.

Bricks. The bricks were made in a sanded mould with a trimmed upper surface. Two examples were accidentally glazed. Thicknesses of 50mm and a width of 120mm were recorded.

Dating: None of the brick fragments were stratified but the similarity in fabric and the presence of accidental glaze suggests a similar date to the tiles. Since the tiles were

stratified below the 16th century destruction rubble they must be of this date or earlier, definitely pre-1539. Similar counter-relief tiles in Staffordshire have been dated by Eames to the 15th century (Eames, 1968, 31 and Pl.1 nos. 6 & 7).

Distribution: (fig.3.21) Found at Wigmore Abbey and Wigmore Grange (BM 11,158). No similar tiles have been found in the study region but the counties of Shropshire and Staffordshire, to which Wigmore is very close, have not been searched for similar fabrics or stamps.

LACOCK ABBEY TILES

Fabric: Not described, fine sandy

Source: Unknown

Description: Shallow inlaid tiles with sharply bevelled sides. Shell-like keys on the knife-trimmed base. Designs found include several renaissance motifs and the monogram of the post-dissolution owner of Lacock Abbey, William Sharington and his wife, Grace. Other tiles found at Lacock Abbey are apparently of the same series but use designs derived from the Great Malvern and Canynges-type series (Eames, 1980, 266). The Lacock tiles have not been examined by the author but it seems as if these late tiles use actual Great Malvern and Canynges-type stamps. If so then this could account for the occurrence of tiles, apparently of these types being found in Dorset, since a Lacock-type tile has also been found at one of the find spots, Glanville's Wooton.

Dating: Mid-16th century. William Sharrington married Grace in 1550 but died in 1553. This probably limits the period

of manufacture of these tiles.

Distribution: (fig.3.22). Lacock-type tiles have been found at Lacock Abbey itself, Bath Abbey and sites in Dorset.

CHAPTER FOUR.

CLAY SAMPLES AND ANALYSIS

Clay samples were taken as part of the research for this thesis (fig.4.1). The majority come from two localities: the Malvern Chase and the Severn Valley, especially in the immediate environs of Gloucester. Samples from further afield were taken when the opportunity arose and are not a systematic survey of the clay sources of these areas.

Four or five basic clay types were recognised from this survey, although in most cases it is not the pure clay which was used in potting but a weathered or redeposited one. Analysis of parent clays by thin-section does not enable any pottery fabric to be adequately characterised, although it is often a contributory factor in the location or confirmation of a pottery source. Most of the information about the source and preparation of a pottery or tile fabric is derived from the study of the rock and mineral inclusions found within the fabric.

CARBONIFEROUS CLAYS.

Geologically, the earliest clay is that from the Carboniferous Coal Measures. This is of two types; a light-firing clay and a red-firing clay. Both have very little naturally occurring quartz silt and are characteristically full of clay pellets. Coal Measure deposits outcrop in a number of areas within and just outside of the region but only three clay samples have been taken; one of red-firing Staffordshire Marl (M718), one of a lump of fired but unworked red-firing clay from the site of the 19th century Coleford Pottery in the Forest of Dean and one sample of

white-firing clay from Pipe Aston in North Herefordshire (M717). The red-firing clay does not appear to have been widely sought after within the study region but was used extensively in Staffordshire and the north-west of England from the 15th/16th century to the 18th/19th century for black-glazed coarsewares. It was only used in the Forest of Dean coalfield in the 19th century.

The white-firing ware on the other hand was highly prized in the medieval period and was used in the Bristol area at Ham Green and in the suburbs of Bristol. Both wares have the characteristic white clay pellets but are tempered with different sands. Other industries using white-firing Coal Measure clay were at: Chilvers Coton, Nuneaton; probably Staffordshire (one kiln is known, at Sneyd Green, and there is a distinctive, partially glazed white ware found in South Staffordshire and West Midlands which has red-painted decoration). White-wares are also known in North Wales, at Ewloe (Davey, 1977). It is also possible that sites other than Bristol in the Bristol-Somerset Coalfield might have been using white-firing clay, there are, for example, references to Kingswood and Hanham potters (Price, 1979).

White-firing Coal Measure clays were used at Pipe Aston for clay pipe manufacture in the early to mid-17th century. They may well have been used in the Broseley industry, which rose to prominence in the late 17th century but it is more likely that imported North Devon clay was used, since there is documentary evidence from this period onwards for the transport of North Devon pipe clay up the Severn (S.

Davies, pers. comm.).

Visually and in thin-section there appears to be little difference between the fabrics of wares made with these clays and the same range of inclusions is often present (for example, red sandstone fragments, clay pellets, iron ore fragments and quartz).

OLD RED SANDSTONE CLAYS.

The Old Red Sandstone measures of the Welsh border include large tracts of clay. This clay has a high iron content, abundant quartz and white mica silt and occasional nodules of carbonate. Several samples of this clay have been taken but most are impure, containing sandstone fragments and some quartz (M530-2, M536, M724, M1053, M1116, 1120-1). These inclusions are probably present because of glacial reworking of the clays, since there was no overlying sand or gravel which might have contaminated them. The use of 'Devonian Marl' for potting dates back to the late 12th or early 13th century (for example Hereford A2 and Hereford A3) but was not extensive until the late 13th century. At this time numerous vessels, mainly glazed jugs are known from sites in Herefordshire, the Forest of Dean and Gwent. It is not known how many centres were involved and only one production site is proven, at Weobley in Hereford and Worcester. In the late 15th to 16th centuries little use was made of this clay type, mainly because of the predominance of Malvern Chase pottery in the region, but in the late 16th and 17th centuries numerous small industries existed using this clay. Their products are quite indistinguishable both visually and in thin-section.

KEUPER MARL.

Keuper Marl clays occur in a narrow north-south band leading through Worcestershire and Gloucestershire (west of the Severn) into South Wales. Separate outcrops are found in Avon surrounding the Mendip Hills and in isolated pockets in the Bristol-Somerset coalfield. A large number of clay samples have been taken from the Keuper Marl, principally around Malvern Chase but including Newnham-on-Severn and Woolaston (M804-6, M1051-2). In the study region only a small proportion of the total extent of Keuper Marl was workable potting clay. Much of the exposed clay was of a blocky texture with a high finely-divided carbonate content. Where samples could be prepared they were remarkably variable in texture and in the type and quantity of inclusions. It is likely that few of these inclusions were present in the parent clay and must have arrived by admixture with overlying sands and gravels. The fact that in places the clay samples were taken from some depth shows the extent to which clays can be contaminated by root activity, possibly animal burrows and by cracking.

General characteristics of the clay are an absence of quartz or mica silt, a variable iron content (but always lower than that of the Devonian Marl) and a variable quantity of clay pellets. In some wares made from Keuper Marl clay pellets are extremely common, for example Canynges-type and Gt. Malvern floor tiles. This was also a characteristic of a clay sample from the outskirts of Great Malvern (M181). Because of the absence of distinctive characteristics it is difficult to say how much use was

made of Keuper Marl by medieval potters. It is the parent clay used for Malvern Chase pottery and may have been used for Worcester-type ware, although there is no proof. It is used for two groups of floor tiles; Gt. Malvern and Canynges-type tiles. The latter is unprovenanced but is most likely to have been made in Worcestershire.

JURASSIC CLAYS.

Jurassic clays occupy most of the study region and are extremely homogenous. They occur in three main facies: fine estuarine clays, shelly marls and fine slightly micaceous clays. The former is by far the most widespread type and includes the whole outcrop of Lower Lias and much of the Oxford Clay. Numerous samples were taken of Lower Lias and Oxford clays but no regional variability was seen (Lower Lias M421-2, M424-5, M436-7, M588, M671, M719-20, M722-3, M1099, M1101, M1108-9, M1111, M1113-5, M1119; Oxford Clay M529, 750, 1107, 1118). The Jurassic estuarine clay was notable for the difficulty experienced in firing the samples, many of which blew up. This was not due to insufficient drying and is most likely a result of a high organic content. In thin-section, this clay when fired usually has a distinctive vesicular appearance and an extremely low quantity of quartz. Very little use was made of this clay by medieval or post-medieval potters, considering its vast extent. It was the basis for Minety ware, but in a heavily limestone-tempered and possibly weathered version and was used without much tempering in Gloucester TF79, a rare 15th century ware.

The second Jurassic clay type, shelly marl, occurs in the study region. A sample was obtained from a quarry at Hawley, where a thin band of shelly marl was sandwiched between massive Great Oolite beds (M1100). There is no evidence for its use for potting in the region, although just outside the region to the east, in the Oxford area, it was used between the late 8th and the 10th centuries. It is very noticeable in comparison with the untempered Jurassic clays that no problems occur in firing samples at low temperatures, although at temperatures in excess of 800 degrees C. the shell decomposes on cooling (due to the intake of water vapour combining with calcium oxide to form calcium hydroxide). This clay type is readily distinguished in thin-section from deliberately tempered shelly wares by the ill-sorted nature of the shell inclusions and by the presence of micro-fossils and bryozoa fragments alongside the shell. Quartz is usually extremely rare in these fabrics. It is much more difficult to distinguish different wares made from this type of clay. Three distinct wares are the St. Neots-type ware of the 9th to 11th centuries, the St. Neots Jugs of the 12th to 13th centuries and Oxford fabric B.

The last distinguishable type of Jurassic clay is typical of the Middle Lias and is variable in colour. Nodules of red iron ore are frequently found in the clay and are sometimes found in vessels made from this clay. White mica is commonly found but quartz is rare. This clay type is found in Gloucester TF41b and is represented by samples from Bath and Haresfield, in Gloucestershire (M423,M721, M1110, M1102, M1117). The clay occurs in a

narrow band around the Cotswolds between the Upper Lias fine sands and the lower lias clays. A few sherds of the Chaff-tempered pottery from Andoversford, in Gloucestershire, have these characteristics, which also serve to distinguish the limestone-tempered Gloucester TF41b from the Gloucester-made limestone-tempered ware, Gloucester TF41a, and North Cotswolds I ware.

CRETACEOUS CLAYS.

The Gault clay, of Cretaceous date occurs in a narrow band running north-east to south-west through western Wiltshire. It is characterised by a high quantity of ill-sorted quartz and in places is extremely micaceous. However, no clean samples of Gault clay have been examined in thin section and most of the inclusions found in wares made from the Gault were probably added, either intentionally or naturally, from overlying deposits derived from the greensand and chalk. Bath Fabric A, Crockerton wares and Nash Hill ware are all probably made from Gault clays. A sample of 'head' from the Crockerton area was fired and thin-sectioned (M734). It contains a very high quartz and chert content, so that it is extremely friable.

No other clays occur in deposits of Cretaceous date, although pockets of clay are found capping many areas of chalk downland. Samples of this 'clay with flints' have been examined visually but none examined in thin-section. A characteristic of this clay seems to be the variable quantity of quartz present. This must be due to the nature of the tertiary deposits whose erosion created the clay with flints. Most samples were not heavily calcareous and

did contain large angular fragments of flint.

TERTIARY CLAYS.

Tertiary clays occur within the study region only in the east and south-east of Wiltshire and in Berkshire. Two main series of clays occur within these Tertiary deposits, the London clay and the Reading Beds. The London clay in the London area is extremely fine-textured with a high organic content, comparable to the Lower Lias clay. It too sometimes contains microfossils of various types and has a low fluxing temperature, giving rise to a bubbly textured matrix at temperatures below 1000 degrees C.

RECENT CLAYS.

Two types of clay are being formed in the study region at the present day, or have been formed in the recent past. The first is formed by alluvial deposition. In areas where rivers cut through clay deposits this can lead to the formation of a clay with mixed characteristics, such as a fine-textured matrix and a coarser sand fraction. Such clays have been sampled at Pill Harbour, where a silty mud is forming a clay suitable for brick manufacture (M555), and Lassington, where they were formed by deposition from a small river draining into the Severn (M553). In this instance the clay contained quartz and sandstone fragments which probably originated in the Forest of Dean. The clays formed on the flood plain of the River Severn usually have a fine quartz and white mica silt temper often with a reddish colour which indicates their origin in the Tertiary deposits of Worcestershire (M535). Less heavily tempered clays are also found, formed by the redeposition of Lower Lias clay (M46-7, M549-51, M556). The silty Severn Valley

alluvial clays have been exploited since the late 16th century for the manufacture of bricks, ruined brick kilns can still be seen protruding from the banks of the river. Many of these brick fabrics show 'salt surfacing' caused by the action of heat, calcium carbonate, iron and salt. A distinctive range of colours results, the most typical of which is a sickly yellow.

Clays deposited towards the mouth of the Severn or around the shores of the Bristol Channel have different characteristics. In general they are extremely sticky clays with few inclusions, although natural additions of beach sands do occur (M672-3).

The other type of clay formation is from the chemical weathering of rocks. In the south-west peninsula, chemical weathering has given rise to large deposits of kaolinite, the china clays. Within the study region no such large deposits are known but the clay-with-flints deposit found overlying the chalk downlands in Wiltshire was formed in this manner and is extremely extensive, even if not of great depth.

It is suspected that several of the limestone deposits of the study region have weathered to give rise to small pockets of clay. Excavations at Chedworth Roman Villa revealed that the Roman villa was situated not on the oolitic limestone which outcrops behind the villa but on a bed of sticky clay, a sample of which, M736, was fired and contained no limestone but had a very high iron content. One of the characteristics of some limestones is the presence of very small rounded pellets of iron ore,

probably formed by algae. Some pottery fabrics have very fine clay matrixes which also contain these small pellets, such as Cheddar fabric E. The clays formed by the weathering of limestone will tend to contain very little quartz in the matrix, since quartz is rare in both the Carboniferous and Jurassic limestones of the study region. Bristol Fabric C contains angular fragments of limestone and flat fragments of red iron ore, both of which are most likely to have been formed by the weathering in situ of Carboniferous limestone.

The weathering of mudstones and siltstones, both of which have a substantial clay fraction, would give rise to a clay containing angular fragments of mudstone or siltstone while the weathering of sandstones would give rise to a deposit of sand and sandstone fragments.

The main outcrop of rocks of this type in the study region is in the Welsh borderland but the only pottery fabrics to have siltstone and mudstone inclusions are Hen Domen sandstone-tempered ware and Hereford A4. Neither of these fabrics contained angular inclusions and it is likely therefore that they both derived from deposits some distance from the outcrop of the rock fragments found within them. The source of the Hen Domen clay was confirmed by thin-sectioning of a series of clay samples, M914-7, taken from the site of Hen Domen itself (by Mrs. P. Irving). The Hen Domen clay contained the same range of inclusions as the pottery and in both the pottery and the clay the inclusions were rounded.

Sand and sandstone fragments occur in many pottery fabrics but there are no obvious characteristics to distinguish those of detrital origin from those that were formed by *in situ* weathering. Most medium-grained sandstones are too friable to become rounded by abrasion so that there is no way of using the roundness of inclusions as a way of separating the two types of deposit. Grain-size analysis may be used to distinguish ill-sorted deposits resulting from chemical weathering from well-sorted detrital deposits, although it is likely that the physical properties of the sandstone would also affect the grain size of weathering products. The other characteristic which can reliably differentiate between the two types of deposit is the presence of rock types in the same pottery fabric which do not outcrop together.

DETRITAL SANDS AND GRAVELS

The majority of pottery and tile fabrics which do not include 'tempering' present in the geological deposit from which the clay was derived are 'tempered' with detrital sands or gravels. The distinction between natural 'temper' and that introduced by man does not appear to be testable by scientific means, since the mixture of sands or gravels with clays can happen naturally, as is demonstrated by the analysis of clay samples from Malvern Chase (M180-1, M524-8 and M540-8). Although every attempt was made to obtain 'pure' clay samples without contamination from overlying gravel deposits every sample contained rounded quartz sand and angular Malvernian rock fragments. The quantities of these two types of inclusion varied from sample to sample in a systematic fashion. Those samples obtained from the

west of the chase, at the foot of the Malvern Hills, contained the highest quantity of Malvernian rock and the lowest quantity of rounded quartz sand. Conversely, samples from the east of the Chase, closest to the River Severn, contained the highest quantity of rounded quartz sand. The inclusions in these clays were derived from overlying gravel deposits, presumably by plant activity and by cracking of the clay. The relative frequency of the two types of inclusion is a reflection of the composition of the gravels, those from the west of the Chase being formed mainly from talus from the Malvern Hills and those from the east of the Chase being deposited by the River Severn and ultimately deriving from the Triassic sandstones of Worcestershire and areas further to the north.

Similar evidence for local variations in the composition of sands and gravels comes from the Severn Valley around Gloucester. Some sand deposits in the Gloucester region contain mainly rounded quartz, identical to that found in the Malvern Chase clay samples, although usually with the addition of larger rounded limestone fragments (M533-4, M1112).

CLAY ANALYSIS: CONCLUSION.

From the above description it will be clear that thin-section analysis of untempered pottery fabrics made from the main geological deposits of clay in the study region would not enable individual wares to be identified. Indeed, it would be difficult to positively identify the geological deposit from which the clay was obtained. However, the clays used in potting were rarely untempered and, even when

they were, they were rarely pure geological clays. The natural weathering and mixing of clays quite often produced clays with a distinctive appearance and the addition by the potter of further temper also served to produce unique fabrics which, when found in the medieval pottery of the study region, enable the source of the vessel to be positively identified.

CHAPTER FIVE.

MANUFACTURING METHODS.

INTRODUCTION

A detailed survey of the methods used in manufacturing and decorating the medieval pottery used in the study region is outside the scope of this thesis. There are several ways in which an analysis of the methods of manufacture employed at different places and at different times might be used to explain the observed differences in pottery distribution but unfortunately to make a detailed study of these methods requires a large number of complete or near-complete vessels of the same type. In this way it is possible to distinguish random features, which might be caused by accident or by some unusual incident in the construction of the vessel from those features which reveal the way in which the potters habitually made the vessel.

Such conclusions as can be made from analysis of the medieval pottery of the study region are made below but in the writer's opinion any further conclusions would be unwarranted considering the normal size of the pottery sherds dealt with. Several manufacturing techniques are potentially of great economic importance: the use of the fast wheel could make production much faster and would therefore be an advantage to a potter producing for a commercial market (Nicklin, 1971); the use of glaze involves extra expense, which would have varied with the availability of lead ore whilst the number and complexity of manufacturing and decorative processes carried out on a vessel would affect its value and might therefore affect

the distance over which the type was distributed, although this does not actually seem to have been the case in a number of instances, where 'coarsewares' were carried over equivalent or larger distances to 'finewares', see Ch.11.

Many of the techniques described below were actually rare or absent before the late 17th century and are thus outside the scope of this study. They are described partly for completeness and partly to show how restricted the range of techniques used in the medieval and early post-medieval period was in comparison with those used later or indeed those in use during the same period in Northern Europe or the Mediterranean littoral.

CLAY PREPARATION: TEMPERING

The distinction between 'temper' and inclusions is that tempering material is deliberately added, whilst inclusions can be either naturally present in a clay or deliberately added.

The quantity of inclusions present can be measured precisely; using point counting on a thin-section, it can be estimated using a series of reference charts or it can be given verbally. The latter is most certainly the quicker method. The terminology used here works on a three-point scale; sparse, moderate and abundant. The quantity of inclusions can vary considerably within the products of one centre, for example Malvern Chase (Vince, 1977a, table 1). This may be partly due to natural fluctuations in the mixture of sand to clay in the potting clay as dug and partly due to the addition of sand to increase workability. If the clay is too wet more inclusions can be added to give it 'body'. Similarly, if the vessel being formed has thick

walls, or is a tile or brick, more temper may be added to allow water to escape harmlessly, rather than form blisters or spalls during firing.

It is often tempting to distinguish temper from naturally occurring clastic material in thin-section but analysis of clay samples from the study region shows that some clays have all of the characteristics used to distinguish artificially tempered fabrics. The main criteria used to identify tempered fabrics is that there should be two grain-size modes, the larger being added temper and the smaller naturally occurring inclusions such as silt-sized fragments of quartz and mica. Sometimes this can be shown to be the case, for example clay samples of Oxford Clay and other jurassic clays contain few inclusions apart from sparse iron ore fragments, calcareous microfossils and calcareous nodules yet wares made from these clays can contain quartz sand, flint fragments or shell and shelly limestone fragments. It is possible however even in these cases that the clays, although not pure geological clays, were still naturally tempered. Jope (1959) states that the Ascot Doilly pottery contains limestone detritus and is matched by clay samples taken from stream banks in the area. These clays are probably a natural mixture of jurassic clay and the overlying limestone gravels. Similar natural mixtures of overlying deposits and clays of a much earlier geological strata have been noted in the Malvern Chase region and in the clay deposits overlying lower lias clays in the Severn Valley. Also found in most of these clay samples are root fragments. It is therefore possible that

medieval 'tempering' was achieved partly by the choice of self-tempered clays. Another feature of many pottery fabrics, even those of quite late date such as late 16th to 17th century Malvern Chase ware, is that large pebbles or rock fragments are found in the vessels. These serve no useful purpose and indeed erupt on the surface and are often surrounded by cracks that extend throughout the pot thus causing it to leak if filled with liquid. Such large inclusions were removed from Staffordshire potting clay in the late 17th century by slicing the soaked clay thinly with a wire and removing any big inclusions (Dr. Plot, 1686, quoted in Brears, 1971, 89).

UNTEMPERED WARES

Several wares have little or no apparent 'temper'. Most of these, contain large quantities of silt-sized quartz inclusions, which can be viewed in thin-section, or with a binocular microscope. Examples of these very fine textured wares are Hereford A7a, Hereford A7b, Stamford Ware, Tudor Green ware, Saintonge ware and the post-medieval Herefordshire kiln products. The latter are actually finer in texture than local clay samples. It is therefore likely that either sieving or levigation was used to produce some of these fabrics. In sieving the clay would be dried and crushed and the resulting powder passed through a sieve before being mixed with water to produce the potting clay. In levigation the clay is mixed to a slurry with water and allowed to settle in a series of shallow ponds. In these ponds the water evaporates and the clay can then be dug and further prepared for potting. The latter method was in use in the country potteries of the 19th and 20th centuries but

it is probably a late 17th or 18th century development (Brears, 1971, 89).

Theoretically, it should be possible to distinguish the results of the two methods of preparation since sieving should merely remove inclusions over a certain size and leave the grain-size of the remaining inclusions as found whereas levigation should produce a better sorted range of inclusions than was present in the original clay and possibly also alter the proportions of the different mineral types (for example an experimental levigation of clay from Newent Glasshouse produced a gradation of clay fabrics, starting with extremely fine clay in which muscovite was the only visible inclusion down to a coarse sandy clay in which sandstone fragments and quartz predominated.

Chapter 3 book 3 of Eraclius' treatise contains an entry which shows that by the late 12th or early 13th century some potters in Northern France were tempering their wares with powdered grog (De Bouard, 1974, 70-71). This should be visible in thin-section; grog fragments being distinguishable from natural clay pellets by their angularity. No such inclusions have been seen in any of the above wares, but unless the reference in Eraclius was taken from a Byzantine or Classical text the technique must have been used. It would be useful to try and replicate this technique, to confirm that such grog would be recognised in thin-section.

FORMING TECHNIQUES: HAND-FORMING METHODS

The simplest method of construction possible is to make the vessel from a single mass of clay by the 'pinch pot' method. This method eliminates the danger, present in any method where two or more separate blocks of clay are joined, of trapping air in the vessel. The main problems with the method are that it is difficult to obtain an even wall thickness and that the size of the pot is limited by the practicality of wedging and manipulating the clay.

It is likely that much of the Mid to Late Saxon handmade pottery in the region was essentially made by this method and most of it has uneven wall thickness and small size. It is probable however that even on these vessels the rims were added.

Another method of handforming is to use coils of clay which are wrapped around the base in a spiral and joined together by vertical smoothing on both sides of the pot. It is usually quite difficult to spot the characteristic ridges of coil-building on a pot because of the subsequent smoothing and wiping. The vertical finger smoothing is however quite clear on some Minety-type tripod pitchers (fig.2.85). On some 12th century cooking pots the low level of finishing has meant that individual coils can still be distinguished, mainly as corrugations in the profile. The coiling method can be extremely versatile and it is unlikely to have limited the range of shapes or size of vessels made.

WHEEL-THROWING METHODS

Traces of rotary action are present on many pottery vessels but not all of these were formed using the potters wheel. There is an important distinction between the tournette or turntable, which is sometimes known as a slow wheel, and the potters wheel proper.

In the former the pot is actually formed by a hand building technique with the wheel only used in finishing. Much the same effect can be obtained without the use of a wheel simply by horizontal wiping of the pot with the hands whilst still damp.

In the latter case the vessel is actually formed on the wheel, using centrifugal force. In terms of the speed of production it is the 'fast wheel' which makes the most impact. The use of a turntable need not alter efficiency at all.

It can be quite impossible to distinguish small fragments of wheelthrown from turntable-finished sherds but providing a large enough fragment is present and preferably more than one vessel of the type is available it should be possible to detect the differences. Firstly, the lines on a wheelthrown pot are parallel from top to bottom of the vessel, whilst those on a turntable-finished vessel may fluctuate (because of the slower speed).

Secondly, one can find secondary ripples on a wheelthrown pot which are never present on a turntable-finished vessel (these are shown for example by De Bouard, 1974, plate Ia).

Little is known of medieval potters wheels, certainly there is little or no relevant archaeological evidence (Moorhouse, 1981, in a review paper was unable to mention any archaeological evidence for forming methods).

Two types of potters wheel are found in illustrations of Medieval date, neither is known before the thirteenth century. The first type consists of a spoked wheel with a wheel-head in the centre, which was turned using a stick to push the rim (Hodges, 1974, 33-34 and fig.2).

The second type consists of a cylinder, the lower part of which is the flywheel and the upper part the wheel-head.

Until the Renaissance there is no evidence for the use of the kick-wheel, in which the flywheel is joined to the wheel-head by an iron shaft with an axle (Hodges, 1974, 34).

MOULDING

The use of moulds to produce vessels can be divided into two categories; press-moulding and slipcasting, neither used in the region during the period under study.

In press-moulding the clay is soft but not liquid and is pressed over or into the mould. It is then beaten or pushed into the mould to ensure that no air holes exist. The most common example of press-moulding is on Staffordshire combed slipware which was beaten over a ceramic mould with a paddle (leaving paddle marks on the base of the vessel). Tin-glazed dishes and plates were also probably made by moulding, although except on biscuit vessels it is not possible to see any evidence of this. The

underside was turned, presumably while the vessel was still on the mould.

Slip-casting is carried out in a porous, plaster mould. The clay is added to the mould whilst liquid and the excess water is absorbed by the mould.

FINISHING TECHNIQUES

Most traces of the primary construction techniques have been removed by subsequent finishing and it should therefore be easier to distinguish the latter on the pots. Several distinctive textures are produced, of which the most readily distinguished are described below. There remain however, several surface textures whose origin has not yet been elucidated.

Knife trimming is readily identifiable by the faceted appearance it gives to the pot and by the way in which inclusions have been dragged across the surface, giving rise to minute parallel lines. The best example of the use of knife-trimming in the earlier medieval period is Bath Fabric A. These vessels have heavily trimmed bases. The technique is much more common on post-medieval pottery, in particular on red earthenware of the 16th to 18th centuries. This may partially be due to the increased wheelthrown production of plates and dishes. It is impossible to obtain the very wide base angle required for a plate or dish by hand throwing, although it could be obtained by using a former to undercut the body. Therefore the three options were; to use a former, which would still leave an untidy base needing further finishing; to remove the vessel from the wheel and knife-trim it or to invert

the vessel on the wheel and 'turn' it with a knife or more specialised sharp tool. The last is commonly done on Tin-glazed ware (it is present on 13th century imported Tin-glazed ware from Andalusia) but does not seem to have been used in this country on lead-glazed earthenware until the early 18th century, when it is used on many Staffordshire vessels to produce thin-walled pots with moulded bases. The most extensive use of turning was on Staffordshire white salt-glazed stoneware of the mid-18th century.

The use of coarse cloth or other material to wipe the surface of the pot is known as fettling or scratch-marking. The technique was used solely on the cooking pots made in S. E. Wiltshire which have scratch-marking over the base and body (the vessels have rounded bases).

By running a wet hand over a pot it is possible to produce the effect of a fine slip, masking inclusions which would otherwise appear at the surface. This technique is commonly found on post-medieval earthenwares but is rare beforehand. It s use is related to the use of the wheel, although the effect has been noted on some handmade vessels (for example Bath Fabric A).

Burnishing the surface of a pot whilst it is leather-hard produces a characteristic gloss. The technique has not been noted on any Medieval pottery in the region, neither as an all-over burnishing or as decoration (but see 'Grooving' below, which is the same technique but carried out whilst the pot is still wet).

The use of a different colour slip as an overall wash on a pot is found on several wares from the 13th century onwards.

On Worcester jugs and (rarely) on Hereford A7b jugs a white slip is painted around the inside of the rim, with occasional dribbles on the inside of the pot.

On some Newbury C jugs an overall white slip is present on the exterior. This even, thick slip was applied by dipping the vessel. A similar but less well finished technique is used at Nash Hill in the late 13th to 14th centuries, where the slip was painted onto the pot.

Overall white slip is also present on a number of post-medieval vessels from the Herefordshire kilns, Newent Glasshouse, North Devon, South Somerset and Stroat, particularly on Bowls. Perhaps the earliest post-medieval occurrence of the technique is in the South Somerset industry, where some jugs have an overall white slip and may be dated to the 16th century. There is so far no evidence for a continuous use of overall slipping between the late 13th to 14th centuries and the late 16th century.

The most extensive use of slipping occurred in the late 17th and 18th century Staffordshire and Bristol potteries, although some of the techniques (described below) were used elsewhere. Overall white slip was regularly used on light-bodied earthenwares, perhaps to 'prime' the surface of the pot to receive slip decoration. Overall chocolate brown slip was used mainly on mid-18th century turned vessels. A combination of light and brown coloured slips was used on Beauvais Sgraffito ware in the 16th century and again in the Staffordshire industries, both for moulded and wheelthrown vessels. In Staffordshire the slips were swirled whilst still wet to produce a marbled pattern. The

earliest English occurrences of this technique date to c.1680 or later and are thus outside the scope of this study. The technique has a much longer ancestry however and is found on North Italian Marbled Slipware bowls from the 15th to the 18th centuries (Blake,1981, 103-5).

At a slightly later date than the first use of marbling, c.1720 combed slipware was introduced. The clay was prepared in the same manner as for marbling except that whereas marbling was carried out on the finished vessel combing was carried out whilst the clay was still a flat strip. The 'comb' was actually a specially made instrument consisting of numerous teeth set in wood. This was drawn across the slipped clay and by shaking it as it was drawn 'feathering' could be produced (Brears, 1971, 46-7).

APPLIED FEATURES AND SECONDARY MODIFICATIONS: HANDLES

Handles are found on spouted pitchers, tripod pitchers, spouted bowls, frying pans (handled bowls), pipkins, jugs, and a range of minor forms. Lug handles are the earliest handles found, occurring infrequently on Anglo-Saxon vessels. With their exception all handles are made from one or more rolls of clay fastened to the body at one or both ends, finished and decorated.

A modern studio potter produces a vertical handle by rolling out a coil of clay. This is attached at the top end of the vessel and squeezed in the fist whilst pulling down and out. This action produces an oval-sectioned, slightly tapering handle smoothed into the body at the lower end. The resulting handle is very similar to those found on much post-medieval earthenware and there can be little doubt

that the method was used to produce most 17th century and later handles. However, it is also quite clear that this technique was not responsible for many of the medieval handles seen in the region. Most of these appear to have been shaped to their final form before application. Considerable ingenuity has been involved in ensuring that the handles did not fall off. The reasonableness of this precaution is quite justified when one examines the number of vessels whose luted handles have become detached, leaving both body and handle intact.

There are two main ways in which a handle was attached. The most common was by luting it onto the body. To help the handle adhere the vessel surface might be scored or otherwise roughened. This is of course difficult to demonstrate on most vessels and has not been observed.

Another way is for the pot to be pierced and the handle stuck through it. This technique was employed on Malvern Chase tripod pitchers in the 12th century but is otherwise not noted in the region.

One of the most common attachment techniques is to press the handle and body together with thumb impressions. This has the advantage of spreading the area of attachment and ensuring a close join between the two. This is used on some of the earliest handles found; those of Stamford and Winchester-type wares. The number of impressions and their spacing varies from type to type but is often consistent within a range.

The join could be further secured by stabbing or slashing (see below) either the inside or the outside of the handle join. Slashing on the exterior of the pot is by

far the most common technique and is found on Minety tripod pitchers in the early to mid 13th century and on many late 13th and 14th century and later jug types.

Slashing on the interior of the handle join is rare but has been noted on 12th century Minety tripod pitchers.

Stabbing on the exterior of the handle join is a common technique on Ham Green and Worcester jugs.

Other known attachment techniques involve pushing the clay of the body into the handle join from the inside, either leaving a depression on the inside or sometimes filling this depression with a separate wad of clay. This technique has not been recognised in the region but is known from East Anglia and the East Midlands (Hayfield, 1980).

There are a few basic handle shapes which tend to be used in the majority of industries.

Rod handles, with circular cross-sections, are found on Malvern Chase tripod pitchers in the 12th century, some 12th century Minety tripod pitchers and on Malvern Chase late 14th and 15th century jugs. With these exceptions the type is rare in the region. The rod handle is the normal type in the London area from the 13th to the late 14th centuries and was present on London jugs from the middle of the 12th century.

Rectangular-sectioned handles are present on most of the 11th to 12th century spouted pitchers but their use died out during the 12th century. Most of the rectangular handles are short, springing from the rim or neck and joining again at the shoulder rather than the girth.

Strap handles (ie. with a roughly hour-glass section or shallow U-section) are by far the most common type. Perhaps the earliest examples in the region are U-shaped handles on Minety tripod pitchers of early to mid 13th century date. The form however is particularly common in the later 13th and 14th centuries and after. Some later examples, for example Malvern Chase 15th to 16th century vessels may have been formed by pulling (see above).

Oval-sectioned handles (mostly formed by pulling) are common on post-medieval vessels of 17th century and later date. The handles on Malvern Chase chafing dishes, also of 16th century date are similarly formed as are the small handles found on Tudor Green and Cistercian ware cups.

Ham Green and Worcester jugs share a variant handle type - a thin oval or sub-rectangular sectioned handle. There is little if any diminution in width of these handles from top to bottom and they are therefore shaped before application.

Complex-sectioned handles are formed by wrapping two or more strips in a third, sometimes to the extent that the decorative effect is lost. It is therefore possible that they had some function other than pure decoration. Certainly the handles would have taken less time to dry than the equivalent size of solid handle. It is also possible that they were imitations of rope or leather prototypes.

Two forms of complex handle are found. Those on Minety tripod pitchers of the 12th century are usually double rods within a third strip whilst those on Newbury C and Oxford Y tripod pitchers are commonly composed of a central twisted

pair of rods with single rods on either side, all within an overall wrap of clay.

Handles were often highly decorated. Some of this decoration might actually have a practical purpose, such as that suggested above for the complex-sectioned handles: firstly, to aid the joining of the body to the handle and secondly to pierce the handle to enable it to dry out more quickly. However, many thick solid handles exist and were obviously fired without ill effect so that a purely decorative function is just as likely.

Many of the decorative techniques used are the same as those used on other parts of the vessel, for example roller-stamping, combing or grooving, but a few are restricted to handles and other applied features.

Stabbing is a term coined by Barton (1963) to indicate the deep impression of a rounded blunt tool. Such stabbing occurs on Ham Green, Worcester type and some Hereford A7b jugs in the early to mid 13th century.

A variant type of stabbing involves the use of a circular-sectioned tool (a twig or awl?). This 'fine stabbing' is found on vessels from the Thames basin, for example Oxford AM jugs. An unusual variant occurs on some Newbury C jugs and other vessels from Berkshire which have the stabbing on one side of the handle only rather than along the top of the vessel.

Slashing on the other hand is the use of a sharp wedge-shaped tool, presumably an iron knife, to create deep gashes in the handle. There are quite significant differences between types in the handle slashing both in

the size of the slashes and in their layout but the most common type in the region is for the slashes to be about 15 to 20mm long and a maximum of 3 to 4mm wide and for a variable number of slashes to be present along the top of the handle at the join with the rim followed by a column of diagonal slashes down the handle. Such a pattern is typical on 13th century Minety tripod pitchers for example.

Rectangular handles, 10 - 20mm deep set horizontally on the vessel are known on some Malvern Chase conical bowls in the 16th century and on large Newent Glasshouse bowls of the late 17th to 18th centuries. They are rare and were attached by luting only. Considering their rarity, a high number of detached examples are found.

Horizontal loop handles are rare but found on some post-medieval vessels, principally large bowls ('pancheons') and open cups. There are two main forms, strap and rod. The large types are usually strap handles (for example on Stroat ware) whilst the smaller are rods (for example on Hampshire - Surrey border ware).

'Cauldron' handles are very distinctive but very rare in the region. The handles consist of two straight sections meeting at a sharp angle in direct imitation of cast metal cauldrons. They are invariably circular-sectioned. In the medieval period the two most common types having these handles are Coarse Border ware and Dutch Red Earthenware. The Dutch vessels usually have the handle pinched in at the angle. These handles always occur as opposing pairs and were used for suspension.

A small number of vessel types have horizontal handles attached at one end only which, although sometimes bent over at the free end and thus possibly used to suspend the vessel when not in use, were used primarily for gripping the vessel whilst carrying it. Dripping dishes invariably have horizontal handles as do pipkins. The shape of these handles is determined by their function and all are solid, tapering from the body to the end with a concave upper surface, suitable for gripping with the thumb. The dripping dish handles are usually wider than those on pipkins but both are essentially sub-rectangular or oval with the upper surface concave.

FEET

Feet can be applied either by luting alone or as plugs set into the base. Unlike handles, no evidence for feet being pushed right through the wall of a pot has been found.

There are three quite separate shapes of foot used, circular-sectioned, short rectangular-sectioned and tall rectangular-sectioned ('cauldron type').

Circular-sectioned feet are found on virtually all tripod pitchers in the region, from Newbury C to Hereford A2. most are plugged into the base and are set there rather than at the base angle. They taper slightly from top to bottom and are virtually never decorated (a few have stabbed holes in their base, presumably having the same function as stabbing or slashing on handle joins).

Short rectangular-sectioned feet occur on three tripod pitcher types; Hereford A4, Hen Domen type and Shrewsbury type, forming a tight regional grouping.

Later medieval vessels also have short rectangular-sectioned feet. They are found on Malvern Chase dripping dishes in the late 13th to 14th century (a single foot, just below the handle) and on Malvern Chase skillets, and pipkins.

Tall rectangular-sectioned feet are found on Malvern Chase, Minety and Coarse Border ware cisterns in the late 14th and 15th centuries and on Coarse Border ware Cauldrons. These feet are often slashed, either because of the great thickness of clay present or merely for decoration.

All footed vessels have three feet, although it would be quite feasible to make a footed vessel with four or more. This is in contrast with thumbed bases where group thumbing (which is in effect a foot, but pushed out of the body rather than applied) can occur three, four or more times on a pot.

SPOUTS

There are three ways in which a spout or lip can be formed from a vessel rim. Firstly, it can be pulled out with one finger whilst the rim is supported on either side to control the action; secondly, it can be pinched in from either side, whilst a middle finger keeps the spout open; thirdly, a mixture of the two techniques can be carried out. Most spouts in the region were of the pulled type, the earliest being on early 13th century Minety and Hereford A2 tripod pitchers.

By whatever method the spouts were formed virtually all were of a single finger width and were not more than 20mm deep. Outside of the region more elaborate spouts were made by this technique. At Kingston-on-Thames some jugs were made with deep spouts which extended from the rim down to the shoulder of the vessel. These were of late 13th to 14th century date and were made in imitation of metal ewers.

Italian Archaic Maiolica and North Italian Marbled Slipware jugs often have huge pinched in spouts, known as trefoil spouts. Although these may have influenced tin-glaze potters in the Netherlands in the late 15th and 16th century there is no evidence for their manufacture in this country.

There are two forms of added spout, those formed of a complete cylinder of clay (tubular spouts) and those formed of a slab of clay, attached to the vessel at the sides and base.

Tubular spouts are themselves subdivisible into free-standing types, spouts attached to the rim and neck of the vessel (D-shaped tubular spouts) and narrow free-standing spouts usually secured to the rim of the vessel by struts or slabs of clay.

Free-standing tubular spouts are found mainly on 11th to 12th century spouted pitchers. They were formed by inserting a lump of clay into the shoulder of the vessel and then piercing it with a cylindrical tool and smoothing the join.

Both cylindrical and D-shaped tubular spouts occur on tripod pitchers. They vary in their diameter. The larger examples may have been formed by wrapping a slab of clay

into a cylinder whilst the narrower examples were made on a former (perhaps just a stick). In most cases it appears that the spout was not inserted through the body. Instead, the hole through the body was created after the spout has been attached. Cylindrical tubular spouts, usually secured with one or more horizontal strips, are found, for example, on Minety 12th century tripod pitchers and Newbury C tripod pitchers whilst D-shaped tubular spouts (ie. wider spouts secured at either side with vertical strips) occur on Malvern Chase 12th century tripod pitchers.

The narrow free-standing tubular spouts occur rarely on Stamford ware jugs (Kilmurry, 1980, Form 24) with a single example known in Hereford A7b. Examples are found on highly decorated jugs from the Midlands and north-east of England, for example Scarborough ware (Farmer, 1979). Added slabs of clay smoothed into the body on three sides have been used to form spouts from the beginning of the 13th century and get their name from the bridge of clay left at the rim. On some spouts this bridge is removed with a knife, to form a 'cut-bridge spout'. This form is characteristic of south-west France and occurs on both jugs and pegaux.

The shape of the spout varies but is usually one-finger wide with a rounded V-cross-section. The top of the spout is usually just slightly higher than that of the rim. The earliest spouts of this form are those on Ham Green and Worcester jugs with a few examples found on Malvern Chase and Minety 13th century tripod pitchers. This form is common on many late 13th to 14th century jug types.

Variant forms are rare. A distinctive variant is the 'Parrot beak' spout found on south-west French jugs. This form is much taller than the rim of the vessel and is much narrower than the common English form (which is also found on south-west French jugs).

Another distinctive variant, only found in this country on imported vessels, is the 'Gutter' spout found for example on some Andalusian lustreware jugs. This form is very long but comparatively shallow.

BASES

On both handmade and wheelthrown pots the bases were almost always modified in some way after the vessel had been formed. The reasons for this are that both methods of manufacture produce thick bases from which much clay could be removed to produce a lighter, more elegant vessel. It is unlikely that any of these modifications have any more functional motive, unlike the addition of feet.

The typical base on medieval cooking pots, tripod pitchers and 13th century jugs was sagging. This is a deliberate feature, rather than a function of the manufacturing method as has sometimes been claimed (Rackham, 1972, 4). The earliest vessels with sagging bases in the region are Chester-type ware cooking pots, which were wheelthrown but subsequently had their bases pushed outwards. Hand-wiping marks exist on all sagging bases, both inside and out, and there is no evidence for the use of a former (ie. an external mould into which the base was pressed). However, it is by no means certain that the use of such a former would leave distinctive traces on the

vessel.

There are two main types of sagging base, reflecting differences in the manufacturing technique of the vessel itself. In the first there is not a sharp base angle, merely a change in profile. In this case the vessel was probably formed from a single lump of clay. In the second type the base angle is well defined, although the actual angle can vary from less than a right angle ('West Country vessels') to an extremely obtuse angle (on globular cooking pots and tripod pitchers). The wall thickness is invariably greater at the base angle than elsewhere. In this case the vessel is probably formed by coiling, the base being the flat slab from which the walls are built-up.

It is sometimes suggested that the sagging base had a practical value on cooking pots, which may be true, but one of the suggested reasons for having a sagging base is that this would reduce the effect of thermal expansion and contraction in cooking. This is unlikely, for there is certainly little evidence for those late and post-medieval cooking vessels which were made with flat bases having any more breakage around the base than earlier vessels.

Perhaps more reasonable explanations are that a sagging base would throw the flames more evenly around the pot or that the vessel would nestle better into a bed of embers. Whatever the original practical function of the technique it is clear that on tripod pitchers and jugs the technique was used mainly by force of habit since when ceramic cooking pots became less common, in the later medieval period, flat based jugs became the norm. D. A. Hinton

suggests (pers. comm.) that this might conversely show that earlier medieval vessel bases were made on a former.

Rounded bases, with no base angle at all are extremely rare. Only two vessel forms have them, both produced in South East Wiltshire. The method of manufacture has not been determined. In the case of the S.E. Wiltshire cooking pots this is because scratch-marking has obscured the evidence, whilst on the tripod pitchers the main problem is the extreme rarity of substantially complete vessels (there is one from Winchester, one from Dublin and one, heavily restored, from Marlborough).

Flat bases are comparatively rare on medieval vessels but are the norm in the post-medieval period. Most show no obvious signs of tooling nor of the material on which the vessel was resting when wet.

Iberian Red Micaceous ware usually has a gravelled base. This may have been due to the vessel having been placed on a sanded surface to dry although the quantity of gravel found adhering to the base is higher than one would have expected. Frechen stoneware has looped cheesewire impressions on the base, as do some late Saxon wheelthrown vessels, although not those from the study region. Most other types have occasional parallel lines due to the use of a cheesewire in removing the vessel from the wheel. No handmade types with flat bases are known in the study region.

Thumbed bases are of several distinct types. The earliest use of thumb impressions around the base angle of a vessel is of 13th century date and the latest is of late 15th century date.

Continuous thumbing, with impressions overlapping one another, is present on Nash Hill jugs in the late 13th to early 14th century.

Continuous but separate thumb impressions are found around the bases of several jug types, such as Malvern Chase. This is probably the most common type in the region.

Discontinuous thumbing, or 'group thumbing', is known on Minety jugs in the late medieval period. Group thumbing is present on some Essex made jugs of late 13th and early 14th century date and is common on later medieval jugs in the London area (Mill Green ware, Pearce et al., forthcoming).

Ham Green and Worcester-type jugs have a quite distinct variant of the thumbed base in which the base angle is actually frilled between the thumb and forefinger to form a 'piecrust'. In many cases it can be seen that this is formed from an added strip of clay, although it is possible that some are made from an extra thick wall at the base angle. A similar technique is used on Siegburg drinking jugs of the 14th century as well as on earlier Rhenish red-painted and ash-glazed vessels (Reineking-Von Bock, 1971, for example, Nos.55-6, Nos. 86-95; Beckmann, 1974, nos 26-32, 44-50, 56-156). The latest types to have this frilled base are Raeren stoneware drinking jugs and their English copies, some of which are known in the region. It is not known whether these Rhenish vessels have applied frills or not.

It has recently been noted that a few vessels from Eastern England have applied bases, luted to the inside of the vessel. it has been suggested that these might have been necessary to correct some fault in the original base, for example if it was too thin (Hayfield, 1980). The technique has not yet been identified on vessels in the region.

The term 'recessed base' is used here to define a particular type of foot-ring base in which the vessel is thrown with a thick base which is then scooped-out, usually with a knife or similar tool but possibly sometimes with the fingers. The technique is particularly common on London-type ware, from the late 12th to the early 14th centuries, but is also found in the region, for example on Hereford A7b jugs and Nash Hill jugs.

A distinctive method of base treatment is present on Northern French jugs in the late 12th and 13th centuries. Several cordons and ridges are produced on the vessel on the wheel. The same feature is present on London-type jugs of the early 13th century but has not been noted elsewhere in the region.

It is difficult to produce a neat base angle on the wheel using the fingers alone and therefore small tools were probably used to pare away the clay at the base. The exact nature of the tools used is uncertain; bone, wood or metal would all produce the same effect on the clay.

The most common type of tooled base is roughly square in profile with a concave moulding on the upper side of the square. This type is present from the 15th century on Tudor Green vessels and from the 16th century is produced in the

region, on Cistercian type cups. The same method is used to produce the bases on tin-glazed ware albarellos and most Staffordshire/Bristol 17th and 18th century hollow wares.

The bases of Cologne, Frechen and Westerwald stoneware drinking jugs and tankards are usually decorated with complex mouldings. It is likely that these were applied using a template (and certainly on Westerwald stoneware the 'chuttering' that a template would make is visible on the walls of tankards and chamberpots). The technique is not used locally until the early 18th century, when Staffordshire stoneware tankards have this type of base. The template base is not to be confused with a turned base. The former is produced whilst the vessel is on the wheel whilst the latter is produced by removing the vessel from the wheel, allowing it to dry then returning it to the wheel upside down. It is then possible to use the wheel-head as a chuck and to lathe-turn the vessel. Using this method complex shapes can be produced and a much thinner wall can be obtained. The technique is not known in the region, except on tin-glazed vessels until the early 18th century, when it was used extensively on Staffordshire white salt-glazed stoneware (the technique is described by Brears, 1971, 123).

On tin-glazed wares the turned base is found in the 13th century on Andalusian lustreware. Two main forms were produced: the foot-ring which varied in depth but was normally about 10mm deep and the upkicked base which was cut away to produce a shallow cone. The latter form is found solely on Spanish vessels and is particularly common

on Valencian Lustreware of the late 14th to 16th centuries.

DECORATION

Applied decoration consists of strips, pellets, dots and more elaborate shapes used either singly or together to make a design. Given that clay is a plastic medium in which virtually any shape could be produced it is remarkable how little variety there is in the range of applied decoration during the medieval period.

It is necessary to distinguish several different modes of application on the basis of the consistency of the applied clay. These are slip-paint, plastic clay trailed slip and leather-hard clay.

Painted decoration is applied with a brush or the fingers whilst the clay is a liquid slip. In some cases 'smearing' might be a better term than 'painting' to describe the action since it appears that the slip was of a consistency similar to butter when applied. However, no record was made during this study of the incidence of these two variations in application. Two types of slip were used; a red-firing slip (coloured by haematite and often more iron rich than local red-firing clays) and a white-firing slip (coloured by kaolinite, and the absence of iron. These paints often contain fine to very fine quartz and white mica).

Red painted white wares are rare in the region. A notable exception is Coarse Border Ware, where red painted lines, usually grouped together to form arrows, are found on the jugs and cisterns of late 14th and 15th century date. Another exception, on the northern fringes of the region, is Staffordshire sandy red-painted ware, probably

also of late medieval date. Rhenish red-painted ware is not found in the region and only one vessel of Stamford red-painted ware has been found, at Hereford.

Both red and white painted slip are found on a few 14th century Malvern Chase jugs whilst white painted decoration is found on several late 13th to 14th century jugs in Hereford A7b and similar fabrics in S. E. Wales as well as on early to mid-13th century jugs in Newbury C fabric.

Strips, pellets and dots of plastic clay are the basis for much of the decoration on 12th to 14th century jugs.

On 12th century tripod pitchers two sorts of strip are used; broad, usually decorated along the top with thumbing, and narrow triangular-sectioned, usually plain. The differences between the two types appear to be due to methods of application. The broad strips would be rolled out as a sausage and placed in the required position on the pot. They would then be pressed into place with the thumb. Two types of thumbing occur, individual thumb impressions placed square to the strip and diagonal impressions made with the side of the thumb.

The narrow strips might also be coiled and placed in position but would then be squeezed between the thumb and forefinger. Where these narrow strips are decorated it takes the form of a pie-crust thumbing which it would be possible to make at the time of application.

The broad strips are found on Malvern Chase early tripod pitchers usually at the neck, around the spout, around the girth and then vertically joining the neck and girth strips. A similar pattern is found on a few Minety

tripod pitchers but these, like Newbury C and Oxford Y vessels, more commonly use narrow triangular strips in conjunction with combing, usually to form slightly diagonal vertical lines.

Oval, triangular-sectioned pellets are found on Newbury C jugs whilst rounded blobs are found on Bristol Redcliffe jugs (as part of horse-shoe designs).

Slip applied as a thick liquid, probably using a horn or similar tool (cf. Brears, 1971, 119-120) is known as trailed slip. Apart from a few rare examples from the Deerfold Forest kilns, which might be as early as c.1600 (but are unstratified), the earliest use of trailed slip in the region is in the Newent Glasshouse potteries in the 1670's. The first use of Staffordshire redware plates decorated with trailed slip probably pre-dates this but they are usually found in association with clay pipes of the 1680 to 1700 period. The introduction of the familiar Staffordshire trailed slipware plates and hollow ware c.1680 involved the use of more than one colour of slip on the same vessel and often combined with an overall slip as a 'primer'.

Trailed slipware was produced in the Low Countries and the Rhineland at the end of the 16th century (Werra ware) and in the Harlow region of Essex by c.1630 (Metropolitan Slipware). The Severn Valley therefore seems to have resisted this particular trend for at least half a century.

There is evidence from Mill Green, Essex for the use of slip-trailing in the early 14th century but the technique was not used elsewhere (Pearce et al., forthcoming).

The attachment of thin moulded shapes to a pot by luting was known in the Staffordshire potteries as 'Sprigging'. These applique patterns are usually well-moulded and their application must have taken a good deal of skill. Their use is not surprisingly limited to 'fine wares', the earliest of which were probably Cologne Stoneware drinking jugs of the mid-16th century. Late 16th to early 17th Century French barrel costrels (from the Saintonge and/or Northern France) also use this technique (Hurst, 1974, 247-250, Fig.10). The earliest use in this country seems to have been at Woolwich in the early 17th Century (Pryor & Blockley, 1978) and at Fulham in the last quarter of the 17th century, both in the experimental production of stoneware bottles. The technique became more common in the mid-18th century, still mainly with stoneware potters with the production of white salt-glazed stoneware teapots in the Staffordshire potteries and large stoneware mugs in the London potteries.

INCISED AND STAMPED DECORATION

Grooved lines can be added to a pot in two ways; freehand or by using the wheel. Freehand grooving is normally found on handmade vessels. The grooves are usually less than 1mm deep and 2 to 3 mm wide. They were made with a blunt tool, the most common patterns being horizontal wavy and straight lines. Grooved line decoration is found on some cooking pots but is rare, although, it is more common on tripod pitchers. Shrewsbury-type pitchers, of early 13th century date often have cross-hatched decoration on the shoulder and girth. Ham Green jugs typically have closely spaced grooved lines spiralling around the vessel.

These were most likely applied using a tournette or turntable and were added before the handles. Malvern Chase early tripod pitchers often have widely spaced horizontal grooved lines.

Wheelthrown grooving is normally added as the last stage of wheelthrowing, before removal from the wheel (and is distinguished here from 'turning', in which the vessel is replaced on the wheel after some drying has taken place). Wheelthrown grooves usually occur as a group or zone on the shoulder or just above the girth of a pot. A number of post-medieval wares have these grooves, amongst them Malvern Chase, the Herefordshire potteries and Ashton Keynes.

Comb impressions are found on many pot types from the 11th century onwards. The tools used are unremarkable, having between 3 and 6 evenly spaced teeth, the whole comb being between 5 and 10mm wide. No attempt has been made in the study region to identify individual combs and such an attempt would almost certainly fail in all but the rarest instance.

Combing is the most common method of decoration on tripod pitchers of Minety, Hereford A2 and Newbury C types. Only a small number of designs are known, but it would be difficult to identify more with the small number of complete or substantial parts of vessels known.

Ham Green jugs, especially those of type 'A', are often comb-decorated. The usual design consists of horizontal lines, often spiralling like the grooved lines on the same ware. Cross-hatched lines are also found.

INDIVIDUAL STAMPS.

Individual stamps are found on 11th to 12th century spouted pitchers, and rarely on later medieval jugs. These later stamps are usually impressed onto an applied pad whilst the earlier ones are impressed directly onto the body of the pot, usually around the shoulder and more rarely on the handle, spout or inside of the rim.

The stamps are usually round, although square examples are known. They usually consist of simple geometrical patterns, such as the 'wheel' pattern of radiating spokes or the 'grid' pattern of cross-hatched lines. Individual stamps have not been identified in this study but those used in Bath have been analysed by Cunliffe (1979, 145-8, Fig.68). The incidence of stamping varies through the region and is most common in Wiltshire and Avon but is virtually unknown in Shropshire and Hereford and Worcester. In Gloucestershire, as befits its intermediate position, only a small proportion of the spouted pitchers are stamped.

ROLLER STAMPING.

Roller-stamping, or 'rouletting', is found on many Late Saxon cooking pots, normally as a single horizontal line on the shoulder. The technique is then absent from the region until the 12th century, when several tripod pitcher types are decorated with it, but this time used in a more elaborate way. Early 13th century Worcester jugs are decorated with spiral or horizontal bands of roller-stamping, possibly applied on the wheel and this type is often found on late 13th to 14th century jugs in the Welsh Marches, from Gwent to Cheshire.

Only two roller-stamped pottery types are found in the region; Chester-type ware (possibly made at Stafford) and Stamford ware cooking pots. The other fabric in which wheelthrown cooking pots occur is Gloucester TF41a. Roller-stamping does not occur on these vessels, nor on any of the Late Saxon handmade wares in the region.

Only two patterns of roller-stamp are known from the Late Saxon pottery in the region; diamond lattice and, rarely, rectangular lattice. The rollers were mainly between 10 and 20mm wide and quite often only one side of the stamp impression is found, because of the curvature of the pot.

Roller-stamping is found on Malvern Chase, Newbury C, Hereford A2 and Hereford A3 tripod pitchers. The standard pattern in all cases except Malvern Chase is a single row of rectangles, 1-2mm wide.

Malvern Chase tripod pitchers have a number of roller-stamp patterns, the most common of which is the single row of chevrons. The roller-stamping occurs as horizontal, diagonal and vertical lines sometimes combined with applied strips.

Ham Green type 'A' jugs are decorated sparingly with diamond lattice roller-stamping. Decoration is added at the latest stage of manufacture and is often found on the handle, rim and base.

The roller-stamping on Worcester jugs is made with a wide variety of stamps (but only one stamp is used per pot). The most common pattern is the single row of rectangles but much more complicated patterns exist. The

roller-stamping was always applied before the handle and spout and is often partially obscured by the thick glaze. The zone of decoration extends from the shoulder to a point c.50mm above the base.

Roller-stamping is used in the same way as Worcester on jugs from Shropshire and Cheshire, the main pattern used being the single row of rectangles, and on the 'Complex rouletted' jugs of the Gwent/S.W. Herefordshire area but the patterns used there are usually less geometrical and include running vines (Hurst, 1962-3).

Another type of roller-stamping occurs mainly on Oxford AM jugs. On these jugs the roller-stamping is impressed onto vertical light coloured and red-firing strips. The usual pattern of roller-stamping is multiple rows of square impressions. The same type of roller-stamping, also found on applied strips, occurs on early to mid-13th century London-type jugs.

Roller-stamping is rare on post-medieval vessels. The technique was only used on Raeren drinking jugs (diamond lattice pattern), Ashton Keynes flanged plates and rare, red earthenware bowls from Monmouth.

GLAZING

In general glazes have been treated summarily within this study since, without trace element analyses or lead isotope analysis it is unlikely that their study would have given any insight into the sources of lead used nor enabled different wares to be distinguished. However, the study of glazing techniques, recipes and composition is still an important area of research. A representative sample of

glazes of both medieval and post-medieval date has been analysed by J. Bayley of the Ancient Monuments Laboratory using semi-quantitative XRF analysis. Thus the actual quantities of elements is not known but their relative abundance between samples can be indicated by 'normalising' the resulting counts for lead. It would appear that three significant results have been obtained from this series of analyses. Firstly, and most obviously, the use of copper to colour glazes green has been confirmed for a variety of wares of late 12th and later date. Secondly, a small group of post-medieval glazes were shown to have abnormally high quantities of zinc, thirdly Saintonge Polychrome ware was shown to have an abnormally high tin count, fourthly, it appears that green paint was sometimes obtained using a copper/iron mixture and fifthly manganese was shown to be the predominant colourant in Saintonge polychrome brown paint and an important colourant in Malvern Chase brown slip.

This method would repay further use since large numbers of samples can be processed quickly, as opposed to the quantitative methods of plasma-emission spectroscopy or neutron activation analysis.

METHOD OF GLAZE APPLICATION

All medieval glazes were based on lead or lead compounds. It is dif icult to know what mixture was used in any particular example. In order for the glaze to adhere to the pot rather than run off or craze (develop cracks and lift off) the lead was often mixed with another material. Clay slip and glass frit are both known to have been used and would undoubtedly give a different appearance to the

glaze. Eraclius notes the use of a flour paste to stick the powdered glaze to the body, but as De Bouard points out there is no method of checking whether this method was carried out since the flour would burn off in firing. Similarly firing conditions would affect the glaze; too low a temperature and the glaze would not 'mature' whilst too high a temperature would cause the glaze to run off or bubble. Examination of immature glazes under the binocular microscope often reveals blobs of lead and copper, usually less than 1mm across. The presence of these blobs suggests that in these instances the glaze was applied as powdered metal, rather than as the oxide (as recommended by Eraclius (De Bouard, 1974)). However, given the highly complex system, it is easy to offer facile interpretations of glazes based on visual analysis.

Two methods of glaze analysis which help distinguish the glaze recipes are firstly, refiring of sample sherds under controlled conditions and secondly, replication of recipes using the same clays and firing conditions as those suggested for the original vessels. Neither method has rigourously been applied in this study, although some glazes were refired as part of a series of refiring experiments on Hereford and Chepstow pottery. These suggested that the variations in surface finish (matt, crazed, glossy) were all due to firing rather than composition since most glazes on refiring produced a glossy, crazed, clear glaze whatever the original appearance.

Qualitative and semi-qualitative analysis by X-Ray Fluorescence does not distinguish the recipes since the final glaze composition is always a mixture of lead and the clay body. No attempt has therefore been made here to suggest which glaze recipes were used on any type.

Three methods of glaze application are known from documentary or from modern parallels; Splashing, painting and dipping.

SPLASH GLAZE.

Spatters of glaze occurring randomly are probably the result of glaze having been applied as a liquid using either the hand or a brush to flick the glaze onto the pot. Alternatively, the glaze could have been applied as a powder onto a primed surface (for example a mixture of flour and water, De Bouard, 1974).

Most of these glazes have noticable pitting, and in under-fired examples these pits still contain blobs of metal. This suggests that the pitting is the result of the glaze being applied as a relatively coarse powdered metal, rather than as a suspension of a lead compound.

Splash glazes have a long history in the London region, being first found in the mid-12th century and still being used in the early 14th century. Most splash glazes do not have colouring agents, although they are known. The technique has not been recognised on any locally made pottery in the study region.

PAINTED GLAZE

Glaze occurring as streaks, usually diagonal to the pot was probably applied as a liquid by painting. Like splash glazing this method produces a very thin patchy glaze but unlike splash glazing there is more control over the area being covered. It is likely that painting was the main method of glaze application in the region from the 12th to the 15th century. Some vessels, for example a late Malvern Chase tripod pitcher show very clear evidence of painted glaze as do many of the late 11th to early 12th century Stamford Ware pitchers from the region. The patchy glaze on Minety cooking pots could only be applied by painting, since it occurs around the inside of the rim and the inside of the base only.

DIPPED GLAZE.

Dipped glazes are usually thick, lustrous and cover the whole of one or both sides of a vessel. If the vessel is internally covered with dipped glaze, for example a post-medieval bowl, then there will be a clear edge to the glazed area and if too much glaze was applied then there will be evidence of the excess having been poured off. Dribbles of glaze are common on dipped vessels, running down from the rim. The earliest definite dipped glazes found in the region are those of Ham Green and Worcester jugs. Both types suffer from an excess of glaze which during firing has run and gathered at the rim (the vessels being fired upside down) and on the base of the supporting vessel. Dipped glazes are used on Bristol Redcliffe, HerA7b and Nuneaton late 13th to 14th century jugs but the technique then goes into decline in the later medieval

period (not being used at either Minety or Malvern Chase). It is quite possible to produce the 'bib' glazes found on jugs in these wares by dipping and indeed this method produces a very distinct 'bib'. The decline in use of the technique is therefore not related to this change in fashion but is more probably an attempt to conserve lead. The re-appearance of the technique in the post-medieval period can be dated to the first half of the sixteenth century, when it is found on Cistercian-type cups. Locally-made coarsewares however did not follow suit until the very end of the 16th century when regularly applied clear lead glazes are found on several types, for example Stroat, Ashton Keynes and Malvern Chase.

ADDED COLOURING AGENTS.

Only three glaze colouring agents are known on locally made pots, of which copper is by far the most common.

COPPER-LEAD GLAZE

The use of copper to give a rich green glaze (sometimes verging on black) is first found on Developed Stamford Ware jugs imported to the region in the late 12th and early 13th centuries. There is no evidence for the use of the technique on locally made vessels until the first half of the 13th century, when the technique is used on Worcester-type jugs (see table 5.1). There are two types of copper glaze, one in which the copper is present as 'speckles' in a plain background and the other in which the colour is diffused throughout the glaze. This must represent differences in glaze preparation since the speckled effect is found on vessels of varying firing temperature. The best

example of these two glaze types is found in Saintonge Ware. Both mottled and homogeneous copper-lead glazes are found. The homogeneous type is often found in conjunction with polychrome decoration. this suggests that is was more valuable. Green 'paint', either applied before glazing or as a glaze, has been analysed on Saintonge and London-type vessels. It has a higher concentration of iron than one would expect from either a clear lead glaze or an all-over or speckled green glaze as well as a high copper content. It seems therefore that green paint was a mixture of iron and copper compounds.

Table 5.1 shows the results of XRF analysis of several locally produced medieval and post-medieval glazes. The copper counts can be interpreted as three groups.

Group 1 has no copper whatsoever and consists predominantly of 12th century types, including both locally produced tripod pitchers and non-local jugs (Stamford and Andenne). The analysed samples of North Devon gravel-tempered ware and Wanstrow ware similarly have no copper.

Group 2 consists of glazes containing detectable copper (which probably means in the order of parts per hundred rather than parts per thousand, pers. comm. J. Bayley). Into this group can be put Ham Green ware, Bristol Redcliffe ware, Nash Hill clear glazed (although it is known that some vessels were deliberately coloured with copper) and Oxford AM together with two post-medieval samples; Ashton Keynes ware and ?Weston-super-Mare coarseware.

Group 3 consists of glazes deliberately coloured with copper. Into this group can be put Worcester-type jugs, Nash Hill green-glazed jugs, a sherd of a locally produced jug from Richards Castle, Hereford and Worcester, Nuneaton Ware, North French Monochrome, Saintonge polychrome and mottled wares, London-type ware Kingston ware and Developed Stamford ware. Of the post-medieval wares analysed only South Somerset slipware glaze had a high copper content, used in that case for paint rather than an overall colour.

These are wares for which scientific analysis is available. On the basis of visual comparison we can add Malvern Chase late medieval glazes and Newbury C green-glazed jugs.

From these results one can say that mottled green glazes on an oxidized or slip-covered body can be said with certainty to be coloured deliberately with copper. With mottled green glazes on a reduced high iron body it is not so easy to be certain, and until the analyses were carried out it was not known for certain that Worcester-type jug glazes were coloured with copper.

The identification of group 2 glazes is of interest. All are 13th century or later but have no other characteristics in common, except that they were probably all dipped rather than splashed or painted-on glazes.

Eraclius' treatise contains a recipe for making a green glaze:

> "... However, if you want to obtain a green colour, take some copper, or better still some auri-calum [brass or bronze], and mix it with the lead as follows: take the lead and melt it in a pot; when it

is molten stir it with your hands [!!!!] in the pot until a powder is produced, and mix this then with 6 parts of brass filings. When the poty has been dampened with water and flour sprinkle it immediately with lead, ie. with the filings mentioned above. if you want a yellow glaze sprinkle the pot with pure lead without brass filings.

Then place this pot in a bigger pot and put it in the kiln so that it will become more brilliant and beautiful, but in a slow heat, not too much nor too little." (De Bouard, 1974, 69).

This recipe suggests that we should find a correlation between the presence of copper and that of either zinc or tin, at least in Northern French green glazed jugs. However, as can been seen in table 5.1 there is no correlation between tin or zinc and copper. Equally high concentrations are found in plain lead glazes. De Bouard reports on some experiments carried out at the Caen Centre of Medieval Archaeological Research to replicate the green glaze of Northern French green glazed wares, and on analyses carried out on archaeological samples. These showed that a good approximation to the medieval glaze could be obtained with a mixture of 96.72% lead to 3.28% copper. The quantity of copper found in the archaeological samples (which varied in date from the 9th or tenth century to the 13th or fourteenth century) varied from 0.3% to 4% (De Bouard, 1974, 75). De Bouard does not state whether the glazes with low copper, which are possibly comparable with group 2 above, were coloured green or, like group 2, clear.

IRON AND IRON-MANGANESE GLAZES

The use of iron and/or manganese to colour glazes is a complex subject since, as stated above, all lead glazes are mixed with clay to some extent. A method of analysis which can distinguish the two is milliprobe analysis of a thin-section. Using this method the concentration of iron and manganese can be measured at varying depths in the glaze. If the glaze has taken up iron and manganese from the body alone then there should be a sharp gradient in the concentration whereas if iron and manganese have been added to the glaze the gradient should be less steep. However, since one method of glaze application involves its mixture with clay the second result would still not prove that iron or manganese had been added as colouring agents.

As an example of the problem one can take Saintonge polychrome ware, Stamford ware and Andenne ware glazes, all applied to a white or off-white clay. The glaze of the Saintonge ware is completely colourless whilst that on Stamford ware is often a pale yellow or green (depending on oxidation) and that on Andenne ware is a rich light brown (often with speckles of dark brown, which can be seen to overlie iron ore inclusions in the matrix).

Semi-quantitative X-Ray fluorescence analysis, carried out by Justine Bayley of the Ancient Monuments Laboratory reveals the same order of concentration of iron in all three wares (see table 5.1).

The distribution of values for iron in the XRF analyses has a single peak, between 200 and 400 counts. If there is any pattern at all to the results it is simply that those samples with a thin or patchy glaze cover show higher iron

counts than those with a thick, overall glaze. Manganese was only present in six of the samples and in all but two cases the sample also revealed a high iron content (for the reasons outlined above). In the remaining two cases; Saintonge polychrome brown paint and Malvern Chase 'pink' ware with a brown slip, it is likely that the manganese is present as part of a manganese/iron slip or paint. There is thus no evidence from this series of analyses for the use of iron or manganese as an intentional glaze colourant. Biddle and Barclay record a series of quantitative analyses of the glaze on Winchester Ware (Biddle and Barclay, 1974, 140). These show negligible quantities of copper, nickel or cobalt but consistently 3-4% of iron. They did not, however, determine the origin of the iron.

There are some wares, however, where the use of iron or manganese to give a black, brown or purplish brown glaze is proven. The earliest of these is of late 13th to 14th century date and is obtained by adding iron scale to applied strips. On firing this produces a hideous bubbly glaze with a metallic gloss. The technique never had wide application in the region but is found rarely on Her A7b jugs, for example.

The colouring agent in the latter case was definitely introduced through the clay. In the next main use of iron/manganese colouring, Cistercian type ware, it is by no means certain whether the glaze was adulterated or whether the colour comes from the body. The latter is more likely since it is noticeable that 'low-fired' examples of Cistercian ware have a clear, brown glaze and the

distinctive coloured or opaque glaze is restricted to high-fired examples. In some thin-sections minute opaque crystals can be seen in trails leading from the clay surface into the glaze. These give many cistercian ware and later black glazes a distinctive glittering appearance under the binocular microscope.

There is in fact another type of blackish glaze found on cistercian ware; a mottled purple glaze. This has the same appearance as many kiln bricks, accidentally glazed by fuel ash. It is possible that some cups were intentionally given a fuel-ash/lead glaze by throwing ash into the kiln. This form of Cistercian ware, although noted rarely in the region, is probably not a local product.

Staffordshire and Surrey-Hants Border wares are sometimes covered with a mottled brown glaze over a light-coloured body, which could not have given rise to such a colour. The technique was definitely in use in the Surrey-Hants border by the begining of the 17th century but the first occurrence of the technique in the Staffordshire potteries seems to be at the very end of the 17th or begining of the 18th century. As in copper-green glazes the mottling is probably a reflection of the distribution of iron/manganese in the glaze (whereas mottled brown salt-glaze is caused by the application of a uniform brown slip, the mottling is a reaction between the salt and the iron, causing the glaze to 'crawl').

TIN-LEAD GLAZE.

The use of tin to opacify a lead glaze was known in the Mediterranean region in the 8th century and tin-glazed wares were produced in Spain and Italy from the 13th century onwards. The presence of tin in medieval glazes has been noted by Jope, on the basis of the analysis of Minety handmade cooking pots (Jope, 1952 a). Similar evidence has been found from the XRF analysis of a variety of wares (see table 7.1). Despite this, there appears to be no significance in the distribution of tin, which can be either completely absent (for example in two samples of Rouen ware), present as a trace (for example in four samples of Stamford ware) or present in the order of 20 to 50 counts per 7000 of lead. The Minety samples mainly had detectable tin but within the same range of values as for other medieval glazes.

This level of tin is insufficient to have any effect on opacity, and is too low to be the result of using pewter instead of lead. There is no correlation with the concentration of copper or zinc and it is thus unlikely that the tin was added as an impurity with these metals. The likelihood is that the tin was an impurity in the lead, in the same way that zinc and cadmium probably were.

The fact that the three highest tin counts obtained were for samples of Saintonge polychrome ware may be significant in relation to the problem of how such a clear glaze was obtained.

The earliest tin-glazed wares made in this country were of late 16th century date in Eastern England and mid-17th century in the West. The earliest documented tin-glazed

pottery in the west was in Brislington and archaeological evidence confirms that tin-glazed wares were rare or absent before that date.

MINOR AND TRACE ELEMENTS.

Both zinc and cadmium were detected in a number of medieval and post-medieval glazes (see table 5.1). The distribution of zinc values has a bimodal curve with peaks between 50 and 100 counts and between 400 and 500 counts. This second peak contains three samples; North Devon gravel-tempered ware, South Somerset and ?Weston-super-Mare coarseware. All three are 18th or 19th century in date and from the South-West of England.

It is possible that they reflect a change in lead source. Wanstrow ware is known to have been glazed with Mendip lead (V.C.H. Som II, 1911, 429) and has a zinc count of 162.

Cadmium occurs as a trace in more than half of the glazes but there appears to be no pattern in its occurence.

SALT GLAZE.

Salt can be used to give a clear, pockmarked glaze to vessels. The method of application is extremely simple. Providing a suitable temperature has been reached, the salt only needs to be thrown into the kiln, where it will vapourise and react with the surface of the vessels. The technique was not used in the region in the medieval period (in fact it was not used in this country at all). The earliest definite use of saltglaze on the continent is in the early 15th century Langerwehe industry, although putatively salt-glazed Siegburg stoneware of late 13th or

early 14th century date has been postulated. Even in the Langerwehe industry most vessels were given an iron wash but were not glazed. Raeren stoneware, however, is all saltglazed, as is Cologne, Frechen and Westerwald. The earliest use of saltglazing has the same history as the use of stoneware and until the introduction of 'Bristol glaze' in the mid-19th century all English stonewares were saltglazed.

ALKALINE GLAZE.

One type found in the region has an alkaline glaze, Syrian, or Egyptian, Alkaline Glazed ware. This thick, sugary glaze is heavily crazed and usually has a slight blueish tinge. Alkaline glaze is translucent and usually covers blue and black painted decoration.

FIRING

When a clay is fired it undergoes a series of changes, some of which are reversable and some of which are not. The first change occurs between room temperature and 200 degrees C. All of the water trapped between the plates of clay minerals is driven out as steam. For this reason particular care is taken when drying a vessel before firing. In some present-day cultures the vessels are pre-heated to ensure complete drying. Naturally enough, there is no evidence for or against this practice in the medieval period, with the exception of one structure interpreted by S. Moorhouse as a drying kiln (Moorhouse, 1981). If drying takes place too quickly, or unevenly, then the vessel will warp and possibly crack.

At temperatures above 200 degrees C. chemically combined water is driven out of the clay but if the vessel is taken out the kiln at this stage it will gradually re-adsorb water from the atmosphere.

At 550 degrees C. the quartz in the vessel will change from alpha to beta quartz. This causes the quartz to expand. If too much coarse quartz was present this might cause the vessel to crack or shatter. Vessels with a high quartz content therefore need to be taken slowly through this part of the firing. This might be one reason why coarse sandy fabrics replaced those with calcareous or organic inclusions.

Above 600 degrees C. the clay begins to undergo non-reversable changes. Gradually the clay begins to fuse together, forming an amorphous material distinguishable in thin-section by the absence of birefringence. The temperature at which the whole of the body becomes isotropic varies from clay to clay. In particular iron acts as a flux in this change and wares with a high iron content 'mature' at lower temperatures than those with a low iron content. Similarly the identity of the clay minerals affects the maturing point. Kaolinite requires the highest temperature.

Above the maturation point there is a range of temperatures over which no changes can be discerned followed by a point at which the clay starts to warp or bubble. This temperature too will vary from clay to clay. Calcite will decompose at c.850 degrees C. to form calcium oxide and carbon dioxide (although the exact temperature depends on the available oxygen and the pressure). On

cooling this calcium oxide will take up water to form calcium hydroxide. This reaction causes the inclusion to expand. Isolated calcium carbonate inclusions will cause spalling whilst a heavily limestone-tempered fabric will completely shatter if fired above this crucial temperature.

For a given clay there is a certain range of temperatures over which it can be sucessfully fired. If this range is too narrow then the clay would not have been usable without considerable control over firing conditions.

The firing temperature is therefore an important feature of any vessel. Perhaps equally significant is the length of firing and the atmospheric conditions in the kiln. There are several methods available for determining firing temperature and conditions. Of these the simplest and least accurate is to refire samples of the ware at known temperatures and in known conditions and to compare the appearance of the resulting sherds with the original sherds. A number of samples were refired, principally from Hereford and Chepstow. These showed firstly and conclusively that the colour of greyware sherds was in the main due to oxygen starvation in the original firing and that with few exceptions the clays would fire red at 1000 degrees in an oxygen-rich kiln atmosphere.

Similarly a rough indication of maximum original firing temperature was given by comparing oxidized sherds with refired samples. In no case, until the 16th century, need the vessels have originally been fired above 800 to 900 degrees C. Even after this date many of the wares examined were probably relatively low-fired.

A more accurate determination of firing temperature can be obtained by differential thermal analysis, in which a sample is reheated whilst monitoring the energy taken to heat the sample. This can also reveal something about the composition of the sample, since calcium carbonate will produce a distinctive change in heat output as will the different clay minerals. This method is still inaccurate and much more time-consuming than the refiring method.

The third method is to use scanning electron microscopy (SEM). Using this method it is possible to see the degree to which the clay minerals have been vitrified and also to compare the surface with the core (which should give an indication of the duration of firing). This method is prohibitively expensive.

BONFIRE FIRING.

The simplest method of firing is to place the vessels on the ground and cover them with combustible material (for example, brushwood or peat). This is then lit and simply allowed to flare up. The whole firing can last as little as 20 minutes and maximum temperatures as low as 600 degrees can produce usable vessels (N. Tobert, pers. comm.) Naturally, this method can leave no trace whatsoever in the archaeological record.

CLAMP FIRING.

A development of this method, used to prolong the firing and to control it is to cover the pots and fuel with turf, tile fragments or broken potsherds. This forms a temporary kiln and by adjusting the amount of air allowed into the kiln both the oxidation or reduction of the vessels and the speed of firing can be controlled (Bryant,

1977). The remains of such a clamp kiln may have been found at Chilvers Coton (Musty, 1974, 48).

KILN FIRING.

The earliest permanent post-Roman kilns found in this country are, with the exception of a dubious example from Cassington, of mid - late Saxon date, for example those found at Ipswich. These early kilns had a single flue/stokehole and had a small capacity. Musty (1974) has termed these Type I kilns and has divided the type into two sub-groups based on the presence or absence of a raised oven floor. Although the examples without raised floors are all early type 1b is also found in the late or post-medieval periods, at Crockerton and Newport, Dyfed for example.

The incomplete plan of a 12th to 13th Century kiln found at Penhow, Gwent, seems to discount the presence of two flues. Unlike other examples classified by Musty this kiln has a central spine without trace of a raised floor (Wrathmell, 1981, 4-7). Wrathmell quotes two parallels for the form of this kiln, one at Pottersbury, Northamptonshire, and the other at Nettleden, Hertfordshire. The products of the kiln, Chepstow HA (Penhow) ware, are also more similar to those of the home counties than they are to other local wares.

At a later date double-flued kilns are found. These too have been classified by Musty into those in which the pots were fired on the floor of the kiln (types 2a and 2b) and those in which there was a raised floor (type 2c). Three kilns of type 2 have been exacavated in the region. The

earliest was probably at Ham Green, of early to mid-13th century date. This kiln had a central division (type 2b) which did not apparently support a floor (Barton, 1963). The other two sites are of later 13th to 14th century date, Laverstock and Nash Hill, both in Wiltshire (Musty et al., 1969, 88-90, Fig.4; Mc Carthy, 1974). Double-flued kilns are known from the region in the post-medieval period in the North Herefordshire potteries (Marshall, 1948). All of these kilns were probably associated with very small scale pottery production.

To judge by the ground plans there was considerable overlap between the single and double-flued kilns in their capacity, although the simpler type 1a kilns were probably smaller that the remainder of type 1 and type 2.

Multi-flued kilns (Musty type 3) on the other hand have a much larger ground plan, hence probably the need for multiple flues. From the examples quoted by Musty (1974, 63-4) it appears that this type is essentially late and post-medieval in date and at present it is confined to the north-east of England and the Midlands. Examples are known from Chilvers Coton in Warwickshire and Sneyd Green in Staffordshire. These round, multi-flue kilns are similar to the earliest post-medieval kilns known in the Potteries, for example an example excavated at Hanley, Staffordshire (Celoria and Kelly, 1973).

The ground plans of kilns therefore show a gradual progression from small through medium to large kilns. As the size was increased there was a need to increase the number of flues from one, to two and then many (five or six being the most common number). It is idle to speculate on

the relationship between the output of these kilns and the organisation of production in the region until more kilns have been excavated.

THE USE OF SAGGARS.

The earliest evidence for the use of saggars in the region is in the mid-16th century, from Falfield, Glos., where Cistercian-type ware and saggars were found.

Saggars have also been found at several of the post-medieval Herefordshire kilns, mainly associated with the production of black-glazed tygs. In a few of the North Herefordshire kilns ring-saggars have been found. These are used to separate plates in firing. The Newent Glasshouse pottery also produced plates but there are no saggars from the site and the kiln scars found indicate that the plates and dishes were fired one inside the other, leaving blemishes on the rim and side of the vessels.

The Herefordshire kilns have also produced fragments of sandstone coated with glaze. These were probably used to separate coarsewares in the kiln. Many of the medieval glazed wares typically have rim scars on the base of the jugs, showing that these separators were not used. There is not enough kiln evidence to show when this technique was first used in the region.