FORTIDEN I TRONDHEIM BYGRUNN:
FOLKEBIBLIOTEKSTOMTEN

MEDDELELSER NR. 25

IAN W. REED

1000 YEARS OF POTTERY

AN ANALYSIS OF POTTERY TRADE AND USE

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from the research project
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An analysis of pottery, trade and use

Riksantikvaren, Utgravningskontoret for Trondheim

Trondheim 1990

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A research project by the Central Office of Historic Monuments and Sites, Norway, in cooperation with the University of Trondheim/Institute of History and Trondheim Council.

ISBN 82-90 652-26-7

200 eks.

Cover illustration: Fighting with earthenware jugs: 14th cent. (After Luttrell Psalter, East Anglia, British Library MS. Add. 42130, fol. 153, in Millar 1932).

Published by: Riksantikvaren,
Utgravingskontoret for Trondheim,
Kongens gate 85,
N-7012 TRONDHEIM

Printed by: Trondheim Kommunes reprosentral.

Volumes in this series are available from the address above. Price Meddelelser vol. 25 NOK 50,-.

FOREWORD

The pottery forms by far the largest single group of finds from the archaeological excavations conducted on the Library Site during the period 1973-1985. The amount of material (c. 34,000 sherds divided into c. 100 types), its stratigraphic documentation and the pottery's own special qualities with regard to the identification of cross-fitting sherds provide a unique opportunity for systematic investigation of source-critical problems, and in particular those concerning movement within and between layers. Such problems have a particular bearing upon the quantitative analysis of bodies of material derived from the town, and in this report emphasis is placed upon examining the material's potential for providing insight into the horizontal and vertical movement of finds within occupation layers. In addition, some of the effects that horizontally and vertically distorted distribution can have upon a material analysis based on quantitative analytical methods are pointed out.

Apart from the methodological problems which the report's author, **Ian W. Reed** has stressed, the results of the analysis are used in a tentative attempt to assess Trondheim's changing international trade relations throughout the medieval period. Particular weight is given to this aspect in order to realize the research project's original aim of analysing the ceramic material within the framework of one of the project's main research topics, namely "trade and the exchange of goods". Other analyses relevant to this topic have been conducted on runic inscriptions (Meddelelser No. 8), griddle stones (Meddelelser No. 15) and coins (Meddelelser No. 22).

On behalf of the Project, a big thankyou should be given Ian W. Reed of Riksantikvaren's Excavation Office in Trondheim, who, despite all his other practical duties managed never to lose the thread or become overwhelmed by the mountain of material. Without his extensive knowledge and comprehensive grasp of medieval pottery types and production this present work would have been impossible to undertake.

Thanks should also be given Trondheim Council's reprocentre and Per Lohse, who always manages to find a little space for us in between the printing of council documents.

Trondheim, December 1990

Axel Christophersen
Project leader

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ACKNOWLEDGEMENTS

Firstly a special thank you to my old friend Clifford Long who first brought me to Norway nearly 20 years ago and who actively supported my interest in ceramics during the period we worked together . The leader of the research project, Axel Christophersen, deserves gratitude for not totally losing faith in me. Also my gratitude to Erik Jondell who freed me from the burdens of administrative work in order that I could complete this analysis. All my colleagues and friends at the Riksantikvaren's Excavation Office in Trondheim receive my warmest thanks, in particular Chris McLees who was the guinea pig on whom I tested many of my ideas. Thanks are also due to Liv Renolen who revealed the mysteries of several computer programmes used in this analysis. Marit Longva has prepared the manuscript and Ingrid Volden has produced the finished illustrations.

I would also like to take the opportunity to thank my many colleagues and friends in the Medieval Pottery Research Group who have answered innumerable questions and helped to identifiy numerous pottery sherds. Thanks go in particular to John G. Hurst, Lyn Blackmore, Alan Vince, Sarah Jennings and Gareth Watkins.

Finally, I dedicate this work to a friend whose *joie de vivre* brought me renewed inspiration during the final stages of the analysis.

Ian W. Reed

Trondheim November 1990

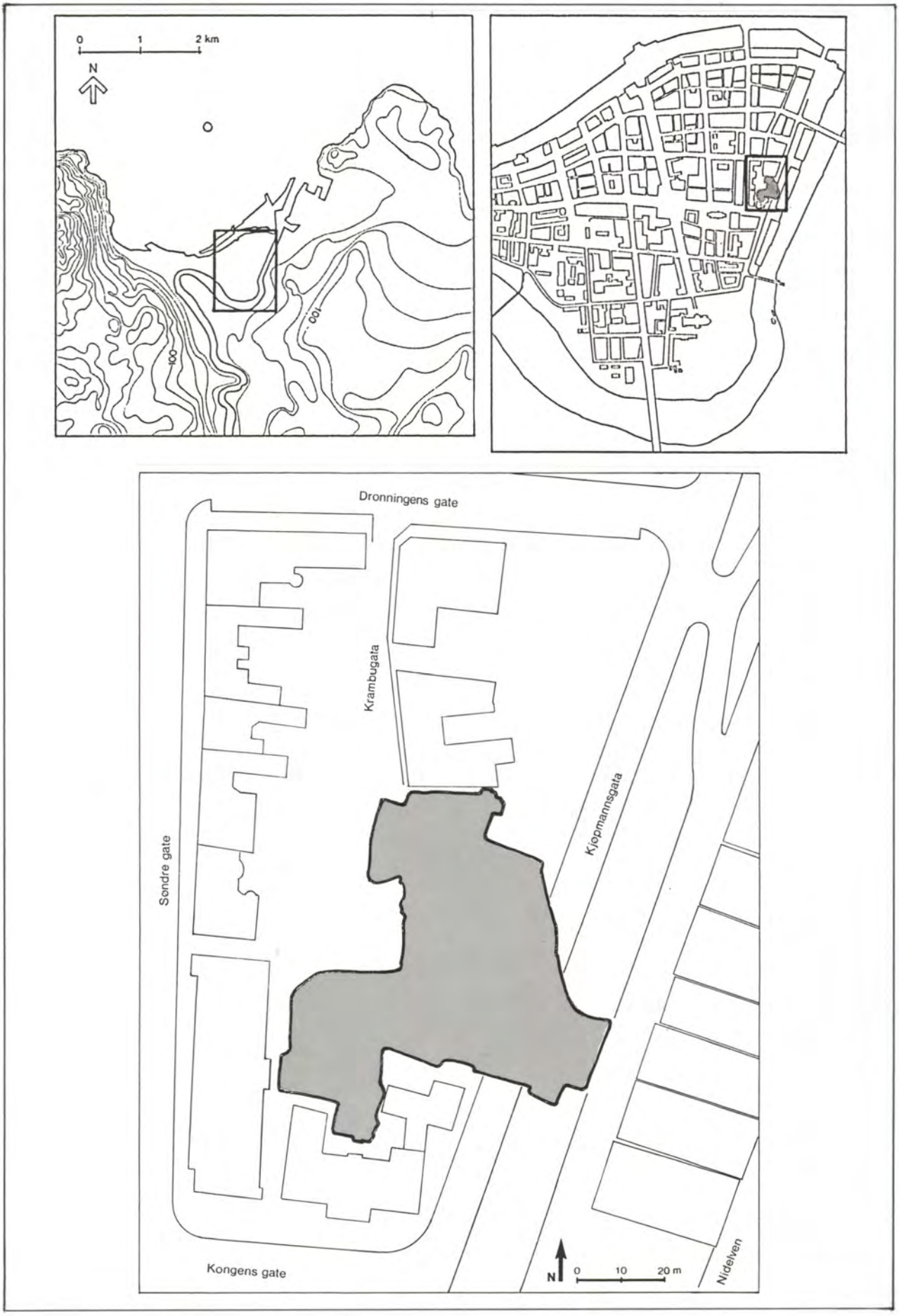


Fig.1 *Folkebibliotekets tomt (The Library Site), Trondheim.*

1. INTRODUCTION

This report contains a discussion of the medieval and later pottery found on excavations which took place on *Folkebibliotekstomten* (The Library site), Trondheim (fig. 1 and 2), between 1973 and 1985. The site covered an area of approximately 3200 m^2 in the central part of the medieval town, near the mouth of the River Nid. Here continual occupation of the site from the late 10th century was uncovered, consisting of a number of rectangular, intensively built-up properties on either side of one of the town's main medieval streets - Krambugate.

The results of these excavations are published in a series of reports Meddelelser. The stratigraphic analysis of the various parts of the site is published in volumes 3-5, 7 and 9-11, while volume 13, Utgravning, kronologi og bebyggelsesutvikling, presents the background to the excavation, together with the methodology and the course of events and also gives a general description of the development of the settlement in the area, together with the phasing and chronology. A shortened English version of this can be found in Meddelelser no.17, Excavation, chronology and settlement development.

The medieval pottery from this site is fairly fragmentary, with the exception of a few reconstructable profiles. For the post-medieval period, however, there are a number of contexts producing numbers of reconstructable vessels and profiles. As a result of the nature of the material and the fact that the pottery types found are, on the whole, well known, the radical decission was taken not to publish an illustrated catalogue. Instead the main types are presented with the reader being refered to other published reports.

This report is organised as follows: a chapter on methodology, covering quantification and the problem of residuality. The next chapter covers the method of classifying the material and presents the main pottery types. Chapters 4 and 5 discuss some of the interpretive uses of the pottery and the source of the pottery found in Trondheim. The concluding chapter draws together some aspects of the ceramic evidence and suggests lines of future research.

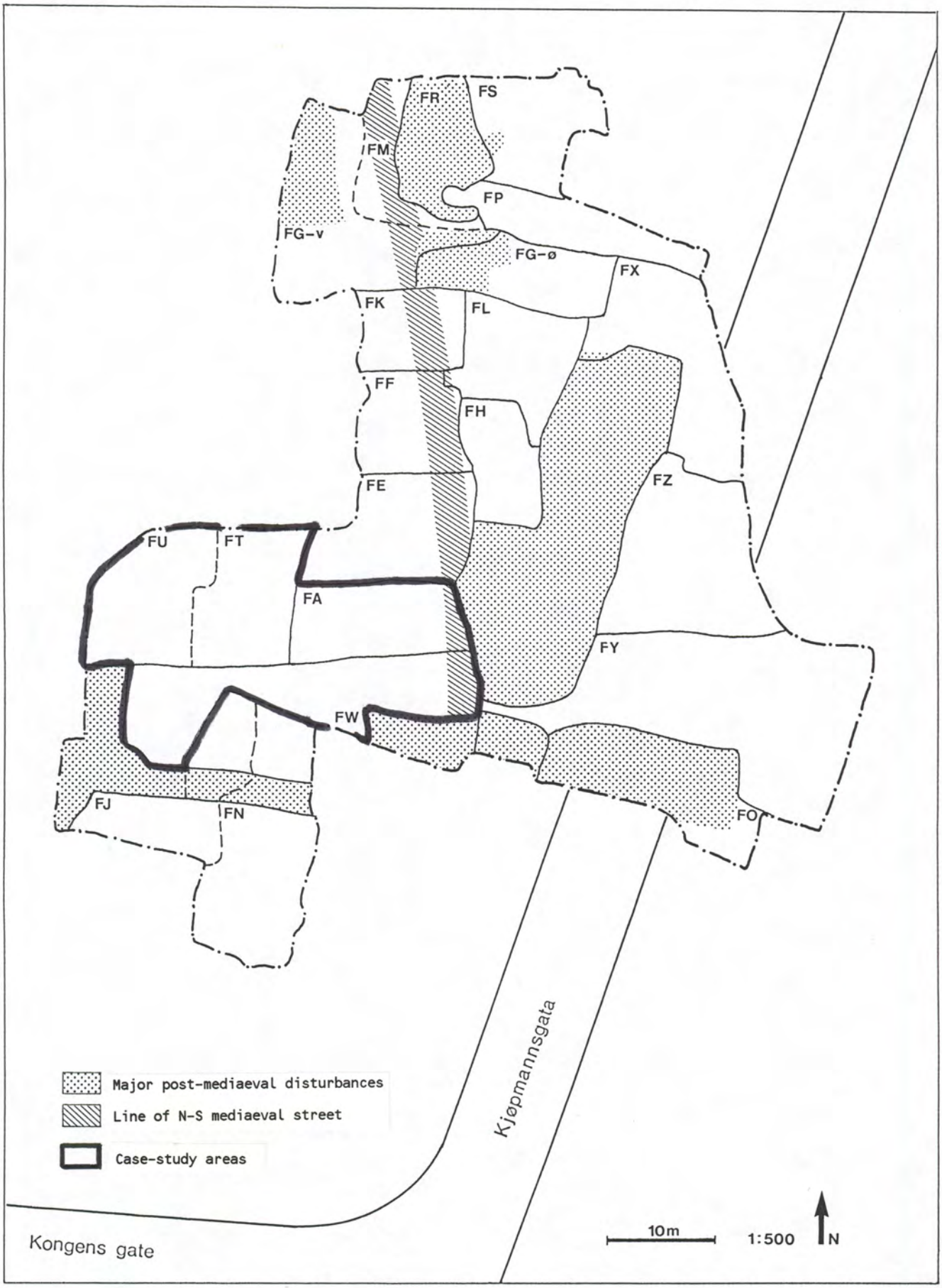


Fig.2 *The Library Site: individual excavated areas. Case-study area outlined boldly.*

2. METHODOLOGY

2.1 Quantification

There is no method of quantifiying large numbers of pottery sherds that is universally regarded as completely reliable, and each method has its advantages and disadvantages. The ultimate choice of a measure of quantity will depend on the nature of the site and of the pottery. The total assemblage of pottery from the Library site has been quantified by recording the number of sherds. In addition the medieval sherds were quantified by weight and by vessel equivalents based on sherd groups. Counting and weighing have the advantage of being objective, but both methods are subject to bias owing to the differences in size and thickness of the sherds being dealt with. Statistically the picture given by both these methods is very similar.

Quantification by vessel equivalents is more subjective. This is simply a count of sherd groups after all the possible joins have been made, and in cases where joins could not actually be made but sherds were without doubt from the same vessel, these were counted as one group. This was the only method which could be applied consistently to all types of pottery. A major problem with this method, however, is that of residuality. Because of the nature of its deposition every residual sherd will probably represent one vessel, whereas with pottery in primary contexts each vessel may be represented by a number of sherds. The total number of vessel equivalents arrived at by this method will, therefore, represent the maximum number of vessels from which the assemblage was derived.

Quantification by estimated vessel equivalents was considered inappropriate in this case; this method involves adding up the fractions of complete rims or bases represented. It was not always possible to measure the size of a rim or base from the sherds, either because the sherds were too small or the rims were not circular. Furthermore, vessels or types represented only by body sherds will not be accounted for at all.

Information about the occurrence of the different pottery types within each phase is presented in Appendix 1 and in seriograph form. Appendix 1 shows the 34134 pottery sherds divided into 98 different types. The seriograph (fig.3) show each type as a percentage of the total number of sherds from each phase. Only 56 types are shown here as many of the minor type, such as the post-medieval English wares, have been grouped together as have all the unidentified types. The earliest phase is at the bottom of each seriograph, the latest at the top. The total number of sherds in each phase is also given, so that the size of the sample can readily be assessed; the smaller the sample is, the less reliable the percentage will be.

2.2 Residuality

Pottery is one of the most indestructable archaeological finds and is, apart from bone, one of the commonest finds on urban excavations. Consequently, the survival of potsherds from the preceding phases of occupation is a recurring hazard in the assessment of pottery assemblages. If we consider, for instance, building 404, phase 9 (Christophersen 1988, p.134), it is c.15m x 5m founded on posts placed at approximately 1.5m intervals along the walls, that is to say approximately 30 posts to support this building. The digging of the holes for these posts will result in pottery from earlier periods being brought to the surface and scattered around. It will subsequently be joined by pottery contemporary with the erection and occupation of this building. If the building had been demolished and the posts removed some of the soil originally disturbed may be used to fill the posthole. The associated group of pottery from these postholes could thus include pottery current long before the building was built, as well as pottery contemporary with the occupation and demolition of it.

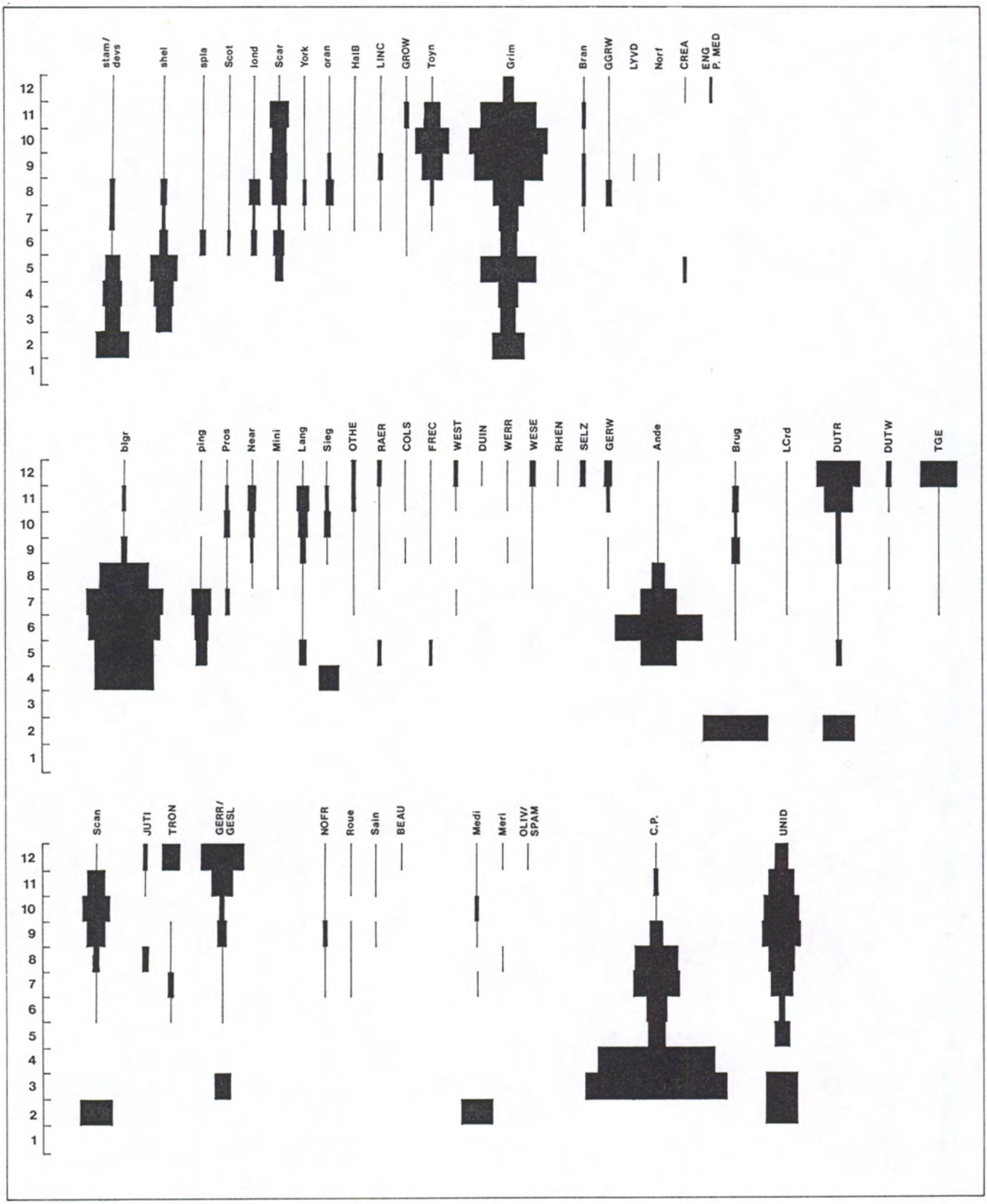


Fig.3 *Seriograph showing each pottery type as a percentage of the total number of sherds in each phase.*

Residuality primarily affects quantification, as it is impossible to be certain which pottery types are in contemporary use in any period, and what is the relative importance of each type. Residuality also affects the dating both of site periods and fabric types. An attempt to quantify the problem is shown in the seriograph fig.4, here it can be seen that the highest proportion of residual pottery occurs in phases 10 and 11, this comprises mainly early medieval pottery (see appendix 1).

The problem is, however, not as straightforward as it may seem, and is further complicated by some pottery types which are very long lived, e.g. Grimston. When sherds of a pottery type occur in phases thought to date from the end of the time range of that type, it is possible that some are residual. It is not easy to prove this, however, and impossible to quantify the degree of residuality. Because of this, one tends to take a more cautious approach resulting in some of the figures being too low because of the bias caused by residuality of long-lived pottery types.

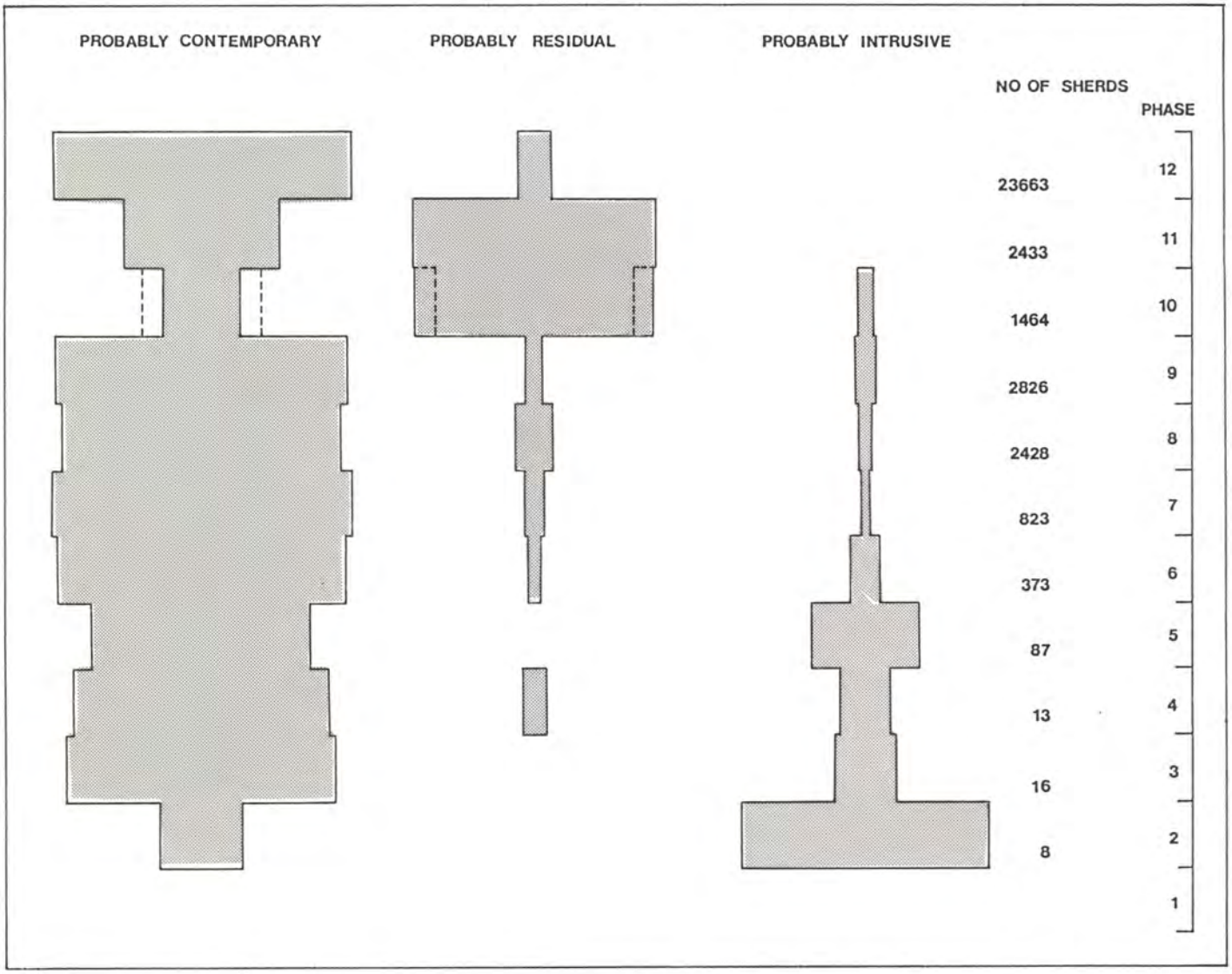


Fig.4 *Seriograph comparing percentages of probable contemporary, residual and intrusive pottery in each phase.*

2.3 The life-expectancy of ceramic vessels

Another aspect which compounds the problem of residuality is the life-expectancy of different types of vessel. It is quite obvious that the life of any ceramic vessel that is in everyday use is largely fortuitous: for example, a cooking pot, a purely functional vessel, lasts until it is broken; it is not a thing of style that will go out of fashion. It is however possible for some ceramic vessels to survive for a considerable time after the pottery type has ceased to be made. Fine and ornate tablewares, such as Scarborough ware knight jugs, if they are prized for their appearance, and therefore perhaps used infrequently, are potential candidates for this sort of survival. This has been suggested for Stamford ware (Kilmurry 1980, 196-200) and Scarborough ware (Farmer and Farmer 1982, 103-108). In this assemblage this type of survival is well illustrated by the local slip-decorated bowl (N56069) dated 1693; this has been repaired with lead strips and was finally discarded in a rubbish pit with material from the mid-18th century.

However, survival may also occur with plain utility wares, particularly large storage containers or other thick-walled vessels that are seldom moved. Ethnographic evidence, and common sense, suggests that the less a pot is handled or moved, the less likely it is to break.

It is also possible that even when broken, pottery pieces may still be useable. Farmer has suggested the possibility that even broken pieces of Scarborough ware knight jugs could survive as children's toys or ornaments (Farmer and Farmer 1982, p.104). No evidence of re-use was recognised in this assemblage. but on an excavation in the western part of the medieval town, Nordregate 1, the lower part of a re-used London-type jug (N48326) was found (Reed, in prep.). Here the broken upper edge had been trimmed and several holes drilled, pressumably to take a rope or leather-thong handle.

2.4 "Cross-fits" - the horizontal and vertical distribution of sherds from the same vessel.

A number of studies have been carried out concerning refuse disposal and the relationship between the location of various activities and the location of refuse from these activities (Schiffer 1972). Schiffer recognises three main categories of refuse which he terms *primary*, *secondary* and *de facto* refuse. Primary and secondary refuse are the products of the normal conduct of a society; objects which are worn out, broken or unwanted by-products of some activity. Primary refuse occurs where the location of last use and the location of disposal correspond. Secondary refuse, however, is characterised by there being an element of transport between the location of last use and the location of disposal. *De facto* refuse refers to material which has entered the archaeological record without being discarded; in other words complete useable artefacts that are found in the archaeological record. All three should be readily recognisable on an archaeological site, but normally secondary refuse is the most common.

It is doubtful whether any cases of primary refuse have been recognised on this excavation. Most buildings had wooden floors, which in many cases were raised up above ground level, when these buildings were demolished or the floors removed any primary refuse would have been removed. It seems, however, highly unlikely that there would be very much refuse left on these floors, particularly broken pottery.

Secondary refuse seems to have been dumped wherever a suitable spot was available, be it a hole or an open area. The relationship between the location of last use and the location of disposal is, therefore, difficult to establish. This is definitely the case on this site where no rubbish pits were found within the properties. These would, at least, have indicated that the rubbish had come from the individual properties and would have given an indication of which activities had taken place on the different properties. Evidence from this excavation suggests that rubbish has

been dumped in open areas but has also been carted elsewhere to be used for the raising of the ground level or as metalling in the road. In these cases the finds can only be related to the area (settlement/town) contributing the refuse and not to particular property. A well documented example of this type of secondary refuse occured after the town fire of 1681 when, on June 16th 1685, orders were given to the army to fill the holes left by the burnt-out cellars with stones and earth (Kregnes 1981, p.102-103).

Any multi-period site which has seen a number of major building changes (in this instance, 12 major phases (fig. 5)) with numerous sub-phases, is bound to have a considerable amount of disturbed ground and, consequently, disturbed finds. This can occur directly through the digging of, for example, post-holes and pits or through the carting-in of material to raise the level of the ground as mentioned above.

One of the most important qualities of ceramics is that when the object or vessel is broken it breaks into a number of pieces. This means that sherds from the same vessel can still be recognised when dispersed around a site. However, this requires the quantification of the material according to the number of individual vessels, where all the sherds from the same vessel are brought together. This entails a certain amount of subjectivity, and ultimately reflects the sharp-sightedness and experience of the researcher in identifying sherds from the same vessel, which is not an easy task with large quantities of unevenly fired pottery.

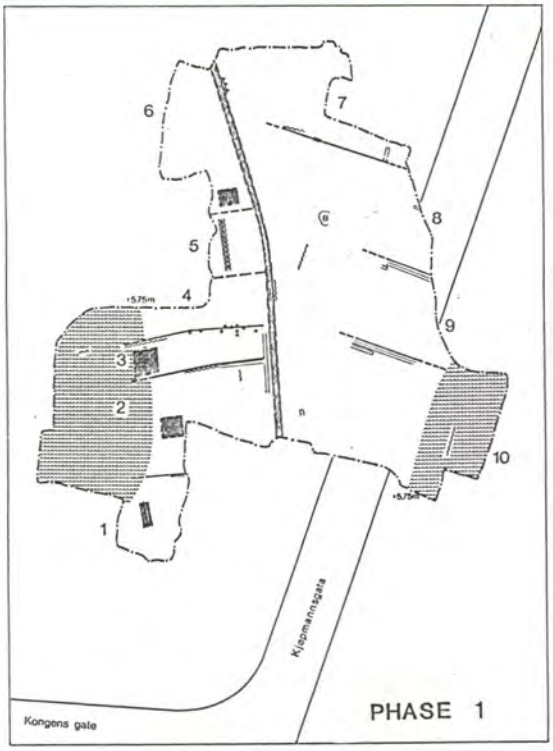
The distribution of sherds from the same vessel can offer a number of sources for understanding the phasing and the uses of a site. These range from the linking together of parts of a site to the suggesting of patterns of dumping and management of rubbish (Reed 1990, p.61-63). In Southampton, cross-fits were used to show that seven stratigraphically distinct deposits in a stone-lined garderobe pit were more or less contemporary and that there was no long-term chronology (Brown 1985). Moorhouse has shown the wide variety of information which can be gathered from examining pottery assemblages in this way (Moorhouse 1986).

Horizontal dispersal of sherds from the same vessel.

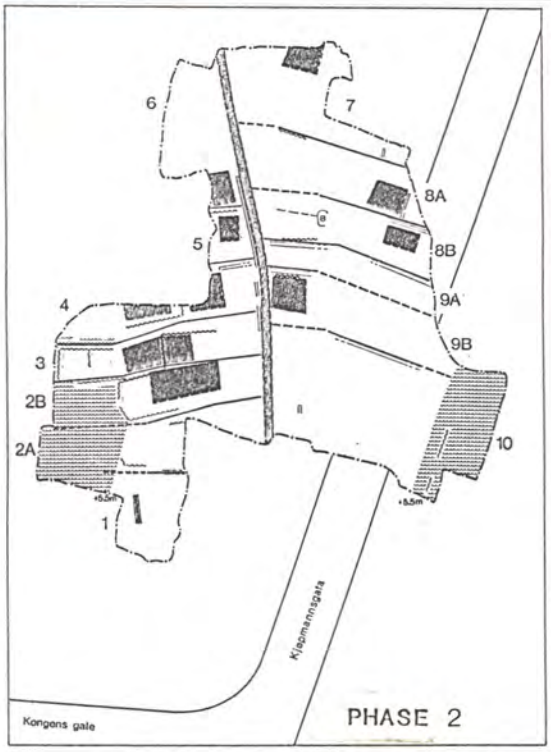
a) **Within a localised area**. A total of 520 cases of conjoining sherds dispersed within the postulated boundaries of individual properties were identified in the medieval assemblage. Typical patterns are shown in figs. 6 and 7 by the distribution of sherds from 7 vessels, scattered in a number of contexts within localised areas.

In order to examine the distribution of conjoining sherds within a localised area, main phase 8 for properties 2B + 3 (fig. 5) has been chosen as a case study. Table 1a shows the proportional distribution of sherds by percentage of weight for a number of vessels found in different contexts on sites FT and FU (fig. 2). Their horizontal distribution is shown in fig.7. The majority of these conjoining sherds occur within the same phase, but due to some secondary disturbance a number do occur as residual sherds in later phases.

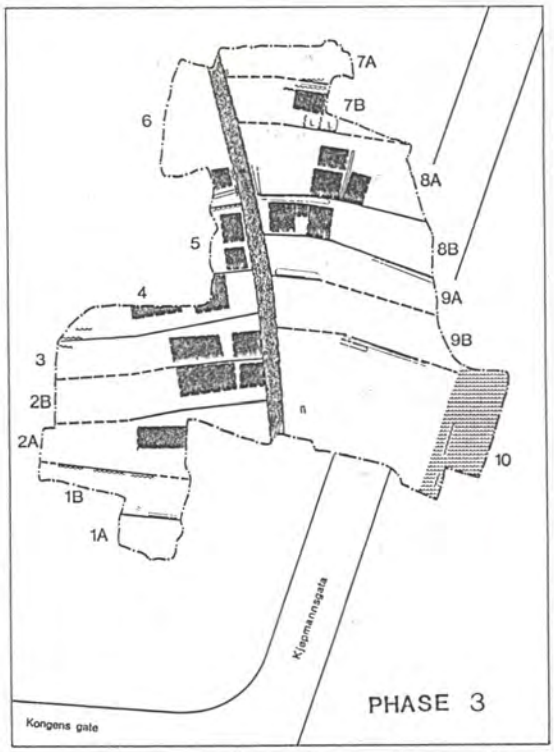
In table 1a the weight of unworked animal bone found in each context on FT and FU is also included. In addition to the animal bone, there are large quantities of worn-out shoes and other leather (O.Marstein archive report), together with quantities of bone waste from comb-making (L.Flodin archive report). It seems quite clear, in this case at least, that this material represents refuse which has been dumped and levelled off in advance of new building activity on this property. To what extent this refuse actually derives from the property on which it was found is uncertain. Common sense should tell us that the medieval householder would keep his living area clean, but can we accept the possibility of quantities of domestic refuse (in this case at least $8.5m^3$, and possibly as much as $16m^3$) being dumped in such an intensively built-up area, and was there space available within the bounds of the properties for dumping this refuse?



PHASE 1



PHASE 2



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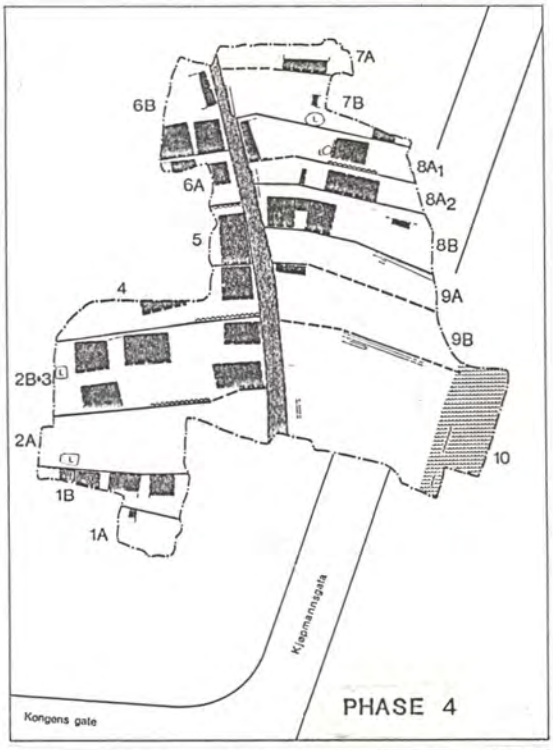
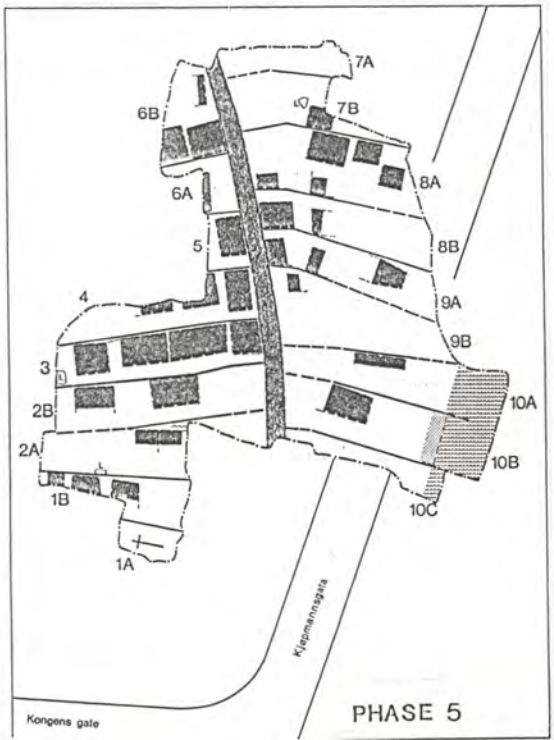
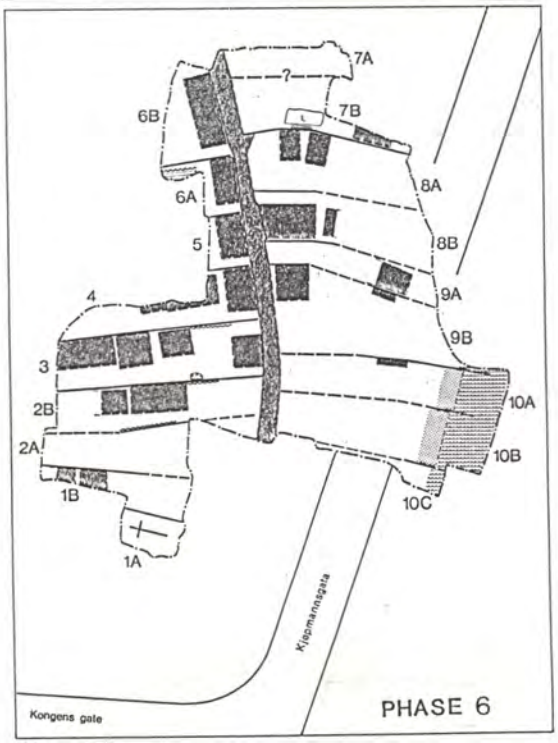


PHASE 4



PHASE 5



PHASE 6

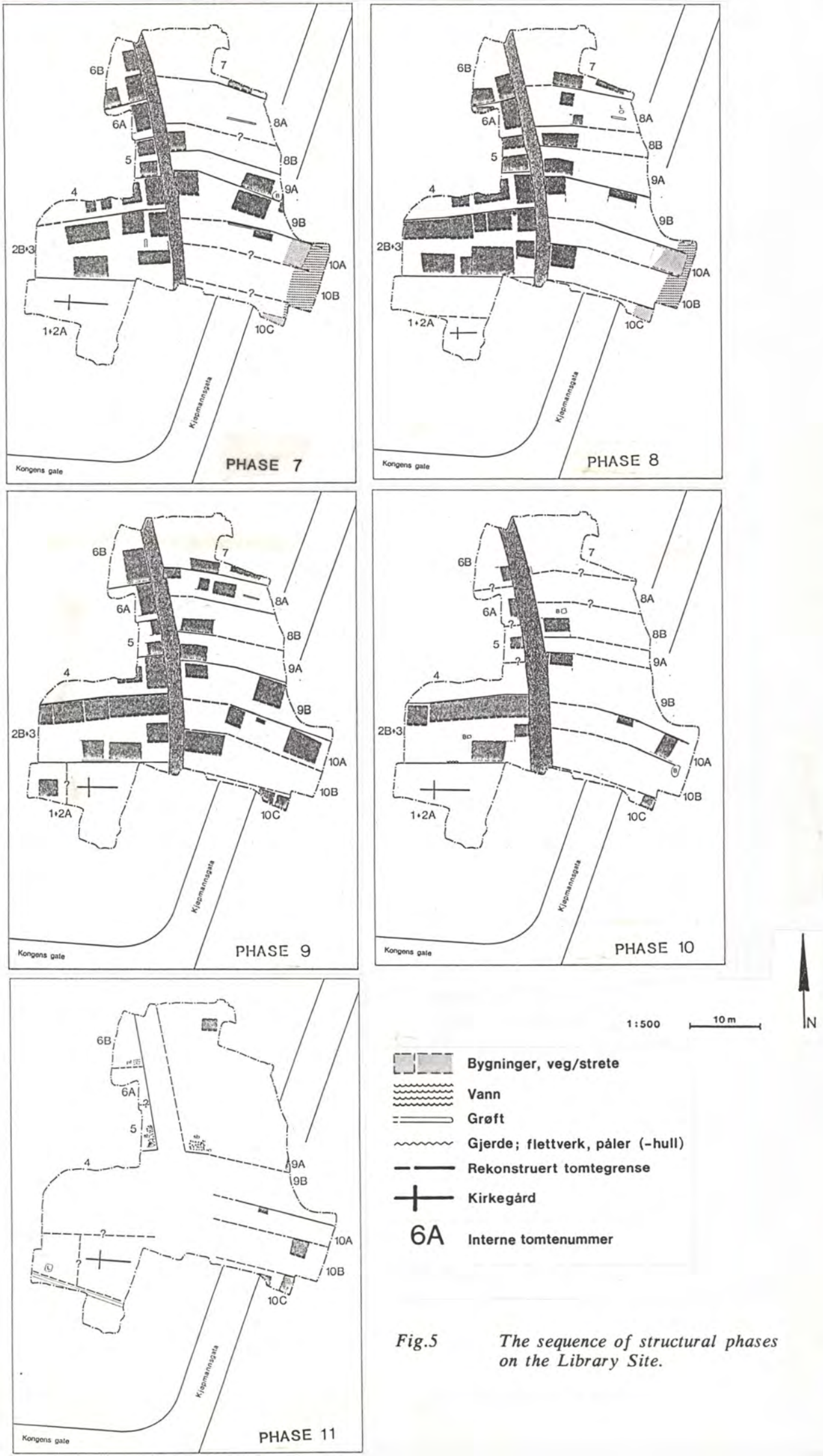


Fig.5 *The sequence of structural phases on the Library Site.*

Layer	FT3	FT10	FT29	FT50	FT74	FT77	FT78	FT108	FU133	FU137	FU140	FU145	FU152	FU184
Bone kg	1,46		1,24	,24	48,30	6,58	14,89	2,84	17,81	4,58	19,08		8,48	6,85
Vessel 51860			20,32		30,47	45,18							4,04	
52823					78,96		2,67	18,37						
54105						67,90								32,10
57855									30,03		69,97			
53257	15,22	11,62		22,53	16,73	33,89								
57853									22,59			77,41		
52544					25,77				42,11	32,12				
51861			58,81		41,19									

1a

Layer	FA308	FA309	FA316	FA335	FA342	FA343	FA353	FA358	FA371	FA373	FA377	FA381	FA423	FA429	FA432
Vessel 23334	9,36				11,77			44,47	8,54						25,86
21387		95,95					4,05								
23198			62,01			9,44	28,55								
34354				2,85						57,76	8,71	20,04	9,32	1,33	
34352						11,21		75,09	13,70						

1b

Table 1 *Proportional distribution of sherds by percentage of weight of a number of vessels found on sites FA, FT + FU*

As no rubbish pits have been found on this property the refuse must, therefore, have been dumped on the ground surface to form a heap, which would undoubtably smell and attract flies, vermin and dogs. It seems highly likely that the temporary storage of small quantities of refuse could take place, but because of the nuisance factors it seems highly unlikely that the long-term storage of large quantities of refuse would take place on the properties in such an important area of the town. This leaves us with the possibility that refuse was carted-in from elsewhere to raise the ground surface, or to level up the area prior to a new phase of building. In both cases one would find similar patterns of sherd distribution. In the first instance, however, one would expect to find sherds conjoining to form substantially complete vessels, something which is comparatively rare in this assemblage. This leaves us with the second alternative. The true situation, however, probably lies in a combination of the two.

Having said this, there are in the study area in main phases 7 and 8 cases of dispersed sherds conjoining to form substantial parts of vessels, fig.8 and table 1b. These occur on site FA towards the street and must indicate that refuse was temporarily stored, during these phases, on this part of the property. Although these vessels occur in both phases 7 and 8 it seems, from the nature of the finds, that this represents refuse dumped here, probably only for a short time, at the end of phase 7 and levelled prior to the rebuilding in phase 8.

In addition to what has been mentioned above, there are several cases of substantially complete vessels on site FF (property 5) in main phase 9. As with site FA this material is dumped close to the street-frontage and suggests that for a short length of time this area was used as a rubbish dump. Other case of substantially complete vessels do occur elsewhere on the site, e.g. N36669, N25223 and N18933, but these are all partly or wholly secondarily burnt and must be considered as *de facto* refuse.

To what extent the case study is representative for the whole site is difficult to ascertain, owing to the fact that it is only here that we have excavated an almost complete property. If, however, we look at the waterfront area (the eastern part of area FY) of the site, the construction of these waterfronts usually required the dumping of large quantities of soil as infilling behind the revetments. This infilling may include material from local rubbish dumps, but could also include material brought in from some distance. If the material was collected locally from rubbish dumps on individual properties, then one would expect substantially complete vessels to be found. If it was brought in from elsewhere (possibly a communal rubbish dump) then the chances of finding substantially complete vessels would decrease considerably. On this site there is very little pottery from the waterfront area: there are no more than 5 cases of conjoining sherds, involving in each case no more than 2 or 3 sherds. This suggests that the material is redeposited, probably having been brought in from some distance from the site.

The composition of the pottery finds from the dump layers in the waterfront and the compostion of the pottery finds from phase 8 in the study area are very similar. This similarity seems to strengthen the argument in favour of the layers in the study area having been brought in from outside the site.

b) **Widespread dispersal**. The wide dispersal of sherds from the same vessel is not as rare as might be imagined (Moorhouse 1986, p.88-100). Several instances of widespread dispersal occur in main phases 8 and 9 and are shown in figs.9 and 10a. Of these, fig.9, shows sherds found in property 6B to the west of the street conjoining with sherds found at the east end of the central passage in property 8A, representing a distance of some 25m. The sherds from 6B were found in layers containing a considerable amount of bone waste from comb-making. There was a similar concentration of comb-making waste on property 8A (Flodin 1989, p.56-57). The spread of these sherds suggests that material was needed for levelling up the area to the east or for infilling in connection with work in the area along the river frontage, and that it was carted or carried along the passage.

There are also several instances of sherds cross-fitting between property 2B + 3 on the north side of the churchyard and contexts within the churchyard i.e. N57809, N84282 and N86815, fig.10a. The size of the sherds in N84282 would seem to indicate that the material was dumped in the churchyard almost immediately after being discarded as it had not been subjected to secondary fragmentation. These should also be seen in relationship to the spread of sherds from N88288, fig.10b. The distribution of these sherds would seem to indicate that domestic refuse from this property has been dumped along the churchyard boundary and has later been levelled off and spread about.

It is noticeable that the carting-in and movement around the site of refuse, as indicated by the dispersal of conjoining sherds in this case study, appears to be confined to the period from main phase 8. It is, however, quite clear from the character of the pottery found in the earlier phases (vessels are mainly represented by single sherds) that there must have been a removal of refuse from the excavated area already from the earliest occupation of the site. This may have been used as infilling in the inlet to the south and west of the site (Christophersen 1989, p.34-37), although excavations there (Søndre gate) in 1971 did not reveal any significant quantities of pottery, and that which was found was largely in the form of single sherds.

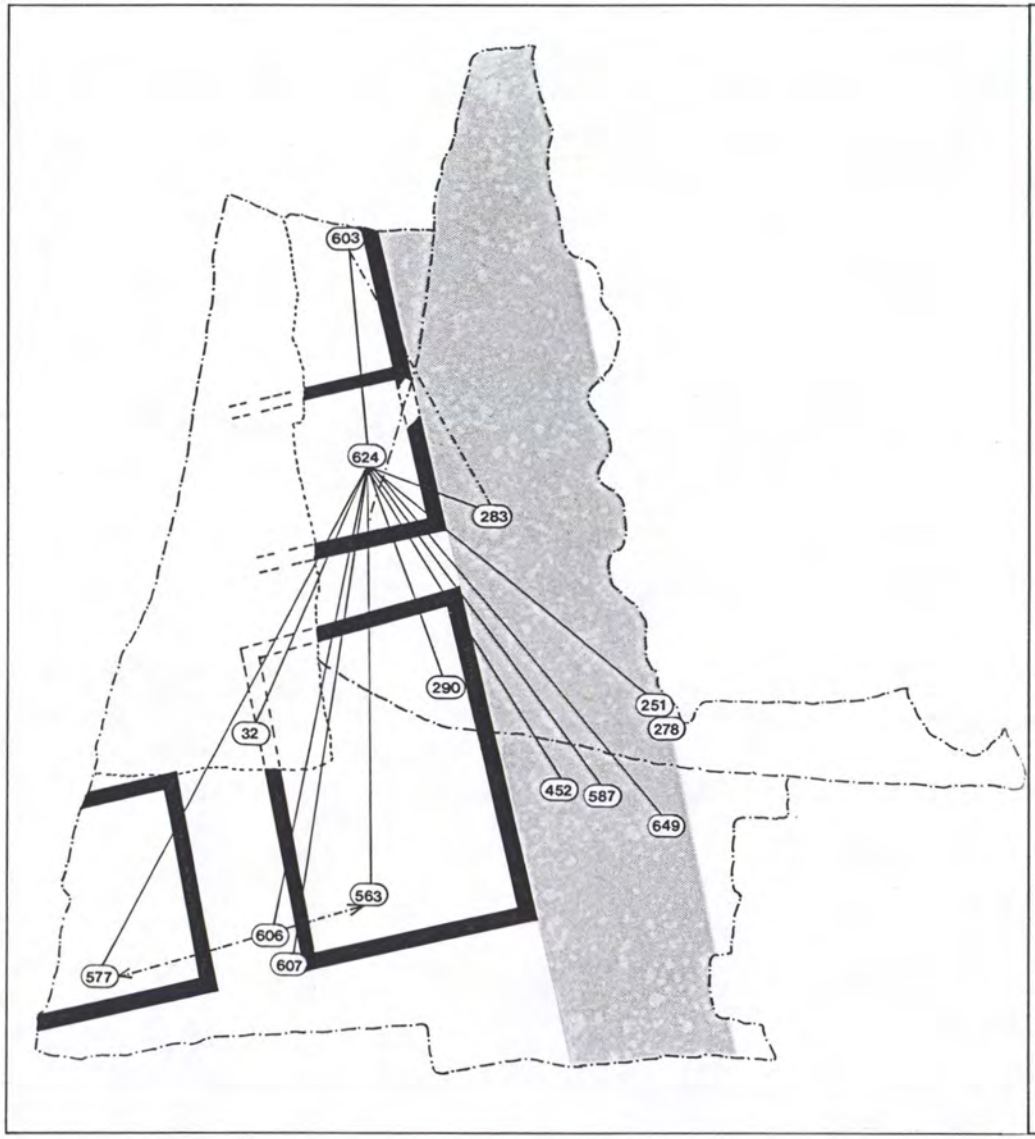


Fig.6a *The horizontal distribution of sherds from vessel N78048 within property 6B in main phase 7. Scale 1:200.*

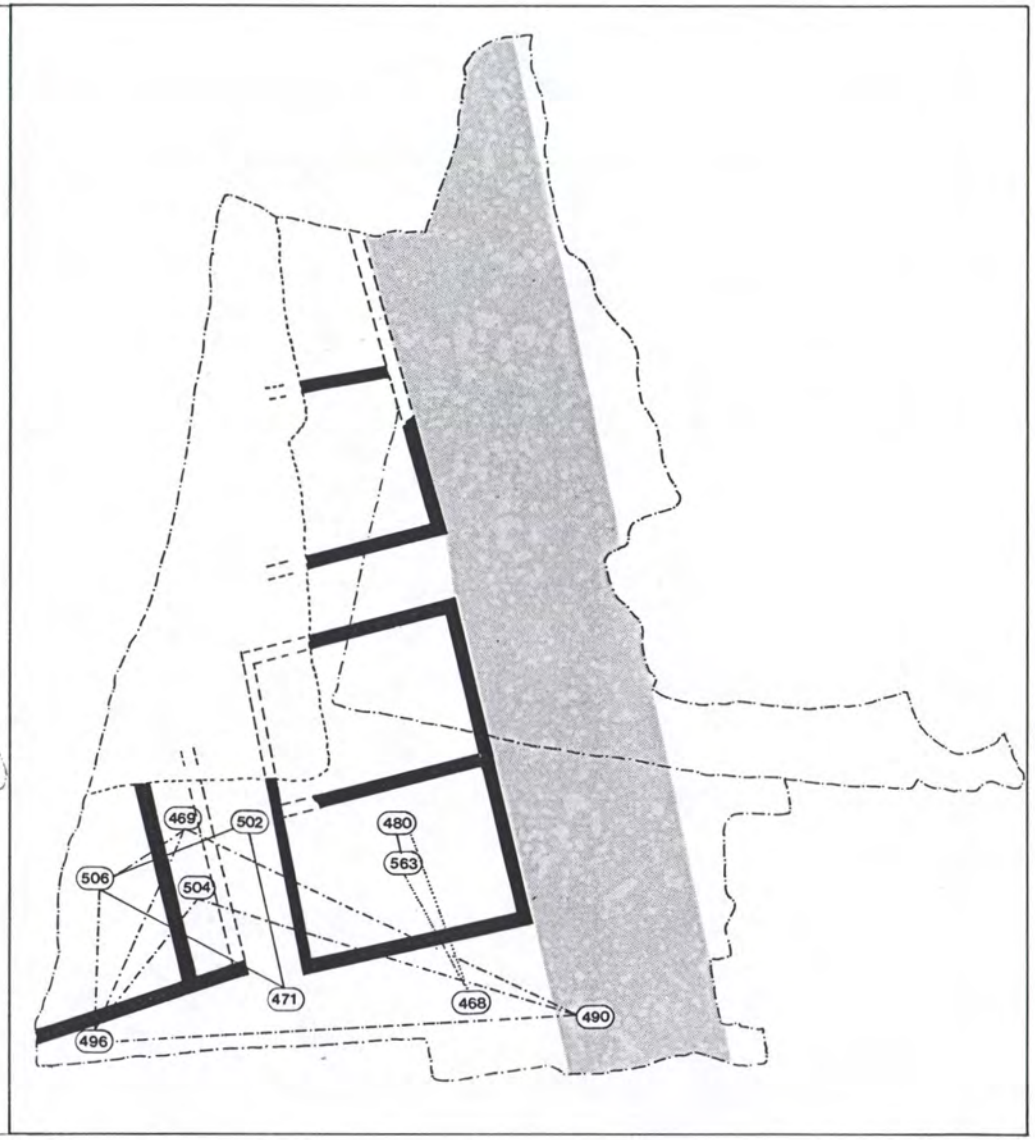


Fig.6b *The patterns of horizontal dispersal of sherds from 3 vessels within property 6B in main phase 7. Scale 1:200.*

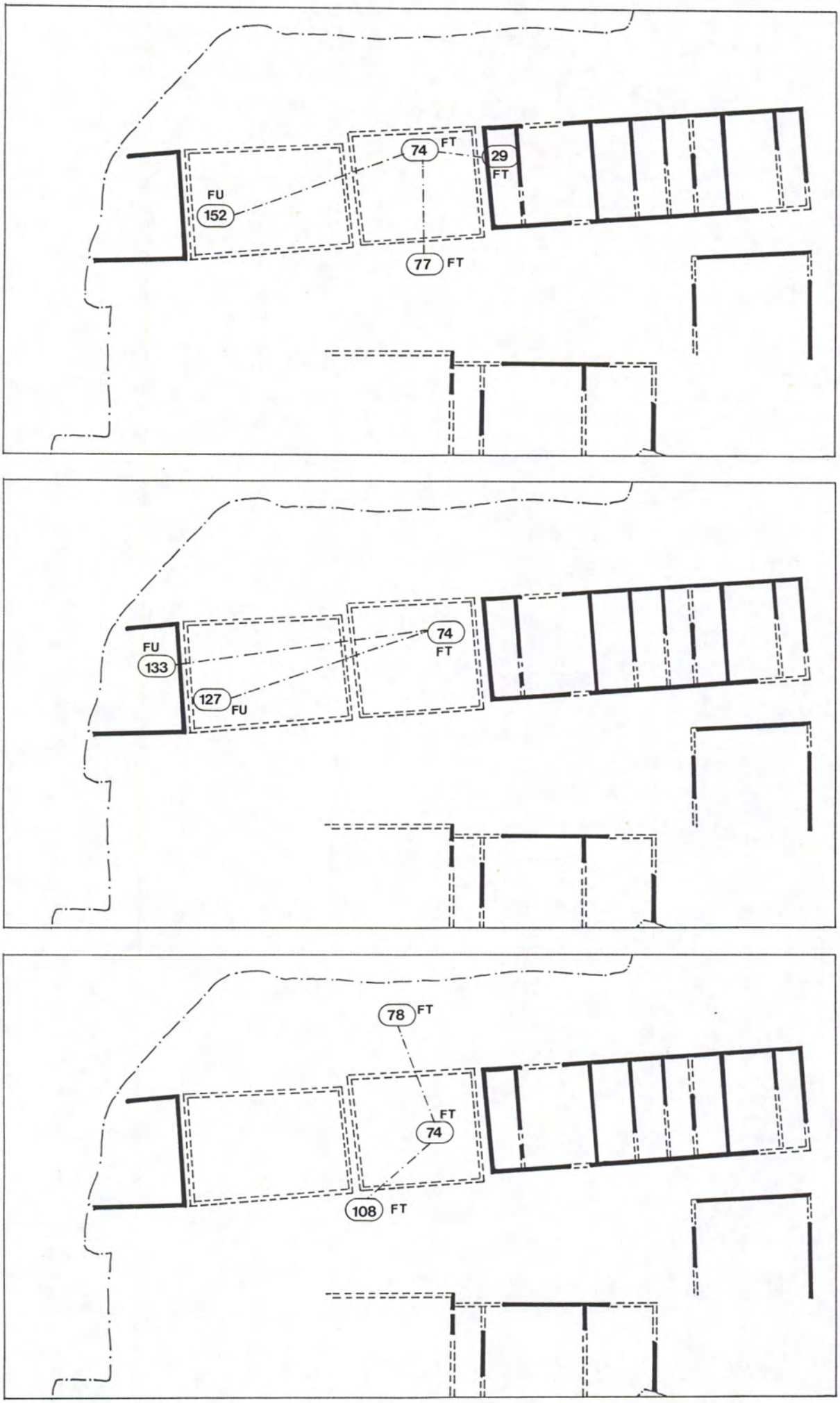


Fig.7 *The horizontal distribution of sherds from 3 vessels found on sites FT and FU. Scale 1:200.*

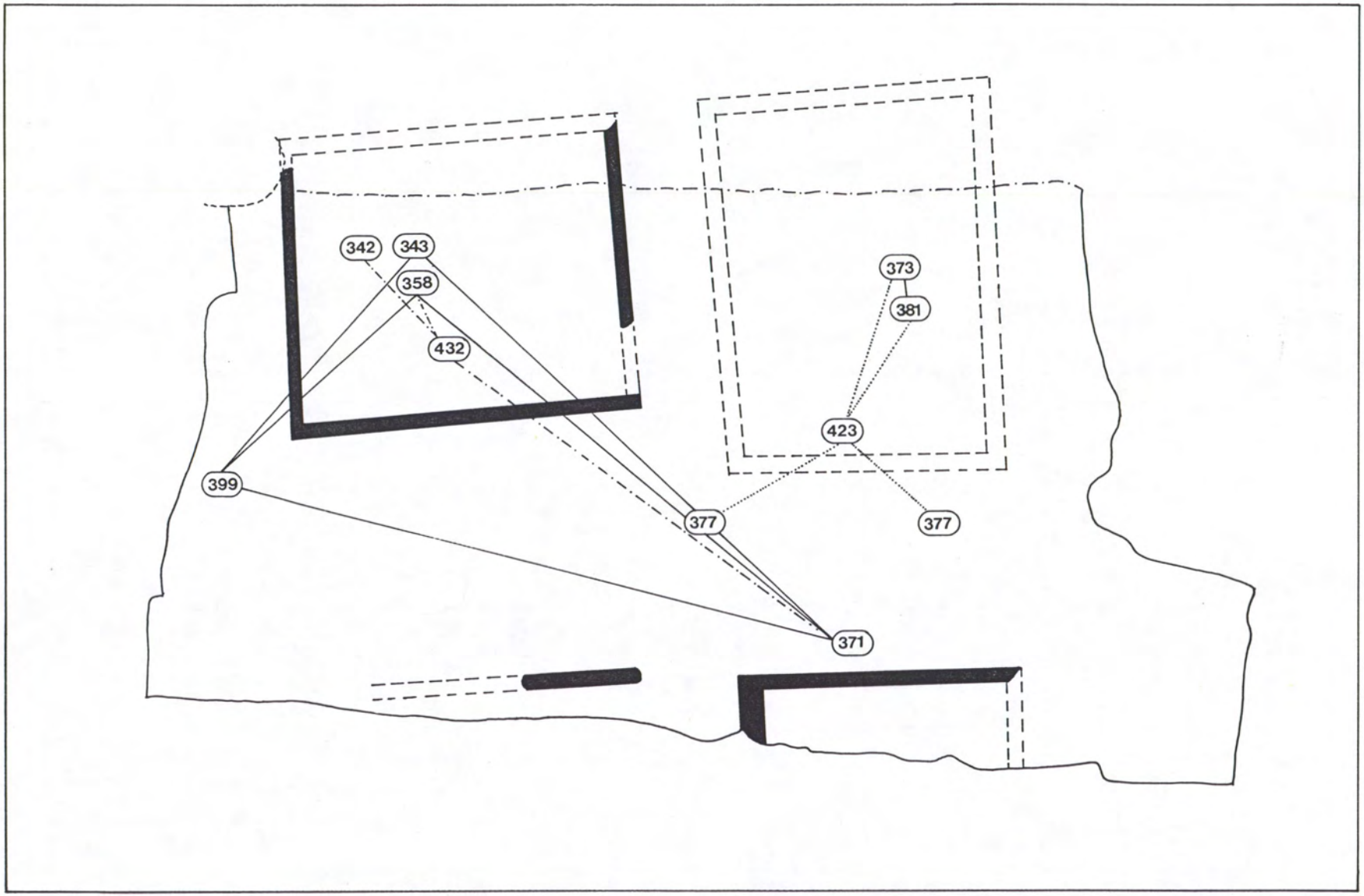


Fig.8 *The dispersal of sherds from 3 vessels found on site FA. Their proportional distribution by weight is shown in table 1b. Scale 1:100.*

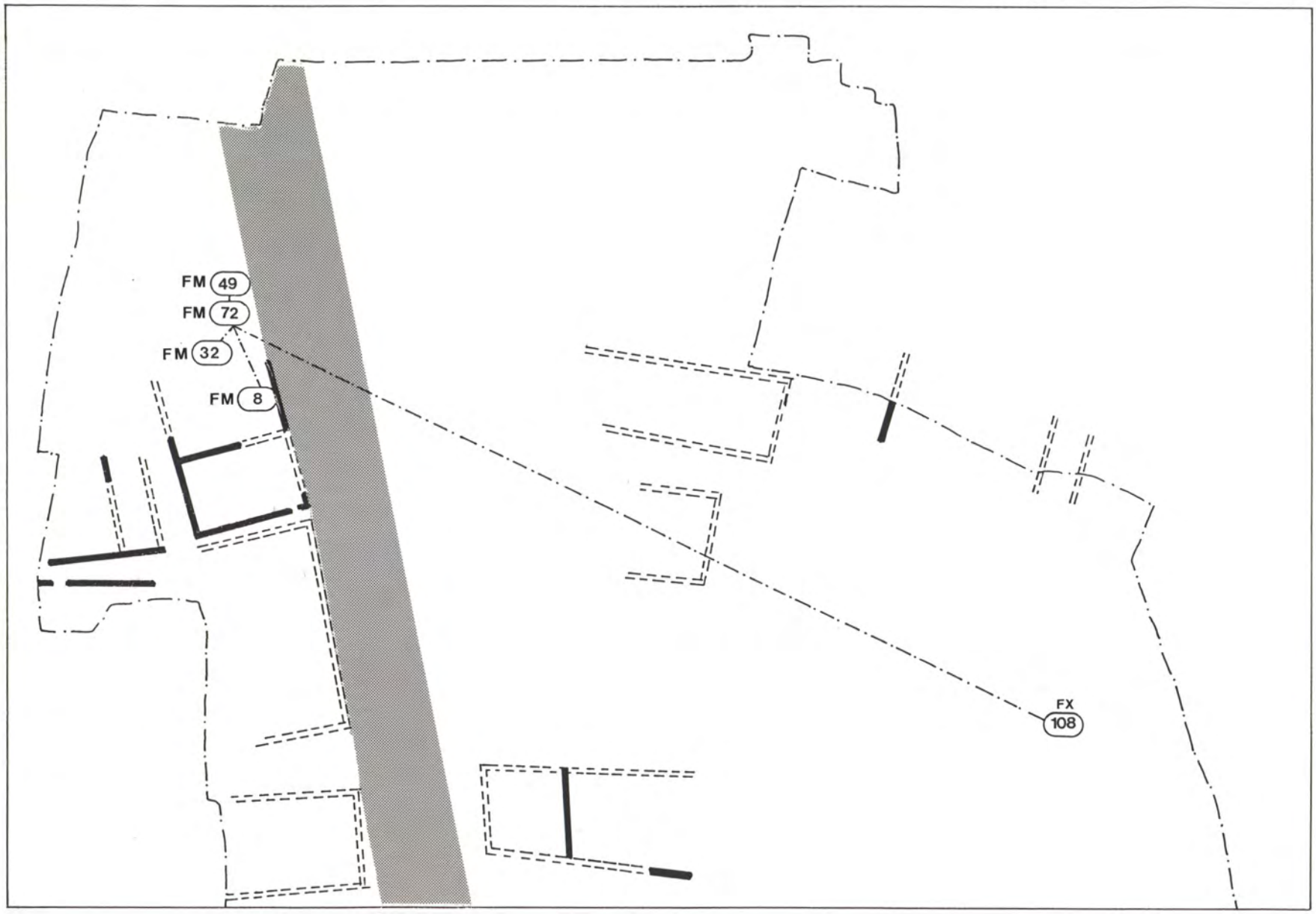


Fig.9 *The widespread dispersal of sherds from vessel N52781. Scale 1:200.*

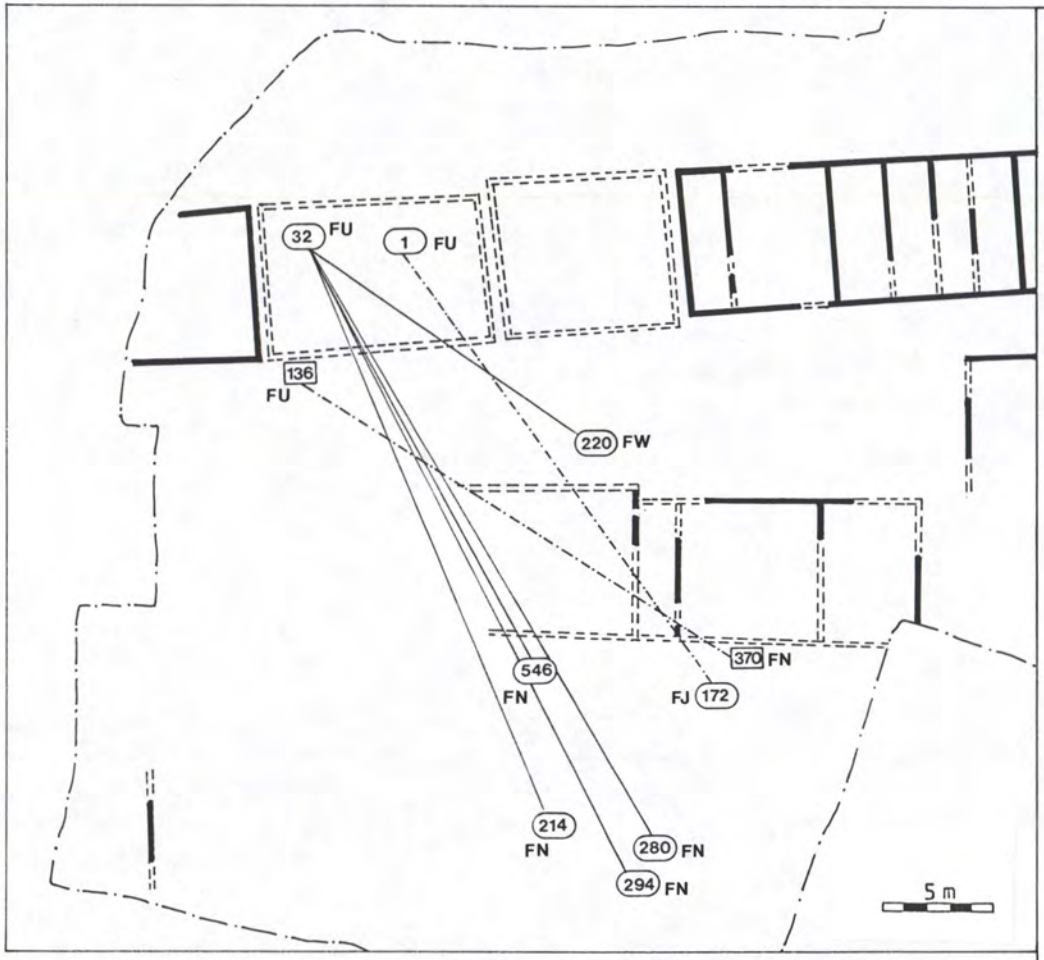


Fig.10a *The widespread dispersal of sherds from 3 vessels found in property 2B+3 adjacent to the churchyard.*

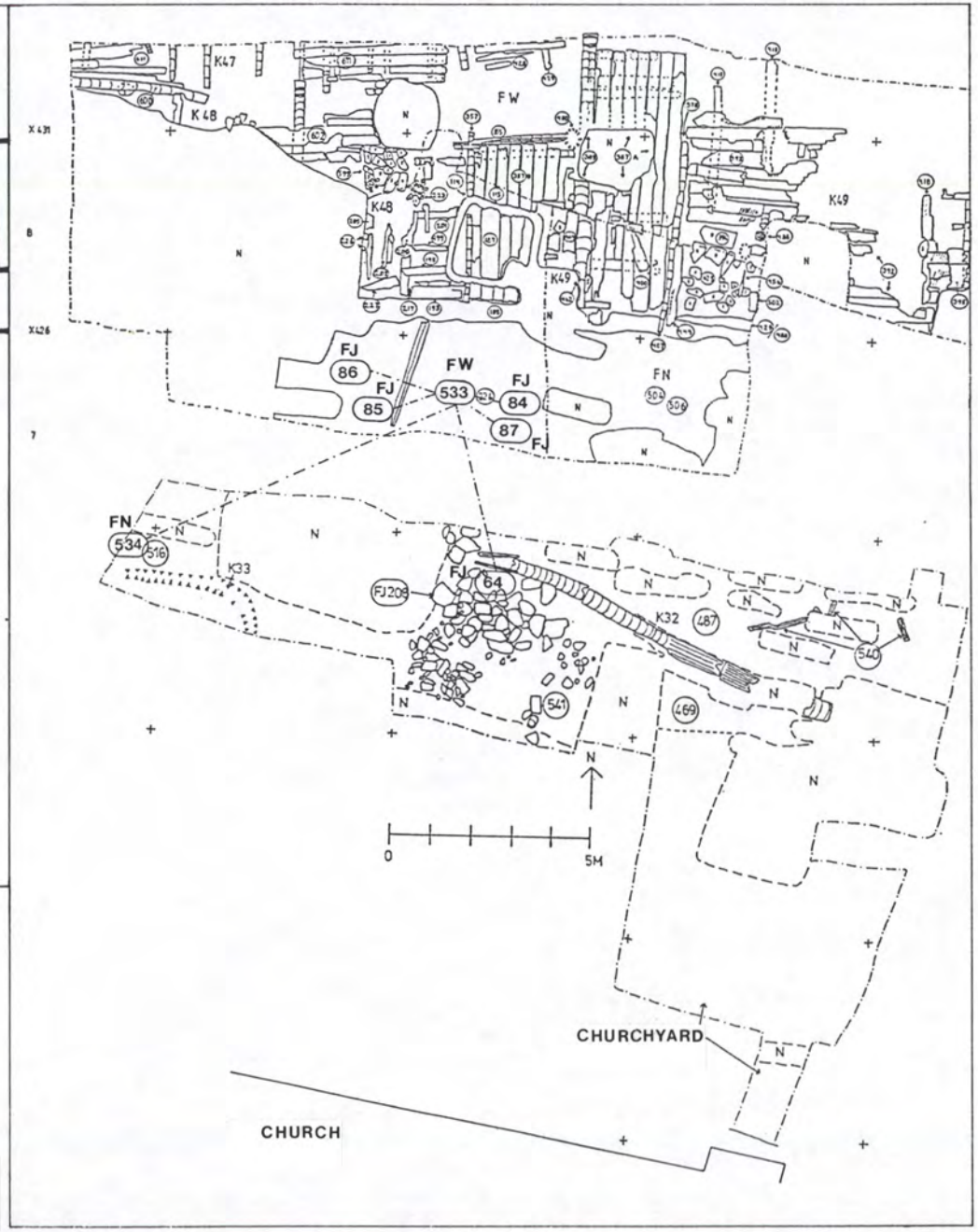


Fig.10b *The dispersal of sherds from vessel N88288 within the churchyard.*

Although it is dangerous to generalise on the basis of the situation on one particular property, the fact that a similar pattern of movement of refuse occurs in the northern part of the site (see above) suggests that this was a fairly common occurrence. Consequently this should validate any conclusions based on the situation in the case study of property 2B + 3.

Vertical distribution of sherds from the same vessel.

Of the total of 7517 medieval vessel equivalents, 2216 (c.29.5%) are represented by 2 or more sherds. Of these 531 (c.24%) have definite cross-fits and a further 177 (c.8%) have probable cross-fits (there are no joins). Of the 531 vessel equivalents with definite cross-fits, 199 (c.37.5%) cross-fit over two or more phases, involving a total of 1687 sherds. This represents approximately 14% of the assemblage of medieval sherds (2.7% of the assemblage of medieval vessels).

Fig.11 shows a diagramatic presentation of some of these cross-fits, the method employed was developed in Southampton by Duncan Brown (1985, p.35-42). The accession numbers of the vessels are arranged at the top, while the main phases form the vertical axis, the earliest at the bottom. The total sherd weight for each vessel is shown along the bottom. The percentage of these totals for each vessel in any phase is represented as a horizontal line, the width of the line indicates the amount. The wider the line, the higher the percentage. The horizontal lines are joined up to make the pattern of the cross-fit distribution more obvious. Breaks in the vertical flow occur where sherds of a vessels are not present in an intervening phase.

Phase	**Vessels**	**Sherds**	**% vessel**	**% sherd**
11-12	30	115	15.07	6.80
10	29	150	14.57	8.87
09	51	486	25.63	28.74
08	43	476	21.61	28.15
07	27	245	13.57	14.49
06	19	190	8.04	11.24
05	2	27	1.01	1.60
03	1	2	0.50	0.12

Table 2. F-site, the distibution of cross-fits per phase and their percentual distribution.

If we look at the distribution of cross-fits within the main phases, table 2, we can see that there are marked increases already between phases 5 and 6 and again between phases 7 and 8, there is also a slight increase between phases 6 and 7. These increases in the number of cross-fits should be seen in relation to the increases in building activity within the area. During phase 6 large rectangular buildings raised up from the ground on massive posts are built along both sides of the street. Again during phase 7 the buildings along the street are replaced. During phases 8 and 9 there is a marked intensification of the built-up area within each property (Christophersen 1988, p.78-79).

Table 2 shows the phase from which the cross-fits are believed to originate, their numbers in each phase and their percentual distribution. A number of questions arise from these figures, amongst others, when were the sherds disturbed? Was it during the phase following the vessel's disposal, did it occur later or have the sherds been disturbed a number of times? As an extension of this we must also question the stratigraphic relationship of the contexts in which the pottery was found. Have they been correctly attributed to a phase? It is quite clear that on certain parts of this site

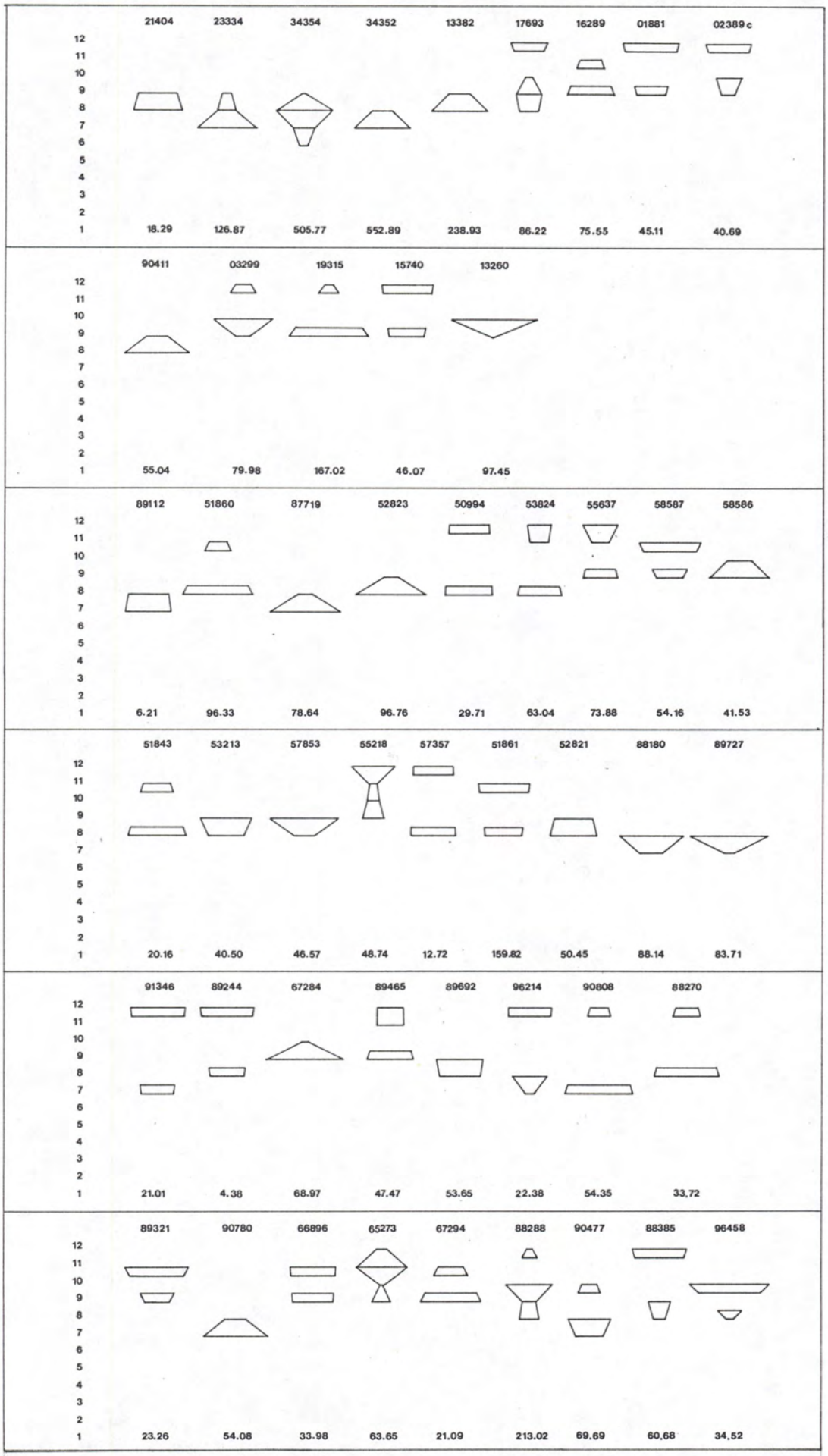


Fig.11 *A diagrammatic presentation of cross-fits from areas FA, FC, FT, FU and FW.*

the stratigraphy has not been clear cut. This is particularly apparent in the north-eastern part of the site, particularly area FX (Nordeide 1988, p.51-57). As a result of this there are a number of cross-fitting sherds of late 13th century Grimston ware in phases 5 and 6, both 12th century phases.

These figures must also be seen in relationship to the currency of pottery on the site, appendix 1. It is obvious that the more pottery is used on the site, the greater the chance of more cross-fits. From phase 6 to 7 there is more than a doubling of the number of vessels in use (from 339 to 794), while from phase 7 to 8 there is a trebling of the number of vessels in use (794 to 2323). It is obvious that the greater the amount of pottery that is in use, the greater is the chance of pieces being disturbed by building activity. However, they do illustrate clearly the way in which building activity can result in the transportation of material from its original context to other later contexts.

Conclusion

This site, as with most urban sites, has produced a prodigious array of material, whose interpretation is fraught with difficulties. The intensive occupation of this site means that earlier levels and deposits were constantly being disturbed by fresh building activity, resulting in the presence of residual pottery in most of the phases; approximately 14% of the medieval pottery sherds in this assemblage have been affected in this way.

The problem is further compounded by rubbish being introducted on to the site for infilling in the waterfront area or for the levelling/raising of the ground surface. This material may originate from a communal rubbish dump or from the digging of pits or cellars on an adjacent property. In terms of the pottery, this can result *inter alia* in the introduction of totally archaic pottery types on to a site with no occupation from that particular period. These problems are, however, not only restricted to the pottery, they also apply to other material, whose residuality cannot be so easily determined. Take, for example, the large quantities of animal bones found amongst the domestic waste. These are mainly discussed in relation to the phasing of the site, with deductions drawn from the varying percentages in each phase (Lie 1989). What effect has residuality on our understanding of the range and types of species present in medieval Trondheim?

If groups of finds from urban excavations continue to be published as excavated, and, more importantly, material found together be assumed to be of the same date without any critical assessment of its validity, then the problems of applying realistic dates to, for example, pottery chronologies will only grow. Furthermore, failure to recognise earlier material in later groups will almost certainly distort our picture of what has taken place on a site.

3. POTTERY TYPES

3.1 Classification of the material

The traditional method of classifying pottery in Scandinavia is based primarily on firing and the absence or presence of glaze. Products from different kilns are thus counted in the same group, while pottery from the same kiln may be counted in different groups. This method was devised by Selling (for principles see Selling 1976, p.IX) and has been used or adapted by other authors (Carlsson 1982, p.5 & Molaug 1977, p.74). Many techniques are available for the scientific analysis of pottery (Blake & Davey 1983, p.13-19). These include some which help to characterise the raw materials from which the pots were made, e.g. the petrological examination of thin-sections, and can thus enable an identification and characterisation of the kiln source. Methods such as this are time-consuming, relatively expensive and demand the availability of reference material from the production sites. This assemblage has, therefore, been divided, on the basis of a macroscopic examination, into pottery types consisting of groups of vessels which have fabric and other characteristics in common, which may or may not be contemporary in date and which may have been made at one or more kiln sites.

Wherever possible the pottery types have been given a topographical name, refering to the pottery produced or found in quantity in that particular place or area. When this has not been possible a pottery type has been named according to its fabric characteristics, i.e. *sandy orangeware* or *green-glazed reduced ware*. The terminology used follows the guidelines laid down by the Medieval Pottery Research Group (Blake & Davey 1983, p.39-40). Thus all sherds grouped under *Pingsdorf-type ware* are characterised by particular features, but need not actually have been made at Pingsdorf.

The unidentified group contains unidentifiable sherds, such as fire-damaged material, whilst groups such as unidentified redwares contain unprovenanced sherds.

During the computerised data-processing of this material it was necessary to give each pottery type a code, and a list of these codes and their expansions is given in Appendix 2.

The different wares are described in more or less chronological order within the individual countries.

3.2 Pottery types

3.2.1 English wares

1. Stamford ware

These wares derive from Stamford, Lincolnshire, where a number of kilns dating from the mid-9th to the first half of the 13th century have been excavated (Kilmurry 1980, p.30f). The wares produced show great diversity through almost four hundred years of manufacture but form two main groups: undeveloped Stamford ware and developed Stamford ware, the latter occuring during the second half of the 12th and first half of the 13th centuries.

Eight fabric types have been distinguished amongst the Stamford wares (Kilmurry 1980, p.58-59) and six glaze types. The majority of the sherds represented here resemble Kilmurry's fabric B, which is very fine and virtually always oxidised to a pale cream or whitish colour. One sherd appears to be of fabric E, which is moderately sandy and usually medium grey to buff in colour. Two glaze types occur, these are Kilmurry's glaze types 1 and 3. Glaze 1 is fairly thin, clear and glossy,

ranging in colour from light yellow to pale green. Glaze 3 is bright green due to the addition of copper filings, but may be speckled green and black where these are not mixed properly.

Of the wide variety of vessel types produced at Stamford (Kilmurry 1980, p.13-20) only four types were found on this site: the spouted pitcher (Kilmurry type 5), and jug forms (Kilmurry type 6) which began to replace the spouted pitchers in the mid-12th century, including at least one example of a tubular spouted pitcher (Kilmurry type 24). A number of the jug sherds are decorated with thumbed and combed applied strips. More unusual is the neck of a bottle (Kilmurry type 18).

2. London-type ware

It is thought that these wares were produced in the London area, probably close to the City, but it is not certain whether this was inside or outside the wall (Pearce *et al* 1985, p.5-6). The fabric is harsh and sandy, and is either oxidized to a light orange-red or reduced to light grey. The clear lead glaze has copper filings added and appears as orange-yellow with green flecks on the oxidized fabric, or mottled green on the reduced fabric. The glaze is normally splashed and pitted.

These wares were first made in the London area in the mid-12th century; they have a peak of popularity in the middle of the 13th century but are virtually absent from finds contexts in London by the middle of the 14th century (Pearce *et al* 1985, p.13-21). On this site they are found in late 12th century and early 13th century contexts.

Vessel types found in this assemblage include jugs, mainly of the early rounded or early baluster types, and cooking-pots.

3. Splashed ware

This is a loose generic term covering a variety of related fabrics sharing a distinctive pitted glaze which forms spots where carelessly applied. The fabric, which may be fine, sandy or gritted, is generally red or reddish-brown, but is sometimes reduced to mid or dark grey. The glaze colours are yellowish or reddish-brown through to olive and rich green. There are clearly a number of production centres in the East Midlands and Yorkshire (Brooks 1987, p.150-151), the best-known being Nottingham (Gilmour 1988, p.145). These wares are currently thought to begin in the early 11th century and to end by the middle of the 13th century.

4. Shelly ware

These wares occur over a large area of eastern England, from the London area to Yorkshire, and range in date from the 9th to the 14th century. On this site they occur in contexts from the 11th to the 13th century. A macroscopic examination of the material by L. Blackmore suggests that the bulk of the material is of the London shelly-sandy type, with some sherds which are probably from the East Midlands (Blackmore and Vince forthcoming).

The fabric is soft and sandy, heavily tempered with shell and reduced to a dark grey, often with the surfaces oxidized to light brown; the shell is normally leached out.

5. Scarborough ware

A number of pottery kilns have been excavated within the town walls of Scarborough, which is situated on the east coast of Yorkshire. Two main fabric types have been distinguished (Farmer 1979, p.28), both of which are represented here. Type I fabric appears to date from the mid-12th century to c.1225 and is a soft, sandy pinkish-red, occasionally gritty. The type II fabric is hard and smooth with a colour range from near white to a uniform grey. Small red inclusions are common, and black specks of coal are almost universal. Type II fabrics belong to the

period c.1225 - 1350 when the industry was in decline, although type I fabrics continue to be used for decorative elements on some type II vessels. The glazes vary from numerous shades of green to brown and yellow.

Of the wide variety of vessel types produced at Scarborough it is mainly jugs that are represented in this assemblage. Scarborough ware jugs are almost invariably decorated, types ranging from the simplest applied pellets and scales to the highly decorated 'knight jugs'. Other vessel types found include aquamaniles and pipkins.

6. Yorkshire wares

By the mid-13th century about 6% of the pottery in the assemblage comes from this area. Although some wares are believed to come from a kiln in or near the city of York (Holdsworth 1978, p.12), possible sources for other types have been located elsewhere in Yorkshire, notably the kilns at Brandsby (see 7 below) and at Winksley (Bellamy and Le Patourel 1970).

The various wares in this group all have a light fabric tempered with quartz grits which may be dense but are generally small and angular. The fabric colour is generally white, light grey, pink or even very pale brown, but is sometimes dark grey. The glaze is normally light green with flecks, medium green or dark green but can be yellow, often combined with decoration in contrasting brown. The characteristic products are jugs, often highly decorated.

These wares occur from the late 12th century and flourish during the first half of the 13th century, but are in decline during the second half (Brooks 1987, p.152).

7. Brandsby-type ware

A production centre for this ware is known at Brandsby, North Yorkshire (Le Patourel 1972), but there is reason to believe that there may be other kilns in the same area producing similar pottery (Brooks 1987, p.153-154).

Brandsby-type ware is a lightly gritted fabric, generally oxidised to white, but can be reddish-yellow and may have a grey core and internal surface; external unglazed surfaces are often reddish-yellow. Glazes are usually apple green or dark green with copper speckles, but can occasionally be olive-green. Forms include various types of jug and, less commonly, cooking-pots and bowls. Decoration is usually in the form of rouletting, wavy combing and horizontal grooves on the neck an shoulders of the jugs.

The date range of Brandsby-type ware is thought to be c.1250-1350, but it probably continued in use to the end of the 14th century.

8. Hallgate-type ware

These wares were made at kilns found in Hallgate, Doncaster, Yorkshire (Buckland *et al* 1979). Three fabric types were produced, of these only one similar to Hallgate 'B' wares has been identified here.

Hallgate 'B' is a white gritty fabric, often with a buff surface and can occasionally have a light grey core. The glaze can vary from olive green to yellow. Forms produced were mainly jugs but also cooking pots, bowls and pipkins were made. The jugs are often decorated with notched strips, combing and rouletting. It dates from late 12th century.

9. Beverley-type ware

These wares were produced in the eastern part of Beverley from the 12th to the 14th century (Didsbury & Watkins 1990, p.50). The vessels found on this site are in fabric type 2B which contains abundant fine sand tempering, and displays a variety of

surface and core colours. Reduction is a common occurrence, but it is usually oxidised to a light red. The glaze varies from an olive brown to a dark copper green, or olive with dark green copper speckles. This ware was from its outset a highly decorated ware with, amongst other things, applied scale decoration and face-masks. Jugs and pipkins appear to be the most common Beverley ware forms.

Beverley type 2B is present on excavations in Beverley from the late 12th/ early 13th century to the late 13th century.

10. Grimston-type ware

These wares were produced at Pott Row, Grimston, 8km east of Kings Lynn, Norfolk. They form the largest single group of vessels from any source.

The fabric is usually a reduced, sandy grey which varies little throughout the period of production (Clark and Carter 1977, p.200). The main indicators of date are, therefore, shape and decoration: slender narrow-bodied jugs are more typical of the 13th to mid-14th century, while globular jugs with wide, multi-ridged strap handles (N18929) are found during the late 14th and 15th centuries. The glaze is a reduced iron-green; it is often lustrous, the 'depth' of green varying with the greyness of the body. The amount of glazing over the body is variable. The earlier vessels are usually glazed over the top two-thirds of the exterior only, the unglazed areas having either a lighter grey surface, or one which is partly oxidized to a patchy orange to reddish-brown. The later vessels tend to be more extensively covered.

Many of the 13th and 14th century jugs are decorated. A variety of techniques were employed, including applied strips, arcades, spots and scales of iron-enriched clay. One of the most distinctive vessel types is the tall slender jug with a face on either side between the bridge spout and the handle (N27239).

The date range for these wares runs from the late 12th to the 16th century, with the highly decorated jugs dating from the mid-13th to the mid-14th century.

11. Scottish East Coast white gritty ware

This is a hard off-white to pale brown quartz gritted fabric produced in three areas: Fife, Lothian and Tweeddale (Haggerty 1984, p.396). Cooking pots predominate, but jugs do occur. The most common form is the straight-sided cooking pot, the rim is slightly everted and the body cylindrical. On the basis of the available evidence in seems that this pottery was produced from the second or third quarter of the 12th century. There is little evidence as yet to indicate when production ceased, but it may be in the early 14th century.

12. Lincoln-type 1 ware

No kilns producing this ware have been found, but their concentration in and around the city of Lincoln suggests that they were produced there.

The fabric of the Lincoln-type 1 vessels found on this site is similar to that termed as Lincoln ware (Adams 1977, p.45). The fabric is generally a hard sandy grey with light orange-tan to red-brown interior surface, and off-white to light grey outer margin. The glaze varies from olive green to dark green and may be mottled or brown-stained.

The vessels produced are mainly jugs, but pipkins and other vessels do occur. The jugs appear to develop during the late 12th century and are current until the 14th century.

13. Lincoln-type 2 ware (gritty orangeware)

This is a small group with a characteristic hard orange-red fabric with occasional buff internal surfaces, tempered with abundant sub-angular quartz and large red (hematite) inclusions. The glaze is olive green to brown and is mottled with copper additives. The vessel type represented here would appear to be jugs some of which are decorated with curved applied strips.

This fabric is comparable to material produced in Lincoln in the 14th century (J.Young pers. comm.).

14. Toynton All Saints ware

Three pottery kilns have been excavated at Toynton All Saints, c.20km north of Boston, Lincolnshire (Healey 1984).

The fabric is hard-fired and sand-tempered, the colour ranging from orange when oxidised but can be reduced grey with orange surfaces. External surfaces where unglazed are often covered with a thin buff to pale pink slip. The glaze is olive green and is only applied to the upper part of the vessels. A wide range of vessels were produced, the highest proportion of these being jugs. The jugs are usually decorated with brown slip pellets, scrolls and applied strips.

This ware was produced during the late 13th century and early 14th century.

15. Green-glazed reduced ware

This small group has a fabric which varies from a fine to gritty dark grey or black with an orange to brown inner suface and a light grey outer margin, and orange-red unglazed outer surface. The glaze is olive green. Vessels represented are jugs and a pipkin. The jugs are decorated with complex patterns of applied strips, possibly representing foliage. The source of this ware has not yet been identified.

16. Lyveden/Stanion ware

This ware was produced at two adjacent villages, Lyveden and Stanion, in Northamptonshire. Four fabric types have been identified from this source (Pearson, forthcoming), of which only the phase II fabric has been identified here.

The pottery is hand-made, coiled and finished on a wheel or turntable. The fabric is well-fired and is tempered with both crushed shell and limestone. It is usually reduced to a dark grey or light blue-grey with the surfaces oxidised to a brown colour. The glaze is a dirty dark green. The jugs are often decorated with applied strips.

This fabric is dated from the early 13th century to c.1300 (P. Blinkhorn, pers. comm.).

17. Black iron-glazed wares

These wares were common to most of England from the 16th century and continued in use throughout the 17th and 18th centuries. They were produced from the iron-rich clays of the Coal Measures. The fabric varies considerably but is usually hard red to dark purplish-red and can be streaked white. The glaze varies from dark brown to black. Production centres are known at Buckley, Clwyd (Amery & Davey 1979) and Burslem, Staffordshire (Kelly 1968), but these wares were probably made at a great many more sites on the Coal Measures (Barker 1986, p.59). Most of the sherds found in this assemblage appear to be fragments of large storage vessels (cf. Amery & Davey 1979, p.70 fig.10.97).

18. North Devon gravel-tempered ware

These wares are known to have been produced at a number of centres in Devon including Bideford and Fremington (Williams 1979, p.32). The fabric is usually oxidised pink on external and unglazed surfaces; internal and glazed surfaces are reduced grey. It is heavily quartz-gritted with large grits up to 2.0mm. The internal surfaces have a clear lead glaze which takes the colour of the underlying body, usually orange but is often dark green on the reduced surfaces. The sherds found here (N1134) represent large storage vessels (cf. Evans 1979, p.22 fig.3.51) and a slip decorated plate (N24913).

These wares were produced from the 16th to the 19th century and during the late 17th and 18th centuries were exported in large numbers around the Irish Sea and across the Atlantic to America.

19. Staffordshire-type slipwares

These wares were made predominantly in Staffordshire, in the vicinity of Burslem (Celoria and Kelly 1973; Kelly and Greaves 1974), but similar wares were made at Bristol (Barton 1964, p.198) and at the Buckley potteries in North Wales (Davey 1975).

The fabric of these wares is thin and hard-fired, ranging from white to buff. Vessels are usually yellow glazed, but some have one of the surfaces glazed black. The decoration is usually achieved by trailing a white slip over a red slip background. This trail can either be left plain or marbled, or combed and feathered to form an intricate pattern. A wide range of vessel types were produced, the commonest here are posset pots, dishes and bowls.

The production of these wares began in the late 17th century and continued throughout the 18th century.

20. White salt-glazed stoneware

White salt-glazed stoneware was made in Staffordshire from the first to the last quarter of the 18th century (Mountford 1971). A wide range of both functional and ornamental products were made by using slip-casting and mould making techniques, as well as by wheel throwing. It has a high quality white fabric and an even white salt glaze covers the whole vessel, except where occasional stacking marks occur.

21. Staffordshire-type brown salt-glazed stoneware

Stoneware was made in Staffordshire from the last quarter of the 17th century (Jennings 1981, p.219), but vessels found on this site date from the first half of the 18th century. The fabric is a light grey to light buff stoneware with small black inclusions. The finds here all derive from salt-glazed tankards with a brown iron wash on part of the vessels. A distinctive feature of this ware is the use of turned bands near the base; some vessels have overlapping bands of heavy rouletting around the base (N57711).

22. Red stoneware

Red stonewares were produced at a number of centres in Stoke-on-Trent (Barker 1984, p.65 and Barker & Barker 1984, p.89) from the late 17th century, but it was common throughout the 18th century and was still produced in the early 19th century. The single sherd found here (N24950) is part of a slip-moulded teapot.

23. Creamware

This was first made in the 1730s. It was made at a number of centres in England, particularly at the potteries in Staffordshire (Towner 1978), but because the quality and shapes from the different centres are very similar, it can be difficult to attribute individual pieces to specific places.

Creamware and white salt-glazed stoneware were made from the same clay, with calcined flint, but the creamwares were fired at a lower temperature with a lead glaze which results in a rich cream colour. As the techniques of firing and glazing changed during the 18th century creamwares became paler in colour.

From c.1780 some creamwares have mocha decoration, i.e. fern-like designs in greens and browns.

24. Pearl ware

This term is used for a ware originally produced by Josiah Wedgwood from c.1779. To make his creamware less yellow and more like porcelain he added cobalt oxide to the glaze to provide a bluish tinge. Pearl ware was decorated in two ways; with hand painted (N407) or transfer printed designs.

25. Fine white earthenware

This category covers white glazed earthenwares of late 18th-19th century, and modern material.

3.2.2 German wares.

26. Pingsdorf-type ware

The original Pingsdorf ware came from a group of villages in the low hills of the Vorgebirge to the west of the Rhine near Cologne (Lüdtke 1989, p.39). Kilns producing similar wares have been located, not only in this region, but to the north near Hanover, as well as in Limburg (Bruijn 1962-63) and in the Langerwehe area, south-east of Aachen.

A wide range of vessels were made, the best-known examples being spouted pitchers with thumb-impressed bases, small jars with similar footring bases and sagging-based cooking pots. Jugs are also common in the Limburg material. Nearly all the vessels were decorated with various designs in red paint, the paint can often be unclear, particularly on the reduced fabrics.

There are two basic fabric types, both of which are present in this assemblage. The oxidized fabric is buff to yellow in colour and is hard fired. The reduced fabric is a near-stoneware, very hard and dark brown to a lustrous dark green on occasions. Both fabrics are coarse textured due to the large sand inclusions.

27. Paffrath-type ware

The best-known source of this blue-grey ware is Paffrath, c.10km to the east of Cologne, a centre clearly associated with the later Siegburg stoneware industry (Beckmann 1974).

The fabric of these 12th and 13th century wares is very hard, sometimes comparable with proto-stoneware; it is whitish-grey, while its most characteristic feature is its surface, which has a silvery or blue metallic sheen.

The most characteristic Paffrath ware form is the globular cooking pot with a simple everted rim and rounded or sagging base. A second distinctive type is the handled ladle, a simple small cooking pot with the addition of a stubby curved handle.

28. Coppengrave-type miniatures

Miniature vessels and animals in lead-glazed buff fabrics were produced in the Coppengrave area of Lower Saxony during the medieval period (Stephan 1981, p.42-45).

29. Proto-stonewares

Proto-stoneware has a fabric which is not completely fused and which is heavily tempered with quartz, the colour varies from brown or reddish to grey, depending on the degree of reduction. A slip was added to these vessels during the second quarter of the 13th century (Stephan 1983, p.97) giving a glassy reddish or brownish surface. Red-slipped proto-stoneware vessels occur as containers for coin hoards from the second half of the 13th century onwards (Lüdtke 1989, p.33).

Red proto-stonewares were produced in the Upper Weser region (Stephan 1983, p.101).

30. Near-stonewares

Near-stoneware has a denser structure than the proto-stoneware, and is almost completely fused approaching real stoneware. The main difference between this and real stoneware is the presence of a rough sandy tempering giving the surface the feel of sandpaper (Janssen 1983, p.173). Siegburg near-stoneware varies in colour from grey to yellowish, with all shades in between.

31. Siegburg stoneware

Siegburg is located on the river Sieg shortly before its confluence with the river Rhine to the north-east of Bonn. It was the first of the large stoneware manufacturing centres in the Rhineland. Production is thought to have begun there in the mid-12th century, but true stonewares were not achieved until the early 14th century (Beckmann 1974, p.188f).

The fabric is fine and compact, off-white to light grey in colour. Some vessels have patches of a thin, light brown glaze; all have frilled bases until the production of the highly decorated wares in the 16th century.

Although an extensive range of forms was produced at Siegburg (Beckmann 1974, p.189-190), it is mainly the long-necked jugs (Beckmann type 77) and the small jugs (Beckmann type 90) which are found here during the medieval period, there are, however, several different cups of Beckmann group VII. During the post-medieval period tankards appear to be the commonest form (Hurst *et al* 1986, p.182 pl.31-32).

32. Langerwehe stoneware

Langerwehe is situated between Aachen and Cologne on the south side of the River Eifel. Production of true stoneware began here c.1324, although there is evidence for pottery production from the end of the 12th century (Hurst 1977, p.220).

The fabric is usually a dark grey, though this can vary: some underfired examples can be creamish-buff or pinkish-buff in colour. The use of an iron wash (red slip), which turns matt purple or brown when unglazed, and bands of rouletting are typical features of Langerwehe stoneware. Although there is a wide variety of products from Langerwehe (Hurst *et al* 1986, p.186), jugs are the most commonly exported form.

The use of an iron-wash was not peculiar to Langerwehe, these "red-slipped" stonewares were also produced in Lower Saxony, particularly in Duingen. No attempt has been made to distinguish these wares from one another, and it is furthermore extremely difficult to distinguish the late 15th century Langerwehe wares from those made in Raeren.

33. Raeren stoneware

Raeren is situated in Belgium, 10km south-west of Aachen and 1km from the present German border.

The fabric is a uniform, reduced grey stoneware covered with a grey salt-glaze, sometimes over a light iron wash. The forms most commonly found in Trondheim are small globular drinking vessels, jugs and miniature standing costrels. In the last quarter of the 16th century decorated panel jugs are introduced. These were manufactured with far more care and were glazed a lustrous even brown. The decoration is divided into zones: moulded decorative bands around the neck and centre of the jug are separated by carved and faceted panels which sometimes also have delicate stamped motifs.

Although there is evidence of pottery production here from the 12th century, the stoneware industry originates in the 15th century; and its products were exported in vast quantities during the late 15th and 16th centuries (Hurst *et al* 1986, p.194).

34. Cologne stoneware

The Cologne stoneware industry expanded at the beginning of the 16th century with the production of many types of elaborately decorated vessels. As a result of the frequent movement of potters to and from Frechen and Cologne many of the products from these two centres are virtually indistinguishable (Hurst *et al* 1986, p.208).

The fabric ranges in colour from pale cream to mid or light grey. On the earlier vessels the salt-glaze is thin and even, varying from fawn to yellowish brown. Later in the 16th century the glaze can vary from grey, with light brown areas, to a dark brown heavily speckled 'tiger' ware. The most common vessel types are small straight-sided mugs and globular jugs. The straight-sided mugs generally have panels of moulded decoration, whereas the globular jugs are often decorated with scroll stems and either roses and rose leaves, or acorns and oak leaves. The larger jugs, which date mainly from the second and third quarters of the 16th century, are decorated with two zones of applied stamped motifs separated by a stamped central band. The applied motis are either acanthus leaves or medallions containing the profile of a human head; the central band may consist of an inscription or a running scroll.

35. Frechen stoneware

Pottery was made in Frechen, which lies c.10km west of Cologne, from the beginning or the middle of the 15th century (Stephan 1983, p.111), but it was not until the second half of the 16th century that the Frechen coarsewares began to dominate the export market (Hurst *et al* 1986, p.214).

The fabric is a reduced grey stoneware and the exterior is covered with a salt glaze, which is usually brown, but which sometimes has grey patches. This becomes speckled during the late 16th century, resulting in the distinctive 'tiger' ware typical of the later *bartmänner*. The Frechen vessel most commonly found here is the *bartmann* jug with the typical face mask and medallion. These were produced well into the late 17th century. The later vessels became more ovoid and the necks were thinner; as a result the face mask became narrower and more stylised.

36. Westerwald stoneware

Westerwald is an area east of the Rhine between the River Sieg and Lahn, where pottery production was centred on the towns of Grenzau, Höhr and Grenzhausen (Hurst *et al* 1986, p.221).

This area produced a very distinctive group of stonewares which had a pale grey to cream fabric with a light grey salt glaze normally covering the entire vessel, except the base; decoration is usual, initially in cobalt blue, but from the third quarter of the 17th century also in manganese purple. There are three main types of decoration: applied stamped pads, combed stems with leaves and flowers, and incised borders to coloured motifs. The latest wares include plain white or grey salt-glazed jugs and mugs with sgraffito decoration. Forms represented in this assemblage comprise mainly jugs, tankards and chamber pots.

The industry here started in the 1590s and continued into the 18th and 19th centuries making utility wares and still thrives today.

37. German lead-glazed whitewares

These whitewares were produced at a number of centres in the Rhineland and Hesse (Hurst *et al* 1986, p.227), particularly in the Coppengrave (Stephan 1981, p.102) by the 16th century.

The generic term German whiteware covers a wide and varied range of pottery forms probably from a number of separate small production centres. In this assemblage there are a number of fabric types. Two main types are, however, distinguishable: the first is generally off-white, hard and slightly gritted with red iron oxide inclusions; the second is generally soft buff or pinkish buff and often has a thin white slip usually only on one surface, but occasionally on both. The yellow lead glaze is often speckled or streaked with brown iron stains. A number of pieces have a copper-green external glaze and a yellow internal glaze. One piece (N62132) has traces of an external polychrome decoration.

These wares occur mainly in the late 16th and 17th centuries.

38. Werra slipware

This distinctive slipware was made during the late 16th and early 17th centuries at several centres in the vicinity of the Werra River near Kassel, Germany, including Witzenhausen and Wanfried-an-der-Werra. Evidence for a production centre has also recently been found near Enkhuizen, in Holland (Hurst *et al* 1986, p.242-250).

The distinctive features of this ware are a well-fired, light brick-red fabric with small, opaque, white/pink inclusions, and white slip designs which appear pale green when covered with a clear lead glaze. Most vessels have dashes on the rim edge, sometimes arranged in groups separated by a short line, and all have one or two bands of a thin, closely-spaced line below the rim edge around a central motif. These motifs can generally be classified in three groups: botanical, anthropomorphic and zoomorphic. Many examples of the flatwares are dated, ranging from 1571 to 1632, although no dated examples were found here.

39. Weser slipware

This highly decorated slipware was produced at several centres in the area between the middle Weser and the Leine in Germany (Stephan 1981, p.95-96), and was much exported during the first half of the 17th century (Hurst *et al* 1986, p.251).

The distinctive features of this ware are the fine, hard fabric, varying in colour from buff to pink, and the hammer-head rim on the flatwares. All the bases are flat with wire-cut marks. Decoration usually consists of a simple geometric motif

executed by slip technique. The majority of the flatwares have a white slip covering the whole of the inside and extending over the outer rim edge. This, when covered by a clear lead glaze, has a pale yellow appearance. The decoration, in orange-brown and green, is applied over the basic slip. Those vessels which do not have the overall slip are decorated in the same style with yellow and green on the orange background, producing a reversed effect. The central motif is nearly always surrounded by concentric zones of thick and thin lines; these are separated by additional motifs, the most frequent being vertical zig-zag lines of green and brown or green and yellow, either singly or in groups.

The vessels most commonly found are flatwares, carinated bowls with pairs of loop handles and dishes, but several examples of hollow wares have also been found.

40. Lower Rhine slipwares

These slipwares were made in the area west of the Lower Rhine between Krefeld and Kleve where a large number of kiln centres have been studied (Scholten-Neess & Jüttner 1971). The earliest dated piece is 1663, but it has recently been shown that the type may go back to the late 16th century.

The fabric is a sandy red-brown with a red-brown lead glaze. The forms found here are shallow bowls with flat bases. The central medallions on these dishes contain simple geometric, botanical and zoomorphic designs. The medallions are normally surrounded by concentric circles or spirals of yellow slip superimposed by red, orange or green wavy lines. The flanges of the dishes are painted with yellow blobs.

3.2.3 Low Countries wares

41. Andenne ware

The pottery industry at Andenne in the Meuse valley is well known for its early glazed wares (Borremans and Warginaire 1966). Although this centre was in production from the 11th to the mid 15th century, producing a great range of vessels, only the sagging-based pitchers of the early period are represented here.

The fabric of most sherds is whitish, but can be pink or even grey. The clear lead glaze ranges from yellow or yellow-brown, often with iron speckles, to green; it tends to be glassy and is often finely crackled.

42. Low Countries highly decorated wares

This group of wares has long been refered to as Aardenburg ware but it is doubtful whether they were ever produced there. New evidence (Verhaeghe 1983a) suggests that the kilns producing these wares were mainly in Flanders, notably Brugge, and in northern France and Dutch Zeeland.

The fine sand-tempered fabric is generally oxidized but frequently has a greyish core; the colour ranges from orange-red to reddish brown. The dark body colour is often masked by a white slip, which serves to enhance the colour of the lead glaze. This usually covers most of the vessel and often has copper added to it to obtain a mottled green colour.

The most common vessel is the jug, which occurs in a number of forms. Features common to all types of jug are plain rims with an internal bevel, and solid rod handles which are always attached immediately below the rim.

Three decorative techniques are employed on the jugs: applied strips, rouletted patterns in great variety and complexity, and stamps and moulds. The latter appears less frequently.

The general date range for these wares seems to be c.1250 - 1325, although there is some evidence that they may occur in Flanders as early as the 12th century (Verhaeghe 1983a, p.70).

43. Low Countries slipware

These wares are known to have been produced in Utrecht and Aardenburg and probably at several other centres (Hurst *et al* 1986, p.146). They continue the tradition of the highly decorated wares, but in forms which were not found in the Rhenish stonewares, particularly dishes.

The fabric is a hard slightly sandy red, usually with a brown glaze. The commonest type of decoration are linked arcs and blobs of white slip.

The slip-decorated dishes are not common before c.1400, and appear to be more usual during the mid-15th century. Vessels with similar but debased decoration last until the early 16th century.

44. Low Countires sgraffito ware

Sgraffito wares have a sandy red fabric covered with a white slip which is incised to expose the red fabric below. They have a lead internal glaze but are unglazed externally. The only form found here is a large dish. The most common decoration is based on heraldic and religious motifs. These were produced from the late 15th century to the middle of the 16th century at a number of centres (Hurst *et al* 1986, p.150).

45. Low Countries common redwares

This is the most characteristic product of the Low Countries and was made at many centres. Kilns have been found at Aardenburg (Trimpe Burger 1974), Utrecht (Bruijn 1979) and Bergen op Zoom. They occur from the late 13th century onwards and show a remarkable typological homogeneity.

The fabric is hard and sandy and varies in colour from light brownish-orange, through orange to reddish-brown, with brick red and a light orange-red being the most common. Some of the thicker parts of the vessels often have a grey core. The clear lead glaze derives most of its colour from the body, it usually appears as brown-orange to yellow-orange. Later examples tend to have yellow glazes. Some reduction does occur on the inside of the hollow wares, here the glaze often appears as dark brown or olive green. The early types often only have patches of glaze outside, but by the late 15th century the glaze becomes overall.

The forms found on this site include cauldrons, bowls, shallow dishes, skillets and pipkins.

46. Low Countries greywares

The greywares are made from the same clay as the redwares but are simply fired in reducing conditions. The same basic forms are found in both fabrics. They were made at the same production centres as the redwares. This group, however, presents a number of problems due to the fragmentary nature of the assemblage where very little typological information could be gleaned.

These wares can be dated from the 12th to the 14th century.

47. Low Countries white wares

These wares were made in small quantities at the same potteries as the redwares and in the same range of forms, using clay imported for making white slip. The fabric is oxidized, hard-fired and varies in colour from white to pale pinkish buff. The

two glazes used are rich and evenly applied, either as a translucent copper-green or a clear yellow. Vessels are either monochrome or bichrome glazed.

Examples of white ware are known in the Low Countries from the 14th century onwards, but they do not occur in large quantities until the 17th century (Ellison 1981, p.147).

48. Low Countries slipware (post-medieval)

These wares can be divided into two main groups: the undecorated slipwares and the slip-decorated wares.

The undecorated slipwares were produced at a number of centres in the Low Countries during the late 16th and 17th centuries. The vessels found are bowls, dishes and pipkins, some having the characteristic footring bases. The fabric is the same as that of the Low Countries redwares, the characteristic feature being a white slip-coating applied to the inside of the vessel, which is covered with a lead glaze with copper additives, producing an even or speckled pale green. The unslipped areas of the vessel usually have a clear lead glaze.

The slip-decorated wares have not been tied to specific sources, even though some are similar to wares found in the province of North Holland (Hurst *et al* 1975). The fabrics are basically the same as the other Low Countries redwares. Vessels found are usually bowls or dishes although there are some decorated flatwares. These range in date from the late 16th century and throughout the 17th century.

49. Low Countries tin-glazed earthenware

The earliest wares in this group were produced at a number of centres including Antwerp, Haarlem and Amsterdam. The most famous of the later centres is Delft, but production also occured at Maachum.

The fabric of these wares is usually soft, whitish or pinkish-buff or cream with occasional red iron oxide inclusions. Two types occur: those with tin glaze on one side and lead glaze on the other (maiolica), and those with tin glaze on both sides (faience), but both are usually refered to under the collective name delftware (Hurst *et al* 1986, p.120). The decoration is usually painted in blue, but polychrome vessels with decoration in yellow, ochre, green and manganese purple do occur.

In this assemblage there are a number of sherds (N85382, N85740 & N85809) which would appear to be part of a South Netherlands Maiolica floral flower vase (cf. Hurst *et al* 1986, p.119 fig.54.168) of 16th century date. There are also a number of sherds of Malling-type jugs (Hurst *et al* 1986, p.126) which are usually dated to the second half of the 16th century.

The earliest of these wares, the maiolica, can be dated to the late 15th century (Hurst *et al* 1986, p.117), whilst the peak period for the faience comes with the products from Delft and can be dated to the 17th and 18th centuries.

3.2.4 French wares

50. Northern French monochrome green-glazed ware

This is a loosely defined category which covers a group of Northern French products which cannot be attributed to any definite source. They have a fine white fabric similar to the Rouen ware but have a mottled copper green glaze. The forms are also similar to those made at Rouen. One vessel (N23262) has a pierced, flattened hollow handle with an applied roller-stamped strip.

In this assemblage these wares occur during the late 12th and 13th centuries.

51. Rouen ware

No kiln sites producing this type of ware have been located but it is thought to have been produced in the Seine valley and to have been distributed through Rouen (Barton 1966). The characteristic form is a globular jug with a flat base in a fine white fabric. The bodies of these are usually decorated in panels to which applied roller-stamped strips and bosses have been applied. A red slip is often added to some of these panels, contrasting with the yellow colour of the lead glaze (Barton 1966).

These wares occur in the late 12th century but are more common during the 13th century.

52. Saintonge wares

Saintonge is a province of south-western France centred on Saintes. Recent surveys have located 50 kilns on a limestone plateau which dominates the River Charente to the north-east of Saintes (Hurst *et al* 1986, p.76-77).

The fabric of these wares is a fine off-white or buff, often micaceous. Two types of this ware are represented here, the most common has a light green glaze which is sometimes speckled, the other is a single sherd of a polchrome decorated vessel (N74802). A wide range of forms were produced, however, those represented in this assemblage being jugs and large globular *pégaux* with parrot-beak spouts.

The green-glazed wares occur from the mid-13th century onwards, while the polychrome wares usually occur during the late 13th and 14th century.

53. Beauvais ware

These wares were produced in a group of potters' villages to the north-west of Beauvais, which is situated at the south end of the Pays-de-Bray.

Beauvais sgraffito has a fine white fabric but can vary to grey, and is lead glazed. The forms include bowls, jugs, albarelli, chafing dishes and costrels. The vessels are covered with a red slip which is scored through to the fabric leaving a yellow-white design.

The earthenwares were produced from the late 15th century, but more particularly in the first half of the 16th. The sgraffito continued throughout the 16th century but the classic types are datable to the first half. Sgraffito went out of fashion in the 17th century (Hurst *et al* 1986, p.108).

3.2.5 Scandinavian wares

54. South Scandinavian and Danish redwares

These wares and the closely associated Low Countries redwares have a great many similarities in fabric, glaze and decoration and are, therefore, difficult to differentiate. Those sherds with the very characteristic types of decoration present little problem. For the rest of the material in this group the division is based on the technical quality, with the Scandinavian wares being slightly inferior to those of the Low Countries, which they were presumably copying (Dunning 1968 and Barton 1968). However, without a microscopic analysis, this division can only be tentative.

Several production centres for these glazed redwares are known in Denmark: kilns have been excavated at Farum (Nielsen 1955) and Faurholm (Liebgott 1975), and waste material has been found in Ribe (Bencard 1979 and Madsen 1980). In Sweden production is believed to have taken place in Lund (Mårtensson 1973).

There are two main fabric types within this material: the first is a hard sandy red fabric, sometimes with a grey core and lighter surfaces, the glaze is often uneven and is mainly a very rich brown but can be green. The second type is a very hard dark red fabric, with a dark brown glaze, the colour varying according to whether the vessel is slip-coated or not. (The latter may simply be an overfired version of the standard fabric, and consequently both could be products of the same kiln.) The decoration on these wares is perhaps their most striking feature, as it is boldly executed. The most common patterns are applied strips forming panels or large chevrons which are usually filled with scales applied in a white slip (N48413). The only vessel type recognised here is the jug, of which there are a number of different types (Bencard & Roesdahl 1972, p.10-12).

The date range usually proposed for these wares is c.1250 - 1350.

55. Danish greywares

Greywares feature amongst the wasters excavated at Farum Lillevang (Bencard & Roesdahl 1972, p.10), and are represented there by globular cooking-pots, with or without handles, and tripod cooking-pots with handles (*ibid*, p.9 no.88).

The fabric of the vessels in this assemblage is a hard sandy grey to dark grey, and the vessels are unglazed. One of the characteristic features of this group is the band of rilling around the shoulder of the vessels. Where rims occur they are everted and flanged.

In Denmark these greywares are dated to the 13th and 14th centuries.

56. Scandinavian and north German red wares

This group of redwares accounts for c.24% of the total assemblage of post-medieval pottery from the site. It undoubtably represents the products of a number of different centres covering a large geographical area.

One of the most characteristic vessel forms within this group is the *stjertepotte*, a tripod pipkin with a horizontal hollow handle. Other forms include tripod skillets, bowls and storage jars. The fabric is generally hard and ranges in colour from orange red to brick red. The glaze, which normally only occurs on the inside, varies from bright orange to dark green-brown and even blackish-green. All vessels have pronounced external rilling, and several of the tripod pipkins have roller-stamped or stabbed decoration on the rim and shoulder.

Vessels of this type have been found in north Germany (Hahn 1978) where they are believed to have been produced, but wasters found in Copenhagen (Ehlers 1967, p.33) and in Stockholm (Galt 1981, p.85) show that they were also produced in Scandinavia. These tripod pipkins were also produced locally (see 58 below).

On Helgeandsholmen, Stockholm, tripod pipkins with hollow handles were found in contexts from the 14th century onwards (Broberg 1982), in Schleswig they are found in 16th century contexts (T. Westphalen pers.com.) and in Oslo they are found in 17th century contexts (Molaug 1981, p.57-58 & 60-61). On this site the vessels found are of types which do not appear elsewhere before the 16th and 17th centuries.

57. Jutish ware

This group of handmade coarsewares were predominantly manufactured on the island of Jutland, Denmark, until the early years of the 20th century. Other production centres include Karhuse on Fuenen where a primitive wheel was used (Lynggaard 1972, p.135). All are clamp-fired except the products from Karhuse.

The fabric is sandy, dark grey or almost black and invariably unglazed. Most of the hollow wares are burnished internally and some vessels have decorative burnishing externally.

These wares are present in Halmstad, Sweden, from the beginning of the 16th century (Augustsson 1985, p.77-78). Their peak period of production, however, appears to have been from the late 18th to the middle of the 19th centuries.

58. Local lead-glazed earthenware

This, together with the closely associated slipware, was made at a number of kilns within the present city of Trondheim. There is a single documentary reference to a potter in Trondheim as early as 1607, then a lapse of 90 years before the next reference to a potter, an immigrant from Flensburg. Documentary sources from the 18th and 19th centuries indicate that at least three workshops existed in 1736 and at least eight in 1801.

The fabric is hard, 3.0-5.5 Moh (Mikolajczyk 1977), fine and has a close texture. There are occasional inclusions of grog, quartz and, very occasionally, organic matter; the fabric can also be micaceous. It is always oxidized and varies in colour from brown-buff to light orange-red. The lead glaze is usually evenly applied, the brown colour varying in depth according to the fabric colour; occasionally copper is added to the lead glaze to give it a greenish colour.

Recent excavations on Bakklandet, on the west bank of the River Nid, in Trondheim have shown that tripod pipkins were produced locally (Fulks 1988, p.15). This evidence together with wasters found on other sites, in particular Nordre gate 1 (Reed in prep), suggest that these vessels were produced during the mid 17th century. Other vessel forms in this group appear to be limited to bowls and storage jars. The bowls have fairly simple upright rims, often thickened in the middle and frequently convex. The base is almost invariably flat and there are two opposing loop handles. The storage jars, which have two opposing vertical strap handles and flat bases, vary considerably in size. They have a simple upright rim, usually flat-topped and often slightly concave; some examples however are collared and may also have an external lid-seating. These vessels may be decorated externally with a single incised wavy line on the shoulder and some have in addition one or more incised horizontal lines at or just below the junction of the handles.

59. Local slipwares

These are in the same fabric as the local lead-glazed earthenwares. The vessel types are, however, more varied with bowls, dishes, plates, lids and money boxes occurring. The only piece so far attributable to the 17th century is a slip-decorated bowl (N56059) bearing the date 1693 (Reed 1982a).

The bowls are basically the same as those in the plain ware but can be as large as 36cm in diameter. There is, however, one group of bowls with fairly straight sides, simple upright rims, and flat, or occasionally footring, bases which only seem to occur in the slipware group. The plates are all wheel-thrown with simple flanged rims, the basal angle is sometimes knife-trimmed. A large number of these vessels have an external slip in the same body colour.

The slipwares can be divided into two main groups: the slip-coated wares and the slip-decorated wares.

Slip-coated wares. The white slip-coating is normally applied to one surface only, usually the inner, but examples do occur with slip-coating externally and on both surfaces. The coating is usually covered with a clear lead glaze usually giving a cream-yellow colour. Some vessels, particularly those with external slip-coating, have copper added to the glaze giving a blotchy green, or manganese giving a blotchy purple-brown.

One special group of slip-coated wares have sgraffito decoration internally, the decoration appears as brown against the cream-yellow background.

Slip-decorated wares. This group can also be divided into two groups: the first has the slip-decoration applied directly on to the fabric; the second has an internal slip-coating with the trailed decoration applied to this.

The vessels are decorated with two main types of design, botanical and geometric, usually applied in white trained slip. A red trailed slip is often used on the slip-coated vessels. The white trailed slip is often enhanced with copper green. The geometric designs seem to be most common with concentric circles, dots and elongated S-shapes; the botanical designs are often very stylised.

The bowls often have slip borders both inside and outside, some have elongated reversed S-shapes and wavy lines. Some of the internal borders are very broad and are decorated with concentric circles of stabbed dots.

3.2.6 Mediterranean wares

Italy

60. Montelupo maiolica

These wares were produced at Montelupo, Tuscany, on the river Arno between Florence and Pisa from c.1500 to c.1650.(Hurst *et al* 1986 p.12-20).

The fabric is buff or light grey with a glossy overall tin-glaze. The polychrome decoration is done in dark and light blue, dark and light green, red, brown, orange and purple. The outsides of dishes have characteristic horizontal purple bands. Flanged dishes, bowls and *tazze* with simple rounded rims are the most common forms.

61. Ligurian *berettino*
Beretinno is a technique developed in the 1520s in which the decoration was in dark blue on a light blue background (Hurst *et al* 1986, p.26). These wares were produced at Genoa, Albicola and Savona in Liguria, Italy.

The fabric is a fine buff with a light blue tin glaze inside and out. The decoration is painted in dark blue, and the vessels usually have a series of interlocking arcs on the outside. Flanged dishes and small bowls are the most common forms.

Spain

62. Spanish lustrewares

Spanish lustrewares may be divided into 4 groups: 1. Early Andalusian Lustreware made at Malaga in the 13th and 14th centuries; 2. Late Andalusian or Early Valencian Lustreware produced either at Malaga or Manises during the 14th and early 15th century; 3. Mature Valencian Lustreware made at Manises during the mid-15th century; and 4. Late Valencian Lustreware produced during the late 15th and 16th century (Hurst 1982, p.83). Only types 3 and 4 have been recognised in this assemblage.

Mature Valencian Lustreware has a thick sandy fabric ranging from buff-pink to red-brown with characteristic buff inner and outer surfaces and has a white tin glaze (Hurst *et al* 1986, p.42). A wide range of dishes and bowls were produced, along with albarelli and jugs. The decoration is largely based on botanical motifs, ivy and bryony foliage being the most popular.

Late Valencian Lustreware tends to have a mainly pink fabric with the characteristic buff surfaces. The vessels have an overall tin-glaze and are decorated with an overall lustre, the foliage patterns becoming more debased (Hurst *et al* 1986, p.49).

63. Seville olive jars

Amphorae and olive jars have been produced in the Seville region since the Roman period. They have thick rough orange-red to pinkish-buff fabric, often with a buff outer slip. They sometimes have a yellow or green internal lead glaze.

There are three basic shapes (Goggin 1960) varying from elongated, globular and carrot-shaped.

Portugal

64. Merida type unglazed redware

Micaceous redware costrels were originally thought to have been made in the Merida area of Spain. However recent research (Hurst 1982, p.101) has shown that they are probably products of the Alentejo area of Portugal. The costrels are known to have been exported from the late 13th century (Vince 1985, p.81) and by the 16th century a wide range of forms were exported. With the exception of one possible 14th century sherd only post-medieval costrels have been recorded in Trondheim (Reed 1982b, p.194).

Near East

65. Blue alkaline glazed ware

These blue glazed wares thought to be of Near Eastern origin were first discussed by Hurst in 1968. However, recent work has shown that many of these vessels were probably produced in the western Mediterranean (Hurst 1983, p.132). The piece found here (N55054) is part of the rim of a bowl in a hard white fabric with internal and external blue glaze (Reed 1982b, p.191). This is attributed a definite Near Eastern origin by Hurst (*ibid*, p.132).

4. THE INTERPRETIVE USES OF THE POTTERY

4.1 The horizontal distribution of the pottery.

As already demonstrated (p. 22) the distribution of conjoining sherds in the main phases up to and including phase 7 is largely confined within the property in which it is found, but from phase 8 there seems to be a wider dispersal of the material and there is the distinct possibility that material has been transported in as and when necessary. This would seem to suggest that the secondary refuse found on each property up to and including phase 7 is largely derived from activities which have taken place on that particular property, whereas from phase 8 this is not necessarily the case. Having accepted this, it should be apparent that the pottery types and forms found on each property up to and including phase 7 are likely to reflect the activities on that particular property and the socio-economic fortunes of its inhabitants.

One intrinsic problem in using the pottery data in this way lies in estimating how representative of the activities taking place on a particular property the individual assemblages are? On much of the site it is only the area along the street frontage which has been excavated. Large areas of several properties to the east of the medieval street have been excavated, these are all, however, poorly preserved and/or heavily disturbed. To the east of the street it has been possible to excavate one almost complete, well preserved property, namely 2B + 3. One question arising out of this is whether there is any significant difference between the vessel types and forms found along the street frontage and those found further back in the property? In order to examine this it is necessary to look in detail at one property which, for obvious reasons, must be 2B + 3.

Table 3 shows the number of pottery vessels from the front and rear of these properties; the horizontal distribution of the sherds is shown in fig.12a-e.

	Property 2B		**Property 3**	
Phase	Front	Rear	Front	Rear
3	0	0	0	2
4	2	1	5	1
5	1	0	0	1
6	0	1	6	1
7	3	9	16	22

Table 3 The distribution of pottery vessels from the front and rear of properties 2B and 3.

In general terms it would appear that the distribution of pottery within these two properties reflects the siting of the "courtyard" or open areas, where rubbish may well have been dumped. (A similar concentration of rubbish or waste in open areas and passages has also been noted in connection with comb-making activities on this site (Flodin 1989, p.45 ff)). In phase 3 this would appear to have been to the rear of property 3, while in phases 4 and 6 there were larger open areas towards the street (Christophersen 1988, p.102, 107 and 119). In phase 7 much of the pottery is found in the passage/courtyard area between the two rows of buildings. As a result of this the part of property 3 excavated along the street frontage (FA) in 1976 gives the appearance of being aceramic in phase 3 whilst sherds from two vessels were found at the rear of the property. In phase 4 the situation is reversed with only one sherd of pottery being found at the rear of the property as against 12 at the front.

Fig.12 *The horizontal distribution of sherds on property 2B+3 in phases 3-7. The number beside the symbol indicates the number of sherds from each context.*

It is quite clear, therefore, that the presence or absence of pottery on a particular part of a property is not necessarily representative of the situation on the rest of that property. It is possible that this may reflect the use of this particular part of the property, but it is more likely that this presence or absence of pottery is indicative of the internal structure of the property as described above. What is clear, however, is that the pottery found in these open areas represents approximately 90% (based on a sherd count) of the pottery found on these particular properties and as such should give a very good indication of the relative proportions of the different types of vessels used in the properties.

4.2 Vessel forms and their uses

Of the large repertoire of vessel forms produced by medieval potters, only a limited number are represented in this assemblage (fig.13). Nearly all of these are connected with the storage, preparation and serving of food and drink; the commonest of these are the cooking-pot/jar and the jug/pitcher.

The term *cooking-pot* implies a specific function for a vessel, but it is quite clear that this basic vessel shape, which can vary considerably in size, can have had a number of uses. Besides the group of miscellaneous cooking-pots this vessel type occurs in Paffrath-type ware, greyware, shell-tempered ware, Scottish East Coast gritty white ware and there are also several vessels in London-type ware. From the apparent lack of flat base sherds it would appear that most of these vessels were of the typical *kugeltopf* (globular) type. Doubtlessly many of these vessels were used for cooking – they have sooted exteriors indicating that they have been used on a fire – but others were probably used for storage.

Apart from the *cooking-pots*, other vessels were used for cooking. These include the pipkin, a small jar with a horizontal handle attached to the shoulder and a pouring-lip. Many of them are glazed. They occur in Scarborough ware, Grimston-type ware and the green-glazed reduced ware. These vessels would be ideal for preparing small quantities of food or for the warming of liquids. These are not common in the medieval period – the assemblage contains at least 30 vessels, but during the post-medieval period tripod pipkins occur in quantity. Another vessel connected with the preparation of food is the cauldron (Dutch *grape*) which occur in the Low Countries redwares. Most of these appear to be post-medieval but several may be late medieval.

Another important class of domestic vessel is the pitcher and its successor, the jug. Pitchers occur in Stamford ware, Pingsdorf-type ware and Andenne ware, whilst jugs occur in at least 30 of the medieval pottery types in this assemblage. The prime function of these vessel types was to contain beverages to be served at table, although they also had other uses. Pitchers appear to be confined to the 11th and 12th centuries, whereas the jug does not appear before the middle of the 12th century. There is a marked increase in the number of jugs from the late 12th century and throughout the 13th century, which may reflect the fashions in tableware brought about by the growth of the wine trade, or may simply reflect changes in social customs.

Other vessels connected with beverages include beakers, cups and drinking jugs, none of which are common before the 14th century. Wooden bowls have probably been used instead. Beakers do, however, occur in Pingsdorf-type ware (Lüdtke 1989, p.55-59), but due to the fragmentary nature of this material it is difficult to be certain whether any occur in this assemblage. With the influx of both Langerwehe and Siegburg stonewares in the 14th century purpose-made drinking-vessels occur, the most common being the various types of Siegburg cup of Beckmann type VII (Beckmann 1974, p.198-199).

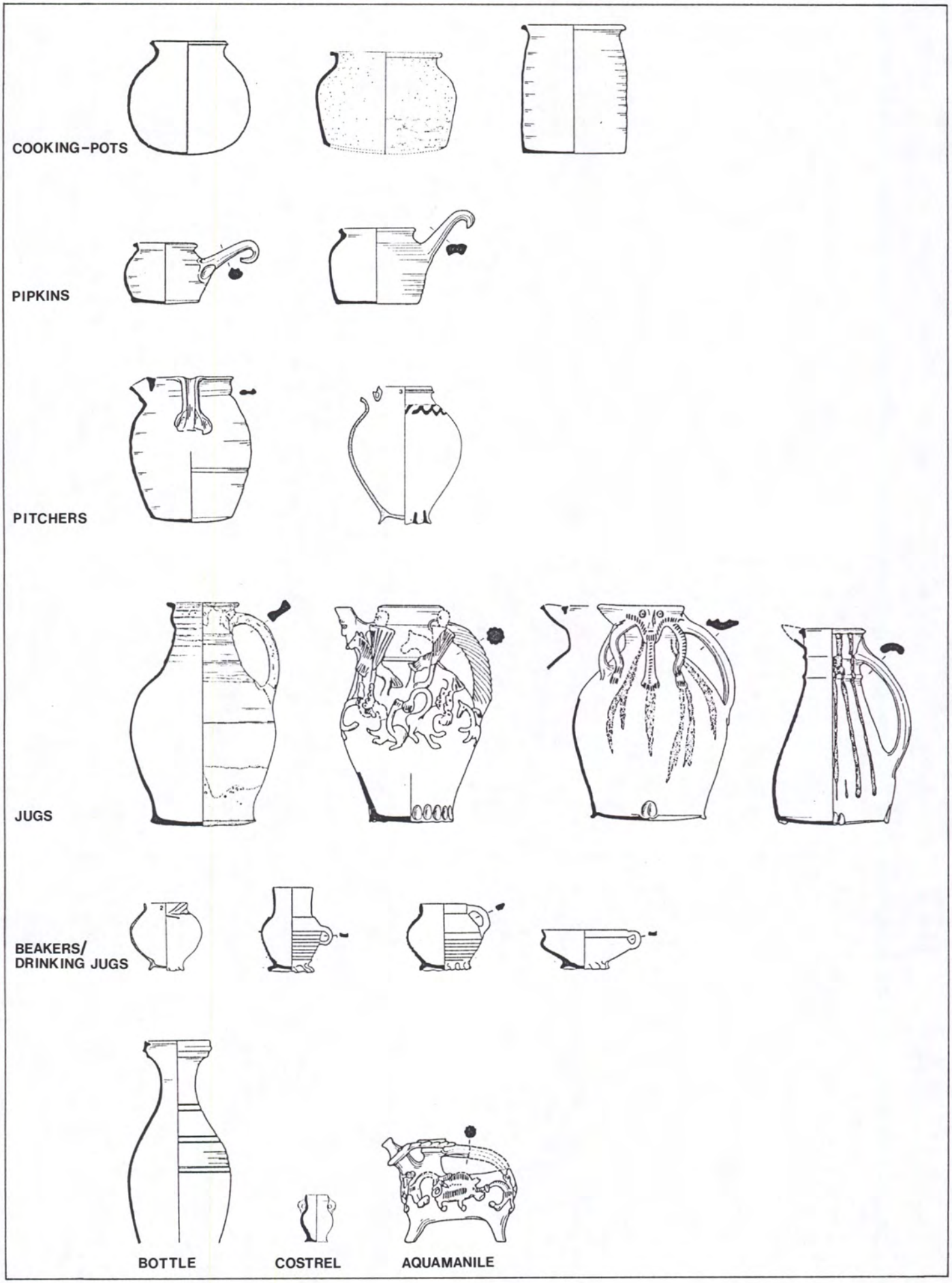


Fig.13 Vessel forms found in the pottery assemblage from the Library Site.

Other ceramic forms which can be mentioned here are bottles and costrels. Only one possible example of a bottle was found in this assembage (N57149), this is probably the neck of a bottle of Kilmurry form 18 (Kilmurry 1980, p.18), in developed Stamford ware. Costrels appear to be primarily a post-medieval form in this assemblage, the earliest are the miniature versions of the standing costrel in Raeren stoneware, but, as mentioned elsewhere (p.78), these may have had other functions.

Less common vessels used at the table include dishes and aquamaniles. Dishes first occur during the 15th century and are here represented by several slip-decorated Low Countries redwares. With regard to aquamaniles fragments of two definite and two possible vessels are present in this assemblage, all in Scarborough ware. These zoomorphic vessels were used in connection with hand-washing at the table.

Other domestic vessel forms found in this assemblage include lamps, but these are not common before the post-medieval period. In this assemblage only one medieval example, from phase 3, was found (N38061), this is in shell-tempered ware. Only part of the bowl was found so it is not possible to say what its original form was.

Less common forms include the toys produced in the Coppengrave and pottery bird whistles. The toys in this assemblage include 16 miniature vessels and two animals, including one complete horse (N22969). Bird whistles appears to be a post-medieval form in this assemblage.

One ceramic form which is not dealt with in this report is the crucible. These form the largest group of industrial ceramics found on this site, consisting of 159 sherds from a maximum of 113 crucibles. They are discussed by Ulla Bergquist in connection with the other metal-working finds (Bergquist 1989, p.30-34).

From the post-medieval period there is a varied collection of vessel types. The tablewares include jugs, tankards and mugs, teapots, cups, dishes, bowls, saucers and plates. Cooking vessels include cauldrons, skillets and pipkins. Other vessels include colanders, lamps and chamber pots.

4.3 The distribution of vessel types

We must assume that the types of vessels found in the assemblage represent the needs of the consumer and reflect what he was able to buy. Blake (1980, p.5) states that pottery "is an elastic consumption commodity because it is inessential and its function can be performed by vessels made in other materials." The degree of elasticity, however, depends "on its relative price and on taste, custom and other socio-cultural factors, which may have made a necessity of a want." Blake is of the opinion that before social and economic interpretations can be made from the pottery, two premises must be fulfilled:

1. Pottery must have been used widely without the excessive utilisation of metalware at the top of the social scale, or of wooden vessels at the bottom.

2. In order to create diversity and to register change, there must have been a desire to mimic the lifestyle of the more affluent by acquiring similar possessions, if they could be afforded.

Table 4 shows the minimum number of vessels represented in each phase. It is quite clear from this that pottery did not become common on this site until phase 6 (c.1150-1175). This very fact, combined with the knowledge that both soapstone and wooden vessels were commonplace (Nordeide 1989), should in effect negate premise 1. But, bearing in mind that when these premises were set up they were based on countries with a widespread indigenous production of pottery, in contrast to Norway where everything is imported. It should still be possible to draw some conclusions based on the evidence available here.

	1	2	3	4	5	6	7	8	9	10	11	12
stam		1	1	1	4			2				
devs					1	3	14	25	15	2	1	6
lond						4	9	42	13	2	1	7
spla						3	3	4	8	1	11	13
shel			1		1	7	6	26	15	1	1	3
Scar						4	4	101	141	68	117	146
York							1	13	12	4	9	10
Bran							1	20	29	5	22	18
HalB							2	10	11		5	14
oran							1	33	17	4	8	17
Grim		1	1	1		8	26	153	439	339	480	680
Scot						3	4	11	3	1	4	2
LINC							2	11	31	7	21	29
GROW						1	1		12	9	23	12
Toyn							1	11	41	71	88	116
GGRW								16	9	4	5	3
LYVD									1			
Norf									1			
ping						4	7	10	3		2	4
blgr				2	11	39	121	155	48	7	24	33
Mini								6	13	1	1	4
Pros							2	3		14	16	28
Near								3	20	28	30	87
Sieg									7	13	33	103
Lang							2		34	37	73	158
OTHE							1		8	2	27	20
Ande					10	35	50	65	22	2	7	13
Brug		1				3	6	13	46	13	44	33
LCrd							2	7	10	9	12	26
LCrb								2	3	2	1	8
LClm											3	1
NOFR							5	2	7	1	1	2
NFMO								3	4			2
Roue							1	15	7		3	3
Sain									4		2	
SAPY												1
NORM								1				1
Scan		1				1	8	36	139	116	152	143
Medi		1					1			1	3	8
C.P.			3	3	6	20	45	127	87	10	25	43
grey								5	9	5	12	11
UNID			1		2	9	27	99	134	69	115	130

Table 4 Maximum number of vessels of medieval pottery types. For most types the vessels found in phases 10-12 must be residual.

Tablewares

Blake (1980, p.6-8) and other scholars have argued that the occurrence of better quality tablewares on rural settlements in Italy (a pottery-producing land) at certain periods in time must indicate that their inhabitants underwent a number of social and economic changes. Figs.14a and 15a (see p. 55-63) shows the distribution of those wares which may be termed tablewares in the early medieval assemblage on this site. The table is subject to bias due to the fact that property 6B was only excavated down to phase 4, while only part of properties 4 to 6A were actually excavated. On the basis of these figures and the fact that all the pottery is imported, it seems highly unlikely that those of lower social status in early medieval Trondheim would have had the means to purchase such exclusive imported tablewares as the Stamford and Andenne pitchers (the latter is classified as a "luxury ware" by Verhaeghe; 1983b, p.8). This would appear to indicate that the properties in the south-west of the site (2B/3 and 4) were owned by fairly well-off people during phases 2 to 4. The absence of tablewares in phase 5 is a mystery. It does not seem to have been caused by economic decline since the properties 2B and 3 are again divided along the original boundary between them, and 2B is extended to encompass part of the neighbouring property, 2A, to the south (Christophersen 1988, p.110). The occurrence of only two ceramic cooking pots in this area may suggest that it is the character of activity on these properties at this stage which gives rise to this absence rather than any impoverishment of the owners.

From phase 6 it would seem that there is less differentiation in the social status of the various property owners along the west side of the street. This lack of differentiation could, however, also indicate that upper-class customs were filtering down the social scale. It is also at this point in time that we see the introduction of the jug to this assemblage, represented by two new pottery types, the London-type ware (fig.15b) and the developed Stamford ware (fig.16b) on properties 5 and 6A respectively. The occurrence of this relatively new innovation, the jug, and these **new** wares at such an early point in their production period points towards the desire of the property owners to emphasise their social status.

Due to certain stratigraphic problems on property 2B and in the north-eastern part of the site in phase 7, difficulties arise in estimating the numbers of tablewares due to probable intrusive material. It would appear that the Andenne and Pingsdorf pitchers still dominate the picture, but there is a marked increase in the number of jugs, particularly the Stamford products. It is otherwise interesting to note that it is properties 6A and 6B which have the greatest diversity of pottery types. Does this indicate that the occupants of these properties were better off than those on the rest of the site?

Cooking pots

This group includes the miscellaneous cooking pots (C.P.), shell-tempered wares Paffrath-type wares and the Scottish east-coast gritty wares.

Continuing with the case study we find the following distribution of cooking- and tablewares on these properties (tab. 5 figures represent number of vessels):

Property	1A		1B		2A		2B		3		4		5		6A		6B	
PHASE	C	T	C	T	C	T	C	T	C	T	C	T	C	T	C	T	C	T
2	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
3	-	-	-	-	1	-	-	-	-	2	1	-	2	-	-	-	-	-
4	1	-	-	-	-	-	1	2	3	3	1	-	1	1	-	-	-	-
5	Churchyard		-	-	-	-	1	-	1	-	2	-	-	-	-	1	-	4
6	Churchyard		-	-	-	-	1	-	3	4	5	3	2	2	-	3	6	6
7	Churchyard						7	-	30	6	7	2	12	13	2	4	66	18

Table 5 *The distribution of ceramic cooking pots (C) and tableware (T) in phases 2-7 on properties along the west side of the street. (-: no finds).*

These figures are biased influenced by, amongst other things, the life-expectancy of the different types of wares. It should be obvious that cooking vessels which are in everyday use and which are subjected to heating and cooling will last a lot less time than tablewares which, in some cases, may only have been used on festive occasions. This differing longevity means that there will consequently be a significant difference in the proportions of vessels found amongst the refuse and those found in use in the household: in this case this will lead to the over-representation of cooking vessels. It is probably not possible to estimate the actual number of ceramic cooking vessels in use in a household at any one time, particularly in the light of the fact that finds from the site include a large number of soapstone cooking vessels. It is therefore all the more apparent that the number of ceramic cooking vessels found will depend on the frequency of their use and on the period of time over which the rubbish was dumped.

It is clear that soapstone cooking vessels were much more common than ceramic cooking vessels up to phase 6. This comparison is carried out on the basis of a sherd count and should be treated with the necessary caution. It does, however, show a clear favouritism of soapstone contra ceramics and may be caused by the difference in the relative costs of these articles. It is also possible that the ceramic vessels may have had some special function, for instance reheating small amounts of food which had previously been prepared in the larger soapstone vessels.

Within the case study area there are only two cases, both in property 3, phases 4 and 5, were sherds of cooking pots were actually found in association with hearths where it may be assumed that they have been used. A general survey of the occurrence of cooking-pots in relation to fire-places on the site (figs.20-22), shows no real correlation, again pointing towards the conclusions drawn in the early part of this section.

4.4 Horizontal distribution of wares

During the initial pottery analysis apparent concentrations of different wares were recognised. It was decided, therefore, in connection with the discussion on trade, to examine the horizontal distribution of the pottery and its provenance to see whether it was possible to determine whether individual merchants had concentrated their trade with particular countries at any specific time. A similar analysis was attempted by Lüdtke with a selected group of wares from Bryggen, Bergen (Lüdtke 1989, p.25 ff).

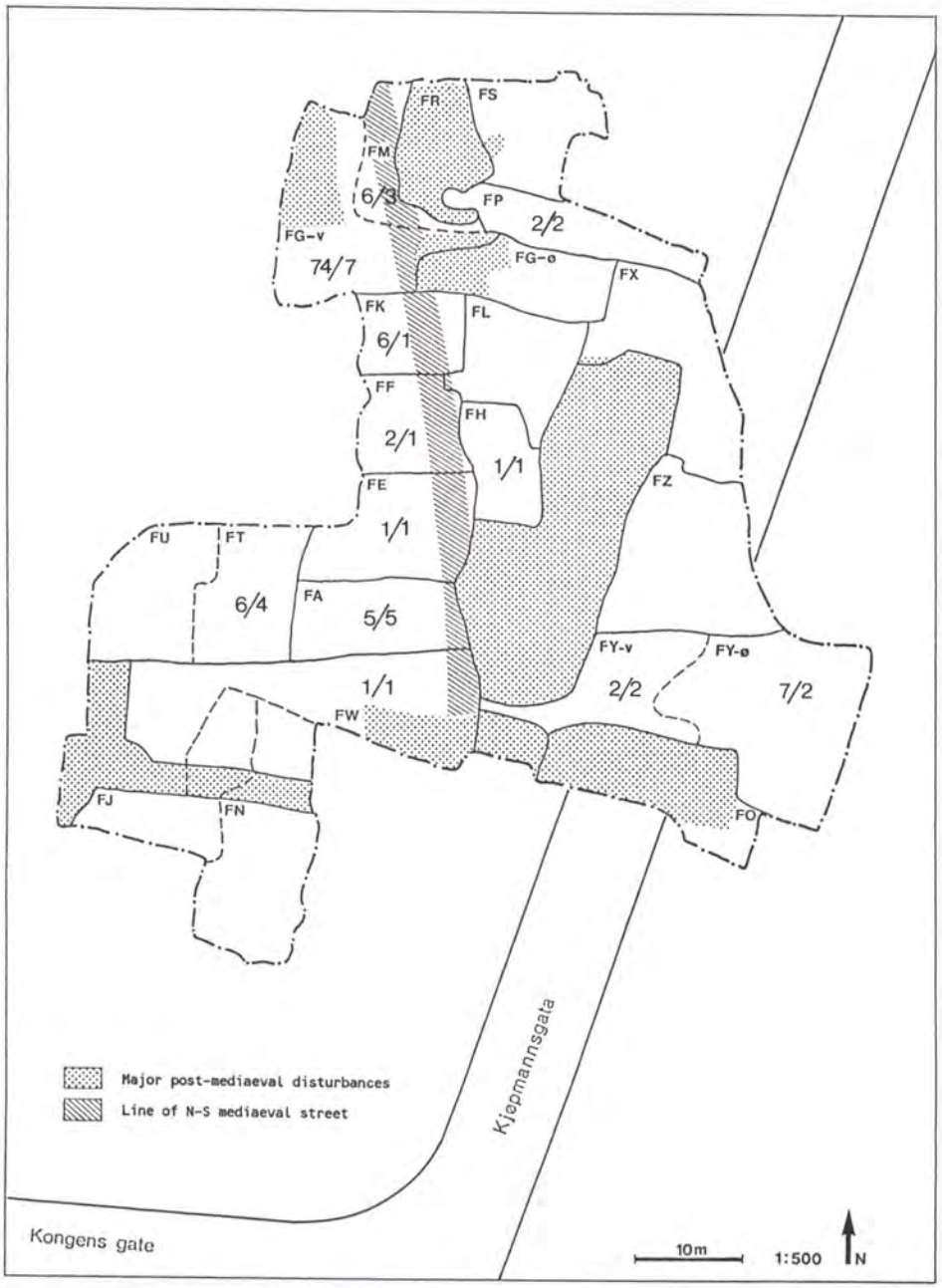
Methodologically this analysis presents one major problem: how to quantify the material. If we examine the distribution of Pingsdorf ware on this site (fig.14a), c.65% of the sherds were found in area FG-v, these sherds represent c.23% of the maximum number of vessels. In contrast, areas FA/FU have only c.10% of the total Pingsdorf sherds, but these represent c.29% of the maximum number of vessels. It is quite obvious, therefore, that concentrations based on sherd counts do not give a reliable picture of the situation, comparisons must be made on the basis of a vessel count. It is also quite clear that residuality will also affect the results here, as will the problems discussed in chapter 2.4.

The horizontal analysis, based on a maximum vessel count, of the major medieval pottery types is shown in figs.14-19, while the distribution based on the actual number of sherds per phase is shown in appendix 1. It is clear that the interpretation of eventual concentrations should not be done solely on the basis of individual wares, but rather on the basis of groups of wares shipped from the same ports, such as the Pingsdorf, Paffrath and Andenne wares which were all shipped through the Rhine/Maas delta. Looking at these three wares (figs.14a-b and 15a) we see that the greatest concentrations of Pingsdorf ware are on areas FG-v, FA and FT, whilst Paffrath ware is concentrated on areas FG-v, FU and FA. The Andenne ware has a slightly different distribution with the main concentration being in area FF, followed by FY-ø, FG-v and FA. The concentration on FY-ø is caused by residual

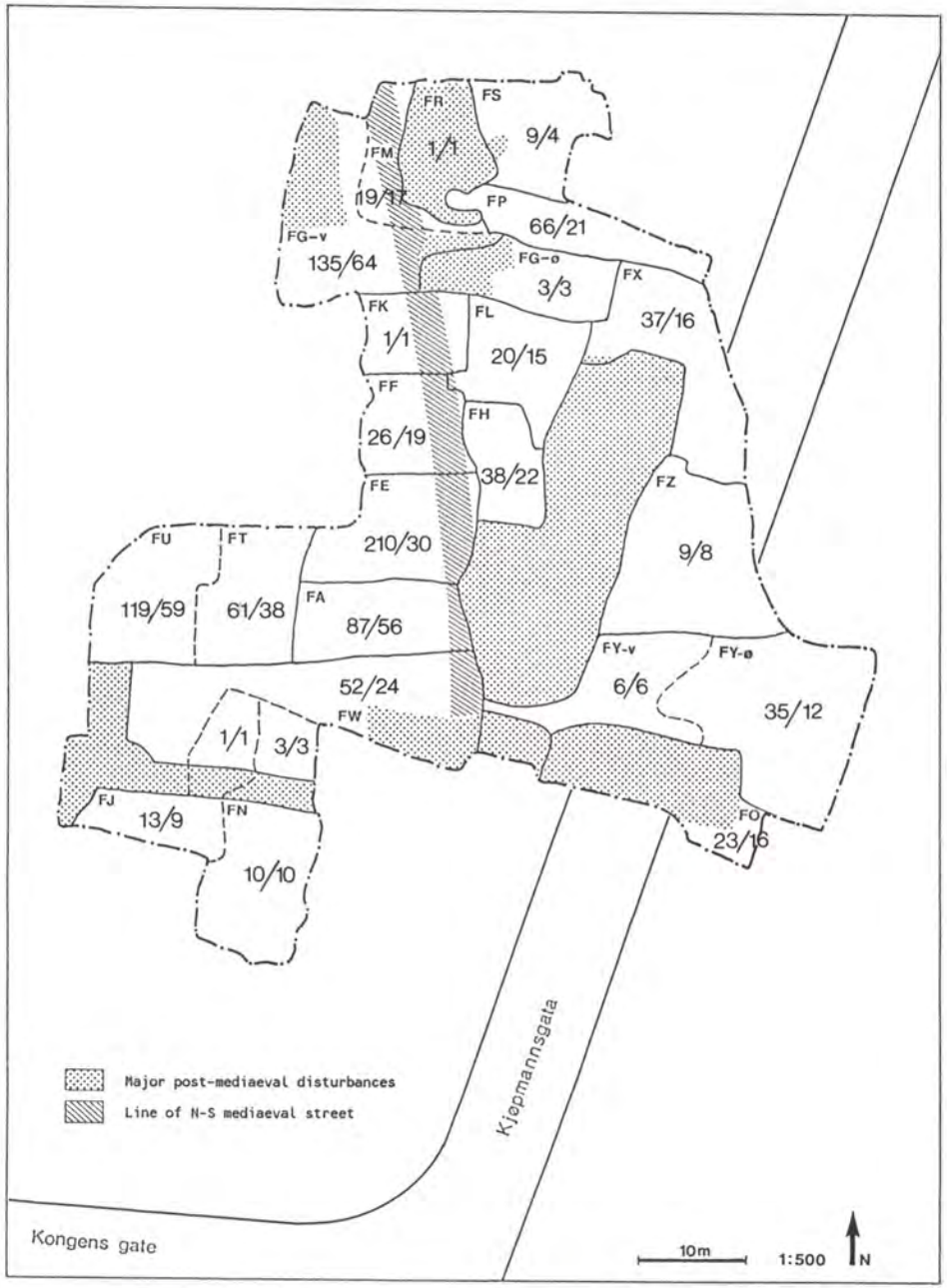
material used in the infilling of revetments along the waterfront, and can therefore be discounted. On the basis of this it would appear that there are concentrations of pottery exported from the Rhine on areas FG-v (property 6B) and FA, FT and FU (property 3). If we examine the distribution of two other coeval wares, the London-type ware (fig.15b) and the shell-tempered ware (fig.16a), both probably shipped out of London, we find remarkably similar concentrations. The London-type ware is concentrated in areas FT/FU, FA, FW and FF, while the shell-tempered ware is concentrated on areas FA, FT/FU, FG-v and FP. Consequently, for the 12th century, it does not seem to be possible to determine any specialization of individual merchants.

If we examine the occurrence of some 13th century English wares, the Beverley-type ware (fig.17a) and the Lincoln-type wares (fig.17b), we find a remarkable concentration of these wares in the areas FA, FE, FT and FU, which might suggest some special affinity between the property owners here and the areas in which these wares were produced. However, these wares occur in a period when there appears to have been a large scale levelling of these properties with material brought in from elsewhere (see p.22), and, in consequence, it cannot be determined how much of this material actually was in use in these areas or how much is redeposited. This data must therefore be classed as unreliable in this analysis and cannot therefore be used.

In conclusion it must be stated that the horizontal distribution of wares does not give any definite evidence of specialization on the part of merchants/property owners.

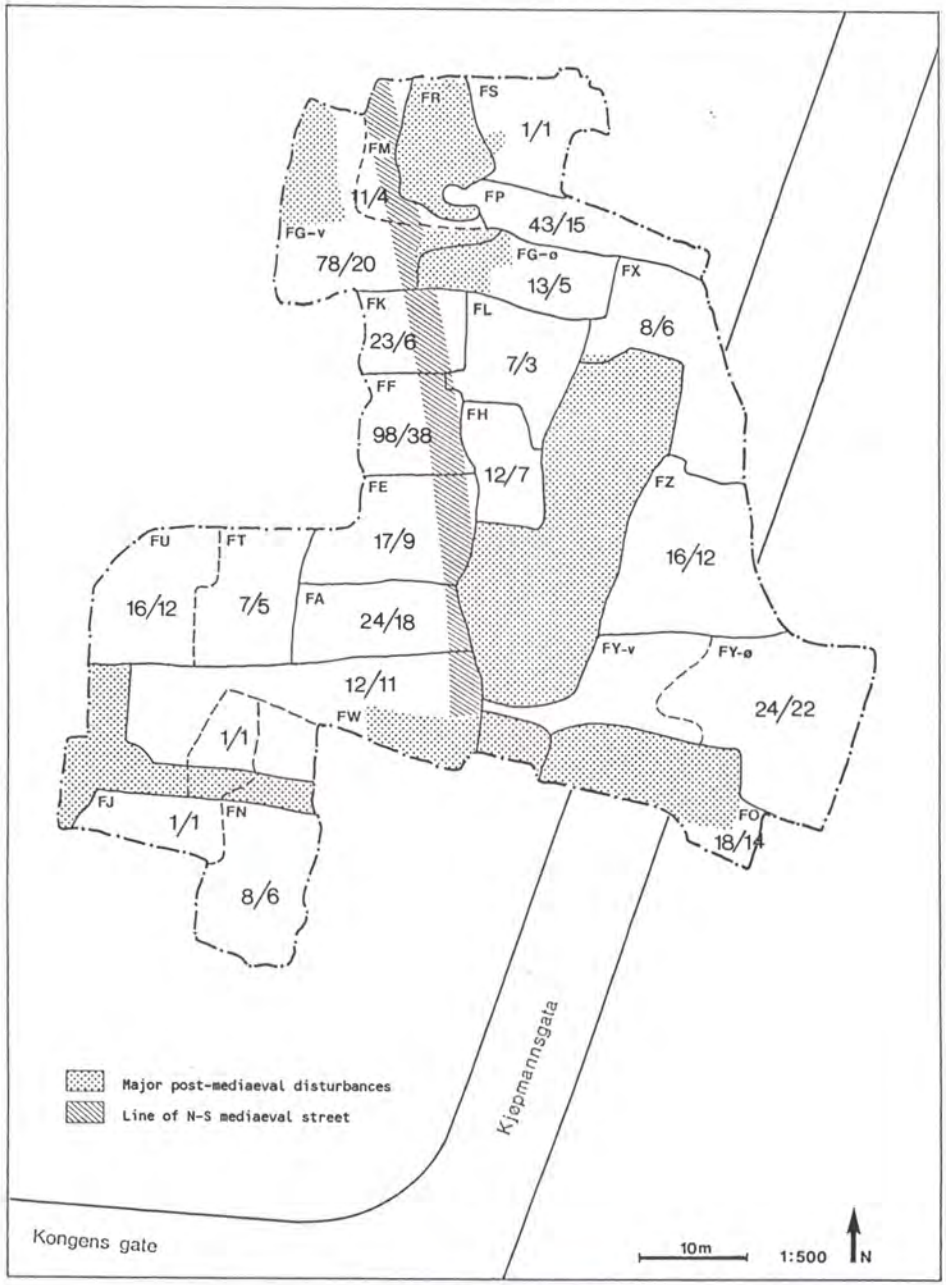


a: Pingsdorf.

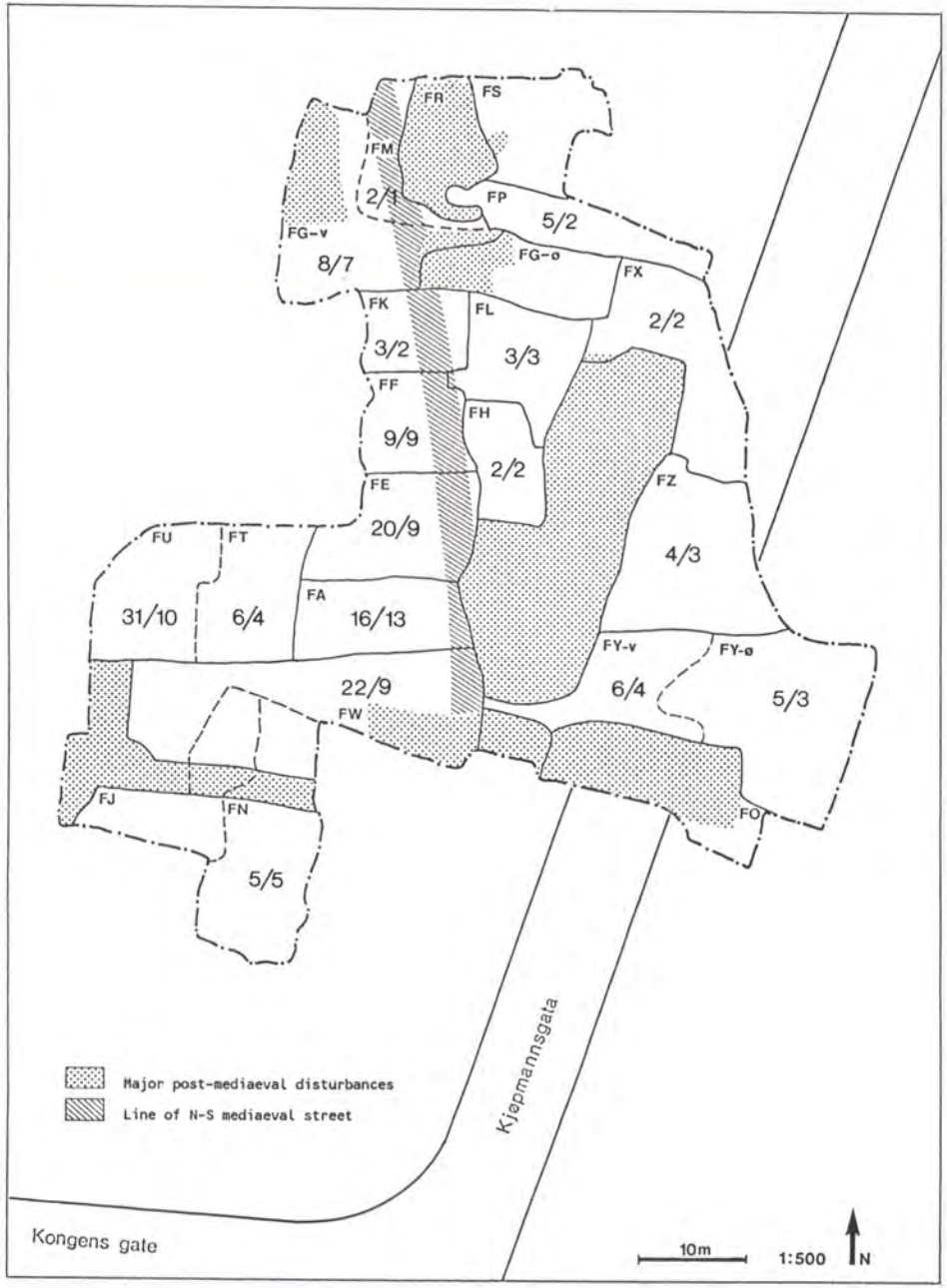


b: Paffrath-type.

Fig.14 The horizontal distribution of major pottery types.

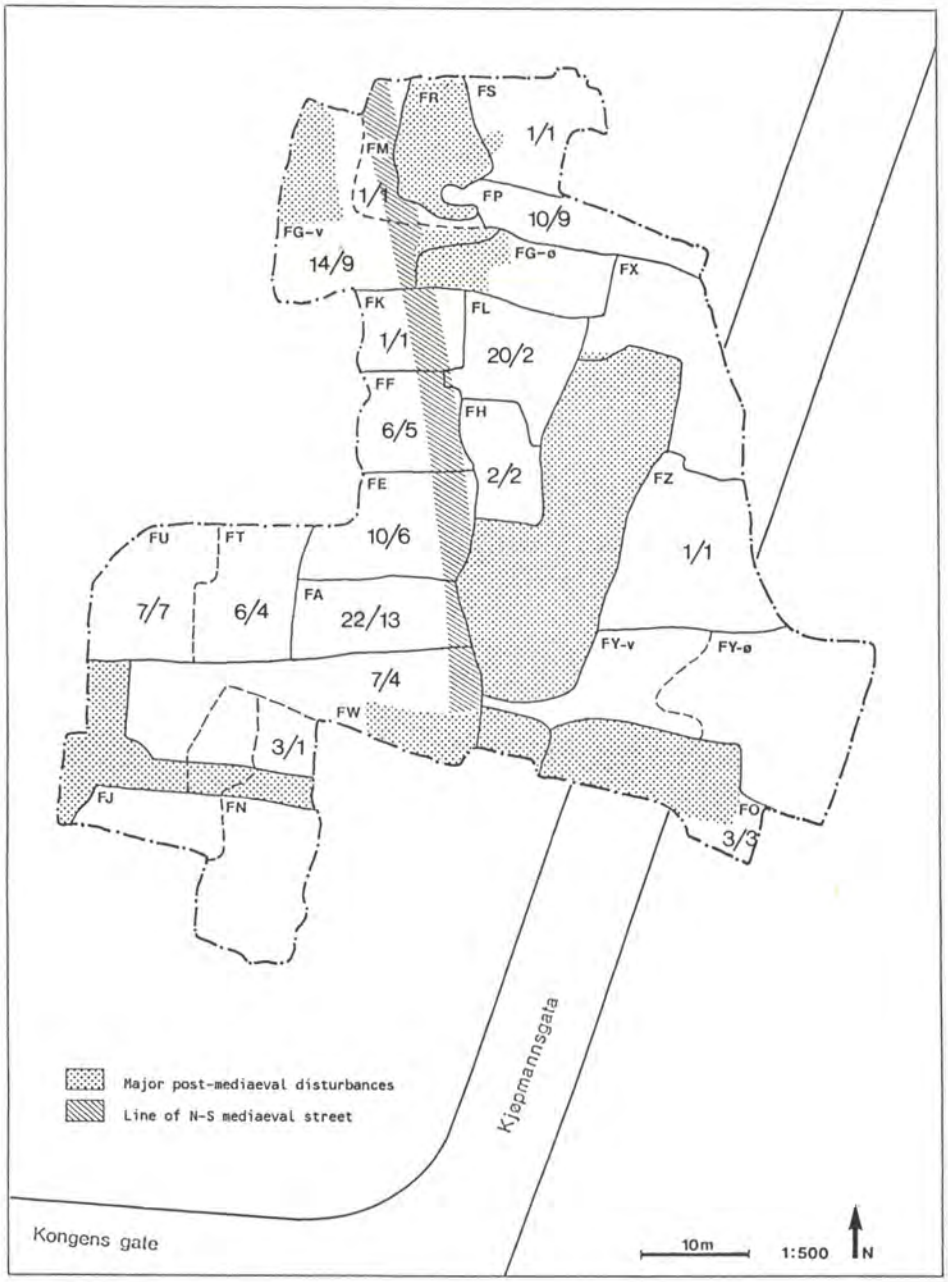


a: Andenne-type.

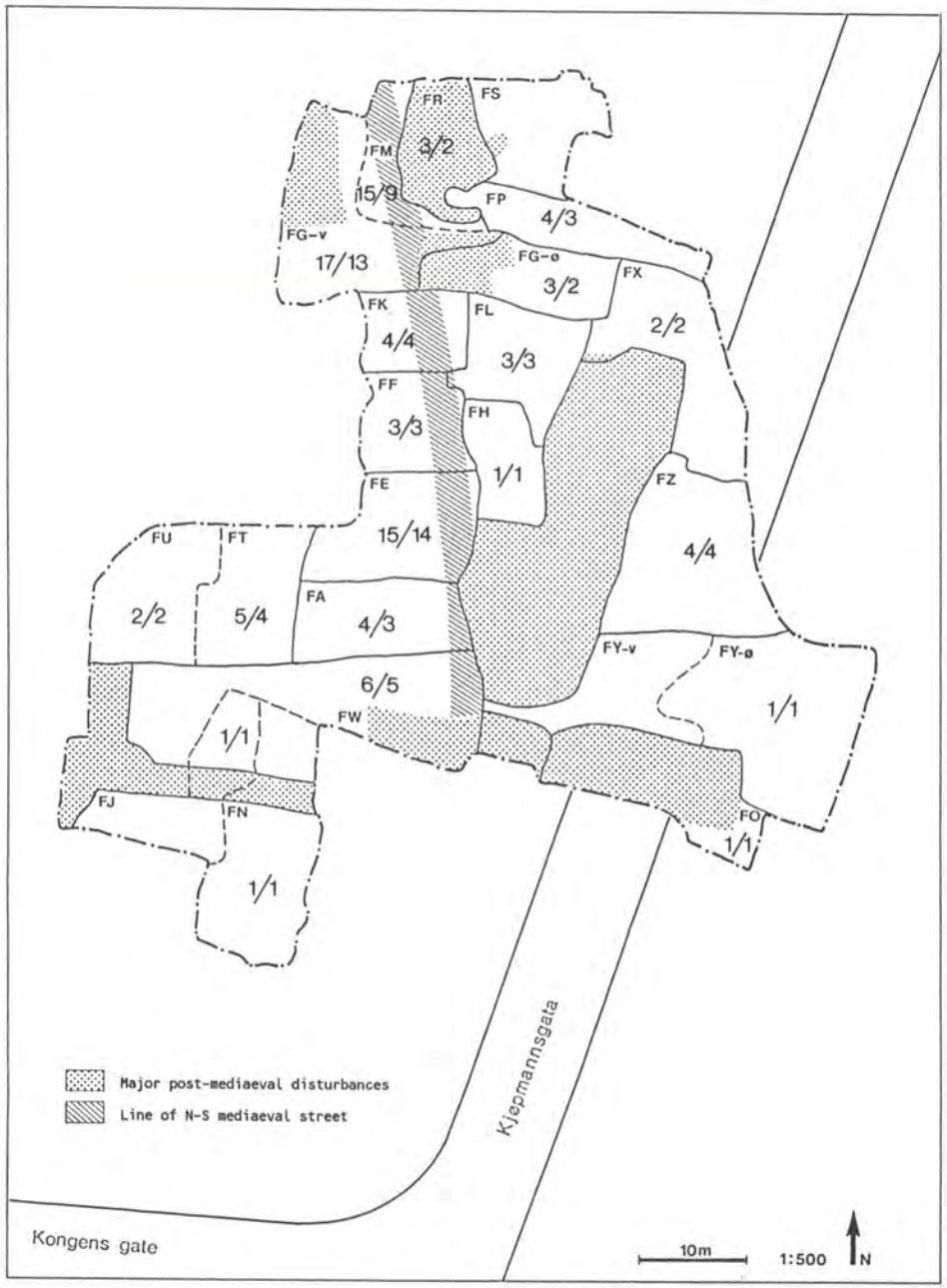


b: London-type.

Fig.15 The horizontal distribution of major pottery types.

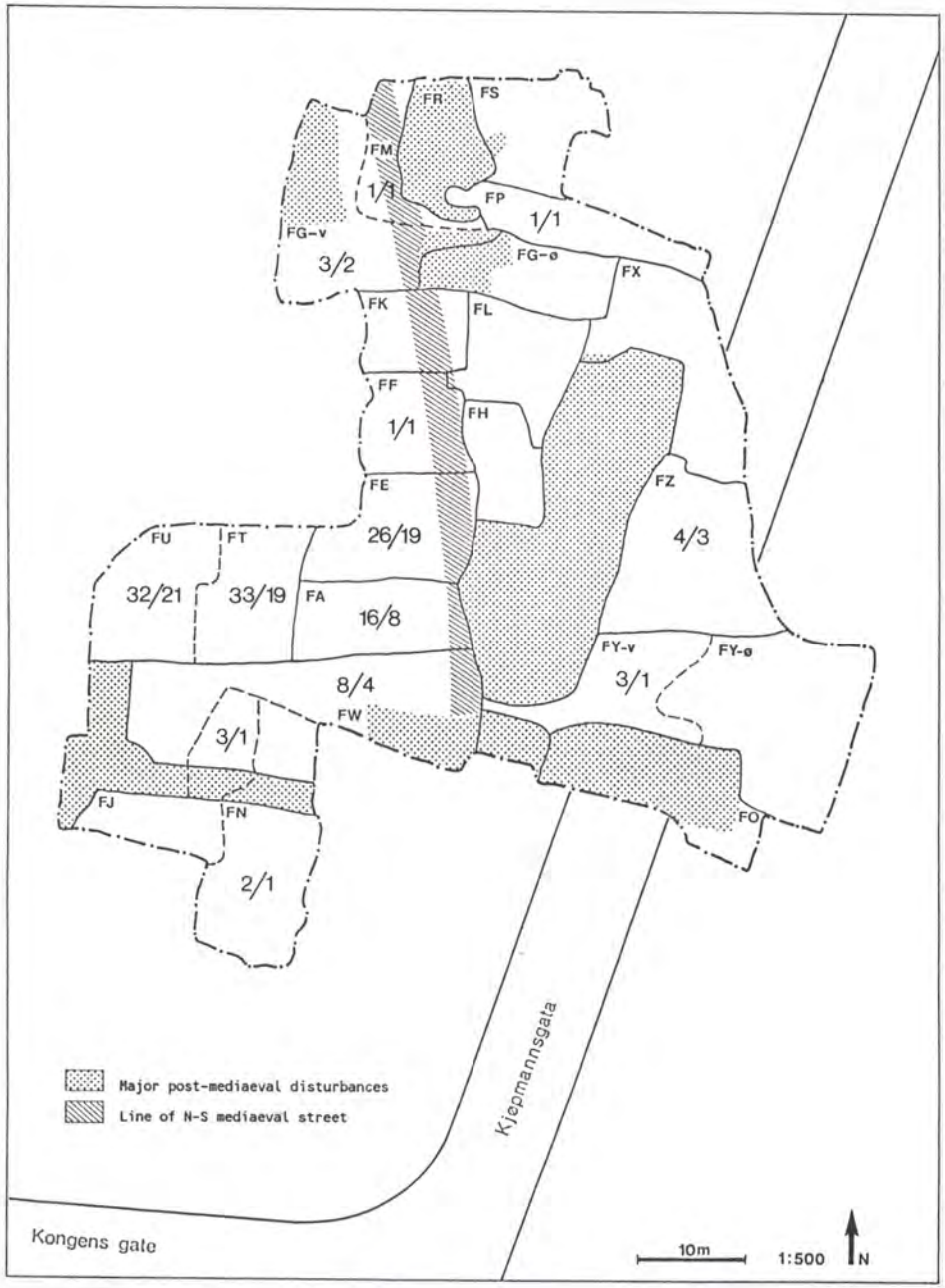


a: shell-tempered ware.

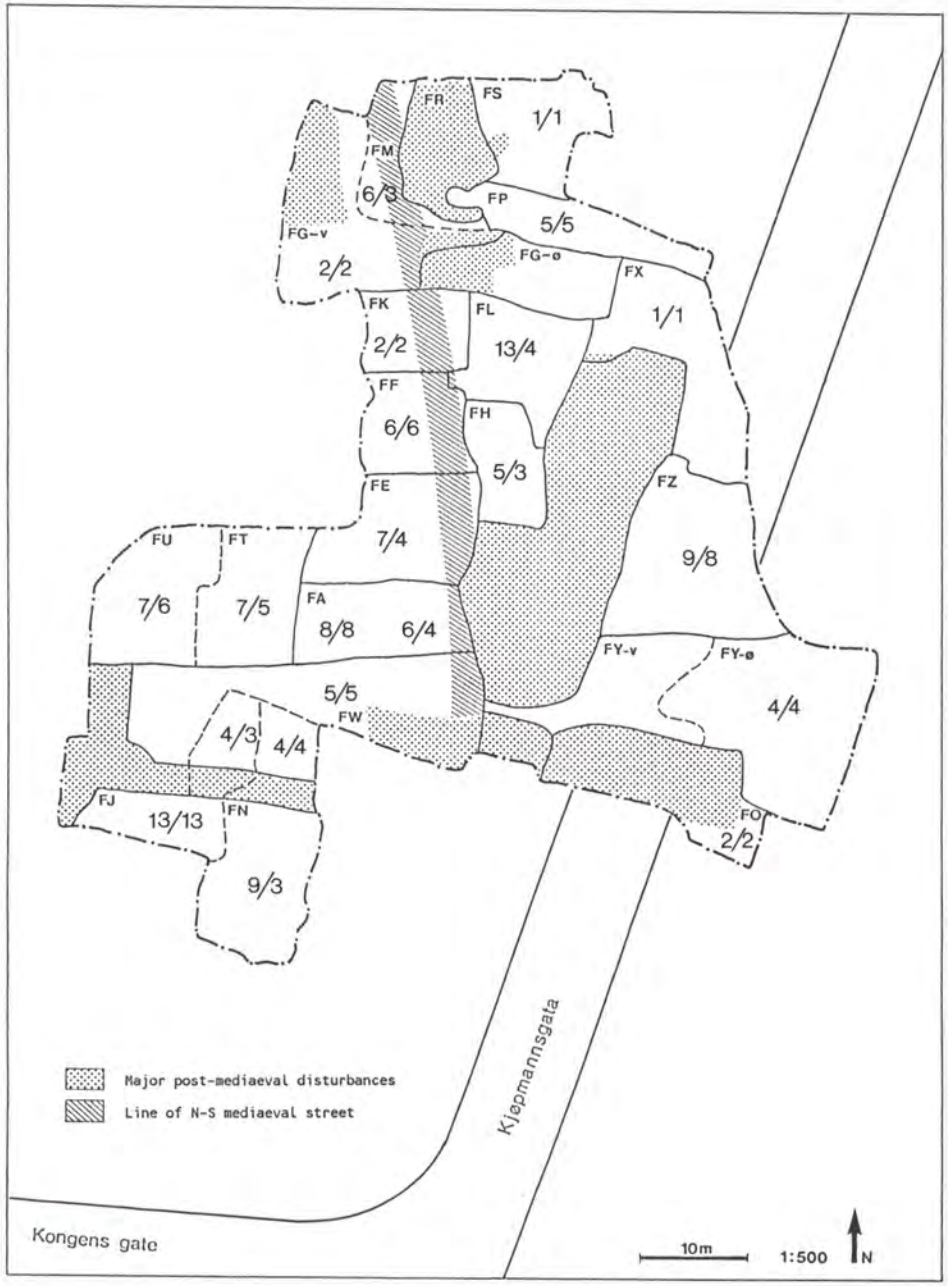


b: developed Stamford ware.

Fig.16 The horizontal distribution of major pottery types.

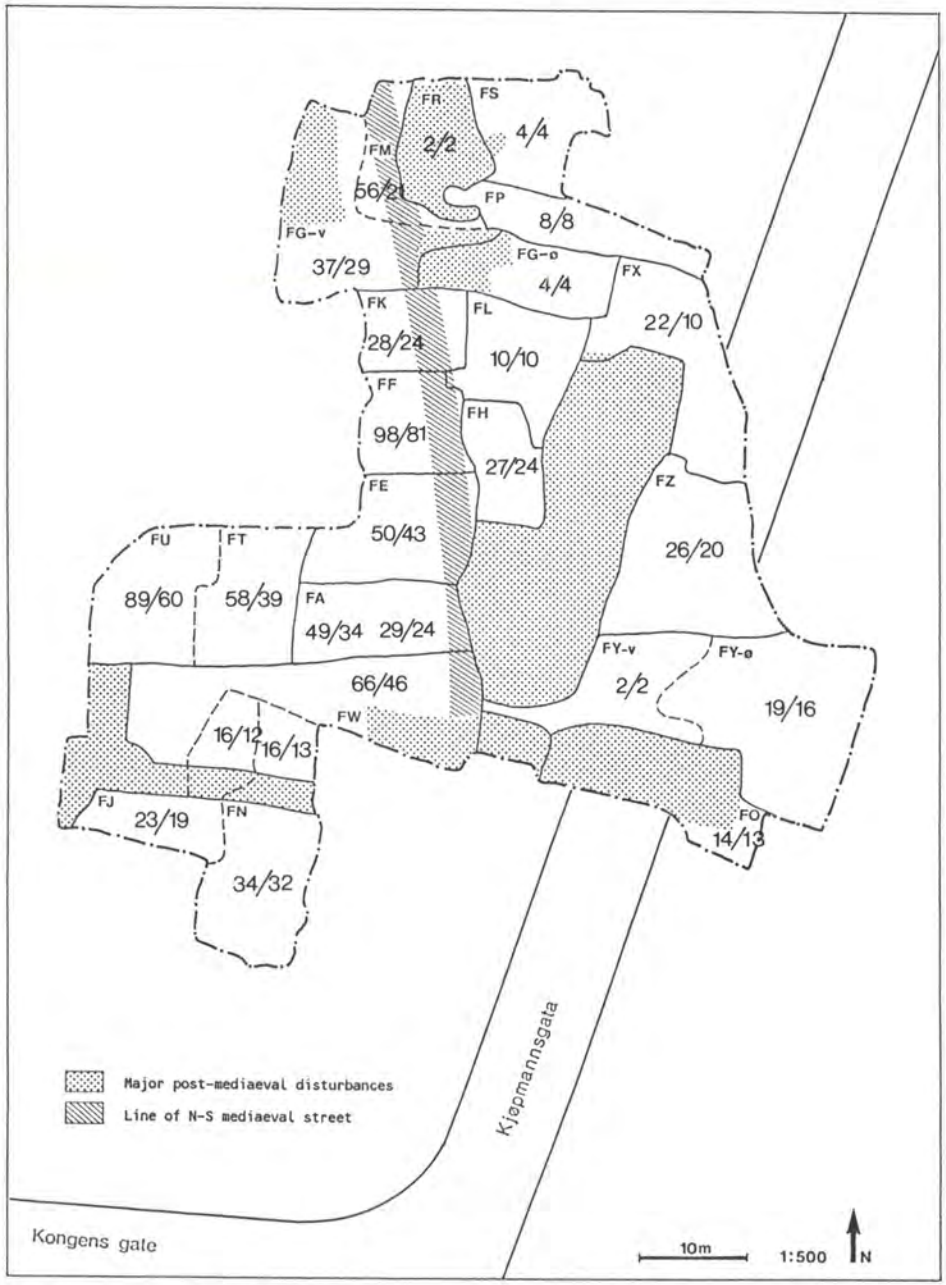


a: Beverley-type ware.

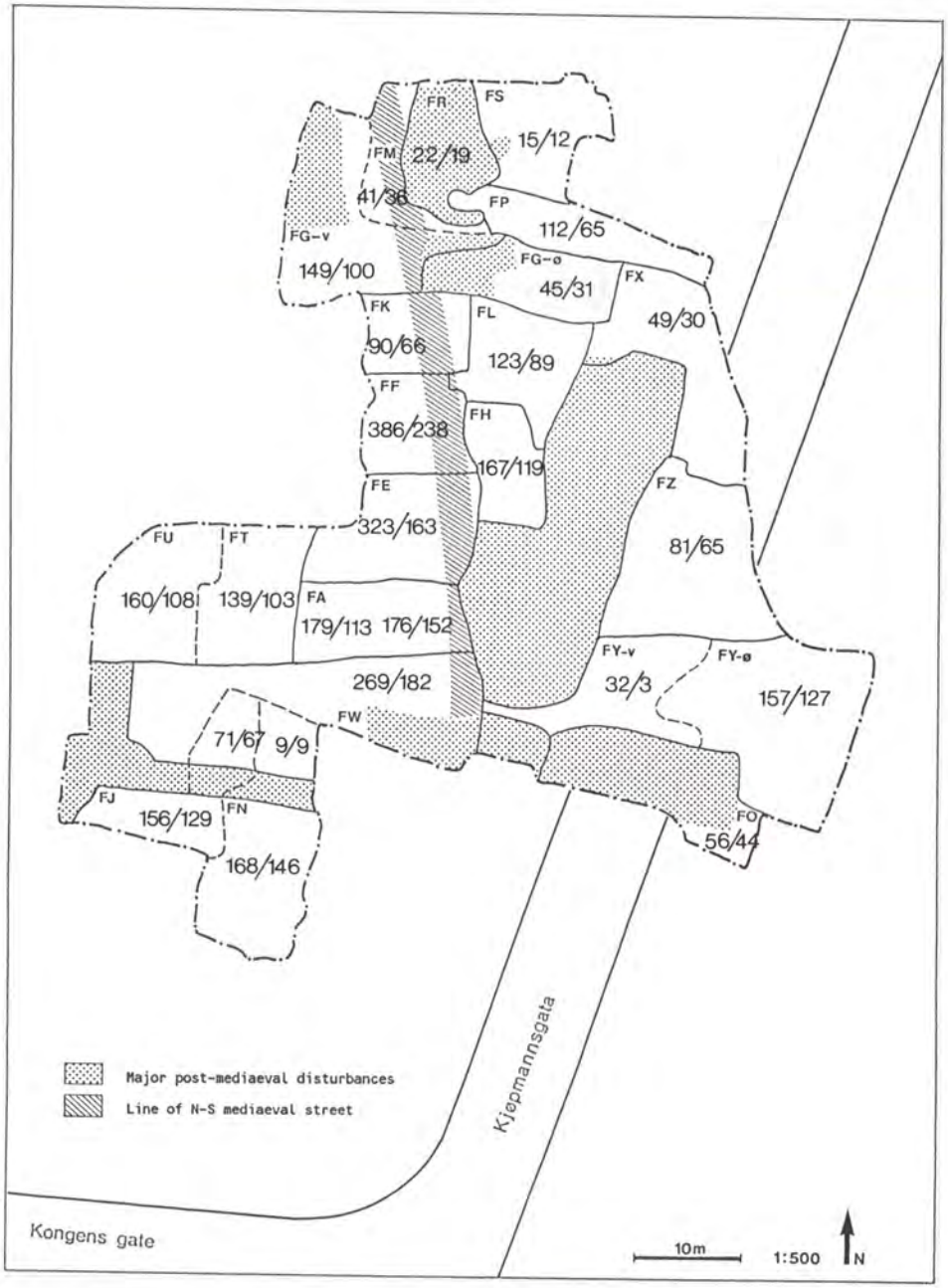


b: Lincoln-type ware.

Fig.17 The horizontal distribution of major pottery types.

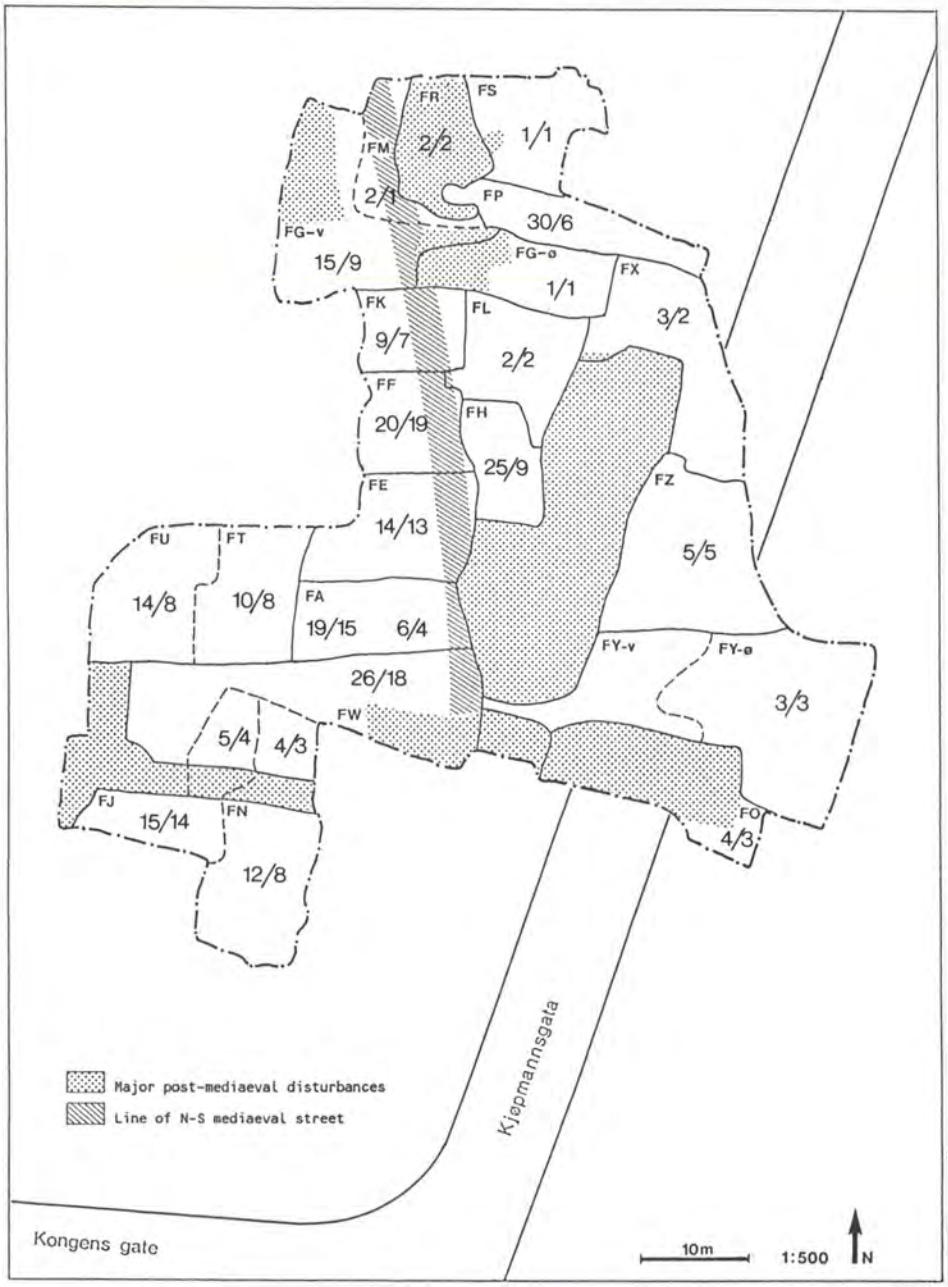


a: Scarborough ware.

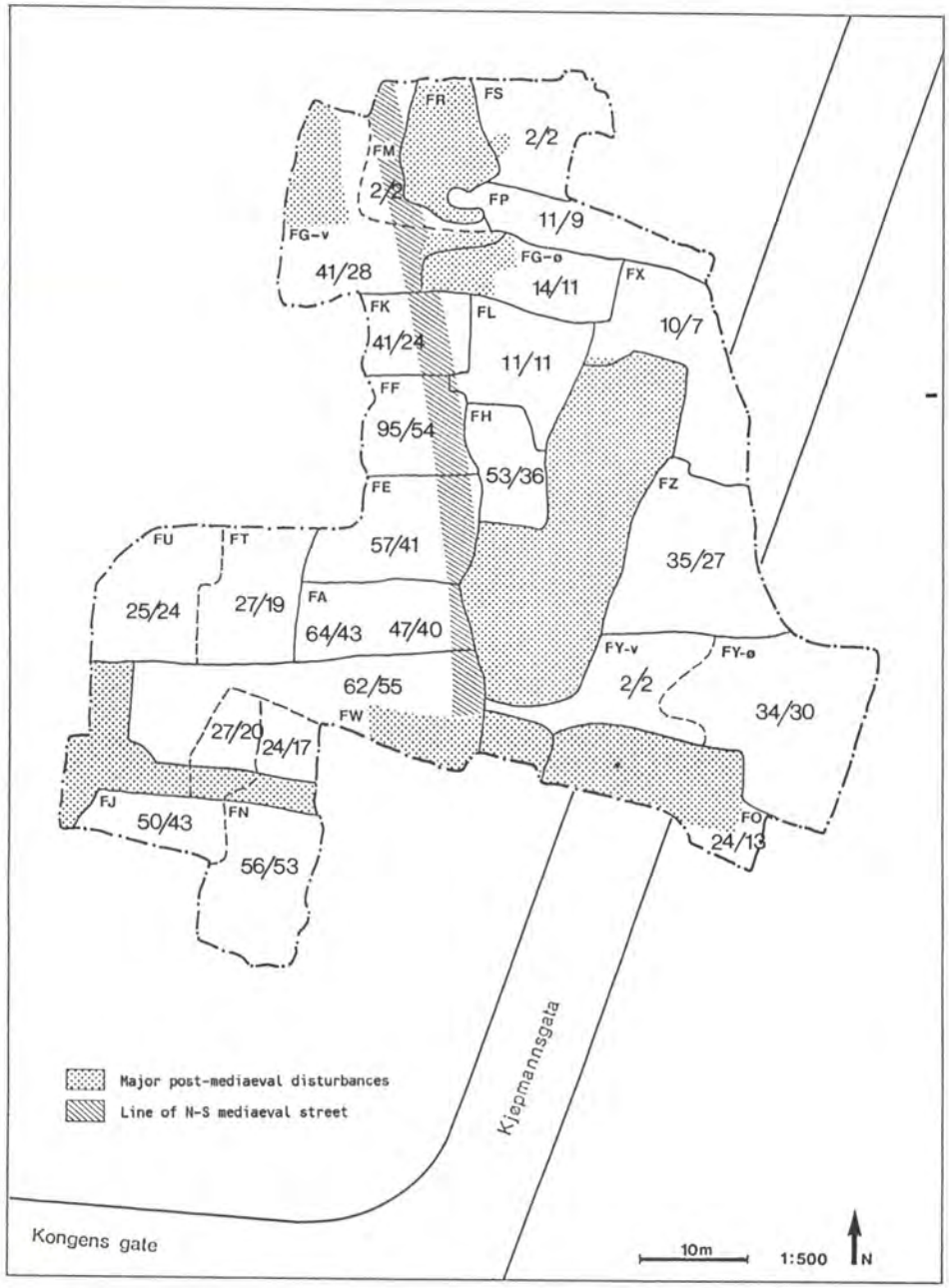


b: Grimston-type ware.

Fig.18 The horizontal distribution of major pottery types.

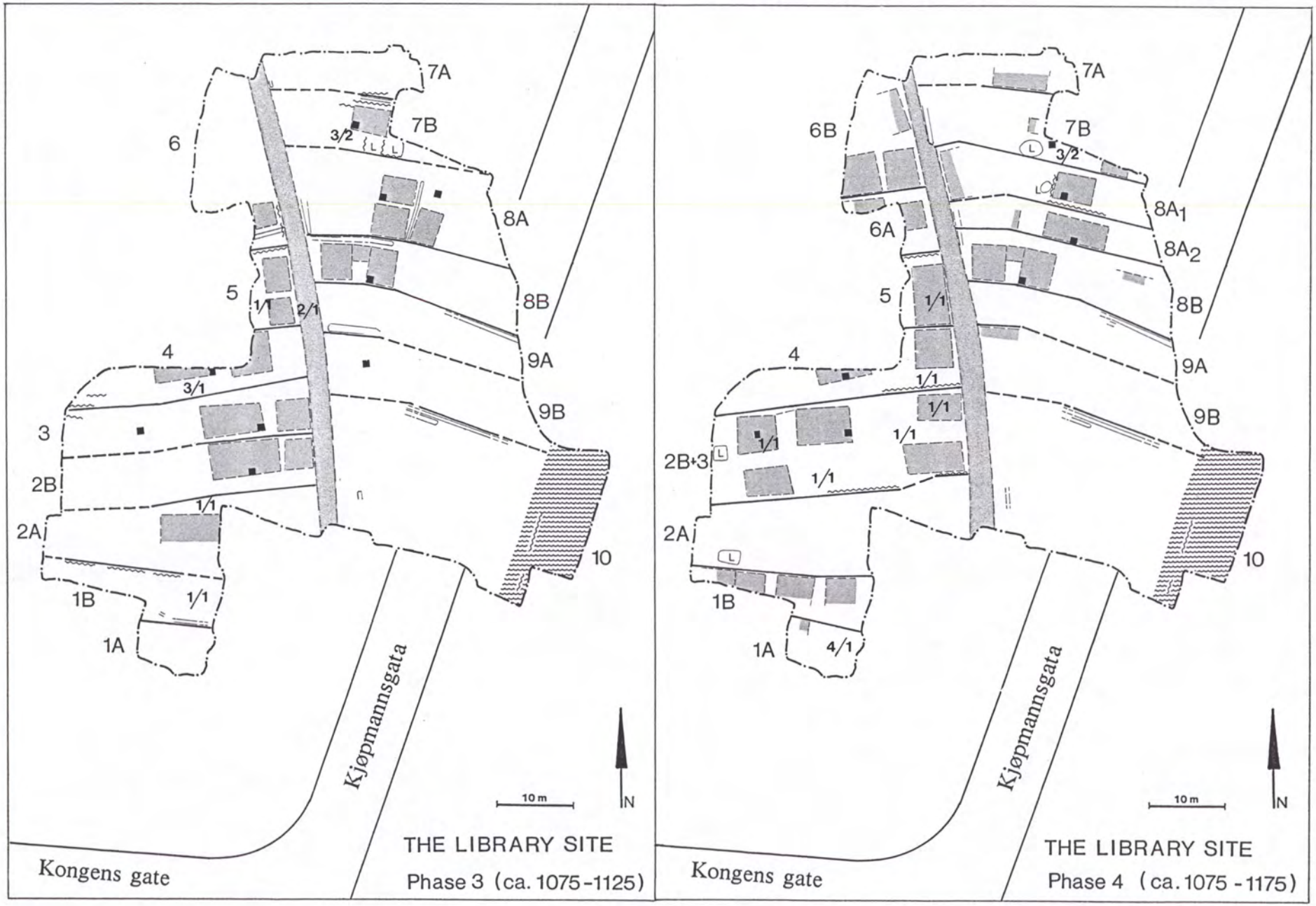


a: Brugge-type ware.



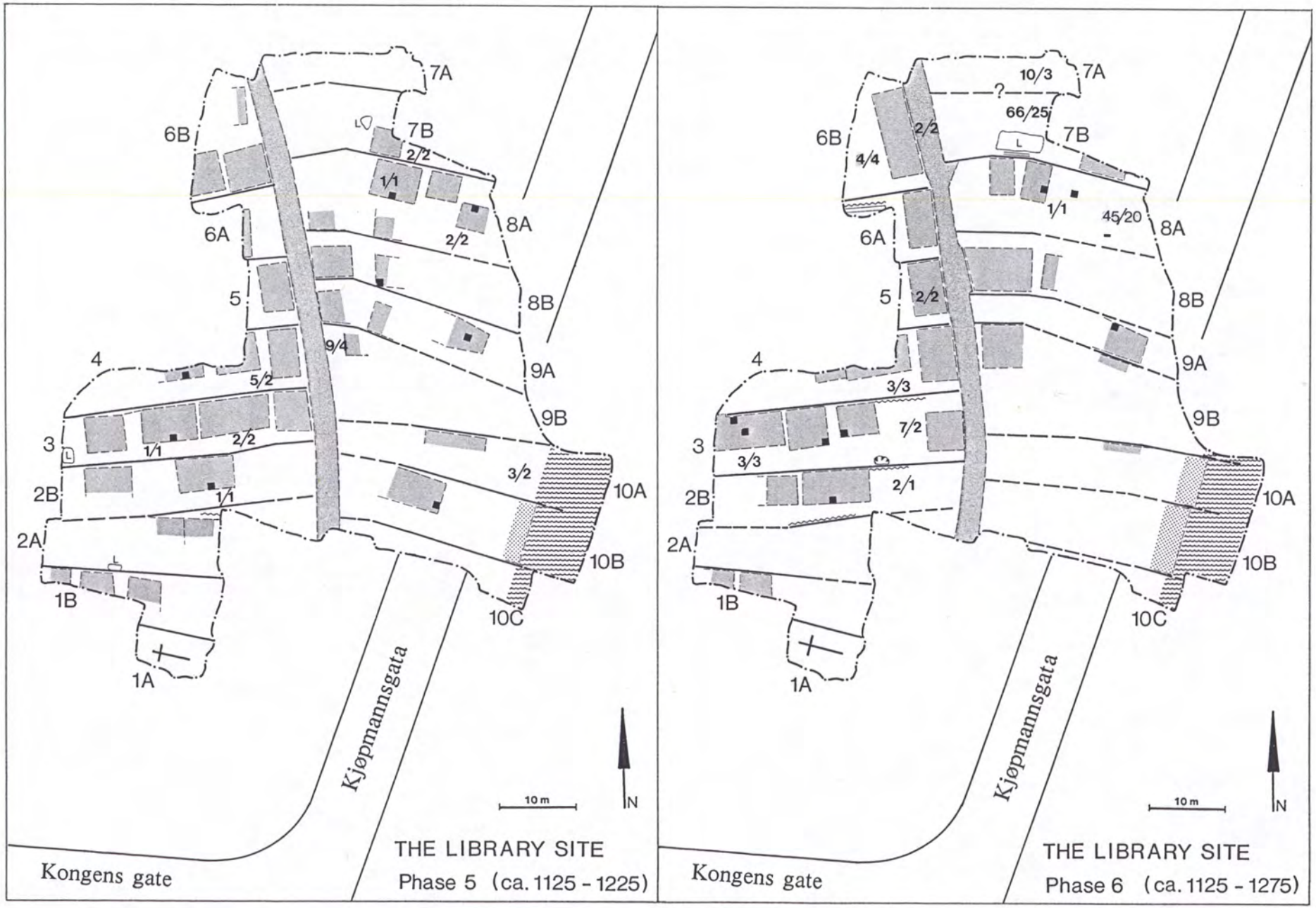
b: S. Scandinavian redware.

Fig.19 The horizontal distribution of major pottery types.



b: Phase 4.

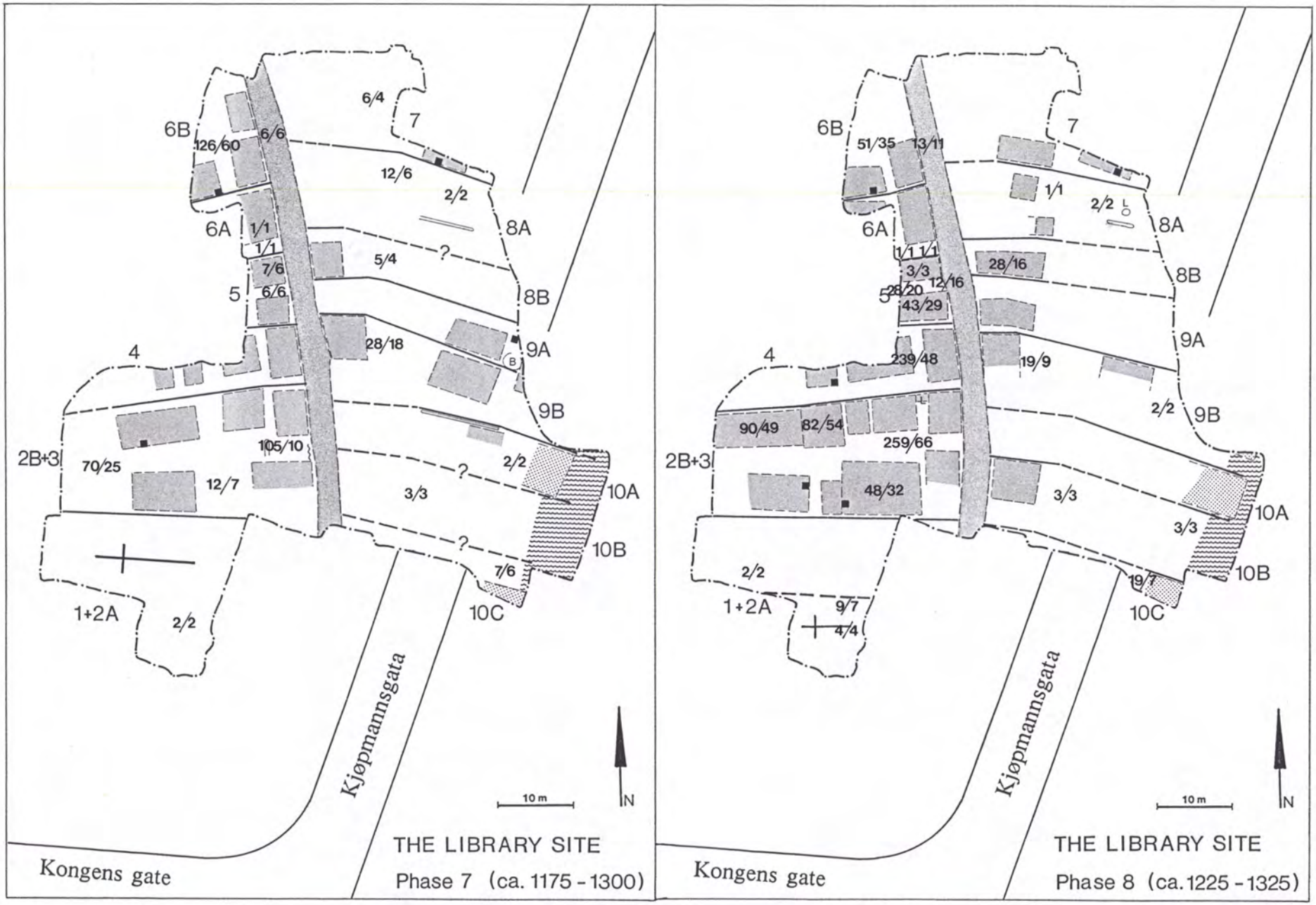
Fig.20 *The horizontal distribution of sherds of cooking-pots in relation to buildings with fireplaces.*



a: Phase 5.

b: Phase 6.

Fig.21 *The horizontal distribution of sherds of cooking-pots in relation to buildings with fireplaces.*



a: Phase 7.

Fig.22 *The horizontal distribution of sherds of cooking-pots in relation to buildings with fireplaces.*

b: Phase 8.

5. POTTERY AS EVIDENCE FOR MERCANTILE ACTIVITY

5.1 Documentary evidence for trade with pottery-producing countries

Before discussing the traded ceramics it is necessary first to outline the documented trade connections between Trondheim and the pottery-producing areas. (The documentary evidence for trade in the Middle Ages has been presented in a thesis by Petter Søholt (1980).) The majority of the documentary references concern trade with England.

The earliest reference to trade between Trondheim and England dates to 1203 when Archbishop Eirik and his successors were granted a privilege by King John, that each year they could load a ship with corn and other goods duty free. This probably predates 1203 since John refers to both Richard I and Henry II having granted the same privilege to the archbishop. It is possible that this was first granted in 1187 when Archbishop Øystein was in England. This privelege was renewed in 1222 and 1241, and was of such importance that, despite a ban on exports from England in 1226, the Archbishop of Trondheim (Nidaros) was allowed to load his ship in Kings Lynn.

The Archbishop of Trondheim appears to have imported relatively large quantities of English goods, it is documented that he had two ships in England in 1233 and 1236. He was, however, not alone in this trade: other clerics also had contacts with England, many of these with Kings Lynn. It is, however, documented that the Abbot of Nidarholm abbey was in London in 1247/48.

Another person to have contact with England was Earl Skule, Earl of Nordenfjelske Norway from 1223, who is known to have had a ship in Kings Lynn in 1224 and 1225.

Changes in the English system of charging customs dues in 1275 resulted in an increase in the documentation of the goods imported and exported. These are recorded in the *King's Rememberance Accounts* 1275-1565 and the *Enrolled Customs Accounts* for 1303-1605. As a result of this from 1303 to 1308 the cargoes of the visiting Trondheim ships are well documented, as are the ports they visited. It is clear from these that the majority of ships visited Lynn (Kings Lynn) but contacts with Ravensere, Hull and Newcastle are also documented.

Trade with other European countries is only sparingly documented. A Trondheim merchant is documented as being in St. Omer, northern France, and it is known that Archbishop Jørund was in Brügge, Flanders, with his ship in 1301.

To summarise: according to documentary sources, trade between Trondheim and England was centred on Kings Lynn, but there was also contact with the northern ports of Hull, Ravensere and Newcastle. Contacts with ports south of the Wash are limited to a single reference to London. Other European contacts were almost non-existent.

5.2 The sources of Trondheim's medieval pottery and their relative importance

Although pottery was produced in Norway during the migration period and the Viking age, as far as is known there was no indigenous pottery production in the medieval period. Consequently all the medieval pottery found on this site was imported. The first locally-produced wares occur in the late 17th century.

The sources of the pottery imported into Trondheim vary considerably with time, but are dominated by the areas bounding the North Sea: eastern England, the Low Countries and Germany. The identified sources for the medieval period are shown in fig.23 and those for the post-medieval period are shown in fig.24. The different sources and their relative importance are discussed below.

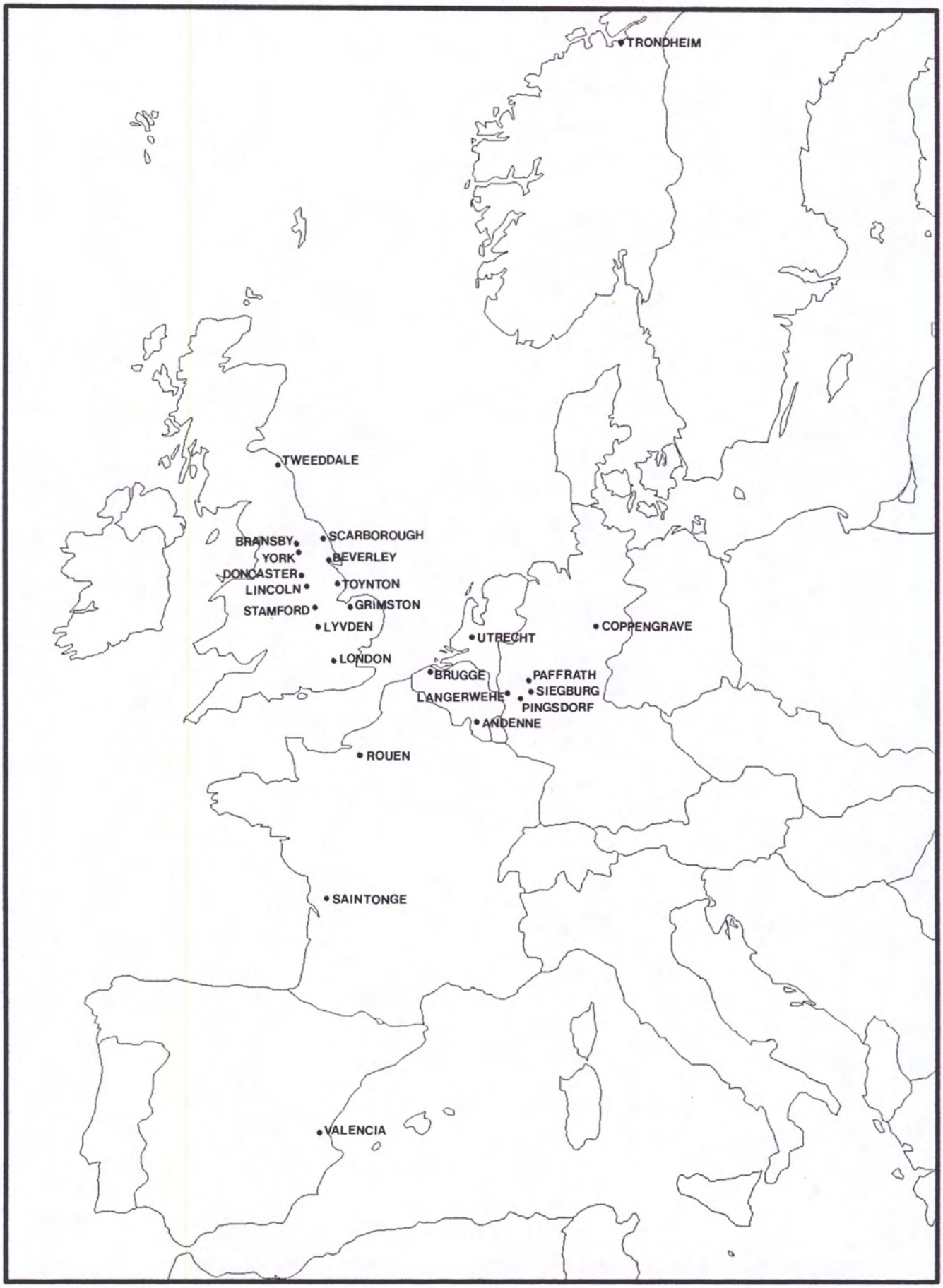


Fig.23 *The sources of medieval pottery found on the Library Site.*

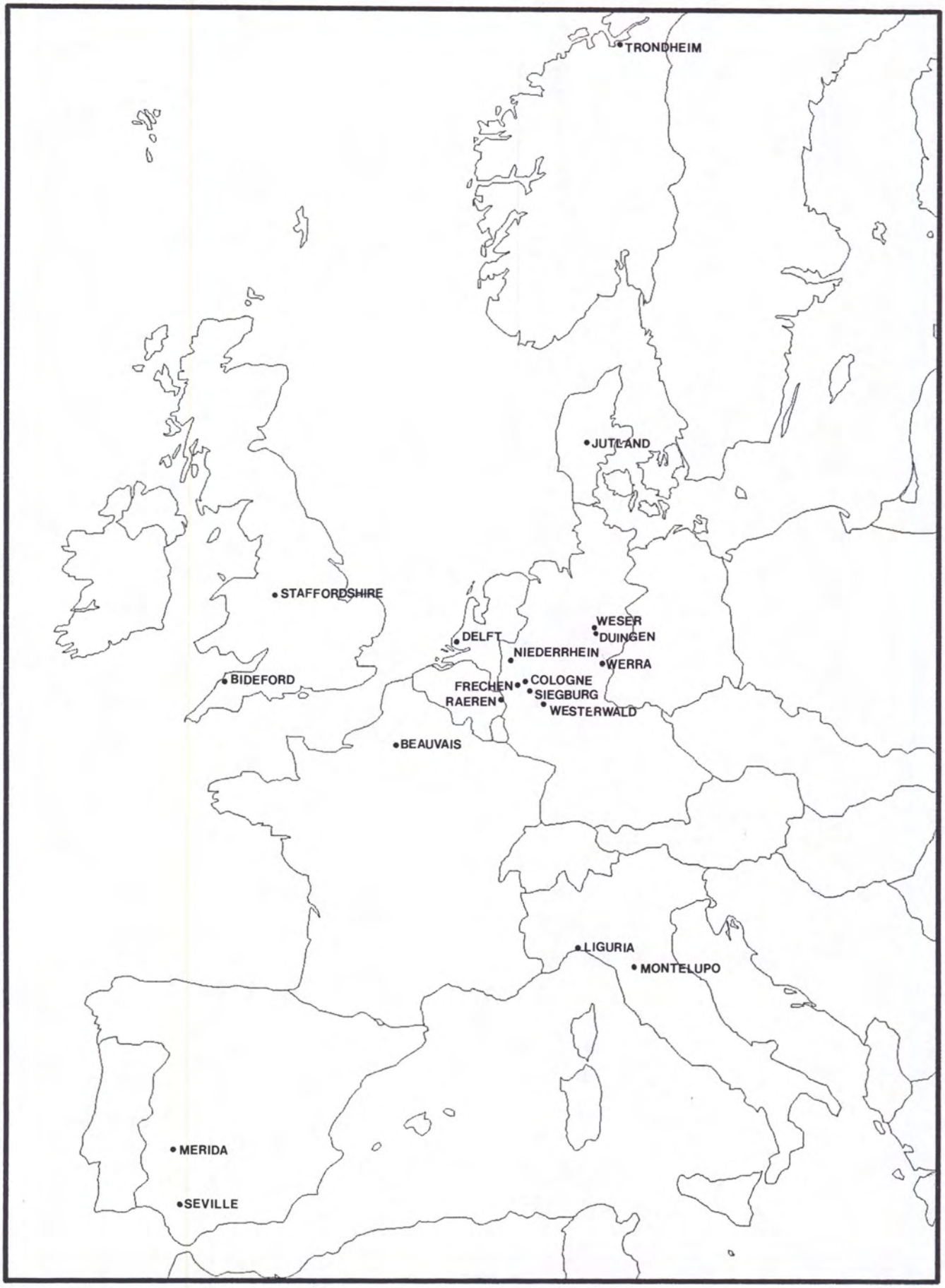


Fig.24 The sources of post-medieval pottery found on the Library Site.

England

The earliest group of English imports to reach Trondheim are the Stamford wares, the first pieces occur already in phases 2 and 3. In all, these wares account for c.22% of the English imports in the early medieval assemblage, with the developed Stamford ware accounting for c.90% of these wares. The vessel types found are typical tablewares, pitchers and jugs.

The second group of English wares are the shell-tempered wares which account for c.24% of the early medieval English imports and occur already in phase 3 but are of little importance before phase 5. The bulk of this material is comparable with the shell-tempered wares produced in the London region, but there is a small proportion which may have been produced in the East Midlands (L. Blackmore pers. comm.). One vessel (N96213) is similar to the Lincoln fine-shelled ware of late 10th or early 11th century date (J. Young pers. comm.).

Also from the London area are a group of glazed wares, represent c.31% of the early medieval English imports. They occur first in phase 6 and have their peak in phase 8. The forms include a few cooking pots, but are mainly jugs of the early rounded or early baluster type, many of which are decorated, some being copies of contemporary northern French types (Pearce et al 1985, pl.I & III and pl.V).

Another group is the so-called splashed wares, c.15% of the early medieval English imports. These may have been produced in Yorkshire but could also come from Nottingham where there appears to have been a fairly large-scale production.

The next group to arrive in Trondheim is the Scarborough ware, probably the most widely travelled of the English pottery types. This accounts for c.15% of the high medieval English imports, and consists mainly of highly decorated jugs and several aquamaniles. There are, however, fragments of a number of glazed skillets. It seems that this ware was produced very largely for export by sea: it occurs in small quantities in the immediate hinterland, but these quantities cannot compare with those found on sites along the east coast of England and Scotland. It has been suggested that this widespread distribution is due to the entrepreneurial flair of the Cistercians, on whose land it is claimed the pottery kilns were located (Farmer 1982).

Other smaller groups of Yorkshire imports include Hallgate-type wares from Doncaster (c.1.5%), Beverley-type ware (c.2.5%), Bransby-type ware (c.2.5%) and several other York products, including York brown ware (c.1.5%). All of these are represented by glazed jugs.

The largest group of English pottery is the Grimston-type ware, accounting for c.57% of the medieval English imports. It is not entirely certain how much of this material was actually produced at Grimston. Certain types, notably the face-masks can be directly paralleled, whilst others exhibit distinct similarities. It seems likely that this group also includes products from other Norfolk and East-Anglian kilns, one instance is the unglazed grey rope-twist handle (N25638) which was probably produced elsewhere (S.Jennings pers.comm.).

Another large group are the Lincolnshire products which occur mainly in phases 8 to 10, and are represented by wares from Lincoln and Toynton All Saints. Of these the latter is dominant, representing c.14% of the medieval English imports, the Lincoln wares accounting for c.3.5%.

Of minor importance as an import, but nonetheless worthy of mention, is a sherd from a jug produced in the Lyveden/Stanion region of Northamptonshire. This ware is also present in Bergen (R. Dunlop pers. comm.). As this ware is also found in Kings Lynn it is possibly only coincidental that the vessels were bought there, and does not reflect deliberate foreign trading of this ware.

The Low Countries

The first group of Low Countries pottery to reach Trondheim are the Andenne-type wares, approximately 20% of the early medieval assemblage and the only Low Countries import in this period. The vessel types appear to be pitchers of the classic Andenne type (Borremans & Warginaire, 1966, fig. 22,8 & 32,1). This indicates the existence of at least indirect contacts with the Meuse valley.

The second group, the highly decorated wares, are closely linked to the western part of the Low Countries, particularly the costal area. Kilns producing these wares are known in Kortrijk, Brugge and Harlem, but it is also probable that such wares were produced in other Flemish towns, as well as in northern France. However, important here is the fact that many of the vessels found in Trondheim are decorated with rouletting, a prominant trait found on the wasters from Brugge. These wares account for c.59% of the medieval Low Countries imports.

A small group, consisting of 3 redware dishes with slip decoration in the form of linked arcs can probably be linked to one of the kilns found at Utrecht, although they occur fairly frequently throughout Holland during the 15th century. These represent c.1% of the Low Countries imports in this period. These are seen as a continuation of the earlier highly decorated wares on forms which are not found in the Rhenish stonewares which appears to have ousted the jugs during the 14th century.

The common redwares are poorly represented during the medieval and late medieval period, but become important during the 16th and 17th centuries representing c.21.5% of the post medieval assemblage and c.53% of the Low Countries imports, and are still represented in the early 18th century. Two factors make it difficult to be definite about the exact geographic origin of these wares. Firstly, during the medieval period, the sherds are generally too small to determine what kind of vessel they come from, therefore typological evidence is lacking. Secondly, the fabric allows for a general Low countries identification, but it is not possible to link the finds to any particular kiln.

A further group of Low Countries imports is the tin-glazed earthenware. These wares occur initially in phase 11 but are most numerous in phase 12. They represent c.43% of the post-medieval Low Countries imports.

Germany

One important thing to bear in mind when discussing Rhenish imports is the fact that most of these probably reached Trondheim via Low Countries ports, after being transported down the Rhine. It is known that Dordrecht was an important market for the sale of Rhenish stonewares and Dutch earthenwares (Ellison 1981, p.130). More direct links can also be proven, in particular a sherd of green-glazed Siegburg stoneware (N70314) found on an excavation for Norge Bank, Trondheim (Reed 1986, p.42). This belongs to a particular group of products, many of which have been found in the area of ports in the Low Countries, and also among kiln waste at Utrecht from c.1400, which indicate that Siegburg jugs were re-glazed in Low Countries kilns (Hurst *et al* 1986, p.129).

The earliest relevant imports are the Paffrath-type wares, particularly ladles and cooking pots, but some sherds are from spouted pitchers (N78493) such as those found in Dowgate, London (Dunning 1960, p.75 fig.40,25). These account for approximately 90% of the early medieval German imports.

The Pingsdorf ware is only of minor importance accounting for c.10% of the early medieval German imports. All the sherds found would appear to be fragments of pitchers, in other words, they are table ware connected with drinking.

The products from Siegburg have a wide distribution throughout Europe, and there seems little doubt that this was due to the merchants of the Hanse. It seems also clear that the Siegburg potters were helped by the well-established trading of the earlier

Rhenish wares, Paffrath and Pingsdorf, around the North Sea (Stephan 1983, p.101). In this assemblage the vessels found are both in near-stoneware fabric and stoneware. They consist almost exclusively of biconical jugs, *trichterhalskruger* and *Jacobakänner*, but there are also some cups, Beckmann group VII (Beckmann 1974, p.217 fig.16), accounting for c.17% of the medieval German imports. The most common post-medieval form is the *schnelle* with moulded decoration, accounting for less than 1% of the post-medieval German imports.

Langerwehe products are more common than those from Siegburg, comprising c.41% of the medieval German imports, and in fact constituting the major group of German imports in this period. This type is represented with both proto-, near- and proper stoneware. The vessels found are jugs, Hurst types I to IV (Hurst 1977) and mugs, the latter being of the typical Raeren-type (Gaimster 1987, p.341 fig.2.4).

The earliest Raeren vessels recorded appear to be the so-called oil-pots (Hurst *et al* 1986, p.198). These are accompanied by the ubiquitous Raeren-type jugs of the late 15th to mid 16th century. During the latter half of the 16th century the Raeren products consist of large and small *Schnellen* and decorated panel jugs. The products from Raeren account for c.9% of the post-medieval German imports.

Cologne stoneware was widely traded throughout north-west Europe, but is not common here, accounting for c.1% of the post-medieval German imports. The fragmentary nature of these finds raises the difficult problem of attributing them to a specific production centre. This is due to the fact that typical early to mid 16th century Cologne forms have been found in kiln waste heaps in Frechen (Gaimster 1987, p.346). These Cologne/Frechen types are the jugs with sprigged decoration and the *Bartmänner* with both inscribed and geometric waist-bands. Other finds include fragments of a *Schnelle* with panels of decoration depicting the Madonna and child.

The most typical Frechen product is the ubiquitous *Bartmann* jug, which were exported by the million and have a very wide distribution. In this assemblage, however, they account for c.5% of the post-medieval German imports. It is interesting to note that the decline of these vessels has been attributed to the growing competition from glass bottles during the second half of the 17th century.

A further group of stonewares, those from Westerwald, account for c.14% of the post-medieval German imports. Most of the vessels represented in the assemblage are tablewares: jugs, the earliest of which resemble the typical Raeren jugs with panels and friezes, and tankards. There are, however, also a number of decorated chamber pots.

A very small group of Rhenish imports are the 16th century whitewares, which include a bird-whistle, a horse and rider and several sherds of probable Hafner polychrome jugs. All of these were probably produced in Cologne (Hurst *et al* 1986, p.229-237).

Material from other parts of Germany other than the Rhineland are limited. Red proto-stonewares were produced in the Upper Weser region (Stephan 1983, p.101), whilst red-slipped proto-stonewares with buff or grey fabrics were produced at Duingen, Coppengrave and Bengerode, in Lower Saxony, but were also produced in Langerwehe, in the Rhineland (Lüdtke 1989, p.25). It is also possible that some of the red-slipped stoneware catalogued as Langerwehe may indeed come from the Duingen/Coppengrave area. Due to the fragmentary nature of the material no attempt has been made to distinguish between these. What is, however, clear is that the miniature vessels and toy animals do come from this area (Stephan 1981, p.42-45). They account for c.3.5% of the German imports in the high medieval assemblage, and must be classed as luxury articles.

During the post-medieval period the Weser ware produced at a number of centres in the *Pottland* between the Weser and the Leine is the major import from Lower Saxony. These wares were widely exported and here account for c.15% of the post-medieval German imports. Also from this area are the Werra slipwares, produced at a number

of centres along the Werra river. These account for c.2% of the post-medieval German imports. Both these wares were exported from Bremen during the late 16th and early 17th century.

The group of other stonewares, accounting for c.14% of the post-medieval German imports, are mainly utilitarian vessels, bottles etc. No attempt has been made to pinpoint their exact origin, but many of them bear a marked resemblance to vessels produced in the *Pottland* around Duingen/Hann (cf. Stephan 1977, taf.56.2). Others may well have been produced in the Rhineland; some are almost certainly from Westerwald.

The Southern Baltic

The material believed to come from the Baltic includes cooking pots, the fabrics of which are often difficult to distinguish from one another. How common this material is in Trondheim is difficult to assess. Judging from the diagnostic pieces, rims and body sherds with decoration, this material is of limited importance. The vessels represented here appear to be of the so-called *eldre svartgods* - early blackwares - with several of the sherds having incised decoration in the form of horizontal lines, crossing wavy lines and notches. One piece (N96211) is similar to late Slavic material found in Århus and Schleswig (cf. Madsen 1971, p.86 fig.82 and Lüdtke 1985, Taf.23.8), and is also known from Wollin and Lübeck, where it is dated, on the basis of coin evidence, to the middle of the 11th century (Lüdtke 1985, p.50). A second piece (N78049) also has parallels in Schleswig (cf. Lüdtke 1985, Taf.25.6) which Lüdtke places in the *Bobziner Gruppe.*

After weighing all the available evidence Lüdtke is of the opinion that these wares were produced in the western Baltic area, possibly even around Mecklenburg (Lüdtke 1985, p.50-51).

Scandinavia

The lead-glazed redwares from south Scandinavia account for c.9% of the high medieval assemblage on this site. Although a number of production sites are known or inferred, it would appear that the unpublished kiln site at Farum Lillevang, 16km north-west of Copenhagen, has been the most productive. The kiln produced a number of jug types which were decorated with practically every type of decoration known on south Scandinavian redwares (Dunning 1968, p.51 and Bencard & Roesdahl 1972, p.10-11). A survey of two types of decoration, rosettes and alternate rows of scales and strips, found on this site and known to have been produced at Farum, shows that they are found mainly in the Kattergat area and along the northen Baltic coast of Sweden. The Farum products are sufficiently different from the material originating both from Faurholm in North Zealand (Liebgott 1975) and from Ribe (Madsen 1980) which would seem to strengthen the inference that the south Scandinavian redwares found in Trondheim do originate here.

A second group of probable Danish products to occur are the greywares. As mentioned earlier these are known to have been produced at Farum alongside the glazed wares. Because of the fragmentary nature of this material is its difficult to give exact figures as to what proportion of the greywares in the assemblage are Danish. Having said that, it should be noted that at least 50% of the wares in this assembalge are comparable with published Danish material. That will say that they represent slightly more than 0.5% of the medieval assemblage, or c.7% of the Scandinavian imports in the same period.

The next group of Danish wares to appear in Trondheim are the Jutish black burnished wares. These occur mainly in phase 12 and account for c.9% of the south Scandinavian imports in the post-medieval assemblage. The production of these vessels was a sideline to the uneconomical farming in the area, and maybe classed as a sort of "cottage industry", produced not only for own use but also for sale. The potters usually sold their wares at the market and the wider distribution was done by skippers who bought

the pots and took them with them on their voyage, selling them at their ports of call (Augustsson 1985, p.78).

The largest, and perhaps the most difficult group of Scandinavian wares are the post-medieval lead-glazed redwares. These account for c.19% of the post-medieval assemblage. These are found in relatively large quantities on most post-medieval sites throughout Scandinavia, the most common form being the tripod-pipkin (*stjertpotte*), which as a result are believed by many to be locally produced in the area they are found (Augustsson 1985, p.91-93). Wasters have been found in a number of areas, as mentioned previously, even in Trondheim (Fulks 1988). It is therefore not really possible to say anything definite about the sources of the material found in this assemblage.

France

French imports are not common in Trondheim. They account for c.1.5% of the medieval assemblage, with the northern French material dominating.

Green-glazed jugs from northern France form the largest group of French imports, c.70%. These occur first in phase 7, but are more numerous in phases 8 and 9. It is difficult to attribute these pieces to any definite production centre, but similarities in fabric between these and the Rouen ware suggest that a least 22% of them have a source in the Rouen area.

The typical red-slip decorated Rouen jugs occur primarily in phases 8 and 9, although there is one sherd from phase 7. These account for c.15% of the medieval French imports.

Two types of Saintonge ware are found here: polychrome and green-glazed, together accounting for c.12% of the medieval French imports. The polychrome Saintonge is represented by a small rim sherd found in a residual context. The green-glaze wares are mainly jugs although there are rim/spout fragments of two *pégaux* (pitchers). Half the material is residual, but the stratified material occurs in phase 9. These wares are often regarded as being connected with the great wine trade of Gascony which was exported through Saintes. Recent work in this area has revealed a port on the river Charente at Port Berteau, only a few kilometres west of the kiln sites, where a total of 5,255 complete or near complete vessels were recovered from the river bed (Chapelot 1983, p.51-52).

Post-medieval French imports are almost non-existent, the only piece to be definitely identified being a bowl in Beauvais single slip sgrafitto. In addition to this there are several sherds which may be from 16th century bichrome glazed Beauvais vessels. These are only small sherds and could possibly be German white ware.

Spain

Late medieval Spanish imports are not numerous in Trondheim (Reed 1982). In this assemblage there are four vessels of Valencian lustreware. which include fragments of a dish (N61773), an albarello (N86969) and the base of a *tazza* or jug (N74877) (Hurst *et al* 1986, p.48 fig. 20.52) in mature Valencian lustreware, and a bowl in late Valencian lustreware (N16332) found in phase 10/11. There is also a large part of a secondary burnt tin-glazed alberello with a foot-ring base (N16443) found in phase 9/10, which is probably Spanish (Hurst *et al* 1986, p.42). The trade in these wares was controlled by Ligurian Merchants from Genoa (Hurst *et al* 1986, p.42).

During the post-medieval period Spanish coarsewares begin to arrive in Trondheim, these are primarily the Seville olive jars. Two almost complete vessels with a pointed base (cf. Hurst *et al* 1986, p.65 fig 29.80) were found in two cellars, one destroyed in the fire of 1681 and the other destroyed either in 1681 or 1708. The fabric of these is a lot finer than the typical olive jar fabrics and it is possible that these are Merida-type ware, exported through Lisbon in Portugal and not through Seville (Hurst *et al*

1986, p.67). Martin (1979, p.283-284) has suggested that the varied shape and size of these olive jars many indicate different uses. If he is correct then these two jars were probably used for the transportation of olive oil.

Portugal

Merida-type ware from the Alentejo in Portugal occur primarily during the post-medieval period. However, one sherd from an early 14th century context has been tentatively identified as Merida ware (J. Hurst pers. comm.). All the sherds found appear to be fragments of the classic standing costrel form (Hurst 1982, p.104 fig.11.1), which Hurst (1982, p.101) presumes must have come as containers rather than objects for use. These wares are believed to have been exported from Lisbon.

Italy

Probably the earliest import is a fragment of a jug in archaic maiolica (N87720), this was made in relatively small quantities in most Tuscan towns (Blake 1981, p.101).

A single Montelupo polychrome maiolica dish with net pattern (N63943) was found in a cellar (K533) probably backfilled in the early 17th century. It seems that Montelupo during the 16th century gained a monopoly on the polychrome maiolica trade around the Mediterranean, up into the North Sea area and even across to America (Hurst *et al* 1986, p.12).

From the same cellar (K533) come pieces of two dishes of Ligurian *berettino* (N63073 & N63091). These are known to have been produced at Genoa, Albicola and Savona and were widely traded. Examples are common in the Netherlands (Hurst *et al* 1986, p.26), something which must certainly be taken into consideration when one knows the trading links which existed between Trondheim and the Low Countries.

Other Mediterranean wares

Possibly the earliest Mediterranean imports are the rim sherds of two bowls with a distinctive golden brown glaze. One of these was found in phase 2 (N37475), the second is from a disturbed context in phase 7 (N62103). Parallels to these have been found in York, Beverley, Lincoln, Ipswich and London. Two almost complete bowls from Ipswich and bowl fragments from Lincoln have stamped decoration. The vessels appear to be of 11th century date; one vitrified rim sherd, wrongly identified as Lincoln Sandy ware (cf. Gilmour 1988, fig.30 no.43) (J. Young pers. comm.), is dated to c.1000/10-1040. These were tentatively identified as being of eastern Mediterrarean, possibly even Byzantine, origin.

Possibly the most distinctive piece of Mediteranean ware is the rim of a bowl with a blue internal and external glaze (N55054). It seems probable that this blue glazed vessel comes from Syria, Egypt or the eastern Mediterranen in general (Hurst 1968, p.199). Unfortunately the piece is probably residual in a 17th century context.

5.3 Fluctuations in the pottery imports to Trondheim.

Seriograph fig.25A shows the percentage of imports from the different areas for each main phase. The percentages are based on the numbers of sherds for which it has been possible to identify a source. Sherds for which it has not been able to establish a provinence are not included. One of the largest groups of these unprovenanced sherds is the cooking pots, many of which may be north German or Scandinavian and the figures for these area are therefore under-represented. The actual numbers of sherds used in each phase are shown at the end of the seriograph and are given as a percentage of the total number of sherds from each phase. As it stands this seriograph includes all the intrusive and residual sherds which were found, and does not therefore give a realistic picture of the imports from the different areas in each phase.

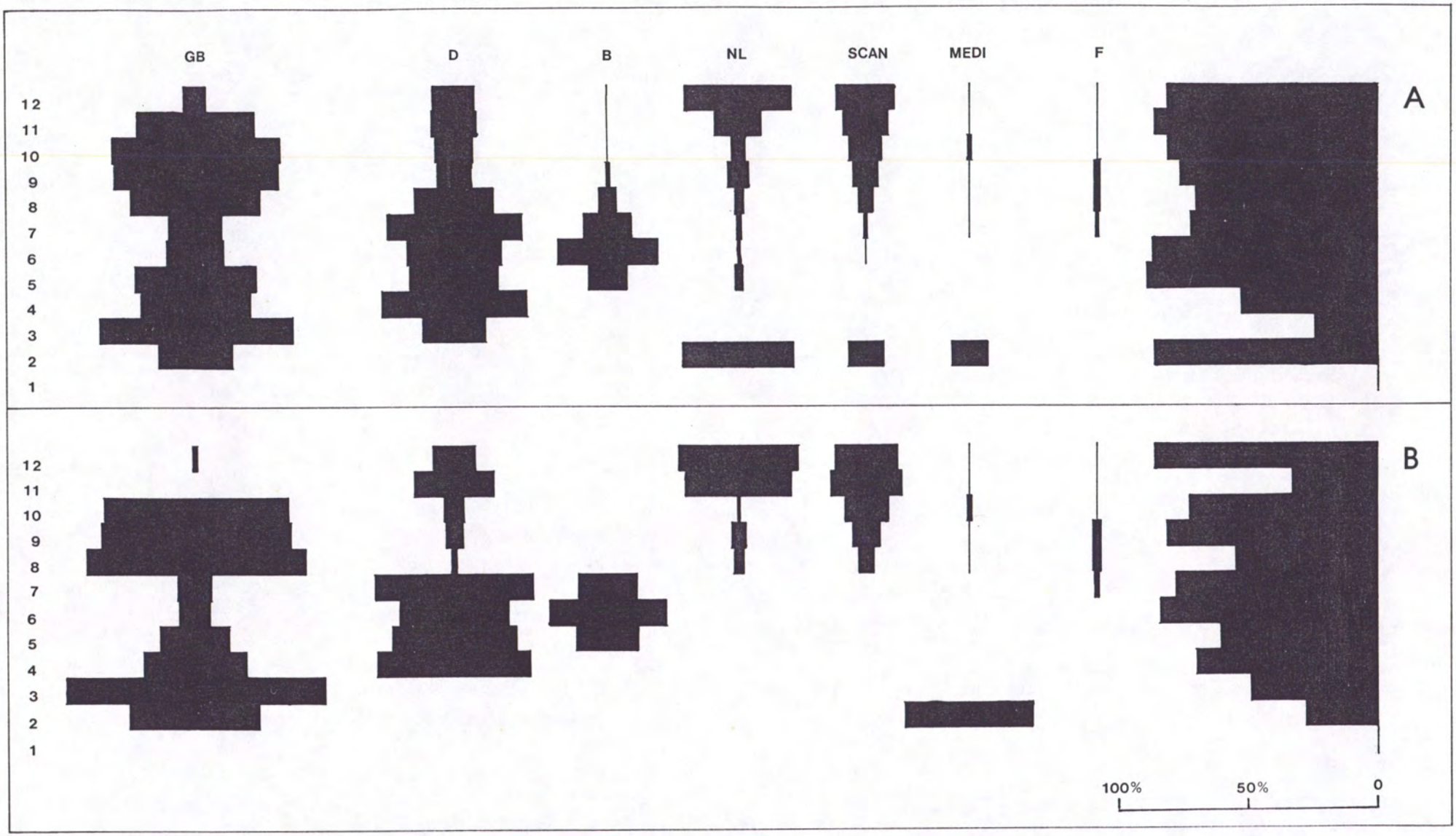


Fig.25 *Seriographs comparing proportions of pottery from different countries of origin per phase:*
A: percentage of all types of pottery
B: percentage of probable contemporary wares, excluding known residual material.

In seriograph fig.25B an attempt has been made to remove these intrusive and residual elements, in order to give a more correct picture of the situation. There are, however, several short-comings with this method:

Firstly, when dealing with pottery types which are fairly long-lived, it is difficult to be certain which sherds are residual when they occur in phases towards the end of the time range of a particular types. Consequently over-caution with these types has probably led to an over-representation in the respective phases, this being particularly true for the English imports in phase 10 which may be grossly over-represented.

Secondly, by removing the residual and intrusive elements from the seriograph the actual numbers of imports from each area is reduced. These elements are probably derived from the phases covering their period of currency and are consequently important with regards to the total number of imports from these area.

Thirdly, a number of important imports only exist as residual sherds, with the consequence that when these sherds are removed from the seriograph these wares will not be represented at all.

There is, however, one major draw-back with this method of presentation. Pottery was traded for an number of reasons, and by various means: it could be traded for its own sake for sale; it could be brought by traders for their own use in preparing their own meals etc.; it might be brought as an accoutrement to, for example, the wine trade; or it might be brought simply as a souvenir. In none of these cases are the pottery imports dependent on the local development patterns represented by the differnt building phases on a site. These phases merely indicate at which point in time in the local chronology a particular pottery type first occurs, and the approximate length of time that type was in favour. It is highly likely that when a building or group of buildings were replaced the inhabitants took their possessions with them to the new house, as indeed we do today. These possessions would almost certainly include pottery vessels imported sometime before. Similarly, a merchant importing pottery would almost certainly have a stock of vessels (documentary evidence indicate that pottery vessels were sold by the hundred), possibly of different types, which would be sold after demand. This demand would pressumably be greater after some catastrophe, such as a fire, when a number of people may have lost most, if not all of their possessions. Also when new products arrived on the market it is quite possible, as today, that the merchant would place his old stock on special offer. This means, for instance, that pottery imported towards the end of phase 8 may well still be on sale during the beginning of phase 9, possibly after contacts with some of the actual areas had ceased.

Another major problem with relating the pottery imports to the phases is the danger of circular argumentation, inasmuch as the pottery was one of the major contributors to the preliminary dating of the main phases (Reed 1988, p.163-167). The proposed dates were derived from an evaluation of the occurrence of the leading artifact types and their correlation within the individual area phases. With regards to the pottery the dates suggested were based on the production periods of the different types present in each phase. No account was taken, however, of the proportionate quantities of the different types. Due to the problems of residuality etc. which have since become apparent (p.13), it is obvious that many of these dates should be adjusted particularly in the light of the fact that many of the sherds used may indeed be classed as *type fossils* and are therefore irrelevant to the dating. The dangers should, therefore, be quite clear: the pottery is used to date the phases which in turn are used to date the fluctuations in the trade in pottery from different areas.

Despite these draw-backs the seriographs are included here in order to facilitate a comparison with other artifact groups which have been or will be presented in a similar manner.

It is obvious that in order to examine the fluctuations in the pottery imports they must be put into some kind of chronological framework. In order to do this, three chronological periods have been defined:

> **Period 1 (c.1000-1250)** Production and distribution of the early medieval pottery types Stamford, Paffrath, Pingsdorf and Andenne cease during the first half of the 13th century.
> **Period 2 (c.1250-1500)** From c.1250 the production of the characteristic high medieval pottery types, e.g. Scarborough and Grimston, begins.
> **Period 3 (c.1500-) Post-medieval** From c.1500 the production of salt-glazed stonewares begins in Raeren.

All wares were assigned to a period: it was assumed that each type had its peak within the given period.

The results of this, the proportional distribution of the pottery by countries of origin and period, is presented in fig.26.

Period 1 (c.1000 - 1250)
In this period the products from the Rhineland dominate, with England and the Low Countries having similar quantities. One unknown factor in this period is the cooking pots accounting for c.9% of the assemblage. These have not been provenanced, but it is highly likely that they come from northern Germany, the southern Baltic (see p.70) and possibly Denmark.

During period 1 c.22% of the pottery imports are from England. Of these c.2% are 11th century in date, the rest can be dated to the second half of the 12th century. This material comprises 11 glazed Stamford ware vessels, mostly pitchers, and one shell-tempered ware lamp. To what extent these finds represent trade as such is difficult to ascertain. Stamford was one of the Five Boroughs of the Danelaw (Kilmurry 1980, p.146), so it is possible that these finds simply reflect one of the spheres of contact the Norwegian Vikings had.

During the 12th century the Stamford ware products continue to appear, these developed Stamford wares accounting for c.4% of the material from this period. Several new contact areas within England develop during this period, the most dominant being the London region with c.12% of the imports in this period. Of these approximately half are glazed jugs, the rest are shell-tempered cooking pots. The second area is slightly more diffuse. The imports are the 'splashed wares' accounting for c.3% of the imports in this period. As mentioned previously there are a number of production centres known for these wares, all of which, however, had access to the North Sea via the Humber estuary: Nottingham via the Trent, York via the Ouse and Doncaster via the Don.

A further small group consists of the Scottish East Coast white gritty wares, which occur first in phase 6 and have a marked peak in phase 8. They represent c.2% of this assemblage. These were traded from Tweeddale and are found in a number of Scottish east coast burghs, and they have also reportedly been found in Bergen (Haggerty 1984, p.396).

The largest group of imports from this period have undoubtably reached Trondheim via the Low Countries ports after coming down the Meuse and Rhine. These wares are the Andenne-type products, Rhenish Pingsdorf-type ware and Paffrath-type ware. The Andenne wares account for c.20% of the material from this period while the Rhenish products account for a total of c.49%, of which the Pingsdorf wares represent c.5% and the Paffrath wares c.44%.

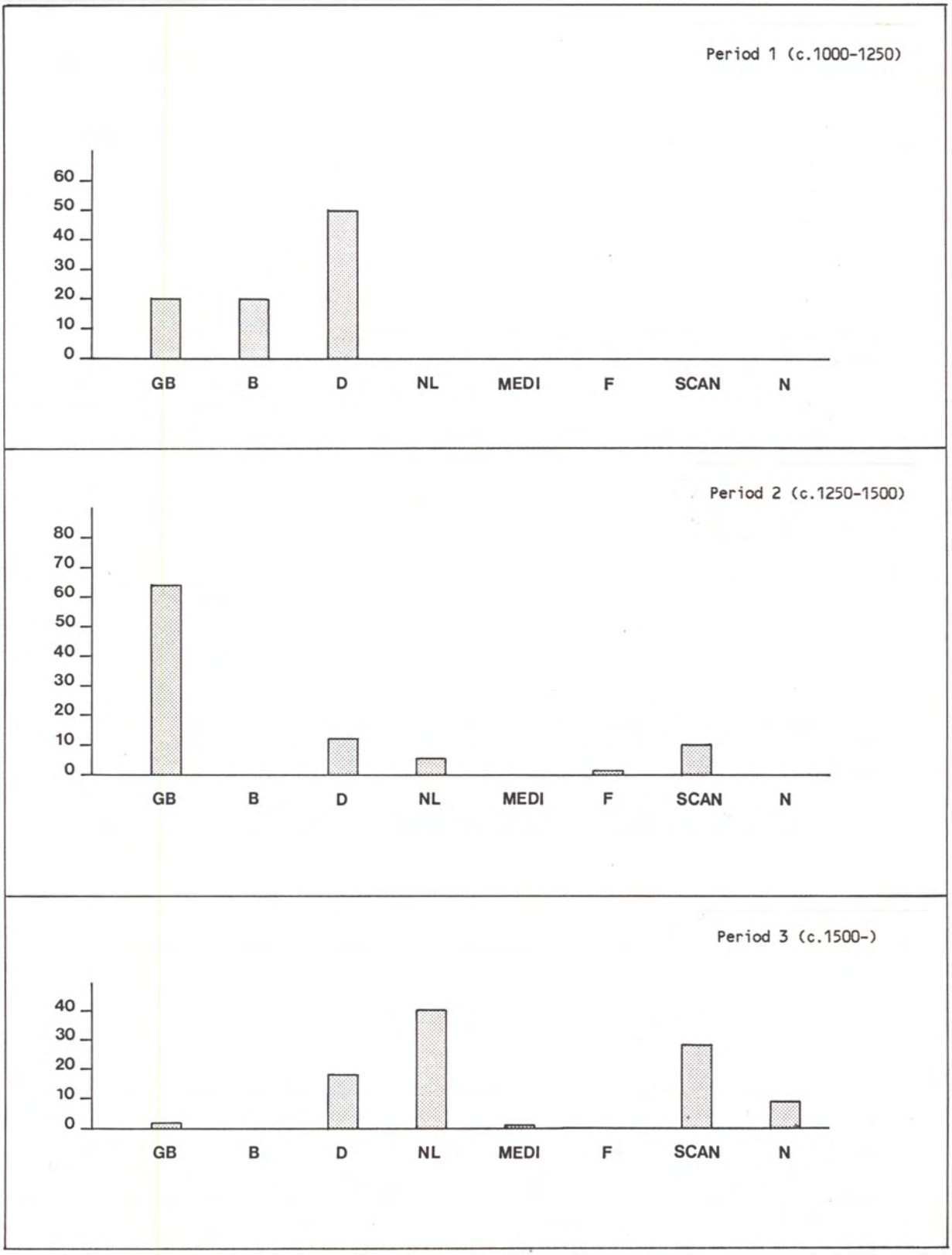


Fig.26 *The proportional distribution of the pottery by country of origin for periods 1 to 3.*

One very small 11th century group (2 vessels) is thought to be of eastern Mediterranean origin. If this identification is correct, then there would seem to be little doubt that these must represent souvenirs brought back by members of Harald Hardråde's army from Constantinople where, up to c.1041, they had formed the Varangian Guard, the bodyguard of the Byzantine emperor.

Period 2 (c.1250 - 1500)
During this period we see the dominance of the English products, the German products coming in second place. New sources in this period include France and South Scandinavia. As with period 1 the cooking pots have not been provenanced; they account for c.7% and are probably from the same source areas as suggested for period 1.

The dominance of the English material, c.61%, in this period is the most obvious difference from the previous period. What makes this dominance even more remarkable is the fact that the English material is mainly concentrated in the first hundred years of this period.

The largest single group of imports from any period is the Grimston-type ware, which accounts for c.35% of the pottery in this period. This dominance must clealy be seen in the light of the various documentary sources which show that most ships from Trondheim visited Kings Lynn, on the Wash, the port through which the Grimston wares must have been exported. On account of the extremely large quantities of Grimston ware found in Trondheim, Bergen (cf. Lüdtke 1989, Diag 28), Tønsberg (Reed 1990, forthcoming) and other towns in Norway can it be assumed that these were made in large quantities for the Scandinavian market?

The second largest group of English wares are those produced in Yorkshire, totalling c.14% of the assemblage in this period. Of these Scarborough ware is dominant with c.9% of the assemblage. The Hallgate wares from Doncaster represent c.1%, the Brandsby-type wares c.1.5%, the Beverley-type wares c.1.5% and diverse other York wares total c.1% of the assemblage. It is highly likely that the Hallgate, Brandsby and Beverley wares have been exported through the Humber ports of Hedon and later Hull: Hallgate ware is found on excavations in Hedon, while Brandsby and Beverley wares are common on excavations in Hull.

Another large group of English imports are those from Linclonshire, representing c.11.5% of the assemblage in this period. The largest group here are the products from Toynton All Saints with c.9%, while the Lincoln-type wares account for c.2.5%. These wares occur primarily in phases 8 and 9. Both wares are presumably exported through the port of Boston on the north side of the Wash, the Lincoln products arriving down the River Witham, while the Toynton products were transported overland by cart (J. Le Patourel pers. comm.).

The Low Countries imports represent c.5% of the medieval assemblage, of which the highly decorated Brugge-type ware is the largest group accounting for approximately 3% of the assemblage. These decorated wares continue on a small scale in the 15th and 16th centuries with the slip- and sgraffito-decorated dishes. The common red- and greywares are of minor importance in this period. In conclusion it can be seen that the Low Countries imports must be considered as luxury wares, belonging on the table. The highly decorated wares, in particular, are thought to belong in the houses of the more or less well-to-do (Verhaeghe 1982, p.169).

German imports represent c.12% of the assemblage in this period, the earliest finds occur in phase 8 and consist of proto- and near-stonewares together with some Duingen-type miniature vessels.

The Duingen-type miniatures occur first in phase 8 but are more numerous in phase 9, they account for less than 0.5% of the assemblage.

The beginning of fully-developed Siegburg stoneware is much discussed (for brief summary of evidence see Lüdtke 1989, p.33); it would, however, appear that it occurs first c.1300. Here, this material accounts for c.2% of the assemblage, but among the near-stonewares are a number of Siegburg products, and when these are taken into consideration imports, from Siegburg account for a little over 2,5%. Siegburg products occur from phase 9.

Red-slipped proto- and near-sonewares are thought to have been produced from the late 13th century onwards, and there are numerous examples found as containers for coin hoards from the 14th and 15th centuries (Lüdtke 1989, p.33). Together with the red-slipped stonewares and other Langerwehe products these account for c.5% of the assemblage and occur first in phase 9. The origins of these wares has been discussed previously (p.69).

French imports during this period account for c.1.5% of the assemblage, but it is obvious that those from northern French dominate, acounting for 1.25% of the assemblage. It is interesting to note that in Bergen the French imports also account for c.1.5% of the assemblage. There, however, the Saintonge products dominate with slightly more than 1% (Lüdtke 1989, p.100-1 diag.25 & 26). The N. French green-glazed wares occur first in phase 7 but are at a peak in phase 9, and the Rouen-type wares peak in phase 8. This is consistent with the finds from London where these wares occur from the late 12th century to the mid-13th century, but continue to occur in the late 13th century, but in smaller quantities (Vince 1985, p.47-48 & 54). The Saintonge wares occur in phase 9 which again is consistent with the finds from London where these wares occur from the late 13th century and into the mid 14th century (Vince 1985, p.51-54 & 59).

Period 3 (1500-) Post-medieval.
During this period there is a further swing from the dominance of the English imports to a dominance of the Low Countries imports. The southern Scandinavian wares are in second place followed by the German wares, while the English wares are of only minor importance. One new source during this period is the locally-produced wares.

The English imports which were at a peak in the previous period now represent slightly less than 1.5% of the assemblage in this period. Over 70% of the finds are fine tablewares from the Staffordshire area produced during the 18th century. Some of the black-glazed wares may be 17th century, the bulk, however, are 18th century. Interesting here is the fact that these finds represent a shift in the trading connections from the east to the west coast of England. English clay pipe found on this site were produced at Chester (Janet Rutter pers.comm.) and Bristol, whilst pipes found elsewhere in the town were produced in the Liverpool area, again indicating connections with western England. It is highly probable that many of the Staffordshire products were shipped out of Liverpool.

The German imports in this period occur predominantly in the 16th and 17th centuries but do continue into the 18th century with the Westerwald stoneware and Lower Rhine slipwares. They account for c.14% of the post-medieval assemblage. Of the finds with readily identifiable sources (c.50%) the bulk, c.64%, comes from the Rhineland, while the rest come from Lower Saxony. The stonewares in the early part of this period are mainly tablewares, jugs and beakers, but a small group of Raeren vessels, the miniature standing costrels, are believed to have held oil used for spinning (Hurst *et al* 1986, p.198 fig.94.308). In this assemblage most of them are found in or around the churchyard to the south of the site, indeed numbers of them have been found in connection with churches in central and northern Norway and are believed to be connected with pilgrims, presumably being used for carrying small quantities of consecrated water or oil.

The dominant region in this period is the Low Countries, accounting for c.41% of the imports. Of these approximately 43% are tablewares the rest are either storage or cooking-vessels. The tablewares are represented mainly by the tin-glazed wares. These

are mostly products from Delft and are doubtlessly exported from Rotterdam. The common redwares were produced over such a large area of Holland that it is difficult to pinpoint the origin of individual pieces or to say exactly where they were shipped from. It is, however, known that there was an important market at Dordrecht for the sale of both redwares and Rhenish stonewares (Ellison 1981, p.130).

In connection with the imports from the Low Countries it is highly likely that the small group of Chinese porcelain, c.2% of the post medieval assemblage, probably came to Trondheim via Holland. Millions of porcelain items were imported to Europe during the 17th and 18th century on ships belonging to the *Vereenigde Oostindische Companie* (Dutch East India Company).

Similarly with regard to the Italian, Spanish and Portugese imports in this period, they occur in such small quantities (they total less than 0.5% of the post-medieval assemblage) that it is highly unlikely that there was any direct contact with these areas. Based on the quantity of these wares found in the Low Countries it seems fair to assume that also these wares reflect the trade connections Trondheim had with this area.

6. SUMMARY

6.1 The management of rubbish

It seems clear from the ceramic material and the lack of rubbish pits on this site that some form of rubbish management existed in Trondheim from the earliest period. It is obvious that most of the properties on this site have had some form of temporary storage of small quantities of rubbish before it was removed from the living area. Whether this removal was done by the inhabitants or whether it was in a more organised form, remains uncertain. This seems to be corroborated by similar situations on other excavations within the town. Natural features such as the inlets to the south of the site and that further north (Christophersen *et al* 1989, fig. 8a & 9a) would seem to be ideal places to dump rubbish as they became isolated from the river through landrise and began to dry out, similarly the river would be a natural dumping ground.

An amendment of 1313 to a local bylaw (NGL III, nr.56) forbids the dumping of rubbish in the river, particular reference is made to shoemakers who were not allowed to throw bark from the tanneries into the river. The fact that this clause is written into the town law suggests that the dumping of rubbish here has been practiced prior to this date. Excavations along the river bank on this site, however, do not confirm this, it must be remembered, however, that there was a well developed waterfront in this area from the 12th century and it is unlikely, therefore, that rubbish would have been dumped infront of this. In connection with this it is interesting to note that in a commentary to the new town plan of 1681 the architect, Johan Caspar von Cicignon, writes that the rivermouth needs to be artificially narrowed to prevent the deposition of sand and stones which would quickly make the habour unusable (Lysaker 1981, p.228). Obviously silting was a recognised problem which would cause the local authorities to be very restrictive with regard to the dumping of rubbish in the river. Excavations in and around the inlets to the north and south of the site have not prodvided sufficient evidence to confirm their use as rubbish dumps.

Whatever happened to it afterwards, the rubbish was at least removed from the built-up area. During the 13th century, at least, it would also appear to have been dumped in such a way that it was retrievable, as indicated by the fact that some areas of the site appear to have been filled in or levelled using redeposited rubbish.

Whether there are any chronological differences in the management of rubbish is not clear. Similarly the extent of the use of redeposited rubbish for levelling etc. is not clear. Is it, as suggested here, a phenomenon of the late 13th century, or was it something which took place during all periods? Similarly, is it something which was common practice throughout the town, or was it localised to a certain area or even to a number of properties? These questions cannot be answered here, but comparative studies with other excavations within the town may shed more light on this.

6.2 Pottery as evidence for social differences and change

As evidence for differences in or changes in the standard of living pottery has a somewhat limited value. This is because it is difficult to assess its ratio to vessels in other materials. However, a number of pottery vessels, particularly jugs and aquamaniles, have distinct metal prototypes. This would seem to suggest a rising standard of living, with the poorer population copying the style of their betters, albeit in what may be considered as an inferior material. This copying does not, however, stop here for in this assemblage there are several examples of copies of more exotic pottery types, amongst others the 12th century London copy of a Rouen jug.

Mention has been made of the question of whether or not fine-wares reflect high-status households (p.52). Certainly the only pottery type which is found on all medieval sites in Trondheim, and pressumably, therefore, at all levels of society is the Grimston-type ware. On the basis of this, it should be clear that in order to resolve the problem

of which levels of society lived where and which levels of society were using which imports, a comparative analysis of a variety of sites within different parts of the town should be undertaken. This should demonstrate what differences, if any, existed between different status households.

In connection with this comparative study the post-medieval groups should not be forgotten. Many of these 17th and 18th century groups contain dated vessels which help to tie the deposits to documented property owners of known social status. Used retrospectively the information gleaned from these groups may help us to better our understanding of the medieval groups.

6.3 Pottery as an indicator of trade

It is clear from the extant documentary sources that pottery shipments must have been so insignificant in terms of bulk or value that they were rarely recorded. Further it is possible that pottery formed a very insignificant part of a much more important trade in perishable goods. If we argue that pottery forms an incidental adjunct to trade in other commodities, then how well does it reflect those commercial links Trondheim had?

The reconstruction of the medieval trade routes to Trondheim using both documentary and archaeological sources (particularly the pottery) has been attempted by Søholt (1980). The sources of most of the pottery found on this site have been identified and their relative proportions measured (p.64-72). This can be summarized as follows: during the period c.1000-1250 products from the Rhineland dominate, with English and Low Countries products following with almost equal quantities. In period 2, c.1250-1500, English products dominate with a total of c.61% of the pottery, German products come in second place followed by those from the Low Countries. New sources in this period include France and southern Scandinavia. During the post-medieval period we find a dominance of Low Countries imports followed by those from southern Scandinavia and Germany, the English wares represent only a minor trade. However, using the data from one particular site to reconstruct the history and development of trade links is liable to produce misleading results. The reconstruction of trade links is therefore a topic which demands the use of material from as many excavations as possible within the town in order to provide a coherent view.

To study the trade in the pottery found in Trondheim it is not only necessary to examine material found in Bergen and along the west coast of Norway, but also all over western Europe and beyond. By comparing the quantities of any particular type of pottery found in Trondheim with that from other settlements it should be possible to reveal trade routes and trans-shipment points. The latter, in particular, is worth stressing because it means that finds of particular pottery types do not necessarily indicate direct contact with their country of origin, but merely contact with one of the trans-shipment ports. This is easily recognised in this assemblage, where the Spanish and Italian pottery types were probably trans-shipped from one of the Low Countries ports. We do not, however, need to look so far afield, Bergen may well have acted as a trans-shipments point for many of the pottery types found in Trondheim. This can only be resolved by a comparative study of material from Trondheim, Bergen and other relevant sites along the west coast.

APPENDIX 1 - 2

APPENDIX 1 FABRICS BY PHASE - THE INCIDENCE OF TYPES BASED ON THE NUMBER OF SHERDS.

HFase	1	2	3	4	5	6	7	8	9	10	11	12	Total
Ande					12	128	113	130	26	2	7	20	438
BEAU												2	2
blgr				3	20	105	242	470	57	8	27	46	978
Bran							2	27	36	5	40	20	130
Brug		2				3	6	22	84	19	57	54	247
CHPO							1				2	377	380
COLS									1		1	21	23
C.P.			9	6	6	31	151	413	138	13	37	51	855
CREA					1							40	41
devs					1	3	14	41	21	2	2	11	95
DIVR		1						1	5		11	508	526
DIVW						1		1	3		1	87	93
DUIN												7	7
DUSC								1	1			4	6
DUSL									5		2	215	222
DUTR		1			2	1	4	15	57	32	273	3858	4243
DUTW								1	3		7	392	403
ENGS												1	1
EUPO												3	3
FINW			1						1			978	980
FREC					1				4	2	3	126	136
GERR			1				4	16	79	22	193	3405	3720
GERW								4	7		31	692	734
GESL						1	1		2	7	11	516	538
GGRW								44	21	4	5	4	78
grey								23	37	16	20	21	117
GROW						1	1	1	18	11	35	16	83
Grim		1	1	1	19	24	58	292	754	457	526	928	3061
HalA								27	14	5	8	11	65
HalB							4	13	19	1	5	31	73
Hall								1					1
Humb									1				1
JUTI								57			1	359	417
KILN												1	1
Lang					2	1	2	1	53	52	106	222	439
LClm											3	3	6
LCrb								2	4	3	1	5	15
LCrd							3	16	14	9	20	32	94
LINC							2	12	35	8	23	46	126
lond						7	11	97	16	3	1	14	149
LYVD									1				1
Medi		1					1		1	16	3	12	34
Meri								1				8	9
Mini								13	19	1	1	4	38
MISC										2		1280	1282
MOCH												2	2
MODE									1			18	19
Near								4	36	34	59	119	252
NDEV												37	37
NFMO								3	14			10	27
NOFR							7	10	17	1	1	6	42
Norf									1				1
NORM								1				1	2
oran							1	42	15	1	1	12	72
OLIV												85	85
OTHE							1	4	13	3	33	319	373
PEAR												6	6
ping					4	18	61	17	4		6	4	114
PMBL												50	50
Pros							10	4	18	29	29	48	138
RAER					1			1	6	6	14	259	287
REFR												15	15
RHEN												61	61

HFase	1	2	3	4	5	6	7	8	9	10	11	12	Total
Roue							1	18	13		4	3	39
RSTO												1	1
Sain									8		4	4	16
SAPY												1	1
Scan		1				1	8	54	212	158	182	201	817
Scar					3	15	9	148	187	88	158	179	787
Scot						4	5	16	6	1	4	2	38
SELZ												453	453
shel			1	1	9	11	11	43	19	1	1	21	118
Sieg				1					12	21	38	129	201
SOW1							3	23	176	130	100	111	543
SOW2										1	18		19
SOW3								4	49	58	33	80	224
SOW?								4	1	4	3	4	16
SPAM												2	2
spla						8	4	8	18	3	13	19	73
stam		1	1	1	4			4					11
STSL												19	19
SWSG												129	129
TGEB									1	1	4	1913	1919
TGEP										1	4	461	466
TGEW							1	1	2	1	5	1098	1108
TRON						1	15	1	4			1678	1699
Ugr1									2				2
Ugre						1	5	17	12	10	17	11	73
UNID					1	6	54	168	366	168	182	513	1458
Ured					1		5	45	32	23	36	30	172
URED										1		6	7
Uwhi			2			2	7	19	8	2	11	18	69
WERR									1		2	62	65
WESE								2	8	2	20	443	475
WEST							1		2		2	381	386
Yobr							1	11	9	3	4	5	33
Yogr								6	4		3		13
York							2	3	3	1	1	5	15
Yowh								6	4	1	3	2	16

APPENDIX 2. POTTERY CODES AND THEIR EXPANSIONS

Code	Expansion
Ande	Andenne ware
BEAU	Beauvais sgraffito ware
blgr	Blue-grey (Paffrath) ware
Bran	Bransby-type ware
Brug	Brügge-type ware (Aardenburg)
CHPO	Chinese porcelain
COLS	Cologne stoneware
C.P.	Cooking pot (misc. types)
CREA	Creamware
devs	Developed Stamford ware
DIVR	Diverse redwares
DIVW	Diverse whitewares
DUIN	Duingen stoneware
DUSC	Dutch slip-coated redware
DUSL	Dutch slipware
DUTR	Dutch redware
DUTW	Dutch whiteware
EUPO	European porcelain
FINW	Fine white ware
FREC	Frechen stoneware
GERR	German redware
GERW	German whiteware
GESL	German slipware
GGRW	Green-glazed reduced ware
grey	Grey ware
Grim	Grimston-type ware
GROW	Gritty orange ware – Lincoln-type 2 ware
HalA	Beverley type 2B ware
HalB	Hallgate B-type ware
Hall	Hallgate-type ware
Humb	Humber-type ware
JUTI	Jutish ware
KILN	Kiln furniture
Lang	Langerwehe stoneware
LClm	Low Countries late-med. redware
LCrb	Low Countries brown-glazed redware
LCrd	Low Countries redware
LINC	Lincoln-type 1 ware
lond	London ware
LYVD	Lyvden-type ware
Medi	Meditteranean wares
Mini	Miniature vessels + toys
MISC	Miscellaneous
MOCH	Mocha ware
MODE	Modern wares
NDEV	North Devon gravel-tempered ware
Near	Near-stoneware
NFMO	N.French Monochrome
NOFR	N. French
Norf	Norfolk-type greyware
NORM	Normandy gritty-type ware
oran	Beverley-type ware
OLIV	Spanish olive jars
OTHE	Other stonewares
PEAR	Pearl ware

Code	Expansion
ping	Pingsdorf ware
PMBL	Post-med black-glazed ware
Pros	Proto-stoneware
RAER	Raeren stoneware
REFR	Refined redware
RHEN	Rhenish slipware
Roue	Rouen ware
RSTO	Red stoneware (Ehlers type)
Sain	Saintonge ware
SAPY	Saintonge polychrome ware
Scan	S.Scandinavian-type wares
Scar	Scarborough ware
Scot	Scottish East Coast gritty white ware
SELZ	Selzer bottles (stoneware)
shel	Shell-tempered ware
Sieg	Siegburg stoneware
SOW1	Sandy orangeware type 1 – Toynton All Saints ware
SOW2	Sandy orangeware type 2 "
SOW3	Sandy orangeware type 3 "
SOW?	Sandy orangeware uncertain type
SPAM	Spanish red micaceous ware
spla	Splashed ware
stam	Stamford ware
STSL	Staffordshire slipware
SWSG	Staffordshire white salt-glazed stoneware
TGEB	Blue + white tin-glazed ware
TGEP	Polychrome tin-glazed ware
TGEW	White tin-glazed ware
Toyn	Toynton All Saints Ware
TRON	Local lead-glazed earthenware and slipware
Ugr1	Unidentified greyware 1
Ugre	Unidentified greyware
UNID	Unidentified (inc. sec. burnt)
Ured	Unidentified redware (med)
URED	Unidentified redware
Uwhi	Unidentified whiteware
WERR	Werra ware
WESE	Weser ware
WEST	Westerwald stoneware
Yobr	York brown ware
Yogr	York grey ware
York	York-type ware
Yowh	York white ware

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Fig 26, Med 25

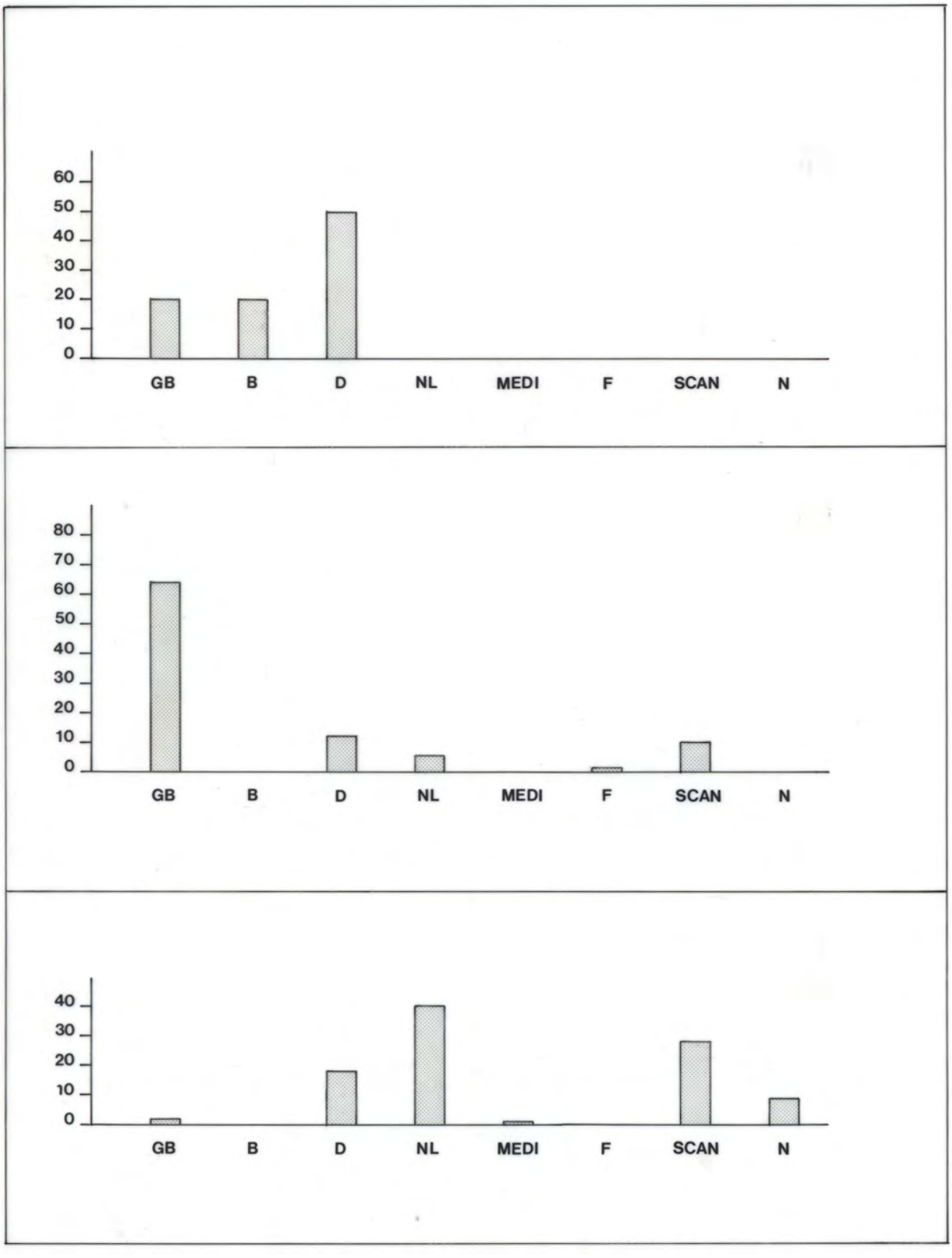
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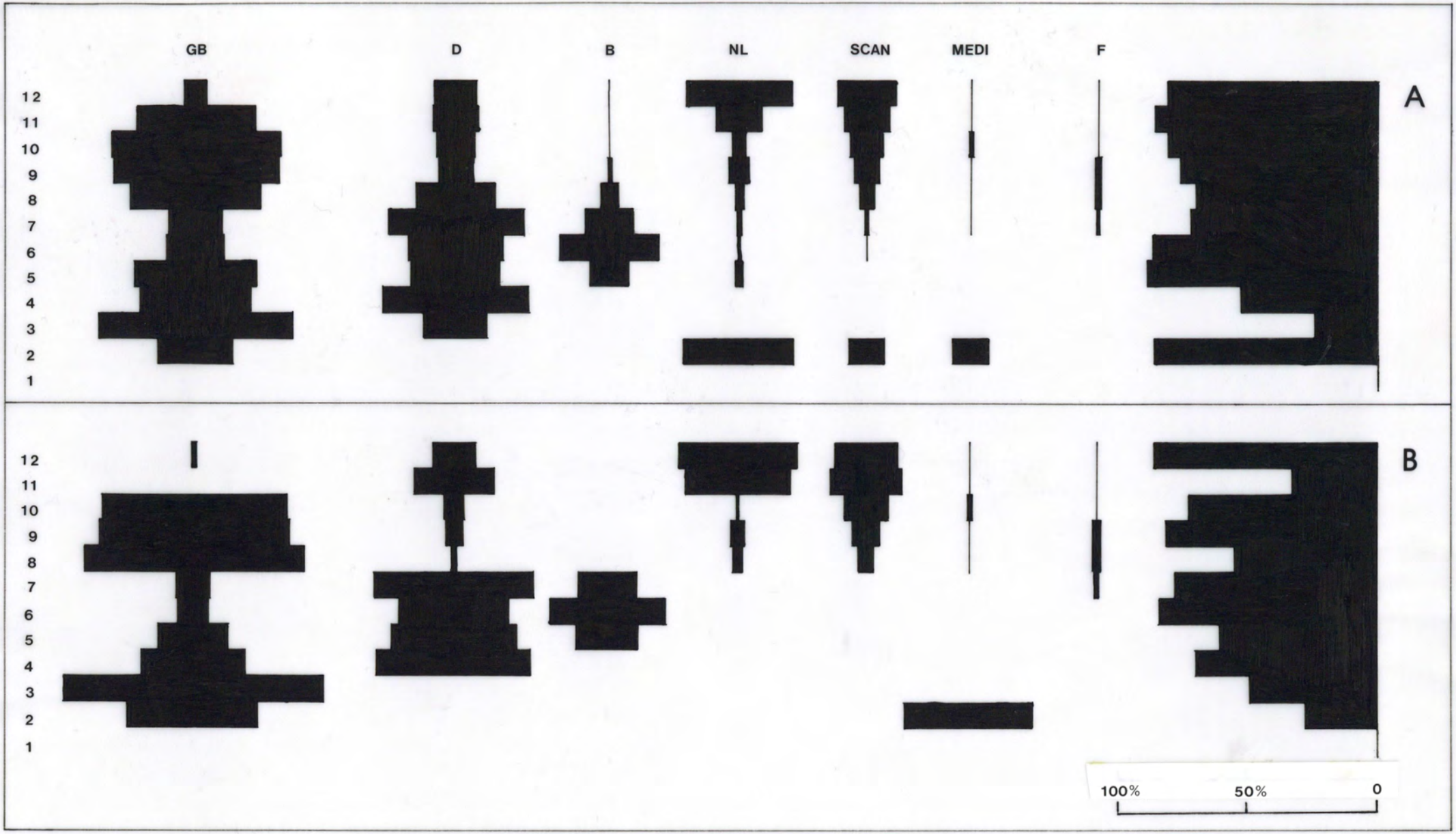
Fig 25, Med 25



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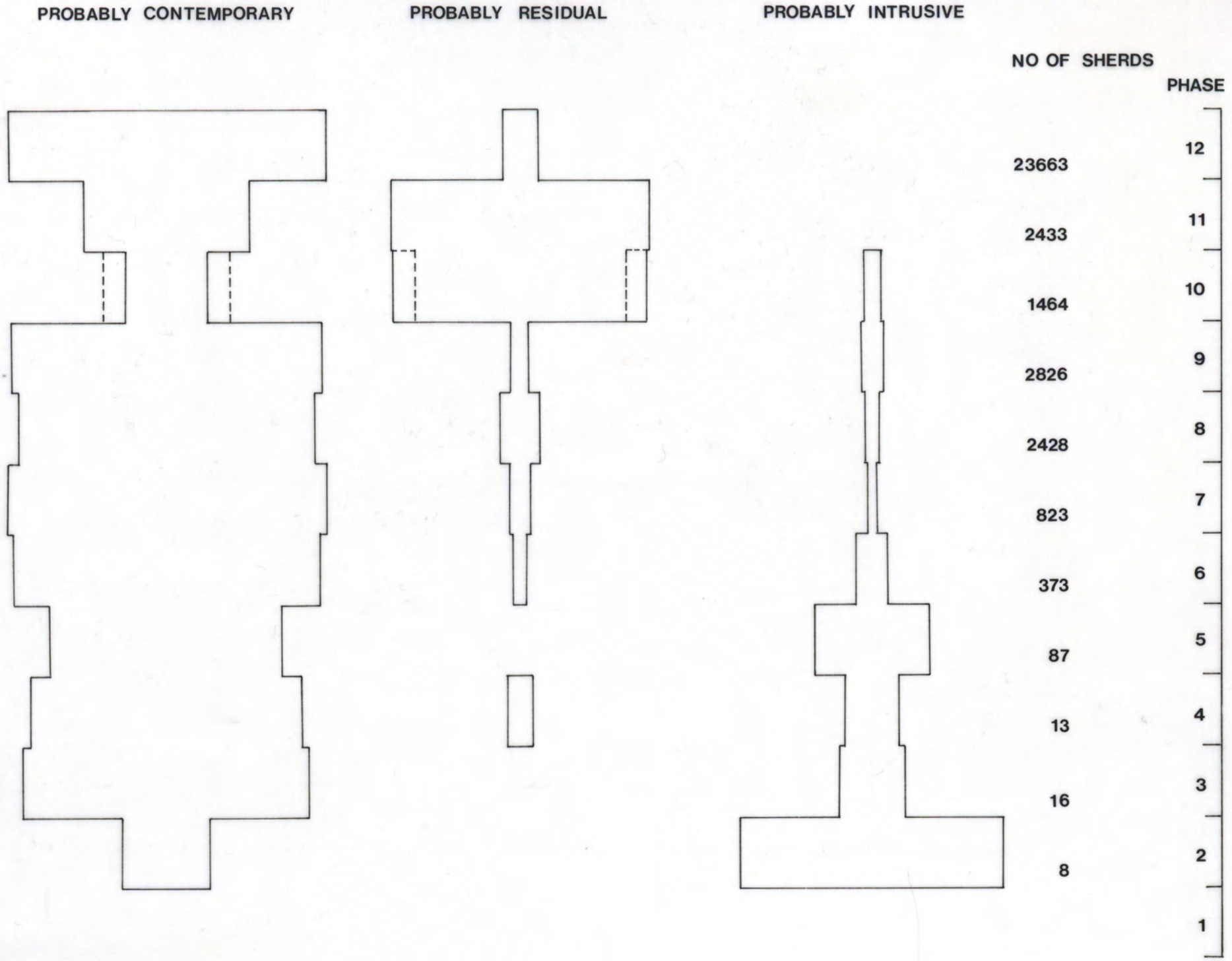

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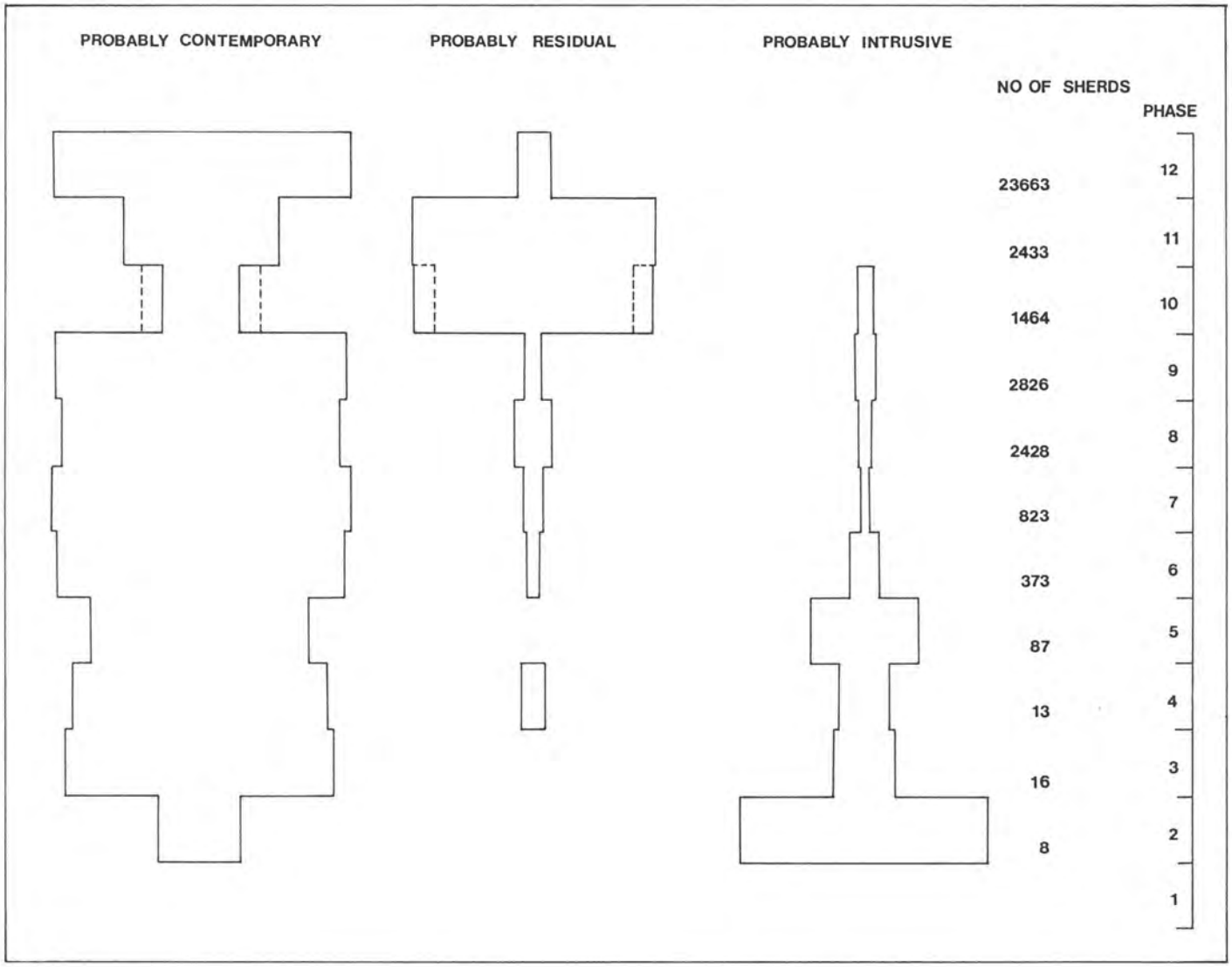

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IAN W. REED

1000 YEARS OF POTTERY

AN ANALYSIS OF POTTERY TRADE AND USE