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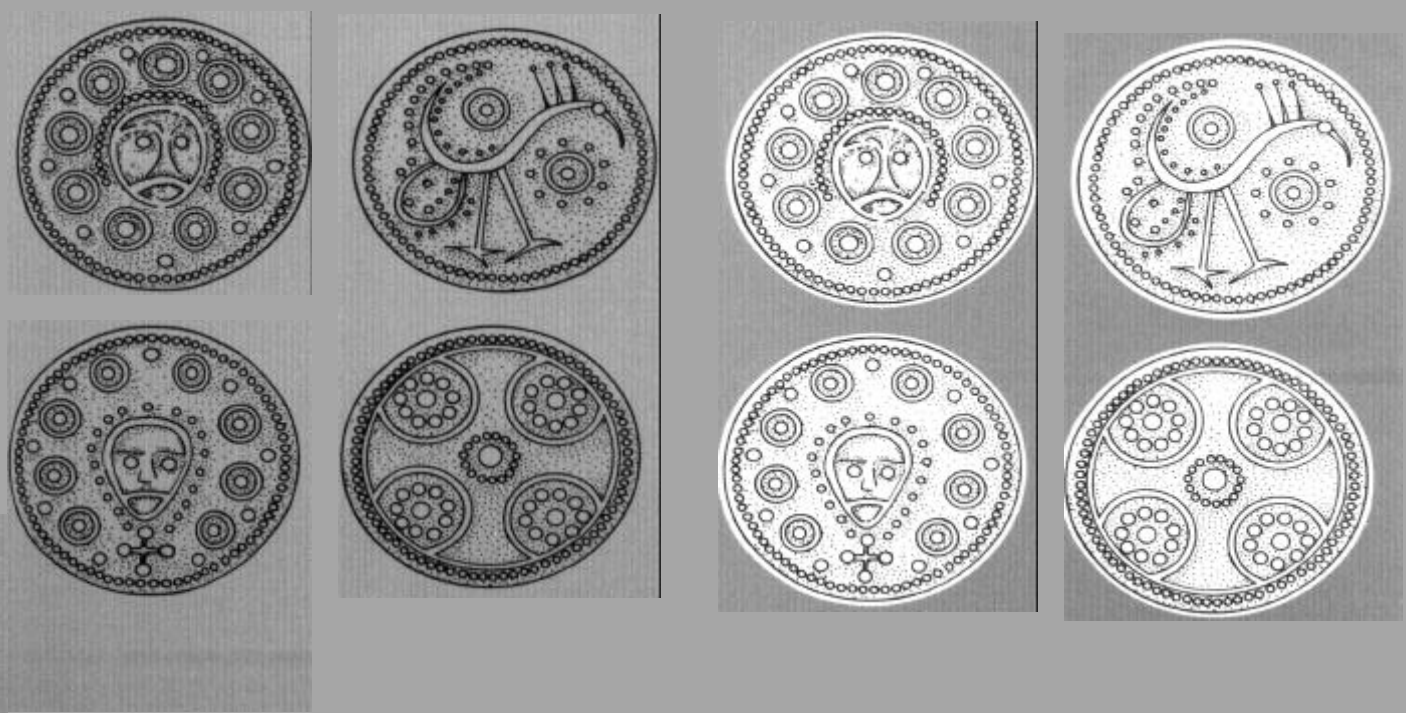

Excavations at Melbourne Street, Southampton, 1971-76

by Philip Holdsworth

With contributions on The 'Hamwih' brickearths by Myra L Shackley, and on HAMTVN alias HAMWIC (Saxon Southampton) : the place-name traditions and their significance by Alexander R Rumble

Edited for SARC by David A Hinton

Research Report 33

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Illustrations

Foreword

In 1971 a Working Committee was established to assess the long- term. archaeological needs of Southampton arising from urban development. As a result of the Working Committee's report *(Agenda and Working Papers of the Inaugural Meeting,* 1971), the inaugural meeting of the Southampton (Archaeological) Research Committee was held in October 1971, with the aims of promoting the study of the past of Southampton and of coordinating archaeological research on sites of all periods within the City boundary.

This publication is the first in a series on the excavations undertaken by the Southampton Archaeological Research Committee on the site of the Anglo-Saxon town of Southampton. The first volume includes important and definitive contributions on the geology of the sites by Dr Myra Shackley, and the place-name evidence by Mr Alexander Rumble, and the Committee is grateful to them and to the other specialists for their reports. The excavations, which are described by the supervisors of the sites, took place between 1971 and 1976. Site I was excavated under the direction of Mr Peter Addyman, Sites IV-VI under that of Mr Laurence Keen, and Site XX under that of Mr Philip Holdsworth. Preparation of the reports was initiated by Mr Keen.

John Barr
Chairman, Southampton Archaeological Research Committee

Acknowledgements

The Committee has benefited greatly from the support and interest it has received from many quarters over the years. Mr Peter Addyman was the driving force behind the Working Committee and served as Secretary before his appointment as Director to the York Archaeological Trust. Since its inception, the Committee's Chairman has been Councillor John Barr, who has played a major part in running the day-to-day business and has offered substantial support and encouragement throughout. Mr F S Grey, of the City of Southampton, is Treasurer and Dr T C Champion, of the University of Southampton, Secretary. Mr D A Hinton, of the University of Southampton, is the Committee's Hon Editor. The Committee's first Director, from 1972-5, was Laurence Keen. under whom major sites were excavated in the Saxon and in the later medieval towns. The Committee is most grateful for the continuous interest in and support for archaeology in Southampton received from the Department of the Environment, particularly from Dr G J Wainwright and Dr C J Young of the Inspectorate of Ancient Monuments, and also from the City of Southampton. Thanks are due to the University of Southampton, Department of Archaeology, for help in many ways, and also to the University Library for the use of its facilities. The excavations have been financed by generous grants from the Department of the Environment with additional funds from the Leverhulme Trust, the British Academy, the City of Southampton, and a number of other institutions and individuals.

For permission to excavate the Melbourne Street sites the Committee is grateful to the City of Southampton and the Southern Gas Board. The cooperation and goodwill of a large number of individuals within both organisations must also be acknowledged. The daily supervision of the excavations was undertaken by the authors whose reports are published below, with the assistance of Nick Adams, Mike Adey, Jonathan Catton, John Cooke, Rob Ellis, Jake Goodband, Phil Harding, Paul Lomas, Alan Morton, Don Plant, and Neil Swanick. Joan Evans, Carol Ross, and Pat Symonds were in charge of the finds. Birgul Biktimir, from the Institute of Archaeology, was responsible for the conservation of finds from the earlier sites and the work was undertaken at the Department of Archaeology, University of Southampton, with advice from Nick Bradford and David Leigh. The conservation of the Site XX finds was undertaken by Chris O'Shea, Conservation Officer, Portsmouth City Museums. The pottery drawings were prepared by Lynn Dyson Bruce and the plans and sections by Maggie Holland, Peter Cottrell, and Alan Morton.

This first volume on the Saxon excavations has benefited greatly from the individual reports of the various specialists and their contributions are gratefully acknowledged. Finally I would like to thank Mrs Barbara Cooper, my secretary, who with patience and fortitude transliterated the many handwritten drafts into a final text.

Philip Holdsworth
Director, Southampton Archaeological Research Committee

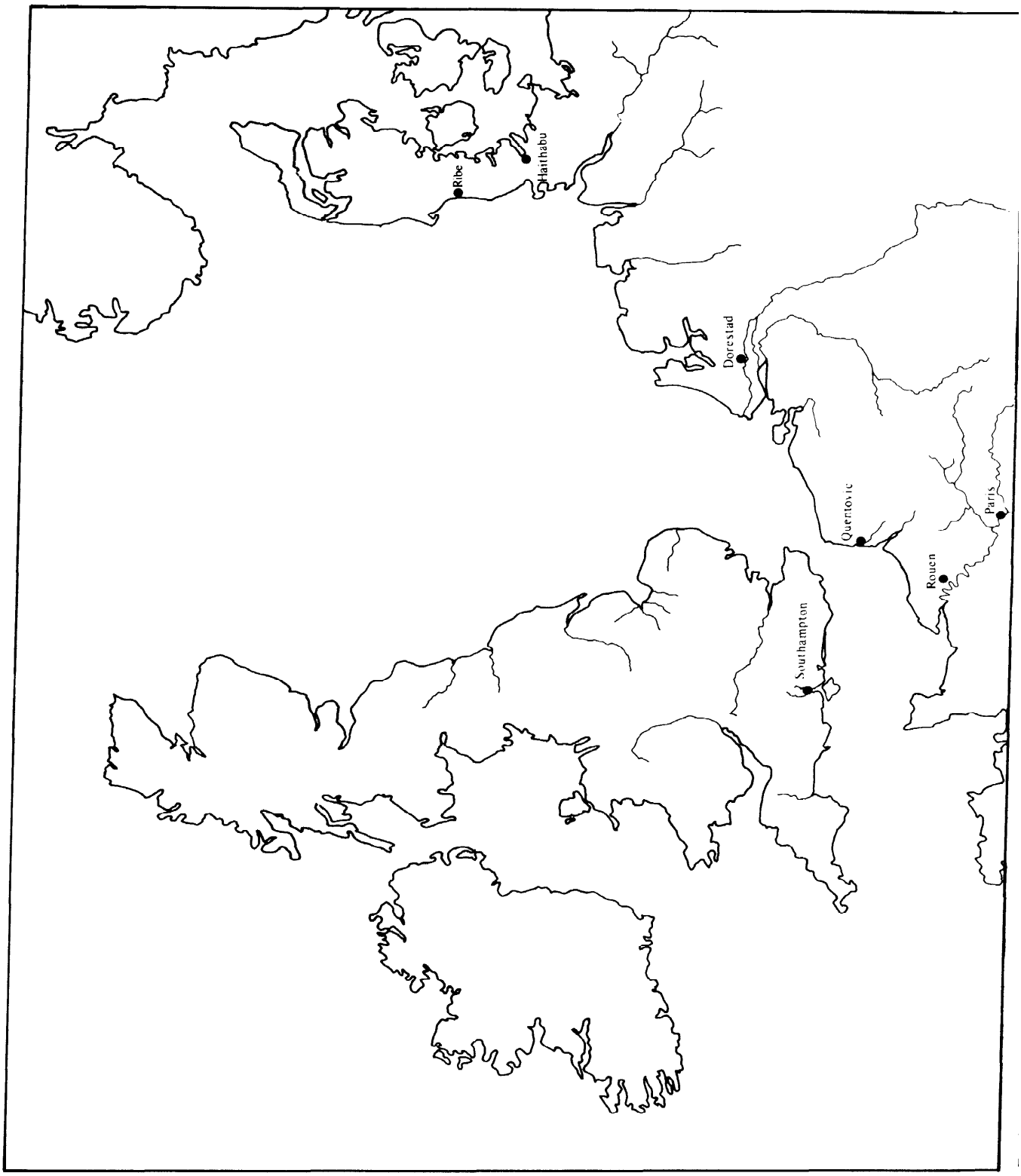


Fig1,1 'Hamwih' and other north-west European emporia

1 Introduction: Saxon Southampton

by *Philip Holdsworth*

The major post-Roman trading emporia in north-west Europe were such ports as Ribe on the Jutland peninsula. Dorestad near the mouth of the Rhine. Quentovic on the Pas-de-Calais, and 'Hamwih'* on the Solent estuary (Fig 1, 1). For some 150 years 'Hamwih' was the centre of economic activity on the south coast of England, acting as a redistribution centre for goods imported from the continent and exchanged for the products of the English kingdoms.

Like its continental counterparts, 'Hamwih' was not a reused Roman town. It was Sited on low-lying flats of brickearth by the west hank of the River Itchen on the eastern side of the Southampton peninsula, an area which had not been intensively occupied at any time before (Fig 1.2). The reason for the founding of the settlement here rather than on the higher, more defensible plateau gravels to the west has been explained in the past by the suggestion that a lagoon existed in the Saxon period which would have provided a natural harbour protected from the open sea (Crawford 1949, 45-6). Recent analyses of brickearth samples taken from widely spaced ares, three of them from within the postulated lagoon, have disproved this theory (see shackley below, p 7). Although it remains true that some measure of protection was provided by a bend in the river, a number of other factors may be seen to have influenced the choice of site. Firstly, shipping could be beached on the Itchen mud flats. obviating the necessity for the construction of wharves: secondly, the Itchen valley facilitated communications with Winchester, 18 km to the north. Biddle (1972. 246-7) has argued that the growing importance of Winchester in the 7th and 8th centuries as an administrative centre accounted in part for the exceptional growth of 'Hamwich'. Lastly, the Roman fort, about 1 km north on the opposite side of the Itchen, may have affected the choice of site for the new town, for its standing walls would have offered some measure of protection against sea-borne invaders. Hill (1967) has argued that the 'burh' at 'Hamtune' recorded in the Burghal Hidage was the Roman fort.

the archaeological and topographical evidence suggests that 'Hamwih' was an unenclosed town covering an area of some 33 ha (Fig 1,3). It had a network of parallel and interconnecting streets: aligned with the streets were houses often surrounded by property boundaries within which were the households rubbish pits, latrine pits, wells, and ancillary building. The information that these provide about the economy and activity of those who made use of 'Hamwih' has been summarized recently (Addyman & Hill 1968, 1969, with a synopsis of all excavations and observations made in 'Hamwih' before 1969; Holdsworth 1975, 1976) and it is the aim of the present escavations to amplify the evidence. The emerging picture is one of a highly developed urban community composed of merchants. artisans, and other specialists supported by the efficient exploitation of the agricultural capacity of the surrounding region.

During the fast decade urban archaeology has revealed a number of pre-Conquest towns which appear to possess elements of a regular plan. Considerable discussion has recently centred on the definition of a planned town and the extent to which relict or topographical features may have accounted, in whole or in part, for such regularity of lay-out (Biddle 1975). The street pattern at 'Hamwih appears so regular that it may be of great importance in this debate, but the evidence remains incomplete. The road found in Melbourne Street was not a primary feature of the site, at least in its final form (Site IV below, p 25). but the archaeological evidence suggests that its metalling may have been laid on a pre-existing track.

Similarly debated is whether the foundation of 'Hamwih' can be attributed to the increased political and economic security provided by the reign of King Ine of Wessex (688-726) (Loyn 1962, 138), or indeed whether the town was established by royal prerogative.

There are very few, documentary references to the Itchen port (these are listed below, p 16), the earliest precise date occurring in the Life of St Willibald which describes how in 721 the saint and his followers boarded ship at Hamble Mouth, *iuxta illa mercimonia que dicitur hamwih* and set sail to the continent (Holder-Egger 1887, 91). The *Anglo-Saxon Chronicle* records that by 755 Hamtun had given its name to the shire, an indication of its 8th century importance in Wessex.

Another measure of 'Hamaih's' importance is the large number of coins discovered. Although an assessment of the coin evidence will form a separate publication, some discussion is appropriate here. The vast majoritv of coins from 'Hamwih' are sceattas, over 200 having "been recovered either as chance finds or during excavation. The occurrence of large numbers of BMC types 39. 48, and 49 in 'Hamwih suggests that coinage was being minted in the town in the 8th century, the first to be struck in Wessex. The occurrence of early 8th century sceattas of Mercian origin at the Itchen port indicates that prior to Aethelbald gaining control of London in 731 or 732 'Hamwih' may have acted as the port for the Midlands kingdom as well as for Wessex

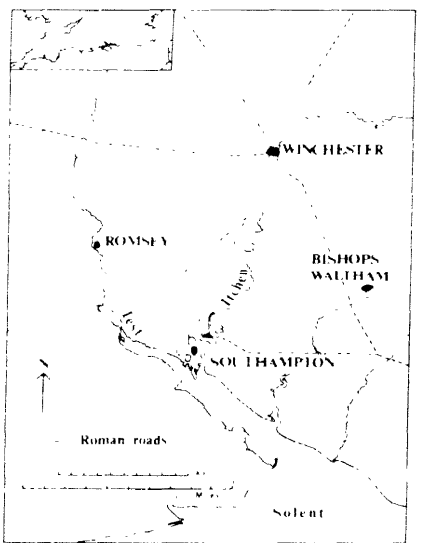


Fig 1, 2 The location of 'Hamwih', showing Roman fort (a), Saxon port (b), and medieval town (c). River frontages shown are those of the modern port

*Despite Alexander Rumble's demonstration in Section 3 below that the settlement was known to contemporaries as *Hamwic* or *Humtun*. the term 'Hamwih' has been retained for brevity, and because 'Saxon Southampton' cannot be used specifically of the Itche-side settlement; the Bitterne and the lest-side areas were also in use for at least parts of the Saxon period. 'Hamwih' can be regarded as having established itself as a satisfactory modern name-tradition among archaeologits.

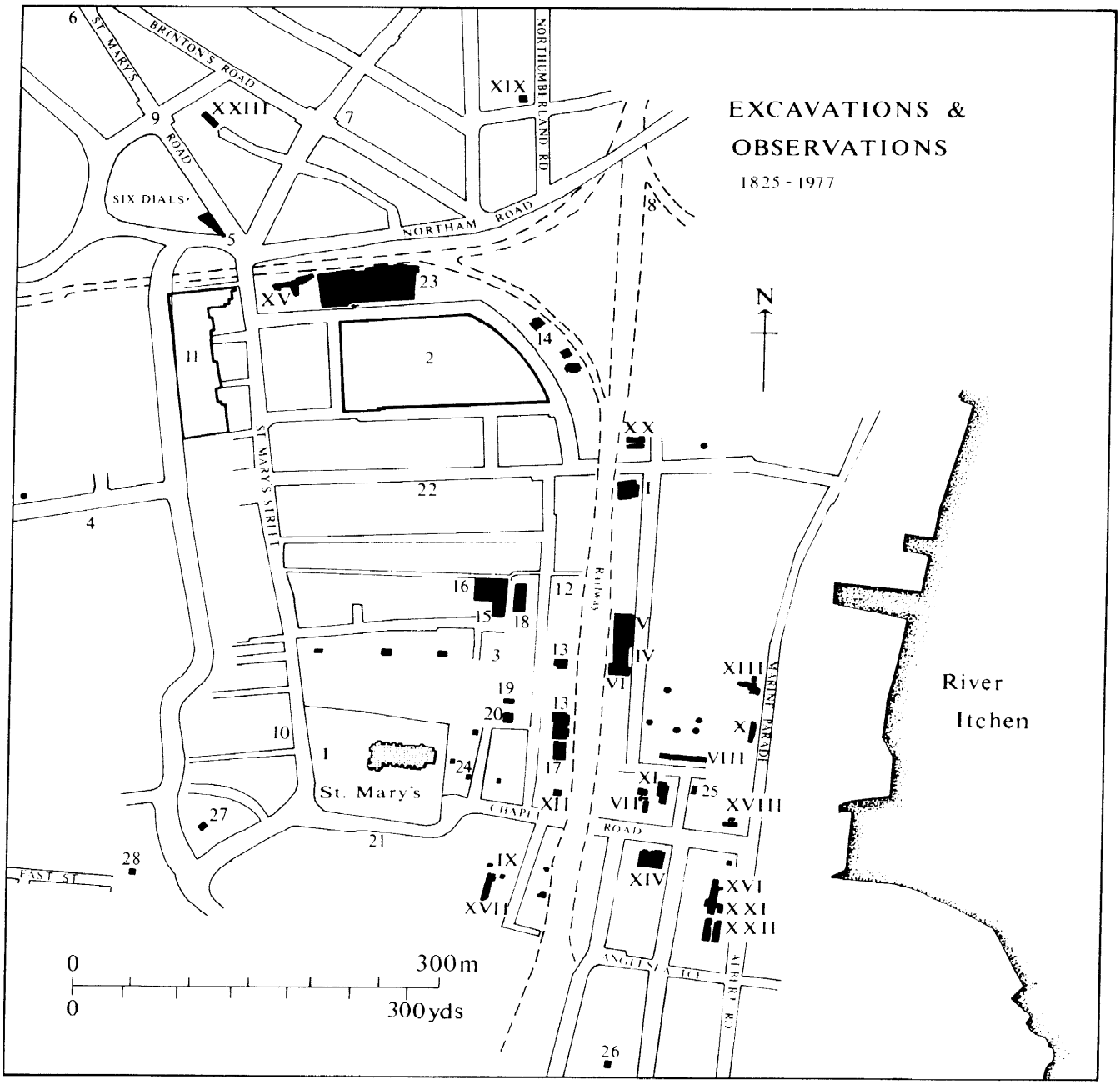


Fig 1, 3 'Hamwih' sites. Roman numerals: sites excavated by SARC since 1971; Arabic numerals and spots: other sites excavated and observed

TABLE 2,1: Location of samples taken: see also Fig 2,1

Sample No	Site	Grid Reference	Location	Notes	
1	SARC IV	428150 117900	Top surviving 'brickearth'	[Shackley 1975. Sample A] *Site 2*	
2	SARC XIII	4299320 11716	Top surviving 'brickearth'	[Shackley 1975. Sample B] *site 3*	
3	SARC XVIII	429000 115780	Top surviving 'brickearth'	*Site 4*	
4	SARC XVIII	429200 116200	Top surviving 'brickearth' depth 0.98 m	*Site* 5	
5	SARC XVIII	429200 116200	Middle surviving 'brickearth', depth 1.14 m	*Site 5*	Depths below present ground level. Some 'brlckearth' lost due to building and disturbance
6	SARC XVIII	429200 116200	Base surviving 'brickearth' depth 1.26 m	*Site 5*	
7	SARC V	428150 117800	Top surviving 'brickearth'	*Site* 6	Probably 250-300 mm below original brickearth surface
8	SARC XX	428350 119500	Top surviving 'brickearth'	*Site 7*	

the vibration method. The weight of sample retained on each sieve was recorded, and the residue which passed the finest sieve was dispersed in 1000 ml of distilled water containing 25 ml of 10% 'Calgon' (sodium hexametaphosphate). A sedimentation analysis was carried out using a modified Andreasen pipette, samples being withdrawn at times and depths corresponding to ½Ø intervals. The results of these methods were then combined. giving a complete size distribution for each sample. Results were processed using the Fortran IV program SIEVETTE, run on the University of Oxford's ICL 1906 computer, which yielded a standardized textural description together with the Inclusive Graphic Statistics of Folk and Ward (1957). To facilitate comparison with the first two samples the cumulative percentage frequency size distribution curves were also drawn, the complete series being shown in Fig 2.2. This was done principally to provide a visual demonstration of differences between the samples. and to aid in the detection of bimodality, since the descriptive parameters can be calculated by the computer without drawing the curve.

Operating details of all analytical procedures and the SIEVTTE program may be found in Shackley 1975.

Results

Visual examination of the samples was unproductive. and they contained no bone or shell inclusions. All were totally decalcified. The gravel fraction of the sample (-0.5Ø) was composed of irregularly shaped angular and sub-rounded flint pebbles, often with a white patination and clearly derived from the underlying terrace gravels. The quartz sand grains were, on the whole, rather glossy in surface texture and markedly rounded in shape.

Fig 2,2 shows that samples 1 and 2 were remarkably similar in composition, both consisting of over 50% silt, the remainder being fine sand and clay. The mean size of both samples fell in the fine sand/silt range, both being positively skewed and with high kurtosis values. These characteristics were in some measure shared by samples 7 and 8, which also contained large quantities of silt but had more coarse material. Their skewness and kurtosis values also varied. Samples 3-6 were. however, quite different in character. None contained more than 12% total mud (silt and clay), most of which was clay, whereas the mud fraction of samples 1, 2. 7. and 8 had been mostly silt. The gravel fraction of these samples varied between 8 and 50% the highest value coming from the base of the 'brickearth' where it had presumably been in contact with the terrace gravels. Samples 3-6 were

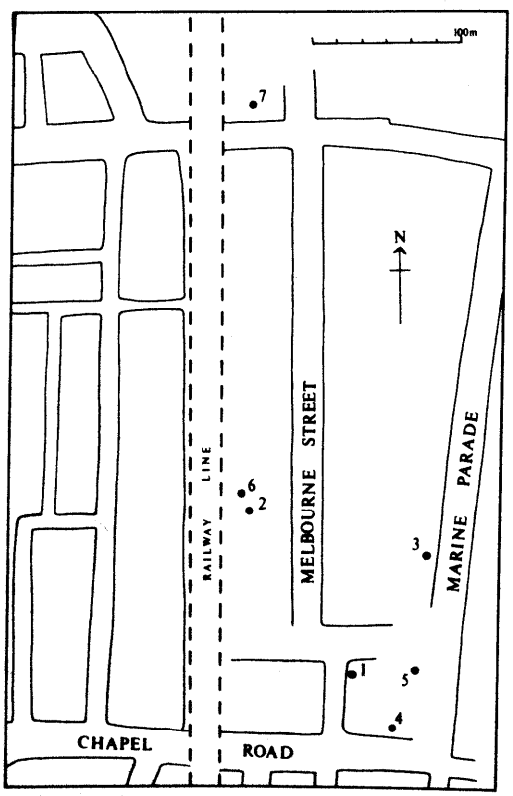


fig 2,1 'Brickearth' sample locations

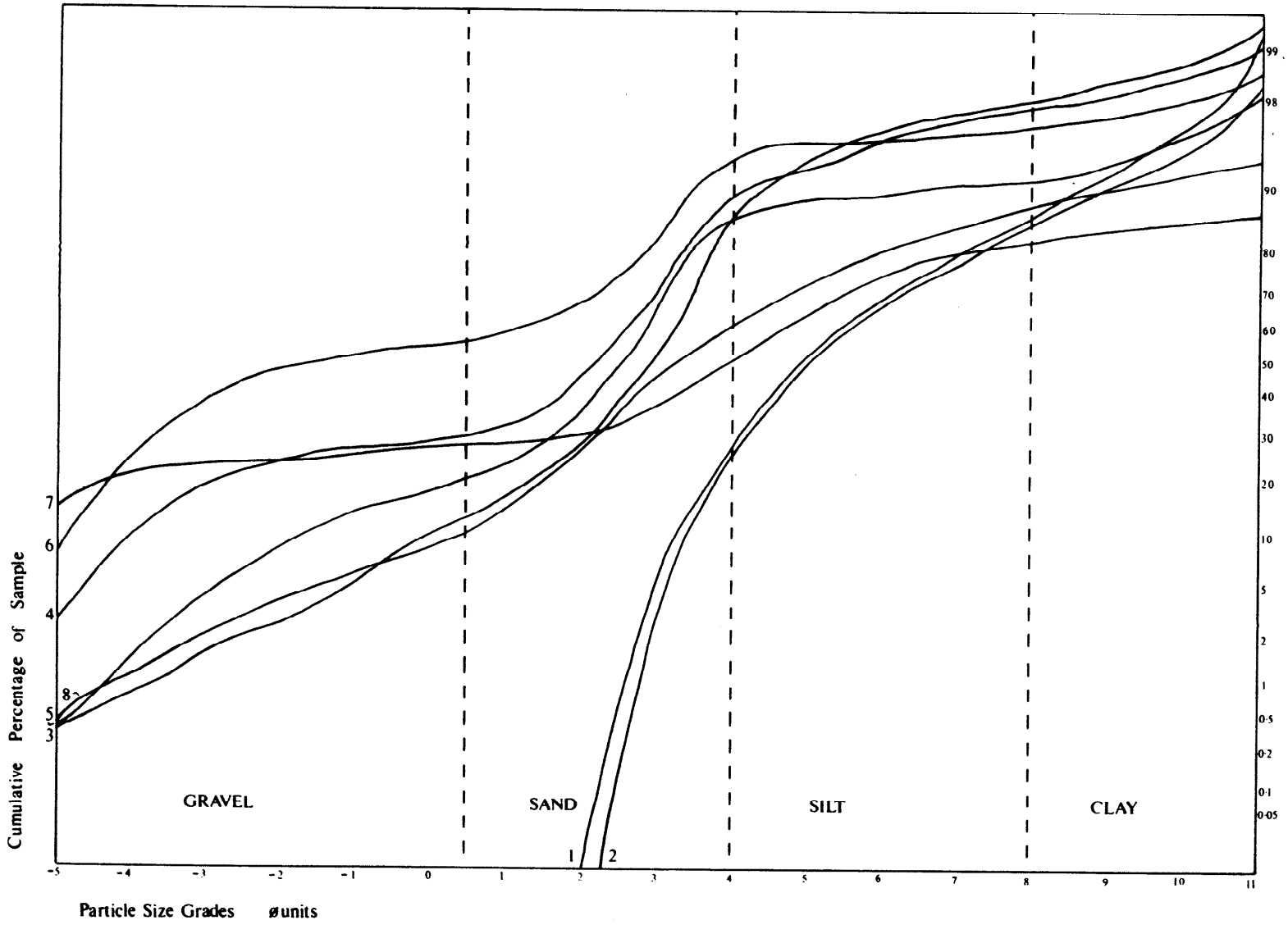


Fig 2, 2 Cumulative percentage frequency size distribution curves

TABLE 2,2

Sample No	Weight (gms) processed	Particle sizing method	% gravel	% sand	% mud Silt Clay	Descriptive (after Folk & Ward 1957) Mz	Ø1	Sk	Kg	Description
1	-	Coulter Counter	0	24.00	76-total mud	0.40	2.139	0.377	6.557	Very poorly sorted. Positively skewed. Extremely leptokurtic.
2	-	Coulter Counter	0	22.00	78-total mud	0.45	1.932	0.136	7.259	Very poorly sorted. Positively skewed. Extremely leptokurtic.
3	135.61	Dry sieve & pipette	8.41	84.95	6.64 total mud	2.283	1.188	+0.024	1.629	Poorly sorted. Nearly symmetrical. Very leptokurtic.
4	63.44	Dry sieve & pipette	26.85	67.02	6.94 total mud	0.690	3.391	-0.518	0.941	Very poorly sorted. Very negatively skewed. Mesokurtic.
5	41.18	Dry sieve & pipette	14.53	73.47	11.90 total mud	1.910	2.870	-0.257	1.318	Very poorly sorted. Negatively skewed. Leptokurtic.
6	91.278	Dry sieve & pipette	50.37	44.95	4.67 total mud	-0.70	3.225	-0.428	0.558	Very poorly sorted. Very negatively skewed. Very platykurtic.
7	122.040	Dry sieve & pipette	27.049	21.525	35.265 16.139 51.424 total mud	2.439	5.550	-0.190	0.938	Very poorly sorted. Negatively skewed. Mesokurtic.
8	89.630	Dry sieve & pipette	8.122	53.275	23.512 10.04 38.603 total mud	3.565	3.680	0.204	1.392	Very poorly sorted. Positively skewed. Leptokurtic.

principally composed of sand, with a major mode in fine sand (2-4 Ø) and a small minor mode in gravel (>-0.5Ø). Mean sample size lay in the sand range, with the exception of the gravel-rich sample 6. The deposits were negatively skewed, with the exception of sample 3 which had a very small positive skewness value.

Conclusions

It is generally agreed that high kurtosis values indicate a low-energy depositional environment, and vice versa. Negative skewness values have been taken by many workers as being particularly characteristic of beach sands, since they are extremely rare in any other type of sediment. Beach sands also tend to have rather small percentages of mud, since such fine materials are removed by the 'winnowing' action of the tide, and the resulting sorting values tend to be rather poor. Such information suggests that two distinct environments of deposition are represented here, that of samples 1, 2, 7, and 8 (Group 1) and that of samples 3-6 (Group 2).

The high kurtosis values of Group 1 indicate either an estuarine or an aolian (wind-blown) environment, but the unimodal nature of the size distribution and the poor sorting values would support the latter. Such a high silt content and general size distribution was taken by Pitcher *et al* (1954) as typical of aolian deposited loess. The slight differences in texture between the samples of Group 1 may very probably be attributed to differential weathering *in situ,* and Cornwall (1958) noted that the percentage of clay in loess tended to increase at the expense of the sand fraction as the material was weathered. Samples 7 and 8 are not, however, pure loess, and seem to have been affected by contact with the underlying gravels which have contributed the coarse fraction.

No features of the Group 2 samples suggest a similar origin, although the high percentages of fine sand are within the particle size range capable of being wind transported. The origins of these sediments seem to have been complex. It is suggested that the sand fraction was probably deposited by water, under medium velocity flow conditions. This was sufficient to impart negative skewness values but insufficient to remove all the fine material. The gravel fraction could again be derived from the underlying material, and the mud laid down in slowly moving water. This composition suggests conditions similar to those of a small tidal creek, but not an open beach or a strongly tidal estuary. In the former case the percentage of mud would be lower and in the latter the percentage of clay would be higher.

Implications

If the samples of Group 1 do indeed consist of weathered loess then they are far from being unique in the area. Other, similar, deposits are described by Swanson (1968-9) and Everard (1952) at Holbury and Nursling near Southampton, both of which are marked on the geological maps as 'brickearth'. These deposits probably all form part of the Younger Loess, deposited during some phase of the Devensian (Weichselian) glaciation towards the end of the Pleistocene.

Samples 3-6 indicate the presence of a small creek. such as that recorded by a detachment of the Royal Sappers in 1845/6 when examining the site with a view to land reclamation (I am indebted to Mr P Holdsworth for this information). The theory that the Saxon town was bounded on the south-west by a tidal creek leading to a lagoon (Crawford 1949) has led several writers to interpret the 'brickearths' as the products of this lagoon. Excavations at Sites 25 and 26 (Addyman & Hill 1968,

75) produced material described as 'presumably lagoon silts' and 'fine apparently waterlain silts above gravel'. These may well be references to sediments similar to those of Group 2, since the sampling points are close to the area of the proposed creek. However, none of the samples remotely resemble lagoonal deposits and, if a lagoon existed, it must have been located considerably to the south of any of the locations sampled.

The results of these analyses suggest that the majority of the 'Hamwih' 'brickearths' consist of redeposited loess, but that in the extreme south the former presence of a small creek may be inferred.

Acknowledgements

The writer would like to thank Coulter Electronics for processing samples 1 and 2. and the University of Oxford for providing laboratory and computing facilities. Thanks are also due to Mr A M ApSimon. Mr P Holdsworth. Miss R Kenedy, and Dr D P S Peacock for their help and criticism.

3 HAMTVN *alias* HAMWIC (Saxon Southampton): the place-name traditions and their significance

by *Alexander R Rumble*

It is a common and oft-repeated piece of folklore among archaeologists that the Anglo-Saxons had two alternative names-Hamtun and *Hamwih-* for the place now called Southampton.[1] In fact the Anglo-Saxons described the place in several different ways but did not ever call it *Humwih*. This spelling (a late 8th, early 9th century Continental Germanic rendering of what in the insular language would have been written as *Hamwic)* appears but once in historical sources-in an early manuscript copy of a hagiography of St Willibald. composed at Heidenheim in Middle Franconia in AD 778.[2]

Despite the fact that from a linguistic point of view it cannot ever have been a name-form current among the inhabitants of Anglo-Saxon England, the spelling *Hamwih* has been generally adopted in modern archaeological literature to refer to the excavations of the Middle Saxon sites in the St Mary's area of the city in contradistinction) to those of the Late Saxon and medieval period in the Above and Below Bar areas. This unfortunate convention was apparently first adopted by archaeologists because the solitary *Hamwih* form occurs in the earliest historical source to mention Southampton and was contemporary with the period when the St Mary's sites were flourishing. The convention would seem to have become usual after the publication in 1949 of the first interim report on excavations at Southampton by Mr Maitland Muller. In it he defined the sites of ancient settlement at Southampton as the Roman Town of Clausentum and 'the Saxon Town of Hamwih'.[3] The subsequent use by archaeologists of the form *Hamwih* as a conventional name for Saxon Southampton has led to misteading and inaccurate statements on the part of recent commentators on the sites. for example: 'As late as 1009-17, when the St Mary's area settlement was declining, or had even. perhaps, largely shifted, the names *Hamwih* and *Hamtun* were being used indiscriminately on coins of the Southampton mint': *Hamwih* may have been the local and merchants' name for the harbour area of the settlement *Hamtun*'; 'The place is variously named *Hamwih* of *Hamtun* in late Anglo-Saxon sources; (ie later than the Life of Willibald): 'Hamwih was also raided in the second Viking assault, in 980 and 994, though it is likely that by this time the town had moved to another location'; The first mention of a port in the Southampton area is a mention of 'that market which is called Hamwih" in 721. The port appears again in several different documents, sometimes as Hamwih, sometimes as Hamtun.'[4]

The main objection to such statements is that they do not make the necessary distinction between a name-form (ie a recorded a spelling, such as *HANTVNE* 1086: Domesday Book) and what may be termed a name-tradition. The latter is the name itself, that which the spellings attempt to represent. In this case *Hamwih* is a spelling representing the name-tradition **Hamwic,** which we know of from other sources.[5] Since *Hamwih* is but an isolated, and unusual, name-form it is not acceptable to treat it as a name-tradition, which is precisely what the commentators quoted above, and others, have done. A further very strong argument against the use of the form *Hamwih* as a conventional name for Saxon Southampton is that it might easily be confused by the unwary with a (non-existent) name-tradition having OE wig, *weoh*. 'and idol, holy place, temple' (*EPN* ii. 246-5), as final element.

This chapter will follow onomastic practice and the latest rather than the earliest spelling for this (now lost) name-tradition, that found on coins *c* 973 to 1015 as *HAMPIC,* which in modern script may be represented as *Hamwic,* and which, being an insular place-name form, is closest to the name-tradition for which it stands. As explained in detail below, this name-tradition should be thought of as but one of various names given to Saxon Southampton and should not automatically be taken to apply only to the sites in the St Mary's area of the city.

The knowledge that Saxon Southampton had more than one name has affected commentary on other, more constructive, ways. It has led to the production of opposing theories about the origins and later development of the settlement and port. On the one hand, it has complicated the investigation of the process by which the main concentration of settlement moved from the shore of the Itchen to that of the Test. This it did by stimulating Mr L A Brugess to postulate that two topographically and onomastically distinct communities were already present at Southampton by the early 8th century—the one a *wic* with a commercial function and the other a *tun* fulfilling an administrative role.[6] On the other hand, the use of the one name-tradition (Hamwih *rectius* **Hamwic)** in a deliverately exclusive application to the St Mary's sites by archaeologists may perhaps have suggested too clear a break between what has been thought of as a predominantly Middle Saxon settlement on the east of the peninsula and the later town site on its west. From these examples alone it may be seen that the correct interpretation and and application of the early place-name evidence for Southampton is a very important part of the analysis of non-archaeological information on the sites concerned. It has already acted as a powerful catalyst on modern thinking about the development of the early medieval port of Southampton.

By pointing out the limitations of the place-name evidence as well as its significance, it is hoped that its use may thereby be both more clearly defined and more carefully applied. To this and a new collection of name-forms has been made from the major historical sources which deal with events in Hampshire and Southampton up to *c* 1100 and is presented as an Appendix below. This collection of name-forms has been arranged in such

a way as to allow due consideration to be given to the relative dates and reliability of the sources used, and is the basis for the discussion below of both the source traditions and the names themselves.

The sources and their perspective

Although place-names themselves are linguistic items which are formed, used, and re-formed in the course of everyday speech, the evidence upon which any scientific study of their chronological development must be based is of a written nature. It is for this reason that the volumes of the English Place-Name Society[7] consist primarily of a topographically-arranged collection of place-name spellings culled from historical sources. Although such evidence is all that survives to tell us what a place was called in an historical perspective, it must always be remembered that it is evidence which is subject to the orthographic conventions of previous centuries and to the editorial intervention of the writers concerned. Consideration of place-name spellings gathered from such sources must always be accompanied by an investigation of the context in which they were written and of the linguistic or editorial bias of their writers.[8] Since the more successful or useful texts were copied frequently they often survive in a number of manuscript versions, each adding the influence of its copyist to that of the original writer of the place-name form. Due care should therefore be exercised in dating the surviving manuscripts of a particular text and in dating place-name forms found therein to the date of the manuscript rather than to that of the events described. This is a somewhat conservative approach but it is in fact an easier way to identify those cases where a late copyist is faithfully recording an early spelling from his exemplar rather than substituting a 'modern' form (see spelling 83, for example).

The main sources for the study of place- and personal-names in England up to about the year 1100 may be divided into four broad categories, each with its own limitations of perspective and purpose -narrative sources, coin evidence, diplomatic sources, and the records of central government.

Narrative sources

A significant proportion of the written sources for Anglo-Saxon history may be described as narrative in form. These are the work of both chroniclers and annalists, each written within the same general chronological framework but each being subject to its own historical perspective and editorial conventions. Annals may be written up year by year and thus be contemporary records of the events described or, alternatively, large portions of them may be copied from the notes of earlier writers. Chronicles likewise may either be original works of historical commentary, based on documentary or oral sources, or they may simply be a conflation of the writings of previous commentators. Rarely in fact are such narrative sources written by contemporary witnesses to the events described and often they are composed at both a physical and a temporal distance from the places at which the events took place. Onomastic material contained in such sources is therefore more likely to reflect the usage of the writer and his audience, or of a later copyist, than of the historical period or geographical region being described. Name-forms in such sources are subject to the editorial whim of the writer, his use of, or access to, reliable sources of local information, and his familiarity with the subject, period, or region written about. In general, narrative sources written in England and in the Anglo-Saxon period are more reliable as sources of onomastic material for Anglo-Saxon England than those written on the Continent or in the period after the Norman Conquest. For Saxon Southampton the most important narrative sources are as follows: [9]

(i) *Insular writers*

Anglo-Saxon Chronicle. The importance as an historical and a linguistic source of the series of vernacular annals generally known as the *Anglo-Saxon Chronicle* cannot be overestimated. For onomastic purposes the five main manuscripts (texts A-E) are best regarded as different sources from c AD 900, each capable of reflecting the language of the different places at which the Ælfredian edition of the annals was continued.[10] Spellings for both Southampton and Hampshire[11] occur in these manuscripts only as variants of a tradition of naming based on the form *Hamtun (scir).* The only time that a text of *ASC* differs radically from its fellows is when C (the Abingdon text) uses the form *Sudhamtun sa* 980 (spelling 23) to distinguish (Sout)hampton from (Nort)hampton. This occurrence has been rightly described as 'the first instance of a distinction which had become necessary now that the old kingdoms of Mercia and Wessex had become merged into a unified England'.[12] Such a distinction would have been most necessary for the annalist at Abingdon, situated between the two shire-towns called *Hamtun.*[13] The five texts of *ASC* supply spellings for Southampton and Hampshire in the following order:

A (written at Winchester from *c* 900 to 1001, later at Christ Church, Canterbury), spellings 4-6. 16;

B (copied late 10th century from an Abingdon version up to *annum* 997), spellings 11-13;

C (copied mid 11th century at Abingdon and continued up to the Norman Conquest), spellings 18-19, 21, 23, 25-7, 29-31, 33. 35;

D (a northern recension copied mid 11th century and continued up to *annum* 1079. at first at York or Worcester and later in southern England), spellings 18, 20, 22, 24, 26, 28-30, 32, 34-5;

E (a post-Conquest copy, making use of both the northern and the Canterbury versions, written c 1121 at Peterborough), spellings 53-64.

Æthelweard (spellings 13a, 96-7). This chronicle, written in Latin by one Æthelweard, who is probably to be identified with the ealdorman of the West Saxons of that name in the time of Æthelraed Unraed, is mostly based on Bede's *Historia Ecclesiastica Gentis Anglorum* and a (now lost) revised version of *ASC* text A. It contains no mention of Southampton independent of *ASC.* The only known manuscript, of early 11th century date, was destroyed in the fire in the Cotton Library in 1731, except for eighteen fragments. Modern readers of the chronicle are dependent on a late 16th century (1596) edition by Henry Savile for the contents of the rest of the manuscript.[14]

Florence of Worcester (spellings 41-52). This work, written at Worcester in the early 12th century, consists of a conflation of various earlier histories and annals, many of which are now lost.[15] Its author seems to have had access to material peculiar to each of the five texts of *ASC* referred to above as well as to the lost Mercian Register.[16] Although its medium is Latin some of its sources were in the vernacular and undoubtedly it must therefore be regarded as an important bridge by which otherwise lost facts about Anglo-Saxon history have descended to us. Unfortunately, with respect to its treatment of spellings for Southampton and Hampshire, it exhibits the too-usual penchant of Anglo-Norman chroniclers for modernizing and standardizing the name-forms of their sources. From its annal for 980 onwards

Flor uses a Latinized form, *Suthamtonia,* for Southampton (except *sa* 994 where it has a vernacular form, see spelling 43) and a Latin form, *Suth(h)amtunensis provincia,* for Hampshire. These forms should be compared to those of what were presumably its sources in ASC (C,D) as indicated in the Appendix below. It is possible that Flor constructed these Latin spellings from the vernacular form in *ASC* (C) *sa* 980 (spelling 23). The source of Flor's one vernacular form *Suthamtun* (spelling 43) is unknown unless it too is based on spelling 23.

Simeon of Durham (spellings 83-5). Like Flor this source is an Anglo-Norman conflation of historical writings from various periods.[17] It is important when using such sources to discern from which part of the collection a particular piece of information or a particular spelling comes. Of those used here, for example, spelling 83 comes from the *Historia Regum* attributed to Simeon of Durham while spellings 84-5 are included in the tract *De Injusta Vexatione Willelmi Episcopi Primi,* an account of the harsh treatment by King William I of Bishop William of St Carilef.[18] Although the *Historia Regum* survives only in a manuscript of the late 12th century and was composed in its present form *c* 1130, its annal for 764 containing the spelling *Homwic* (83 below) is of great importance and describes events otherwise unknown, while the spelling *Homwic* itself is important as a rarity. In contrast, the spellings (84-5) included in *De Injusta,* which was composed in the late 11th century and is thus earlier in date of final composition than the *Historia Regum,* are disappointingly Anglo-Norman in character.

(ii) *Continental writers*

Life of St Willibald (spellings 1, 87, 94). Although the Latin life of Willibald was composed by an English nun at the monastery of Heidenheim in Middle Franconia in 778,[19] the earliest surviving manuscript is not quite contemporary (being of late 8th/early 9th century date) and exhibits Continental Germanic influences in the place-name forms of places in England, including Southampton. This early manuscript is however important both as being the first record of Southampton as a port *(mercimonia)* and of the **Hamwic** name-tradition, albeit in an outlandish form.

Nithard (spellings 2-3). This Latin history of the sons of Louis the Pious was composed as a contemporary account of events during Nithard's lifetime but only survives in a manuscript written about half a century after his death in 844. Like Willibald, this source records events not otherwise known, but uses Continental forms for its spelling of the names of places in England. Like Willibald also, this chronicle prefers the **Hamwic** name-tradition for its spelling of Southampton.

Coin evidence (spellings 7-10)

Provided that a viable chronology of coin-types can be constructed for a particular mint, the place-name spellings found on coins of the late Anglo-Saxon period (c 973 onwards) represent a body of data that forms a valuable supplement to spellings for that place found in manuscript sources. It should be remembered, however, that the spellings of the names of mints appearing on such coins would be affected by the amount of space available and may sometimes approximate more to the sort of abbreviated inscriptions found on stone memorials of the same period. Further caution is also necessary in deciding on the degree of general linguistic currency enjoyed by the names as spelt on the coins, since sometimes a conscious archaism is present which resurrects spellings and name traditions long since out of fashion in other types of historical source.[20] Even so, it is to be noted that however archaic such forms might have been they do seem to have been recognized as possible designations of the places concerned, at least when thought of as centres of coin-distribution.

There are several problems arising from the spellings on coins ascribed to Saxon Southampton. The first is that of distinguishing the coins from Southampton dies with *(H)AMTVN* and *HAM* spellings from identically-inscribed dies for Northampton; this is impossible from the mint-names themselves and other more subtle ways are still being developed by numismatists to achieve a correct division.[21] The second difficulty is to decide the relationship between contemporary dies with *HAMTVN* or *HAMÞIC* signatures which overlap for Southampton between *c* 973 and 1015; either they belong to (at least two) moneyers working in the same commercial centre at the same time and using different name traditions of Southampton (ie **Hamtun** and **Hamwic)** on their coins; or they reflect the work of (at least two) moneyers minting simultaneously in different communities.[22] Since it is not at present possible to decide between these alternatives on numismatic grounds, it is unwise to use either of them as evidence to determine the relationship between the alternating name traditions **Hamtun** and **Hamwic** recorded by one or the other arrangement of moneyers. The coin evidence does at least show that *Hamwic* was still considered a viable mint-signature for a Southampton moneyer as late as *c* 973-1015. A further problem arises from the form *HAM* (spelling 8) which could either be a contracted form of *HAMTVN* or of *HAMÞIC* or could itself represent an otherwise unrecorded simplex name for Southampton.[23]

Diplomatic sources (spellings 14, 17, 36, 65-82, 86, 88-93)

The 28 spellings for Southampton and Hampshire taken from documents (diplomas, writs, leases, and wills) relating to the Anglo-Saxon period are potentially a very useful collection of spellings but one which must be subjected to careful criticism regarding the date to which each can be ascribed. Such ascription of dates can only be achieved by a careful study of the status and provenance of the texts in which the spellings appear.[24] Such texts may be on single sheets of parchment, written either contemporarily with the date of the transaction or centuries later. Alternatively they may only survive as cartulary copies of lost exemplars. With both late replica-copies and cartulary-copies one must be careful to isolate the influence of the copyist in the text that survives and to remember that, even if the copy is faithful to its exemplar, the latter may not have been an authentic document in the first place.

Although from the historian's point of view it is vital to know whether such documents are authentic or forgeries,[25] and while such information is important as part of the context in which the place-name spellings are found, from the onomastic point of view all spellings are interesting and valid material for study. The spellings in a 13th century cartulary, even when they do not faithfully represent those of an earlier exemplar, are of interest as 13th century attempts either to modernize or to cope with unfamiliar materials. This said, it must be admitted that such over-edited name-forms are less useful than those in original documents or in faithful copies when it comes to constructing a chronology of early name-traditions and spellings for a particular place.

Taking, then, into consideration the form of the spelling, the date of the manuscript quoted, and the status of the text therein, the following critical division may be made of the spellings for Southampton and Hampshire in the diplomatic sources:

(i) a spelling which occurs in an original document: 36;
(ii) spellings occurring in later copies, but which are possible name-forms for the dates of the respective transactions recorded: 14, 72, 74-8. 88, 92;
(iii) spellings as in (ii), but copied from exemplars which were probably not authentic documents: 65-9). 86. To these may be added spelling 17, which is a later insertion in an otherwise original document;
(iv) spellings which only represent those of a copyist improving his exemplar: 70-l. 73, 79-82, 89-91, 93.

Among the above it should be particularly noted that: of the spellings containing the element *sud* (81-2. 88-9. 93) the first four occur in Abingdon cartularies while the fifth is the work of a later copyist (cf Aspect (d) below); that the simplex **Wic** name (spelling 74) occurs in a copy of a diploma relating to South Stoneham, an estate neighbouring Southampton to the north and east (cf Aspect (b) below); and that the spelling of the only document in category (i) has a stress-mark over the first vowel of *hám* tune. suggesting that the scribe may have interpreted the name as the compound appellative *hamtun* (with a long -ã-). rather than as a compound of *hamm* (with a short -a-) and *tun* (cf Aspect (c) below).'"

Records of central government (spellings 15, 37-40. 95) The name-forms found in the rare early texts which reflect the formulation and execution of what can only loosely be termed 'central government policy' should represent what their writers, at least. thought were the official names of places. When such tests were compiled from the reports of local agents it is quite possible that the scribe drafting or writing the final collated summary would alter any spellings too far removed from his own or the official dialect to a more acceptable spelling. The intervention of an editor is thus often to be contended with in any attempt to use the name-forms in such administrative documents as evidence for the actual names by which the places were called by their inhabitants or near neighbours.

Thus, while Domesday Book is of great value to the onomast merely as a national record of the existence of places in 1086, it is unfortunately of less value to him than it might have been had its original local returns not been so drastically edited by the Norman administrator\ who supervised its compilation. The spellings of place- and personal-names in it can only be used as evidence for the Old English forms by a process of neutralization of the orthographic changes made by Normans unfamiliar or impatient with insular name-forms.[22] Its spellings for Southampton (37-C)) show. Norman changes of *-mt-* to *-nt-*, while its spelling for Hampshire *(Hantescire* (40): from which the county abbreviation 'Hants' descends) represents a shortening of an (unrecorded) Norman French form **Hantunescire* from OE **Hamtunscir.**

In contrast to these Domesday Book spellings reftecting, as they do, the change of personnel in the upper ranks of the 'central government' brought about by the advent of a Norman hierarchy after 1066, the spellings for Southampton found in the Nowell transcript of the Burghal Hidage (95)[28] and in the early 11th century copy of the Laws of Æthelstan (15) are acceptably Old English, and may be taken as those of the exemplar manuscripts.

From this discussion of the sources available for a study of the pre-Conquest name-traditions for Southampton it will be evident that each of the four categories of source has its own specific difficulties as regards the survival of tests, the intervention of editors, or the limitations of its purpose and perspective. It should be particularly noted that certain spellings found in some sources with great consistency do not appear in others at all and that such spellings visually represent the application by a writer of an editorial principle of modernization or standardization of place-name forms. Such spellings (most of those in Flor, 41-2, 44-52, for cxample) represent a very localized usage, not necessarily that of the inhabitants of the place described and, in chronicles, not often that of the historical period under discussion. Dating of all spellings is best done therefore by a system of bracket-dating, as in the Appendix of spellings below, where the date of the event or transaction being described in the source as occurring at the site of the name is always accompanied by the date of the manuscript actually being quoted.

Any consideration of the development of the names of Saxon Southampton must take the source traditions into consideration if erroneous conclusions as to the relative age of variants are to be avoided. Here. as elsewhere, there is a clear distinction to be drawn between the date of an historical event and the date of its record; the former is of great importance to the historian, but the onomast must be more concerned with the latter. With this in mind the Appendix of spellings below has been arranged in the chronological order in which the surviving manuscript records were written rather than of the events they describe. Only when the sources arc critically examined and arranged in this way can they provide a clear chronological distribution of spellings upon which, it is hoped, a surer discussion of the names themselves may be based.

The aspects of naming

As shown above. the writers of the various historical sources in which mention was made of Saxon Southampton each ordered and edited their material according to their immediate purpose, their expected audience, and the limitations of the genre in which they were working. The degree of change wrought by an author during the course of editing and collating hi4 primary sources, whether oral or literary, would no doubt have been affected by the spatial and temporal perspective in which he viewed the events recorded therein. He might very well have felt freer to alter the linguistic detail if he were writing of a distant country or of a bygone age. Other variations in viewpoint affect the actual giving of' a name to a place. Here we may talk of the *aspect* in which a place is viewed rat her than the degree of distance or *perspective* involved. *Aspect* is t tie light in which a place is seen. the context in which one speaks or thinks of a place. the particular view one has of what the nature of the place consists of. Different people may thus give the same place different names depending on the particular aspect of the place they themselves have in mind or under discussion at the time. Such variability in the characterization of places must lie behind many of the recorded cases of variation anti change in English place-names.[29]

In the different names given at various times to the site of Saxon Southampton there is evidence showing that the place was seen to possess at least four different aspects, each representing a particular view of the settlement and its site. These four aspects-topographical. mercantile. administrative, and directional-coexisted throughout the history of the Saxon settlement and still exist today in relation to the modern port of Southampton.

(a) **The topographical aspect** (represented by the name-element OE *hamm,* see *EPN* i, 229-31; *DEPN,* 214; and below, spellings l-35, ?36, 37-71, 73, 78-97)[30]

From the recorded spellings. it is certain that the earliest names for Southampton, of which we know, were compounds of *(hamm + wic)* and *(hamm + tun)* respectivery, and that possibly the latter name was later interpreted as being the compound element OE *hamtun.* The relationship between these name traditions is discussed below in the section on the sequence of naming. The element *wic* is explained in Aspect (b) and the clements *tun* and *hamtun* in Aspect (c). All the spellings cited above, except for six, could in fact formally stem from *hamtun,* but the *(H)om-* spellings in *CW* (65-8) and in SD II (8.3) could only be derived from *hamm.* while the lot-tit in spelling 8 (Coins), simplex as it stands, must be from *hamm* not *ham.* It is possible that the accented form in spelling 36 represents the interpretation by an 11th century scribe of the **Hamtun** name-tradition a being the element *Hamtun. Hamm* is the basic topographical element in the names **Hamtun, Hamwic,** and Southamp ton. This element originally had an application to sites whose character could be summarized as a plot of land confined or *hemmed* in by natural topography, for example by water, or by rising or falling ground' but it later acquired the extended meaning of an artificial enclosure'." At Southampton the application was most probably to the whole promontory of dry land between the mouths of the rivers Itchen and Test, upon which the Saxon, medieval, and modern town(s) stand. There is a possibility, however, that it reters specifically to the ridge of higher ground upon which the Late Saxon and medieval town was built. but this is something that cannot be proven from the onomastic evidence and on the whole unlikely, given that early occupation of the peninsula was not confined to. or even apparently much in evidence in. that area.

To the basic element *hamm* other elements, *wic* and *tun,* were added in final position (see Aspects (b) and (c) below) and when thus compounded with them, *hamm* became a refining clement rather than a defining one, being used to distinguish the *'hamm' tun* and the *'hamm' wic* from other places also thought of as possessing the respective attributes of a *tum* or a *wic.*

The other *hamms* in the immediate vicinity of Southampton are at (South) Stoneham and Northam, both examples of places which have been defined as 'land in a river-bend. It is impossible to say whether the place *Nordhunnwig,* referred to by Nithard *sa* 842 (spelling 3) in the context of a Viking raid on Southampton *(Hamwig,* spelling 2) is a reference to either of these *hamms,* both to the north of Southampton. As a name-form it represents an OE name-tradition **Nordhamwic** which has been influenced both by Continental Germanic and by scribal error. If it does refer to (South) Stoneham it could be evidence for the continued use of the Roman site at Bitterne as a refuge in the 9th century, while it to Northam it would imply the existence of a rival settlement of some note immediately to the north of Southampton at that time. It may be. however, that *Nordhunnwig* is not the name of a settlement at all but merely a garbled form of a phrase (taken by Nithard from a now unknown Anglo-Saxon source) be *nordan Humwic,* to the north of **Hamwic:** that is, the Viking raided the port and the countryside north of it. as in AD 860 *(ASC)* when they reached as far north as Winchester.

(b) **The mercantile aspect**

(i) (The name-element OE *wie,* see *EPN* ii, 257-63; *DEPN,* 515-h: and below. spellings l-3, 9, 72, 74-5, 83, 87, 94.)[39]

The element *wic* occurs as the second element in the compound **Hamwic** *(hamm + wic)* on coins c 973-1015 (spelling 9), in Continental narrative sources of the 8th and 9th centuries (Willibald, spellings 1, 87, 94; Nithard, spellings 2,3) and in an annal for the year 764, of uncertain origin, which survives only in a late 12th century transcript (SD II, spelling 8.3). In the two Continental sources the spellings of the compound are influenced by Old High German, from which has arisen the modern confusion over the form *Hamwih* already discussed.

Wic also occurs as a simplex place-name. It is found thus in the appurtenance-clause to the South Stoneham charter of AD 1045. surviving only in a copy of c 1130 (in *CW,* spelling 74). In the boundary-clause of the same text the element occurs in primary position in a compound with OE *hyd* landing-place' *(EPN* ii, 278; spelling 75 below), which name also appears in the *CW* copy of the late 10th century text of the same boundary (spelling 72). Because of the historical context in which spelling 1 occurs in Willibald there can be little doubt of the significance of the element *wic* in the compound **Hamwic.** The hagiographer refers to **Hamwic** (in the spelling *Ham-wit c* 721 (778) (1.8 x e.9)) as a *merci-monioa,* a 'mercantile centre', near the mouth of the river Hamble, Both Nithard and the annal for 764 in SD II refer to the place. as a notable settlement ravaged by disasters or Viking raids, in the company of such places as Winchester, York, and Quentovic.

The trading aspect of the compound **Hamwic** is underlined by its occurrence on coins. The use of the element *wic.* a term whose origin is in Latin *vicus* 'a quarter in a town, a town', to describe a specialist trading centre in this way is not surprising. It also occurs in the names of other early trading settlements in England. such as Dunwich, Fordwich, Harwich, Ipswich, Norwich, Sandwich. and, later, in that of York (by rationalization of the Celtic **Eboracon* to OE *Eoforwic).*[40] It should be noted that Mr Burgess's assertion that a *wic* must always be subservient to a fortified *tun* cannot be upheld in England, whatever the case on the Continent. [41] The OE element *wic* had a life of its own and could in the early medieval period be applied to economic centres of the first order, of which Saxon Southampton was one, without any necessity for those places to be seen as dependent on anything but their viability as *entrepôts* of long-distance trade.[42]

The significance of the simplex use of the element *wic* in the mid 11th century (spelling 74) may reflect the decline of the Itchen shore of Saxon Southampton. which was perhaps particularly associated with the early mercantile renown of Southampton characterized by the name-tradition **Hamwic,** in favour of that of the Test. This simplex usage (applied to the St Mary's area).[43] and also the us2 of the element in primary position in the compound name denoting an Itchen-side boundary point of a neighbouring estate (spellings 72. 75). is a colloquial and local use (in charters written at Winchester) which contrasts to the international perspective in which the compound name **Hamwic** had been used. The underlying significance of these later usages may) even be in the sense 'the former *wic'.* 'the landing-place associated with the former *wic',* reflecting a familiarity on the pat-t of the namers with the area's history and former prosperity. It is very important, however. to note that such usages do not necessarily mean that the same area had never also been referred to as **Hamtun,** a name-tradition later associated more particularly with the Below Bar area.

(ii) (The name-element OE *port*[2], see *EPN* ii, 70-1 and *DEPN,* 371: below, spellings 76-7)

The element *port*[2] occurs with reference to Saxon Southampton in two compound minor-names to the north of the peninsula. These are those of Portswood and *portes bryeg*. both first recorded in 1045 *(c* 1130) (spellings 76-7). Whoever first coined these names must have assumed an association between the wood, the bridge, and the nearby market-centre of Southampton, an association which need not have been one of legal possession.[44] The designation of Southampton as a port by these names, a status also given to it in the Laws of Æthelstan.[45] is a further example of the place's mercantile importance already indicated by its designation as a *wic*. Such *ports* were (in Æthelstan's reign at least) the only places allowed to possess a mint (Southampton was allocated two moneyers in Æthelstan's laws) and were centres of trading which were specifically regulated and protected by the central government. Amongst their number by the early lith century could be counted both ancient cities such as London and Canterbury and more recent *burhs* such as Wareham or Bristol.[46] As an established trading centre with an international reputation and also as a *burh*. [47] Southampton was not out of place on either account.

(c) **The administrative aspect**

(i) (The element *tun,* see *EPN* ii. 188-98, and *DEPN*. 482: below, spellings 4-7, 10-35. ?36, 37-71, 73, 78-82 84-6, 88-93, 95-7 Ct also OE *hamtm, EPN* i, 232-3: *DEPN* 216: (?spelling 36 below).)

Tun occurs as the second element in the compound **Hamtun** *(hamin + tun)*. which is first recorded in the three annals for 755, 837, and 860, in the version of the *Anglo-Saxon Chronicle* written at Winchester c 900 (spellings 4-6 below 4 and 6 being references to the shire). The compound also occurs on coins from the reign of Æthelstan (spelling 7) and, although replaced for a while by a simplex HAM spelling (8) and then alternating with a spelling from the **Hamwic** tradition (9), by 1015 (spelling 10) has replaced both the others as the coin-signature for Saxon Southampton. There was, however, a period of up to ninety years when either of these compounds seems to have been acceptable to traders as a name for the place between the mouths of the rivers Itchen and Test where they came to trade. The, coin evidence is here very important as showing the co-existence of the two compounds **Hamwic** and **Hamtun** in the period c 973-1015, for in other sources the two are mutually exclusive. The significance of this numismatic alternation might be as a reflection of the source itself-coinage being a commodity both under the control of royal government but also dependent on the economic viability and success of the place at which it was minted for use. It might thus be expected to reflect both the mercantile and the administrative aspects of Saxon Southampton each encapsulated in an alternative name-tradition made use of by the moneyers there.

That it was the **Hamtun** compound which was in the end preferred in all sources, rather than the **Hamwic** one, probably reflects the strength of *Hamtun's* ancient reputation made at an early period of West Saxon history, as a local centre of royal administration. Although the revival of Winchester as a royal centre in Wessex, from the late 9th century onwards, must have considerably decreased the actual importance of *Humtun* in the administration of Hampshire by the end of the Anglo-Saxon period, it remains the eponymous town of the shire to the present day (cf below *sv scir*[1]*).*[48] The **Hamtun** compound contained the element *tun* which reflected this administrative aspect of the place much more adequately than the element *wic*. The basic sense of the element *tun* is that of a man-made enclosure, such as would surround the administrative centre of an estate. but it also developed the extended sense of a 'village, a collection of houses and later of estate, manor, vill.[49] Because of these extended senses it is unwise automatically to assume the existence of a defensive enclosure at Southampton, a *tun* in its most basic sense, physically separate from the place called **Hamwic:**[50] the compound **Hamtun** more likely signified 'the estate at the *hamm* than 'the enclosure at the *hamm*. The boundaries of this estate may well have included the whole peninsula up to the bounds of the neighbouring estates of Millbrook and South Stancham.

It was particularly within the context of royal control and protection of its trade that the place was habitually called **Hamtun** in the records of central government (Burghal Hidage, DB. Laws: spellings 95, 37-40, and 15 respectively). while the same compound is used of the place when charters were granted there (spellings 14, 65-8). In the earliest examples at least of the compound **Hamtun,** therefore, it is quite possible that the location referred to thereby as a *tun* was the same as that also called a *wic,* in the compound **Hamwic,** when looked at in its mercantile, as opposed to its administrative. capacity. Similar alternative forms are recorded as the names of other places in England also subject to such variability of characterization. London, for example, is called both *Lundenburh* and *Lunderwic* in Anglo-Saxon sources, while the name Hastings is defined by both the elements *port*[1] and *ceaster* in the 11th century.[51]

As stated above the origin of the compound **Hamtun** is as and amalgam of *chamm - tun).* There is a possibility, however, that the compound was later, by some seribes at least assumed to derive from the compound element *hamtun*. [52] As a derivative of *tun,* this element inherited the latters basic meaning together with the added idea of status given by the element ham.[53] It in fact it were later taken to be a *hamtun* this would underline the place's entrenched reputation as a centre of royal administration in the shire by the 10th century.

(ii) (The name-element OE *scir* see *EPN* ii, 109-11 and *DEPN,* 407: below, spellings 4, 6, 11, 13, 13a, 16, 18, 21-2, 25, 27-35, 40, 53, 55, 58-63, 69, 78-80, 86, 92, 96: cf the Latinizations of the shire-name in spellings 44-5 47,50,52,93)

The majority of the vernacular references to Hampshire **(Hamtun** - *Scir*[1]*)* in the period up to 1100 occur in the *Anglo-Saxon Chronicle,*. In the later annals the significance of this compound is clearly as a designation of the district of royal administration originally governed from the shire-town of *Hamtun* a district probably conterminous with the medieval county of Hampshire. Most of the occurrences in *ASC* are in the context of Viking raids and the organization of the communities of the shires of Wessex in defence against them, but that under the annal 755 (spellings 4,11,18,53) is of a different nature. The annal in question (actually referring to events of 757)[54] states baldly that Sigebeorth, king of the West Saxons, was deprived of his kingdom, except for *Hamtunscir (buton Hamtunscire ASC* A. spelling 4: cf 11,18,53,96) because of his unjust deeds. The fact that Sigebeorht was allowed to retain this *scir* (although he later lost this too) may either show that Hampshire was not yet very important within Wessex, which might have implications for the status of Winchester in this period. and or that this *scir* continued to support him and did not allow itself to be taken from him by his opponents.[56] A further possibility, a less likely one, is that the *scir*

referred to in this annal does not represent the same area as that in the later references and was not so large as the later county of Hampshire.[57] Such an inference is possible from the name itself since the basic sense of *scir* is merely that of any administrative district governed from a centre and only in the later Anglo-Saxon period is its usage, in southern England at least, limited to describing the large areas of land later called counties.[28]

Most of the references to the shire in *ASC* are copied into Flor, but in a Latinized form, adding *Suth-* to all spellings (see Aspect (d) below) and expressing the meaning of *scir* by Latin *provincia* (spellings 44-5. 47-50, 52). The Latin version of King Eadræd's will, AD 951 x 955, in a 14th century cartulary (see spelling 93), also uses a form beginning with *Suth-,* but this text's lack of authenticity in general is underlined by the use of Latin *comitatus* to translate OE *scir,* thus betraying its post-Conquest date.[59]

In contrast to spelling 93, other name- forms from documentary sources which use the compound **Hamtunscir** are acceptable for the dates of the transactions recorded (see spellings 69, 78, 86, 92).

In Domesday Book, as noted above, the compounded occurs in a contracted Norman French spelling (40) from which has descended the modern county abbreviation 'Hants'.

It should be noted that the element *scir* occurs only with the compound **Hamtun** and not with **Hamwic.** This is a reflection of the fact that it was the administrative aspect of the place. exemplified by the element *tun* (or *hamtun),* which most readily came to mind in the context of shrieval organization and that therefore it was the former compound that was used of the place as an early shire-town, a reputation it never lost.

(d) **The directional aspect** (the name-element OE *suo,* see EPN ii, 169 and DEPN, 453-4; below, spellings 23. 41-52. 81-2, 88-9). 93.)

The addition of the element *suo,* 'south'. to the compound **Hamtun** in the C (Abingdon) text of the *Anglo-Saxon Chronicle sa* 980 (spelling 23) is the first record of the name-tradition that lies behind the modern name Southampton. This annal was actually written in *ASC C* in the mid 11th century [60] so we may say that by that time at least the ancient shire-town of Hampshire was seen to possess a fourth aspect which could be expressed by means of its name. This aspect was, and is that it lay in a southerly direction from the place which we now call Northampton. the one other place then called *Hamtun* that had become a shire-town by the middle of the 10th century. The need to distinguish between these two particular settlements called *Hamtun* did not become important until after each had been seen to act as the centre of a shire. The southern *Hamtun* may have been such a centre by the year 757 (see Aspect (c) (ii) above) but Northamptonshire did not emerge as a shire, s distinct from an area settled by a Danish army, until after the recovery of the southern Danelaw by King Ælfræd's successors in the first part of the 10th century.[61] Only after both had acted as shire-town, and were thus likely to be mentioned as the venue of noteworthy events in the *Anglo-Saxon Chronicle,* would much if any confusion arise, and even then only among an audience as used to having dealings with the northern *Hamtun* as the southern one. The fact that spelling 23 occurs only in the Agingdon version of *ASC* is therefore not too surprising in consideration of that abbey's position midway between the two places, on an important early line of road for travellers.[62] This isolated occurrence of the new compound **Suðhamtun** in the Abingdon version of *ASC* is a useful reminder of the local character of the source by the end of the Anglo-Saxon period,[63] and that it was one that overall had become progressively less West Saxon in character and content.

In view of the spelling in the Abingdon version of *ASC* it is interesting to note that. apart from the spellings in Flor (41-52). which are 12th century and may even have been modelled on spelling 23, as many as four out of five of the other early occurrences of the compound **Suðhamtun** were written at Abingdon (spellings 81-2, 88-9). These four spellings are, however, in manuscripts not earlier than the mid 12th century. and two are: actually cartulary-rubrics (82, 88). As for the one other occurrence of the compound in the Appendix of spellings below, it too was written after the Norman Conquest and in fact, like the text it is in, probably represents a 14th century modernization (93).

This aspect of the name Southampton clearly has a very local incidence in the sources written before the Norman Conquest. It represented a usage only necessary when hen the Hampshire *Humtun* was viewed in a certain perspective, that is from a point at which (Sout)hampton and (Nort)hampton were equally important to the namer. It is noteworthy that the element *suo* is not added to either the name of the shire or to that of the town in Domesday Book (spellings 37-40). In this respect DB. written at Winchester. has the character of a local source. It takes for granted that *hantone. HANTVNE,* and *Hantescire* are recognizable spellings for Southampton and Hampshire but in contrast writes not only *Hantone,* but also *\NORTHANTONE and NORTHANTONE SCIRE,* for Northampton anti Northamptonshire.[64] Likewise, to the city chamberlains of Winchester as late as 1465-6 the form *Hampton* was an acceptable designation for Southampton.[65] To these Hampshire writers there was no risk of confusion in not distinguishing their local *Hamtun* from that in the Midlands. With the greater centralization of royal government in Westminster from the 12th century onwards. however, the custom of always distinguishing between the two counties and two towns in official records grew until it is now adays invariable in all contests.

Alterntive explanations of the compound **Suðhamtun** have in the past been put torwardard. for example that it was 'south' in relation to a postulated lost place called *Hamtun* north of the walled medieval city.[16] or that it was named in relation to Northam, but such explanations have not been based on any detailed study either of the early occurrence of the name or of the specific perspective implied by the giving of such a name to an ancient shire town, a perspective which must be other than local.

The sequence of naming

A comparison of the source in which the various spellings appean allows some discussion of the relative age of the different name-tradditions for Saxon South ampton, each reflecting one of the aspects of the place examined above. It should be remembered, however, that no absolute conclusions can be reached as to the date of first coining of any of the names. All that can be said with certainty is that a particular tradition was first written in the surviving sources at a particular date and in a particular context. Always remembering these limitations which are a part of the available sources, it is possible, however, to postulate a sequence of use for the different traditions and to suggest periods of their coexistence. This hypothesis, based on the Appendix of spellings (p 15) is expressed in Table 3. I below. In it. name-traditions are listed in the order in which they were discussed under the various aspects identified above, and

TABLE 3, 1. Saxon Southampton : Recorded Name-Traditions And Their Co-Existence. A.D. 701-1100.

Name - Traditions	701-750	751-800	801-850	851-900	901-950	951-1000	1001-1050	1051-110
HAMM						Y		
HAMWIC	?	Y	?	Y	?	Y	?	
NORDHAMWIC			?	Y				
WIC (-)						?	?	?
PORT -					*		?	?
HAMTUN		?	?	Y	Y	Y	Y	Y
HAMTUNSCIR		?	?	Y	Y	Y	Y	Y
SUDHAMTUN						?	Y	?

*Southampton (Hamtun) is described, with other places, as a port in Laws II Æthelstan 14, see spelling 15 in Appendix of Spellings and source quoted there

an indication is given of their occurrence in fifty year periods from AD 701 to 1100. A tick in a particular box indicates that the name-tradition appears in a source written in the fifty year period shown. A question mark indicates that the tradition is associated with the period shown by a source written at a later date. A reading of the table horizontally thus shows both the possible and the definite date of recording of a tradition, while a reading vertically shows the coexistence, definite and possible, of the various traditions.

While then the earliest recorded name-tradition for Saxon Southampton is the compound **Hamwic,** with a single occurrence of the related **Noröhamwic** (spelling 3). this tradition eventually disappears from record in the period 1001-1050 (in fact by 1015; spelling 9). By that time it may. in colloquial usage. have degenerated to simplex **Wic** (spelling 74).

Although **Hamtun** was recorded somewhat later than **Hamwic,** and coexisted with it for up to 300 years, it was eventually the dominant and surviving name-tradition, helped no doubt by its use as the name of the shire-town of **Hamtunscir.** From the tradition **Hamtun** also developed eventually that of **Suöhamtun,** but only after the making of the midland *Hamtun* into a shire-town in the 10th century.

The basis for a simplex **Hamm** name-tradition, the only one describing topography rather than human activity, was and still is present in the physical character of the place. In the sources, however, it occurs only in a very limited period and in one type of source (Coins 955-9; spelling 8). The implication of this rarity of occurrence (unless this is not really a name-tradition and is merely a numismatic abbreviation) is perhaps that the definition of the particular human activities going on at the *hamm* became as important to the namers as the actual physical appearance of the venue of such activity, if not more so, and therefore that they found it convenient to add *tún* or *wíc.* to the original topographical element to clarify the particular aspect of the place with which they were most concerned.

The tradition of calling Saxon Southampton a *port* (in the sense 'market-town, town with a mint') may not, strictly speaking, represent a further name-tradition, as opposed to the use of yet another descriptive term. That is, it is improbable that Southampton was ever called Port, rather than *'the port'.* As a description, however, it is worth recording as a further reflection of the mercantile aspect associated with **Hamwic** and **Wic.** The coexistence of various traditions at different times and over quite long periods is noteworthy and is discussed below.

Saxon Southampton: the place named

This chapter has attempted to define and criticize some of the sources upon which any application of onomastic evidence to the archaeology of Saxon Southampton must be based. It has tried also to catalogue the different name-traditions for Saxon Southampton and to associate them with different aspects of the place. Such name-traditions are to be taken as variable descriptions of the place, differing with the particular perspective of the namer or the nature of his interest in the place named. The question arises, however, whether at any time one tradition is referring to a different locality from others, all nevertheless within what may now be termed 'Southampton'. This is a question that is impossible to answer from the onomastic evidence with any degree of certainty. With major place-names it is always impossible to say with what exactitude they designate a place in the minds of their users, many of whom have never visited the place concerned. It is therefore highly dangerous to use variants of such names as evidence for the existence of a sub-community within the place named at one date rather than at another. In particular it is not advisable to assign such variants too firmly to a particular archaeological excavation site, often chosen and defined by modern expediency.

The different name-traditions discussed above all refer to Southampton before AD 1100 but none, apart from simplex **Wic** which can be assigned to the St Mary's area by AD 1045 *(c* 1130),[68] may be more precisely connected with a specific location within the peninsula. The rest were all used to refer to Southampton as a generalized venue of human activity in the minds of the namers, which is after all the usual function of a major place-name.

With respect to the names for Saxon Southampton. it has been assumed by previous writers[69] that a study of the development of the various recorded major place-names can answer such questions as to what extent the east and west habitation sites were ever part of the same community and how far the names reflect the shift of the main concentration of settlement at Southampton to the west of the peninsula in the late Anglo-Saxon period. Such questions may be borne in mind when studying the evidence for the sequence of naming but beg the general question as to the real usefulness of major place-name material in the solving of extremely local problems which involve a degree of topographical precision not actually present in a major name once it has gained national,. and sometimes international, currency.

For this reason, it is impossible ever to prove that the names **Hamtun** and **Hamwic** did not at some period refer to the same community. It is unwise to conclude from the onomastic evidence more than that the alternation of these compounds between *wïc,* and *tùn* as final element, particularly in the period *c* 973-1015 (spellings 9. 10). represents the continuing coexistence of alternative names for Saxon Southampton. each having its origin in a different as aspect of the place's lift and business.

The application of the study of major place-names to the precise localized discipline of archaeological excavation is thus limited, by the very nature of such names, to being often not more than a (necessary) part of the general historical background of the ancient administrative area in which an excavation is conducted. When so used such names should be carefully studied from the evidence of their recorded spellings, always considered in the context of the historical sources concerned. In particular, care should be taken not to use one variant of a name with exclusive application to a particular excavation site unless this is justified by the historical evidence. In the case of Southampton there is no real justification to call sites on the east of the peninsula **Hamwic** rather than **Hamtun.** and none to call them *Hamwih* which is a Continental spelling rather than an independent name-tradition. In the long run it may be better to identify sites by their modern locality-name, such as 'St Mary's', or by a street name, terms which are specific to actual areas of excavation. In general references to the port and settlement throughout the Anglo-Saxon period the term 'Saxon Southampton' probably retains enough of the ambiguities of the onomastic evidence to serve as the least inaccurate designation for the place, wherever its nucleus at a particular period may have been..

In contrast to the generalizing nature of major place-names, a study of microtoponymy, minor place-names, will pay much greater dividends to the archaeologist. Such names do actually pinpoint a location with some exactitude. A properly conducted survey of *all* local place-names,[70] including those not thought of as immediately relevant to the location of the site, should be made for a large area surrounding such an important focus of human activity as Southampton. For the understanding of the functioning of the early medieval settlement at Southampton it is important that its relationship to neighbouring estates be more clearly defined. Topographically this will not be possible until the Anglo-Saxon charter boundaries of North and South Stoncham and Millbrook have been firmly fixed on the modern map;[71] this in turn cannot be done until a scientifcally-based collection of all the minor place-names in the region of these estates has been completed. Such a collection would supply details of the human contest to all the archaeological sites in the Southampton area (including the as yet insufficiently-studied Roman fort and medieval manor at Bitterne) and may be expected to reflect such things as local economic resources,. land communications, dependent settlements. and riverine traffic.

From the onomastic point of view. then, the present survey of the evidence for the variant major names of Saxon Southampton, although hopefully an advance on previous statements, must be admitted as being but a small part of the potential information to be gained from a thorough survey of naming in the town and its hinterland at the most local level.

Appendix of spellings

The following collection of name-forms has been assembled from the major historical sources which recorded events in Hampshire and Southampton to *c* AD 1100.[72] Certain Anglo-Norman narrative sources have, however. been omitted since their spellings either simply reproduce those in Florence of Worcester (Flor) or are simply Latinized Norman French spellings such as *Hantona, Hantonia;* for such spellings see, for example, *Guillaume de Jumieges, Gesta Normannorum Ducum* ed T Marx *(Sociètè de l'histoire de Normandie,* Rouen and Paris 1914): *Guillaume de Poitiers,* ed R Foreville *(Les classiques de l'Histoire de France au moyen age.* Paris 1952); *Chronica Magistri Rogeri de Houedene* ed W Stubbs *(Rolls Series* **51,** London 1868); *Memoriale Fratris Walteri de Coventria* ed W Stubbs *(Rolls Series* **58,** London 1872) etc, *passim*. Likewise, Simeon of Durham (SD) is only quoted where its spellings are independent of those in Flor.

The spellings in the Appendix are arranged in the chronological order in in which surviving manuscripts of the sources were written; within each of such manuscripts the spellings are arranged in the date order of the

events described therein. The Appendix thus represents a chronological distribution of 98 surviving spellings (l-97. and 13a), those written earliest being numbered nearest to 1 and those latest nearest to 97. Although the order of spellings thus obtained is a conservative one it has two advantages: firstly. there is no premature dating of a name-tradition; secondly. where a late manuscript does preserve an earlier spelling-tradition from its exemplar this becomes the more obvious from its dissimilarity to the spellings written in other manuscripts contemporary to the copy; see. for example, spelling 83. For a full discussion of the merits and limitations of the various types of source see the section on the sources and their perspective above.

The following abbreviations are used in the Appendix:

Æthelweard	*The Chronicle of Æthelweard* ed A Campbell *(Nelson's Medieval Texts.* London *1962)*
ASC	*The Anglo-Saxon Chronicle,* ed B Thorpe *(Rolls Series.* **23** London 1861). The different manuscripts are referred to here by the conventional *sigla.* Years cited are those of the annal as written in the manuscript, not those of the corrected dating of events given in Whitelock 1965
ASWrits	*Anglo-Saxon Writs,* ed F E Harmer (Manchester University Press 1952)
BCS	*Cartularium Saxonicum,* ed W de G Birch (London 1885-99)
Burghal Hidage	Hill 1969. 84-92
Coins	Contribution by M Dolley to Addyman & Hill 1968. 78-9
C W	*Codex Wintoniensis* (British Museum Add MS 15350). the 12th century cartulary of Winchester cathedral priory (Davis 1042)
Davis	G R C Davis, *Medieval Cartularies of Great Britain, a short catalogue* (London 1958)
DB	*Domesday Book, seu Liber Censualis Willelmi Primi Regis Angliae,* ed A Farley (London 1783)
e.	early
Flor	*Florentius Wigorniensis Chronicon ex Chronicis,* ed B Thorpe *(English Historical Society,* Londor: 1848-9), volume I
Gransden	Gransden 1974
ib	*ibidem* (printed in italic if referring to a manuscript rather than to a printed source)
Ker	Ker 1957
l.	late
Liebermann	Liebermann 1903-16
m	mid
Nithard	Nithard, *Histoire des Fils de Louis Le Pieux,* ed P Lauer *(Les Classiques de L'Histoire de France au Moyen Age,* Paris 1926)
r	recto
sa	*sub anno*
Sawyer	Sawyer 1968. Where this abbreviation is given in italic print then the spelling to which it refers has been taken from the manuscript text(s) indicated
SD	Simeon of Durham, *Symeonis monachi opera omnia:* Vol I *Historia Ecclesiae Dunhelmensis;* Vol II *Historia Regum.* ed T Arnold *(Rolls Series,* 75 London 1882-5)
Tobler	T Tobler (ed), *Descriptiones Terrae Sanctae ex sueculo VIII. IX. XII. et XV., S Willibaldus* (Leipzig 1874)
v	verso
Whitelock ASChron	Whitelock 1965
Willibald	*Vita Willibaldi Episcopi Eichstetensis,* ed O Holder-Egger *(Monumenta Germanica Historica, Scriptorum,* XV(i), Hanover 1887) Cf Tobler

1	*Ham-wih c* 721 (778) (1.8 x e.9,)	Willibald p 91 (*ex* MS1). Cf 87. 94. (Note Tobler's edition, p 320, reads *Hamuuih* from this MS)
2	*Hamwig* 842 (1.9)	Nithard Bk IV.3, p 124
3	*Nordhunnwig* 842 (1.9)	ib
4	*buton Hamtúnscire sa* 755 *(c* 900)	*ASC A* (Ker 39, art 1) Cf 11, 18. 53, 96
5	*æt Hamtune sa* 837 *(c* 900)	ib Cf 12. 19-20, 54, 97
6	*mid Humtunscire sa* 860 *(c* 900)	ib Cf 13, 13a. 21-2.55
7	*AMTVN* 923-39	Coins
8	*HAM* 955-9	ib
9	*HAMPIC c* 973-1015	ib (where quoted as *HAMPIC)*
10	*HAMTVN c* 973-c 1025	ib
11	*butan Hamtúnscire sa* 755 (1.10)	*ASC B* (Ker 188, art 1) See 4
12	*æt Hamtúne sa* 837 (1.10)	ib See 5
13	*mid Hamtúnscire sa* 860(1.10)	ib See 6
13a	*Hamtunscire sa* 860 (e. 11)	Æthelweard p 35 Cf 6
14	*Hamtun* 900 (e.11)	BCS 596 (Sawyer 360). (Place-date to a non-contemporary single-sheet charter)
15	*to Hamtune* 924 x939 (e.11)	Liebermann I p 158: Laws II Æthelstan 14 (Ker 180, art 5)
16	*togeanes Hamtunscir sa* 1001 (e.11)	*ASC A.* Cf 46
17	*an ham tune* 956 (m10 x m11)	*Sawyer* 636 MS1. (Single-sheet charter. This spelling occurs in a clause added to the document written in a darker ink and a different pre-Conquest hand, perhaps copying from *Sawyer* 1008). Cf 70
18	*butan Hamtunscire sa* 755 (m11)	*ASC* C.D (Ker 191, art 4; and ib 192). See4
19	*æt Hamtúne sa* 837 (m11)	*ASC C* See 5
20	*æt Hamtune sa* 837 (m11)	*ASC* D. See 5
21	*mid Hamtúnscire sa* 860 (m11)	*ASC* C. See 6
22	*mid Hamtunscire sa* 860 (m11)	*ASC* D. See 6
2.3	*Suðhamtun sa* 980 (m11)	*ASC* C. Cf 41
24	*Hamtun sa* 981 (m11)	*ASC* D. Cf 42.56
25	*on Hamtunscíre sa* 982 (m11)	*ASC C'*
26	*to Humtune sa* 994 (m11)	*ASC* C,D. Cf 43,57
27	*ón Hamtunscire sa* 994 (m11)	*ASC* C. Cf 44,58

28 *on hamtunscire sa* 994 (m11) — *ASC* D. Cf 44, 58

29 *of Hamtunsicire sa* 998 (m11) — *ASC* C,D. Cf 45,59

30 *of Hamtunscire sa* 1003 (m11) — *ASC* C,D. Cf 47,60

31 *þuruh Hamtunscire sa* 1006 (m11) — *ASC* C. Cf 48,61

37 *þuruh Hamtunscire sa* 1006 (m11) — *ASC* D. Cf 48,61

33 *on Hamtunscire sa* 1009 (m11) — *ASC* C. Cf 49,62

34 *on Hamtunscire sa* 1009 (m11) — *ASC* D. Cf 49,62

35 *Hamtunscire sa* 1011 (m11) — *ASC* C,D. Cf 50,63

36 *on ham tune* 1045 (m11) — *Sawyer* 1008 MS1

sheet charter). Cf 73

37 *iuxta hantonte* 1086 — DB fo 41v

38 *in Hantone* 1086 — ib fos 46v, 52r

39 *INBURGODE HANTVNE* 1086 — ib fo 52r

40 *Hantiescire* 1086 — ib fo 37v

41 *Suthamtonia sa* 980 (e.12) — Flor Cf 23

42 *Suthanmtoniam* (Latin accusative) *sa* 981 (e.12 — ib Cf 24

43 *ad Suthamtun sa* 994 (e.12) — ib Cf 26

44 in *suthamtunensique provincia sa* 994 (e.12) — ib Cf 27-8

45 *de suthamtunensi provincia sa* 998 (e.12) — ib Cf 29

46 *in suthamtonia sa* 1001 (e.12) — ib Cf 16

47 *de Suthamtunensi . . . provinci* [a] *sa* 1003 (e.12) — ib Cf 30

48 *per Suthamtunensem provinciam sa* 1006 (e.12) — ib Cf 31-2

49 *in . . . Suthamtunensi provincia sa* 1009 (e.12) — ib Cf 33-4

so in . . . *suthamtonensi . . . provinci* [a] *sa* 1011 (e.12) — ib Cf 35

51 *in Suthamtonia sa* 1016 (e.12) — i b

52 *Suthamtunensem provinciam* (Latin accusative) *sa* 1066 (e.12) — i b

53 *buton Hamtunseyre sa* 755 (*c* 1121) — *ASC* E (Ker 346). See 4

54 *æt Hamtune sa* 837 (c 1121) — ib See 5

55 *mid Hamtunescire sa* 860 (*c* 1121) — ib See 6

56 *Hamtun sa* 981 (*c* 1121) — ib See 24

57 *to Hamtune sa* 994 (c 1121) — ib See 26

58 on *Hamtunscire sa* 994 (c 1121) — ib See 27-8

59 *of Hamtunscire sa* 998 (*c* 1121) — ib See 29

60 *of Hamtunscire sa* 1003 (*c* 1121) — ib See 30

61 *þurh Hamtunscire sa* 1006 (c 1121) — ib See 31 - 2

62 *on Hamtusncire sa* 1009 (*c* 1121) — ib See 33-4

63 *Humtunscire sa* 1011 (*c* 1121) — ib See 35

64 *æt Hamtune sa* 1094 (*c* 1121) — ib

65 *IN HOMTVNE* 825 (*c* 1130) — ***Sawyer*** 272. (Place-date to a cartulary copy of a questionable charter, in *CW)*

66 *in omtune* 825 *(c* 1130) — ***Sawyer 273.*** (As ***6.5)***

67 *in omtune* 826 *(c* 1130) — Sawyer *275.* (As 6.5)

68 *in omtune 826 (c* 1130) — ***Sawyer 276.*** (As 65)

69 in HAMTVNSCire 899 x *925* (*c* 1130) — ***Sawyer*** 382. (*CW* cartulary copy of a questionable charter)

70 *án hámtune* 956 (c 1130) — *Sawyer* 636 MS2. *(CW* cartulary copy of 17)

71 *on hamtune (956) c* 1130 — *CW* cartulary copy of charter` constructed from ***Sawyer* 636** MS1 (see 17) and *ib* 1008 MS1 (see 36)

72 *on pic hyde* 990 x 992 (*c* 1130) — ***Sawyer*** 994. (*CW* cartulary copy)

73 *on hamtunæ* 1035 (*c* 1130) — ***Sawyer*** 1008 MS2. *(CW* cartulary copy of 36)

74 *æt pic* 1045 (*c* 1130) — ***Sawyer*** 1012. (CW cartulary copy)

75 *on þic hyde* 1045 (*c* 1130) — ***ib*** *(CW* cartulary copy)

76 *ón portes þuda* 1045 (*c* 1130) — *ib (CW* cartulary copy)

77 *æt portes bricge* 1045 (*c* 1130) — ***ib*** *(CW* cartulary copy)

78 ***0n*** *Humtunscirr* 1047 x 1052 (*c* 1130) — *Sawyer* 1403. *(CW* cartulary copy)

79 *on hamtun sciræ* 1047 x 1053 (*c* 1130) — *Sawyer* 1402. *(CW* cartulary copy)

HO on hamtunsciræ c 1053 (*c* 1130) — ***.Sawyer*** 1476. *(CW* cartulary copy)

81 *Æt Suthumtunam* 962 (11112) — BCS 1094 (ex Sawyer 701 MS2). (Abingdon curtulary copy: in Davis 3). Cf88

82 Sudhamtuna m12 — ib (Cartulary rubric). Cf 89

83 *Homwic sa* 764 (*c* 1130) (1.12) — SD II *(Historia Regum;* see Gransden pp 148-51, 31-2)

84 *Hamptone sa* 1087 (1011) (1012) — *SD I (De Injusta Vexatione Willelmi Episcopi Primi;* see Gransden pp 122-3)

85 ***Hamptonam (Latin*** accusative) *sa* 1087 (1.1l) (1.12) — ib

86 ***on*** *Hamtunscire* 1053 x 1066 (12) — ASWrits 94 *(ex* Sawyer 1138 MSl). (Non-contemporary single-sheet charter)

87 *Hamwich c* 721 (778) (1.12 x e.13) — Willibald MS4. See 1

88 *ÆT SVDHAMTVNE* 962 (1.13) — BCS 1094 *(ex* Sawyer 701 MS1). (Abingdon cartulary copy; in Davis 4). Cf 81

89 SVTHHAMTVN 1.13 — ib (Cartulary rubric). Cf 82

90 ***Hamptone* 840 *(c.*** 1340) — BCS 431 *(ex* Sawyer 288 MS2). (Glastonbury cartulary copy; in Davis 435)

91 *Hamtone* 903 (14) — BCS 602 (Sawyer 370). (New Minster (Hyde) Winchester cartulary copy of questionable charter; in Davis 1048)

92 *to Hamtunscire* 951 x 955 (14)	BCS 912 (Sawyer 1515). (New, Minster (Hyde) W inchcster cartulary copy of the Old English text of King Eadræd's M-ill; in Davis 1051)
93 *de comitatu suthamptunensi* 951 x 955 (14)	BCS 914. (As 92; Latin text)
94 *Hambich c* 721 (778) (1.15)	Willibald MS-la. See 1
95 *to Hamtune* e.10 (*c* 1025) (m16)	Burghal Hidage. (Nowell transcript of the lost *Cortton* MS Otho B.XI; the other six MSS (13th 14th centuries) have *to hamtona,* a Latinized spelling representing the usage of the several copyists rather than that of the exemplar)
96 Hamtunscire sa 755 (e.11) (l.16)	Æthelweard p 22. Cf 4
97 *Hamtune sa* 837 (e. 11) *(1.16)*	ib p 30. Cf 5

Notes

1 The author wishes to acknowledge the advantage gained from several stimulating discussions with Mr J Dodgson and Mrs P J Jenkyns (*née* Hubble). He is also grateful to the editor, Mr David Hinton, for several useful suggestions concerning the final presentation of this chapter, and to Mr Martin Biddle and Mr Philip Holdsworth for their comments on specific points. Any mistakes which remain are however the author's sole responsibility.

2 Spelling 1 in Appendix of spellings, p 16. All numbered spellings in the present chapter refer to material gathered in that Appendix. See the Appendix also for full bibliographical details of the sources discussed and for an explanation of source abbreviations.

3 Maitland Muller 1949, 65-71. The sites are named in that publication on pages 66-7. The use of 'Clausentum' as a name for the Roman site at Bitterne may be a further example of the application of a lost name to an archaeological site with insufficient cause, there being other possible locations for this Roman station. See also Rodwell 1975, 92; Hughes 1976, 60.

4 Addyman & Hill 1968, 64; *ibid* 64-5; Addyman 1972, 218; *ibid* 219; D A Hinton, in SARC 1975,6.

5 In the present chapter name-traditions are distinguished by **bold** type while actual quotations of name-forms are printed in *italic*. In general, a name-tradition is a reconstruction of the ideal linguistic form of a name based on the evidence of recorded spellings, the latter being but orthographic representations of the spoken name.

6 Burgess 1964, *passim*.

7 Cambridge, 1924—(in progress).

8 For a further discussion of the documentary context of place-name forms see Rumble 1976, especially 164-71.

9 For a brief notice of those Anglo-Norman writers who dealt with the events of Anglo-Saxon history but did not use Old English place-name forms, see the introductory passage of the Appendix of spellings, p 15.

10 For a discussion of the various texts of *ASC* see the Introduction to Whitelock 1965; and for a more general assessment of *ASC* against the background of Anglo-Saxon chronicle-writing see Gransden 1974, 29-41. Palaeographical descriptions of the various manuscripts are to be found in Ker 1957, as indicated in the Appendix of spellings.

11 Spellings for Hampshire are included in the present discussion because they represent a shire-name formed by the addition of an extra element to the name-tradition **Hamtun** and thus indirectly record that tradition from an early period (cf spelling 4). See also Aspect (e) (ii), p 12.

12 Ashdown 1930, 302, *sn Hamtun* (*ASC* 944, 1010).

13 See Aspect (d), p 13.

14 See Introduction to A Campbell's edition (London, 1962) and Gransden 1974, 42-6.

15 Gransden 1974, 143-8.

16 Whitelock 1965, xx.

17 See Gransden 1974, 148-51; Whitelock 1965, xxi.

18 Gransden 1974, 122-3.

19 Stenton 1971, 174-5.

20 The place-name forms for Chester provide an example of a variant name-tradition associated exclusively with mint-signatures. Mr J McN Dodgson kindly supplies the following information: 'Chester was originally named *DĒVĀ*, "place on the Dee". It was a Roman fortress, headquarters of the Twentieth Legion. From this circumstance arises the Welsh name *Caerlleon* (Primitive Welsh **Cair Legion*, etc), "fortress-city of the legion", which is equivalent to Latin *castra legionis* or *legionum*. Nennius has *urbs Legionis*, but Bede's *ciuitas Legionum* appears to be the generally accepted Medieval Latin form.

'Primitive Welsh **Cair Legion* was rendered in OE as **Legion-ceaster* > *Legacæstir*, etc, "the Roman city called *Legion*," but the Anglo-Saxon coins follow another tradition in which Latin *civitas* replaces OE *ceaster* as the suffix. This formula, peculiar to the coins, is comparable with the manuscript formulae *civitas Legionum*, *urbs Legionis*, but it is not necessarily identical with them (the latter is a translation of Old Welsh *cair Legion*). The *LEIACIV*, etc, of the Anglo-Saxon coins represents either a substitution of the more pretentious Latin *civitas* for OE *ceaster* in the form *Legacæstir*, etc, or an abbreviation of *Legaceaster civitas*, "Chester city", an official, political, and fiscal formula rather than a form of the place-name. The *civitas* formula appears only in the coins, and then principally in those of Athelstan and Edmund (*LEIACIV*, *LEIACIF*, etc). The examples from Æthelred Unrede, Confessor, William I, and William II (*LEIGCF*, *LECI*, *LEACI*, *LEHCI*, etc) appear to be the result either of mistaken forms *-CI*, *-CF* for *-CE*, or of a deliberate revival of pretentious antiquarian mint-signatures.'

21 For a brief comparison of the Southampton and Northampton mint-signatures between AD 924 and 1135 by Messrs C E Blunt and M Dolley, see Addyman & Hill 1968, 78-9. I am grateful to Mr Blunt for confirming that the mint-signature *HAMPIC* given in the said article should read *HAMPIC*. For a discussion of early 9th century Hampshire mints, see Dolley 1970, 57-61.

22 Cf Laws II Æthelstan 14 (924 × 939), Liebermann I 1903, 158, where two moneyers were assigned to Southampton. Mr P E Holdsworth notes, with reference to the latter of the alternatives given above for the significance of the two dies: 'It is too late by 973 to consider the possibility of a mint still operating on the Itchen side of the peninsula. All the archaeological

evidence indicates that the settlement had been abandoned long before that date.' If this is so, the coin evidence here shows that **Hamwic** in the period *c* 973-1015 refers to a site or settlement other than one confined to the St Mary's area.

23 See Aspect (a), p 11.

24 For a bibliography of such texts and summaries of criticism of each of them see Sawyer 1968.

25 A useful discussion of diplomatic terminology is to be found in Chaplais 1966, especially 1-3.

26 However, it is not always the case that such stress-marks in Anglo-Saxon manuscripts indicate long vowels rather than word or sentence stress (Campbell 1959, section 26). In the mid 12th century parts of *CW* such accents are used with no coherent system or consistency; cf for example the accents added to spelling 17 in the copy of it in *CW* (spelling 70).

27 Cf Zachrisson 1924, 93-114.

28 See Hill 1969, 84-92. The other six manuscripts (of the 13th and 14th centuries) have *to hamtona*, a Latinized spelling representing the usage of the copyists rather than of the exemplar.

29 For a collection of the recorded examples of such names see Ekwall 1962.

30 See also Gelling 1960; Dodgson 1973.

31 The other possibility is that spelling 8 is an abbreviated form of the mint-signatures *HAMTVN* or *HAMṪIC* (spellings 9,10). See Coin evidence, p 9.

32 But cf note 26 above.

33 See Dodgson 1973, 6-7, for the most recent classification of *hamm* sites.

34 This would be a Dodgson *hamm* type 2a 'a promontory of dry land into marsh or water', *ibid.* That the place-name **Hamtun** contained the element *hamm* was recognized by *PN Nth.* xix; *DEPN*, 431; and Crawford 1942, especially 40.

35 A Dodgson *hamm* type 2b "A promontory into lower land, even without marsh or water", perhaps hence "land on a hill-spur"', Dodgson *ibid.*

36 Dodgson type 1. South Stoneham (*DEPN*, 446 where it is taken to be a *hām;* if so it is a *hām* in a *hamm*) is named from the same topographical features (the Roman fort in a bend of the river Itchen) which were also described as a *byht-ærn* in the name Bitterne (*DEPN*, 46), Stoneham being 'the *hamm* where stone is to be found' and Bitterne being 'the building in the *byht* or river-bend' (cf Crawford 1944-7, 150). Northam (*DEPN*, 343) is 'the northern *hamm*', ie the *hamm* immediately north of Southampton.

37 As argued by Hill 1967. For the identity of South Stoneham and Bitterne see Crawford 1944-7, and note 36 above.

38 Although *Nordhunnwig* could be a reference to a settlement on the *site* of Northam, as suggested by Sir Frank Stenton and accepted by Professor Whitelock (Whitelock 1955, 314 n2) it should not be taken as an early form of the *name* Northam.

39 See also Ekwall 1964, 17-18.

40 Dunwich, Suffolk (*DEPN*, 154); Fordwich, Kent (*ibid.* 184); Harwich, Essex (*PN Ess*, 339; *DEPN*, 223); Ipswich, Suffolk (*DEPN*, 266); Norwich, Norfolk (*ibid.* 345); Sandwich, Kent (*ibid.* 404); York (*PN ERY*, 275-80; *DEPN*, 545).

41 Burgess 1964, 5-7.

42 See Addyman 1972; Biddle 1972, especially 246-7.

43 See Crawford 1944-7, 149. Crawford's identification of 'the minster at **Wic**' stated to be appurtenant to South Stoneham in AD 1045 (*c* 1130) (Sawyer 1968, no 1012; in *CW*) with St Mary's, the mother-church of Southampton, is supported by a document in the *Chartulary of Winchester Cathedral* (Goodman 1927). This is a confirmation by Bishop Henry of Blois to Winchester cathedral priory of its privileges and churches, including 'the church of Stanham (ie South Stoneham) with the churches and all the chapels of Hamptune' *ibid.* no 3. Although the calendar entry given for this document by Goodman bears an impossible date (6 January 1171/2; after Bishop Henry's death on either 8 or 9 August 1171, see Greenway 1971, 85), its contents are quite probable, and the transaction should be assigned to 6 January 1171, the date actually given in the text; Goodman unnecessarily 'modernized' this date, forgetting that the cathedral priory (Benedictine) calendar began the year at Christmas or 1 January, not 25 March; see Salter 1922.

44 As correctly observed by Burgess 1964, 6. Portswood survives as a minor place-name. Crawford 1944-7, 149 n1, tentatively identifies *portes brycg* as the bridge at Woodmill.

45 Laws II Æthelstan 14; Liebermann I 1903, 158. This law confined the minting of coins to places designated as a *port* (market-centre) and went on to allocate two moneyers to Southampton.

46 See Stenton 1971, 535-7. The first evidence that Bristol was a *burh* (and therefore by implication a *port*) comes from coins of Æthelræd Unræd minted there, see *ibid.* 536 n2.

47 See Burghal Hidage (spelling 95).

48 On the revival of Winchester, see Biddle 1972, 248-52.

49 *EPN* ii, 188-98. See also *PN Brk.* **3,** 939-42, for a recent discussion on the senses of this element and of its uneven distribution in England.

50 As does Burgess 1964, *passim.* Similarly, Keen (1975) interprets the term *villa regalis* in the place-date to a charter of AD 840 (*c* 1340) far too narrowly; the implication of the clause *in villa regalis quæ appellatur Hamptone,* BCS 431 (*ex* Sawyer 1968, no 288 MS2) is no more than that Southampton as a whole was a royal vill, not necessarily that a royal residence existed outside the nucleus of the settlement.

51 For London the *wīc* forms occur in *ASC* (E,F) *sa* 604 (early 12th century) and in the Laws of Hlothere and Eadric (Kent, AD 673-685? (early 12th century); Liebermann I 1903,11). For Hastings see *PN Sx.* 534, and for *ceaster* see *EPN* i, 85-7. Such alternative names should be taken to be variable descriptions of the same place and not, as Burgess 1964,7, as being references to topographically distinct communities.

52 See spelling 36, but cf note 26 above.

53 *EPN* i, 226-9, 232-3 and Dodgson 1973, 7.

54 For a revised dating of the events recorded in the annals of *ASC* see Whitelock 1965, *passim.*

55 Cf Biddle 1972, 242-7.

56 As suggested by D Whitelock in note to line 3 of Text I in her revision of *Sweet's Anglo-Saxon reader in prose and verse* (Oxford, 1967).

57 I owe this suggestion to Mr J McN Dodgson.

58 For *scīrs* in Northumbria see Jolliffe 1926, and Barrow 1973, 7-68.

59 Latin *comitatus* is not found with the meaning 'county or earldom' before the Norman Conquest, see Latham 1965, 98.

60 Ker 1957, 191, art 4.

61 See Stenton 1971, 338; *PN Nth.* xviii-xix. The *Hamtun* later known as Northampton is taken to be from OE *hāmtūn, PN Nth ibid.* because there are no spellings on

record that have to derive from a compound of (hamm + tún), in contrast to the case of Southampton which has such spellings (Aspect (a) above); it is at least possible that Northampton also derives from (hamm + tún) *rather than hâmtûn.*

62 PN Nth ibid and Stenton 1970, 237. Note that the compound Northampton (æt Norohamtune) is also first recorded in ASC C (sa 1065. when texts D, E read to *H a m t u n e)* .

63 See Gransden 1974, 40-l.

64 See p 17, spellings 37-40) (Southampton and Hampshire) and DB, fo.219r (Northampton and Northamptonshire).

65 Hampshire Record Office, Winchester City Records, 38/Bx/CR3/24. In 1471-2 however the form Suth'thamp*ton occurs (ibid 29).*

66 Burgess 1964, 20-l.

67 Ekwall 1964, 18. Cf note 36 above.

68 See note 43 above; spelling 74 p 17.

669 Notably Burgess 1964, passim; Addyman & Hill 1968, 62-5.

70 That is, with the advice of place-name specialists.

71 Sawyer 1968, nos 418, 944, 1012, 636, 1008 respectively.

72 I am grateful to Mrs Joy Jenkyns (née Hubble) for permission to use material collected jointly. Both the arrangement of the Appendix and the notes on the sources are. however, my sole responsibility.

THE MELBOURNE STREET SITES

4 General introduction

by Philip Holdsworth

The piecemeal development of sites along the west side of Melbourne Street dictated the pace and scale of the excavations. Work on SARC Site I began in Spring, 1971: Site XX was concluded in December, 1975 (Fig 4,1).

All the sites had been considerably disturbed either by brickearth digging in the 18th and 19th centuries, or by subsequent housing developments and their associated service trenches. In consequence there are early modern features on all the sites. but these have not been discussed in the reports, except where they are relevant to the Saxon archaeology. The four reports begin with a brief introduction and features such as post-holes which can be considered the remains of structures are then described, followed by descriptions of wells and pits. The distinctions that can be made between these are clarified in the Site IV report (see also Addyman 1972, 225). Information that can be obtained from the published plans and sections is as far as possible not duplicated in the text. The contents of the features are indicated by Table 4,1: they are only) mentioned in the text if exceptional.

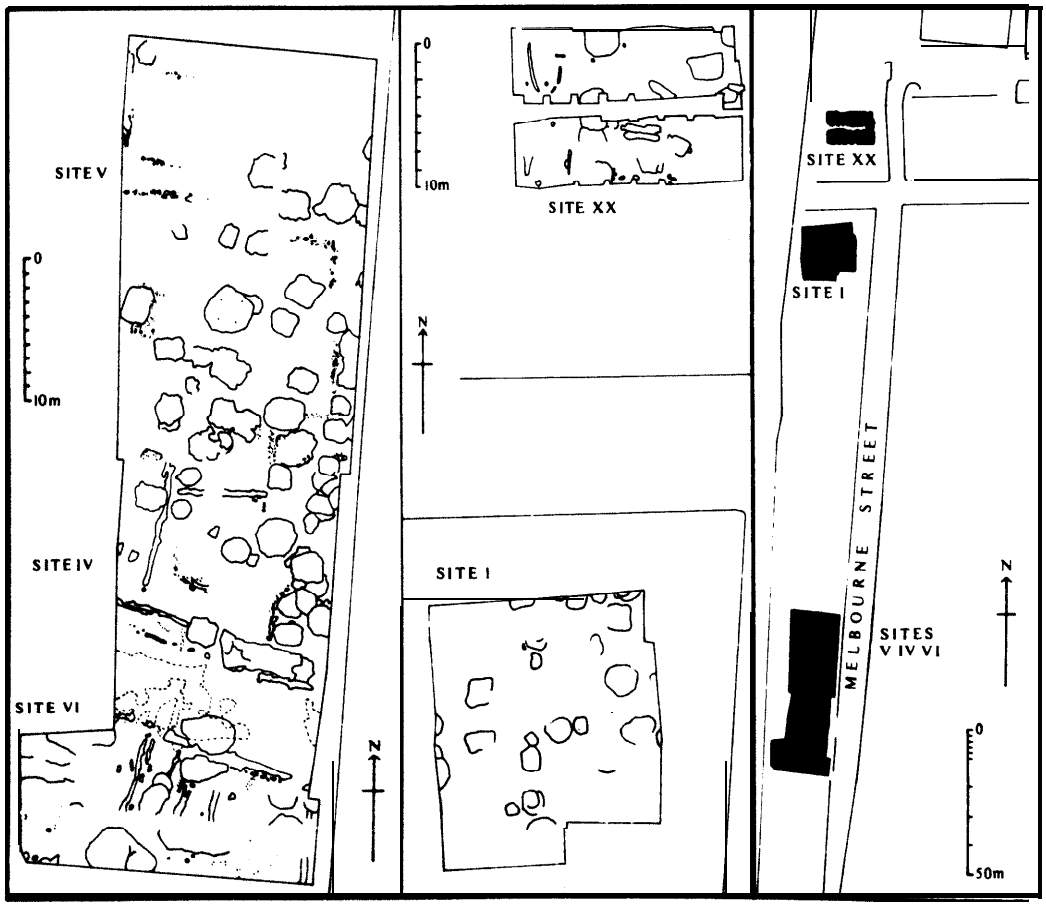


Fig 4,1 Melbourne Street site locations

Link to next section

TABLE: 4,1: Concordance of finds from Saxon pits and wells

Feature No	Local pottery	Imported pottery	Glass	Coin	Bronze	Lead	Iron	Slag	Crucible	Loom-weight	Worked stone	Worked bone	Unworked bone	Shell	Roman material
Site I															
F 1	X	X									X	X	X	X	
F 2								X				X	X	X	
F 3	X											X	X		
F 4	X	X					X	X			X	X	X	X	
F 5	X	X						X				X	X	X	
F 6		X									X	X	X	X	
F 7	X	X								X	X	X	X	X	
F 9	X	X			X							X	X	X	
F10		X						X			X	X	X	X	
F12	X											X	X	X	
F14		X						X					X		
F17	X												X		
F18	X												X		
F19											X	X	X	X	
F21												X	X		
F23			X									X	X	X	
F24	X											X	X	X	
F26	X	X										X			
F27	X	X						X			X	X	X	X	
F28	X	X									X	X	X	X	
F29	X	X	X					X		X		X	X	X	
F31	X											X	X	X	
F32		X													
F33	X	X										X	X		
F25	X	X						X				X	X		
F36	X	X									X	X	X	X	
F37	X											X	X	X	
F38															
F40													X		
Site IV															
F 2	X	X			X		X	X				X	X	X	
F 3	X	X						X				X	X	X	
F13	X	X	X		X		X	X	X			X	X	X	
F15	X	X	X				X	X			X		X	X	
F16	X	X					X						X	X	
F17	X	X	X			X						X	X	X	
F19	X						X				X	X	X	X	
F50 +3500	X	X	X				X	X	X		X	X	X	X	
F51	X	X											X	X	
F55	X	X					X	X	X			X	X	X	
F111	X	X	X				X					X	X		
F150	X	X											X	X	
F3501		X	X									X	X	X	
F3512	X	X					X	X				X	X	X	
F3514		X			X							X	X	X	
F3517															
F3519		X										X	X	X	
F3520		X											X	X	
F3512		X										X	X	X	
F3522	X	X					X					X	X	X	
F3523	X	X									X	X	X	X	
F3540															
Site V															
F 1			X												
F 2			X					X							
F 5							X								
F 6															
F 7							X								
F 8			X												
F 9	X	X	X												
F10	X	X					X					X			
F11	X	X	X		X		X		X	X	X	X			

Feature No	Local pottery	Imported pottery	Glass	Coin	Bronze	Lead	Iron	Slag	Crucible	Loom-weight	Worked stone	Worked bone	Unworked bone	Shell	Roman material
F12	X	X					X	X	X						
F13	X	X					X	X							
F14	X	X	X		X		X	X	X	X		X		X	
F1415	X	X	X				X	X							
F16		X			X		X						X	X	
F17	X	X			X		X	X	X			X			
F18	X	X	X				X	X		X				X	
F19	X	X					X								X
F20		X													
F21		X			X		X	X	X	X	X			X	
F22	X	X	X		X		X	X	X	X	X			X	
F23			X												
F24	X	X	X				X	X							
F26	X													X	
F27		X	X	X	X		X			X				X	
F32	X	X	X	X				X		X					
F34	X	X					X	X	X	X	X			X	
F39	X														
F42															
F50															
F55	X														
Site VI															
F 1	X	X	X				X	X		X	X	X	X	X	
F 7		X										X	X	X	
F 8	X	X					X	X				X	X	X	
F30	X	X	X		X		X	X			X	X	X	X	
F33	X	X					X	X	X		X	X	X	X	
F36	X	X					X	X			X		X	X	
F37	X	X					X	X					X	X	
F38											X		X	X	
F39	X	X	X				X	X			X		X	X	
F40							X								
F49	X	X	X				X	X						X	
Site XX															
F70	X	X	X		X		X	X				X	X		
F114 120	X	X													
	X		X				X	X				X	X	X	
F123	X	X	X				X	X			X	X	X	X	X
F128	X	X	X										X		
F130	X	X	X		X		X						X		
F131	X	X	X	X	X		X	X				X	X		
F132	X												X	X	
F135	X				X		X					X	X		
F143	X						X						X		

5 SARC Site I

by Jane Hassall

Preliminary investigation on Melbourne Street Site I were carried out by P V Addyman and R G Thomson, who dug a series of six trial holes. The writer then took charge of this excavation on behalf of SARC in 1971. An area of some 400 square metres was opened, and planning was done by a numbered grid with coordinates available for every metre square (Fig 5,l).

A Drott was used to remove the immediate modern build-up which varied between approximately 0.75 and 0.90 m across the site. This build-up was thickest on the NE corner, which was abandoned for archaeological purposes when cellars from the 19th century housing along Longcroft Street were encountered. Other large areas of modern disturbance occurred right across the Site and especially in the SE corner. A complex of sewer pipes had also destroyed the archaeology in the SW area.

The site was cleaned by hoe and trowel at the 0.90 m level and a complex of features was uncovered. with patches of Saxon material appearing alongside post-medieval disturbances. It became clear that the site was not going to show a clear vertical stratigraphy, and by removing the modern features and disturbances, the Saxon material was left upstanding, sitting on top of the natural brickearth subsoil. Excavation at the north end of the site revealed the cause of this and the reason for so much disturbance. Thin ridges of upstanding brickearth were uncovered, running south in parallel lines. These represent the manner in which brickearth was excavated (luring the 18th and 19th centuries, in spits

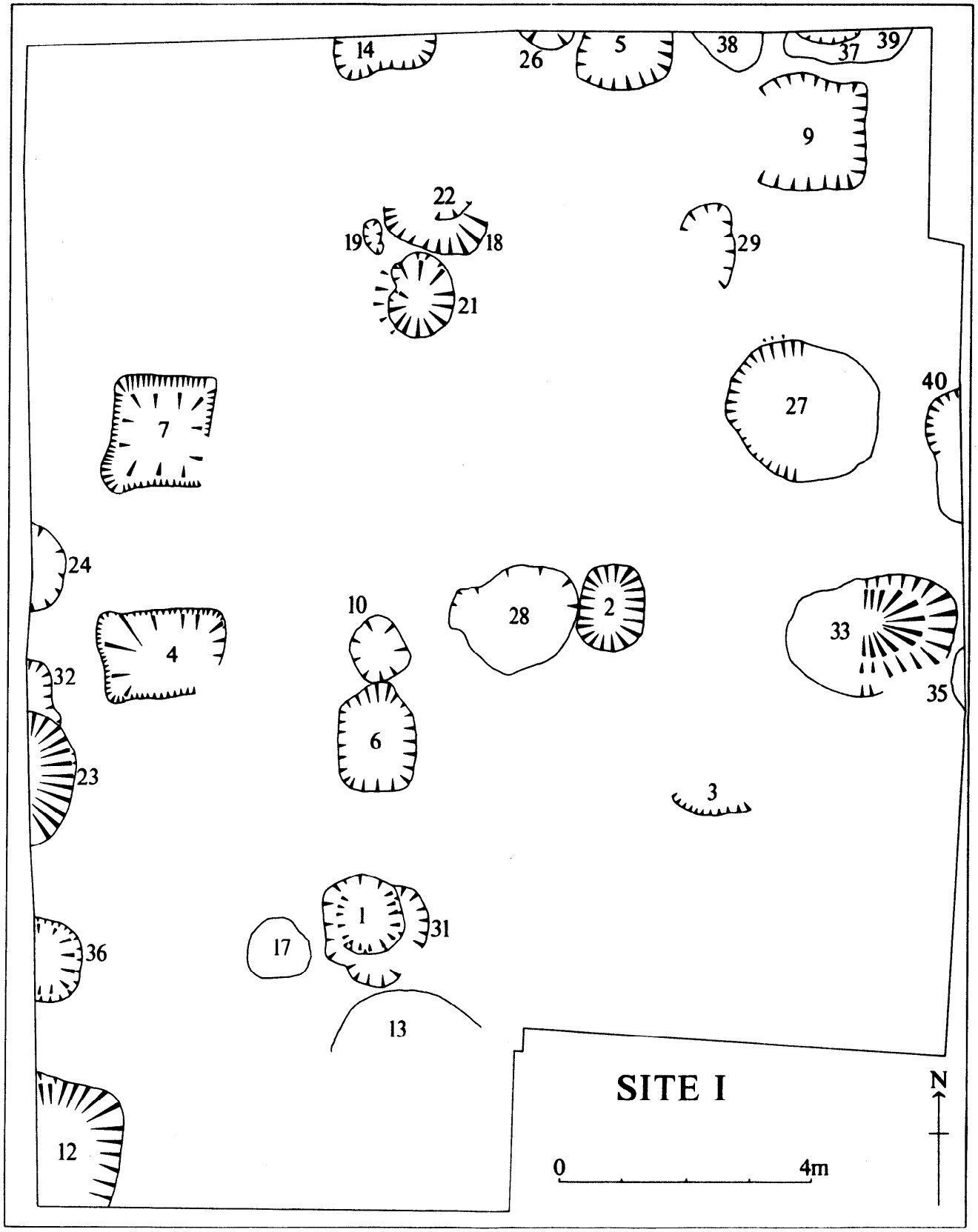


Fig 5, 1 Site I, ground plan

approximately 1.5 m wide. Uncontaminated brickearth was a useful commodity but where Saxon pits were encountered during its removal, they were left, sometimes with a thin shell of upstanding brickearth supporting them, and the excavators moved around them. The long empty trenches thus formed quickly filled up with Victorian rubbish to produce the unexpected horizontal stratigraphy discovered by the archaeologists.

Lack of time precluded the complete excavation of all the pits that were uncovered.

Structural remains

Although there were scattered post-holes on the site, no complexes of structural features were found. F10. F13, F26. and F38 might have been very large post emplacements, but are described with the pits.

Wells

No features that had certainly been wells were found, although Fl2 may have been one because of its fill. and F33 because of its profile (below).

Pits etc

F1 The west edge was disturbed. The sides sloped gently for the first 200 mm, then plunged steeply to a flat base. It had a lining of brickearth. The top layer was a yellow-brown silt, like that in F31. which Fl cut. Most of the finds came from the dark grey silt below.

F2 Regular, oval. with round base. The top 150 mm contained much charcoal. Below this was a band of cess-stained brown silt, which sealed a layer of thick green cess in which were many oyster and mussel shells. Under this, lining the bottom and part of the east side, was yellow-brown silty clay.

F3 Very disturbed by a brickearth trench which had left only the steep south side intact, and had scattered the finds except at the south end.

F4 SE corner disturbed. NE corner sloped more gently than the south side. The soft brown silty fill still smelt strongly of cess, and had been partly covered by a thin layer of sandy brickearth on the south. Several small charcoal bands suggested that rubbish had been burnt nearby (cf F6). Quantities of shell and bone were recovered.

F5 The irregular outline and sides, which varied in steepness, suggested that this pit had been dug in a hurry. It had the typical brownish-black silt fill of a rubbish-pit.

F6 Steep-sided. Thick orange silty clay fill with darker patches. Tip-lines contained small discontinuous charcoal bands (cf F4), and quantities of shell, animal bone, and pottery were recovered. A projection on the north side just cut Fl0.

F7 Disturbed on one side by brickearth digging. A thick green cess deposit lined the carefully cut sides but not the bottom: the rest of the fill was cess-stained yellow-brown silt, with a patch of grey brown loam containing much ash and charcoal.

F9 West side disturbed and upper layers contaminated. Lower, dark brown silt fill. The bottom was slightly pitted.

FIO Only 100 mm deep, with layers of brown and black silts. Marginally cut by F6.

F12 Excavated down to the water table, at about 0.90 m. It had steeply sloping sides and a round bottom. Unlike any of the other pits on the site, its fill, which was dark brown silty clay with charcoal, became stickier towards the bottom. This suggested that it might have been a well.

F13 Not fully excavated. Half of it had been disturbed.

F14 Disturbed at the top. 0.90 m deep. The sides were lined with brickearth. The bottom had a rich silty brown fill, with brownish-black loam above and patches of compact clay. The loam contained many oyster shells and small water worn pebbles, as well as debris which included a complete bone comb (see Fig 15, 1 no 2).

F17 Disturbed and not fully excavated. Dark loamy fill.

F18 Disturbed. Dark silty fill. Cut by F22.

F19 Small. oval feature. only a few centimetres deep. Black loam fill with small pebbles and, unusually, a band of mussel and oyster shells (cf F37).

F21 Steep-sided, almost kidney-shaped. The top contained some redeposited brickearth. and the lower, sandy loam fill contained quantities of animal bone.

F22 Only 100 mm deep. There was some cess staining at the bottom. It cut F18, and was much disturbed.

F23 Large, steep-sided pit, 0.80 m deep. Ashy loam fill with many animal bones. Cut F32.

F24 Disturbed. Fill of redeposited brickearth alternating with black loamy gravel and with brown loam, the last two containing animal bones and sherds. Carefully cut sides. 400 mm deep.

F26 Shallow feature with Saxon material, but too small to have been a rubbish-pit.

F27 Straight-Sided. 1.10 m deep. The bottom half was filled with a silty orange clay and a gravel layer with some dark iron staining. There was much iron slag in this, and also daub. charcoal, fragments of lava quernstone, pottery, and bone. The upper fill was blackish-brown gravelly silt, which included quantities of oyster shell.

F28 100 mm deep. A thin upper layer of dark brown silt held a close-packed band of shells. Below was a brown clay silt layer which also contained charcoal. Much animal bone. including several horn cores, and Saxon pottery occurred, particularly in the upper fill.

F29 Irregular. 500 mm deep. Dark upper silt, then a patch of cessy grey-green silty clay above a lighter silt, Both silts contained animal bones. the upper also quantities of oyster and mussel shells.

F13l Steep-sided. Yellow-brown silty fill. Cut by Fl.

F32 One side only of a 520 mm deep feature, probably a cess-pit because of cess-staining in the grey-brown silt. Sterile. Cut by F23.

F33 SE corner disturbed. Stepped profile, with small rounded base. Uniform brown silty clay fill.

F35 The edge of a pit with a light brown silty fill.

F36 Semicircular, with a narrow lip near the top, and gently sloping sides. Dark gravelly silt fill, with a tew patches of dirty brickearth.

F37 Possibly a layer within F39, rather than a feature cutting it. Only one side could be excavated. It was 80 mm deep. The mid-brown silty fill contained a band of oyster and mussel shells (cf F19).

F38 Not totally excavated.

F39 Not excavated, but probably a pit, cf F37.

F40 Probably the end of a rectangular pit. Silty clay fill with pea gravel round the edges.

Discussion

Despite the fact that no two pits on this site were alike, there were some similarities between them. Some were dug to a specific shape, such as those with straight sides and flat bases which appear as roughly rectangular in plan, eg F7, Fl4. F24, and F27. F7 may well have been used as a latrine. having a hard green lining caused by

cess-staining, for which there are parallels on other 'Hamwih' sites (Addyman & Hill 1968. 83).

Yet the shape of the pits does not seem to indicate their functions, as considerable cess-staining was found to be present in round, square, and irregularly shaped pits on this site. All pits were finally used for refuse, but evidence for a specific primary function was in some cases also present. F27, for example, had traces of iron staining and much iron slag was found. Charcoal and ash were found in some quantities in F4, F6, and F7. Several pits contained shells, chiefly oyster and mussel and a few land snails, but F28 and 1-29 in particular were filled with shells. F19 and F37 also had shell bands. and this was obviously a deliberate method of disposal.

Patches and lumps of daub were recovered from a number of pits (see Table 4, 1) indicating the existence of structures nearby. Although no buildings were identified on this site, it is possible that features such as F10, F26, and F38 may represent very large post pits. Their function otherwise is debatable; but they certainly do fit in with the group of features mentioned by Addyman and Hill (1968, 83) as pits 'which are difficult to interpret'.

6 SARC Sites IV and V

by *P Cottrell*

Work on Site IV' began under G Dowdell in 1972 and was continued by M Adey. After preliminary investigation, excavation was by trowelling successive 50 mm levels. Rain and prolonged sunshine both make the 'Hamwih' brickearth unworkable. so polythene shelters were used. The technique is described further in the introduction to Site VI.

SITE IV

Structural features

A linear spread of yellow gravel. between 2.5 and 6 m wide, extended across the site, dense on the west side. more scattered on the east, and between 50 and 150 mm thick (Fig 6.1). Below it (Fig 6.2) were various post-holes. a pit, F55, and a beam-slot, F104A.

South of the gravel was a line of post- and stake-holes and slots. F100A, with a line of individual post-holes immediately south of and parallel to it. Fl00B. Most of these features were visible in the initial 50 mm level. The slots had post settings visible at irregular interval\. Exposure of the complete line was prevented by the west edge of the site. Various slots and post-hole lines ran at right angles to F100A. and are described in the Site VI report below. In lint with F100A were three large post-holes, F101-3: F:102 was smaller and shallow the others.

Immediately north of and parallel to the gravel was a short length of slots and post-holes. F107A. with a line of post-holes, F107D. at right angles to it, and another short line, F107E. diagonally between them. In line with F107A and cast of it were two large post-holes, F107B and F107C. East of the second was F3503. a slot in which there was no clear evidence of post-holes. Any north-south return from this alignment had been destroyed by later pit-digging.

North of the F107 complex was a series of post- and stake-holes and other slots, Fl05A, the slots sometimes having visible post settings. Other series, F105B and F105C, ran at right angles: there were several pits on the east side of F105B. Some of the post-holes with F105C were more substantial than others, some having stone packing. On the west side of F105C, F3531, and F3532 were two large individual post-holes.

F106 was another line of timber settings, roughly parallel to F105A. F108A was a linear east -west complex of timber settings, with a short and irregular length, F108B. at right angles to it. F109A ran parallel to much of F108A. Neither was parallel to F107 A or F105A.

Wells

Three wells were recognized because of their central, originally timber-lined, shafts, with the surrounding construction pits back-filled (see also pit F3512, below).

F2 'I his well only survived for its final metre, because it had been cut by a later pit. It contained an unusual quantity of fish bones.

F15 This had had its construction pit back-filled with layers of clay and brickearth containing occupation debris, including burnt daub. There was some carbonized wood at the bottom of the shaft, in its primary silting, and dark stains on the sides showed that it had been lined. The shaft had eventually been filled with clay and dark soil. There were stake-holes round the edge of the construction pit.

F50 This had apparently been recut, to insert a new shaft lining, or to remove silt. There was no primary silt, nor any trace of lining, in the shaft. The fill of the shaft and of the secondary cut of the pit contained quantities of crucible fragments, iron, and slag, suggesting metal-working or-king nearby. The shaft also contained large flint nodules and quern fragments.

Pits

F3 Cut by, and thus later than. well F2 and another pit. F3514. It had steeply sloping, almost vertical sides. and a flat bottom.

F13 Contained, amongst much else, some fired clay, and in the layer above this slag and crucible fragments, like well F50 nearby. Yellow gravel at the top had been spread to seal it and to level up the surface.

F16 Also had a gravel sealing layer.

F17 (Fig 6.3) Bottom fill of green-stained soil, with dark, fibrous material immediately on top of it. This has been identified by P Holdsworth as animal dung.

F19 F.51 (which was as later than F13). F3514, *F3520,* F3521. F3522, F3530. F3540, were typical 'Hamwih' pits.

F55 This pit w as below the road, and the gravel from its surface formed the pit's final fill.

F111 Green stains at its bottom, on the brickearth round its edge. and its fill. There were stake-holes round its edge (it was probably a privy in a wattle and daub hut).

F3501 Very large pit containing much redeposited brickearth (it may have been a quarry-pit for gravel for the road surface, predating building 1).

F3512 2 Central shaft in the bottom. perhaps a well. The shaft was not visible further up. however, but it was deeper than the identifiable wells. It may have been an unlined well, used as an ordinary pit after the shaft silted or collapsed.

F3517 Mostly in Site V. and is F13 in that report.

F3519 This had a hearth. F3505 (see below), cut into its upper fill.

F3523 Large. It had a typical pit fill in its upper layers. but much brickearth lower down. so may have been a quarry pit for gravel originally. Slag, iron, and ash deposits suggest metal-working.

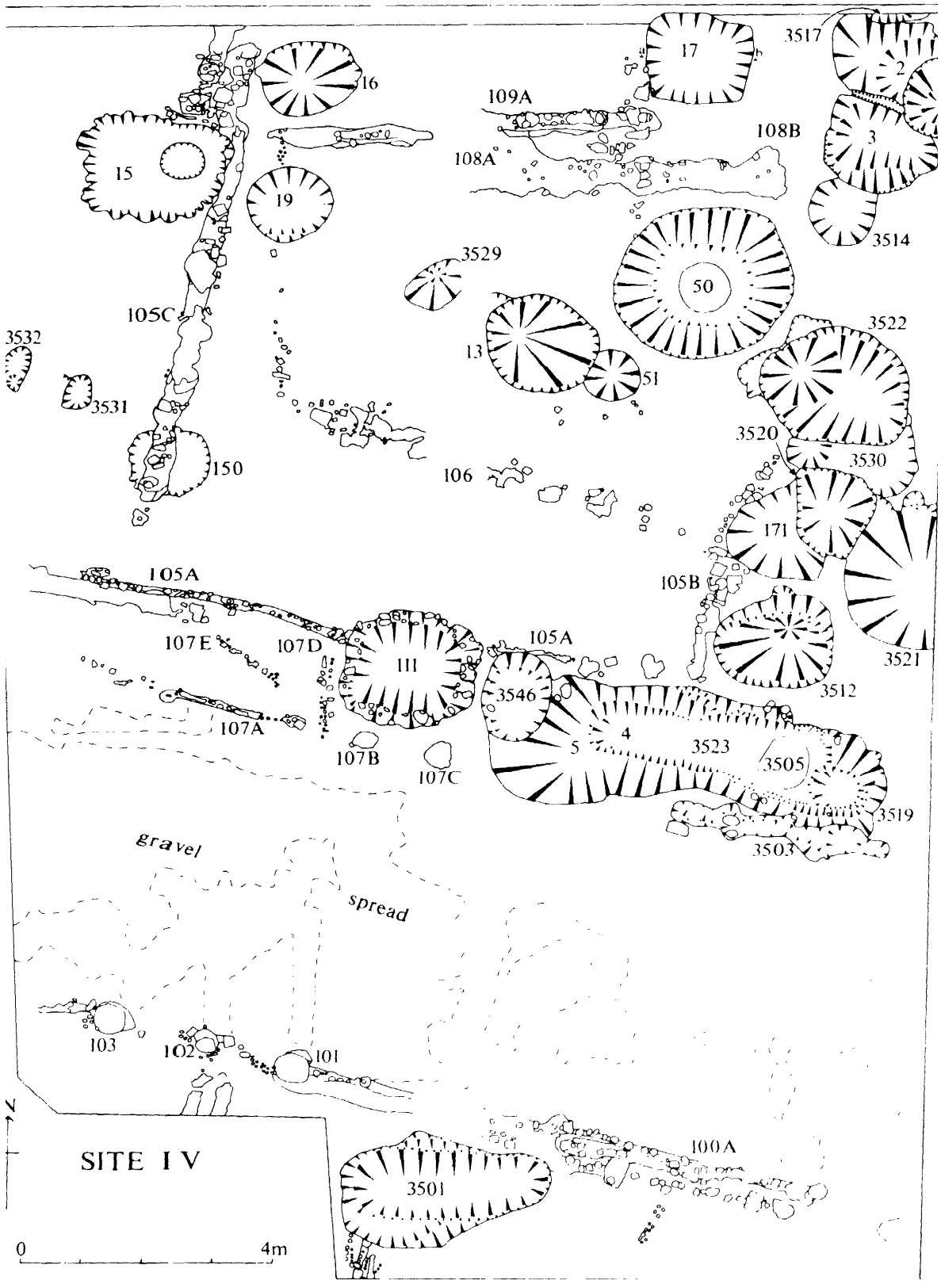


Fig 6, 1 Site IV, ground plan of all features except those under the road

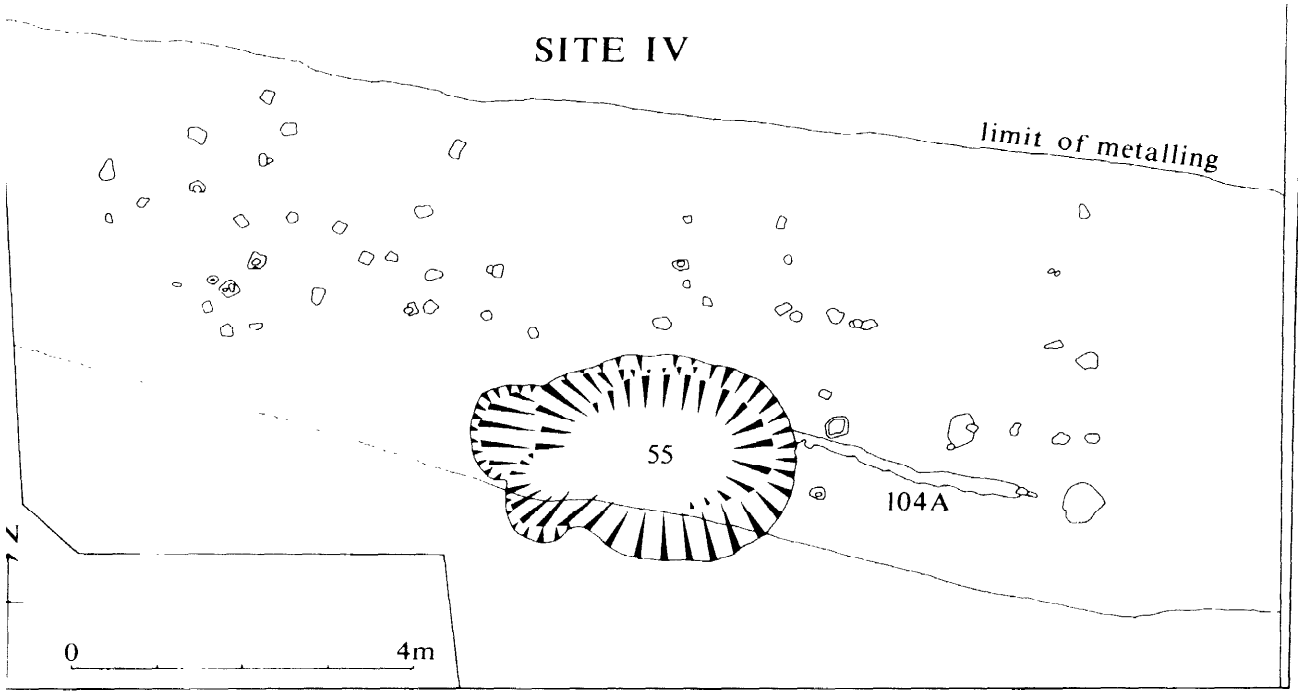


Fig 6, 2 Site IV, ground plan of features under the road

Other features

F150 A small pit, with stake-holes on two edges, horizontal holes in the vertical sides, and three stake-holes in the bottom; two of these may have been part of F3508, however. There was ash and burnt clay in the fill, and a spread of burnt clay on the surface round it, but the sides were not burnt. Its purpose is not established.
F3505 The hearth cut into pit F3519. Bowl-shaped, and surrounded by ash, it had caused the clay around it to bake. It had been disturbed by later stake-holes.

Discussion

The interpretation of these features is discussed below. in the Site V report.

SITE V

Structural features

Site V was the extension northwards of Site IV. Because there had been more brickearth quarrying, and because it was further from the gravel spread which seemed to have been a focus of activity, there was less structural evidence on this site.

Most of what survived (Fig 6,4) were short lines of post- and stake-holes and slots, some with post settings in them. F201A and F202A were parallel east-west lines; F203A was possibly at right angles to them; F204A and F205A formed a right angle, with F204A possibly parallel to F203A. Another right angle was formed by F206A and F207A, but F206A was not quite in line with F205A. Similarly F208A was not in line with F207A. It had a second east-west post-hole alignment, F209A, parallel to it. A slot with post settings, F210A, ran at right angles to them, but a modern disturbance obliterated the junction.

Pits

F7 Very shallow, with stake-holes in the bottom (possibly suggesting a lined storage-pit).
F9, F10, F12, F13, F14, F18, F19, F20, F21, F22, F24, F26, F27, and *F34* were typical Saxon pits.
F11 (Fig 6,5) This had stake-holes around at least three sides of its undisturbed edges (so had had a superstructure). Its fill included slag, crucible fragments, and ash, as did others on this site.
F15 Also had stake-holes round it.
F16 (Fig 6,6) Four stake-holes in its bottom, near the sides, up to 250 mm deep. In the south-east corner, a post-hole shaft could be seen above the stake-holes, through the pit fill. A Cl4 determination of 1140± 60 bp (Har 328) (radiocarbon years) (ie AD 750-870 uncalibrated) was obtained from remains of the stake in the north-west corner (the posts perhaps supported a superstructure, even a roof, but lining for a storage pit is more likely). The pit's eventual fill was the usual cess and rubbish but contained such an abundance of bone data that it was specially processed; see Animal bones report below, p 114.
F17 (Fig 6,7) A typical, straight-sided pit.
F32 Stake-holes round its edges. Its bottom was dished, with a central depression, rather than flat. The upper fill was noticeably cleaner than usual. Its contents included 21 fragments of glass and a sceatta.

Discussion

Structural features

The spread of gravel can be taken to be the metalled surface of a road or lane, as has been seen on other 'Hamwih' sites (Addyman 1972, 221-2). The features found below the gravel mean either that the road did not exist in the first phase of activity on the site, or that it was

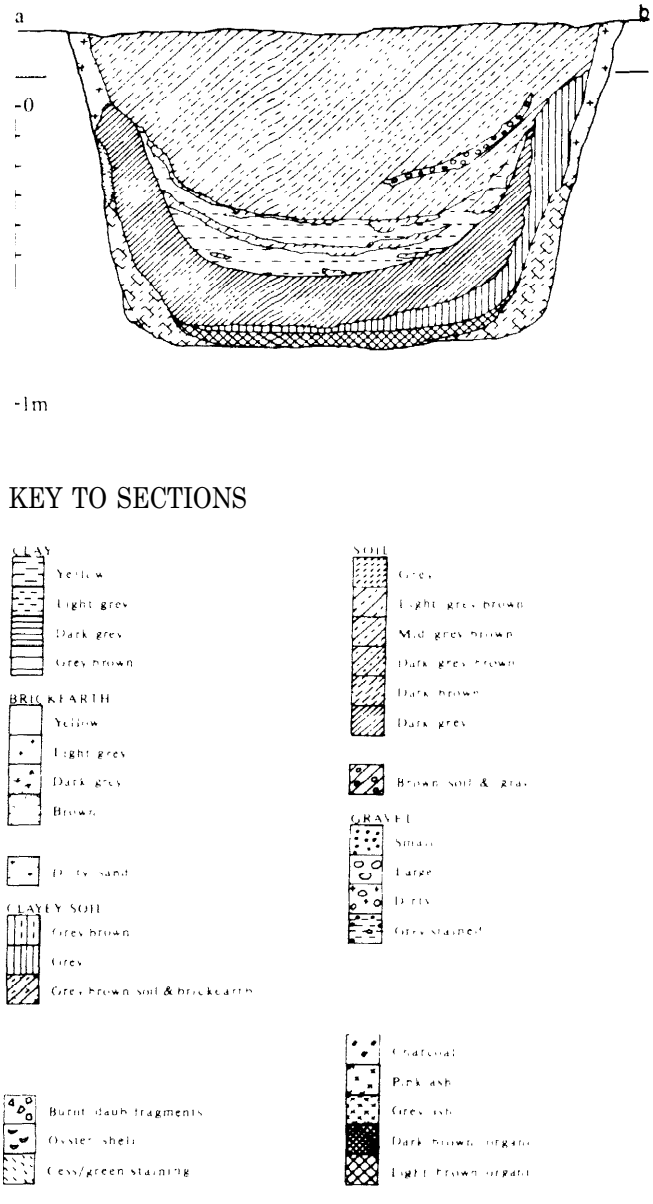


Fig 6, 3 Site IV, section of pit F17 (a-b as on Fig 6, 1), and key to all sections. Horizontal lines = 2m O D

very much narrower, merely an serving some building represented by the beam-slot F104A.

More positive signs of buildings were the lines of post-holes parallel to the road on both sides. On the south, F100A and F100B were presumably the north side of a building: this, building 1, is fully discussed below in the Site V1 report.

North of the road, building 3 can be postulated from the evidence of F105A, etc (the title building 2 has been grandiloquently allotted to the tentative pre-road structure), and pits immediately east of F105B suggest that this was a boundary which they had to respect. The west line, F105C had post-holes so substantial that they were probably load-bearing, F105A seemed to stop at F105B, but to run beyond F105C, just as F105C ran beyond F108A. F106 was not categorically associated with F105B or F105C. Similarly F107B was not positively linked to F3503, which may have been a roadside gulley rather than a structural feature. F107B and F107C may have been door- or gate-posts. although they would have given a smaller entry than F101-3 on the opposite side of the road. Unfortunately the corresponding point in the line of F105A was destroyed by a pit.

Different interpretations can therefore be offered for building 3. It might have had two phases. represented by F105A and F107A. It might have had a narrow enclosure between it and the road, so that F107A was a fence-line, not a structural wall. F107A might have been part of the building. but not structural. forming an outshut. The first possibility is perhaps preferable. because it would also explain the parallel features F108A and F109A, although these were not at right angles to F105C, so cannot be assumed to be the rear wall. Nor was the line of F106 incontrovertibly associated with any of the other lines: its most likely connection was with F107A, since they were more or less parallel. If F107A was a first-phase building, F106 could have been its rear wall. rather than an internal and off-centre partition within a F105A/F105C building. The pits north of F106 might have been dug during the life of the F107A/F106 building, before that area became enclosed.

To the west of F105C, the two post-holes F3531 and F3532 were so substantial that an aisled hall would not be precluded. If this had indeed existed, it could not have been contemporary with the well F15. The stake-holes round the edge of this suggested an enclosure, either a fence or a small well-house attached to the side of building 3.

The structural features on Site V were even more incoherent: no clearly-defined building could be recognized. nor was it clear if the post-hole complexes on the south of the site were part of the building 3 complex, or were parts of different structures. F204A and F205A certainly may have been the corner of a building, as may F206A and A207A. On the north, F208A-F210A could have been three sides of a building, These may have been flimsier that the building along the street, as would be appropriate in such a back-yard position. Another structure of this sort was the pit F11 which was surrounded on at least three sides by post-holes and was presumably a covered privy, perhaps open on its fourth side. The four stake-holes in the bottom of F16 could have supported a superstructure, but it is more likely that they formed part of a lining for a storage pit.

Site use

Various industrial processes typical of Saxon South-ampton could be discerned on the site, particularly of metal-working. The pits which contained most of the crucibles and slag were in the north part of Site IV and

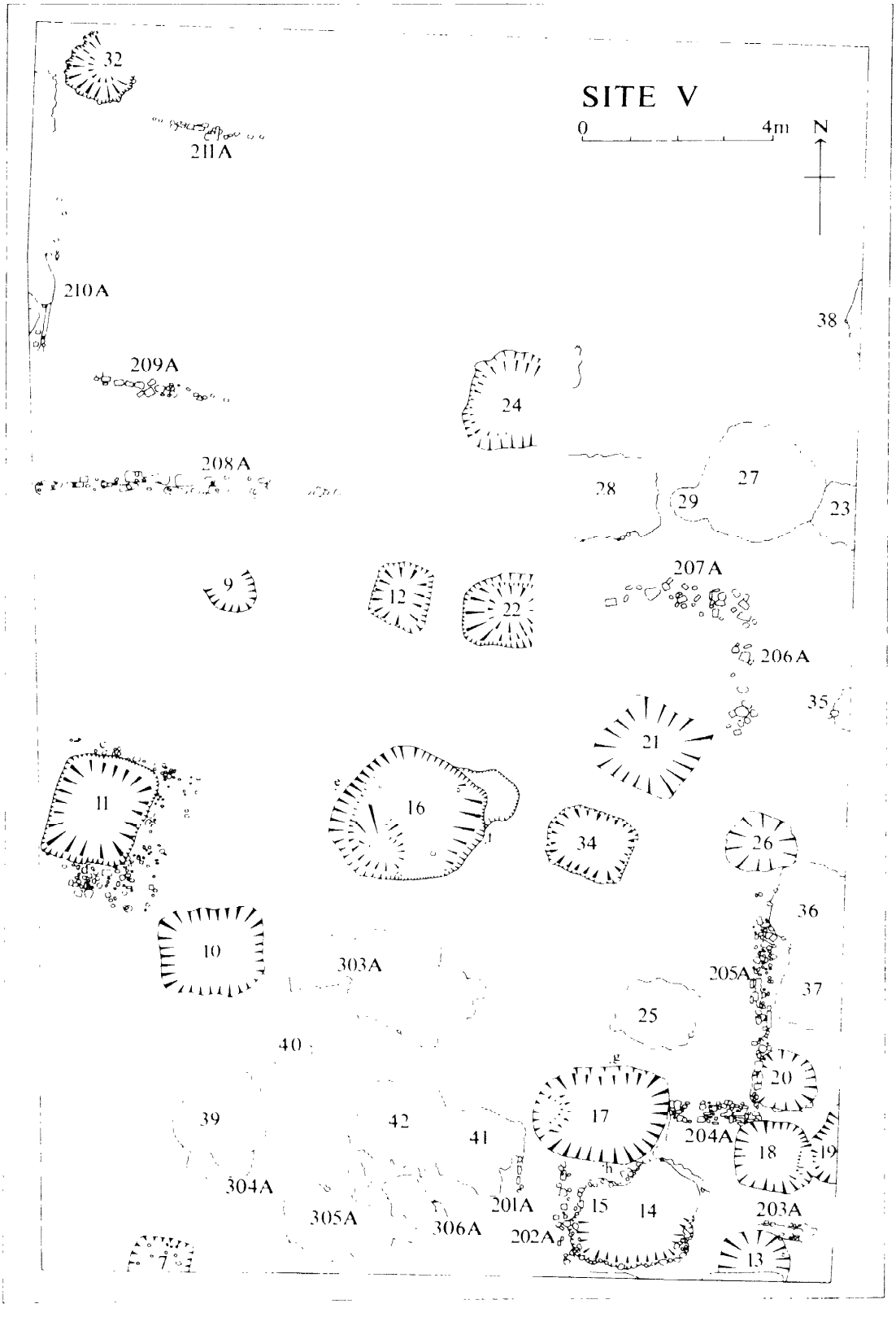


Fig 6, 4 Site V, ground plan

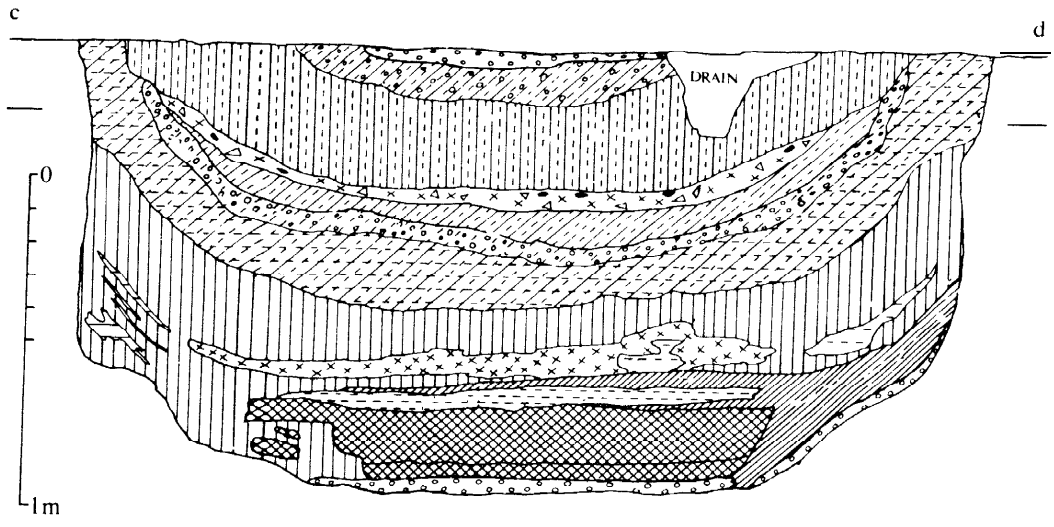


Fig 6, 5 Site V section of pit F 11 (c -d as on Fig 6,4); horizontal lines = 2m OD See Fig 6, 3 for key

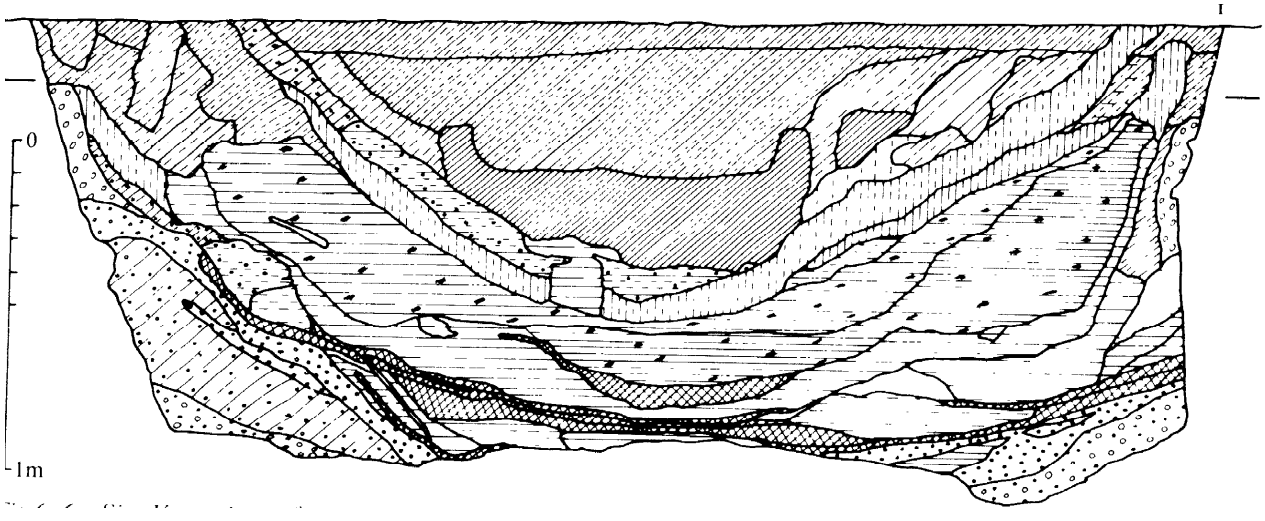


Fig 6, 6 Site V, section of pit F16 (e - f as on Fig 6, 4); horizontal lines= 2 m O D. see Fig 6, 3 for key

the south part of Site V. As some of these pits were within the area of the Fl05A/Fl05C building, and probably therefore predate it, it may be that the metal-working belonged exclusively to an early phase, Hearth 3505, with Pit 3519, may have been part of the industry, but no finds were directly associated with it. Scatters of slag etc were found in the levels during trowelling, but there were no significant concentrations. Much of the slag was ferrous, but the crucibles show that bronze was probably also worked, although no bronze waste was found.

There were several bone objects, but no waste to indicate bone-working. Loom-weights may indicate textile manufacture, particularly near pits F21, F22, and F34 on Site V, which contained the majority of the finds.

Distribution plans of daub found in trowelling the levels showed a concentration near the road in the upper levels, ie the later phase of site use. There was a quantity within the building 3 complex. Charcoal distribution showed a concentration in the north-east of the site, the area already suggested as the metal-working lone from the evidence of the pits. Sherd scatters were found, most notably within building 3. Animal bone was also found to vary in density, the greatest quantity being on Site IV in the areas fronting the road, suggesting its more intensive use for occupation than the back areas of Site V. A concentration just outside building 3 may have been a midden or rubbish-heap.

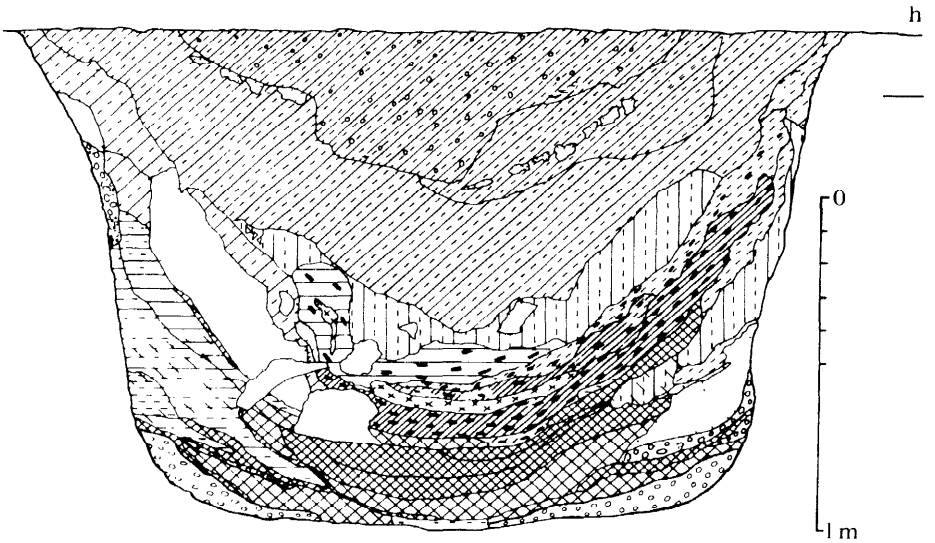


Fig 6, 7 Site V, section of F17 (g - h as Fig 6, 4); horizontal = 2m OD. See Fig 6, 3 for key

7 SARC Site VI

by *Philip Holdworth*

The excavation of Site VI took place before use of the area by Ernest Ireland (Properties) Ltd as temporary site accommodation, and its ultimate development. The main aim of the excavation was to recover further evidence of the large timber structure (building 1) partially excavated during the excavation of Site IV with which Site VI was contiguous (Fig 7,1).

The method of excavation was the same as that used on Site IV and V. A two metre grid was established by driving grid pegs horizontally into baulks surrounding the excavation area at a constant height above Ordnance Datum.. As on Sites IV and V, this allowed three-dimensional recording of all notable finds and the accurate trowelling of 50 mm levels. All site plans were produced at at scale of 1:25 with the aid of a one-metre square planning frame aligned with the grid by plumbing down from strings stretched tautly between the pegs. The advantages of driving pegs into the baulks instead of covering the floor of the area to be excavated with poly - propaline string secured by six-inch nails were that the gird did not have to be relaid after the removal of each 50 mm level and that it did not hinder excavation.

The site was protected against the weather by a portable tubular alloy frame of semicircular hoops slotting into rails which sat on the ground. Unfortunately. this became airborne in a strong wind and on subsequent excavations a heavy duty tubular steel frame has been used instead.

The hulk of the 1.50 m topsoil was removed by machine in November 1973, and preliminary clearance was undertaken with shovels and garden hoes. At this time only the modern features anti larger Saxon pits could be seen. The first 50 mm level was then removed after which most of the structural features and all the pits could be seen. Many of the Saxon features had suffered later disturbance. A pipe trench ran almost the entire length of the centre of the site, truncating all the main structural features and cutting into several pits. A brick-lined soakaway and a pipe trench had extensively destroyed three large pits in the north-west corner of the area.

After the modern disturbance had been removed, the area was planned and photographed. and all discrete features were sectioned, recorded, and excavated completely, replanned, and photographed. This procedure was followed for each of the subsequent three 50 mm levels, below which there were no more features.

A total of 38 post-holes was found, most of which mould be assigned to the building (1 in Site IV), although clearly they were not ail contemporary. None of the twelve pits excavated could be directly related to the occupation of the building but several could be seen to be later.

Structural features

The structural evidence comprised a complex series of post-holes, slots, and post-holes in intermittent slots. Many of these features were related to F100A (Site IV), the north wall of the building fronting onto and parallel with the east - west road.

At the first level of excavation, a seemingly continuous slot. F71, was revealed at right angles to F102 (Site IV) (Fig 7,1). It was 4.68 m in length, and truncated to the south by F72. By longitudinal sectioning F71 was resolved into a line of six irregularly-spaced slots, F21, F23, F52, F70, F46, and F45, the last of which contained stake-holes.

Immediately east and west of F71 were subsidiary slots and post-holes. F14 was a shallow slot, continuous with one excavated on Site IV, appearing at the top level of excavation as one feature with F27. After the removal of the next 50 mm level, however, they were revealed as disparate. A single post-hole was contained within F27, packed with large pieces of animal bone.

It was observed that F25, F28, and F44 were in alignment; each contained possible stake-holes. the most convincing being at the northern end of F28. Two slots,

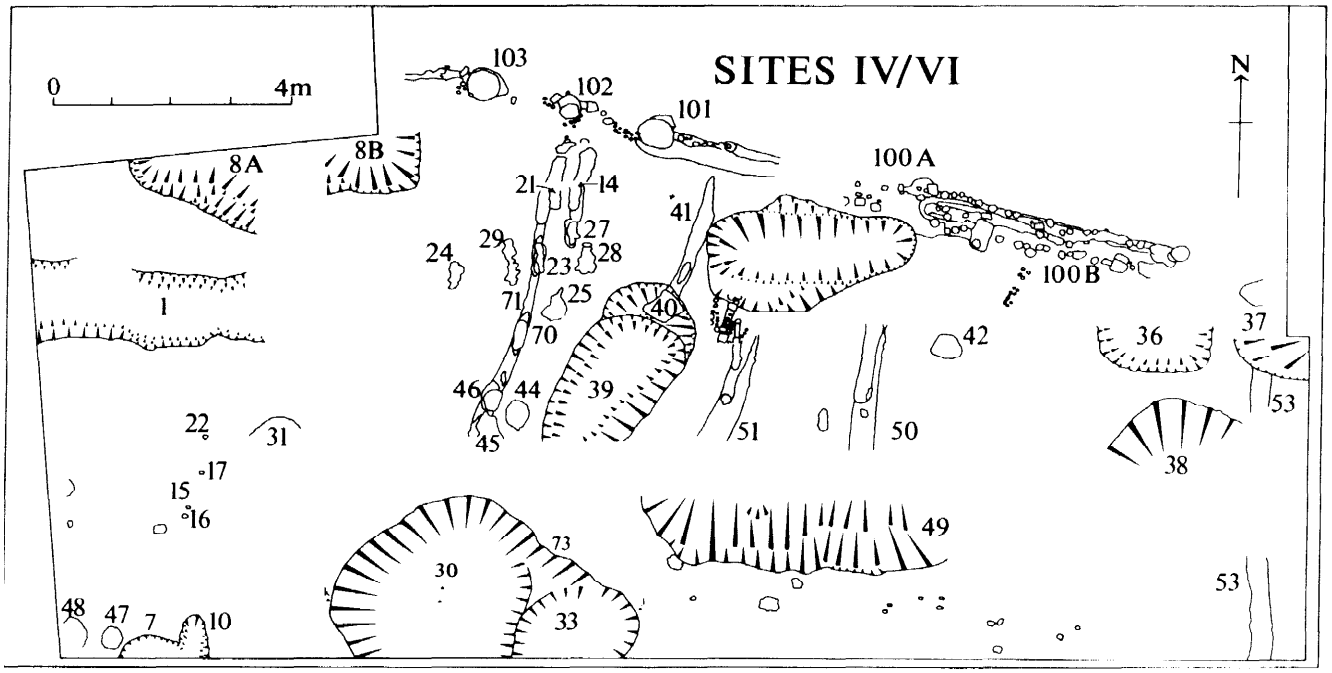


Fig 7, 1 Site VI, ground plan (with south part of Site IV)

F24 and F29, were located to the west of F71. Each had darker vertical staining, indicating stake-holes, in the filling.

Other features in this area which occurred at the highest level of excavation but were not present at lower levels were F67-69, possibly stake-holes, and F27, a curious crescent-shaped feature: these were all too shallow to be excavated.

Parallel with F71 and 2.20 m east was F41, a slot which had been partly excavated on Site IV. Its length in Site VI was 2.20 m with a U-shaped profile and it was truncated to the south by a pit, F40. Towards the southern end of F41 a possible post-hole was noted, but this was so insubstantial that it might just have been a slight deepening of the main feature.

After the third 50 mm level had been removed the vestigial traces of two parallel slots, F50 and F51, containing four post-holes, were revealed. These features were so shallow that they could not be excavated. At the fourth level of excavation F50 and F51 were shorter, each terminating in a butt end, and F54-57 were no longer present.

A large post-hole, F42, appeared at the second level of excavation to the east of F50 and the ghost outline of the upright timber was clearly visible in the section.

Close to the eastern limit of the excavation area a slot, F53, was located. It was bisected by F72, covered by the southern baulk, and truncated to the north by pit F37. To the south of F72 the slot had survived only as a dark grey stain in the surrounding brickearth and proved impossible to excavate. To the north of F72, however, it was deeper and when sectioned was seen to have a shallow, U-shaped profile.

To the south-west of this area an alignment of small stake-holes was excavated, F15-17 and F22. Two large post-holes, F47, and F48, were located close to the west baulk which covered part of F48. The section of F48 showed staining from the upright timber and was closely packed with large pieces of gravel. Both features were U-shaped in section, 300 mm deep.

A number of small post-holes was observed at the second level of excavation, F58-66, but no traces of them survived at the subsequent level of excavation.

Pits

F1 This feature was actually two pits, but intensive modern disturbance made them impossible to separate in plan. It was cross-sectioned in three places, the finds being related to a letter code ascribed to each section. At section line X-X, the feature had a U-shaped profile with a gently sloping bottom and at section lines Y-Y and Z-Z the sides were nearly vertical and the bottoms approaching flat. The maximum depth was 1.32 m and the maximum width 1.80 m. As the fillings observed in each section broadly corresponded, the features are described below as one.

The primary filling was a variegated mixture of clays and charcoal lenses with fragments of oyster shell. It produced a few pieces of daub and a little slag. This was overlain by a thin charcoal lens containing a small quantity of slag and large fragments of daub, some wattle-impressed and with squared edges. This was partly sealed by redeposited brickearth and gravel, presumably to reduce the smell of the underlying layers. Over this was a thick deposit of cess-stained brown soil with some gravel. It contained a small amount of charcoal, daub, and oyster shell fragments. At section Y-Y and Z-Z, the pit had been recut into this layer. The filling of the recut was a dark brown to black, greasy soil, with daub and charcoal flecks, much animal bone and lenses of oyster shell. Notable finds from this layer

included bone comb and bone pin fragments, a piece of granite quernstone, slag, crucible, and fragments of glass.

F7 Partly overlain by the southern baulk and cut by F10. It was 1.55 m in diameter, almost circular, and 0.70 m in depth. In section, the west side was almost vertical and the east sloped gently to a slightly rising bottom. The primary filling, which was 0.50 m thick, was of dark grey to brown soil with daub and charcoal flecks containing shell, animal bone, and a bone needle. Above this was a dark brown to black soil with daub, charcoal, shell, and animal bone. A thick layer of oyster shells overlay this in part to the west.

F8 Partly covered by the northern baulk and badly disturbed by modern features. Four sections were drawn, two in the baulk. The stratification indicated that F8 comprised two pits, F8A and F8B.

F8A was 1.15 m deep with steeply sloping sides. The primary fillings were cess-stained, variegated clays, and a small quantity of peaty brown, fibrous organic material, overlain by a layer of dense charcoal. An iron knife-blade and a fragmentary thread picker or bone pin were recovered from the charcoal deposit. Next was a thick layer of light grey ash succeeded by the upper filling of brown soil containing much shell, animal bone, and several pieces of fired clay.

F8B was 1.10 m deep with gently sloping sides, except in part of the south side where a step had been cut, and with a flat bottom. The primary filling was a light brown soil with thin charcoal lenses partly sealed by subsequent collapse of the pit sides. An abraded Roman samian sherd was recovered from the bottom of the primary filling. The next layer was a thick deposit of charcoal containing a lens of light brown soil. Overlying the charcoal were successive layers of mid to dark brown soil containing several large stones towards the bottom and one piece of slag close to the top. The surface of one of the stones was discoloured by intense heat and may have been used in a hearth. Several bands of mussel shells occurred as lenses in the upper filling.

F30 (Fig 7.2) A large. elliptical pit, cut to the cast by pit F33, and to the north by F72. It was 1.10 m deep with gently sloping sides and an undulating bottom. Both F30 and F33 (below) were cut through an earlier pit, F73. of which very little survived. The consequent difficulty in the interpretation of these three features was increased as F30 and F33 had suffered later recuts in the area where they both cut F73.

This pit was excavated by quadrant; the NE quadrant was removed last as this provided a section through F33 and F73. Nearly all the major fillings of F30 corresponded in each section.

The bottom filling was of sandy clays with small amounts of gravel and pockets of dark brown organic waste. Larger deposits of gravel occurred within and over the bottom layers, representing both collapse of the pit hides and deliberate backfilling. These were succeeded by a discontinuous layer of charcoal in black soil sealed by redeposited brickearth, some of which may have been from the collapse of the pit sides. Animal bone and shell were the most frequent finds from these layers but one fragment of glass and several pieces of lava quernstone were also recovered. Next came a mixture of dark grey soil and charcoal containing daub (some faced and angled), slag. much oyster shell, glass, iron objects (including a ? hook). and various types of stone, sonic of which showed signs of having been heated and may have come from a hearth. In the north-south section only a sealing layer of gravel was present. Elsewhere in the pit a deposit of brown soil succeeded the charcoal deposit, the former also overlying the gravel. The upper layer

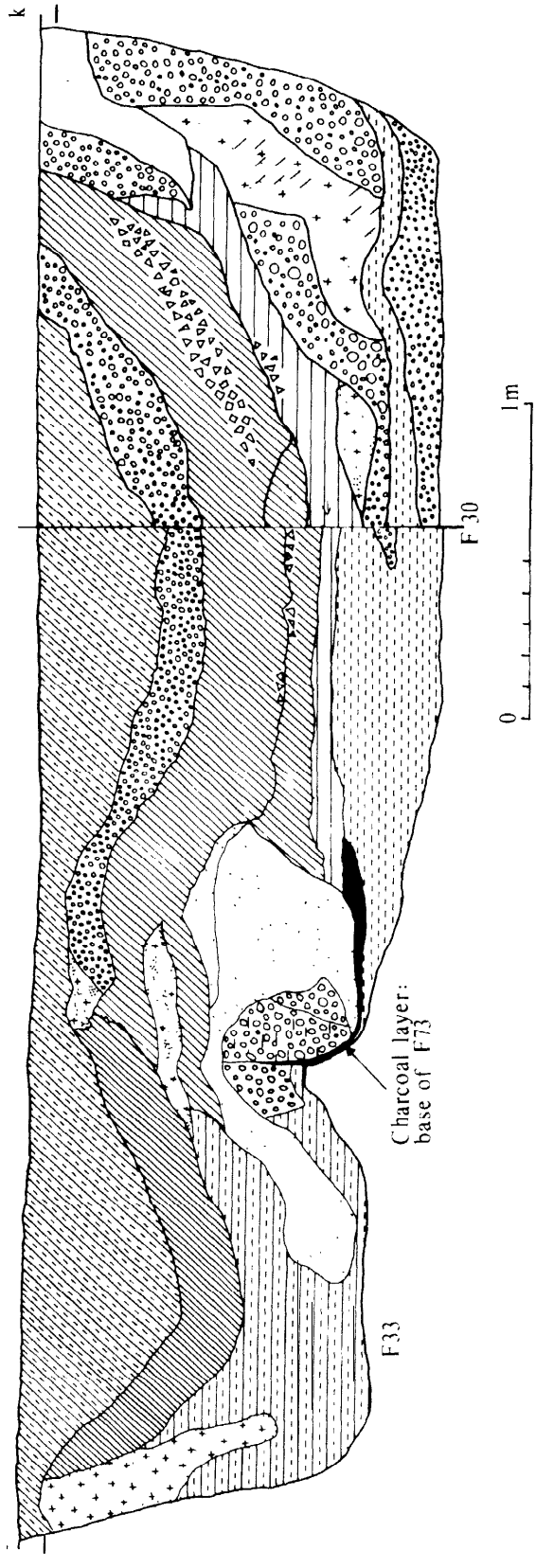


Fig 7, 2 Site V1, section of pits F30, F33, and F73 (j–k as on Fig 7, 1); horizontal lines = 2 m OD. See Fig 6, 3 for key

contained slag. slag glass, a thick lens of oyster shell, and much daub.

F31 Almost entirely destroyed by F72 and survived only in the section of the modern feature to a depth of 1.44 m. About 80 mm of clean silt was succeeded by dark grey soil with much charcoal. Nest came two layers of grey soil, both with charcoal and one with shell, followed by dark brown soil with ash. charcoal, and daub flecks. The final filling was of dark brown soil with shell fragments which graded into the layer beneath. Other than shell, daub, and animal bone, the only find recovered was one sherd of imported pottery from the filling. A sample of the charcoal provided a Cl4 determination of 15 10 ± 70 bp (Har 1167) (radiocarbon years) (ie AD 370-510). However, the sample submitted would seem to have been contaminated as Harwell report that crystalline precipitates formed in the vial during counting.

F33 (Fig 7.2) Cut through the earlier pits F30 and F73. as diseussed above. It appeared to have been almost circular in plan. 0.97 m deep with gently sloping sides except to the west where it became part of the F30, F73 complex.

The bottom lager was of grey soil with a little cess and much charcoal which produced fragments of loomweight and a lump of clay. Contained within it was a thick deposit of cess-stained brickearth which overlay the remnant layer of F73 and continued into the eastern edge of F30. This was followed by a layer of black soil with much charcoal which to the east lay against the collapsed pit side and to the west overlay a lens of sand which extended from F30 in to F33. The upper filling was dark brown soil with daub and charcoal flecks and a small number of oyster shells. In the upper levels of this pit were numerous fragments of bone comb, a thread picker, and two bone pins. Two large lumps of slag were also recovered.

F36 Halt of this rectangular pit was covered by the northern baulk. It had gently sloping sides. a flat bottom, and was 0.85 m deep. The bottom filling was dark grey to brown soil, slightly cess-stained, with small pockets of sand. Above this was a thick layer of oyster shells followed by grey, sandy soil with lenses of daub and yellow sand. Nest came a deposit of brown soil with erushed shell from which pieces of iron were recovered. Over this lay dark brown to black soil with some gravel, containing a large quantity of slag. The top filling was dark brown soil with oyster shell which graded into the layer beneath.

F37 Only the south-east quadrant of this pit could be excavated as it was partly covered by the north and west baulks, The sides were lined with collapsed and redeposited brickearth over which lay the primary filling of green cess. Above this was brown soil with pockets of yellow-brow soil grading upwards into brown soil with much shell and a large quantity of slag.

F38 A remnant outline of a pit largely destroyed by F72, its profile and dimensions being indeterminate. The he fillings were black soil overlain by brown soil with ash succeeded by dark brown soil with daub, charcoal, oyster shells, and fragments of lava yuernstone.

F39 Elliptical in plan, cutting F40 to the north and cut by F72 to the south. It was 1.30 m deep with a flat bottom and steeply sloping sides. The pit had a slight recut to the west and a loose gravel filling down the east which suggests that it may have been lined. The primary filling was heavy black clay with charcoal partly sealed by redeposited brickearth. Above this was a variegated grey soil with lenses of grey ash. The upper filling comprised dark brown soil with much gravel.

F40 Cut F41 to the north and almost completely destroyed by F39

F49 A remnant outline of a pit largely destroyed by F72.

F73 (Fig 7, 2) Only the very bottom of this pit was visible in a section through F30 and F33.

Discussion

The building

The amount of later disturbance means that the interpretation of the building is based largely upon the various construction techniques used.

The outer wall had closely-set stake-holes within a continuous trench, presumably to receive the wall Cladding, which was interrupted by an entrance flanked by substantial post-holes, F101-3, for doorposts. In the centre of the entrance was a less substantial post-hole from which a line of stake-holes (here not in a trench) led to the eastern door-post, F101. Set roughly at right angles to the outer wall were a number of longitudinal features, dividing walls or partitions. These showed a variation of constructional technique suggesting that wattle panels were set between groups of slake-holes in both continuous and irregularly spaced trenches and possibly even on sill beams.

The other internal features were simple post- and stake-holes. except that F42 had a post emplacement within a post-hole.

It appears that al least two main phases were involved. In the first the entrance was 2.38 m wide with a dividing wall all set roughly at right angles to the eastern doorpost. In the second phase the entrance was narrowed to 1.60 m by the insertion of post-hole F102, and a new dividing wall was aligned to it.

The two parallel east-west lines of stake-holes, F100A and F100B, show that the outer wall had been completely replaced. The narrowing of the doorway would seem to have taken place at the same time, or later, as the stake-holes extended from the line of the rebuilt wall to post-hole F102, but were not in a continuous trench, unlike the other stake-hole line.

The second phase dividing wall was strengthened by an additional wattle panel 2 m in length on the east side just inside the entrance. The need for such a strengthening might be explained if an inward opening door were hinged on post-hole F102. It is impossible to interpret the functions of the internal partitions but F50. F51, anti F53 may have been contemporary as they all exhibited the same constructional technique. Similarly, F71 and F41 were probably contemporary but belonged to a different phase from F50, F51, and F53.

With so little of the internal groundplan of this building surviving it is difficult to recognize which were the major load-bearing features but post-hole F42 could have been a roof support and the deepening of F71, 4.80 m in from the entrance, and presumably close to the centre of the building, may indicate a similar function.

Finally, as no return walls to the cast or west were found, it may be reasonable to assume that the entrance located was placed centrally in the long side of the building. It this is the case, then the minimum length of the building would have been about twenty metres.

The pits

The difficulties in the interpretation of the pits excavated on Site VI were increased as not one had escaped some form of disturbance either by Saxon or later activity.

Generally the fillings of the pits comprised household refuse, animal bones, shell, and pottery. Evidence for industrial activity is provided by the fillings of light ash in several pits and by occasional pieces of iron slag. The

largest quantity of slag came from pit F37, which produced 60 pieces. Bronze fragments, loomweights, and pieces of worked bone occurred in such small quantities that their presence could be entirely fortuitous and need not necessarily indicate that related industries took place on the site.

Perhaps the most significant feature of this group of pits was the quantity of charcoal and burnt daub which was present, often as one of the primary fillings. As none of the pits can be demonstrated to be contemporary with building 1, a not unreasonable hypothesis would have these deposits of charcoal and daub a result of ground clearance after the destruction of the building by fire.

8 SARC Site XX

by David Barrett and *Philip Holdsworth*

Site XX was excavated between September and December 1975. Two parallel areas 15 m x 15 m were cleared of modern soil by machine and preliminary site clearance was done with spades and shovels. The methods of planning and recording were the same as those used on Site VI, and both trenches were covered by polythene tents.

No Saxon features were visible after the initial clearance and none was revealed until the removal of the fifth 50 mm level. The site was badly disturbed by modern features and in both areas of excavation several pipes and soakaways had partially destroyed a number of pits and interrupted the alignments of smaller, possibly structural features.

Structural features

Structural features were recognized during excavation, but only after the level plans had been correlated was it possible to isolate individual buildings from the alignments of post-holes and stake-holes, their spatial distribution, the similarity of their fills, and stains in the soil (Fig 8,1).

Building 1 There was evidence for this building in the western part of the excavation in both areas. A series of timber settings, F297, F300, F305, F317, and F315 was aligned E-W. They were all approximately the same size but only F300 and F305 were excavated, the remaining features being too shallow. Immediately south of F297 was a similar feature, F298, which was also too shallow to be excavated.

At right angles to this group was a line of three structural features: a post-hole, F407, and two stains, F168 and F542. These were of a similar size and equally spaced 1.50 m apart. Possibly associated with this alignment was a number of smaller post-holes, F309-12 (not all numbered on ground plan, Fig 8,1), F408-9, and a narrow trench with stake-holes in the bottom, F406.

Various post-holes and stake-holes were located within the area defined by these two alignments.

Building 2 This structure was represented by a group of four large post-holes and one stain in the south area. Three of these post-holes, F156, F161, and F133, formed an E-W alignment and two others, Fl55 and F140, lay immediately to the south of F156 and F133 respectively. A number of smaller features, F159, F160, F434, F437, and F141, may be associated with this group. The largest of the post-holes, F161, had held two upright posts, the ghost outlines of which were visible in section.

Other structural features Other structural features included F118, a shallow slot with stake-holes in the bottom. In places the slot itself had not survived and only the deeper stake-holes remained.

F127 comprised two linear features, A and B, of which A was the later. Each had a deeper post-hole at the western end and a group of features to the west, F172, Fl5l, F170, F332, F323; a post-hole to the east, F174, may be associated with F127.

A group of linear features, F301, F456-7, F459, appeared as pale sandy stains. On excavation these proved to have a U-shaped profile with a number of rather indeterminate deeper areas which may have been stake-holes. Within the area bounded by these linear features was a number of stake-holes which appeared at the same level and may be associated with them. To the north of this group of features was a series of irregular stains and stake-holes which appeared at a higher level: F283-9, F319-28, F335-47.

In the central area of the north trench a large number of stake-holes, stains, and linear features appeared at a number of different levels but because of the lack of stratification no chronological distinction could be made. Various possible alignments have been postulated.

Well

F135 (Fig 8,2) This was the only well recovered during the excavation. The well pit was roughly square in plan, conical in profile, and some 1.20 m deep. The central shaft was circular and visible to the ground surface. The lining of the shaft showed as a dark stain but the material used for the lining was indeterminate. The well pit was largely filled with grey brown clay and flint gravel. A number of different layers of dark grey brown clay and domestic rubbish filled the shaft itself.

Pits

F70 (Fig 8,3) A large, subrectangular pit, 1.80 m deep, with steeply sloping sides. The filling comprised layers of dark brown clay with flint, gravel, and domestic rubbish. There were, however, two layers of clean yellow brickearth which seem to represent sealing layers. Around the sides was a layer of green stained silty material (similar samples of this from pit 123 were analyzed by Dr M L Shackley, see below). There was a large amount of domestic rubbish, particularly animal bone. This was especially concentrated in layer 3, although much of it was in a poor state of preservation. Other finds included glass, an iron knife blade and several nails, a bone spindle-whorl, a bronze pin, and fragments of glass and slag.

F114/120 This feature occurred in both areas of excavation and was partly covered by the central baulk which precluded its total excavation. It was a large, subrectangular pit over 2 m deep with steeply sloping sides. A deeper shaft was visible in both areas after excavation, although there was no indication of this in the pit filling. The bottom of the pit and the central shaft were filled with a fairly clean brickearth with much iron panning. The rest of the fill was dark brown soil and clay with domestic rubbish. The finds were particularly concentrated in the southern part (F114) where a number of different lenses and a charcoal layer were recognized that were not visible in the northern area (F120). A green layer similar to that in F70 lay around the sides of the pit immediately above the initial fill of brickearth. Finds included several iron objects, glass, daub, and slag.

F123 A large, subrectangular pit with steeply sloping sides and partly covered by the north baulk. Only one quadrant was excavated. Several layers were recognized, mainly composed of dark grey brown clay and brown soil. Towards the bottom was a darker grey clay layer

SITE XX

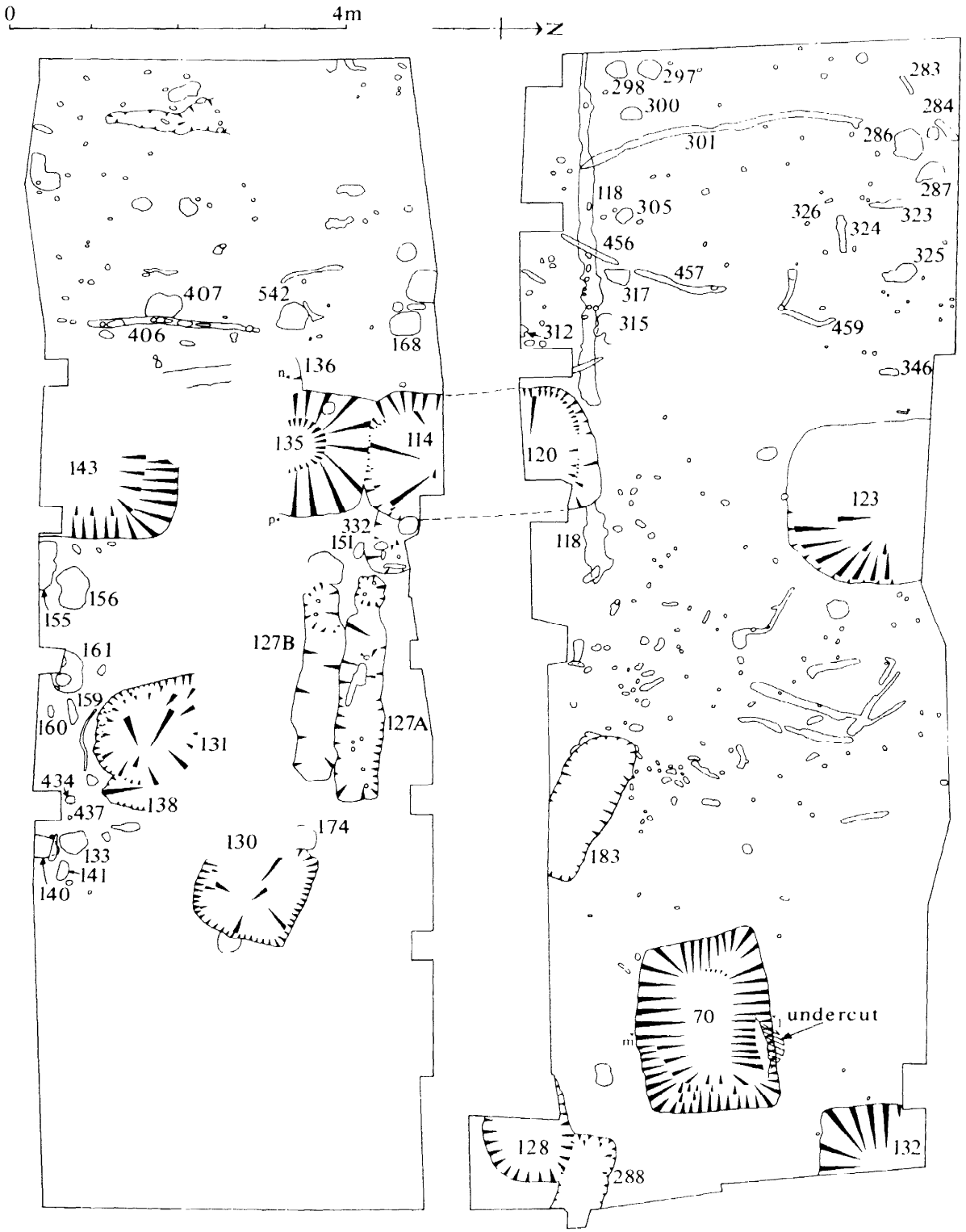


Fig 8, 1 Site XX, ground plan

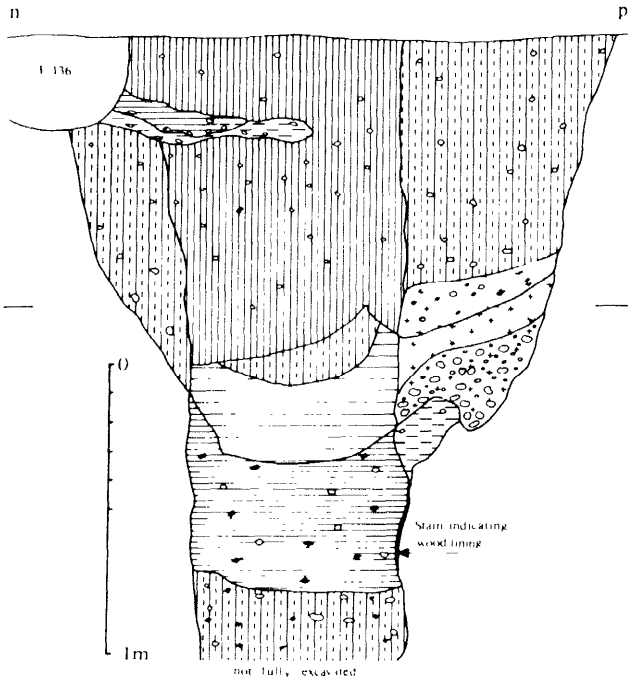


Fig 8, 2 Site XX, section of well F135 (n-pas on Fig 8,1); horizontal lines = 2 m OD. See Fig 6, 3 for key

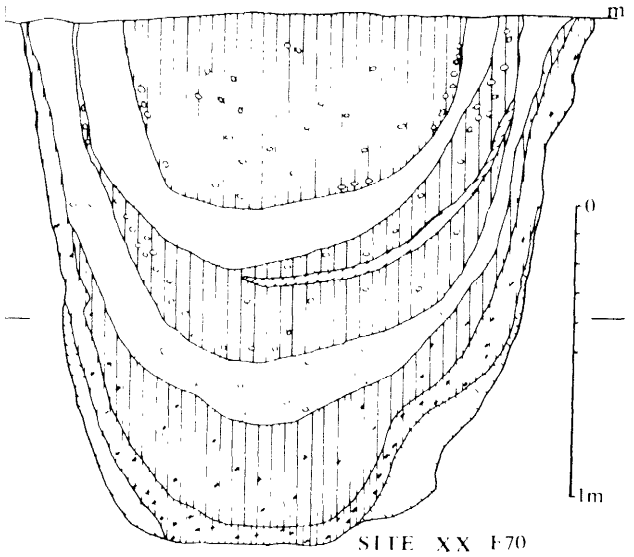


Fig 8. 3 Site XX, section of pit F70 (l-m as on Fig 8, 1); horizontal lines = 2 m OD. See Fig 6, 3 for key

and below this a patch of organic material containing fruit stones and other plant remains. The primary filling which extended up the sides of the pit was a green stained layer similar to that in F70 and F114/120. Samples of this were taken and analyzed by Dr M L Shackley (see below), There were large quantities of domestic rubbish in this feature, especially animal bone; fish bones were also recovered. Other finds included daub, a number of iron objects, a Roman coin of Constantine I, part of a bone comb. a stone spindle-whorl, slag, and glass.

Dr ML Shackley writes.

'Two samples consisting of a greenish-coloured clay rich material which formed the lining to the pit (Sample *F123.SS5)* and a control sample of material taken from the interior of the pit (F123.SS2) were submitted by the excavator, who wished to know whether the greenish material derived from cess. Both samples were examined under a binocular microscope at magnifications varying from x6 to x50 In addition subsamples were broken down in distilled water and examined under a powerful lens to detect the presence of included matter, and routine tests for total phosphate were run.

'Both samples were very rich in clay but also contained a sand fraction composed of redeposited quartz grains together with many heavy minerals. Texturally the samples were very similar. Sample 5 was mottled grey/ green in colour with many black specks, while sample 2 was a more uniform darkish brown. The phosphate content of both samples was extremely high. and there was little variation between the two Alien inclusions in both samples comprised comprised small fragments of flint. decayed cereal husks, seeds (very small and much decomposed), small bone fragments, and much decayed vegetable matter, identifiable only under the microscope. Some of the fibres might possible have been woven.

'This material is extremely similar composition and appearance to cess deposits which I have seen from elsewhere, There is however, comparatively little difference between the interior and the lining of the pit. I suggest that the fill of the pit includes much cess, but that both lining and interior have equal amounts. This is not a case of a cess-type lining to a normal pit. The only observable difference was of colour, and this could be a function of the reducing conditions at the exterior margins of the pit. It is also possible that the fill was cleared out and then left to accumulate again, which might account for the difference.'

(As the green staining was visible on the surface before excavation. it would seen more likely that the staining was caused by reducing conditions at the exterior margins of the pits rather than by cleaning out of which there was no sign in the contents. *DB)*

F128 Only part of this pit was excavated as it lay under the central baulk. It was subrectangular, shallow, and cut grave F288. The fill was composed largely of dark brown soil with a layer of green stained material around the sides. There were few finds.

F130 A small rectangular Pit 0.90 m deep. It was cut to the west by a modern sewer trench. Above the primary filling of dark grey clay with much charcoal and domestic rubbish was a layer of silt derived from the brickearth in the sides of the pit. Above this were two layers of dark brown clay with domestic rubbish. Finds included iron objects bronze, Shell, and daub.

F131 A circular pit 17.5 mm deep, cut on the north side by modern disturbance. The sides were difficult to distinguish because of much tumbled or loose brickearth overlying pit filling in some places, perhaps caused by

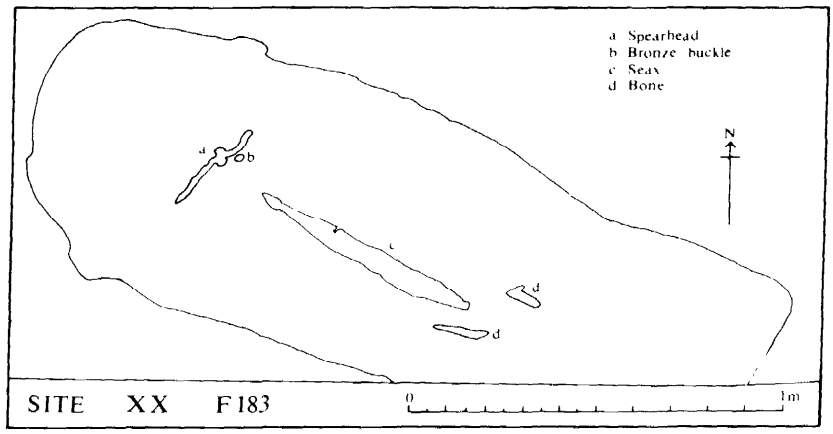


Fig 8, 4 Site XX, plan of grave F183

the pit having stood open for some time. Many different layers were recognized, consisting mainly of dark grey brown clay and soil, domestic rubbish, and varying amount of charcoal. A very localized area of green sandy silt was recorded on the bottom. Two sceattas were recovered from the pit and a sample of very charcoal-stained soil yielded a C14 determination of 1260 ± 80 bp (Harwell 1486) (radiocarbon years) (ie AD 610-770).

F132 Largely covered by the south baulk and cut to the north by a modern feature. It was not possible to excavate this feature fully but around the sides was a very distinct layer of green stained silty material (see below). There were no finds.

F138 An indeterminate feature which cut F131 and was itself cut to the north by a modern disturbance. There were no finds.

F143 Another large rectangular pit some 2 m deep with steep sides. The filling was rather different from that of the other pits. It contained a great deal of redeposited brickearth and burnt clay. There were two main bands of brickearth. The first, at the bottom of the pit, was rather stained and had narrow bands of grey clay and domestic rubbish in it. This was separated from the second band by a layer of dark brown soil. The second band had three recognisable layers in it, the top and bottom ones having much burnt clay in them. Above this were several layers of dark grey brown soil and domestic rubbish. Finds included slag. daub, and iron objects.

Graves

Two graves, F183 and F288, were excavated. Both occurred in the eastern part of the northern area. Fl83 was aligned just north of east - west and F288 was more or less exactly east-west: both contained grave goods.

F183 (Fig 8,4) No skeletal material survived but a number of grave goods were recovered. Lying centrally along the grave was an iron seax and just to the west of this lay a spear head and a bronze buckle (see pp 73-6).

The grave was some 2 m long by 0.70 m wide, and 0.50 m deep when excavated. The fill was fairly clean brickearth and no evidence of a coffin or lining was visible.

F288 (Fig 8,5) This grave was 2 m east of F183 and was 0.60 m wide and 0.25 m deep. Only the western half was excavated as the grave ran under the east baulk. It was cut to the south by F128.

This grave contained a lower human mandible at the west end and two other bone fragments in a very poor state of preservation. Lying centrally in the grave and partly covered by the baulk was an iron spear and immediately west of this lay the residue of part of the shaft and a bronze buckle. The remains of a wooden coffin or lining lining also recognized. This was visible as a dark stain along the sides and bottom of the grave. The fill was similar to that of F183 (see pp 74-6).

Discussion

Building 1

The structural features assigned to building 1 seem to represent part of the north and east walls of a building aligned north - south. As only part of the plan of this building was recovered it is not possible to make any detailed interpretations.

The regular spacing of the posts in the east wall may indicate a pairing of wall posts. Evidence for walling between the posts was notably lacking in the north wall and only F406 seemed to represent it in the east wall. There was a large number of post-holes and stake-holes in the interior of the building, some of which may represent internal structural features, for example F199-200. F204. F214. and F233. From its position F243 may have been the hole for a door post, although there was no evidence of a corresponding one to the south.

F297 and F298 may represent the corner of the building, giving a width of 3.30 m, or alternatively F298 may be a replacement post slightly inside the line of the building.

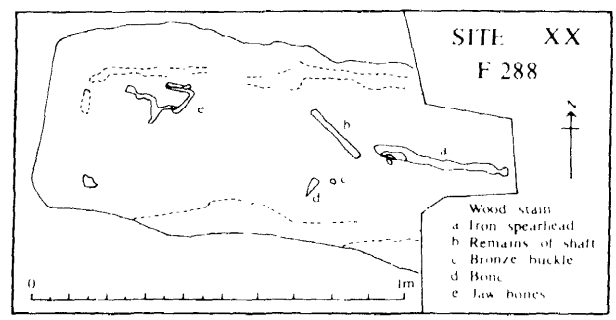


Fig 8, 5 Site XX, plan of grave F288

Building 2

A group of post-holes may represent the north wall of another north-south aligned building, with F155 and F140 representing the first posts of the west and east walls respectively. This would indicate a width of 3.50 m. perhaps suggesting a small ancillary building. The two posts in F161 may indicate a doorway to the east. The recorded post-holes of this building were more definite and deeper than those of building 1, and it is unfortunate that more of this structure could not be excavated.

The pits

As in other 'Hamhih' sites the pits were the main leatures encountered during excavation and it was from these that the vast majority of the finds came. There were few direct relationships between pits; F13.5 was cut by F114/120 and F132 cut F131. The only other direct relationship was F128, which cut grave F288.

F70, F123, F132 were all deep, steep-sided, sub-rectangular pits cut well into the gravel. All had a green stained silty layer around the sides and bottom. This also occurred in F131, though very localized, and F129. F114, 120. Dr M L Shackley's report (see F123) shows that such layers layers probably cess deposits. This would suggest that these pits were in final use as latrines, although no structures were associated with them apart from the post-holes possibly associated with F123.

F114, 120 may originally have been constructed as a well but never used as such. This is suggested by the deeper shaft. which had been rapidly filled up with redeposited brickearth. The green stained layer immediately above this would indicate that the pit was then used as a latrine. However, this interpretation is not without difficulties as the well pit and shaft would have then very large and some other purpose cannot be discounted.

F135 was the only well excavated and is of the same type as the other wells in Saxon Southampton. having a circular central shaft lined with wood or wickerwork.

F143 was another steep sided deep rectangular pit and was cut by modern disturbance on the west. It differed from the other pits of this type in that it had no green stained layer and the fill was largely comprised of fairly clean redeposited brickearth mixed with burnt clay. It is possible that this represents the clearance of an area of debris from construction operations nearby. The absence of charcoal in any significant quantities and the absence of wattle impressions suggest that this burnt clay was not the debris of a building destroyed by fire.

F131 was a deep circular pit which much tumbled or loose brickearth around the sides. A small amount of green staining was visible near the bottom but was very localized, perhaps suggesting that the pit had been cleared out at some point. Two sceattas were found in this feature and a sample of very charcoal stained soil produced a C14 date of 1260 ± 80 bp (Har 1486) (radio-carbon years) (ie AD 610-770). This is an early date but in view of the two graves found is not necessarily surprising.

There is little evidence of any industrial activity on the site. Small amounts of slag were found in five pits and there was little bone which showed any signs of working or butchery. Two pieces of the same bone, relatively unworn. were found in pits F70 and F130 which indicates That these may have been contemporary.

A notable point was the almost complete absence of oyster shell from any of the features. In other pits in Saxon Scuthampton oyster shell has comprised complete layers. but on Site XX it was present only as fragments. mixed with other domestic rubbish.

The graves

The discovery of the graves increases the number of burial sites known in Saxon Southampton to four, in presumed to be the 'minster'. As one of the graves was cut by a pit it can be assumed not only that they were an early feature of the site but that they had been forgotten. or at least were no longer respected, some time before the area was abandoned. The objects in the graves are consistent with a very early date in the life of the town. Both can be assumed to be male burials since weapons were found. That such accountrements were considered suitable to accompany men who were buried in a place where trade was presumably the dominant activity is perhaps a corrective to the too-ready assumption that men buried with weapons thought of themselves primarily as warriors in their own life-times.

It could be argued that the graves predate the town: that they are isolated graves of men who had been buried before the activities in Saxon Southampton began at the very end of the 7th or the very beginning of the 8th centuries (see Pottery report for further discussion of the dates). Although this is intrinsically unlikely, the grave goods (see Iron and Bronze reports below) do not absolutely preclude it, unless the seax can be more closely dated after further research. Then presence of the spears would normally be an argument for a date before the mid 7th century: they cannot be dismissed as 'indispensable adjucts of everyday wear' (Hawkes & Meaney 1970, 53) as can the buckles, but are deliberate grave deposits. The second half of the 7th century has produced very few weapons apart from knives from its known English cemeteries (Swanton 1973, 13). In particular, none has yet been published which has more than one grave with a spear-head in it. Either the Site XX burials are relics of a date before 650, which is geographically unlikely and unsupported by any positive evidence, or they were of visitors from overseas who were unlike their contemporary in England and whose companions buried them according to their own customs, in one case with a seax which is probably specifically a Continental weapon. It cannot be argued further that these men came from an area that had not yet been converted to Christianity. They were buried east-west. but this is not an invariably Christian practice. They are as likely to have come from a part of the Frankish world where Christianity had not yet completely ousted the Germanic custom of burial with grave goods, as from a pagan area such as Frisia, and specifically Dorestad. Their port of origin may never be located.

The significance for Saxon Southampton, however, is that it shows not only that foreigners were present at an early stage in its history. but perhaps also that they were given considerable latitude of social behaviour. It might even be that their separate burial site indicates an acknowledgement, however imprecise, that they had certain specific areas in the town, which is not to suggest that Saxon 'planning' included ghettos, but does imply a concepts of spatial differential at an early stage in the town's history.

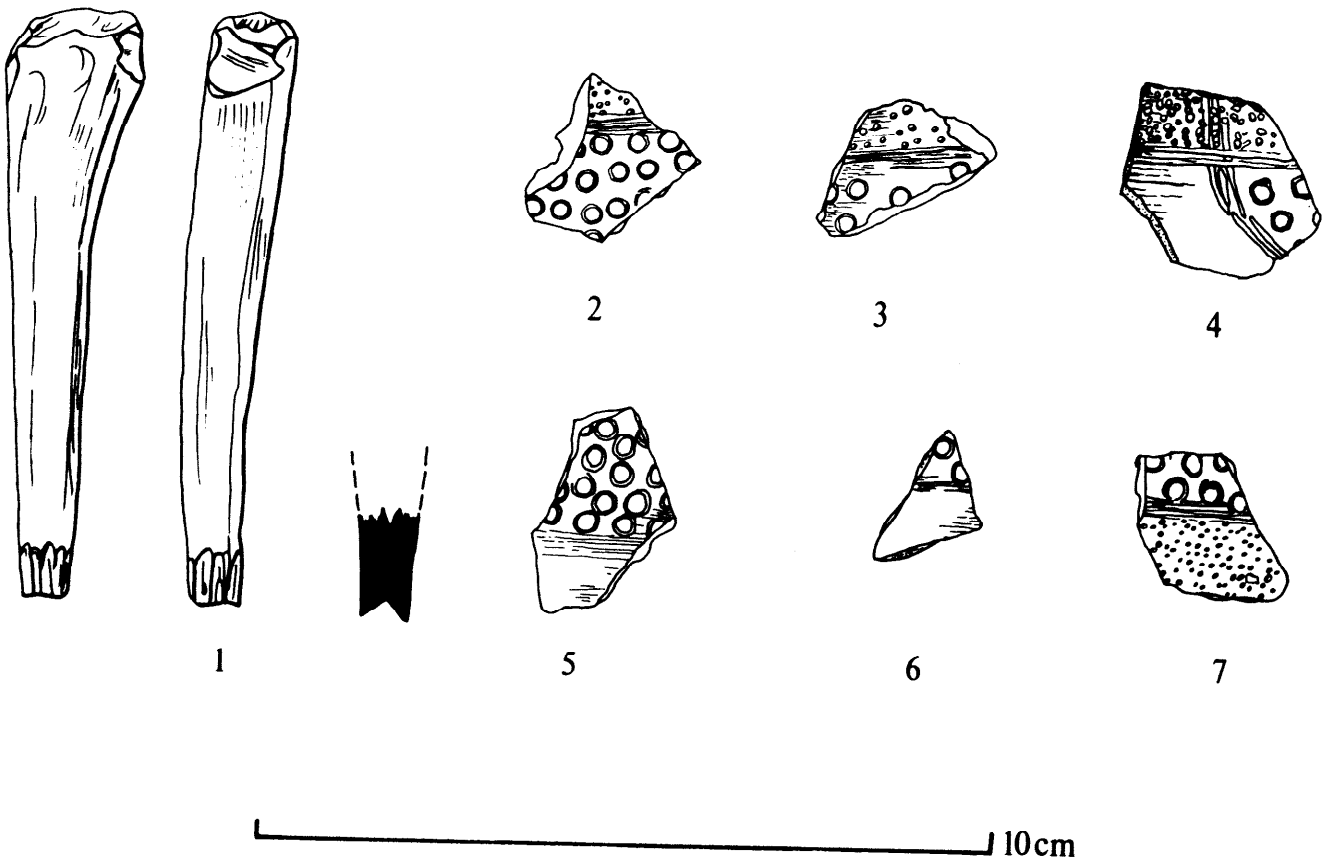


Fig 1O,2 Bone stamp and class 3 decorated sherds possibly associated with it. I: Bone stamp IV F111 CW73A .2: IV F2150, P21; 3: V, F17, P820; 4: V, F17, P535; 5: V, F17, P564; 6: V, F19, P840; 7: V, F17, P536 (ail decoration no 9). Scale 1: 1

THE MELBOURNE STREET OBJECTS

9 General introduction
by *David A Hinton*

The range and quantity of finds recovered from Saxon Southampton has been outlined by Addyman and Hill (1969). It is a record unlike that from any other English site of the period.

In this report, detailed treatment is given to the animal bones, the pottery, the glass, and the coins. The metalwork and worked bone are more summarily treated, as the specialist employed on the finds of those categories from sites excavated between 1969 and 1972 has not presented her report, and it is not possible at this stage to discuss the SARC finds in relation to other discoveries made since Addyman and Hill's 1969 paper. It is hoped eventually to collate all these finds, and to publish full discussions of the different categories. Meanwhile, discussion of some of these is not extensive if the new data do not yet add materially to the interpretations offered by Addyman and Hill.

The objects do not have a single serial number. A letter prefix distinguishes the organization responsible for the site, each of which has a number code-in Roman in most cases. This is followed by the feature or layer number, and then by an artefact code, with finally the unique number of the object within its site. Thus SARC XX, F123, Fe 5, is iron object 5 from Feature 123 on Site XX directed under the aegis of the SARC. Such full reference is not always necessary: XX, Fe 5 is usually enough to identify the object in discussion. Objects from the Saxon surfaces, not from features, are given their site grid references, or a GC code. Objects from later disturbed levels are labelled as unstratified.

Codes

Organization

HAM:	Excavations of 1969-71
CL, SM, DMW, GS:	Excavations of D M Waterman and of M R Maitland Muller
SARC:	Excavations of 1972 seq

Material

AE Copper alloy
Ar Silver
Au Gold
C Coin
CW Worked bone
Fe Iron
GL Glass
P Pottery
Pb Lead and pewter
St Stone

10 The pottery
by *Richard Hodges*

Introduction

This report is in essence a summary of the classification of the 'Hamwih' local and imported pottery presented in the author's doctoral thesis completed in Autumn 1976 (Hodges 1976).* The purpose of the research on the pottery from the 'Hamwih' excavations has been to establish by petrological and archaeological study of the fabrics the sources of the wares represented in the assemblage. It has been argued elsewhere that the study contributes greatly to our further understanding of early medieval trade within southern England, and between England and the continent (Hodges 1976, 1977). In this report, besides a summary of the classification and a catalogue of the imported pottery from the Melbourne Street excavations, there is a brief discussion of the trading mechanisms which brought this pottery to 'Hamwih'.

The pottery has been classified as either hand - made/ slow wheel-made, or fast wheel-thrown. it is believed that the hand-made wares were locally produced and that the thrown wares were imported, but this may prove to be an erroneous simplification when more petrological analyses have been undertaken (cf Hodges 1976_).

The hand-made wares were classified by macroscopic examination of the fabrics and not by thin-section analysis, although a few thin-sections of each class have been included. This means that each of there classes is readily identifiable but, as will become apparent, class 4, which is a miscellany. may include several petrologically different wares for which new classes may need to be allotted, Moreover, further research is necessary to establish the precise sources of these classes; to do this heavy mineral, chemical. or neutron activation analyses may prove more useful thin-sections.

The quantities of each hand-made class in many of the larger pits from SARC and other excavations have been weighed and, with the of close Proximity analysis (Renfrew & Sterud 1969), The varying quantities of these five classes have been used as a means phasing the settlement. The results and a discussion of this analysis are presented elsewhere (Hodges 1976), although a summary is included in this report and where relevant, with each local class defined below.

The classification of the imported, wheel-thrown wares has also been devised for easy use. Study of the assem - blage began by dividing it into macroscopically similar classes and then, when it seemed necessary, thin - sections were made, Thin-sections in certain cases necessitated the creation of new classes, or even the sub - division of classes into groups. However, it must be pointed out that each class does not mean a distinct source.

Some classes in thin-section look very similar and may well have emanated from the same source, but it will be difficult to prove this satisfactorily until more kilns and their products have been found and characterized in France and/or Belgium. Furthermore, some classes reflect the initial, provisional of the classification Thus, for example, class 18 comprises oxidized wares. Oxidized wares were seldom the sole product of a kiln, but occur as individual pots in large kiln loads, presumably because of firing circumstances. The same is also probably true specialized products like the red burnished wares, class 21, which were fired with the normal produce. It seems better to keep some provisional classes for the moment than to assign new classes to anomalous individual sherds.

It is nearly 30 years, since research into these ceramics was initiated (cf Hodges 1976, chapter 1). Yet it has only been possible in the last four years to make any preliminary statements about this manifestly important assemblage. It has been fortuitous indeed, from the author's point of view that changes in Continental archaeology have greatly facilitated the pursuit of this research. But it cannot be emphasized too strongly that the evidence regaling many of these classes is still

*Now revised for publication in 1980 by the CBA.

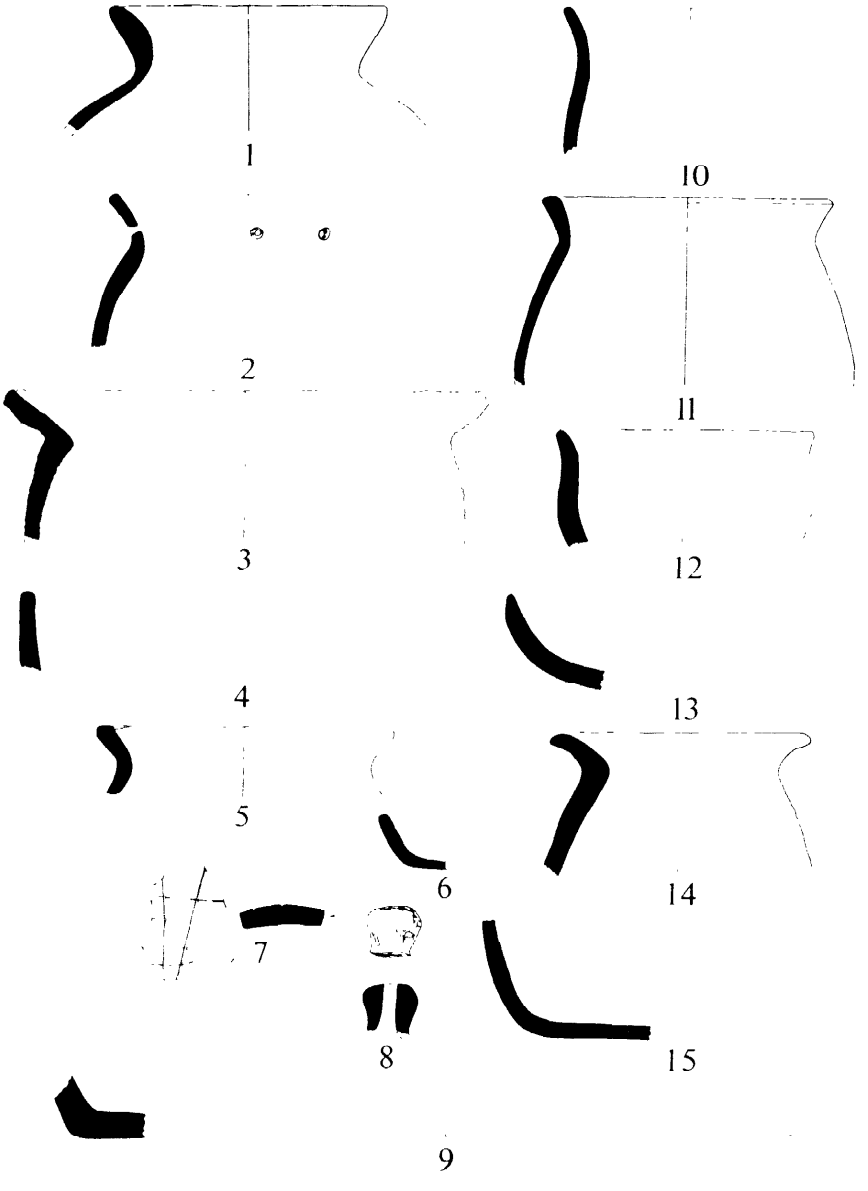


Fig 10, 1 A range of Middle Saxon wares from Melbourne Street. I: V, P1089 (class 2); 2:1, P2000 (class 3); 3: V, P309 (class 4); 4:1, F4, P400 (class 5); 5: V, F34, 505 (class 5); 6: V, F119, 528 (class 3); 7: V, F16, 749 (class 4, decoration no 15); 8: IV, F49, 882 (class 2); 9:1,713 (class 5)10:1, F36, 236 (class 3); 11:1, F33-18, 901, (class 3); 12: V, F119, 528 (class 3); 13: IV, F16, 14 (class 3); 14: VI, F30, 409 (class 4); 15:1, F4, 397 (class 2). Scale 1:4

slight: the precise origins of many wares remain 'mysterious' (cf Addyman 1972, 227). With these reservations, it is hoped that this report will be of value by presenting these hitherto unstudied Continental wares of the 8th and 9th centuries.

Hand-made wares

Some general characteristics

There is a very limited range of forms in the large assemblage of hand-made pottery (cf Fig 10. 1). Most of the vessels were cooking-pots, or jars with flat bases which were probably added to the bodies of the pots. The bases may have been made on a flat stone, and have none of the finger impressions characteristic of the bodies. Many of the class 2 cooking-pots have thickened necks, a feature which Addyman and Hill (1969, 84) noted, and which is less commonly a characteristic of some class 4 vessels. A few class 2 and class 4 vessels have pronounced shoulders, a feature of Middle Saxon pottery to which Dunning drew attention (1943, 78). Addyman and Hill (1969, 93) briefly examined the sizes of these cooking-pots. and referring to the principal 'Hamwih' classes, 2, 3. and 4, considered many to be 150-180 mm in diameter, while a smaller group seemed consistently to be 100-120 mm in diameter. These useful observations have not been taken up here. although now that the seriation enables many of the pit groups to be dated it would seem an especially interesting study, for Addyman and Hill suggested that these sizes were linked to culinary habits. Inside some of these vessels are charcoal residues, possibly of food, which when enough samples are available will warrant analysis. Classes 1 to 4 are usually black in colour, though oxidized, light red vessels are sometimes known. Class 5 is more commonly found in an oxidized fabric. None of the classes is as hard-fired as the wheel-thrown ones, and the sherds tend to crumble at the edges (see Table 10, 2 (below p 57) for sherd: feature correlations).

Class 1: 'Grass-tempered' ware

Only a few sherds of this ware were found on each site in Melbourne Street, which is consistent with the quantity found elsewhere within the settlement. Several general points can be made about this class (for full discussion see Hodges 1976. chapter 2 and chapter 6, section 1). Firstly, this is a very sandy variant of grass-tempered pottery. and very different to some kinds which are packed with organic tempering. Secondly, the small number of sherds with distinguishable features suggests much typological variability. This contrasts with the other hand-made classes and suggests that class 1 was made by households within 'Hamwih' for their own use. Thirdly, this class probably dates to the earliest settlement at 'Hamwih', and, as at Portchester and Winchester (cf Cunliffe 1970, 72), was superseded during the 8th century by other classes.

Class 2: Chalk-tempered ware (Fig 10, 1, nos 1, 8, 15)

This class is characterized by prolific chalk inclusions, or by voids when these have leached out, ranging from 2.00 to 5.00 mm across. (There are no other prominent inclusions, and the chalk- and flint-tempered fabric often found in 'Hamwih' is included in class 4. although it may have been made by the same potters.) A slurry has often been added to the outer surface of this class, which has a soapy texture, In thin-section it has an optically anisotropic brown clay matrix with many large chalk inclusions ranging, in this case, up to 2.5 mm across; a few fired clay pellets; a few grains of iron ore 0.3 to 1.00 mm across; as wel1 as very few inclusions of quartz-sand of two sizes: first first 0.01 to 0.03 mm across, and secondly, sub-angular grains averaging about 0.30 mm across.

Many of the cooking-pots have thickened necks. a feature to which Addyman and Hill drew attention (1969, 84). and which is also a characteristic. though less common, of some class 4 cooking-pots. A very few cooking-pots have pronounced shoulders.

The chalk inclusions suggest that this class was made somewhere near the Downs, at least 15 miles from 'Hamwih'. or, less likely, on the Isle of Wight.

Class 3: Sand-tempered ware (Fig 10, 1. nos 2, 6, 10, 11, 12, 13)

This is a distinctive sandy class which only occasionally has prominent inclusions such as angular flint or iron grains up to 1 mm across. A variant, however, has a few prominent organic inclusions; this might perhaps represent a transitory stage between class 1 and class 3. Thin-sections have revealed large numbers of limonite grains in the matrix. Limonite is a characteristic of the greensand, and may be derived from the Bagshot Beds near Southampton. However, it has been argued. using the seriation data as evidence, that a waster-pit with several kilograms of this class was found on SARC XV (Hodges 1976). This suggests that class 3 was made within the settlement. The theory is further strengthened by the discovery of an antler stamp in SARC IV, F111 (Fig 10, 2, no 1). This stamp was used to decorate class 3 sherds (see below, decoration no 9), examples of which have been found in nearby pus on this site (Fig 10, 2, nos 2-7). The large quantity of this class from 'Hamwih' and its absence, unlike the other hand-made classes, from other Middle Saxon sites in Hampshire tends to confirm the belief that class 3 was made for a short period in 'Harwith'.

The close proximity analysis of selected pit-groups in 'Harwih' has suggested that this class was the most important han-made pottery in the first halt of 'Hamwih's' existence. It appears that its production declined during the late 8th century and by the 9th century there is only a small quantity in the pits which may be residual (see Hodges 1976, chapter 5).

A variety of forms has been found in this class which includes cooking-pots with pierced holes for thongs (Fig 10, 1, no 2). bowls (Fig 10, l, no 13) and a lamp (Fig 10, 1. no 6) (cf Addyman & Hill 1969, fig 33, no 4) of the type which continued to be made in this region until the 12th century (Platt & Coleman-Smith 1975, 2, fig 140, nos 176, 177). Many of the rims of vessels in this class have been finely trimmed, while some vessels have been lightly burnished up and down the girth of the pot.

Class 4

This is a miscellany of fabrics which were tempered with flint, flint and quartz, and flint and chalk (Fig 10, 1, nos 3, 6, 14). In essence, it comprises those fabrics which cannot be included in the other, accurately defined classes. The inclusions in this class vary from about 1.0 to 4.0 min across, and there is a range of quantities of temper to the clay matrix. It is apparent that some fabrics have temper of a larger average size than others.

The tradition of adding coarse temper to the clay seems to have begun by the early 8th century, and coarse-tempered pottery was by the end of the century the most important hand-made class in 'Hamwih'. It was a tradition of potting which was maintained probably by several potters operating in Hampshire and West Sussex during the Middle Saxon period (see Hodges 1976, chapter 6, 3) and one that continued in Southampton

and some rural areas of central Hampshire until the 12th century. (cf Moorhouse 1971)

Class 5: Shell-tempered ware (Fig 10, 1, nos 4, 5. 9) This fabric is found only a little more frequently tha class 1 on 'Hamwih' sites. There is a very large jar found unstratified from e SARC I (Fig 10, 1. no 4), som cooking-pot rims (Fig 10, 1, no 5), and a large flattened vessel (Fig 10, 1, no 9). The fabric is commonly oxidized a light red (2.5 YR 6/6). but reduced black fabrics ar sometimes found g It is a fine sandy fabric with lon inclusions of shell ranging from less than 1.0 mm t about 5 mm. The close proximity analysis has suggeste that this ware did not occur in 'Hamwih until the later 8th or early 9th centuries

Shell-tempered wares were also an important pottin tradition during the early medieval period along th Flemish coastline. Indeed, similar oxidized vessels hav been found in recent excavations at Lampernisse (by F Verhaeghe) and Ghent (see Hodges 1976, chapter 7, 7) There are also shell-tempered wares from Middle Saxo contexts at Gosport (Lewis & Martin 1973, 48-51) and at Sandton, Kent. which suggests that it was a techniqu adopted by coastal settlers utilizing readily availabl temper.

Decorated sherds

It is not necessary to consider the decorated local ware from 'Hamwih' as imitations of imported wares as. for example, Addyman and Hill (1969, 84) and Cunliff (1974, 133) have done. Stamped and incised decoration were a significant element in Pagan Saxon potting. A least 16 decorative styles have been found in Southampton excavations to date. While classes 2, 3 and 4 were sometimes decorated, classes 1 and 5 wer not. Two antlers stamps have been found. The first wa from HAM site 23 (Addyman & Hill 1969, 72). Th second came from SARC IV. F111 (Fig 10, 2. no 1) an was used to make the circles for decoration number 9.

It is north drawing attention to sherds with a simpl clover-leaf stamp from 'Hamwih' (number 2) which hav also been found at Portchester (Cunliffe 1974, fig 2, n 8), and in 9th century contexts in the Cathedral Gree excavations at Winchester The fabric in each case i identical, and is the clearest indication available of th trading of pots in southern Hampshire (see Hodges 1976, chapter 6, section 3).

Note The decoration numbers used here are those i the catalogue of decorated sherds in the author's thesi (Hodges 1976).

Wheel-thrown wares

A primary aim of this research was a preliminar definition of many of the regional sources, at least, an localized sources, at best. of the imported wares found in 'Hamwih'. Despite an extensive museum survey, man small classes remain undefined because they ar unparalleled and have no distinctive inclusions, whil most of the larger classes have only been inferentiall provenanced. In many instances. a primary criterion for distinguishing the regional source is the typology of th bases, because the Middle Rhineland production centre adopted the sagging base during the 8th century. I Belgium, France, and the Upper Rhineland this trans formation did not occur until the 10th to 12th centurie (Chapelot 1970, 70). Since flat bases were also bein made in the Middle Rhineland in the 8th and 9t centuries, this framework has to be used judiciously.

There is considerably less wheel-thrown pottery tha hand-made wares from the Melbourne Street excava tions. as elsewhere within 'Hamwih'. Unfortunately, it is difficult actually to compare the two types statistically since the hand-made wares are heavier and break int larger pieces than the wheel-thrown vessels. It is possible to calculate the number of wheel-thrown vessels because there is a large variety of fabrics each with comparatively few sherds, sometimes only with single sherds (Tabl 10, 1). Orton has written that there is little to recommend

TABLE 10, 1

Site		IV		VI	XX	Total	%
Pitcher cook cooking-pots bowls	19	36	24	15	16	110	87
Jars/storage vessels	-	1	3	3	5	12	< 9
Mortars	1	-	2	-	-	3	< 2
Lids	-	1	-	-	-	1	<
Lamps	-	1	-	-	-	1	<

the estimation of minimum numbers of pots (Orto 1975, 31). yet here it may well be argued that this method is less open to challenge These vessel counts ar tabulated after the classification, as are estimations o the number of vessel forms. This is more difficult t estimate since bodysherds of many storage jars resemble bodysherds of cooking-pots or pitchers. An alternativ and more accurate comparison might be an assessment of the rims, handles, spouts, and bases, but this woul exclude from the analysis many minor wares occurrin only. as sherds The final estimation. therefore wa based on a critical knowledge of the typology of thes classes, with the incidence of jar rims and bases on a site acting as parameters. If the absolute accuracy is i doubt, the general result should not be.

Class 6: Tating ware

There are five sherds of Tating ware from SARC V, four from F16 (Fig 10, 3, no 1). one sherd unstratified. These are part of a fine carinated pitcher. The elaborat decoration involved making vertical incisions, black ening the body and finally applying tin foil. As i survives, the tin foil consists of a Maltese Cross on th body below the carination a horizontal band, and row of diamonds; the upper half of the body is lost Vertical strips of tin foil overlapping into the mout decorate the rim. The core of the pot is red (IOR 4/8). The fabric is very hard and smooth. In thin-section th fabric has a red, optically isotropic clay matrix wit inclusions of sub-angular quartz-sand ranging from 0.03 to 0.4 mm felspar, which includes sanidine, brow hornblende, rounded mudstone, bits of siltstone or fin sandstone, and fragments of black iron or lava ar present.

The inclusions suggest that this vessel belongs to th petrological group 1 Tating ware, defined by the author in his thesis (1976). and believed to derive from the Eifel mountains The incised decoration on this vessel i extremely uncommon and has one parallel at Doresta (Professor van yEs, pers comm), and another at Hedeb (unpublished)

It has to be borne in mind that undecorated sherds o Tating ware may not have been identified as such but, instead, may have been included as particularly fine class 14 wares.

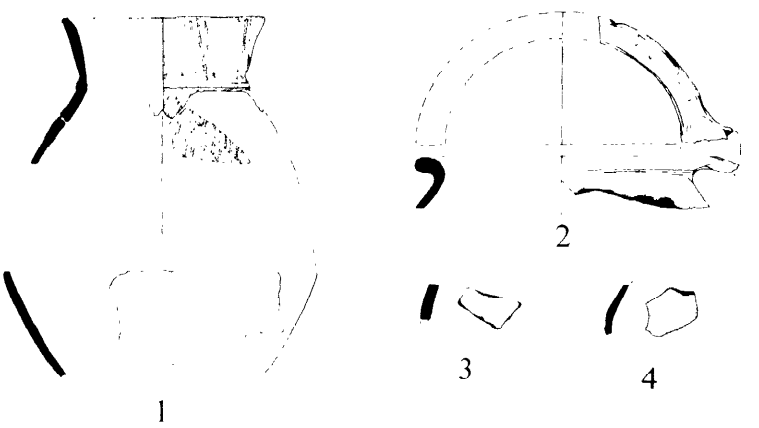


Fig 10, 3 Imported wares I: Tating ware and red painted sherds. 1: V, F16 (Tating ware, reconstructed); 2:1, F30 (Beauvaisis ware); 3: V, F8, P453 (class 12); 4:1, F4, P405 (Beauvaisis ware). Scale 1:4

Class 7: Badorf ware

Very few sherds of Badorf ware have been found in any of the 'Hamwih' excavations, and none of the classic roller - stamped type has been recognized.

Class 8: Relief - band amphora

This class is absent from the Melbourne Street excavations, and only two vessels have recognized from all the 'Hamwih' excavations.

Class 9: Beauvaisis ware

Two sherds of red-painted Beauvaisis ware were found in SARC I from F4 (Fig 10, 3, no 4) arid F30 (Fig 10, 3, no 2); and undecorated sherds, probably of this ware. have been found in SARC IV and SARC XX. The fabric of these sherds is a very pale brown (10YR 8/3), very hard and smooth, with no prominent inclusions. The small sherd from SARC 1, F4, is decorated with a dusky red (2.5YR 3/2) painted ladder pattern. The flattened rim from SARC I, F30, has the springing for a handle. It is decorated with red (2.5YR 5/8) brush strokes inside the rim, and diagonal strokes below the rim. In thin-section Beauvaisis ware has a clean optically anisotropic brown clay matrix with a scatter of rounded quartz-sand c 0.2 - c 0.6 mm across; in the clay are a few grains of iron ore, c 0.01 mm across. The rounded quartz-sand makes this type particularly distinctive, but it was a large industry practised in several villages of the Beauvaisis and there are, therefore, likely to he variants.

There now' seems a good basis for suggesting that the production of painted pottery had begun in the Beauvaisis by the early 9th century since one sherd (HAM 69, 563 (84)) was found associated with a coin of King Ceonwulf in 'Hamwih' (Addyman & Hill 1969. 92). Moreover. a red-painted pitcher of this ware with a characteristic arc and ladder pattern was recently found associated with Ipswich ware at Wicken Bonhunt, Essex (Hodges forthcoming b).

Class 10: Mayen ware

The tiny fragment of Maven ware found in SARC XX, F123, P212, represents the second vessel of this class from 'Hamwih'. The surfaces are dark reddish grey (10R 4/1) and the core is a weak red (10R 4/3). It is characteristically very hard. This fragment is too small to be subjected to thin-section analysis. However, the other Mayen sherd from 'Hamwih' was analyzed and found to have the range of volcanic minerals consistent with the Mayen source in the Eifel mountains (cf Hodges 1976; also Frechen 1948, 297).

Class 11

This is an important 'Hamwih' class, and has been found on most excavations within the settlement. It is usually used for cooking-pots, the two exceptions being the pierced lid from SARC IV, F3522, P93 (Fig 10,4, no 9) and an upright bowl from SARC VII, F55, P82. The wire cutting of the flat bases is always very prominent. The rim profile varies from a simple flattened rim to an elaborately squared rim (eg Fig 10.4, no 11). The colour of the surfaces varies from a pure white (5Y 8/1) to grey (10YR 6/1). Many of the sherds have been burnt black, and some have charred remains inside. Some sherds have rounded quartz-sand inclusions 1 - 3 mm across, but most have no prominent inclusions. Thin-section analysis reveals a light olive brown optically anisotropic clay matrix with prolific inclusions of sub-angular quartz-sand ranging from 0.01 - 0.60 mm, as well as inclusions of quartzite and mica.

The thin-sections provide no indications as to the source of this ware. Macroscopically similar fabrics have been found at Tours (Indre et Loire), Troyes (Aube). and Lorquin (Moselle). However, several Merovingian vessels with macroscopically similar fabrics from cemeteries between the Rivers Evre and Seine have been identified in Evreux, museum (Hodges 1976). A Normandy source has also been suggested for a complete vessel of this

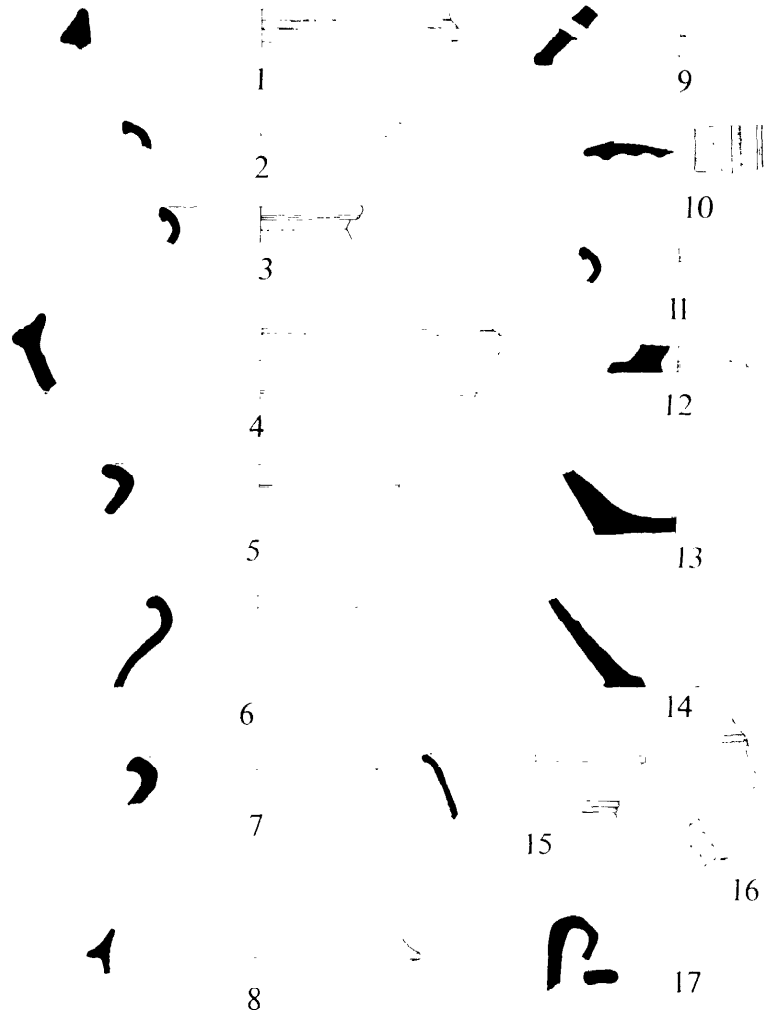


Fig 10, 4 Imported ware 11: Class 11, Class 12, and Class 13 wares. 1: IV F15, P517 (class 12); 2: IV, F16, P529 (class 11): 3: IV, F171, P841 (class 11); 4: V, F16, 745 (class 12); 5: V, F9 547 (class 12); 6: VI, level 2, 135 (class 13); 7:1 GC, 561 (class 13); 8:1, GC 906 (class 13); 9: IV, F3522. 931 (class 11): 10: IV, F2 18. 82 (class 12): 11: IV F171. 841 (class 11): 12: IV. F111, 18 (class 12); 13: IV, F3521. 926 (class 11): 14: V, F16, 534 (class 12); 15: XX, F130, 62 (class 13); 16: V F27 402 (class 12, (class 12, ?mortar); 17:1, GC, 768 (class 13). Scale 1:4

fabric found in Southampton in a 10th century context north of the Bargate (Platt & Coleman-Smith 1975, **2,** fig 175, no 858). A sherd found on this same site was thin-sectioned (T-SP. 185) and was petrologically identical to class 11. Furthermore, sherds of this class from 12th-13th century contexts at Château des Marais, Guernsey, have been found and their similarity to class 11 has been established by thin-section analysis (T - SP. 181). All the evidence suggests that this ware was made from at least the 6th to the 13th century at an unlocated centre in eastern Normandy south of the Seine near Rouen. In fact, it may have been at this same centre that the well-known type of Normandy gritty ware was made from the late 11th to the early 13th centuries (Hodges 1977). The only parallel for class 11 in England outside Southampton is a sherd from the Graveney boat (Evans & Fenwick 1971, fig 3).

One of the exceptions to the consistent form is the pierced lid, Ceramic lids are uncommon in the medieval period. Two 6th/7th century imported Class 'E' ware lids are known from Dalkey Island, Co Dublin, Ireland (Thomas 1959, 98). There are also several pierced lids

from the Carolingian kiln at Meudon (Morbihan) (Hodges 1970) anti several fine rotter-stamped lids from Strasbourg, Hagenau, and Sarrehourg in Atsace (Lobbedey 1968, Tafel 33, 2). It may have been more usual to use cloth, leather, wood, or even a flat stone to cover vessels. One notable exception is an unproven-aneed Merovingian whalebone lid in St Omer Museum (Nord) (Hodges 1975).

Class 12

This is another important ware which is found on every excavation within "Hamwih'. It occurs in a great many forms, and is occasionally red-painted. There arc flanged bowls (Fig 10.4, no 4). flat-rimmed and roll-rimmed cooking-pots (Fig 10,4, no 5). all with flat bases, pitchers sometimes with incised wavy line decoration. a lamp (Fig 10,4, no 12). jars in the so-catted Beerlegem form, and roller-stamped mortars (Fig 10,4, no 16). Besides roller-stamping and incised wavy tine decoration a few sherds have splashed light red (2.5YR 6/8) or black paint, eg SARC V, F10. P556 and SARC' V, F18. P453 (Fig 10.3, no 3). The surfaces vary from white (2.5YN 8/0.) to tight grey (2.5YN 7 0). Many of the sherds have been secondarily burnt black. Some sherds have rounded quartz-sand inclusions up to 1 mm across. The fabric is characteristically micaceous, which distinghishes it from classes 11 and 16. It is hard anti the texture is unusually coatse, although a few\ vessels are burnished and are consequently smooth. Thin-section analysis reveals an olive optically anisotropic clay matrix with abundant inclusions of sub-angular quartz-sand ranging from 0.01-0.00 mm across, as well as mica. quartzite, and in the case of T-SP.92, fine-grained limestone. In most of the thing-sections class 12 appears very similar to class 11, except when considerable quantities of mica, and grains of limestone, are present in class 12. Class 12. however, is very different from class 16 in thin-section.

The thin-section do not provide any precise indication of the source of this ware. and as the timestone grains appear so infrequently. their incidence can hardly be considered firm evidence of a source on sedimentary rocks. However, there is a large. mostly unpublished collection of very similar wares from excavations at St irmin, I rier (Hussong 1936). The wide range of forms in this class is paralleled in the collection at Trier (Hussong & Cuppers 1972, 95-118) and the few red-painted sherds from 'Hamwih' have parallels in this same ware, although only, as yet, from the village site of Oberbillling. Kreis I rier *(Trierer Zeitschrift* (1939)). 14, Abb 54). More work is necessary on this class. especially as its range does not entirely coincide with Hussong's typology. a fact which supports the view that Hussong mistakenly extended the chronology of this forms by two centuries (Hodges 1976).

Class 13

This is a major ware which is found on most sites in 'Hamwih'. Like class 12. the excavations have shown this class to have been produced in a variety of forms. several of which are represented in the Melbourne Street assemblage: a wire-cut flat base bowl which was probably decorated with rouletting: a small handled piteher m a form paralleled at Brebières (Pas de Calais) (Demolon 1972, fig 42, no 54: 245, no 28) (Fig 10,4. no 17); a rolled rim (Fig 10.4, no 7). a strap handled (?)pitcher. and a cooking-pot (Fig 10.4. no 6).

The surfaces of the fabric are usually dark grey (2.5YR N 0) and are often lustrous. The core is red (2.5YR 4/6). Very often there is a sandwich effect presumably caused by firing in two stages: grey surfaces, red inside the surfaces, with a grey core. There is, however, a variant which has (oxidized) burnished red (2.5YR 5/8) surfaces and grey cores. Grains of limestone up to 4 mm across are occasionally prominent in a few sherds of this ware. Thin-section reveals two fabrics. The first has a red optically isotropic clay matrix with a scatter of well sorted sub-angular quartz-sand and occasional inclusions of limestone averaging 0.30 mm across. The second fabric includes a smaller grade of sub-angular quartz-sand in the clay matrix, averaging 0.01-0.05 mm across. In both fabrics there are occasional inclusions of clay pellets. The utilization of slightly different clay sources, may account for this variation. However, it is interesting that examples of this ware from an 11th to 12th century context at Valkenburg Castle in Limburg, in thin-section, are all of the second type with two grades of quartz-sand (Hodges in Jannsen forthcoming).

A Belgian source-seems likely for this type, which has been found at St Peter's Abbey, Ghent, Lampernisse in Flanders (excavations by F Verhaeghe) and Canterbury (excavations by S S Frere; Institute of Archaeology; (Oxford) in 9th century contexts. in Trimpe Burger's excavations at Middleburg in Zeeland (F Verhacghe, pers comm), and in Lime Street, London (Guildhall Muscum. London; identified by thin-section: T-SP.56). It has also been found at Valkenburg, in 11th to 12th century contexts.

Technologically this is an interesting ware. It is characteristically fired very hard and, it seems, in two stages. This probably occurred as a result of letting an extremely hot kiln die down very low until there was a change in atmosphere, at which stage the kiln was stoked up again. It is interesting that several generations of potters must have tired their pots in this way, as at least a century, and possibly two centuries, separate, for example, the 'Hamwih' and Valkenburg assemblages.

Class 13: Black wares (Fig 10.5)

The black wares are one of the commonest wares found in 'Hamwih'. as well as being technically the most finely finished and decorated. with the exception of Tating ware. The principal form is the flat-based pitcher. but there is great variety within this form which presents illustrative problems. Similarly. there is typological variety within the bowl forms, and even with the less common (?) cooking-pots and (?)jars in this class. There is also one storage vessel from SARC VI. F30 (382-5: 170; 401). Indeed, it is an (untested) impression that virtually every vessel is typotogically different. Furthermore, except with group 5. thin-section analysis does not highlight any typological characteristic common only to one petrological group. Consequently. these wares can only be classified by thin-section analysis.

Group 1

Pitchers with it-c-cut bases and flanged bowls usally with black (10YR 2 1) surfaces and light grey (10YR 7 1) cores. There are, however. examples with fine dark grey (2.5YR N4 0) surfaces and light grey cores (eg T-SP-41). and with lustrous dark grey surfaces. Some of the sherds with black exterior surfaces have grey inner surtaccs. With only two exceptions all the sherds beloging to this group have no prominent inclusions, and are very smooth and hard. The exceptions are T-SP.101, 101, a base with large prominent angular quartz-band inclusions up to 2 mm across. and T-SP.100. a sherd which has fine micaceous inclusions.

Thin-section reveals an optically anisotropic tight brown clay matrix packed with unsorted inclusions of sub-angular quartz-sand ranging from 0.01-0.05 mm. as well as a few grains of muscovite.

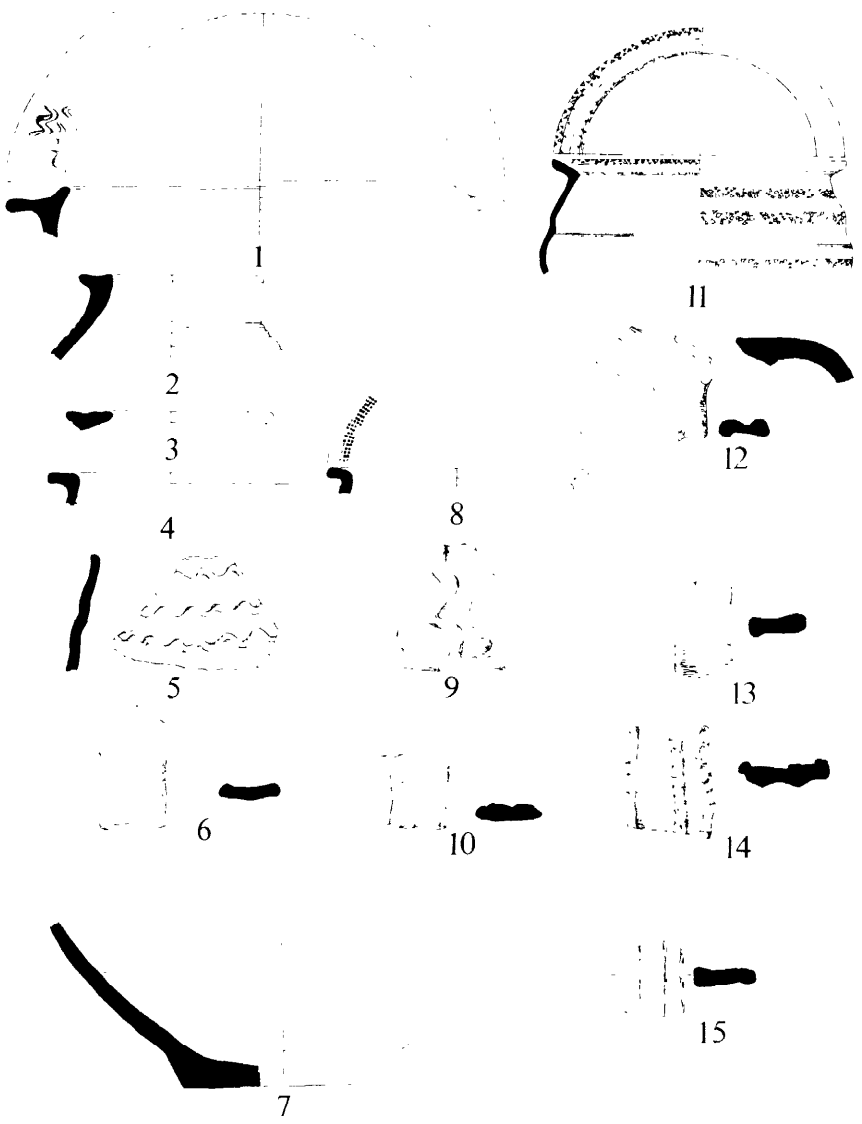


Fig 10, 5 Imported wares III: A range of class 14 black wares .1:I, F14/15, P609; 2:1 F6, P525; 3:1, F35, P798; 4: IV, E3 - 2, 333; 5: VI, F30, 378; 6:V, F16, 669; 7: VI, F30, 400; 8: IV, E3 - 4, 335; 9; V, F22, 943; 10:1, GC ,722; 11: XX, F116, 25; 12: V, F17, 530; 13:1, GC, 720; 14:1, GC, 721; 15: VI, F37, P230. Scale 1:4

Group 2

Impossible to differentiate macroscopically from group 1, it includes a similar range of wares including the type with fine dark grey surfaces and a light grey core T-SP. 98. This group also includes a remarkable upright bucket handle from SARC VII, F53, P146. Thin-section reveals an optically anisotropic clean brown matrix, only occasionally with grains of sub-angular quartz-sand averaging c 0.01-0.03 mm in the matrix.

Group 3

Macroscopically indistinguishable from the above groups. it includes the black surface and the dark grey surface types; pitchers, and a storage jar sherd, SARC I, F35, P785 (T-SP.26). No prominent inclusions, although two sherds in this group, SARCI I, F26, P27 (T-SP. 54), and SARC IV, El-2, P48 (T - SP. 59), have large sand-grains in the surfaces which give them a granular appearance. In thin-section it has an optically

anisotropic, very clean, light brown clay matrix with added sub-angular quartz-sand ranging from 0.3-0.5mm across, as well as a few grains of felspar.

Group 4

Three sherds probably of two vessels. First, SARC V, F16, P763 (T-SP.64), and SARC V, F16, P669 (T-SP. 96). a corrugated sherd and a pitcher handle. These have black surfaces and a grey core; a few inclusions of (?)limestone less than 1 mm across are prominent in T-SP. 96. The fabric is very hard, and has a coarse texture. In thin-section this fabric has a light olive brown optically anisotropic clay matrix with abundant inclusions of sub-angular quartz-sand ranging from 0.03-0.60 mm across, with large grains of micro-crystalline, showing effects of shearing, possibly mylonite, 0.6 to 1.5 mm across, as well as grains of siltstone (cf class 15, group 1 below). Secondly, SARC I, F7, P532 (T-SP. 97). a sherd with black surfaces and a dark grey core quite indistinguishable from groups 1-3. In thin-section it has an optically anisotropic light brown clay matrix with a large number of quartz-mica grains up to about 0.5 mm across indicative of a metamorphic region, as well as some sub-angular quartz.-sand up to 0.3 mm, plagioclase felspar, and a fired clay pellet.

Group 5

A distinctive fabric with black surfaces and a dark red core (2.5YR 3/6): very hard with a smooth texture. A spout exists possibly in this fabric. Thin-section analysis of SARC V, F14, P209 reveals an optically isotropic red clay with a scatter of sub-angular quartz-sand averaging c 0.4 mm. as well as a few grains of muscovite, iron ore, and fired clay pellets, all of which were probably added as temper.

Discussion

The black wares arc a major tradition of potting in the early medieval period (cf Fig 10,5). A number of examples are already known since they were traded to southern and eastern England in the 8th and 9th centuries (Figs 10,6, 8) (Hodges 1976; 1977). Here it is necessary to emphasize that black wares emanating from two entirely different regions have been found in the 'Hamwih' collection, and black wares made of five different clays have been identified. Groups 1 to 3 may emanate from 3 single source, and group 4 from an entirely different one; while group 5, being technically different from groups 1 to 3, was probably made at another centre. The majority of the wares forming groups 1 to 3, and perhaps group 5. are probably derived from one region. either in northern France or perhaps the Meuse valley. Group 4 is petrologically similar to class 15 group 1, whose suggested origin is in a region of metamorphic rock. Several sources have to be considered: western Normandy. the Massif Central, and the northern fringe of the Alps. However, the recent publication of some 11th century grey wares from St Just (Rhônes-Alps), near Lyon (Reynaud *et al* 1975) suggests that one likely source for the class 15 group 1 may be in this region. It has yet to be shown that there are black wares in this area, although it remains distinctly possible that class 14 group 4 may derive from a centre in the environs of Lyon. Black wares are not known from western Normandy or Alsace or the region adjacent across the Rhine. Similarly. little is known of the early medieval pottery of the Massif Central.

Class 15: Grey wares

The grey wares are the commonest wares in 'Hamwih' (Fig 10,7, nos 1, 2, 3, 9). Their primary characteristic is

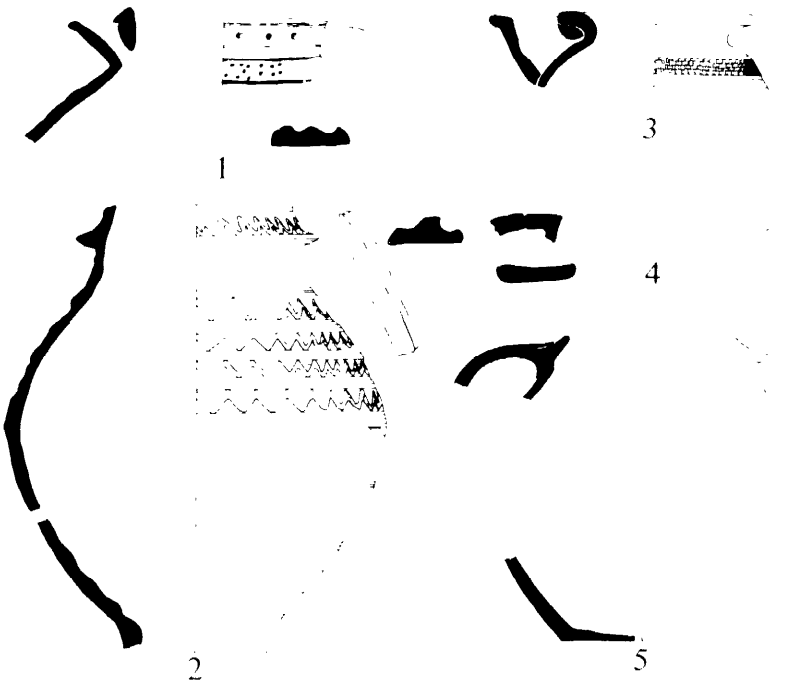


Fig 10, 6 Class 14 imported vessels from other Middle Saxon. sites I: Caistor-on-Sea; 2; Ipswich (5502 0617); 3: Sandton; 4: Chichester, Chapel St, 1971; 5 Breedon-on-the-Hill. Scale 1:4

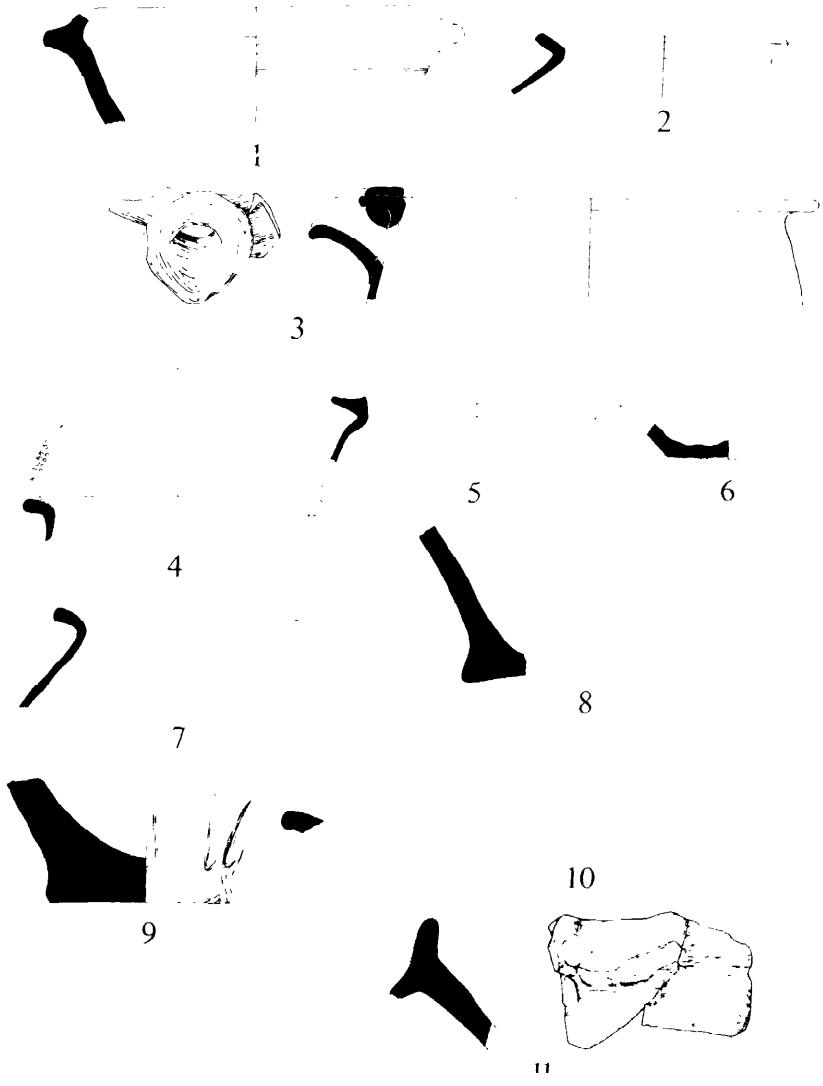


Fig 10, 7 Imported wares IV: Class 15, Class 16, Class 17, Class 19, Class 20, Class 25, and class 29 wares. 1: IV, F51, P676 (class 15); 2: V, F11, P1087 (class 15); 3: V, F16, PI (class 15); 4:1, F10, 589 (class 16); 5: IV, E3 -23,64 (class 16); 6: IV, F3501/54, 852 (class 19); 7:1, F5, 408 (class 20); 8: V, F34, 510 (class 29); 9: V, F27, 209 (class 15, mortar); 10: V, F16, 1095 (class 25); 11:1, F28, 761 (class 17, mortar). Scale 1:4

that they are uniformly reduced grey (2.5YR N6/0) as distinct from the dark grey surfaces of some of the class 14 wares which have light grey cores. A further, though largely subjective, distinction is that the class 14 sherds with dark grey surfaces, unlike the grey wares, have a fine slurry finish. This class comprises mostly beak spouted, flat-based pitchers, some storage vessels, cooking-pots. and some pottery mortars, besides some unusual forms. Like the black wares, they are typol - ogically very varied, and there are also the same macro- scopic difficulties in grouping them, with the exceptions of groups 2c and 3. Therefore, as with class 14 wares, this class can only be defined by thin-section. and the illustrated vessels, many of which have not been thin- sectioned, serve to demonstrate the wide range of this very important class.

Group I

This group includes a beaked vessel (Fig 10,7, no 3) (T-SP.1). One sherd, SARC V. F14. P545 (T-SP. 51) has a lustrous external surface; others have prominent mica inclusions, while some have organic inclusions prominent in the broken edges of the sherd. Thin-section reveals an optically anisotropic grey to light brown clay matrix with

large grains of micro-crystalline showing the effects of shearing, possibly mylonite, up to 1.5 mm across; there is also quartz-sand ranging from 0.03 to 0.5 mm across, quartzite, and several fine to medium-grained sandstone inclusions.

The shearing effect prominent in the micro-crystalline inclusions is indicative of rocks which have undergone strain, usually associated with the faulting in the metamorphic areas on the periphery of granitic regions such as, in this case, western Normandy, the fringe of the Alps, or the Massif Central.

Group 2

This is a provisional group of several fabrics which have petrological similarities. It comprises three sub-groups.

(a) The first sub-group includes a mortar base (Fig 10, 7, no 9) (T-SP. 145), a cooking-pot. SARC IV, F2351, P848 (T-SP. 108), and a large flanged rim, SARC IV, F51. P676 (T-SP. 106). In thin-section it has an optically anisotropic grey matrix with prolific, unsorted sub-angular quartz grains ranging from 0.03 to 1.00 mm across, as well as some quartzite.

(b) A flanged rim, SARC V, F21, P854 (T-SP.6), which is similar in thin-section to sub-group (a), but also includes a number of plagioclase felspar grains averaging 0.4 mm across.

(c) A group distinctive because it has prominent inclusions of quartz, c 1.00 mm across. in the fabric. It includes a storage vessel (T-SP. 173), and a very hard fired flanged rim from earlier excavations. In thin-section, it differs from the other two sub-groups above by having a large amount of quartzite inclusions.

Group 3

This is a distinctive fabric because it has prominent inclusions of limestone, c 1 - 2 mm across. Only one cooking-pot rim has so far been identified: SARC V, F11, P87 (T-SP. 107). Thin-section reveals prolific sub-angular inclusions ranging from 0.03-1.0 mm across, as well as a few very fine-grained limestone inclusions, grains of churt or flint, and sandstone varying from 0.80 - 2.00 mm across.

A highly fired sherd from SARC I, F33, P213, perhaps a badly fired pot (of which there are several Rhenish example from Dorestad). probably belongs to this **group.**

Group 4

Only one very hard fired sherd, SARC VI. F39. P419 (I-SP. 103). with granular surfaces. has been found. In thin-section it has a distinctive optically anisotropic clean brown clay matrix with some added sub-rounded quartz-sand averaging 0.03 mm in size.

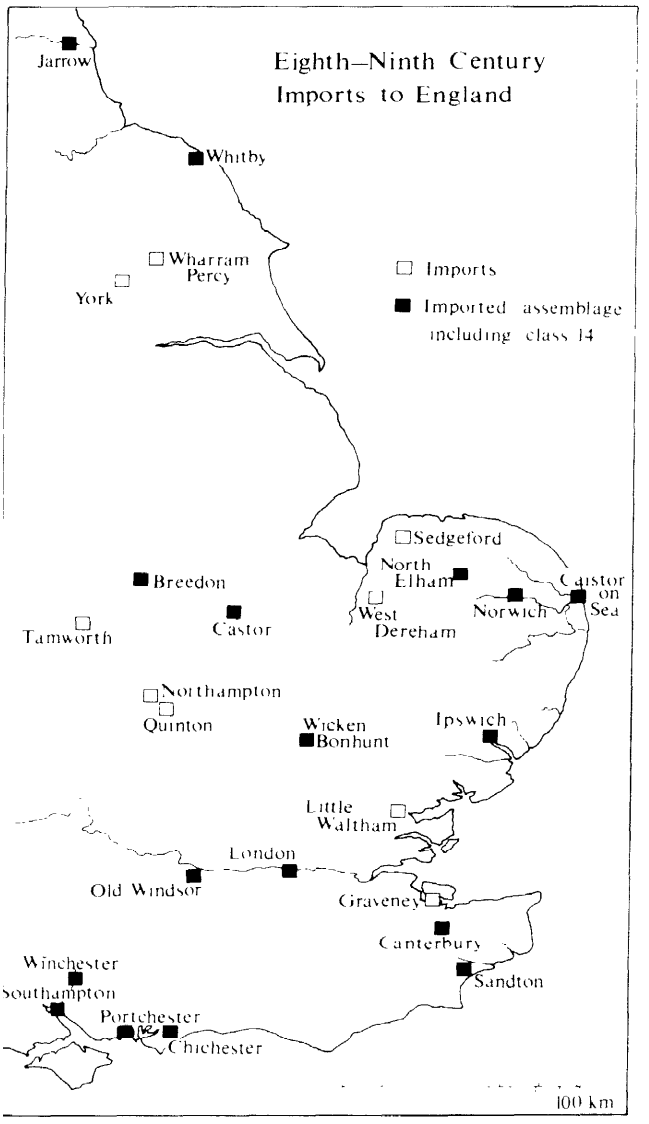


Fig 10. 8 A distribution map of imported vessels in Middle Saxon contests

Discussion

Like the class 14 black wares, the class 15 wares are discussed in detail elsewhere since they are an important class of Carolingian pottery. However, some remarks are apposite here. First. group 1 originates from a zone of metamorphic rocks or outcrops. As with class 14, group 4, there are several possible sources, although typologically two regions. the Upper Rhine and Western Normandy, seem improbable. The recent publication of 11th century grey wares from St Just (Rhônes-Alps). near Lyon (Reynaud *et al* 1975) Suggests that there was a tradition of grey ware production on the metamorphic regions to the north-west of the Alps from which these 8th to 9th century vessels may originate. A likely source for the other petrologically indistinctive groups 2a, 2b, and 4 may be in the environs of Quentovic in the Pas de Calais. where there was a tradition of reduced grey wares from the Roman period until the late Middle Ages. However, sub-group 2c may be a Normandy ware, for the 9th century sherd from Ile Agois, Jersey (Dunning 1959, fig 26, 8) is petrologically similar (T-SP. 47). and so are some 12th to 13th century sherds from recent excavations at Chateau des Marais, Guernsey (T-SP. 196). Finally, group 3 obviously emanates from a limestone region, probably in the hinterland of Quentovic. although petrologically it is very different from class 29, another limestone-tempered ware.

Mortars

One interesting group of grey wares is the mortars, some of which have ribbing (Fig 10,7, no 9). Only one was thin-sectioned, and was found to be in group 2a.

Although occasional stone mortars are known from the early medieval period (eg Jarrow: unpublished recent excavations: van Es 1969, fig 15). the range of pottery mortars in the class 12, 15, and 17 fabrics from 'Hamwih' suggests that the stone varieties were rare until the Purbeck and Caen mortar production started in the 12th century (Dunning 1965-66).

Class 16: Fine white wares

There are only two examples of this class from Melbourne Street: SARC IV. E grid, P64 and SARC V. F14, 15. P531. The first is a pure white flattened rim with a small fragment of roller-stamp decoration remaining on the body (Fig 10.7. no 5). The fabric has no prominent inclusions, has flaked probably because it was fired to a high temperature. and has a sandy texture. The second, P531, is a flat base of either a cooking-pot or pitcher which in thin-section. (T-SP. 132) has an optically anisotropic brown matrix with prolific inclusions of sub-angular quartz-sand *c* 0.01 - 0.05 mm across, a few large grains of quartzite up to 1.5 mm across, and a little muscovite.

There arc a few examples of the use of iron-free estuarine clays during the Carolingian period. There is a roller-stamped pitcher from Corbeilles (Loiret) (Hodges 1976), a small collection of 10th century white wares from M Henri Galinie's excavations at Tours (Indre et Loire), and a burnished white ware beak spout found in excavations at Orléans (Loiret). This slight evidence suggests a source for this class in the Loire Valley.

Class 17: Quartz-tempered white wares

This class is characteristically a white ware with prominent rounded quartz- sand inclusions 1 - 2 mm across, but no mica. The fabric is uniformly white (10YR 8/1) to very pale brown (10YR 8/3); it is very hard and smooth to the touch.

Pitchers with beak spouts, flanged bowls, and mortars have been found in this fabric in the 'Hamwih' excavations (Fig 10,7, no 11). These were almost certainly part of a roller-stamped mortar. Another mortar with applied, undecorated, ribbing was found in SARC VI, F7. P528. Dr Dunning has drawn my attention to a roller-stamped mortar, probably of this class, which was found in Rue de la Vicomté. Rouen (illustrated. Hodges 1976). This is the only parallel for this class and in view of the technical resemblance between this fabric and the later 1lth to early 13th century Normandy gritty ware. a Normandy origin seems likely. However, a Loire origin similar to the preceding class must not be ruled out.

Class 18: Miscellaneous oxidized wares

This is a provisional classification of those oxidized wares which cannot be included in other classes. Oxidized vessels are rare in 8th and 9th century contexts. There are only two large bodies of oxidized vessels from the Altbachal kiln at Trier (Hussong 1936) and of the Bouxwiller/Hamwih class 23 type from Alsace. In Professor Jannsen's excavations at Brühl-Eckdorf there was one micaceous, oxidized bowl amongst an enormous collection of more typical Middle Rhenish wares. It is likely, therefore, that some of the oxidized wares will be integrated into the other classes once a larger sample or more parallels are available. For the moment only those sherds of particular interest are noted, since otherwise this class would comprise a series of single sherds and their corresponding sub-groups.

Groups 1 and 2

Not present in Melbourne Street.

Group 3

SARC VI, F30. P121 and DMW.834. KLC, F8 layer 8: a bowl and cooking-pot respectively, uniformly light red (10R/6) in colour, prominent large sand grains in the surfaces as well as a few large quartz grains up to 1.0 mm across; micaceous. The fabric is hard and smooth. In thin-section, the former sherd (T-SP. 160) has an optically isotropic red clay matrix with a range of angular quartz-sand *c* 0.01-c 0.60 mm in size, as well as muscovite.

This fabric is similar to one of the fabrics found in the Altbachal kiln at Trier, though different to the class 12 type. Comparative samples are needed to test this.

Class 19

This is an uncommon class in the Hamwih assemblage: a few cooking-pot rims, a small incised pot and a relief-banded vessel from Waterman's and Maitland Muller's excavations. as well as a wire-cut base from SARC IV, F3501 (P852) have been found (Fig 10.7. no 6). The fabric is greyish brown (10YR 5/2) and often has a slurry finish that conceals any prominent inclusions. Quartz-sand up to 1.0 mm across is visible, however, in the surfaces of the base from SARC IV. which has no slurry finish. It is a comparatively soft ware for wheel-thrown pottery of this period, and usually has a soapy texture. Thin-section (T-SP. 146, 203) reveals a brown. optically anisotropic clay matrix with sub-angular to angular quartz-sand ranging from 0.1 to about 1.0 mm across; there are also a large number of grains of quartzite ranging from 0.3 to 1.0 mm across. In T-SP.203 a few grains of iron ore and fired clay pellets are also present.

The thin-sections suggest that this class might derive from a source in a metamorphic rock region, probably in France; Britanny, the Alps, or the Massif Central are all, of course, possibilities.

Class 20

This is a rare class which comprises a large cooking-pot rim SARC I, F5, P408 and some body sherds from SARC IV (Fig 10.7. no 7). There are two variants: the first is oxidized light red (2.5YR 6/8) but with brown, often blackened outer surfaces; the second has an oxidized light red core, and light brownish grey (10YR 6/2) to grey (2.5YR N5) surface. Occasional grains of quartz-sand up to 2 mm across, iron ore, and chalk or limestone are visible in the surfaces. There are also a few grains of mica. The surfaces are sandy to the touch, and the fabric is hard-fired and tends to flake. Thin-section (T-SP.86. 109) reveals an optically anisotropic brown clay matrix with prolific inclusions of sub-angular quartz-sand ranging from about 0.01 to (0.5 mm across, a few grains of quartzite, chalk or fine-grained limestone, and in T-SP. 109 a fired clay pellet about 1.0 mm across.

It seems likely that this is a French ware, and the fabric and form are reminiscent of Saran products. However, M Chapelot did not consider it to be a Saran ware, so an alternative source, perhaps elsewhere in the Loire valley or in the Paris basin, located near a chalk or limestone band must be considered.

Class 21: Red burnished wares

Red burnished wares are rare. It seems that it was a tradition that lasted throughout the Merovingian and Carolingian periods, but then, like the black wares, disappeared by the 10th century. The technique may

have been continued from the pre-Roman period in France, or, it has been suggested, it may have been the individual post-Roman potter's attempt at imitating Terra Sigillata (Hodges 1976). Almost as many vessels of this class are known from 'Hamwih', six to date, as from Merovingian and Carolingian contexts in France and Belgium. One spouted pitcher, for example, from the later 8th to early 9th century kilns at Saran (Loiret) emphasizes that it was a specialist type made with the normal wares.

The sherds from Melbourne Street are: SARC VI, F30, P254 and F33, P234, SARC XX, F130, P59. They have red burnished outer surfaces (2.5YR 5/8) with light red (2.5YR 6/6) inner surfaces. They are very hard, fine and smooth to the touch.

Class 22
This is a storage vessel ware absent from the Melbourne Street assemblage. and uncommon in 'Hamwih' generally.

Class 23
This is a rare class in the 'Hamwih' assemblage and absent in Melbourne Street. It is believed that it is a Strasbourg type probably derived from the Bouxwiller kiln (Rexer 1963, 3 nos 1, 2, 3, 5, and 6) and perhaps from elsewhere in Alsace.

Class 24
The fabric is very dark grey (10YR 3/1) to dark brown (7.5YR 4/2). Sometimes the exterior surface is burnished. It is characterized by the large sand-grain inclusions which make it appear granular and very coarse to the touch. There are also a few iron inclusions up to 1.00 mm across. It is very hard. In thin-section it has a black to red optically anisotropic clay matrix with only a few well sorted inclusions of sub-angular quartz-sand of two grades, iron ore. flint, and clay pellets.

This class usually occurs in cooking-pot forms although only one wire-cut base has been found: SARC I, F33, P216. There are. however, other forms: a large storage vessel CL 'B' P.70, 775. a pitcher handle from SARC XV. F75. P2666, and a flanged bowl from SM 69.10.354 (183). A curious sherd with a barbotine-like surface has also been found in this class from HAM E. 158, layer 9. 72 (T-SP.216). The inner surface shows signs of the finger-nail impressions which create the unusual decoration. A flanged bowl in a similar fabric was found at Wicken Bonhunt. Essex (Hodges forthcoming b), and a bodysherd of a vessel, probably of this ware, was found at North Elmham Park (Hodges forthcoming a, no 601b). The only other parallel is a jug of 7th century date from the cemetery at Aylesford Preston Hall, Kent, in Maidstone museum (AS193). The evidence suggests that this class was either made in northern France or Belgium. In thin-section the fabric is similar to Beauvaisis ware; it could be a variant produced at that centre. Alternatively, the coarse texture of the fabric is similar to the 9th century wares found at Ukkle, near Brussels, earlier this century (Borremans 1958). but the forms are rather different.

Class 25
This is a very distinctive fabric which ranges only slightly in colour from pink (5YR 7/4) to reddish yellow (5YR 7/6). There is also one example of a reduced black vessel from SARC IV, F3, P419. There are two types: the first and more common has prolific inclusions of quartz-sand up to 1.00 mm across; the second has finer though prolific and prominent quartz-sand inclusions. Both types have iron inclusions; both are hard fired, but the surfaces of the first type sometimes flake. Both have coarse pimply textures.

Thin-section of the first type reveals a light brown anisotropic clay matrix with well sorted rounded inclusions of quartz-sand of two grades, some iron ore, and muscovite (T-SP. 157, T-SP. 186). The clay matrix of the second type in thin-section is cleaner with fewer inclusions of the smaller grade of quartz-sand, 0.01-0.03 mm across, than was apparent in the first type (T-SP. 154).

Several forms of the first type have been found: a large bowl rim from SARC V, F16 (Fig 10,7, no l0), a wire-cut base from SARC V, F24, P996, as well as a red-painted bowl rim from SM 69.10.51 (129) which was associated in a pit on site 24 with a coin of King Offa (cf Addyman & Hill 1969, 92). In the finer second fabric only a flanged bowl has been identified from SARC XI, F15, P935.

Vessels of this fabric are common in Merovingian cemeteries of the Upper Seine and some years ago Professor B Wailes seems to have mistaken some of these vessels for 'E' wares (Wailes 1963), suggesting as a result that this sub-Roman ware partly originated in this region. There are, however, some 8th to 9th century vessels of this kind from Paris. A group of pitcher spouts and flanged bowls was found during 19th century excavations near St Germain des Prés. and more recently a complete red-painted pitcher in this fabric with a dark green surface sheen was found in excavations in front of Notre Dame. De Bouard and Guibert (in Hurst 1969. 113) have referred to this enigmatic vessel, and clearly the 'Hamwih' finds elucidate a little about it, although its curious surface colouring remains a mystery.

Class 26
SARC IV, F2351, P846. A very tiny sherd with a corrugated surface, very pale brown exterior (10YR 7/4), and yellow (10YR 7/6) interior. Inclusions of (?)chalk up to 1 mm across. Very hard with a smooth surface.

This sherd has no parallel in the 'Hamwih' collection or elsewhere. As it is so small it is impossible to suggest the original form.

Class 27
This class has been found on two sites in Melbourne Street. An abraded flat base was found unstratified from SARC I, P767, and several rilled sherds were found from SARC V. F32. This fabric varies in colour from light red (2.5YR 6/8) to grey (7.5YR N6/0). The fabric has abundant inclusions of iron up to 1 mm across, and is hard with a smooth texture.

In thin-section (T-SP.131) this fabric has an anisotropic light brown clay matrix with unsorted angular quartz-sand *c* 0.01 *c* 0.10 mm across, a few grains of quartzite and muscovite, as well as a large number of iron ore grains.

Class 28
This is rare in SARC excavations; it includes the base of a pottery mortar from earlier excavations, HAM 69/366, 210 (T-SP.176). and a flat base sherd from SARC IV. Fl11, P787 (T-SP.184). The surfaces are reddish-yellow (5YR 6/6) to pale brown (10YR 6/3), and it has a light grey core (10YR 6/1). This class has no prominent inclusions, and is hard and sandy to the touch. The base sherd has abraded surfaces. Thin-section reveals an optically anisotropic clay matrix with prolific sub-angular quartz-sand 0.01 to 0.03 mm across, as well as a

scatter of sub-angular quartz-sand about 0.1 to 0.4 mm across, and fine- and medium-grained sandstone.

This is only a distinctive fabric in thin-section. It seems likely that it originated from a centre located near or on a sandstone band probably in France.

Class 29

Three thick jar bases have been found in this fabric: SARC V. F34, P510 (Fig 10,7. no 8); SARC XV, F28, P841; and HAM 69/277 P242. The fabric is reddish yellow (5YR 7/6) to pinkish white (5YR 8/2). It has prolific inclusions of quartz-sand, iron, and flint up to 1 mm across. In the SARC V vessel there is a large angular inclusion of flint *c* 5.0 mm across. It is hard and has a very coarse texture largely because it seems to flake very readily.

Thin-section (T-SP.149) reveals a clean anisotropic dark brown clay matrix packed with angular quartz-sand ranging from *c* 0.30 mm -*c* 0.80 mm in size, felspars and rounded fine-grain limestone *c* 0.30 mm across, as well as a few grains of quartzite and muscovite.

This fabric is at present unique in the 'Hamwih' assemblage. The flat base suggests that the source of this ware lies in France, possibly on one of the ridges of the Paris basin, or Belgium. although exactly where remains uncertain. It may be noted. however, that the finer of the two wares found at the 11th century site of Dieue-sur-Meuse near Verdun in the Argonne has similar quantities of fine-gained limestone in thin-section (T-SP.179).

Class 30: (?)Souterrain ware

Only one example is known. from excavations in 1969.

Class 31

A bowl from SARC IX, as yet unparalleled.

Class 32

A quartz-tempered storage jar from SARC XI. as yet unparalleled.

Class 33

Only two sherds of this class have been recognized from recent SARC excavations: IV, F50, P644 (T-SP.215) and VI, Fl, P15 (T-SP. 126). Both are featureless sherds. (There is, however. an unusual early example of a collared rim from GS.C. F28 and a thick bodysherd with an applied strip from HAM 69/301 (1), 228.) With the exception of VI, Fl, P15 which has fine pink (7.5YR 7/4) to pinkish white (7.5YR 8/2) surfaces, these sherds are reddish brown (5YR 5/4) to grey (5YR 5/1) and are characterized by prominent iron ore grains on the surfaces often up to 2 mm across, and by their hardness. They are very smooth. In thin-section T-SP.215 has a dark brown optically anisotropic clay matrix with quartz-sand ranging from 0.08 to 0.1 mm across; sanidine felspar, potash felspar, silts tone, mudstone, coarse-grained sandstone. brown hornblende, and mica, besides a scatter of black iron or lava, are present. It is an assemblage characteristic of the Mayen region in the Rhineland. T-SP. 126 has no grains of sanidine felspar or brown hornblende.

It seems likely that this is a variant of Mayen ware, although macroscopically it is different. Thin-section suggests that there was also a sub-group. as Frechen (1948, 297) has pointed out, which does not include some of the minerals typical of a volcanic assemblage. The collar rim from GS.C, F28 is the only one of its kind from 'Hamwih', and it may be wondered whet her this important 10th to 15th century feature on French vessels also originated. like the sagging base and globular form, in the Rhineland.

Class 34

Initially these vessels were thought to be class 11 sherds, but closer examination including thin-section analysis shows them to be a distinct class. Only three sherds have been identified including one from SARC V. Fl4. P252. This has a dark grey outer surface (10YR 4/1) and white inner surfaces. It 'has large sand-grains prominent in both the inner and outer surfaces, but no) other inclusions. They are all very hard. harder than class 11 sherds, and have a smooth texture. In thin-section (T-SP. 158) it has an optically anisotropic light brown clay matrix with two grades of sub-angular quartz-sand: the *c* 0.01 mm grade was probably present in the clay, while the *c* 0.4 - *c* 0.9 mm grade as well as a few fired clay pellets were probably added.

A likely parallel for this class is the vessel from Teeshon Crannog. Co An trim (Hodges 1976) which has a purplish inner surface. If this identification is correct. the limited distribution of this ware as well as its form suggests that it was made either in Normandy or western France.

Class 35

A red-painted beaker rim already discussed by Addyman and Hill (1969, 92), now believed to originate from Alsace. There are parallels at Strasbourg, and in the Bouxwiller kiln (Rexer 1963), as well as a single vessel from recent excavations at Dorestad (unpublished).

Unclassified

Very few sherds have been left unclassified. These include several Roman sherds. and a small urn recently found on SARC XX which is probably of Iron Age date. Those bodysherds from Carolingian vessels which do not fit into the classification are no more than listed here. Their descriptions might only cause confusion with some of the classes.

1 SARC V, K2-20. P62
2 SARC V, F16, P751

Discussion

Hand made slow wheel-made wares

The forms of these wares developed out of the un-decorated Early Saxon pottery of southern England. There are examples of 6th 7th century (?)cooking-pots from the cemetery at Bowcombe Down on the Isle of Wight, and from Iford Bridge, near Christchurch (illustrated. Hodges 1976). An Early Saxon prototype for the 'Hamwih' jar was found in the cemetery at Horndean, Hampshire, (Knocker 1957, 146. fig 17). These forms developed slowly. the rim becoming gradually larger and more everted by the 10th and 11th centuries, until the adoption of the fast-wheel (cf Platt & Coleman-Smith 1975, 2, figs 135-137), Very few vessels indeed can be shown to be imitations of continental wheel-throw wares.

The varying quantities of the five local classes within selected pit groups have been used as the basis of a seriation (Hodges 1976). This suggests that class 1 is an early 8th century class, that production of class 3 was at its peak in the first hall of the 8th century and was

thereafter in decline, while classes 2 and 4, although present in the earlier pit groups, become the predominant classes in the later 8th and early 9th century pits. Class 5 seems to occur solely in the later 8th to early 9th century pits. Class 1 may have been made by individual households in the earliest settlement, thus accounting for its typological variability. It seems to have been an important 7th century potting tradition in south Hampshire that disappeared during the 8th century, perhaps as a result of the limited trading of pots by part- or full-time craft specialists.

The evidence for the localized trading is admittedly very slight. It is restricted to the incidence of chalk-tempered wares (Class 2) in 'Hamwih', 15 miles from the chalk downs, and also the incidence of one distinctive stamp (decoration number 2: Hodges 1976) at 'Hamwih', Portchester, and Winchester. Yet the uniformity of forms of these classes, particularly classes 2-4, all with flat untrimmed bases, suggests craft specialization. while the very few decorated vessels point to that individualism amongst the small potting communities that Foster (1966. 52) has discussed in the case of contemporary peasant potters. The actual economic and social mechanisms inherent in this relatively primitive pottery industry have been examined elsewhere (Hodges 1976). Clearly. an understanding of these mechanisms should shed some light on the production of Middle Saxon pottery generally, and on the economic structure of Middle Saxon England.

Wheel-thrown wares

The sources of the wheel-thrown wares have always been problematical. Dunning (1959, 50). and then Addyman and Hill (1969, 77) suggested that Northern France. the hinterland of Quentovic and Rouen. was the area from which most of the wheel-thrown wares originated. Unfortunately, there has until recently been little attention given to the Carolingian period pottery in France, and from this area. before our research. only a small collection of Carolingian wares was known.

The museum survey and petrological analyses have suggested specific sources for some classes., and regional origins for others. class 14, 15, and perhaps 29 were probably made in hinterland of Quentovic: the Pas de Calars, the Ardennes, and the Meuse region of northern France, Classes 9, 11, and 25 were probably made in Normandy. Class 9 is a Beauvaisis ware, classes 11 and 25 were probably products of centres in the Seine valley, It is also possible that classes 17 22, and 24 originated from this region. Classes 16 and 27 probably originated from the Middle Loire valley. Class 34 may have come from western France, perhaps the mouth of the Loire. Class 13 was almost certainly made in eastern Belgium and was exported' via Zeeland. in particular, we may imagine. via Domborg. Class 12 is probably a Trier ware and probably came to 'Hamwih' by way of the Moselle and then by either the Roman roads or the navigable rivers that lead tow ards the English Channel (Pirenne 1933, 230). This route is suggested by the absence of this class at Dorestad, and by its occurrence at Metz to the south of trier on the Moselle. Classes 6, 7, 10. and 33 originated from the great Middle Rhineland potting centres, but they reprent very few vessels. while class 23, and class 35, unknown from Melbourne Street, were made in Alsace, perhaps at Bouxwiller north of Strasbourg.

The variety of pottery suggests trade. with several continental ports. Quentovic is like to have been the dominant 'port' for trade with England (Dhondt 1962). Rouen was probably already dealing with some, English trade, although that 'port' was to expand considerably in the 10th century (Pirenne 1933). Leighton (1972, 40) has recently drawn attention to Loire merchants sending goods up the Seine via Paris, so this may account for the Loire classes. The Tating ware jug may have come via Dorestad, although the trading mechanisms inherent in the extensive distribution of this class are controversial so we must not expect it necessarily to have come by this trader's routeway (Hodges 1976; cf Lundstrom 1971).

The absence of most of these classes at Dorestad. located at the mouth of the Rhine. emphasizes the importance of the well-studied middle Rhehish ceramic industry there (van Es 1969). Their wine trade and associated pottery industry were very important to the Rhinelanders (cf Ennen 1953, 89-90). It was the trade in wine, wrote the 9th century poet Ermoldus Nigellus exiled in Strasbourg, that enabled the Khinelanders to purchase Frisian finery, probably woollen garments, in exchange: *Utile consilium Frisonibus atque Marinis, vendere vina fuit et meliora vehi* (Faral 1932, 210-11). We may consider this matter more closely. It is apparent that it is only on sites on a band drawn from the northern borders of Alsace across to Trier, then across Luxembourg and central Belgium into Kent, to London, and East Anglia. that small quantities of French Carolingian and Rhenish Carolingian ceramics are found in association (Fig 10, 9). This band presumably indicates the limits of the two wine industries, the trade of the latter, it may be argued, being in the hands of Frisian entrepreneurs (Jellema 1955, 30). A trade competition of this kind has recently been discussed by Bradley (1970-71), and might have caused the Khenish industry to extend its trading area northwards where it could have a monopoly, rather than share the southern English trade with the French industry. The organization of the respective industries might account for their differences. Clearly, there is a much wider range of pottery from 'Hamwih' than from Dorestad or Haithabu, and this variety suggests that there were many small French Carolingian potteries. whereas the Rhenish wares were mostly produced at two very large centres (Hodges 1976). The many small French Carolingian potteries competing with one another may explain why there is a confined distribution of such wares in contrast to the remarkably wide distribution of the Rhenish wares. A more important factor may well be the different forces which brought about the centralization the Rhenish potteries in the 8th century when previously there had been many small centres. as there continued to be in France (cf Koch 1973). Moreover, this may also be a reflection of the respective wine industries.

The variety of fabrics, and the typological variability within the larger groups of fabrics. suggests that the 'Hamwih' wheel-thrown wares may have been imported primarily for use within the settlement by alien traders. as opposed to being traded accoutrements of the wine-trade. This view is supported to a certain extent by the large number of poorly finished cooking-pots in the assemblage. and by the high percentage of tableware (see Hodges 1976). There were restrictions on alien traders operating in Wessex which are recorded in the Laws of Inc (whitelock 1955, 366, nos 20, 23; 367, no 25). It would have been safer for the merchants to have settled. parhaps seasonally. within 'Hamwih' as they were later to do in modieval Southampton (Platt 1973, 215- 16: 267-8). The large number of Mercian coins from 'Hamwih' perhaps bears witness to traders who travelled from these regions to 'Hamwih' (cf Metcalf 1972). Clearly, if this hypothesis is accepted it raises many questions concerning the *raison d'être* of 'Hamwih' and contemporary settlements of this type (cf Hodges 1976).

KEY

▼ KILNS - Rhenish Tradition

▲ " - Frankish "

● " - Meuse "

▽ SITES with Rhenish Pottery

△ " Frankish "

✡ " Rhenish & Frankish Pottery

Fig 10, 9 A distribution map illustrating the extent of the Frankish and Frisian wares; the principal Frankish and Rhenish kiln sites are also indicated

Acknowledgements

This report forms part of the research undertaken while the author held a research scholarship from SARC between 1973 and 1975, and a DES Major State Scholarship, 1975-6. During that time over a hundred museums were visited in Britain, Eire, France, Belgium, The Netherlands, Western Germany, Switzerland, Spain, and Italy, as well as many excavation depots and private collections. My debt to so many curators and archaeologists has been fully acknowledged in my thesis. Here I should like to express again my particular gratitude to Mr L J Keen and Mr P Holdsworth, successive directors of SARC, and to Mr J G Hurst, Dr Colin Platt, Professor A C Renfrew, and Mr K Wade who have in their individual ways been very encouraging and helpful throughout my research. Most of all I am indebted to Mr David Hinton who has tirelessly read through this and other manuscripts on the 'Hamwih' pottery, and to M Jean Chapelot and Dr David Peacock who have directed me patiently in the fields of French medieval pottery and ceramic petrology, respectively.

TABLE 10.2: Sherd count
SARC I

Feature \ Class	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	X
1											3			2																						
4									1						1		1																			
2															1					1															
6														2																					
7														1																					
9												1	1	5																					
10																	2																	
14															1																			
25												1	1	3																					
26														2																					
27														1																					
28												1		1			4																		
29																			1																
30									1																										
31																	1																		
33															1									1											
35														2																					
36																			1																

SARC IV

Feature \ Class	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	X
2													6	1																						
3													1	2											1											
13											1	1			2																					
15												1		1	1	1									1											
16												1		1																						
17															1		1																			
50								1					1	1	1																				1	
51															1																					
55												1	1																							
59														1																						
111												2		1															1							
150											2																									
171													1																							
2150															1																					
2351																										1										
2377																									1											
3501															1				1																	
3512														2																						
3514															1										1											
3518														1																						
3520														1										1												
3521											2																									
3522											1				1																					
3523														1																						

SARC V

Class

Feature	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	X
9												6		1																						
10												13			2																					
11											1	6	1	6	4			1																		
12												1																								
13												1		2																						
14												1		2	6									2										1		
15																																				
16							3				6	6		11	1										1										1
17											1				2																				
18												1		1	1																				
19												1		1																					
21											4				1																				
22															2																				
24											1	1			3										1										
27											1																								
32											1	1		4	1		2										3								
34												1		1																1					

SARC VI

Class

Feature	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	X
Level 2											1		1		1																					
1											1	1		4	1																			1		
7															1		1																			
8																																				
9											1	1	1																							
30											1	5	3	14	10			1			1														
33												2		6	2						1														
36											2				1																				
37											1			1																					
39												3		1	2																				
49														4																					

SARC XX

Class

Feature	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	X
70											1			3	5		1																		
114																		1																	
116																																				
12.3										1	1			1	6									1											1	
128																	1																			
130												3	5	10							1														
131										6			1	1	4	1																			

11 The glass

by John *Hunter*

Our knowledge of the glass vessels used in the British Isles in the Anglo-Saxon period depends to a large extent on the products of pagan inhumation burials. Alter the conversion to Christianity which effectively removed grave furnishings in England by the beginning of the 8th century the number of objects available to the archaeologist becomes severely depleted. Prior to this time most of the material is represented by complete vessels, the typologies of which are well hnown (Harden 1956). The forms are those which broadly correspond to examples from Scandinavia and the immediate continent. The general similarity of types suggests common sources of origin which according to present evidence lay in the regions of north France and the Rhineland.

After the early 8th century the picture changes. In England and on the Continent grave furnishings are rarer and only in Scandinavia where the impact of Christianity was not felt for a further three hundred years did the practice continue. The rich burials from Uppland and Södermanland in Sweden including the great Viking gravefield at Birka provide the main corpus of vessels known from the 8th to 10th centuries. In comparison the British material is poor, consisting of only a few isolated examples, together with a group of fragments comprising vessel glass, window glass. fragments of mounts, and glass beads, from the Brough of Birsay, Orkney (not yet published). Traditionally one has been obliged to turn to Scandinavia to assess the later course of glass development in Britain, assuming in the process that Britain and Scandinavia imported their wares from the same sources and that the areas of production remained unchanged throughout the millennium.

In the light of more recent work there is evidence to suggest that glass working was becoming more localized. It is conceivable that places such as Faversham (Harden 1956. 147) and Glastonbury (Radford 1961-62, 351) were producing glass in the 7th and 9th/10th centuries respectively, and that the monastic establishments of Wearmouth and Jarrow were manufacturing their own window glass (Cramp 1970). Other centres must also have existed although the nature and scope of any industry remains unresolved. The degree to which glass working may have been undertaken on a commercial rather than a domestic basis and the extent to which local wares might be characteristic are problems which have remained unanswered simply through lack of suitable archaeological material. The 'Hamwih' glass is therefore of especial significance. It represents the only large corpus of glass material known from this later period in the British Isles and is crucial to our understanding of the nature of glass manufacture, trade, and distribution in a period which has hitherto been barren.

The glass discussed in this report was discovered in the excavations at Melbourne Street, Southampton (SARC I, IV, V. VI, and XX). Glasses from settlement sites of similar date are known from centres such as Helgö, Sweden (Holmqvist & Arrhenius 1964, 243) and Kaupang. Norway (kindly shown to me in Oslo by Mrs E Hougen) where fragments exist in large quantities. In Britain, earlier settlements such as at Dinas Powys. Glamorgan, (Alcock 1963, 178) have produced substantial quantities of material. The study of fragments as opposed to complete vessels is one which has arisen as a direct result of the archaeology of settlements. As the wares are fragmentary rather than complete, and as the deposition is accidental rather than deliberate as in the case of burials, the understanding of the material requires a more comprehensive contextual approach.

In the descriptions below the fragments are listed in order of their find number. Unless otherwise stated a11 measurements are maximum measurements. Specific vessel forms are only denoted in cases where they can be positively identified and this is assisted by the relatively high number of rim fragments in the material. In other instances only a general description regarding the type of vessel is given and this is based on the thickness of the vessel walling and the alignment of manufacturing marks, and by the orientation of the bubbles within the metal. In order to make colour a more accurate criterion a system of colour coding is employed and this is explained in the subsequent discussion. In the descriptions the worded colour definitions are included only to allow obvious differences in colour to be shown. The actual colour coding follows in parenthesis.

This is the first report and deals only with a part of the known glass from 'Hamwih'. It is hoped that later reports will contain fuller discussion on the implications of the material and devote space to the results of physical examination.

SARC I

F23, GL1 Base of vessel showing pontil wad and mark. Diameter of pontil mark (internal) 11.5 mm and (external) 16.0 mm. Wall thickness 1.5-2.6 mm. Intermediate vessel between palm cup and funnel beaker. Blue (N4 B7 Y3). (Fig ll, l, no 1).

F29, GL2 Body fragment. Wall thickness 0.8 - 1.8 mm. Decorated with applied arcaded trails set around body. Some discolouration in trails. Developed funnel beaker. Blue (N2 B3 Y2). (Fig 11, l, no 2).

SARC IV

GC, GLl Base of vessel showing pontil wad and mark. Diameter of pontil mark (internal) 12.0 mm. Wall thickness 3.3-5.4 mm. Intermediate vessel between palm cup and funnel beaker. Blue (N4 B13 Y7). (Fig 11.2. no 1).

GC, GL2 Rim fragment. Rim folded inwards forming cavity and smoothed on inside of vessel. Slightly splayed rim of thickness 3.2 mm and depth 4.5 mm. Wall thickness 0.9 - 1.0 mm. Later form of palm cup. Blue (N5 B6 Y3). (Fig 11.2. no 2).

GC, GL3 Body fragments. Wall thickness 0.6 - 1.6 mm. Decorated with mould-blown vertical corrugated ribbing. Squat jar or beaker. Purple (N3 B8 R9).

GC, GL4 Rim fragment. Rim rounded, thickened, and slightly inturned. Fully splayed rim of thickness 2.5 mm. Wall thickness 1.2-1.6 mm. Developed funnel beaker. Blue (N4 B6 Y3). (Fig 11.2. no 3).

F4, GL 5 Body fragments. Wall thickness l.0 - 1.1 mm. One fragment decorated with horizontal applied opaque yellow trail of thickness 1.2 mm. Trail very weathered. Possibly from bell beaker. Blue (N3 B6 Y3). (Fig 11.2, no 4).

F4, GL6 Body fragment. Wall thickness l.0 - 1.3 mm. Decorated with corrugated ribbing, Intermediate vessel between palm cup and funnel beaker. Indications of subjection to heat. Blue (N3 B3 Y2).

D2-11, GL7 Body fragment. Wall thickness 0.4-0.6 mm. From lower body of narrow vessel. Indications of subjection to heat. Blue (N3 B3 Y2).

D2-16, GL 1O Body fragment. Wall thickness 0.6 - 2.2 mm. Decorated with arcaded trail containing slight

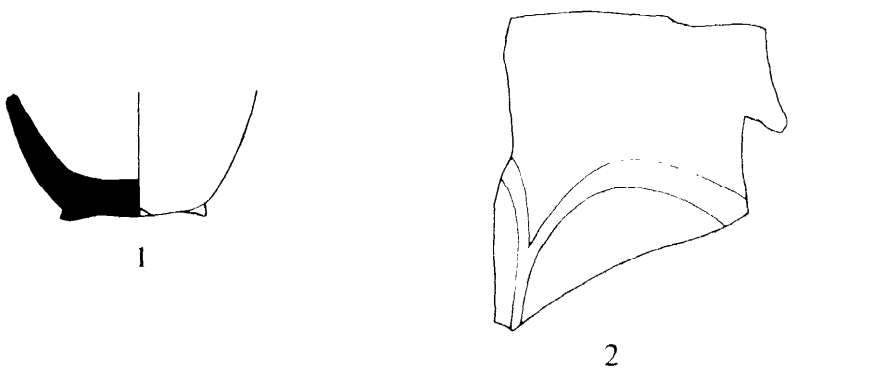


Fig 11, 1 Glass from Site 1 - 1 GLI: 2: GL2. Scale 1-1

discolouration. From lower body of vessel. Blue (N3 B3 Y3).

D2-12, GL 11 Body fragment. Wall thickness 2.6-3.7 mm. From lower body of rounded vessel. Blue (N5 B10 Y5).

D2-7, GL 13 Body fragment. Wall thickness 2.5 mm. From lower body of rounded vessel. Considerable scratching on exterior surface. Blue (N2 B14 Y7).

F3-4, GL 14 Rim fragment. Rim folded inwards forming cavity and smoothed on inside of vessel. Slightly splayed rim of thickness 2.2 mm and depth 4.6 mm. Wall thickness 0.5 mm. Later form of palm cup. Green (N2 B2 Y4). (Fig 11,2, no 5).

F171, GL 15 Rod of twisted glass. Length 45.0 mm. Diameter 4.0-4.5 mm. Cut at both ends. Probably a waster from the manufacture of glass beads or similar objects. Blue, although colouring inconsistent with traces of green at either end. (N3 B25 Y6). (Fig 11,2, no 6).

D3-2, GL 16 Base fragment showing remains of pontil wad and mark. Diameter of mark (internal) 12.00 mm. Wall thickness 1.4- 2.5 mm. Intermediate vessel between palm cup and funnel beaker. Blue (N3 B15 Y16). (Fig 11,2, no 7).

E3-11, GL 17 Body fragment. Wall thickness 0.6 mm. Blue (N2 B5 Y3).

D3-18, GLI8/37/38 Kim fragments. Rim folded inwards forming oblong cavity. Rim thickness 4.8 mm and depth approximately 15.5 mm. Wall thickness 1.7-4.2 mm. Bowl. Blue (N4 B3 Y2). (Fig 11,2, no 8).

E3-2, GL 19 Kim fragment. Rim folded inwards and smoothed on inside of vessel. Rim thickness 3.7 mm and depth 3.6 mm. Palm cup. Blue (N4 B3 Y2). (Fig 11,2, no 9).

D3-18. GL 20 Body fragments. Wall thickness 1.7 mm. Decorated with marvered opaque white trails combed into festoons. Some red discolouration in trails. Small jar or globular vessel. Blue (N4 B5 Y3). (Fig 11.2. no 10).

F15, GL 21 Body fragment. Wall thickness 0.5 mm. From lower body of narrow vessel. Green (Nl B0 Y3).

GC, GL 2 2 Rim fragment. Rim folded inwards and rounded. Splayed rim of thickness 3.9 mm. Wall thickness 1.0- 1.5 mm. Earlier form of funnel beaker. Blue (NS B7 Y.3). (Fig 11,2, no 11).

F3501, GL 23 Rim fragment. Rim folded inwards forming cavity and smoothed on inside of vessel. Slightly splayed rim of thickness 5.1 mm. Diameter of cavity varies between 1.0 and 4.0 mm. Wall thickness 0.6- 1.5 mm. Decorated with mould-blown vertical corrugated ribbing. Intermediate vessel between palm cup and funnel beaker. Blue (N6 B10 Y4). (Fig 11,2, no 12).

F50, GL 24/27 Rim fragments. Rim rounded, thickened, and slightly inturned. Fully splayed rim of thickness 2.0mm. Rim surmounted by applied rod of diameter 1.6 mm wound with opaque white trail. Rod smoothed against rim on inside and outside of vessel. Wall thickness 0.7- 1.2 mm. Developed funnel beaker. Green (N2 B0 Y3). (Fig 11,2, no 13).

E3-2.5, GL 2.5 Body fragment. Wall thickness 1.0 mm. Blue (N4 B4 Y3).

D4-22, GL 26 Body fragment. Wall thickness 1.8 mm. Blue (N6 B7 Y3).

F111, GL 29 Body fragment. Wall thickness 1.1 - 1.6 mm. Manufacture marks suggest arcaded decoration. From lower body of conical vessel. Blue (N4 B2 Y2).

F17, GL 31 Rim fragment. Rim folded inwards forming cavity and smoothed on inside of vessel. Slightly

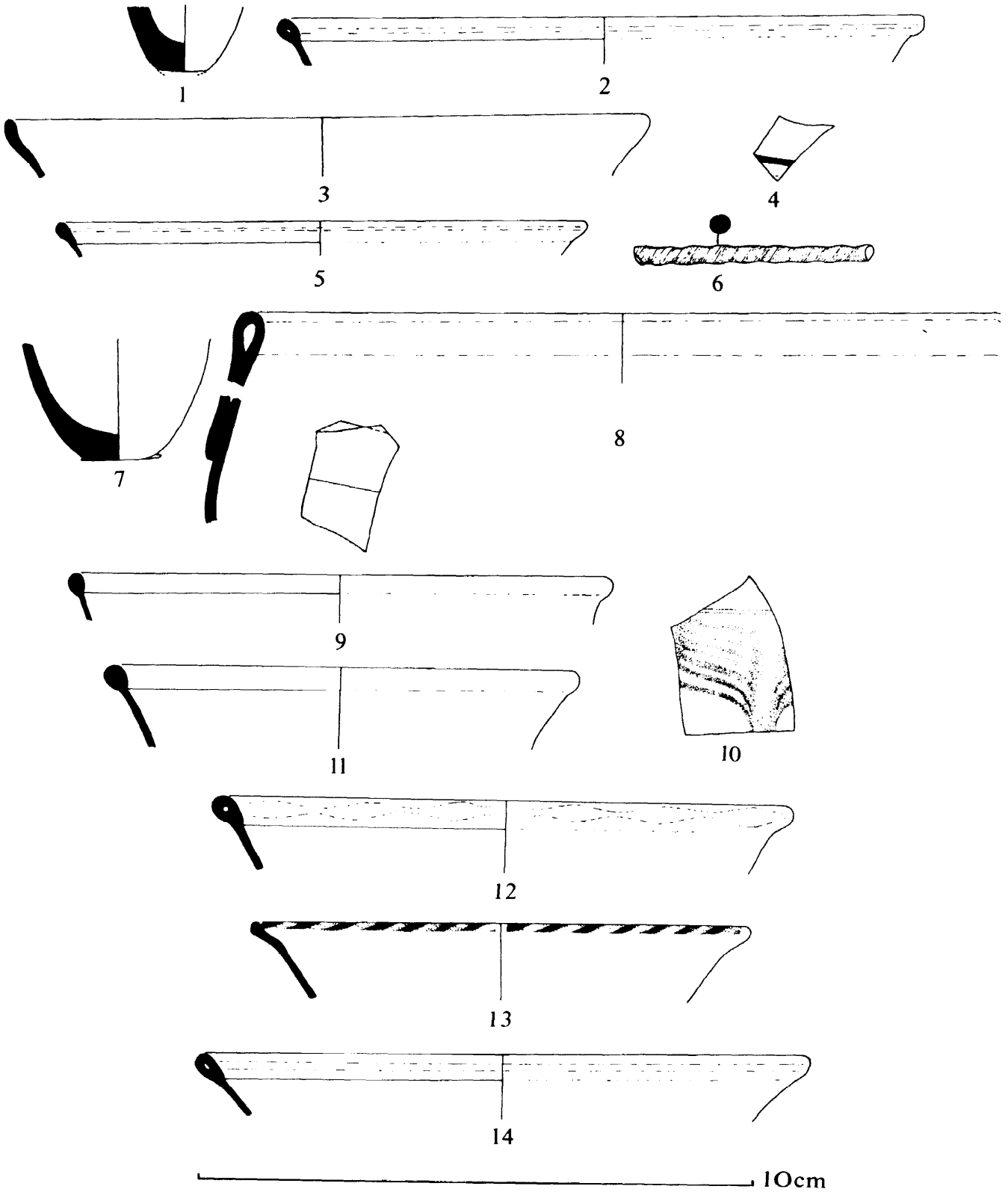


Fig 11, 2 Glass from Site IV. I: GLI; 2: GL2; 3: GL4; 4: GL5; 5: GL14; 6: GL15; 7: GL16; 8: GL18/37/38; 9: GL19; 10: GL20; II: GL22; 12: GL23; 13: GL24/27; 14: GL31. Scale 1:1

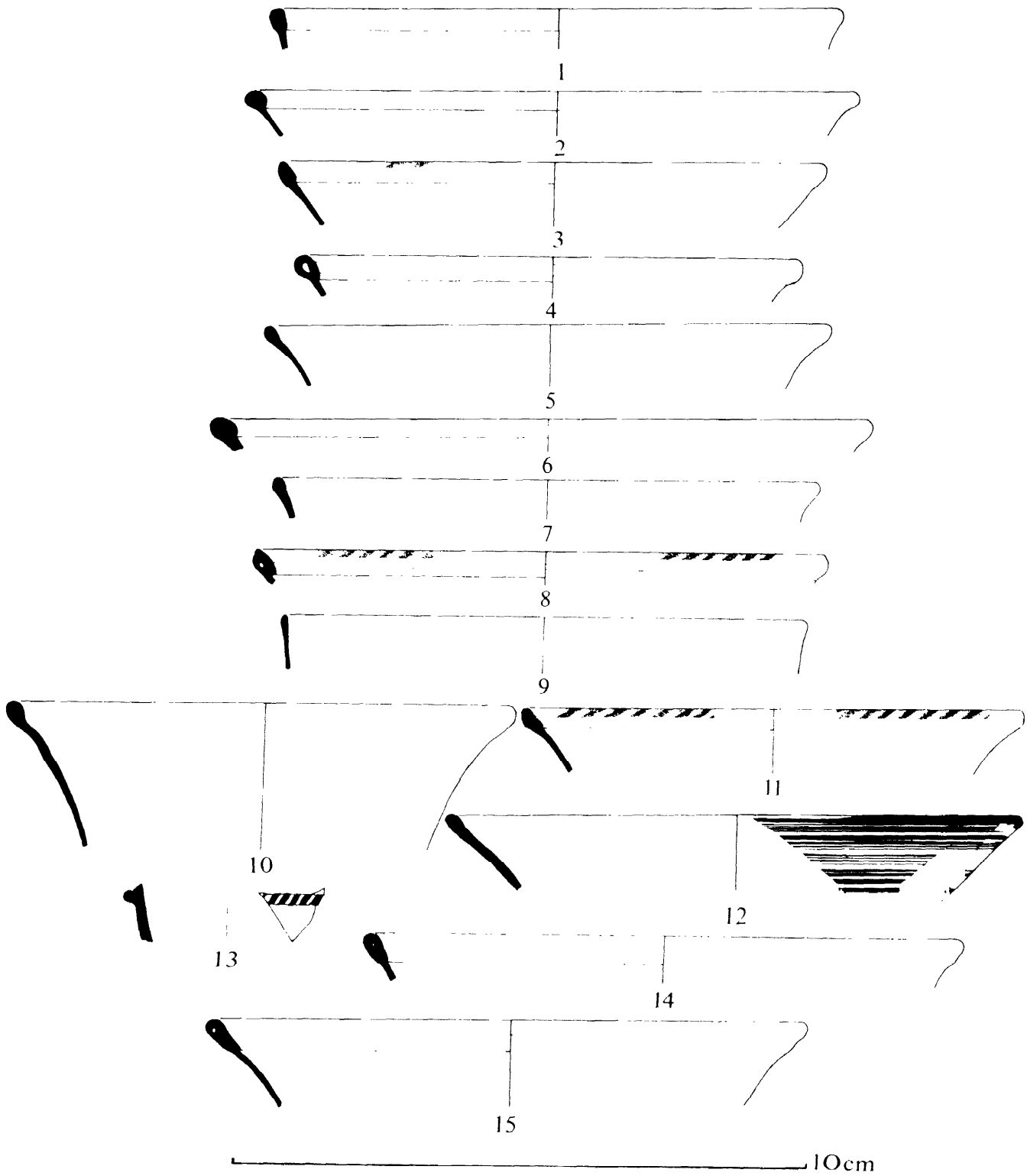


Fig 11, 3 Glass from Site V. 1: GL1; 2: GL2; 3: GL3; 4: GL5; 5: GL6: 6: GL9; 7: GL11: 8: GL13; 9: GL17; 10: GL18; 11: GL19; 12: GL20/26; 13: GL22; 14: GL24; 15: GL27. Scale 1:1

splayed rim of thickness 3.9 mm and depth 7.0 mm. Wall thickness 1.0- 1.3 mm. Earlier form of funnel beaker. Blue (N4 B9 Y3). (Fig 11,2, no 14).

SARC V

GC, GL 1 Rim fragment. Rim folded and smoothed on inside of vessel. Slightly splayed rim of thickness 3.6 mm and depth 4.0 mm. Wall thickness 1.3 mm. Intermediate vessel between palm cup and funnel beaker. Indications of subjection to heat. Blue (N4 B10 Y4). (Fig 11,3, no 1).

GC, CL 2 Rim fragment. Rim folded and smoothed on inside of vessel. Slightly splayed rim of thickness 2.6 mm anti depth 3.2 mm. Palm cup. Blue (N2 B3 Y2). (Fig 11,3, IlO 2).

F11, GL 3 Rim fragment. Rim folded and smoothed flat on inside of vessel. Splayed rim of thickness 2.5 mm and depth 4.6 mm. Rim surmounted by applied rod of diameter 1.5 mm wound with opaque white trail. Rod smoothed against rim on inside and outside of vessel. Wall thickness 0.7 - 1.0 mm. Intermediate vessel between palm cup and funnel beaker. Blue (N3 B3 Y2). (Fig 11,.3, no 3).

L3-22, GL 4 Body fragment. Wall thickness 1,1 - 1.4 mm. Scratched and weathered on exterior surface. Indications of subjection to heat. Blue (N4 B4 Y2).

J2-12, GL 5 Kim fragment. Rim folded inwards forming cavity and smoothed on inside of vessel. Slightly splayed rim of thickness 4.0 mm and depth 5.0 mm. Wall thickness 1.0 mm. Scratched and slightly pitted. Palm cup. Blue (N4 B8 Y4). (Fig 11,3, no 4).

J2-16, GL 6 Rim fragment. Rim rounded. thickened. and slightly inturned. Fully splayed rim of thickness 2.5 mm. Wall thickness 1.0- 1.6 mm. Developed funnel beaker. Blue (N4 B3 Y2). (Fig 11,3, no 5).

F11, GL 7 Body fragment. Wall thickness 1.1 - 1.6 mm. From lower body of narrow vessel. Blue (N4 B3 Y2).

K1 - 3, GL 8 Body fragment. Wall thickness 2.1 - 3.5 mm. From near base of mould-blown vessel showing termination of vertical decoration. form suggests beaker with rounded base. Blue (N4 B11 Y4).

F11, GL 9 Rim fragment. Kim folded inwards and rounded. Slightly splayed rim of thickness 4.4 mm. Wall thickness 1.4 mm. Scratched and pitted. Palm cup or possibly bell beaker. Indications of subjection to heat. Blue (N4 Bl1 Y4). (Fig 11,3, no 6).

F1l, GL 10 Body fragment. Wall thickness 0.4 mm. Decorated with horizontal marvered opaque white trails of thickness 0.8 mm. Cone or bell beaker. Green (Nl B0 Y2).

F11, GL 11 Rim fragment. Rim rounded. thickened, and slightly inturned. Splayed rim of thickness 2.5 mm. Wall thickness 1.2 mm. Developed funnel beaker. beaker. Green (N3 B0 Y2). (Fig 11,3, no 7).

F11, GL 12 Body fragment. Wall thickness 2.1 mm. From lower body of narrow vessel. Blue (N3 B4 Y2).

F11, GL 13 Rim fragment. Rim folded inwards forming cavity and smoothed flat on inside of vessel. Fully splayed rim of thickness 3.0 mm and depth 5.0 mm. Rim surmounted by applied rod of thickness 1.7 mm wound with opaque white trail. Rod smoothed against rim on inside and outside of vessel. Earlier form of funnel beaker. Blue (N6 B12 Y4). (Fig 11.3. no 8).

F11, GL 14 Body fragment. Wall thickness 1.2 mm. From lower body of narrow. vessel. Indications of subjection to heat. Blue (N2 B2 Y2).

F11, GL 15 Body fragment. Wall thickness 0.5 mm. From upper body of vessel. Green (N.3 B0 Y3).

F14-15, GL 16 Body fragment. Wall thickness 1.5 mm. From upper body of large vessel, possibly bowl. Some weathering on interior surface. Blue (N4 B8 Y4).

F16, GL 17 Rim fragment. Kim rounded, thickened, and slightly inturned. Splayed rim of thickness 1.6 mm. Wall thickness 0.7 - 1.0 mm. Funnel beaker. Blue (N4 B3 Y2). (Fig 11,3. no 9).

F16, GL 18 Kim fragment. Kim rounded, thickened, and slightly inturned. Slightly splayed rim of thickness 2.8 mm. Wall thickness 0.7 - 1.8 mm. Developed funnel beaker. Blue (N4 B8 Y3). (Fig 11.3. no 10).

F11, GL 19 Rim fragment. Kim folded inwards and smoothed flat on inside of vessel. Splayed rim of thickness 2.0 mm and depth 4.5 mm. Him surmounted by applied rod of diameter 1.7 mm wound with opaque white spiral. Rod smoothed against rim on inside and outside of vessel. Wall thickness (0.8 - 1.0 mm. Funnel beaker. Indications of subjection to heat. Blue (N4 B5 Y2). (Fig 11,3, no 11).

F14- 15, F24, GL 20 26 Kim fragments. Rim rounded, thickened and slightly inturned. Splayed rim of thickness 3.1 mm. Decorated on rim and surviving body area with horizontal marvered opaque yellow trails. Thickness of trails 0.4-2.5 mm. Wall thickness 1.2-1.7 mm. Funnel beaker. Green (N2 B0 Y3). (Fig 11,3, no 12).

F14, GL 21 Body fragment. Wall thickness 0.9 mm. Slightly weathered on both surfaces. Some twisting due to heat. Blue (N5 B5 Y3).

F23, GL 22 Body fragment. Wall thickness 1.6 mm. Decorated with applied filigree rod containing opaque yellow spiral. Diameter of rod 1.6 mm. Beaker. Green (N3 B0 Y1). (Fig 11.3, no 13).

F14- 15,. GL 23 Body fragment. Wall thickness 0.9 mm. From upper body of vessel. Blue (N.3 B6 Y3).

F14-15, GL 24 Kim fragment. Him folded inwards forming cavity in places and smoothed on inside of vessel. Slightly splayed rim of thickness 3.1 mm and depth 5.0mm. Wall thickness 0.9- 1.1 mm. Earlier form of funnel beaker. Blue (N4 B6 Y3). (Fig 11.3, no 14).

F24, GI. 25 Body fragment. Wall thickness 1.2 - 2.4 mm. From lower body of narrow vessel. Blue (N4 B10 Y3).

F16, GL 27 Rim fragment. Kim folded inwards forming cavity and smoothed flat on inside of vessel. Splayed rim of thickness 2.8 mm and depth 7.3 mm. Wall thickness 0.6-0.8 mm. Funnel beaker. Blue (N2 B7 Y3). (Fig 11.3. no 15).

F16. GL 28 Body fragment Wall thickness 0.4-0.5 mm. From upper body of vessel. Green (N2 B0 Y2).

F14-15, GL 29 Rim fragment. Rim rounded, thickened. and slightly in turned. Splayed rim of thickness 1.7 mm. Rim surmounted by applied rod of thickness 1.5 mm wound with opaque white trail. Wall thickness 1.0- 1.5 mm. Developed funnel beaker. Blue (N4 B6 Y2). (Fig 11.4. no 1).

F18, GL 30 Body fragment. Wall thickness 1.2 - 1.5 mm. Decorated with applied trailing set in Y-shape. From lower body of conical shaped vessel. Blue (N4 B6 Y3). (Fig 11.4. no 2).

F27, GL 31 Body fragments. Wall thickness 1.3 mm. From lower body of conical shaped vessel. Blue (N2 B3 Y2).

F27, GL 32 Body fragment. Wall thickness 0.7 mm. Decorated with red streaking within the metal. Exterior surface shows narrow grooves where applied trailing has been lost. Small hand vessel such as cup. Some pitting on interior surface. Indications of subjection to heat. Green. (Fig 11,4, no 3).

F32, GL 33 Body fragments. Wall thickness 0.5 mm. From lower body of narrow vessel. Green (Nl B0 Y3).

F32, GL 34 Body fragment. Wall thickness 1.0 - 2.0

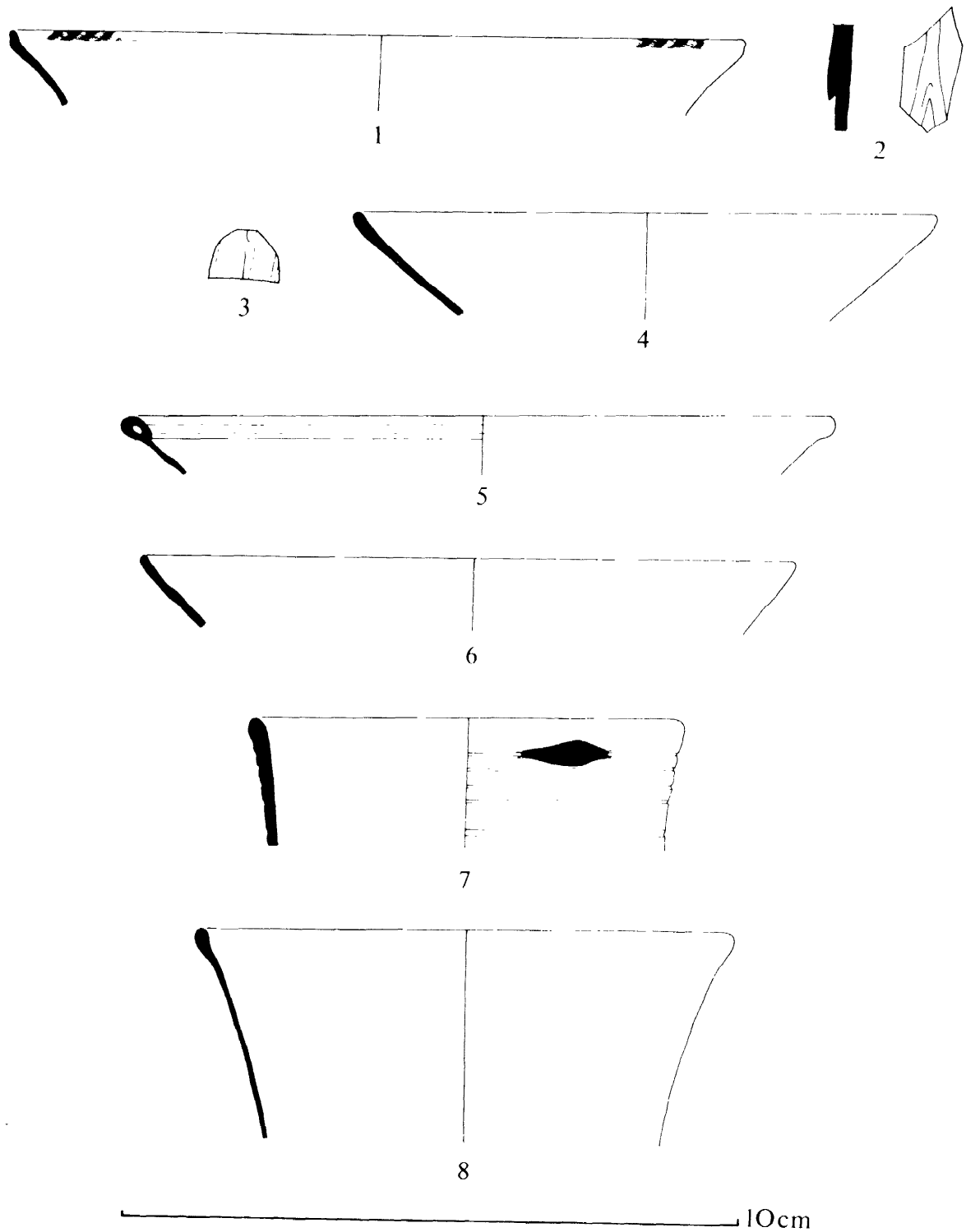


Fig 11, 4 Glass from Site V, continued. 1: GL29; 2: GL30; 3: GL32; 4: GL35; 5: GL36; 6: GL41; 7: GL49/50; 8: GL51/2/3,6. Scale 1:1

mm. From lower body of rounded cup. Both surfaces pitted and seratched. Slightly twisted by heat. Green (N2 B0 *Y3).*

F32, GL 35 Rim fragment. Kim rounded, thickened, and slightly inturned. Splayed rim of thickness 1.9 mm. wall thickness 0.9 - 1.2 mm. Funnel beaker. Green (N4 130 Y3). (Fig 11,4, no 4).

F32, GL36 Rim fragment. Kim folded in wards forming cavity and smoothed on inside of vessel. Slightly splayed rim of thickness 4.0 mm and depth 4.8 mm, Wall thickness 1.0 mm. Intermediate vessel between palm cup and funnel beaker. Green (N3 B0 Y3). (Fig 11,4, no 5).

F32, GL 37 Body fragments. Wall thickness 0.7-1.7 mm. From lower body of narrow vessel. Green (N2 B0 Y3).

F32, GL 38 39 Body fragments. Two fragments decorated with horizontal marvered opaque white trails of thickness 0.2 mm. Wall thickness 0.5 mm. From form of conical vessel. Blue (N4 B6 Y3).

F22, GL 40 Body fragment. Wall thickness 3.6-4.1 mm. From near base of rounded vessel. Dark green impurity streak in metal. Exterior surface badly seratched and pitted. Blue (N5 B17 Y6).

F22. GL 41 Kim fragment. Rim rounded, thickned, and slightly inturned. Splayed rim of thickness 2.7 mm. wall thickness 1.0-1.2 mm. Funnel beaker. Green (N4 B0 Y3). (Fig 11,4. no 6).

F16. GL 49, 50 Rim fragments. Kim rounded. thickened. and smoothed flat on inside of vessel. Slightly splayed rim of thickness 2.8 mm. Decorated with horizontal applied opaque yellow trails of thickness 0.5-1.0 mm. One fragment (GL 50) shows grooves where applied trailing has been lost. Surviving opaque yellow trail badly weathered. Wall thickness 1.0-1.8 mm. Squat jar or beaker. Indications of subjection to heat. Green (N4 B22 Y16). (Fig 11, 4, no 7).

F16, GL 51 2 3 6 Kim fragments. Rim Kim rounded, thickened, and slightly inturned. Splayed rim of thickness 2.0 mm. Wall thickness 0.5-1.1 mm. Devcloped funnel beaker. Blue (N4 B3 Y2). (Fig 11.4. no 8).

Fl6. GL 54 Body fragments. wall thickness 0.5 mm. From upper body of wide vessel. Some pitting. Indications of subjection to heat. Green (N2 B0 Y3).

F16. GL 55 Kim fragment. Kim rounded, thickened, and slightly inturned. Splayed rim of thickness 2.0 mm. Wall thickness 1.2 mm. Funnel beaker. Green (N4 B0 Y3).

F16, GL 57 Body fragments. Wall thickness 0.4-0.7 mm. From upper body of wide vessel. Indications of sublection to heat. Green (N2 B0 Y3).

SARC VI

GC, GL 1 2 3 Rim fragments. Rim rounded. thickened, and slightly inturned. Slightly splayed rim of thickness 2.4 mm. Wall thickness 0.8-1.9 mm. Funnel beaker. Indications of subjection to heat. Blue (N4 B5 Y3). (Fig 11.5. no 1).

GC, GL 4 Rim fragments. Rim folded inwards forming cavity and smoothed on inside of vessel. Rim thickness 2.8 mm and depth 4.0 mm. Wall thickness 0.7-1.0 mm. Intermediate vessel between palm cup and funnel beaker. Green (N2 B0 Y3). (Fig 11,5. no 2).

Fl, GL 5 Kim fragment. Kim rounded. thickened, and slightly inturned. Splayed rim of thickness 2.1 mm. Wall thickness 0.8-1.4 mm. Developed funnel beaker. Blue (N4 B3 Y2). (Fig 11,5, no 3).

F1, GL 6 Body fragment. Wall thickness 0.7 mm. From upper body of wide vessel. Blue (N3 B5 Y2).

GC, GL 7 Kim fragment. Kim rounded, thickened, and slightly inturned. Slightly splayed rim of thickness 3.4 mm. Wall thickness 1.3-2.2 mm. Developed funnel beaker. Blue (N4 B2 Y3). (Fig 11,5, no 4).

F1, GL 9 Kim fragment. Kim folded inwards and rounded. Slightly splayed rim of thickness 3.0 mm and depth 3.0 mm. Wall thickness 0.5 - 1.2 mm. Earlier form of funnel beaker. Blue (N3 B3 Y2). (Fig 11,5, no 5).

Fl, GL 10 Body fragment. Wall thickness 0.5 mm. From upper body of vessel. Some pitting. Green (N2 B0 Y2).

F1, GL 11 Body fragment. Wall thickness 0.5 mm. From lower body of narrow vessel. Green (N2 B1 Y2).

F1, GL12 Body fragment. Wall thickness 0.6 mm. Decorated with horizontal applied opaque yellow trails, now slightly weathered. Thickness of trails 1.0-1.4 mm. From small rounded vessel. Green (N7 B1 Y1). (Fig 11,5. no 6).

F1, GL 14 Body fragment. Wall thickness 0.4 - 0.5 mm. From upper body of wide vessel. Green (N4 B0 Y1).

F9, GL 16 Kim fragment. Rim folded inwards forming cavity and smoothed on inside of vessel. Kim thickness 4.1 mm and depth 5.8 mm. Wall thickness 1.0-1.1 mm. Intermediate vessel between palm cup and funnel beaker. Blue (N5 B8 Y3). (Fig 11,5, no 7).

F30, GL 18 Body fragment. Wall thickness 0.6-1.0 mm. From upper body of wide vessel. Green (N3 B0 Y2).

F30, GL 20 Body fragment. Wall thickness 1.7 mm. From upper body of vessel. Blue (N5 B-1 Y4).

F30, GL 21 Body fragments. Wall thickness 1.1 mm. From upper body of wide vessel. Green (N2 B0 Y3).

F49, GL 22 Body fragment. Wall thickness 1.0-3.9 mm. Mould-blown vessel showing indication of vertical trailing. Large vessel, probably bowl. Blue (N4 Bl0 Y4). (Fig 11.5. no 8).

F30, GL 23 Body fragment. Wall thickness 0.6-0.8 mm. Decorated with applied horizontal opaque yellow trails now some what weathered. From upper body of bell beaker or claw beaker. Red glass containing milky streaking within the metal. (Fig 11.5. no 9).

F30, GL 24 Kim fragment. Kim rounded, thickened. and slightly inturned. Splayed rim of thickness 1.7 mm. Decorated with horizontal marvered opaque yellow trails on and below rim. Thickness of trails 0.5-2.5 mm. Wall thickness 1.0 mm. Developed funnel beaker. Blue (N3 B3 Y1). (Fig 11,5, no 10).

F49, GL 25 Body fragment, Wall thickness 2.0-3.2 mm. From lower body of rounded vessel. Blue (N0 B13 Y3).

F30, GL 26 Body fragment. Wall thickness 0.5-1.0 mm. Decorated with horizontal applied opaque yellow trails. I Trails applied unevenly and now badly weathered with some lost leaving grooves to indicate position. Thickness of trail 0.8-4.1 mm. Bell beaker or early form of funnel beaker. Green (N2 B0 Y3). (Fig 11.5, no 11).

F39, GL 27 Body fragment. Wall thickness 2.2-3.3 mm. From lower body of large vessel. possibly jar. Blue (N4 B10 Y4).

F39, GL 28 Rim tragment. Rim folded inwards forming eavity and smoothed on inside of vessel. Slightly splayed rim of thickness 4.2 mm. and depth 5.8 mm. Wall thickness 1.2-1.5 mm. Intermediate vessel between palm cup and funnel beaker. Blue (N5 B5 Y3). (Fig 11.5. llO 12).

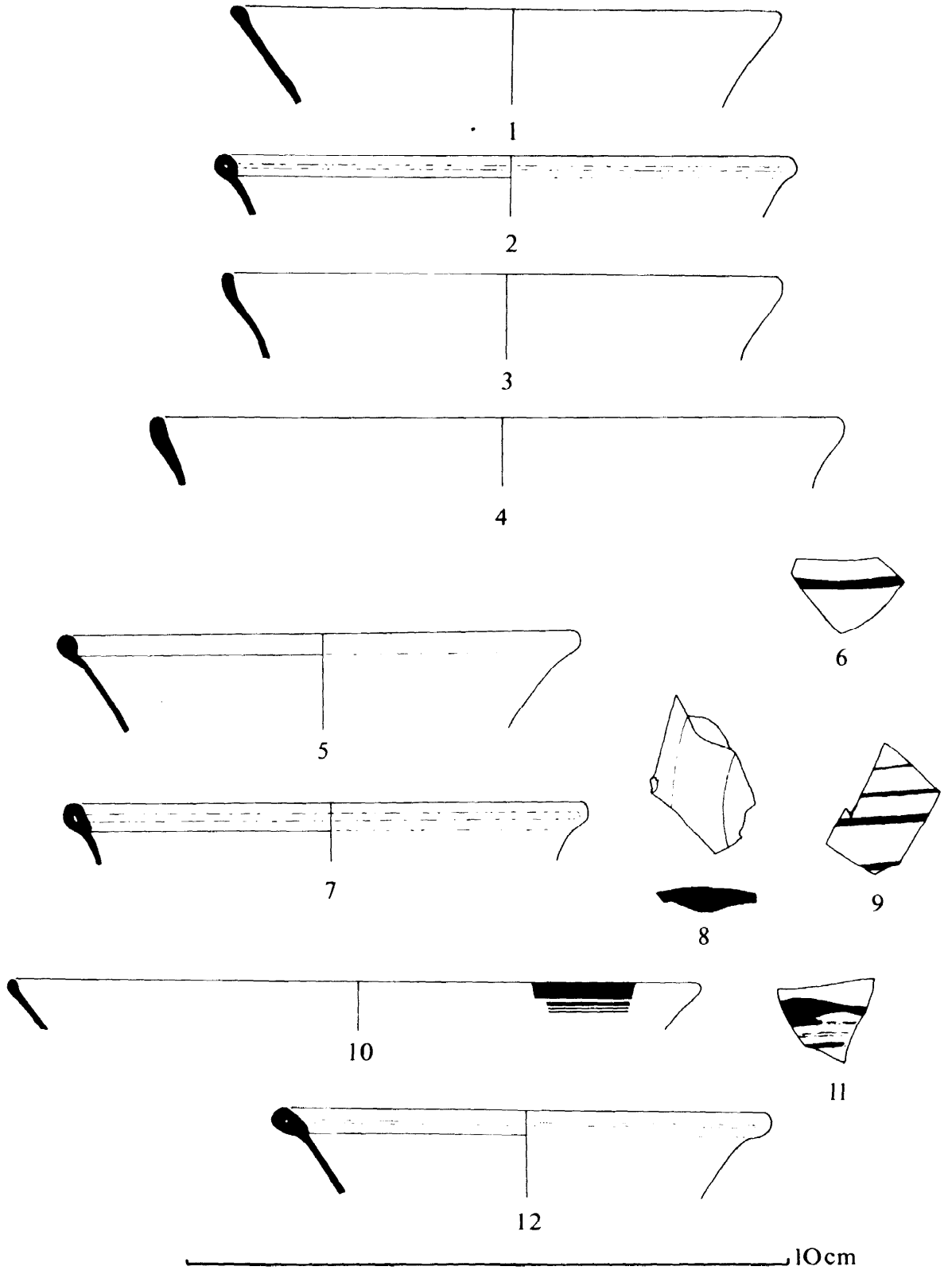


Fig 11, 5 Glass from Site VI. 1: GL1/2/3; 2: GL4; 3: GL5; 4: CL7; 5: GL9; 6: GL12; 7: GL16; 8: GL22; 9: CL23; 10: GL24; 11: GL26; 12: GL28. Scale 1:1

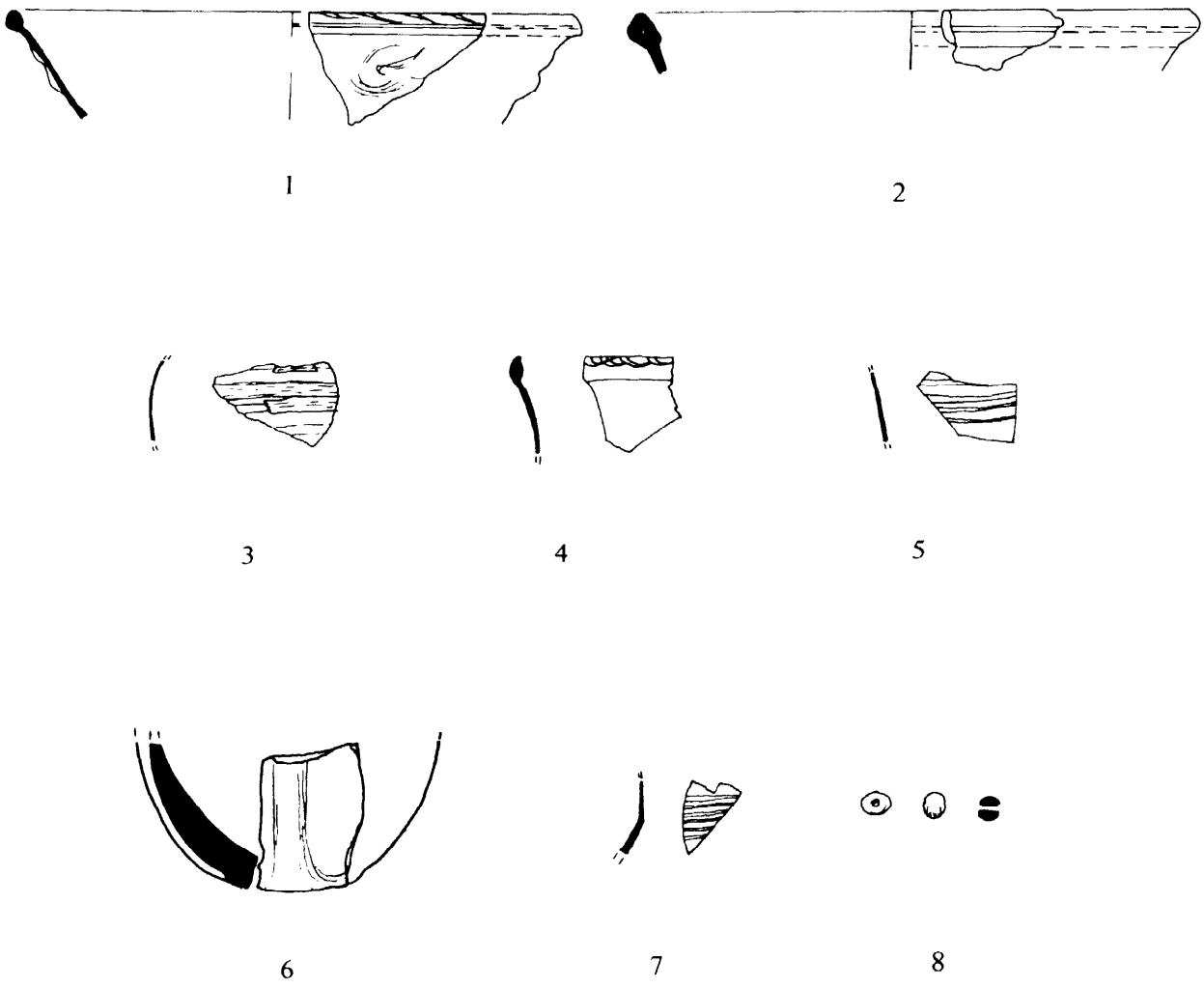


Fig 11, 6 Glass from Site XX. 1: GL1; 2: GL2; 3: GL3; 4: GL4; 5: GL9; 6: GL10; 7: GL14; 8: GL15 (Bead 1). Scale 1: except 8, 2

SARC XX

F12OA. GL 1 Rim fragment. Rim folded inwards and smoothed flat on inside of vessel. Slightly splayed rim of thickness 3.9 mm and depth 3.6 mm. Rim surmounted by applied rod of thickness 2.0 mm wound with opaque white trail. Rod smoothed against rim on inside and outside of vessel. Indications of moulded decoration. Wall thickness l.0-1.3 mm. Funnel beaker. Blue (N3 B2 *Y2).* (Fig 11,6, no 1).

F128B, GL 2 Kim fragment. Rim folded inwards forming cavity and smoothed flat on inside of vessel. Slightly splayed rim of thickness 4.1 mm and depth 5.2 mm. Wall thickness 1.2-1.3 mm. Intermediate vessel between palm cup and funnel beaker. Blue (N2 B4 Yl). (Fig 11,6, no 2).

F70E, GL 3 Body fragment. Wall thickness 0.7 mm. Decorated with applied horizontal opaque yellow trails of thickness 1.0-3.6 mm. Some trails lost with grooves indicating former position. Small rounded vessel. Blue (Nl B2 Yl). (Fig 11,6, no 3).

GR 0056/213, layer 3, GL 4 Rim fragment. Rim rounded, thickened, and slightly inturned. Slightly splayed rim of thickness 3.0 mm and depth 3.3 mm. Rim surmounted by applied rod of thickness 1.7 mm. Wound with opaque white spiral. Hod smoothed against rim on inside and outside of vessel. Wall thickness 0.8-1.0 mm. Developed funnel beaker. Blue (N2 B2 Yl). (Fig 11,6. no 4).

F123, GL 5 Body fragment. Wall thickness 0.8 mm. From upper body of vessel. Colourless.

F123, GL 6 Body fragment. Wall thickness 2.0-3.9 mm. From near base of vessel. Intermediate vessel between palm cup and funnel beaker. Blue (N4 B5 Y3).
F123, GL 7 Body fragment. Wall thickness 0.7 mm. From lower body of vessel. Indications of subjection to heat. Green (N2 B0 Y3).
F131, GL 8 Body fragment. Wall thickness 2.0-2.5 mm. From near base of rounded vessel. Blue (N3 B7 Y2).
F131, GL 9 Body fragment. Wall thickness 0.7-1.0 mm. Decorated with horizontal applied opaque yellow trails of thickness 0.6-1.0 mm. Trailing now somewhat weathered. From below rim of vessel, possibly funnel beaker. Green (N2 B3 Y1). (Fig 11,6, no 5).
F130, GL 10 Body fragment. Wall thickness 2.0-4.4 mm. Decorated with vertical mould-blown ribbing. From near base of intermediate vessel between palm cup and funnel beaker. Blue (N2 B10 Y3). (Fig 11.6. no 6).
F70, GL 11 Body fragment. Wall thickness 0.7-1.6 mm. From lower body of narrow vessel. Green (N1 B0 Y3).
F131, Gl 12 Body fragment. Wall thickness 1.2-1.5 mm. From upper body of wide vessel, probably early funnel beaker. Blue (N3 B4 Y2).
F131, GL 13 Body fragment. Wall thickness 1.2 mm. Blue (N2 B5 Y2).
GR 0023 212, GL 14 Body fragment. Wall thickness O.6-1.1 mm. Decorated with horizontal marvered opaque yellow trails of thickness 0.6 mm. From neck of squat jar or beaker. Green. (Fig 1l.6. no 7).
F123. GL. 15 (Bead 1) Minute bead. Diameter 2.0 mm. (Fig 11,6, no 8).

Discussion

The material contains the remains of a maximum number of 105 individual glass vessels of pre-Conquest origin. Of these 54 (51%) can be broadly ascribed to known or postulated vessel types. A glass rod waster (IV, GL 15) and a bead (XX, GL 15) are the only items not belonging to a vessel form. Identification of type is based mostly on rim fragments of which 41 survive. Decorated fragments are in the minority and show the use of applied and rnarkered trailing or rods. The number of items from the various sites is set out below:

Site	*Total No*	*Identifiable*	*Rims*	*Decorated*
SARC I	2	2	—	1
SARC IV	24	14	9	8
SARC V	44	22	21	12
SARC VI	21	10	8	5
SARC XX	14	6	3	6
	105	54	41	32

The most noticeable aspect of these fragments is the almost total absence of forms and attributes associated with known Anglo-Saxon vessels from before the 8th century. Typical earlier colours such as dark green and brown are not represented and are replaced by clear blues and greens. This change occurred in Scandinavia towards the end of the 7th century and is marked by the presence of the first clear blue palm cups from the Vendel graves (Stolpe & Arne 1927). The quality too is superior. The characteristic flaws of the earlier glasses in the form of impurity streaking and large bubbles within the metal are less evident. The metal is durable and has preserved its clarity and brightness to a greater degree than many earlier wares. All the examples examined were of the high soda-lime variety and there was no evidence for the presence of 'weald' or forest glass.

There arc no examples of the earlier tall conical vessels nor of the claw beaker even in its latest 'developed' Taplow form of the 7th century. According to Scandinavian evidence this type continued to develop in the 8th century and notable examples can be seen from Valsgärde, Sweden (Arwidsson 1932). Only one fragment (VI, GL 23) may conceivably belong to a later form of claw beaker but there is insufficient evidence for proper confirmation. The bell beaker which is characterized by the knobbed base old body constriction is also riot identified. These tend not to appear beyond the 7th century and are common in Merovingian times in France and Germany but much rarer in England. In general they are decorated to a greater degree than other 7th century vessels and only one fragment here (V, GL 10) with opaque white trailing could conceivably belong to this type. The bag beaker. which may possibly be of English origin (Harden 1956, 141) is also unrecorded here. The type almost certainly survives into the 8th century. Rim forms usually associated with these earlier types of vessel such as the rounded and thickened rim form appear on only a few examples and these can be ascribed to the later squat jars or to the palm cup series. Opaque white trailing which is one of the most common forms of decoration prior to the 8th century occurs on only two examples (V. GL 10 and V. GL 38/9).

The majority of vessel forms represented appears to belong to a typological development of unstable vessels illustrated here in its earliest form by the later phases of the palm cup (IV, GL 19) and in its latest form by the developed funnel beaker (V. GI. 29). At least 40 rim fragments and bases can be included in this series. The iri intermediate stages of the development are unclear although the series determined by Ypey (1962-63, fig 40) is a useful guide. The palm cup becomes taller and less rounded and ultimately develops into the funnel beaker- with narrow base. concave body, and splayed rim. Many Of the body fragments may also belong to the palm funnel sequence and this can be determined by an examination of the manufacturing marks and of the bubbles within the metal. The manufacturing marks are aligned sirally on the lower body and broaden out until they lie almost horizontally around the rim. This reflects the final shaping and turning of the vessel on the pontil and enable the contour of the vessel area to which the fragment belongs to be gauged. Examination of the bubbles can indicate the part of the vessel represented. The series shows vertically orientated elongated bubbles on the lower and narrower part of the vessel and horizontally orientated bubbles in the area of the rim. Together with wall thickness these two features enable even small body sherds to be classified with reasonable accuracy. By using the these techniques a further 25 fragments could associated with the palm funnel series giving a *possible* total of 71 individual vessels (68% of vessels represented).

The earliest vessels from the series belong to the palm cup group. The rims are folded (IV. GL 19) and the profile of the upper body only slightly out-turned. These are certainly later than the earliest palm cups represented by the 6th century Coombe, Kent. vessel (Harden 1956, plate XVII, 1) which shows a rounded rim and a ribbed body. The Coombe type appears not to survive beyond the 6th century on the Continent (Rademacher 1942, 301) but continues in England with a folded rim in the 7th century. The earliest of the 'Hamwih' vessels must belong to this period and probably would not appear until the second half of the century. The rounded body fragments (IV, GL 11 and IV, GL 13) can be in-

cluded in this phase. The introduction of the cavity rim occurs on these vessels perhaps as early as the beginning of the 8th century. This is formed by folding the open lip inwards to produce either a spherical or oblong cavity sealed within the rim itself (IV, GL 2). The inside surface of the vessel is almost invariably smoothed flat. The standard of the execution of this rim form varies considerably and it would be tempting to argue that the more crudely fashioned rims are earlier than those more delicately formed.

The next stage in the development shows the beginnings of the splayed rim, often with a cavity (V, GL36), and these belong to a vessel profile significantly more funnel-like in appearance. At this point the form of the early palm cup is virtually lost and the development of the funnel beaker proper begins. The distinction between the two types of vessel is an arbitrary one and vessels at this intermediate phase contain attributes of both. The three base fragments (I, GLl; IV, GLl and IV. GLl0) belong to this part of the development. The penultimate stage shows the vessel rim becoming inturned and the rim profile becoming noticeably splayed with an angular constriction in the upper body (V, GL19). At this stage the funnel beaker is recognizable. the upper body profile becoming concave rather than convex with an angular constriction appearing below the rim. The final stage shows the fully developed funnel beaker (V, GL29) with the concave profile more exaggerated and the inturned rim now only slightly thickened. One fragment (V, GL35) indicates the development of this final movement. Here the rim is slightly thickened and inturned but the profile shows that the technique of the splayed lip was not fully mastered on this vessel form resulting in a slightly bent profile of uneven thickness. Perhaps this can be considered an experimental piece.

The palm/funnel sequence comprises the bulk of the Melbourne Street material and the recognizable forms from this series can be broadly denoted under the following headings:

site	*Late palm*	*Intermediate*	*Early funnel*	*Developed funnel*
SARC I	—	1	—	1
SARC IV	3	4	2	2
SARC V	2	3	9	5
SARC VI	—	2	3	3
SARC XX	—	4	1	1
	5	14	15	12

The dimensions of the vessels are difficult to establish with any accuracy. The rim diameters shown in the drawings are calculated estimates based on the surviving rim portions. In general the funnel beaker has a wider rim than the earlier palm cup ranging perhaps from 90-110 mm. This compares favourably with Scandinavian examples. The rim diameter of the palm cup is slightly less. not exceeding 900 mm.

The greater part of this sequence remains hypothetical. The earliest palm cup forms are relatively common in this country and elsewhere and the latest developed funnel beakers are well represented at Birka. The bases of these latest funnels are almost straight in profile and are of a much more solid construction than earlier bases. For this latter reason they have tended to survive in settlement layers. being stronger than other parts of the vessel. They are known from the Birka 'Schwartz Erde' (Arbman 1937, 52) and their absence at 'Hamwih' may be significant.

The intermediate forms are virtually unknown even in Scandinavia and have only a few parallels on the Continent. For this reason the 'Hamwih' examples of this stage are of particular interest. Furthermore they exhibit features of form and decoration that are rare or unknown elsewhere. The cavity rim is uncommon in Anglo-Saxon glass prior to the 8th century and marks a stage of development followed best in Scandinavia where the earliest obvious example appears on the filigree bowl from Valsgärde (Arwidsson 1932) dated to the mid 8th century. It appears spasmodically on the palm cups with the thickened folded rims and then seems to vanish completely by the early 9th century. In all the 'Hamwih' examples the rim is folded inwards. Palm cups from elsewhere, especially from the Continent (Rademacher 1942, 301), have both inward and outward folded rims. The later Scandinavian funnel beakers of the 9th and 10th centuries all have slightly thickened and inturned rims and show no evidence of ever having developed via a stage in which the cavity rim was an obvious feature. The absence of this type of rim form in Scandinavia and the presence of at least fourteen examples from 'Hamwih' is an obvious anomaly in the argument for parallel development between the two areas. It again implies that Scandinavia and 'Hamwih' were not necessarily supplied by the same houses.

According to known parallels the palm/funnel series is restricted in decoration. Where decoration does appear it occurs in the form of a ribbed body or arcaded trails, or with an applied rim of a different coloured glass. The 'Hamwih' material shows several examples of the ribbed body including the rim of an intermediate vessel with vertical mould-blown corrugated ribbing (IV, GL23) and at least one body fragment with similar decoration (IV, GL6). Two fragments showing thick vertical mould-blown trails (V, GL8 and XX, GL10) probably belong to vessels in the earlier part of the development,. In all instances the ribbing is vertically positioned. There are no examples of spiral ribbing as shown on some earlier examples from Holland (Ypey 1962-63, fig 40). Arcaded trails appear on three examples (I, GL2; IV, GL10; IV, GL29) all of which probably belong to the funnel beaker stage of the development. Some of the Scandinavian funnel beakers particularly from the Birka graves (Arbman 1943, plate 190:2) exhibit rims of a different coloured glass usually in dark blue or green on a lighter vessel. Other Scandinavian examples from Helgö and Kaupang suggest that this was a relatively common form of decoration. There are no examples from 'Hamwih' and this is a significant difference between the two groups of material.

Conversely, the 'Hamwih' series shows two specific decorative features which are rare elsewhere. The most remarkable examples are the seven vessels which have a rod twisted with an opaque white spiral surmounting the rim (IV, GL24/27; V, GL3; V, GL13; V, GL19; V, GL29: XX, GLl; XX, GL4). The rod is smoothed against both interior and exterior vessel surfaces and is applied in such a way into the contour of the rim that it almost escapes attention. The production of this reflects considerable technological skill. On only one example is the rod not smoothed against the vessel surfaces (V, GL29). Here the rim is unusually narrow and the form indecisive, perhaps representing a vessel of slightly inferior quality. In general the rods are applied to the rims of the later funnel beakers although one example (V. GL3) surmounting a rim belongs to the intermediate stage of development. Twisted rods are known as decorative features from Roman times appearing not only on vessels but also on armbands and similar objects. They vanish completely during the Migration Period and

reappear only in late 7th century Scandinavian contexts where they are used as horizontal or vertical trails on beakers and bowls. By this time the trails appear to have the coloured spiral twisted within the rod itself. This is usually denoted as filigree decoration. The rods from 'Hamwih' belong to the same technological tradition although the opaque white trailing is twisted directly against the rod and then marvered to form a smooth surface. The significance of filigree decoration is discussed below with regard to another 'Hamwih' fragment.

Another decorative feature rarely found elsewhere is the application of horizontal marvered trails (here opaque yellow) on the rim itself as well as on the upper part of the body. Two fragments survive in the material (V. GL20/26 and VI, GL24) both belonging to the later part of the funnel development. It may be significant that both vessels are green rather than blue and this is discussed below with regard to the importance of colour. The use of opaque yellow marvering is itself a fairly common decorative element on certain Scandinavian types and is one which rarely appears before the 8th century. In many instances it appears in combination with filigree rod decoration particularly on squat jars and bowls and is a characteristic element of the later high quality wares. However, it is not recorded on any other funnel beaker outside 'Hamwih'. An additional fragment (XX, GL9) with the same type of decoration may also belong to a funnel beaker.

Only a few of the remaining fragments can be positively identified. These include two fragments from squat jars or beakers. One of these (IV, GL3) from a purple vessel shows evidence of vertical mould-blown corrugated ribbing while the other from a dark green vessel (V, GL49/50) shows the remains of horizontal applied opaque yellow trails below the rim. The general form is one which is known in England from as early as the 6th century although the examples here must be somewhat later on decorative grounds. In Scandinavia the types survive into the 8th century and possibly even longer. Ribbed decoration and bright colouring are not uncommon on these vessels, a useful example being the ochre-coloured ribbed vessel from Grötlingbo parish, Gotland (Nerman 1969. plate 85). In view of the large number of these vessels appearing in Kent (Harden 1956, 141) an English source of manufacture is not unlikely.

Perhaps the most interesting fragment is from a beaker with filigree rod decoration (V, GL22). This type of decoration which is formed by the application of a glass rod twisted with trails of a different colour, usually opaque white or yellow, appears to be characteristically Scandinatian. This form of decoration has been discussed at length by Holmyvist (Holmqvist & Arrhenius 1964, 250) but certain points are worth mentioning here. The distribution outside Scandinavia is confined to a single Continental example and two from Britain, one being from the Brough of Birsay, Orkney, discovered in a Norse context, and the other from the Anglo-Saxon monastery at Whitby, Yorkshire. Neither can be closely dated. The Scandinatian finds are most numerous in the trading centres of Helgö, Sweden, and Kaupang, Norway, where they exist in fragmentary form. Complete vessels with filigree decoration are known from burials. The graves at Hopperstad, Norway (Hougen 1968, 100), and Birka, Sweden (Arbman 1943, plate 189). have both produced fine examples. The general dating of filigree decoration seems to lie within the 7th and 9th centuries. The 'Hamwih' fragment shows a rod decorated with an opaque yellow trail and almost certainly belongs to a beaker.

One of the most unusual fragments in the material is an example of green glass containing red streaking within the metal (V. GL32). Streaked glass of this type is known mostly from window glass quarries from the Anglo-Saxon monasteries of Wearmouth and Jarrow (Cramp 1970). and from Repton. St Wystan (kindly shown to me by Mr Martin Biddle), none of which can be dated much before the 7th century. Its appearance in vessel glass is therefore of some interest. The fragment belongs to a small delicate vessel decorated with narrow applied trail:, which have subsequently been lost leaving slight grooves to indicate their position. Streaking within the metal appears to be caused by the use of a colouring agent whose melting point is significantly higher than the temperature used to produce the melt. Few vessels are known with this type of decoration and there are certainly none in Scandinavia. The only other British example is an unpublished fragment from Northampton (examined by kind permission of the Northampton Development Corporation). The effect of the colouring is almost certainly a deliberate one.

A fragment of dark green glass (VI. GL12) decorated with a single applied opaque yellow trail belongs to a further small hand vessel. probably a cup with rounded profile. The colouring of the trail has been much weathered. The loss of trails in this way seems to be characteristic of many of the 'Hamwih' samples and could be caused either by idiosyncratic local soil conditions, or more probably by ineffective application of the trails in the first instance. Glasses which appear in Scandinavian contexts in this period tend to have marvered rather than simply applied yellow trails and survive deposition in the earth; relatively unscathed. Nearly all the 'Hamwih' fragments with applied yellow trailing show the trails to be extremely weathered if not lost completely. This technical difference in the production of trailing between the two sets of material may indicate different centres of manufacture.

Only one bowl can be positively recognized in the material (IV, GL18 38). The two surviving rim fragments show a thick folded cavity rim, slightly inturned and rather crudely formed. The style is similar to that of the bowl mentioned above from Valsgärde (Arwidsson 1932, plate XIV) which also has a folded cavity rim. In terms of quality the 'Hamwih' bowl is inferior and is unlikely to have been decorated to the same extent. Amidst material which is generally of a high standard the bowl is a notable exception.

At a time in which a large proportion of surviving glasses in NW Europe appear to be of eastern origin or inspiration one might reasonably expect to find examples among the 'Hamwih' fragments. The only candidate (IV, GL20) belongs to a globular-shaped vessel. probably a jar or small bowl. The vessel is light blue and decorated with white marvered trails combed into festoons, a technique requiring considerable craftsmanship. This type of decoration is uncommon on earlier Anglo-Saxon vessels although it sometimes appears on the bell beaker form. Only one Scandinavian example is known, from Dollerupgaard, Denmark (Ekholm 1958, fig 13). dated to the Migration Period. In the later part of the millennium opaque white marvering is rare in any decorative form although the N Italian regions appear to have produced vessels with this type of ornamentation into the 8th century. Beyond this time the evidence is strictly confined to the products of Arabic houses, some of which seem to have found their way into Britain, appearing in Fife and in Chichester (Harden 1956, 155) via the Rhineland route\. Arabic glasses in Scandinavia such as the fragments from Järfälla parish, Sweden (Lamm

1941, 7) were presumably traded through eastern Europe. The eastern material known from both Britain and Scandinavia in this period is usually of the phial, flask, or jar form and has no Teutonic equivalents. The festooning, however, is usually thick and heavy, quite unlike the feathered nature of the 'Hamwih' example. Furthermore in terms of colouring the Arabic glasses are often heavily coloured or opaque. The 'Hamwih' vessel is light blue and compares favourably with the colouring of the other 'Hamwih' fragments in the colour discussion below. It would seem more likely that the vessel is of western rather than of eastern extraction and probably the work of the Lombard houses whose products are noted as being characteristic in form (Harden 1972, 85). It can probably be dated to the 8th century and represents the only obvious import in the material. More significant perhaps is the absence of known Eastern glasses here at a time when they were thought to have been relatively common in the British Isles.

The only objects not belonging to vessels are the glass rod waster (IV, GL15) and the bead (XX, GL15). The former is a rod of glass approximately 45 mm in length and 4 mm in diameter. The colouring which is a dark blue with patches of green suggests that it was formed by melting down existing waste fragments which were then pulled and twisted into a rod. In this form the rod could be cut and remelted to produce other objects such as beads. Beads which may have been produced by this method would be characteristically dark in colour reflecting the mixture of colours used in the original melt. The rod is cut at both ends at points where the colour tends to green rather than blue, presumably because the green coloured glass was preferred for the objects required, and the dark blue part consequently survives as waste. The presence of this object suggests the possibility of local glassworking at 'Hamwih'.

The dating of the material which is based purely on typological evidence indicates that the majority of the fragments belong to the 8th and 9th centuries. The earliest vessels represented, notably from the palm cup series, must have existed before this time although probably not before the mid 7th century. The absence of other forms, especially the latest claw beakers and the bag beaker which seem to have existed at that time, is therefore strange. If this dating is correct, on the evidence of the group of fragments studied here one could conceivably assume that 'Hamwih' was in a different area of distribution from Scandinavia and even Kent, where the bag beaker seems to have been a local form. Examination of further material from Saxon Southampton may prove or disprove this. According to the glass types the settlement continued well into the 9th century when the developed funnel beaker appears. In Scandinavia the funnel beaker continues into the 10th century without further typological development. The latest 'Hamwih' funnels belong to either 9th or early 10th century contexts and in the absence of other known forms of the period the problem remains unresolved.

The material shows without any doubt that a continuity of types existed in this country after the 7th century and ample evidence for this is given by the palm/funnel series. The material also shows that the squat jar which originated in the 6th century continued well into the 8th. The only obvious shortcoming is the limited number of types of vessel identified among the fragments. The great variety of forms and decorative elements known from 6th and 7th century contexts is no longer apparent and although development continues it does so on only a few specific types. One question which arises concerns the extent to which the 'Hamwih' wares were representative of those used in the rest of England. Some evidence above suggests that they were not but this can only be established by examination of material from other sites of the same period. 'Hamwih's' wealth in glass may be due to its strategic commercial position which enabled it to import goods and consume them locally in greater quantity than other centres less accessible to trade.

Another major question concerns the relationship of the 'Hamwih' glass to vessels on the Continent and in Scandinavia. One might be excused for assuming that a place such as 'Hamwih' with wide-ranging commercial contacts would receive a considerable quantity of imported vessels. In the absence of suitable parallels elsewhere this is difficult to prove, but there are several indications that this was *not* the case. The twisted rod applied to the top of the rim, the yellow marvering on the rim itself, the preponderance of badly applied yellow trailing at a time when marvered trailing was more common, and the continued occurrence of the cavity rim, are all either extremely rare elsewhere or unique to 'Hamwih'. Added to this is the absence of vessels of eastern origin which are known from other sites. Until more material has been examined it is impossible to determine the relevance of these features in a north-west European context, but for the time being at least the available evidence suggests that the circumstances of glass development in these regions is far more complex than originally believed.

Judging from the number of fragments from the five sites it would appear that the inhabitants of the town were well accustomed to using glass vessels. Nearly all the identified examples are from drinking vessels and many are of high quality. The quantity of fragments alone signifies that supplies were readily available either through the commercial nature of the town or through the presence of a local industry. The only evidence for the latter is in the twisted rod waster which suggests at least that glass working took place on a very basic level. The production of the vessels identified here would require considerably more sophisticated techniques. There is no evidence for glass making in the vicinity of the town but the unique characteristics of the material cannot rule out the possibility.

Colour

Colour is often employed as a descriptive element and the use of a coding system here is an attempt to make it a more accurate criterion. The majority of the fragments can be traditionally described within the range of light blue to light green on a completely subjective scale. By using shades representing combinations of the three primary colours (red, blue, and yellow) and by obtaining values for each fragment a more precise definition can be obtained. The blue/green fragments are coloured by a combination of blue and yellow pigments, the degree of blueness determined by the depth of blue pigment and the degree of greenness determined by the depth of yellow pigment. The varying thickness of the vessel walling affects only the lightness/darkness feature of the colour (ie the extent to which it transmits light or the extent of wear) and not the combination of the primary colours. Assuming that the glass melt is heated to a sufficient temperature to allow the ingredients to mix homogeneously the colour will be consistent for each part of the vessel. The colour atlas used, the *Colour Atlas* produced by Imperial Chemical Industries Ltd, provided three parameters relating to the depth of blue (B), the depth of yellow (Y), and the use of a neutral filter (N) enabling the slightest variation in colour to be recorded. Even under controlled conditions of white light a certain

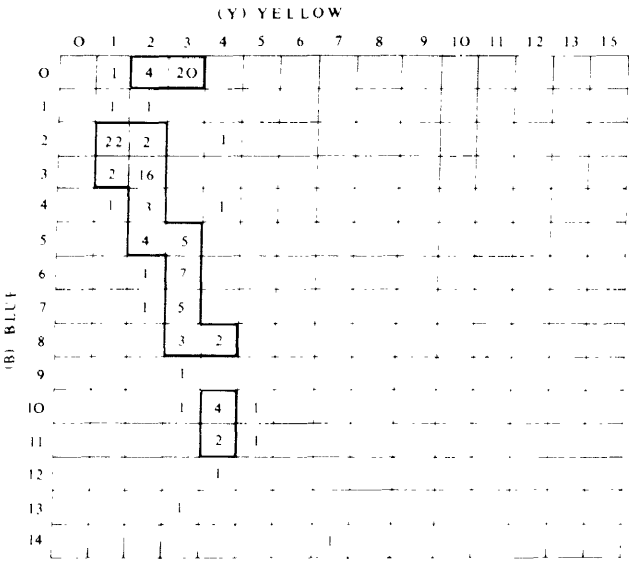


Fig 11,7 Colour definitions of 'Hamwih' glass fragments

amount of subjective choice is still involved but the scope of that choice is minimized. With only a few exceptions the majority of the fragments here show combinations of the blue and yellow pigments. Fig 11,7 shows the appropriate relationship between the fragment and the increasing depths of blue and yellow. Each square represents a specific shade and the numbers in the squares denote the numbers of fragments matching that shade. Ninety-five fragments were plotted. The values given by the neutral filter (N) relating to thickness and wear were not included. Squares in which a minimum of two fragments appear are heavily outlined in an attempt to form groupings.

The general distribution shows that the depth of the blue pigment (0-17) is significantly more varied than the depth of the yellow pigment (1-7). The bulk of the material lies within the range B (0-11) and Y (1-3). This must reflect chemical differences, the yellow indicating the presence of the stable non-colouring ingredients and the blue the colouring agents for these particular glasses. It is hoped that at a later date it may be possible to isolate the colouring agents by physical examination and relate them quantitatively to the colour scale.

The fragments appear to fall into three groups although at this stage and with this number of fragments it would be unwise to place too much emphasis on them. They do however show that the 'Hamwih' glasses are in the main confined to a certain area of the colour spectrum and that the use of colour coding is a potentially useful instrument in glass analysis. Fragments from the various sites are distributed throughout the table and there is no correlation between any specific site and any one of the groups. The most obvious group which lies at the top of the table contains twenty-four examples and varies only in depth of yellow Y (2-3). The colour can best be described as light green in comparison to the greater depths of blue in the remainder of the material. The group contains possibly twenty-one examples of the later palm/funnel series including the two fragments with marvered rims. Although no coding has been employed on material from elsewhere certain Scandinavian vessels including several funnel beakers and the Valsgarde bowl appear to be of the same shade. Many Scandinavian vessels exhibiting opaque yellow marvering are similarly coloured. It would not be statistically valid to draw conclusions from the evidence as it stands but with the major part of the 'Hamwih' glass still to be examined it seems as though colour is potentially a useful discriminating factor.

12 The coins

by *Marion Archibald* and *Daphne Nash*

Roman period

by Daphne Nash

SARC XX, F123, C3
AE Follis, Constantine I, mint of London, AD310
Obverse: IMP CONSTANTINVS PF AVG
Reverse: SOLI INVICTO COMITI--$\frac{\text{TIF}}{\text{PLN}}$
Reference: *Roman Imperial coinage,* **6,** London 121

Saxon period

by Marion Archibald

SARC VI. 0560/3580, Cl
MEROVINGIAN
Denier, before AD 700
Obverse: Bust to right *11b* MIAEIU-devolved form of legend IN PALACIO
Reverse: Cross pattée with anchor hooks emerging from ends in anti-clockwise direction
Weight: 0.78 gm (but see below)
Reference: de Belfort 1893, cf no 3532
The weights of the coins in Belfort of this type showing a similar degree of devolution are on average c 1.20 gm. At face value therefore the weight of the Southampton coin would appear to suggest that it belonged to the light-weight series with a date after AD 700. However, the almost literate legend and the general aspect of the coin suggest that it should belong to the heavy series before AD 700. A decision to disregard the low weight in this way is strengthened by the fact that other coins from these excavations, although they may appear to be little affected by corrosion, are systematically lighter than they 'should' be on other grounds. It therefore seems justifiable to suggest that this coin was heavier at issue than its present weight.

SARC I, Fl5, C2
FRISIAN
Sceatta, *c* AD 700
Obverse: 'porcupine' with////below
Reverse: TOT II in square (no extra pellets)
Weight: 0.896 gm corroded (see above)
Reference: BMC type 5; Metcalf 1966, fig i, Rev type A

SARC I, F16, C3
ANGLO-SAXON
Sceatta, *c* AD 720
Obverse: 'porcupine' with////below
Reverse: Runic inscription AETHILIRAED in two lines within triple circle
Weight: 0.857 gm (but see below)
Reference: BMC, Mercia No 4

This coin is from different obverse and reverse dies from the three previously-known. good-style Aethiliraeds: BMC 4; BM 1975/1/8/1 found at Stone-by-Faversham; Mack Sylloge 312. The circles in the Southampton coin are composed of less clearly defined pellets than in the other coins. The weights of these three coins, 1.23, 1.30, and 1.06 respectively, are again systematically higher than the Southampton specimen, but the dies are so similar that one would not expect it to be appreciably later in date. Again, despite its apparently good condition, this coin has probably suffered some loss of weight from that at which it was originally struck.

SARC V, F32. C4
ANGLO-SAXON
Sceatta. 2nd quarter of 8th century
Obverse: Face surrounded by 7 pellets in circles with cross below face
Reverse: Fantastic bird to right; cross with pellets in angles below head; pellet in circle over back
Weight: 0.693 gm (but see above)
Reference: BMC type 49

SARC V, F27. C5
ANGLO-SAXON
Sceatta, 2nd quarter of 8th century
Obverse: As V, C4 above
Reverse: As V, C4 above except disconnected-pellet cross below head
Weight: 0.291 gm corroded

SARC XX, F131Q. C6
ANGLO-SAXON
Sceatta. mid 8th century
Obverse: Bearded facing bust with cross on either side of head; shoulders formed of three concentric arcs
Reverse: Fantastic animal to left, head turned back over shoulder to right
Weight: 0.305 gm chipped and corroded
Reference: BMC type 41

SARC XX. F131R, C7
ANGLO-SAXON
Sceatta, mid 8th century
Obverse: As C6 above except shoulders formed of three pairs of straight lines forming open triangular shape
Reverse: As C6 above
Weight: 0.503 gm chipped and corroded

SARC IV. unstratified, C8
ANGLO-SAXON
Sceatta, mid 8th century
Obverse: Fantastic animal
Reverse: Man holding two crosses
Weight: 0.762 gm corroded
Reference: BMC type 23 (var)

General editor's note: This section has deliberately been restricted to a catalogue as a volume on the "Hamwih coins is in preparation. General discussion will be found in Addyman & Hill 1968, 76-91.

13 The bronze, iron, lead, and wood

by *David A Hinton*

Bronze objects

The lack of precious metal remains one of the surprising aspects of the archaeology of Saxon Southampton, and most of the bronze objects are functional rather than solely decorative. All numbers have the SARC prefix.

Mount
V, F16. AE16. Oval mount with central perforation, and incised cross with pear-shaped arms and segmented space-fillers. 'There is a distant comparison to the design on the enamel of the Minster Lovell jewel, which has the broad ends of the cross arms at the centre (Hinton 1974, no 22). L 36 mm (Fig 13,1, no 1)

Pins
A number of pins was illustrated by Addyman and Hill (1969, fig 26), and those from Melbourne Street do not extend the range significantly. Eight pins with heads were found, and five shafts probably from pins. None is illustrated.
IV. unstrat, AE4. Pin with flat plate head, broken across. L 51 mm
V, unstrat, AEI. Pin with spherical head. L 4.5 mm
XX, F131, AE4. As V, AEI. L 61 mm
XX, F124, AE2. Pin with spherical, pointed head. L 41 mm
V, F16, AE17. Pin with wrythen head (cf Addyman & Hill 1969, fig 26, no 9). L 61 mm
V, unstrat, AE59. As V, AE17. L 49 mm
XX, F70. AE9. Pin with spherical head, the upper half with radiating lines. L 43 mm
V, unstrat, AE2. Pin with twisted wire head, ?recent

Strap-ends or ear-scoops
V. F27, AE14. ?Strap-end. broken half-way down the shaft. so that only the split end with a single attachment hole survives. Two full-length examples illustrated by Addyman and Hill (1969. fig 27. nos 1 and 2) end in spoon-like terminals; these are reminiscent of earlier toilet articles (Brown 1974, fig 53). which however have ring-fittings, not rivets to attach to a small ribbon or strap. L 21 mm (Fig 13,1, no 2).
V, F27, AE15. ?Strap-end. similar to V. AE14, and from the same deposit. L 24 mm (Fig 13.1. no 3).
XX. F116, AE10. Corroded strip, both ends flattened from a rectangular centre. one apparently spatulate. L 38 mm (Not illustrated).

Chain
V, F17, AE11. A small quantity of close-meshed oval links. Similar chain has been ascribed to mail (Holmqvist *et al* 1970. 1980), but a purse or similar pouch is another possibility. Links L *c* 13 mm (Not illustrated).

Decorated strip
XX. F70, AE36. Flat strip, broken at both ends. Lozenge-shaped centre with four circles stamped on it, tapering to strips with running pattern of pairs of stamped dots. L 41 mm (Fig 13.1, no 4).

Buckles
The two buckles found were both in graves on Site XX, associated with iron weapons. They are very common in 7th century graves (eg Evison 1963, figs 17 and 18). There is one from a 7th century context at Winchester (Hinton forthcoming).
XX, F183, AE28. Single frame buckle with plain rect-

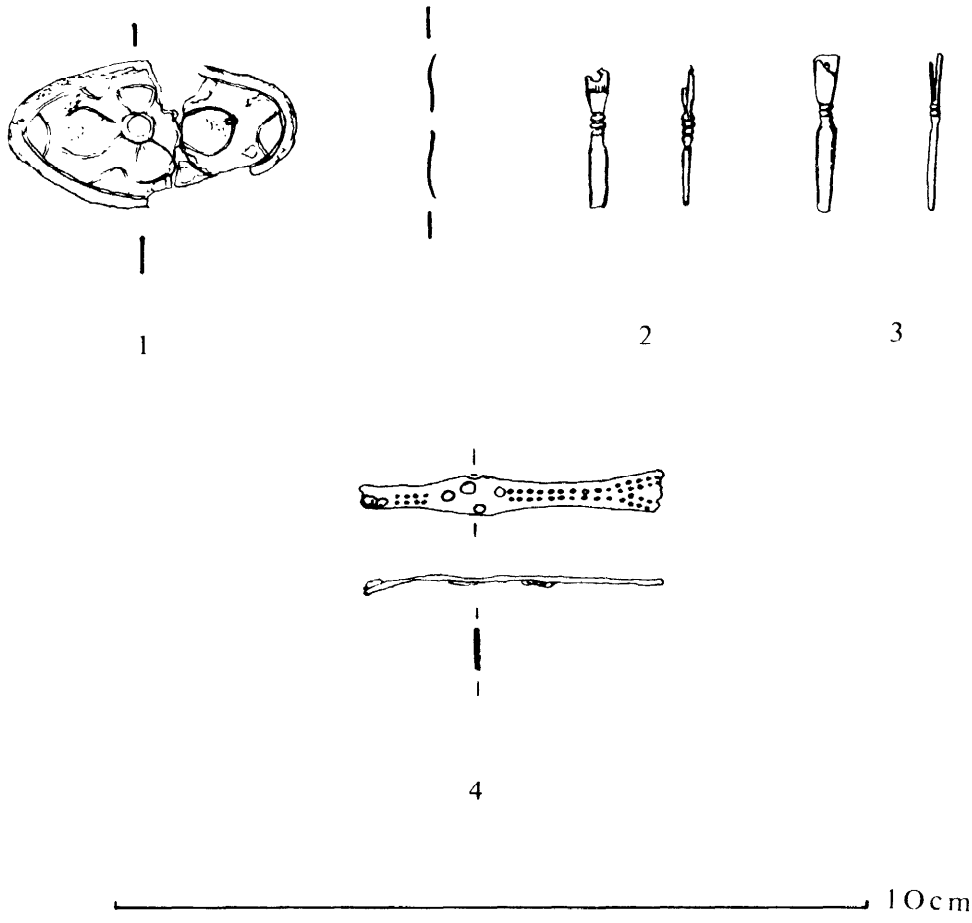


Fig 13, 1 Bronze objects. 1: Mount, V, AE16: 2, 3: ?Strap-ends, V, AE14 and V, AE15; 4: Strip XX, AE6. Scale 1:1

angular plate, now detached and broken, folded round the pin bar and secured by two rivets. Corrosion within the frame may be from an iron pin. Loop H 17 mm. Associated with a seax and a spearhead (XX, Fe25; XX, Fe36).
XX, F2N8, AE11. As XX, AE28, but with extant bronze pin and more complete, slightly tapering, plate. Frame H 18 mm. Associated with a spearhead (XX, Fe32).

Other objects
There were no other complete bronze objects. A hollow-cast handle, a hook, and two possible catch-hooks are recognizable. There are also fragments of twisted wire, discs, etc.

Iron objects

The iron from the Melbourne Street sites, as elsewhere in Southampton, is heavily corroded, and even with X-ray photographs few positive identifications can be made. None is illustrated in this report. The only objects which extend the range illustrated by Addyman and Hill (1969, 63-6) are the weapons and the two rivets.

Knives
Twelve objects can be identified as knives, with a further fourteen as possible examples. Eight are recognizable as having curved blades and backs; one is angle-backed (IV, FE133). They do not extend the range described by Addyman and Hill (1969, 65).

Weapons
Apart from knives, three objects can be identified as weapons. The X-ray photographs only show indistinct outlines, but it is hoped that more complete analyses may be possible when restoration and cleaning have been completed. The descriptions given here are therefore only preliminary.
XX, F183, Fe2.5. Seax. From a grave; see also spearhead XX, Fe36 and buckle XX, AE28. It has a curved back, reduced for the scale tang, and tapers to a sharp point. The cutting edge is very ragged, but probably had a slight convex curve. The curved back is probably a Con-

tinental characteristic, and Miss V I Evison has suggested that this object may prove to be Frankish. L *c* 670 mm.
XX, F183, Fe36. Spearhead. Broken. Slender, ?leaf-shaped blade, and split socket. From same grave as Seax XX, Fe25 and Buckle XX, AE28. L *c* 126 mm, W *c* 160 mm max.
XX, F288, Fe32. Spearhead. Long, leaf-shaped blade, widest point about two-thirds from the tip. Socket crushed, but probably split. From same grave as Buckle XX, AE11. L *c* 330 mm.
XX, F288. Fe33. A fragment of wood preserved by iron oxide in its pores. Apparently circular in section, and so possibly the shaft of the spear.

Rivets

Two objects identifiable as rivets were found, in the same feature. Their size suggests that they may have been from a boat (cf Bruce-Mitford 197.5, fig 277). and, if this is so, they are the first direct evidence of the maritime activities of Saxon Southampton.
XX, F123, Fe5. Rivet. with fixed head at one end, and rivet plate corroded to the shank at the other. The thickness of the timbers clasped would have been *c* 650-700 mm. L *c* 90 mm.
XX, 123, Fe19. Rivet, as XX, Fe5. L *c* 90 mm.

Patches or nail rivet plates

V, F16, Fe21. Lozenge-shaped plate with central perforation (as Addyman & Hill 1969, fig 24, no 5). L *c* 50 mm.
IV, F297, Fe96, As V, Fe21.
IV, F13, Fe47. Plate with irregular outline.

Nails

Very common, but too corroded to permit classification. Five suggest use as door- or strake-nails because of their size, or their domed heads.

Hooks

Seven, including two possible door pintles, can be distinguished from bent nails.

Other objects

IV, F2350, Fe123. Perforated sheet, probably part of a sieve or colander.
V, F17, Fe25. As IV, Fe123.
IV, F17, Fe16. Styliform object, ?pin (cf Peers & Radford 1943, 64-5). L *c* 110 mm.
XX, F70, Fe13; XX, F114, Fe37. Two ?pin shafts.
IV'. F61, Fe120. Ring. D *c* 27 mm.
IV, Level D3-18, Fe399. Tube. L *c* 30 mm.

Lead working

Despite Continental references to English lead production, and 'Hamwih's,' favourable position to take advantage of any output from the Mendips, finds of lead remain infrequent (Addyman & Hill 1969, 71).
IV, F17, Pb1. Small sheet. 37 x 31 mm (Not illustrated).
V, Level H2-8. Pb1. Strip, flat on one face with bevelled edges. 72 mm (Not illustrated).

Wooden objects

The 'Hamwih' soils rarely preserve wood, except at the bottom of some of the wells. The only fragment from the Melbourne Street sites was preserved by iron oxide replacing the tissue, and is described as XX, Fe33 in the Weapons section, where it is tentatively suggested that it is the shaft of a spear.

14 The stones
by D P S Peacock

As on the worked bone, bronze artefacts etc, a complete report will be published on the stone from all the 'Hamwih' sites at a later date. The lists here are therefore kept to a minimum.

Introduction

A very large number of rock samples was recovered. The majority consist of rounded pebbles or boulders, but some are shapeless fragments. Most are of local origin, emanating from the Tertiary limestones of the Isle of Wight, best known in such quarries as those of Quarr or Bembridge. In addition rounded pebbles of flint are common and there are occasional fragments of sandstone and mudstone from local Tertiary beds.

Although local, they were nevertheless imported to the site. Since the majority are rounded pebbles, perhaps picked up on a beach, they could have arrived as ballast in ships, principally those plying to and from the Isle of Wight. Doubtless on arrival at 'Hamwih' they would have been utilized for other purposes such as flooring, hard standings, or as thatch weights.

Some of the shapeless fragments are of more distant origin, though again ballast would seem the most likely explanation of their presence. These are:
1 Biotite-muscovite-granite from south-western Britain or Brittany (IV, F3500; VI, F1).
2 Phyllite of similar origin (V, F10).
3 Unidentified metamorphic or igneous rock; black, fine grained and highly indurated (IV, F 19).

Carstone

Several fragments of ferruginous sandstone were recovered. Since they are very rich in iron it is possible that they were imported as ore. However, it is equally plausible that again they served as ballast. Outcrops of carstone are widespread in the Cretaceous and Tertiary deposits of the Hampshire basin, and these pieces could have come from a number of places such as the Folkestone beds of the Liss area, the Heathland around Wareham, or, more probably, the Isle of Wight, where extensive deposits are developed (IV, F50; IV, F13; VI, F39; VI, F120; XX, F130).

Querns

None of the fragments show any typological features that might suggest their use as querns. However, a number of pieces of the well-known Mayen lava are present. and it is almost certain that they were imported as querns or mills (I, F4; I, F26/10; I, F27; I, GC; IV, C2-3; IV, F-3521. V, F12; XX, F131).

Whetstones

Only four whetstones were recovered although one further fragment of grey-black slate seems to have served for sharpening (IV, GC, St4).

One of the stones is of quartz-mica-schist now generally regarded as an import from Norway (VI, F1). Another is of a grey quartzite of uncertain origin (IV, F9). The two remaining stones are similar and are of a hard grey indurated limestone, possibly from the Carboniferous of the Mendips (V, F21; IV, 12, St13).

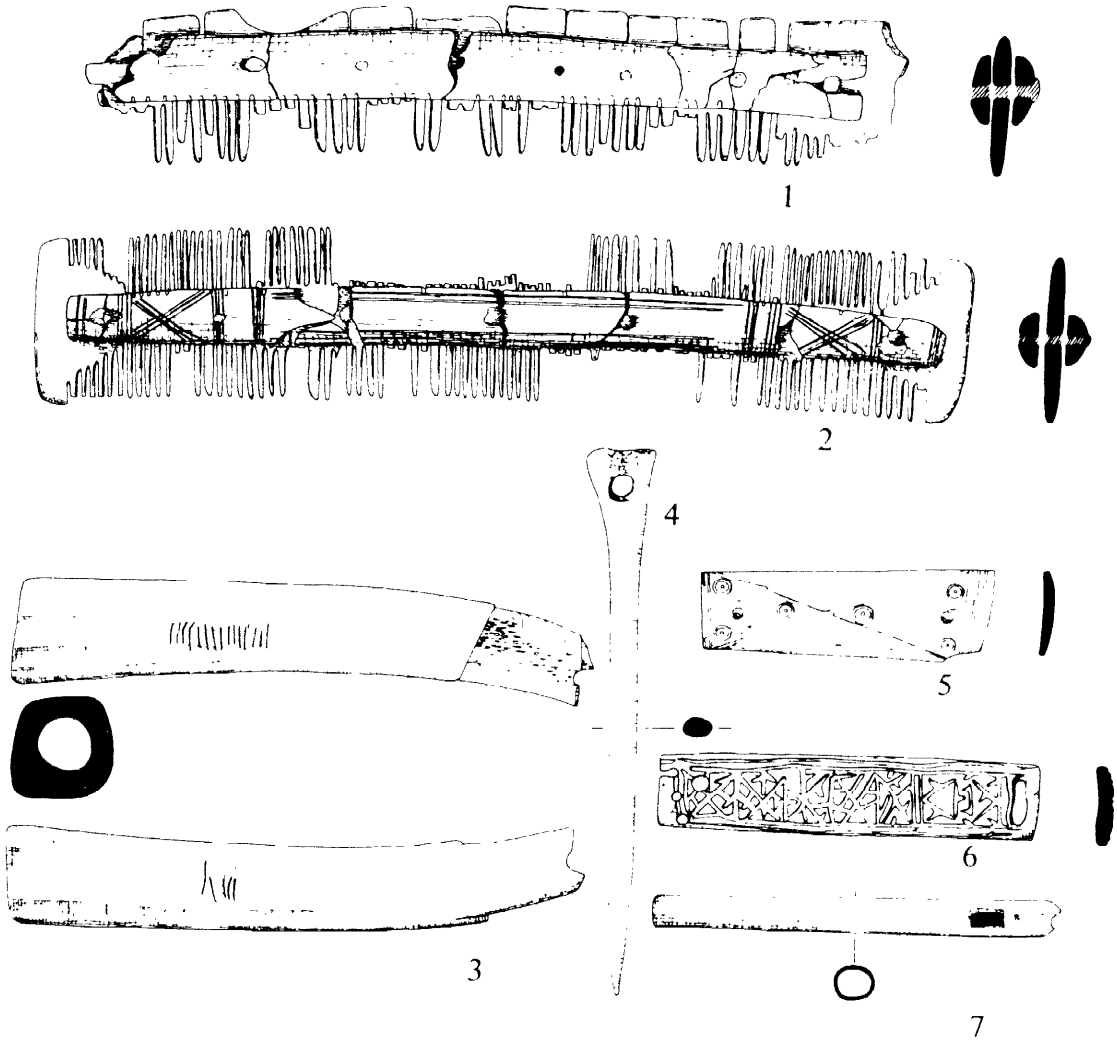


Fig 15, 1 Bone and antler objects. 1-3: combs, IV, CW110, 1, CW15, and V, CW5; 4: Needle, IV, CW 19; 5, 6: Mounts, 1, CW20 and V, CW252; 7: Whistle, IV, CW16. Scale 2:3

Spindle whorl

One spindle whorl of hard grey mudstone was recovered. Its origin is uncertain but it may come from the Mesozoic rocks of the Hampshire basin (XX, F123, Stl).

15 The bone and antler objects

by *David A Hinton*

The enormous quantities of bone from Southampton (see Animal bone report below) provided raw material for an important industry, the production of tools (Addyman & Hill 1969, 75-7). In the descriptions here, the identifications of species arc by Miss J Coy, of the DoE Fauna1 Remains Project, and by Mrs J Bourdillon, to whom I am grateful: they discuss bone-working in their report (below p 97).

Combs

The technique of manufacture has been described by Addyman and Hill (1969, 75). Double-sided examples outnumbered single-sided ones in a ratio of about 12: l. Decoration, if present, consisted of saw cuts, incised grooves, contour lines, panels and diagonals on the connecting plates, and a ring-and-dot motif on one end segment. One rivet-hole has traces of red colouring preserved and protected below adhering dirt.

The connecting plates are usually, but not always, antler, one of the exceptions being a single-sided comb, on which bone, probably a rib, was used. Some of the thicker teeth segments may have been antler, others were certainly bone.

The number of teeth per centimetre varied from as few as two to eleven. Manufacturing waste included a broken antler connecting plate rough-out.

IV. Level 10, CW 110. Comb, single-sided. Broken at one end. L 165 mm (Fig 15, 1, no 1).
I. F14, CW15, Comb, double-sided. The simple decoration on the connecting plate is typical. L 188 mm (Fig 15, l, no 2).
IV, Level X, CW109. Comb. End segment with ring-and-dot decoration. H 49 mm.
V, F16, CW5. Comb. Curved handle cut from an antler. Broken (cf Addyman & Hill 1969, plate VIIA, centre, for complete example with straight handle). A study of the distribution of this unusual type of comb may prove rewarding (Roes 1963, 22-3). The irregular cuts on both sides of the handle are deliberate, but do not appear to be meaningful. L 109 mm (Fig 15, 1, no 3).

Needles

There were fourteen complete or attributable needles, made, where recognition was possible, from pigs' fibulae. At least one had not had a hole bored through its head.
IV, F3, CW19. Needle. Selected as a typical example. L 121 mm (Fig 15, 1, no 4).

Pins

Only three were definitely recognized, the two complete ones being 390 mm and 480 mm long.

Points

The shafts of two long, circular-sectioned, broken points may have been from needles, but were apparently not from pigs' fibulae.

Pin-beater

VI, F33, CW17. Double-ended implement probably used in weaving-the only one found, although such objects are common on most Saxon occupation sites. L 136 mm (Not illustrated).

Spindle- whorls

XX, F70, CWl. Probably antler. D 29 mm.
IV, F121, CW10. A femur head. D 43 mm (Neither illustrated. For a third, see Stone report.)

Handles

V, F20, CW1. Tapering, rounded antler handle, with a hole drilled into the centre of the (broken) narrow end. Two small notches in the sawn-off wider end. L 51 mm (Not illustrated).
I, F5, CW5. Fragment of a tubular handle, with incised transverse grooves and a rivet-hole. L 53 mm (Not illustrated).

Mounts

I, F4, CW20. Tapering, slightly convex strip cut from horse or cow rib. Ring-and-dot and incised line decoration. Iron rivets pierced through centre at both ends. L 58 mm (Fig 15, 1, no 5).
V, F14/15, CW252. Strip with flat back and slightly rounded upper surface. Cut from an antler. Crude, deeply incised, jumbled geometric ornament, pierced by a secondary hole at one end. Three attachment holes at one end, slot at other. No trace of corrosion on attachment piercings, so perhaps intended to be sewn onto textiles or leather. L 76 mm (Fig 15, l, no 6).

Other objects

IV, F247, CW16. Broken flute or 'penny-whistle'. Probably made from a goose ulna. One finger-hole extant, broken across another. The blow-holes were probably cut to respect and remove the foramen. Such flutes are common from the Palaeolithic onwards: there are contemporary examples from Thetford, York, Haithabu, and Birka (Megaw 1960). L 80 mm (Fig 15, 1, no 7).
IV. F111, CW73A. Red deer antler tine trimmed as though for a handle, and cut at one end to leave a small circle with the centre bored out. This is thought to be a pottery stamp, and is further discussed in the Pottery report (p 42). L 81 mm (Fig 10, 2, no 1).

THE MELBOURNE STREET ENVIRONMENTAL DATA

16 Human skeletal and dental remains by *Peter Cook*

Skeletal

Ten small fragments of human bone were found in the grave on Site XX, F128. These were examined directly and radiographically. The fragments comprise:

1 Most of the right petrous temporal bone with the adjacent posterior part of the temporal squamosa. This measures 56 x 40 x 36 mm. The mastoid process is short and coarsely pneumatized with individual air cells up to 8 mm in diameter. Finer pneumatization extends into the squamosa and to the petrous apex. The internal and external auditory canals are complete. Their size is within normal limits although smaller than usual, the internal meatus measuring 4 mm in its maximum diameter. The impression for the sigmoid sinus is rather narrow, but it is deep and the development and the overall size and proportions are otherwise those of a normal adult. A post-mortem defect exposes the attic of the middle ear, and the ossicles are missing. Radiographs show good detail of much of the bony labyrinth including the cochlea and the superior and lateral semicircular canals.

2 Three small fragments of the right temporal bone. The largest of these measures 27 x 18 x 11 mm and includes most of the glenoid fossa for articulation with the mandibular head together with part of the arcuate eminence more anteriorly. The articular surfaces appear normal with no evidence of osteoarthritis. Fine pneumatization extends into the posterior root of the zygomatic arch. The two smaller fragments measure 25 x 20 x 9 mm and 20 x 14 x 6 mm. These also show some pneumatization extending into the squamosa and into a short mastoid process as on the left side. The smallest fragment was traversed by the distal part of the facial canal which was of normal size. This fragment disintegrated before a radiograph was obtained.

3 A smooth slender blade of bone measuring 101 x 10 x 6 mm with slightly irregular margins. One surface is slightly convex from side to side and the other is correspondingly concave. This fragment is probably a part of the body of the sternum.

4 Five fragments of the mandible and maxillae. These together comprise most of the alveolar ridges of both sides. There are two fragments of the left mandible which fit together to measure 62 x 15 x 13 mm. The canine, both premolars, and all the molar teeth are present. The separation passes between the first and second molars. A slender fragment of the right mandible measures 65 x 16 x 4 mm. The third molar tooth is present and there has been post-mortem loss of both premolars and the first and second molars, the sockets of which are partially preserved. A piece of the right maxilla measures 37 x 15 x 11 mm and bears both premolars and the first molar. The first premolar is loose and is not included in the radiograph. In addition the sockets of the canine and the second molar teeth are present, these teeth having been lost post-mortem. A piece of the left maxilla measures 53 x 20 x 17 mm and bears all the teeth from the lateral incisor to the third molar. The lateral incisor is loose and was not included in the radiograph. A part of the socket of the central incisor is also present.

The bone structure of these fragments of the jaw is unremarkable both on direct inspection and radiographically. The bony interdental papillae are well preserved and there is a moderate degree of alveolar recession.

Dental

Sixteen teeth are present including eight molars. A further seven teeth which have been lost post-mortem show their sockets preserved to a greater or lesser degree. This may be briefly expressed in the following dental formula:

/ X 6 5 4 X / /	X X 3 4 5 6 7 8
8 X X X / / / /	/ / 3 4 5 6 7 8

where X represents all or part of an empty socket

There is no dental caries either on direct inspection or radiographically and there is no evidence of periodontal or periapical disease. Attrition of the enamel of the occlusal surfaces is very marked. The molar teeth are worst affected with complete erosion of the cusps and exposure of the dentine (Fig 16,1). On the first molars a sharp residual edge of enamel persists around the margins of the occlusal surfaces and this has fractured in several places. Where the surface of the dentine is exposed this is flat and 'work hardened' due to further attrition. There is no supragingival calculus but many of the teeth show hard brown or black ceruminal calculus on the apical side of the cemento-enamel junctions.

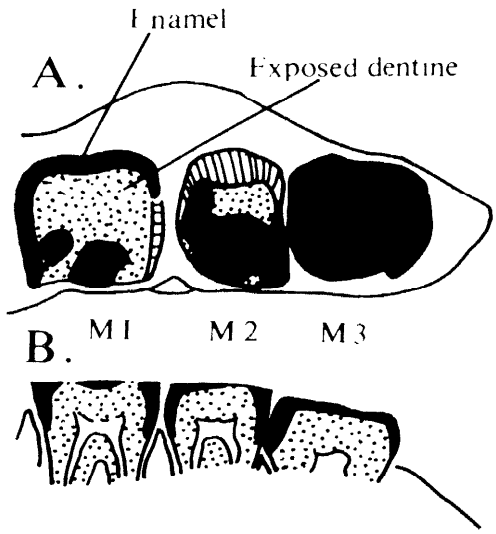


Fig 16, 1 Diagrams of (a) occlusal surfaces. (b) radiograph left maxillary molars showing progressive attrition of approximal enamel

Discussion

The fragments of the temporal bones show no evidence of pathology. The normal pneumatization suggests that major or repeated infection was not present during the growth and development in childhood. The right petrous bone is of normal adult size. Some of the features might seem to suggest smallness of stature but could equally be present in a subject of any height. The pieces of the jaw are too small to allow any attempt at standardized measurements either of the mandible (Morant 1936; Moore, Lavelle & Spence 1968) or the maxilla (Goose & Parry 1974). Similarly it is difficult to judge the sex of an individual from isolated specimens even when these are complete (Frake & Goose 1977). The present fragments are too small and worn to permit any reliable assessment.

The presence of eight molar teeth, however, enables an estimate of the age to be made according to the methods of Miles (1963). The differing degrees of attrition of the cusps and the occlusal enamel of the molars together with the presence of facets of wear on their mesial aspects are used to make an assessment of the length of time since eruption; Fig 16,1 shows diagrammatically the gradation of attrition in these three molars of the left maxilla. There were similar degrees of attrition of the corresponding molars in other quadrants of the jaw. The rate of wear may obviously vary in different cultures and between the sexes (Olsson & Sagne 1976a). Nevertheless Miles (1963) regarded it as fairly constant in people with similar dietary habits. His material was drawn from an Anglo-Saxon burial site of about 800 AD at Breedon-on-the-Hill, Leicestershire, and is, therefore, probably comparable with the present individual. An estimate based on molar attrition suggests that the subject is between 25 and 30 years of age. The degree of alveolar recession present would be in agreement with such an estimate. The presence of such marked tooth wear can probably be taken as an indication of a coarse fibrous diet, perhaps containing abrasive materials, and with uninhibited masticatory habits playing a part (Miles 1969). The use of the teeth as tools, for example in the preparation of basketry materials or skins, is an unknown factor to be considered even at a relatively sophisticated settlement like 'Hamwih', but would be likely to affect the anterior teeth more than the molars. Only one incisor and two canine teeth are present in this specimen and these also show very marked wear of enamel and exposure of dentine. Miles (1969; 1972) found abundant supragingival calculus in some Anglo-Saxon specimens. This was surprising in the presence of marked attrition as the latter would suggest a rough diet making the formation of such calculus unlikely. It was suggested that the calculus might have resulted from a terminal illness during which the rough diet was not maintained. If this be so then the almost total absence of supragingival calculus in the present specimens could indicate that there was no prolonged terminal illness.

Conversely, the abundant ceruminal calculus, although not justifying, in so few teeth, the assessment of a 'Calculus Index' (Sagne & Olsson 1977) is almost certainly related to the presence of oral debris and poor hygiene. There is no periapical and very little periodontal disease. There is also no evidence of dental caries, even of the marginal type related to fractures of the sharp, worn edges of the enamel although some fractures of this type if were present. Other authors (Brinch & Moller-Christensen 1049; Hardwick 1960) have indicated the probable inaccuracy of estimating the overall incidence of caries from that found in remaining teeth but the low incidence corresponds with that in other reports (Brothwell 1963; Brabant 1967). Attrition probably proceeds more rapidly than damage due to caries and reduces the retention of food (Olsson & Sagne 1976b). Within the limits of the small number of teeth examined and in common with other reports (Lavelle 1968) there is no evidence of overcrowding. This also has been regarded as a reflection of jaw development in response to vigorous chewing but some reduction of the mesial-distal width of the teeth due to attrition may also be partly responsible. There is no evidence of any other dental pathology such as nondevelopment, noneruption, or malposition.

17 The animal bones

by ***Jennifer Bourdillon*** and ***Jennie Coy***

Materials and aims

The bones under review come from stratified Middle Saxon levels on the five Melbourne Street sites (I, IV, V. VI, and XX) and form perhaps a quarter of all the animal bone which has been excavated from 'Hamwih' by SARC.

The Melbourne Street sites were dug by hand. In contrast to some other 'Hamwih' sites, there was no routine sieving, though the appearance in a feature of particularly small or fragile bones usually led to the dry-sieving of the immediate area. One large pit (F16 on Site V) was recognized in the early stages of its digging as being very prolific and much of it was sieved; it turned out to be the only source of small wild species and to yield most of the fish evidence from Melbourne Street. It cannot be known for sure how far this feature was typical nor how much similar material may have been missed elsewhere. The sieved and sievable material awaiting study from other parts of 'Hamwih' may in time throw more light on the question, but present evidence tends to support the immediate recognition of the feature as something wholly distinctive: a great wealth of tiny fragments has been recovered from all the main pits, and samples taken for seed flotation have also been scrutinized for bone. yet nowhere else on the Melbourne Street sites have small wild species been found. The sieved material from Site V, F16, is welcomed then as widening the range of species recovered from the Melbourne Street area, but no suggestion is made that similar abundance or variety should be inferred for other pits.

Both in quantity and in quality the Melbourne Street material forms a viable unit of study. There are nearly 50.000 identified bones or bone fragments and a further 40,000 splinters and shavings too small to be diagnostic. Though few of the larger bones are whole. this stems from deliberate Saxon activity and not from later decay, and the pattern of cuts is itself of interest. The standard of preservation may be gauged from the way in which bones that were chopped in Saxon times can be tautly reassembled today: on three separate occasions their halves had been preserved in different pits and yet could be fitted together as convincingly as though they had just been cut (Site I, F28 and F35; Site IV, F50 and F55; Site XX, F70 and F130). Such rare preservation gives confidence in the material as a solid basis for research.

The first aim has been to find out about the bones in and for themselves. Many measurements were taken. and the results are offered as a quantified description of a substantial and rare collection of Middle Saxon animal bone.

Secondly. it is from a detailed study of the bone that inferences may be drawn about the animals themselves and about the husbandry of the time. Any early economy

must have been based essentially and directly on the land, and 'Hamwih's' relatively large area of urban settlement and its extensive international trade would both have needed solid agricultural support. There can be no full understanding of the town if the key role of animals is ignored.

Lastly, we have tried to be alert to wider comparisons. Many references, for example, are made to the Haithabu report (Reichstein & Tiessen 1974). partly for the interest of its methods but also because this site presents valuable parallels to 'Hamwih': though geographically remote and-heyday compared with heyday-a little later in time, it nevertheless showed the same rapid development into a major European port. Other significant comparisons may be made when the animal bone from other sites is published, and we have tried to collate the 'Hamwih' information as clearly as possible so that it can be of use to workers from outside. In particular we look forward to the animal bone report from Dorestad, since traders from this dominant Rhine port must have had close links with their contemporaries at 'Hamwih'. We are grateful to Miss Wietske Prummel of the Biologisch-Archaeologisch Instituut der Rijksuniversiteit te Groningen. who is making a computerized study of the Dorestad animal bone, for full and friendly discussions on the progress of her work.

The archaeological context

The five Melbourne Street sites span a distance of 265 metres, with only two breaks (see Plan above, Fig 4.1). At the northern end Sites I and XX are quite close: not far to the south, sites V. IV, and VI (in that order) are contiguous. The bones therefore form a natural group for study and results may validly be given for Melbourne Street as a whole.

It could also be illuminating to break down the material into smaller working units, to test for convergence in the results or to identify and interpret deviations; but this presents some problems.

To divide the material on some time-scale would be of the greatest interest. 'Hamwih' existed as a settlement for 150 years and more, yet there is a serious lack of stratification and with this lack comes an absence of any clear phasing. Detailed studies of the main finds may eventually produce clues which, taken together, could lead to sub-division of the dating range; but such feedback would be secondary and at present the primary specialist reports, of which this is one, must stand on their own in matters of phasing and dating. The animal bone does not by itself suggest appropriate sub-divisions in time, and for the moment this question must lapse.

Another possible division would be topographical, and indeed for many purposes the results are studied site by site. The sites were numbered separately since they were excavated in different years: excavating techniques have grown steadily more scrupulous and there may be some small level of difference in the finds on this account. But it would be in the highest degree unlikely that these modern divisions, created ad hoc in response to rescue possibilities, should reflect clear cut differences in Saxon occupation. One must look elsewhere to find a working unit which stands for some entity in Saxon terms.

The great mass of animal bone in these five sites came from large features which (whatever their original function) ended their useful Saxon life as rubbish pits, domestic or industrial or both. Within many of these pits different layers of deposit were observed, particularly with the increasing expertise that had built up by the time Sites VI and XX came to be excavated. Bones from such layers were marked and recorded separately and these groups may be reconstituted either physically or on paper; but it seems likely that the pits were normally filled quickly-bone-fits, for example, have many times been found between the layers-and as an active unit of bone study each pit was regarded as a whole.

A small part of the material (just over 5%), though authentically sealed as Saxon. was nevertheless scattered across the occupation area, lying loose on the former surface instead of deposited in pits. This material was not found evenly throughout the whole Melbourne Street area, but was concentrated to the south and in particular on Site IV. The brickearth diggers are known to have penetrated the Saxon surface in various parts of 'Hamwih' and to have removed considerable quantities of bone (Addyman & Hill 1968, 67). It may well be that in these places they removed the bones from the Saxon occupation surface: such loose material as remains is not taken as typical solely of the place in which it was found, but should be seen more generally as representing that sort of bone material which was not placed deliberately and quickly in the pits.

It therefore seems that archaeologically the most meaningful comparisons may be made on the one hand between the bone material from the occupation surface and that from the pits as a whole, and on the other hand between the separate pits.

General method

'Hamwih' bone studies have sprung naturally from the excavations themselves. Animal bone is the main find by number, bulk, and weight and its traditional undervaluing changed at 'Hamwih' earlier than in many other places: the later years of the Melbourne Street excavations saw the building-up of a comparative collection of material and a regular two-way liaison between the bone-room and the sites.

Identification

Everyday basic identifications were carried out during the preliminary sort by Jennifer bourdillon at SARC using for instant reference archaeological material carefully checked out against the modern skeletal collection at the Faunal Remains Project, southampton University. jennie Coy worked for approximately one day a week during the early stages at SARC and spent the rest of the week running the Project.

Constant reference was made to the modern material by both of us and any problems found their way to the osteology Department of the British Museum (Natural History) where Dr Juliet jewell grave help and encouragement.

Accurate identification is essential if the fragment counts and weighing are to have any validity. To assess the part played by the horse it is necessary to distinguish horse and cattle fragments, even to vertebrae and ribs where possible. As explained in the section on wild mammals, distinction of the various species of deer is also of some significance in this period. The separation of, for example, fox/dog/wolf; wild and domestic pig'; wild and domestic eat: and rabbit and hare is necessary in any study of British archaeological bone. These are not all possible all the time- a fact which leads to some frustration when trying to discover what animals people kept, bunted, or introduced in Britain.

Basic recording

Primary records were kept in terms of the smallest archaeological unit (the feature, with each layer within it recorded separately; or the metre square of the occupation surface).

Each fragment, including loose teeth and unfused epiphyses, was counted separately.

Most large animal bones that could be identified to species were of cattle, with a very few horse and red deer bones. Fragments not identifiable to species but coming from large mammals were probably therefore mostly from cattle and called 'cattle-sized' fragments with this assumption. Similarly, most of the small pieces recorded as 'sheep-sized' fragments probably were from sheep as this was the most likely possibility, but this category could obviously include fragments of goat or pig (although very small pieces of these were often separable) and, even more rarely, roe deer. Bird, fish, amphibian, dog, cat. and small mammal bones went to the Faunal Remains Project for checking or specific identification.

All material was weighed species by species or in the main unidentified groups.

At this stage there was a quick routine check of every fragment for surface cuts, deeper chopping, saw marks, traces of burning or polishing, signs of gnawing, and evidence of genetic or pathological abnormality.

Minimum Numbers of individuals were assessed for each species, first for each layer separately and then with a further visual comparison for the feature as a whole.

Analysis and measurement

The nest stage was an overall analysis. Some data could be assembled directly from the primary records, but other work required a fresh handling of the material.

The pattern of cuts could be seen more readily when fragments of a like kind (eg all cattle humeri) were assembled together. Epiphysial fusion data were collected and tooth eruption and wear were studied on the mandibles. Minimum Numbers were calculated once more visually, and also this time bone by bone, taking all Melbourne Street as the unit.

The analysis formed a useful check to any earlier misidentification: in particular, the sheep/ goat distinction was considered afresh in the light of the material as a whole. All measureable mammal and bird bones were measured.

At first it bad seemed sound to take only a few measurements for this initial study, but the good preservation of the material and the lack of parallels in Britain led instead to the preparation of a corpus of measurements for detailed later comparisons. It has not been possible to print the *Statistical Appendix* as an integral part of this report, but duplicated copies are available from SARC (1977), price £1). This appendix contains:

for horse, cattle, sheep, goat, pig, domestic fowl, goose
- -collated measurements (means, ranges, standard deviations and coefficients of variation) of all major bones and of mandibular tooth rows;

for horse, cattle, sheep, goat, pig
- -withers height calculations:
- -age-groups from tooth evidence;
- -age-groups from fusion evidence;
- -minimum Numbers calculated bone by bone;
- -identified fragments as distributed bone by bone;
- -relative proportions in various sites and pits, by fragment count, by weight, and by Minimum Numbers.

The necessity to measure in a repeatable way has led to the preparation of a series of notes on-measuring bones. These notes are an extension of notes made in 1968 by Jennie Coy, which were then based on Duerst's (1930) work and current methods in use in European institutes. A recent handbook on measuring archaeological bones (von den Driesch 1976) appeared too late to influence our methods but the way in which bones are measured in von den Driesch is virtually the same as our way and we recommend it as the best source available.

All measurements were taken with vernier calipers, to an accuracy of 0.1 mm except for circumferences and other curves which were measured with a tape measure to an accuracy of 1 mm.

bones were measured only when their epiphyses had fused. A broken end would be measured it its fusion was

TABLE 1. 1: Identified fragments, weights. and Minimum Numbers

Species	No fragments	Weight in Kg	MNI overall*	MNI cumulative**
Horse	49	4.4	5	21
Cattle	23,896	587.9	211	422
Sheep Goat***	14,606 (130)	128.1 (7)	265	480 (59)
Pig	6,953	94.8	192	386
Dog	23	0.2	4	9
Cat	144	0.1	13	25
Red deer ****	12 (64)	0.3 (1.4)	5	12
Roe deer	8	0.1	2	7
Small mammals	13	0.01	5	5
Goose	353	1.3	16	102
Fowl	800	1.4	63	199
Wild birds	47	0.2	22	32
Amphibians	20	0.01	8	8
Fish	1,290	0.3	?	107
Totals	48,214	819.1		

*MNI calculated for Melbourne Street as a whole.
**MNI as cumulative total of separate features.
***with goat content in brackets.
****figures for antler in bracket following.

complete. but mid-shaft measurements on the other hand were taken only when it was evident that they came from bones which were finally mature.

Different species produced different measurement problems. The few horse bones were straightforward. Pig bones, generally more plentiful. showed a scarcity of mature articulations from the latest-fusing group. The many cattle bones were commonly very cut, so that while widths and diameters were plentiful a full-length measurement for a long-bone was rare, and to a certain extent this also applied to sheep and goat.

The whole archival material is stored at SARC and the Faunal Remains Project and may be used for further research.

Detailed method and results

48,214 fragments were identified, with a total weight of 819.1 kg (Table 17.1): This gave a mean weight of 16.99 g.

In addition there were 38.840 fragments of unidentitied material, mostly in small undiagnostic shavings, with a total weight of 105.92 kg (Table 17.2). This gave a mean weight for each unidentified fragment of only 2.73g.

TABLE 17.2: Unidentifiable fragments

	no	weight in Kg
Cattle-size	7,795	59.3
Sheep-size	27,701	46.4
Bird	260	0.02
Fish	3,084	0.2
Totals	38,840	105.92

These tables show major totals for the purposes of summary only: it must be remembered that in birds and fish the bones may form a lower proportion of the total body weight.

The domestic wild ratio

In assessing the proportions of wild and domestic animals the 64 pieces of antler have not been taken into account since they may well have been gathered after they were shed to be brought into 'Hamwih' as raw material for working.

The overwhelming proportion of mammals was domestic (99.93% by identified fragments, see Table 17.3).

There are problems in ascertaining which birds were wild at the time and which had been domesticated and such problems are discussed more fully below, but for immediate comparison the conclusions are anticipated: 96.08% of the bird fragments were domestic. The final proportion. taking mammals and birds together, gives 99.83% domestic and only 0.17% wild.

The figures show that 'Hamwih depended almost exclusively for its meat on mammals and birds reared in domestication. Such production was presumably achieved with a comfortable margin of ease: the rarity of post-cranial deer fragments may be a measure of the unconcern which left these animals largely unhunted.

Bloch (1962), in considering the state of mind of medieval man, ranked the exigencies of self-defence and the wider need for food as equal partners with a zest for sport in the practice of hunting. In this he was concerned to emphasize early medieval man's close dependence on nature and his necessary response to its changes. 'Hamwih's' meat production showed on the other hand a marked independence of nature, or at least a strong element of choice and of successful control of natural procedures.

TABLE 17.3: Domestic/wild percentages by identified fragments

MAMMALS		
Domestic animals	45,670	99.93%
Deer less antler	20)	
Small mammal	13)	0.07%
Pig, perhaps wild	1)	
	45,704	
BIRDS		
Goose and fowl	1,153	96.08%
Other	47	3.92%
	1,200	
MAMMALS AND BIRDS		
Domestic	46,823	99.83%
Wild	81	0.17%
	46,904	

Nor was 'Hamwih' alone in this. From a similar period Haithabu shows a fragment count of 99.7% domestic bones. although there was certainly abundant deer in the neighbourhood and probably also wild pig (Reichstein & Tiessen 1974, 53). From several centuries earlier. Iron Age Manching shows a fragment count of 99.8% domestic' bones: it has been suggested that the wild life of the immediate area had quickly been hunted away (Boessneck *et al* 1971, 5). Both were substantial settlements of long duration.

Such solid and successful domestication is a sign of ample provisioning. In the end 'Hamwih' was to be a Deserted Medieval Town, but in its main years it had no limping economy. The land could support the people, and there was plenty of food.

The specific ratio of the main domestic animals and the problem of Minimum Numbers

I he aim is to present the proportions of the different species in a way which bears a good relation to their relative importance in the animal economy of 'Hamwih'. We can only work from excavated material, and yet it is not self-evident that the ratio between the species has stayed constant through the vicissitudes of Saxon use, of selective disposal of preservation in the ground, of the sampling inherent in the very selection of a site, and of the process of excavation itself.

Working backwards, we can see that the excavated material is only part of what could have been found. The sieving of much of F16 on Site V does. however, suggest that the proportions of the main domestic animals as assessed by fragment count and weight were not much affected by sieved or unsieved recovery methods (see Table 17.4).

Differential preservation may have affected the balance: Mrs Geraldine Done at Mucking has suggested (pers comm) that while pig material is more subject to decay and loss than is material from the other domestic animals, it is quite well preserved when in contact with a good quantity of bone. and since this was normally the case at 'Hamwih'. pig may not have been disproportion-

TABLE 17, 4: Site V, Feature 16
Proportions of the main domestic animals as recovered by normal methods, compared with those as recovered by sieving

	Horse	Cattle	Sheep/ Goat	Pig
By fragment count				
recovered normally		52.0%	31.6%	16.4%
recovered by steving	0.1%	54.1%	30.6%	15.2%
by weight				
recovered normally		74.5%	13.9%	11.6%
recovered by steving	0.1%	73.8%	16.7%	9.3%
By Minimum Numbers				
recovered normally	——	42.1%	31.6%	26.3%
recovered by steving	2.45	26.2%	40.5%	31.0%

ately at risk. But a ratio. even an exact one, of the bones in the pits is only a ratio of the bones which the Saxons threw away there; it may have been affected by their choice of some material to dispose of in pits, whilst other bones, say, were thrown to the dogs, turned into tools, or taken outside the town in trade. Furthermore, the active use of bones may have varied from one species to the next. Only if bones from the different species have survived all this in roughly similar proportions, or if any changes can be located and corrected, does it make sense to present ratios which are based on excavated material as valid ratios for the Saxons who lived on the site. And if a specific ratio could be fairly assessed for Melbourne Street, would it apply to 'Hamwih' as a whole?

Various methods of quantification and comparison have been widely tried: the fragment count, weighing, and the calculating of the Minimum Number of Individuals. Meat weight ratios may also be assessed.

The fragment count deals simply with excavated bone. It makes no attempt to allow for the distortions of the earlier stages, but it has the merit of a clear and undoctored score. The ground rules adopted for the 'Hamwih' fragment count were that every fragment was recorded separately, unless broken in the process of digging; that separate epiphyses were separately counted: and that loose teeth were counted individually unless they could be replaced in an accompanying fragment of jaw.

Ducos (1968, 8) argues that a fragment count is in itself a fair assessment of the ratio of the species. Certainly most animals have a very roughly similar number of bones what is lost on the horn cores, say, is gained on the upper incisors. But it does not follow that all bones have proportionately the same chance of survival as between the different species. That must be disputed between small and large, and in other intrinsic ways. It is further disputed in terms of human use-a larger bone, chopped, will have more chances of scoring in the fragment count than will a smaller bone left whole. A fragment count is in part a count of fragmentation, which may have cultural significance if it was caused by human agency but which would need to be distinguished from the random operation of chance.

Fragmentation is discounted if the total material is weighed. The weight bears a reasonable relation to the instant impression made by the material on the worker and, by inference, in some way to the impression made on the Saxons themselves. Wetghing was pioneered by Kubiasiewiez and used, with full explanation and introduction, at Manching. It has been discussed in particular by Uerpmann (1973). Its advocates say that since bone weight bears a reasonably constant relation to the live weight of an animal (somewhere around 7%), and since this live weight in turn bears a reasonably constant relation to the amount of meat available, the ratio as calculated by bone weight must be the meat weight ratio as Weighing was adopted at 'Hamwih'. though with a reservation that different species or different pits might have been differently affected in their bones, being made lighter say by leaching, or heavier by the deposition of salts, and that unless this process affected all species similarly the validity of the ratio was at risk.

The third method of quantification, that of the Minimum Number of Individuals, aims to go behind the transitional stages and, working from the excavated bones, to take into account the bones that must have been lost. Indeed the Minimum Number gives some idea of what has been lost-or, more accurately, of the minimum that must have disappeared-and this at least highlights the problem that other methods seem to disregard. The 'Hamwih' Minimum Numbers have been the starting point for a demonstration of the very small proportion of material that has been recovered; this will be shown in the discussion below.

Minimum Numbers may be used in their own right to prove a good supply of animals. They may be used to prove an abundance of meat and hence presumably an abundance of consumers, as most notably at Manching (Boessneck *et al* 1971, 12). These two particular uses were thought inappropriate for this report. Firstly, until the 'Hamwih' phasing can be worked out one cannot be sure which pits were open together, and the whole area must be taken as a single unit, which in terms of Minimum Numbers is likely to give a figure that is far too low. A further objection is that Melbourne Street is only a part of greater 'Hamwih' and that, with much more material to be looked at later, it would be premature to extrapolate from the one small area a figure for 'Hamwih' as a whole.

Another use for Minimum Numbers is to make separate calculations. bone by bone, for each species, as was done at Haithabu (Reichstein & Tiessen 1974, 21). The bones which produce the lowest minimum figures arc the bones which have been the most lost. This discounts fragmentation; we need not worry for this particular purpose if the ratio between the species has been disturbed; and in tracking down the points of greatest loss we are looking deliberately at the area of alteration which the other methods ignore. But since this use of Minimum Numbers is not related to the specific ratio the results will not be discussed in this section but saved for the reports on the separate species.

Most of all, Minimum Numbers are used as the basis for a specific ratio. and they were used for this at 'Hamwih'. But, as the many hundred complex calculations were made, for each species, each pit. and each layer of each pit, and then again bone by bone for Melbourne Street as a whole, doubts grew more insistent. It is the pairing or rejection of different bones as having come from one individual animal that is in practice an open-ended problem. Different bones provide a different number of clues as to possible pairing, and the cut-off point of the exhausted worker will vary. The figure that is given must be somewhat arbitrary. and cannot claim to represent an absolute number; and yet when it is used as the basis of a ratio it is effectively taken as such. Unless the Minimum Number for each species bears the same geometrical ratio to the unknown absolute for that species, its use in establishing a specific ratio is mathematically dubious. It has to be hoped that perhaps over many calculations the inevitable mistakes will cancel out.

The ground rules were calculated to be as fair as possible to the different species. New criteria for pairing and rejecting pairing were inevitably evolved in the course of so many calculations, but as far as possible standards were kept constant throughout. When it came to the later analysis, left and right bones were paired by age groups only, as the wealth of the material and the proliferation of chopping rendered visual pairing impossible. Mandibles, however, were the exception. Pairing, or confident rejection of pairing, was very much easier through the morphological individuality of the teeth and through the numerous stages of tooth eruption and wear. For all species it was therefore the mandible count which gave the greatest Minimum Numbers and it was on this that the final relative frequencies were based. In the pits, sheep and goat were distinguished as far as possible. But this could not be done in the mandible count, for 'Hamwih' mandibles did not divide themselves with any certainty into sheep and goats and the frequency had to be assessed jointly for them both.

Results

Fig 17, 1 is a graphic simplification of some of the statistics which are presented more precisely in Table 17, 5. Figure and Table should be taken together. Both relate to Melbourne Street as a whole.

The fragment count (Fig 17, l a) shows cattle well in the lead: sheep goat (mostly sheep: see below p 109) and pig are spaced behind, but each has a clear significance. Horse is last and negligible.

The weight frequencies (Fig 17, 1b) extend the cattle lead, shrinking sheep/goat considerably and pig more slightly. Horse rises-indeed, it quintuples its proportion-but is still of minor importance.

On Minimum Numbers horse moves up further but still remains outclassed. Sheep/goat is now in the lead, followed first by cattle and then by pig. This order is the same whether Minimum Numbers are assessed on the mandibles (Fig 17, 1c) or by a totalling of the figures of the full range of bones based on the separate pits (Fig 17, 1d). but in the cumulative reckoning the species are bunched more closely together. This closer bunching may be a fault produced by the method's tendency to give extra weight to the least represented species, a tendency compounded when in the many primary calculations the least represented species are the same. The mandible count is therefore taken as the more accurate ratio between the species. But it must be conceded that the broad general agreement between the two Minimum Number frequencies goes some way towards confounding any natural scepticism to the method.

From Minimum Numbers one can move to the meat weight frequencies. For these the live weight figures used in the Manching calculations proved a welcome point of reference (Boessneck *et al* 1971, 9). It will be shown, in the appropriate section below, that 'Hamwih' horse and cattle were on average larger than the Manching animals, and for these two species the higher Manching figures were therefore preferred (300 kg and 275 kg respectively). 'Hamwih' sheep and goat were a little smaller, 'Hamwih' pig a little larger than their counterparts at Manching, but the differences did not seem great enough to warrant any adjustment to the Manching midpoints (37.5 kg and 87.5 kg respectively).

TABLE 17,5: Relative frequencies of the main domestic animals, and kindred topics

	Horse	Cattle	Sheep/Goat	Pig	Total or mean
(a) fragment count	49	23,896	14,606	6,953	45,504
(b) fragment percentages	0.1	52.5	32.1	15.3	
(c) weight in Kg	4.4	587.9	128.1	94.8	815.2
(d) weight percentages	0.5	72.1	15.7	11.6	
(e) MNI (mandibles)	5	211	265	192	673
(f) MNI (mandibles) percentages	0.7	31.4	39.4	28.5	
(g) MNI (cumulative)	21	422	480	386	1,390
(h) MNI (cumulative) percentages	1.6	32.2	36.7	29.5	
(i) meat weeight from mandibles	750	29,012	4,982	8,409	43,153
(j) meat weight percentages	1.7	67.2	11.5	19.5	
(k) mean fragment weight in g	89.8	24.6	8.8	13.6	17.9
(l) fragments per individual (mandibles)	9.8	113.3	55.1	36.2	67.6
(m) fragments per individual (cumulative)	2.3	56.6	30.4	18.0	34.8
(n) live weight in kg. from Manching figures	300	275	37.5	87.5	
(o) meat weight similarly	150	137.5	18.8	43.8	
(p) bone weight similarly	21	19.3	2.6	6.1	
(q) total expected bone weight (from mandibles) in Kg	105	4,.0721	689	1,171	6,037
(r) % age of (q) recovered	4.2	14.4	18.6	8.1	13.5
(s) total expected bone weight (cumulative) in Kg	441	8,144	1,248	2,354	12,187
(t) % age of (s) recovered	1.0	7.2	10.3	4.0	6.7
(u) life expectancy in years, from kill-off graphs	12.0	4.1	3.3	1.6	
(v) MNI (mandible percentages) corrected for life expectancy	2.8	41.1	41.5	14.6	

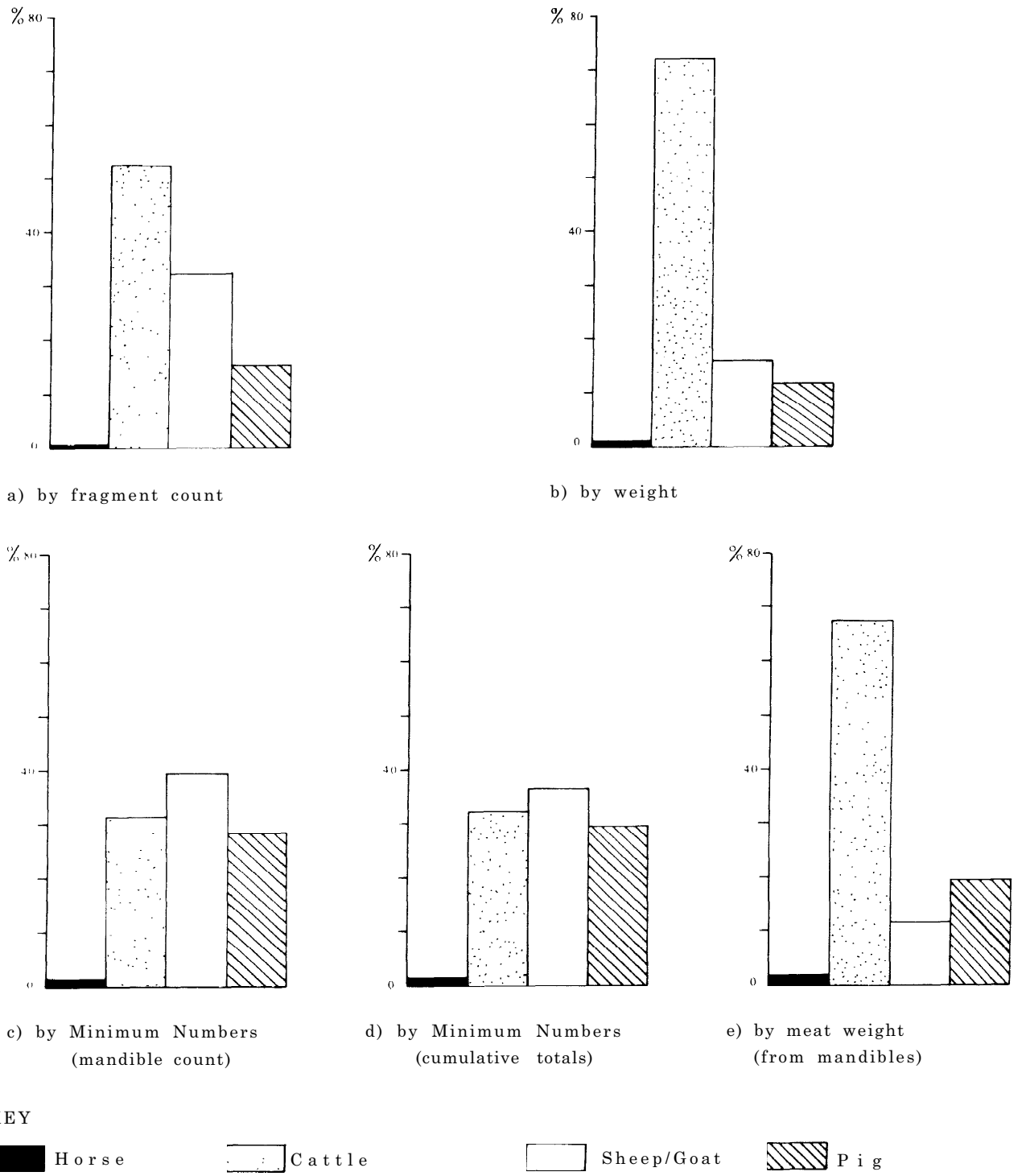


Fig 17, 1 Overall relative frequencies

These figures represent the live weights, but (still in the broad Manching tradition) it was assumed that live weight. meat weight, and bone weight ratios would be tolerably constant, with the live weight cut to some 50% for meat and to 7°$_0$ for bone. Similarly, it was assumed that the weight of each bone fragment stays reasonably steady in archaeological conditions.

If these assumptions and approximations are sound. the relative frequencies for (excavated) bone weight and for (calculated) meat weight should be the same. But in comparing Fig 17,lb and le. although the cattle correlation is good, horse moves up significantly and sheep goat and pig are changed so markedly that the balance between them is reversed.

The various statistics may be put together to give greater information. Many combinations are shown in Table 17,5: more might easily be produced.

From the fragment count and the weight of excavated bone come the mean fragment weights, both overall (17.9 g) and for the different species. There is a wide divergence between the species. clue in part to the sizes of the animals.

One can combine the Minimum Numbers with the fragment count to find the mean number of fragments recovered for each established individual, 67.6 on the mandible reckoning and 34.8 on the cumulative total. Again there is a marked variation between the species.

Perhaps most valuably one can calculate the expected bone weight for the minimum number of animals and compare this with the amount which was in fact recovered. From the absolute minimum. the mandible count. a total bone weight of 6.037 kg would be expected; only 815.2 kg was found (13.5°$_0$). Yet if on this, the sternest possible reckoning, some 86°$_0$ of the material has been lost, can it be believed that from every pair of mandibles some distinctive fragment has survived?

In fact Minimum Number's in the separate pits were calculated sternly in every separate case. Whenever there was the slightest doubt a further individual was not added. The figures were never given the benefit of any doubt. It has been argued that minima arrived at in this way may not be as good a basis for a ratio between the specie; but as a general overall measure of animal abundance the cumulative total is likely to be nearer the absolute than was the limited mandible count. If this is accepted, the total weight of expected bone would be 12.189 kg: the actual weight found on this basis now drops to 6.7°$_0$.

If the loss is of this order of magnitude, it seems more than ever unlikely that the ratios between the species have stayed constant throughout the many different hazards that have intervened between the slaughterers of 'Hamwih' and the finds trays of Southampton.

There is one further comment on these ratios. It must be stressed that they relate to the dead animals as represented in the excavated bone material. To consider the animals as sources of meat and other final products, such a ratio, if accurate, would give a fair guide to the animals relative showing. But it can give no valid comparison in terms of the repeated products, eg milk, of a living animal which may be available for a large part of its life and be a fairer measure of its economic importance. And it certainly does not reflect the ratio of living animals as visible in the flesh in the catchment area of 'Hamwih' at any particular time. For this, the age of animals at death would make all the difference: animals killed young would make a brief living impact, others would be in evidence for years. The next big question is therefore to assess the ages of the animals, and after this the ratio may be tackled afresh.

Ageing

Ageing was calculated both by epiphsial fusion and by tooth eruption and wear, and the -results were usefully compared. Silver's (1971) data for modern fusion and tooth eruption ages facilitated comparisons between the two methods. but they should not be taken as giving any absolute chronological ages when applied to Saxon stock.

For the fusion calculations all relevant bones were used with the exception of the vertebrae, and the pelves which were often too broken or chopped in the areas of fusion for any sure assessment to be made. Fusion was defined as fully present when the join still held throughout its length, whether or not the-line of junction could be seen.

The fused: unfused ratio was calculated separately for each separate point of fusion. The results were transferred to block diagrams (Fig 17, 2), either singly or as a mean for a group of bones expected to fuse at the same time. Some discrepancies will be discussed below.

Ageing by teeth was carried out on the mandibles only, since the maxillae were commonly more broken. All mandibles, left and right, were closely examined for pairing and on the rare occasions when a pair was found (only 7 times from 680 mandibles), one of the two was rejected.

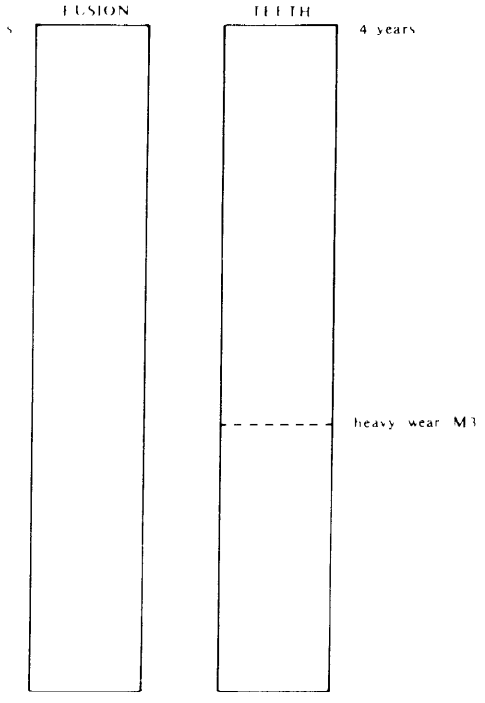
Loose teeth were replaced wherever possible but were not otherwise taken into account. Sheep and goat mandibles could seldom be distinguished with confidence and were therefore aged together.

For each domestic species six groups were established. The three youngest groups end at the initial signs of wear on the first, second, and third molars respectively; the next group covers the coming into wear of all three cusps of the last tooth. Such objective definitions posed no problems, and the patterns of recording as suggested by Ewbank for the eruption of the Barley Iron Age sheep (Ewbank et al 1964) and by Payne (1973) for wear on the teeth of Anatolian hill sheep were directly applicable to 'Hamwih' sheep and redly adaptable for cattle, hose, and pig.

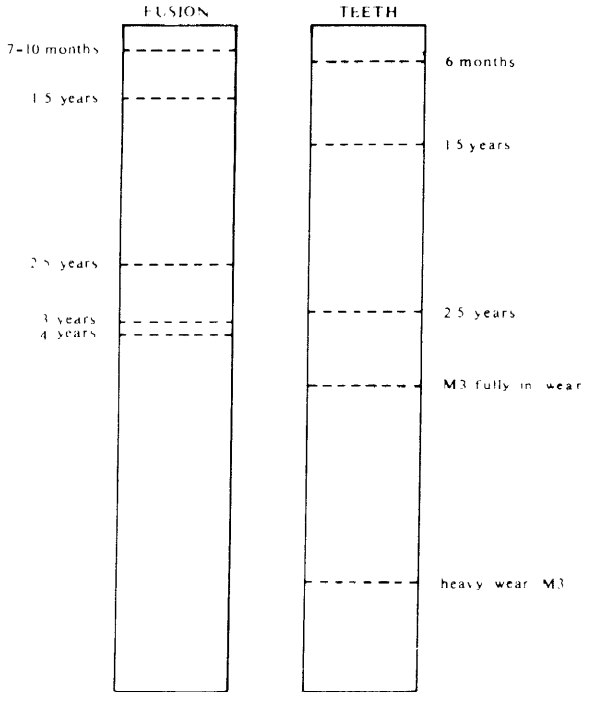
In all remaining mandibles (groups 5 and 6) the tooth row was fully in wear. It seemed importan to separate those teeth showing prolonged wear for-barring age-related pathology-it is only the teeth that supply information to span an animal's maturity. Payne's criterion of molars worn beyond the crescent pattern in the dentine proved too delaved for the 'Harwih' material. Instead, the final group was distinguished from the fifth in cattle, sheep, and goat when the ridges of the molar cusps were wearing flat, and in horse and pig when the molar biting surfaces were concave (see Fig 17, 3).

Results

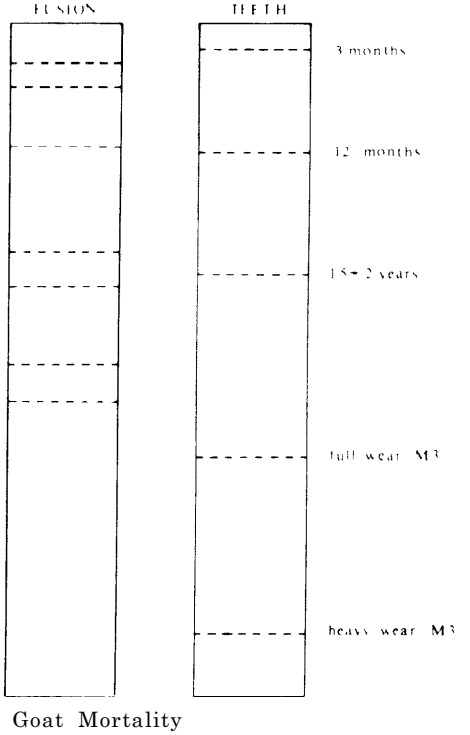
Before any wider comparisons were possible there was a need to examine some internal inconsistencies in the fusion results. Horse anti pig presented no real problems, but among cattle and sheep goat some bones expected to fuse simultaneously gave widely differing results. Distal humerus, for example, showed some twice as many unfused bones as did proximal radius, both in cattle and in sheep (14.2% to 7.8% in cattle, 5.4% to 2.3% in sheep). Cattle first and second phalanges were still further apart (12.8% and 4.9% respecively), These, the worst, examples came from early-fusing bones; but conspicuous among the nest fusion group were distal tibia and metacarpus, expected from modern data to fuse at the same time, yet giving 14.7%) and 26.4%) unfused bones in cattle, and 30.5% and 44.0% in sheep. All these calculations were made from good-sized samples, never fewer than 120, which should be more than adequate for a fair cross-section of the herd.



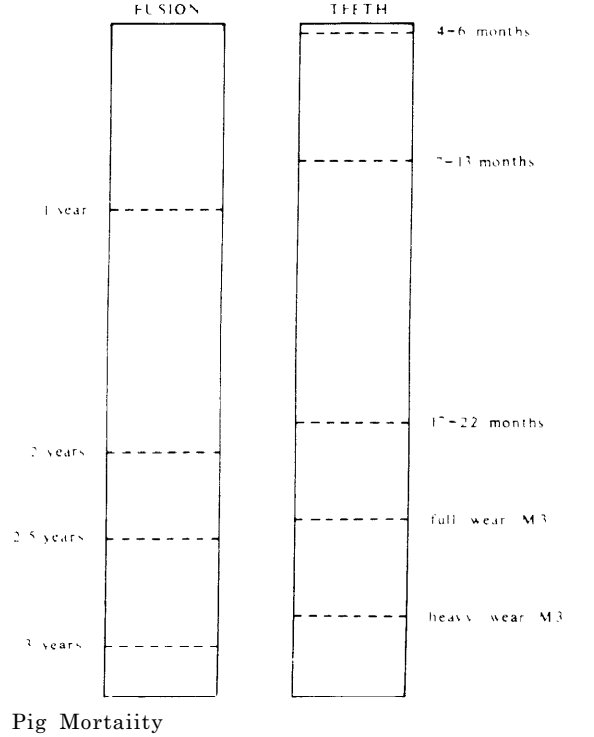
a) Horse Mortality



b) Cattle Mortality

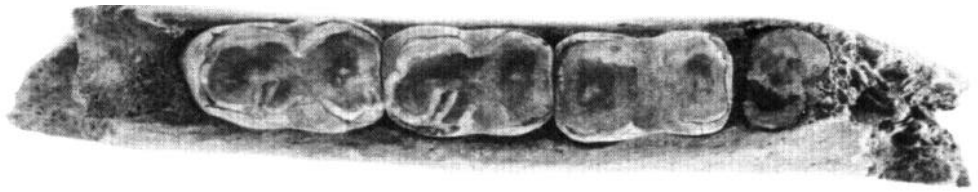


c) Sheep / Goat Mortality



d) Pig Mortaiity

Fig 17,2 Mortality as indicated by bone fusion by tooth eruption and wear. Each block represents the entire population of a species. The broken horizontal lines divide the populations into those killed (above the line) and those still living (below it) at any particular age or stage. Chronological ages *are the modern equivalents (Silver 1971) and are used without prejudice to an evaluation of the rate of ageing in Saxon times. Full supporting data are available in the separate Statistical Appendix (SARC 1977)*



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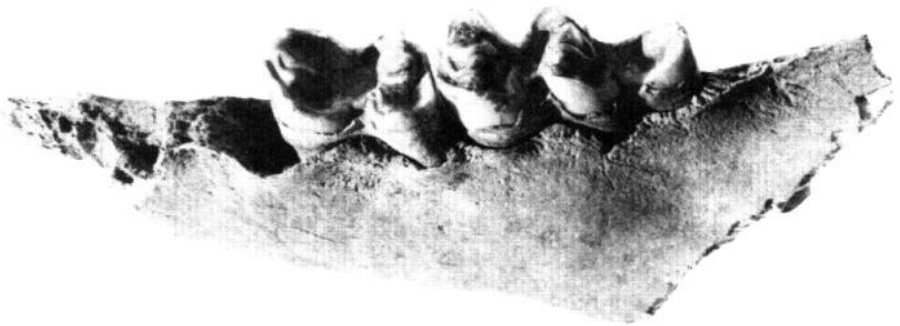

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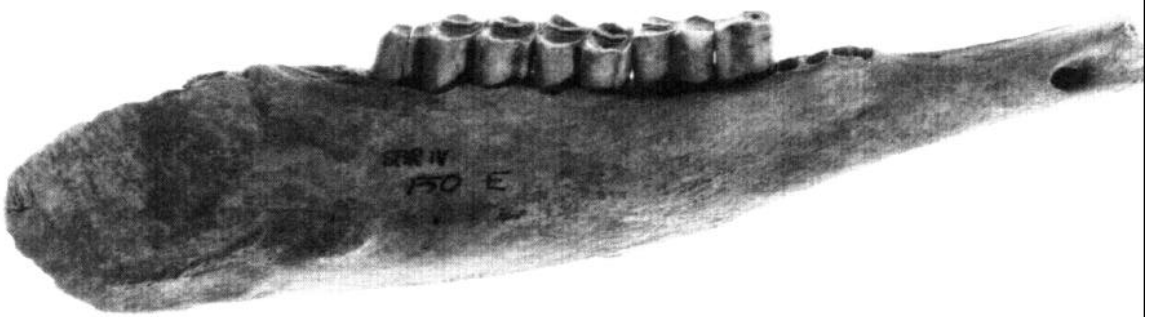

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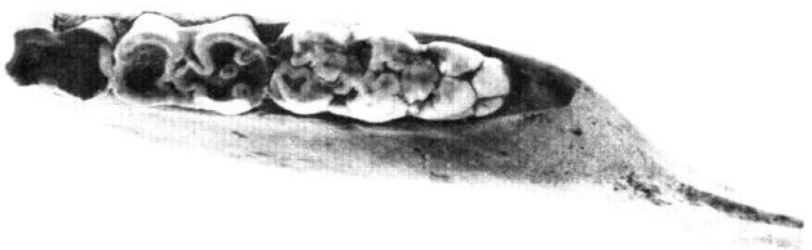


d

Fig 17, 3 The last stage in molar wear in a) horse, b) cattle, c) sheep/goat, d) pig

Many explanations were considered. The two most likely seem to be a difference in preservation of fused and unfused bones, and a failure of modern fusion groupings to relate to ancient stock.

Differential preservation seems likely. At least 90% of the bone material has been established as missing, and it seems reasonable that young, unfused bones would be lost in grater numbers. Some particular bones could be more vulnerable than others, and in any marked discrepancy it is likely to be the figure with the lower ratio of unfused bones that is the more at fault.

But differential preservation may not be the only explanation. First and second cattle phalanges, for example, give their widely spaced results from such substantial sample (556 and 285 respectively) that sine further factor needs to be brought into account, and it is suggested that there was some definite difference in the age at which these two bones fused. If there was indeed some staggering of fusion as between bones which are closely grouped in modern stock, this would imply a lengthening of the whole process, with the gap from first to final fusion (the full span of adolescence) taking longer in Saxon times than it does today. Sheep/goat phalanges, on smaller samples, give a similar pattern and Noddle's work on feral goats (1974. 198) certainly fits the theory that first and second phalanges may have fused at different ages in more primitive stock.

Two suggestions are therefore made, first, that unfused bones are underrepresented and second, that the process of bone maturity may have been considerably delayed. These two could cancel each other out in the preparation of a percentage diagram for a herd as a whole. The first, in postulating missing immature animals, would lower the horizontal lines in Fig 17.2 but the second would make corresponding changes to the calibrated ages. However it would be rash to assume that two probable wrongs made one convincing right. It is safer to proceed with care.

Ageing from teeth gives a straight ratio on the basis of all recovered mandibles. Each age-group may be calculated only in relation to the rest and in consequence there are no internal cheeks on the results. Untractable as the fusion data may be, it us these alone that can provide a basis of comparison for the teeth and an attempt must. therefore be made to set the two results against each other. For each species, the block diagram showing the percentage of animals killed at each fusion stage is set side by side with the block diagram shoeing the precentages killed as established by tooth eruption and wear. the ages quoted are those applicable today.

The horse achieves perfect consistency every possible epiphysis is fused and all teeth are fully in wear. There are no headaches of methodology nor is anything learnt about the processes of maturation, but it is unequivocal testimony that 'Hamwih' horses were old.

There are discrepancies in the cattle diagrams but reconciliation is not hard. If we postulate a number of unfused bones that have not been recovered, we need to modify the fusion diagram by somewhat lowering the lines, and the general pattern of dating fits quite well with that given by the teeth t. This does not vindicate the actual calendar ages, but only the general correspondence: if cattle teeth formerly erupted more slowly, as is suggested by Silver's figures for older breeds, then fusion took longer as well. This has already been suggested on the evidence of the phalanges.

Notable for cattle are the large numbers of animals killed in middle to late adolescence, and the tailing off there after. This would suggest that a certain proportion of beasts was used for meat- late adolescence us a sound time for slaughter to give the best returns in terms of meat provided in relation to foodstuff consumed. But once this group had been kelled the death-rate waned. most of the remaining cattle being kept for other uses.

Notable too. is the suggestion that the coning into full wear of the third molar started at about the time of the fusion of the metapodia and had not been completed when the final epiphyses had fused. This process of fusion takes time and it looks as if tooth wear was slow it us certainly fair to assume that the final group, those 15% of the mandibles which showed signs of really strong wear, would have come from animals which had been mature for man years. There was a substantial core of old cattle among the 'Hamwih' herds.

Sheep and goat show greater discrepancies as between fusion and teeth. A significant toll of lamb is apparent from the mandibles and wet the fusion figures do not fit with this. Even more than cattle, many unfused bones have been lost and such an assumption would shift the block diagram throughout. If tooth ages are to be amended to correspond with those given by Silver for unim proved breeds, the ages on the fusion diagram would need to be altered as well. The universal problem in here is the lack of records for epiphysis fusion before 18th century stock improvement.

As well as the mortality of the young lambs, many sheep were killed between the fusion of the metatarsus (at 28 months in modern terms) and the point of final fusion at a modern three and a half years. This apparent bunching would be less marked is fusion were formerly more delayed (compare here Noddle's information for feral goat ulna. 1974, 199). If the fusion diagram is amended to for more young animals than are on it at present and it must be if tooth evidence id to be taken into account-this higher death rate overlaps with the high proportion of animal killed while the third molar was coning into wear. This death peak us a little older than that noticed for cattle, in terms of developmental stages, It could correspond in part to animals chosen deliberately for meat, but it might also represent those animals rejected at the end of a first breeding season.

Fewer sheep and goats lived into the final tooth wear group than did cattle but again it seems that the coming unto full wear of the third molar apparently outlasted a prolonged period of bone fusion and that tooth wear was therefore slow. One can therefore say that the 9% of sheep and goats which lived into the final age group were old.

Goats have had to be included with sheep on mandible ageing. On fusion it seemed best simple to use figures from the metapodia, since the sheep goat difference is distinctive here from an early age, from these it appears that by a little over two years (in modern terms) about 30% of the goats had been killed.

There remains pig, where the correlation of bone and fusion figures is good and where a great many unfused bones have been preserved.

In a way this is disturbing. It questions the reconciliation of the problems posed by cattle and sheep and the contrast between the species needs to be examined

The bone of young pig preserves proportionately better in relation to its teeth, than does that of calf or lamb. The difference between the species may, however. lie partly in the mandibles themselves. The proportion of pigs in the first tooth group (1.5%) us minimal, especially in view of large pig litters and presumed high early mortality. The inference seems to be that pig's teeth gives their mandibles no differential advantages as against immature bone generally.

In fact the picture for pigs teeth at 'Hamwih' is of rapid wear and decay. The first molar was commonly quite heavily worn before the eruption of the second, and

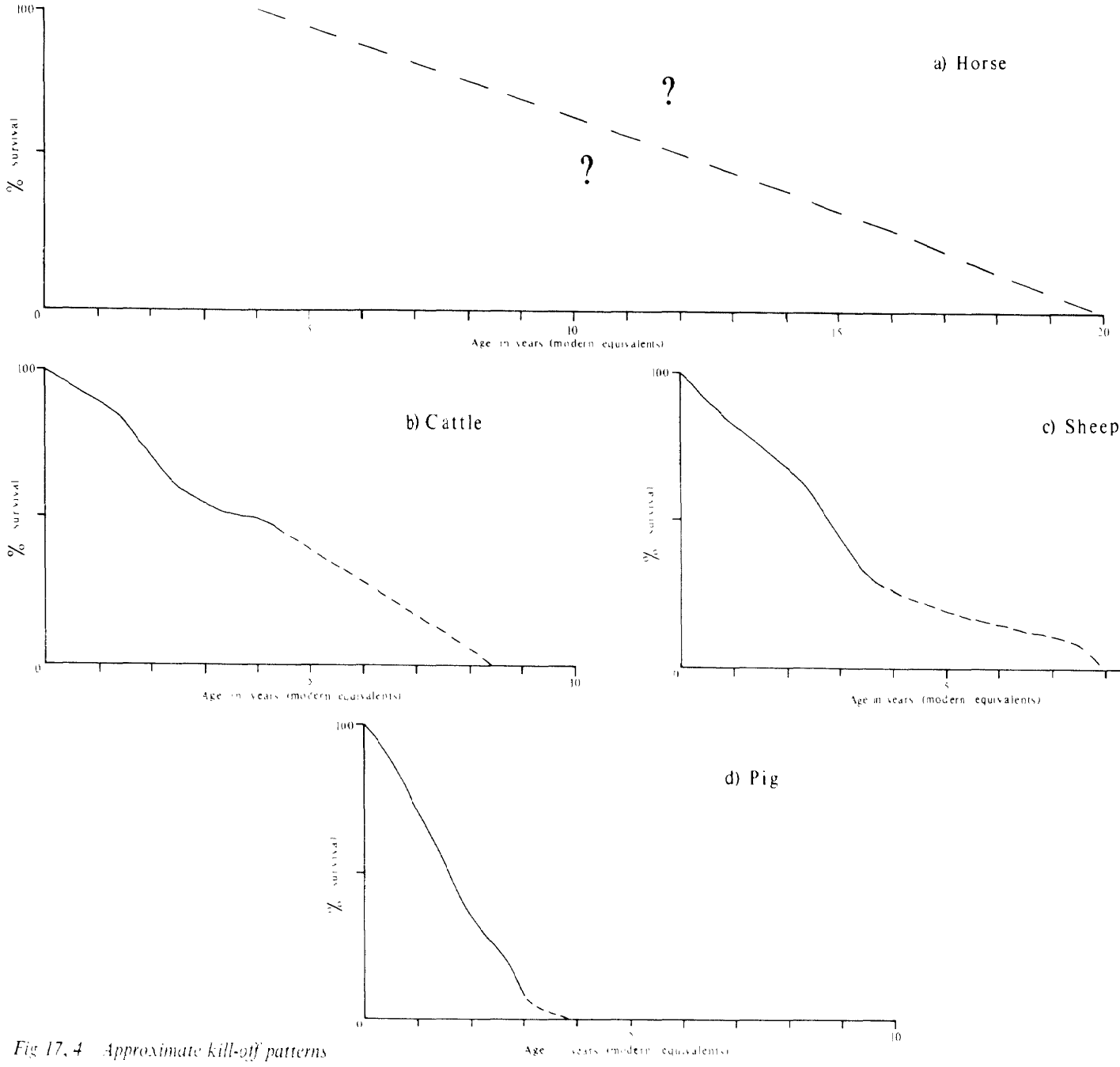


Fig 17, 4 Approximate kill-off patterns

wearing flat by the eruption of the third. The high number of pigs in the final tooth group therefore does not contradict the overall conclusion that most of the pigs died young.

For a broad visual comparison of ageing in relation to the main domestic species, approximate graphs of the kill-off patterns have been drawn up (Fig 17,4). These have been based on the results as presented in the block diagrams, but modified as discussed above. It must be stressed that, although the modifications could be a move towards a fairer representation of the 'Hamwih' animals, they are a step away from the first results which, for all their inconsistencies, did at least have the merit of being accurate calculations from the material as found. The kill-off graphs must be taken in conjunction with the general discussion, and they make no claim to precision.

Finally one may return to the relative frequencies of the different species calculated from Minimum Numbers (Fig 17.lc). This, left as a ratio of dead animals in the pits, may now be amended to take into account the varying life-spans of the different species (Fig 17,5). Pigs tumble, leaving sheep/goat and cattle far more clearly to the fore. These final relative frequencies are likely to be a fairer measure of the animals alive in 'Hamwih' and its neighbourhood at any particular time.

Pathology and other abnormalities

The 'Hamwih' material overflows the groupings suggested by von den Driesch (1975). but an effort has been made to preserve her valuable distinction between (i) variations with a genetic basis (though she herself confines her discussion on this point to teeth), (ii) reactions to disease or to long-term strain, and (iii) the consequences of injury and accident.

Variations with a genetic basis

Genetic variations frequently occur in the teeth, and 'Hamwih' shows some but not all of the more common changes. The incidence varies widely between cattle, sheep, and pigs.

Oligodonty, or the eruption of too few teeth, is the most usual variation. In the 'Hamwih' cattle 10.9% of the lower second premolars are absent, and on 2.6% of the lower third molars the final cusp is lacking. Perhaps as a result of the shortening of the lower biting surface, four upper molars show a strange deformity of wear. In sheep and goats, though they have between them produced the greatest number of adult mandibles (170), only five lower second premolars are absent (2.9%), and all lower molars are fully cusped.

Pigs' mandibles are known to be irregular. At 'Hamwih', 55% of the lower first premolars are missing; but although alignment is poor no oligodonty as such was observed among the molars.

One lower third molar of sheep or goat has all its three cusps of equal size, but apart from this there is no suggestion of polydonty (excess of teeth) in any species. Nor is there any tooth irregularity in the few fragments from horse, dog, and cat.

Some post-cranial variations were also observed, all of them in cattle. The most widespread variation concerns the foramen in the centre of the dorsal surface of the proximal metapodia (Fig 17,6a and b). In 39% of the metacarpi this is missing, as in 40% of the metatarsi. The absence cannot be interpreted as a sign of age since

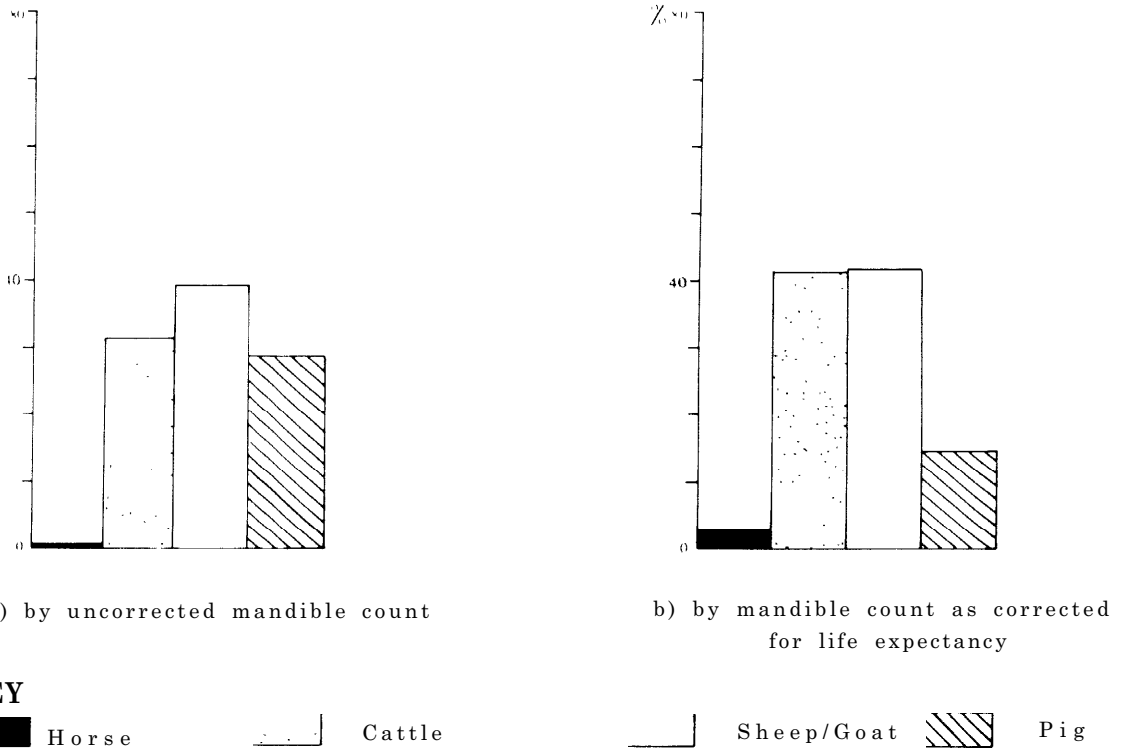


Fig 17,5 Final relative frequencies (relative frequencies by minimum numbers, mandible count, corrected for differing life expectancies)

fused and unfused bones are alike affected, nor does it correlate with probable sex, and it may perhaps relate to a difference in breeding groups. Some vertebrae have ventral foramina that are distorted or badly one-sided (Fig 17,6c), and five pelves show a small smoothed slit at the medial side of the acetabulum near the ilio-pubic junction (Fig 17,6d). These, too, could be genetically based.

Such trivial variations would have been of small moment to the animals concerned but if their incidence is studied, within 'Hamwih' itself and also more widely, some clues may be found as to the homogeneity or otherwise of the domestic stock. Many small variations, found rarely in the wild, grow more common with the break-up of natural selection. Records of percentage occurrence of such epigenetic features could help in time to clarify the genetic impact of continuing domestication, though for any such serious study far more information is required and extensive analysis like those for mice and men by Berry (1968) would be needed. with assessment of asymmetrical expression; and this is difficult in fragmentary archaeological material.

Pathological and other reactions

(a) to age and hard usage:

Arthritis, spondylosis, ankylosis, and similar conditions commonly show some form of exostosis, or accretion of the bone. The name and details vary, in part with the location on the body. and it is often hard to make a clear distinction. Even veterinary experts are quite properly cautious in a diagnosis of archaeological material and in this present report the various terms are used with limited and simple definitions. 'Exostosis' is a general term for accretion of bone; in 'arthritis' the surface of a joint itself is damaged. in particular the pelvis or the lower limbs: 'ankylosis' is used to cover similar conditions associated with fusion of the carpals and tarsals, and 'spondylosis' when exostosis is present on the vertebrae. These troubles may be attributed either to inflammation or to chronic strain on a joint, but whatever the technicalities it is reasonable to see such conditions as evidence of age and long-term stress (von den Driesch 1975, 418).

In the horse. a proximal metatarsus is affected by arthritis and two first phalanges are touched with exostosis. This is a high incidence (three fragments out of a total of twelve from the lower leg), and may well reflect the hard use to which horses were put and the great age to which they were kept.

Cattle, too. show signs of trouble. Two metapodia, two pelves, a distal radius, and a second phalanx are all affected by arthritis, and two first phalanges by general exostosis, one of them heavily (see Fig 17.7a). Deep, distorted muscle attachments on a calcaneum and two pelves give additional signs of heavy use. It seems that cattle could be worked hard and long, although the proportions of the affected fragments are much smaller than those from the horse. The three phalanges, for example, came from an excavated total of 1,171 (0.3%).

No similar conditions were found in goat.

Two sheep metapodia show some signs of arthritis, but most sheep pathology is concentrated at the elbow., where five proximal radii, two distal humeri, and three ulnae are all affected by exostosis, and two further ulnae have ossified tendons. There is also a fractured radius shaft (Fig 17,7c). Such localization of trouble suggests a point of long-term strain. It is unlikely that sheep were used as package animals or for draught. It is possible that they were firmly restricted to prevent movement, for example during milking, yet the ossified tendons and the fracture suggest straining and activity. No certain answer can be given but it is suggested that sheep were sometimes hobbled, or tethered.

For pig, one vertebra shows signs of spondylosis, two tarsals arc fused in ankylosis, and a third metatarsus has exostoses along the length of the shaft. Three cases are not a heavy toll, but such conditions come more commonly with age and most 'Hamwih' pigs died young. There is also one pig tibia with a distal growth of lighter and more spongy bone (Fig 17,7b): this growth is untypical, not only in its texture, but also in that it had occurred before the epiphysis had fused.

(b) to infection:

There are a few cases of infection. or of possible infection. The most conspicuous, and the hardest to explain, is a cattle mandible with a great cavity on the inner surface at the root of the third molar (see Fig 17.8). It is hard to know whether this had been caused by some deep-seated infection, perhaps actinomycosis (lumpy jaw). or by a cancerous growth. The animal was of a good age and the condition had been long-lasting, for the wear of the molar showed unusual distortion as from uneven biting over a protracted period. The very large isolated cavity with rounded margins is suggestive of a benign tumour or discrete abscess but modern comparative material of these and lumpy jaw has been difficult to find and further information would be welcome.

One sheep or goat mandible shows periodontal disease. with thickened bone and with swollen cavities left by the first and second molars, but one solitary case of this diseuse makes it notably rare and suggests either that 'Hamwih' sheep and goats were generally resistant to this common trouble or that few among them lived to be particularly old. A case of hyperplasia on a distal femur. and a hole on an unfused distal metacarpus, both in sheep, could both have been caused by infection.

A pig mandible from an elderly male has a big swelling at the root of the canine, and this had caused irregular wear on the tooth above. Additionally. a pig scapula shows a large rounded hole within the glenoid cavity. Infection could have been the cause of both.

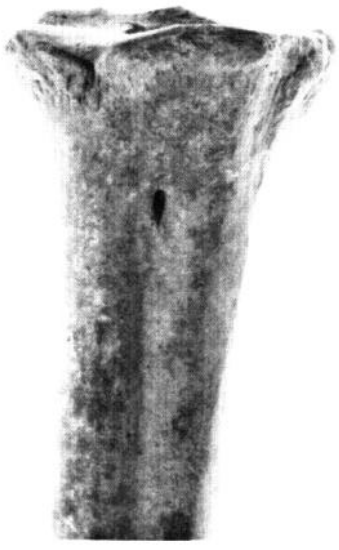
Many infections could, of course. have been present in the animals without leaving traces in the bones. Yet a maximum of six cases seems modest, anti the impression is that the animals, though they gave signs of working hard, had a good resistance to disease.

(c) to possible malnutrition:

On sheep horn cores there are many shallow indentations, at times barely perceptible, but at others clearly pitted into the surface, which seem to correspond to the marks recognized by Hatting (1975) as signs of malnutrition. Such signs are found almost exclusively on the horn cores of wethers. and if the diagnosis is correct it establishes the practice of castration (Fig 17,9a, b).

A large number of horn cores are affected in this way (48 out of a combined total of 213 for rams, ewes. and wethers combined). All three groups could have been similarly fed, and if this is so there would have been a wide measure of deficiency among the flocks as a whole-more than the chance results of the occasional lean season. This is not easily reconciled with the state of health as inferred from the mandibles. nor is it immediately acceptable that one species, and that the most numerous, should shows marks of undernourishment when the other species were apparently well fed. and the implications of this will be discussed in some detail in the section on sheep (below. p 109).

It should be recorded that no comparable marks were found on the horn cores of goats. these may not be similarly susceptible, but the horn cores were particular-



a

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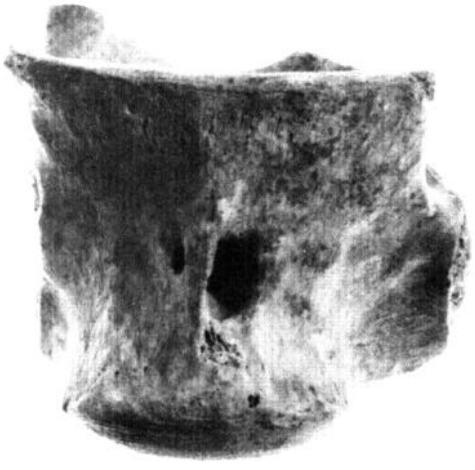

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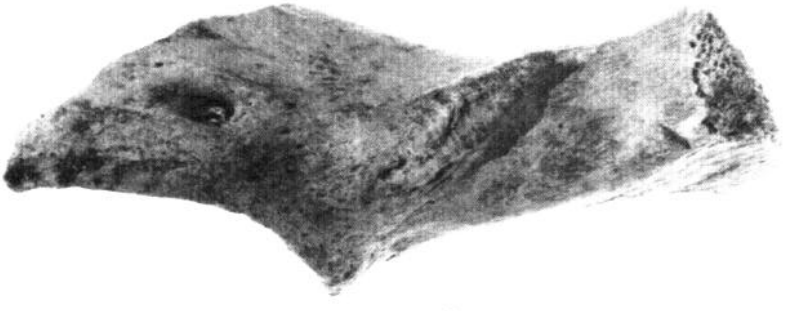

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Fig 17,6 a) Cattle metapodial with dorsal foramen; b) Cattle metapodial with no dorsal foramen; c) Asymmetry in foramina of cattle vertebra; d) Cattle acetabulum showing unusual opening

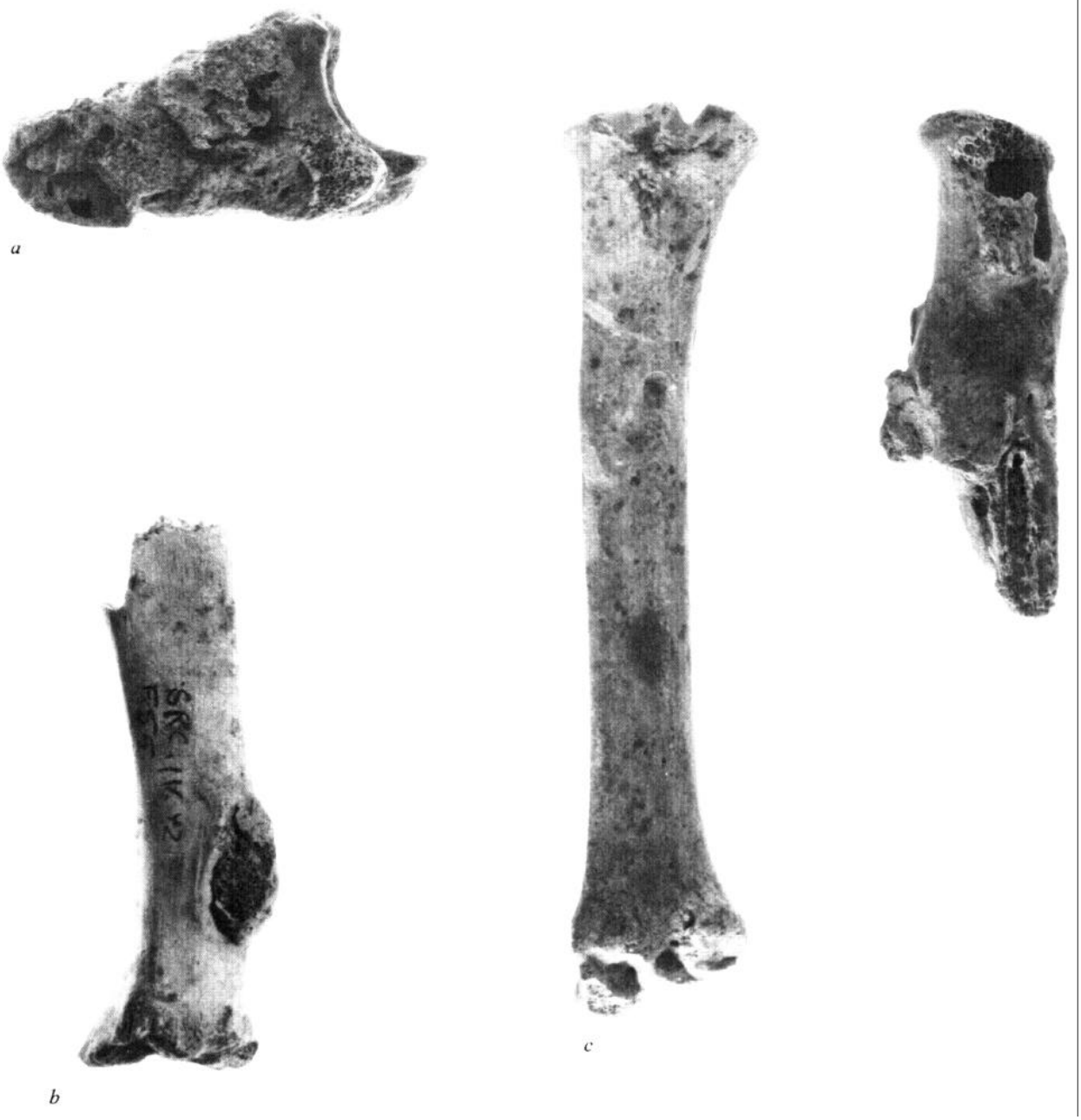


Fig 17,7 a) Cattle phalanx with exostoses; b) Pig tibia with distal outgrowth; c) Fractured right radius of sheep shown beside normal one

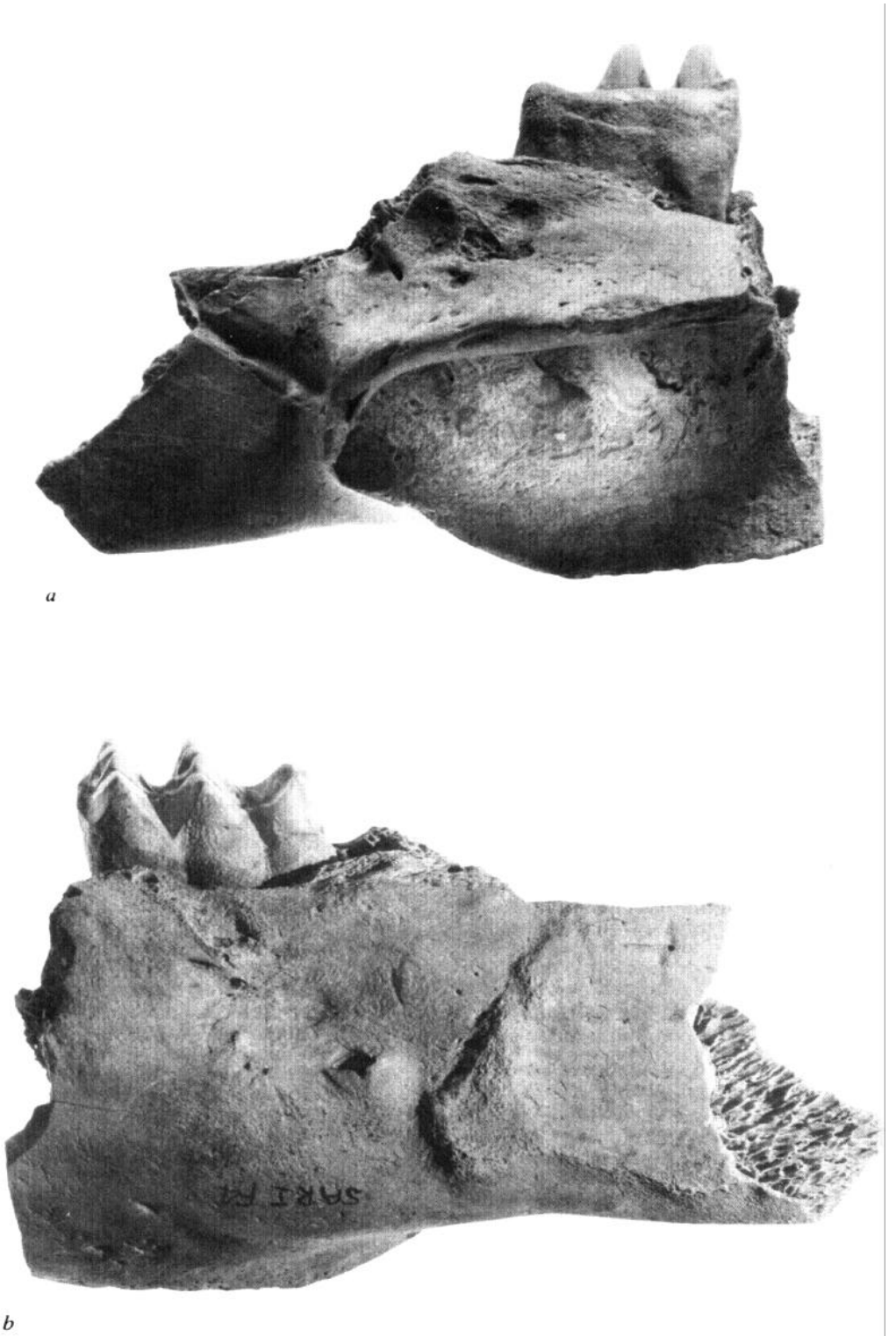


Fig 17,8 Diseased cattle mandible: a) lingual view; b) buccal view

Fig 17,9 a) and b) Horn cores of wethers showing surface indentation; c) Fractured pig tibia

ly solid and substantial and, like the goat material in general, gave the impression of coming from active and vigorous beasts.

Consequences of injury and accident

Signs of injury and accident are rare. There are nine damaged ribs (seven cattle, one sheep or goat, one pig), the products perhaps of hard handling or of rough and tumble among the stock themselves. There is the sheep's fractured radius, discussed with the other sheep forelimb troubles (above, p 92 and Fig 17,7c). And there is one pig tibia fused at the distal end only, which had fractured almost completely and had grown much new bone tissue in repair (Fig 17,9c).

The location of this fracture is interesting. Von den Driesch (1975, 421) quotes many pigs from Heuneberg and Manching with tibia fractures at just this point, with the inference that pigs were tied up by their hind legs and that the livelier animals broke their legs in pulling against the tie (Boessneck *et al* 1971, 78). One cannot establish the same husbandry practice from one single bone at 'Hamwih', yet the examples from elsewhere add conviction. And in this context it is fair to recall the growth on the pig tibia (above, p 92 and Fig 17,7b). Was this caused perhaps by rubbing? Both the fracture and the growth were on the lateral side of the tibia, and at the narrowest point, precisely where---were an animal tethered by its leg-the point of strain or irritation would occur.

It seems that pigs were vulnerable on the hind leg, as sheep were at risk on the fore.

Butchery and working

The analysis of such a complex process as butchery-using the word to include slaughter, disjointing, removal of meat and other products, and processes associated with cooking-is extremely time-consuming and difficult to quantify. It may be that the only way ahead will be the type of vertical and polar coordinate recording system set up by Biddick and Tomenchuk (1975) for the analysis of the Fengate material. This specifies location of fracture and butchery marks with the sort of accuracy that makes intra- and inter-site comparisons possible.

We have not analyzed butchery in that depth and these

notes therefore rcpresent superficial impressions gained by analysis of the recording sheets for sawing, chopping, and fine cuts, and of sketches made as the work proceeded. After looking at a considerable amount of Saxon bone we felt that we could distinguish cut surfaces produced by use of a 'chopper' from those resulting from other forces. We may be wrong and certainly more rcfercncc to American work on splitting and weathering of bone, followed by a really detailed analysis using a computer. might give a different picture. Such an analysis would more than double the time spent recording this kind of bone collection.

The frequency of what we consider were man-made marks was cstremely high. The fine cuts, similar to those described later for the bird bones, might have shown an even greatcr frequency if we had done more than swiftly appraise each fragment.

Gnawing ing marks were occasionally seen but obvious dog-gnawing with the deep scratches made by the dog's claws (well illustrated in van den Driesch & Boessneck 1975. plate 7) was not noted. This suggests that either dogs completely consumed the bones while they were fresh or the incidence of dogs was small. Dog-gnawed bones would also tend to lie about on the surface or be only superficially buried by the dogs and be less likely to survive than bones buried deep in pits.

Slaughter evidence is lacking but this is scarcely surprising in view of the fragmentary nature of most of the skulls. There is no evidence in the ungulates for penetration of the brain cavity either in front of the horn cores or behind them. It may be that the evidence has been lost. Alternatively, killing may have been by another method,. eg 'simultaneous and instantaneous severance of the carotids' as used in Kosher practice. with or without prior stunning of the animal. which would not usually show up on the bones. Slaughter could well proceed without stunning as it did until very recently in the USA for hogs. calves. and sheep (Libby 1975).

Both method of slaughter and division of the cattle carease provide a contrast to the Roman practices at Portchester (Grant 1975. 392; Grant's work on the Saxon bones at Portchester (Cunliffe, 1970) had not been published when the Melbourne Street Animal bone report was written). At 'Hamwih', chopping transversely through a joint. giving results like those in Fig 17, 10a. is rare. We suggest that disjointing was done, if at all, by use of sharp knives and that cattle meat was removed from the skeleton as it is today in a knackers' yard.

At some point the major bones were separated in cattle as many of them are chopped longitudinally from the joint surface. In cattle the longitudinal cuts are the most frequent, with transverse cuts across the shaft or to remove the epiphyses the next most common. Some typical splitting is illustrated in Fig 17. 10b, e, and d. The number of clean joins still possible between cattle fragments chopped apart by the Saxons suggests that bones were splil logitudinally (probably for the removal of marrow) and were then almost immcdiately buried in pits. This would also explain the excellent overall preservation.

Pig and ovicaprid skulls were frequently cleft for brain extraction but butchery on the long bones of these species was not consistent. Some bones show knife cuts in the joint region but chopping through diaphyses was apparently al more common method of dividing the carcase,

The lack of burning on bones and the lack of 'ivory'-textured bone (Coy 1975) suggest cooking by stewing rather than roasting and, as we know that most of the bone has disappeared, much of it could have disintegrated during. or as a result of, prolonged cooking. Older cattle would need good, long stewing and the toughness would be even greater in fresh meat. Hanging the meat for several days might have been difficult under Saxon conditions and it may not have occurred.

We can only guess at preservation practices but there would have been access to salt-producing areas on the Hampshire coast and salting of all domestic species (including geese) and fish would hare been possible either for hard times, for shipping, or as a delicacy. Bones from 'hams would be unlikely to survive as they would be attractive to dogs (a fact frequently recorded since medieval times,) and not unpleasant enough to require burial. The bones we are seeing from pits may therefore be only the bones which were not cooked or preserved in meat. Our species ratios may be seriously at fault for this reason as beef would be less likely to be preserved on the bone than mutton or pork. This to some extent justifies the use of Minimum Numbers dependent on mandibular evidence.

Consistency between sites and pits (see next section) suggests no centralization of butchery: bones missing are mainly those which for reasons of late fusion or thinner walls are not often preserved.

At 'Hamwih', sawing always seems to indicate bone-working rather than butchery practice. Horns of cattle, sheep, and goat were all used (Fig 17.11). Cattle horn cores tend to be sawn or hacked across to separate them from the skull but some marks at the base of the cores could be from attempts to remove the horn. Horns of males. females. and castrates were all used, with a wide range of circumference sires. Such marks at the base are not found on the goat cores. either because, being straight. they were easier to remove, or because rotting had occurred to at greater extent, perhaps during transport. We suggest elsewhere that some of the goat horns may have been imported as horns-on-cores. Sawing across goat horn cores sometimes occurs higher up the core. suggesting use of the core itself (for which we have no other evidence) or sawing of the horny material into suitable pieces while it was still on the core. When only the very tip has been sawn off it might have been to allow easier removal of the horn from the core.

Of the three species. goat would provide the largest area of straight horn. Importation of some cattle horns for making containers could account for the variety of horn cores found. but whether short- or medium-horned cattle yielded he best horns for the required purpose we cannot know Such importation could complicate the picture of sex dimorphism from horn cores.

Sawing occurs across long bones (Fig 17,12a-d) to provide large areas of flat, thick. solid bone for. eg. comb making. A few of the smaller objects of worked bone come from sheep or goat and one from goose (Fig 15, 1. no 7). Cattle femur capita were sometimes fashioned into spindle-whorls or used for rubbing or polishing (Fig 17. 12e and f). and pig fibulae were made into needles.

Red deer antler is extensively worked when it occurs, with saws and possibly with choppers and sharp knives (Fig 17,13a and b). Apart from the actual antler objects. the worked antler found in Melbourne Street seems to be waste material in that most pieces are from junctions of tines with the main shaft,. or of terminal parts of antlers.

We hope to gain more extensive evidence on bone working from Site XIV where there is some evidence of localization.

Consistency

The purpose of this section is to check the consistency of results as these reflect Saxon use. Inconsistencies which spring directly from different methods of recovery. in

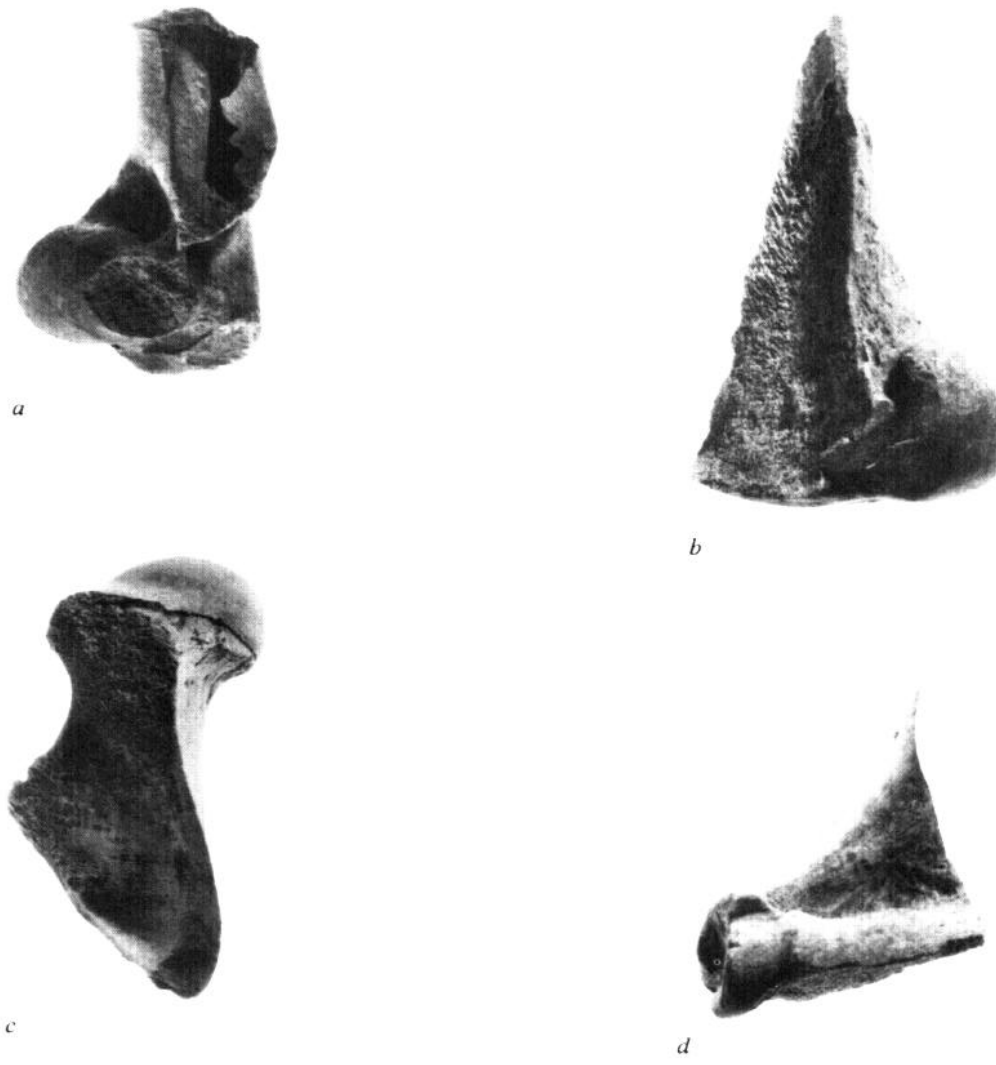


Fig 17,10 a) Cattle humerus chopped transversely; b), c), and d) Examples of longitudinal splitting

particular from the proliferation of small fragments found through the water-sieving of much of F16 on Site V, have therefore been discounted.

Most results are comfortably consistent between the different sites. Of the mammal fragments, the proportion of unidentified material is close to 10% by weight throughout, and by fragment count ranges from 30.0% to 37.7%. Pathological conditions are scattered quite evenly, as are off-cuts from bone-working. There is no horse on Site XX, nor dog on Site I, but otherwise horse, goat, dog, and deer are evenly distributed.

The ageing pattern is generally consistent: the main exceptions are an increase of mature cattle on Site XX, of young sheep on Site I, and of older pigs on Site VI.

Measurements need to be more fully investigated, but a first analysis suggests few if any significant changes between the various sites.

On the other hand, the ratio of the three main domestic species shows some small fluctuation. It is pertinent first to compare for consistency the three methods of quantification---fragment count, weight, and Minimum Numbers. If one looks at the separate sites there is good correlation for all three species between fragment counts and weights (see Fig 17,14a for sheep/goat) but less correlation between these and Minimum Numbers (see Fig 17,14b for fragments against Minimum Numbers). This relationship between the three methods holds, though to a lesser extent, in the pits. In particular it holds for the sieved and unsieved material in Site V, F16 (see above, Table 17,4).

Provisionally the correlation between fragment count and weight inspires more confidence than do the erratic Minimum Numbers, but it seemed wise to test this judgment by an analysis of the frequency of the different bones. Each species varies somewhat in its proportions here, but each shows steady consistency between the different sites and this suggests that their patterns of use, butchery, and fragmentation were constant. If this is so

Fig 17,11 Horn cores of a), b), and c) cattle; d) sheep; e) goat; showing saw marks or chopping at base

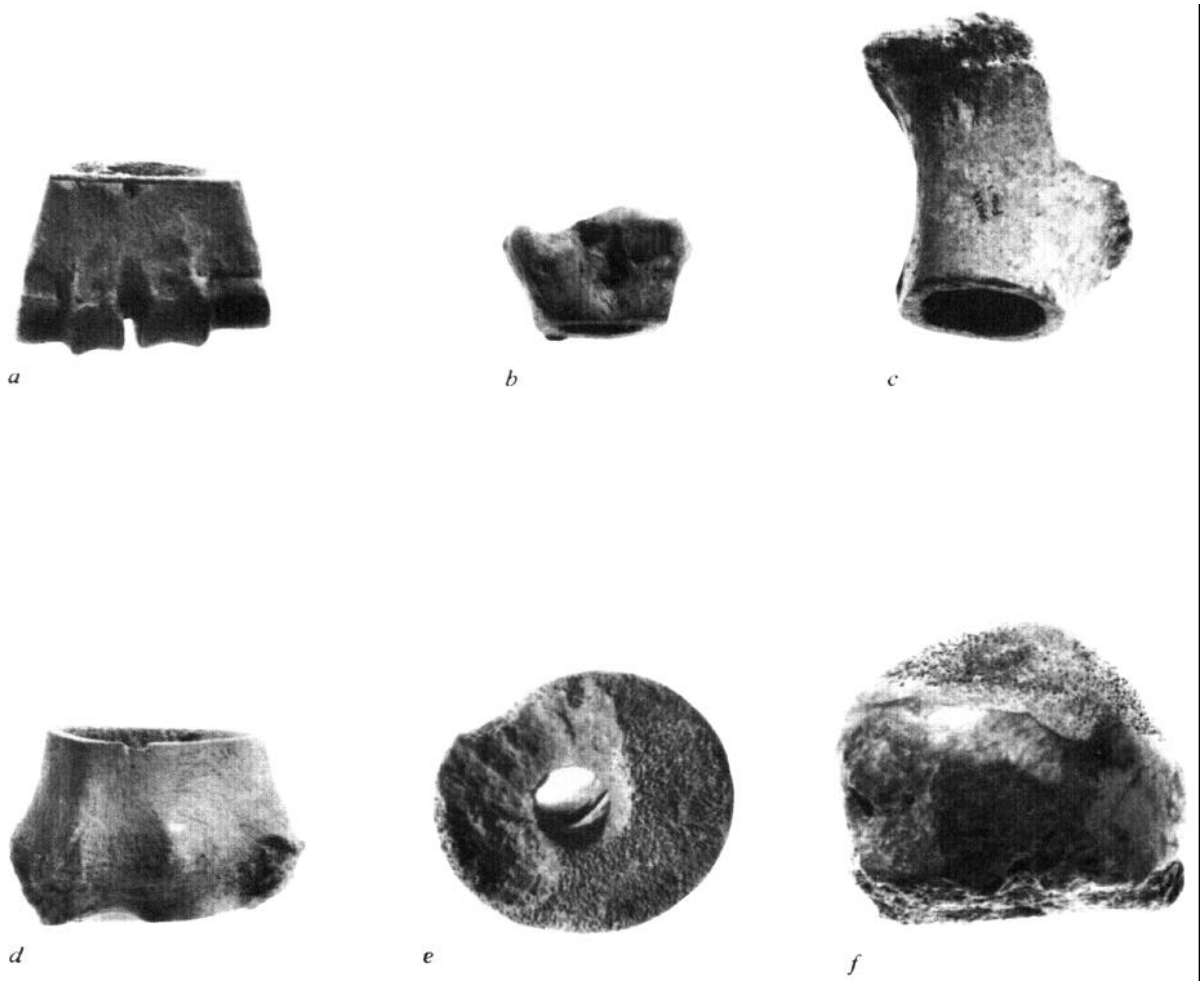


Fig 17,12 a) and b) Sawn cattle metapodials; c) Sawn cattle proximal femur; d) Sawn horse distal radius; e) Spindle whorl from cattle femur caput; f) Femur caput used for polishing

the proportions by fragment count and by weight seem a more reliable measure of consistency than those by Minimum Numbers which, as has been suggested earlier, are theoretically more suspect where questions of ratio are concerned.

From Fig 17,15 it can be seen that by fragment count and by weight cattle proportions among the main domestic animals are remarkably consistent between the different sites, ranging from 49.2% to 54.3% by fragments, and from 69.0% to 74.2% by weight, with coefficients of variation of 4.1% and 2.9% respectively. The coefficient on the Minimum Number ratio by contrast is 15.3%.

Sheep range from 27.2% to 37.4% by fragments and from 12.6% to 18.5% by weight, with coefficients of 10.7% and 13.4%; pig range from 13.0% to 18.8% by fragments and from 9.9% to 14.7% by weight, with coefficients of 13.7% and 15.1%. Sheep are proportionately more prevalent on Site I and less so on Site VI; with pig the changes are reversed.

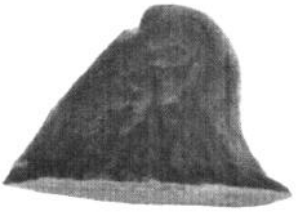
Before taking this particular variation any further it is as well to see the picture as a whole. The general consistency, in so many ways, is very good between the sites. This probably means that there were no great topographical differences within Melbourne Street in the use and disposal of bones; abut a general correspondence could also allow for very significant differences between the different pits if these pit changes were themselves distributed between the sites in such a way that variations averaged out. The next stage in the investigation was, therefore, to look at the smaller units; in the absence of any stratification or phasing which could class the pits into some distinct Saxon groups the pits were compared and contrasted as prime units in themselves.

Forty-six pits had each provided at least five kilos of bone from the main domestic animals, and these were tested for the consistency of their specific ratios. Minimum Number ratios, pit by pit, again bear little relationship to those derived from fragment count and weight, and again it is the good correspondence between the last two that forms the basis for inter-pit comparison.

Cattle again show the smallest coefficient of variation, 18.7% by fragment count as against identical figures of 25.5% each for sheep/goat and for pig. These figures are

a

b



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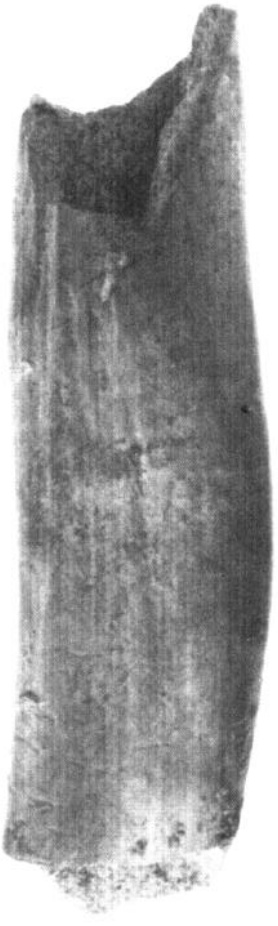
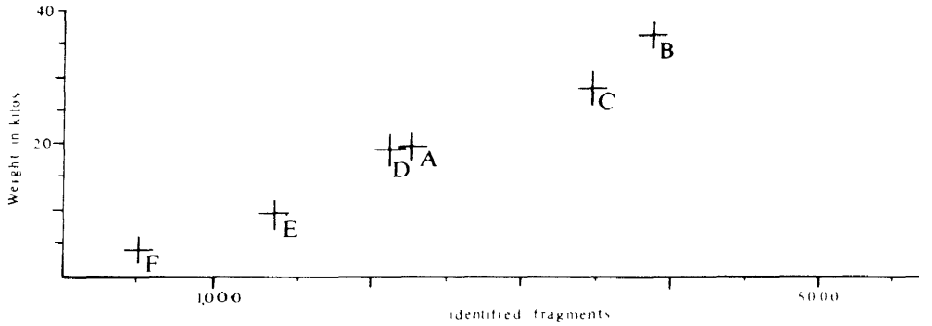


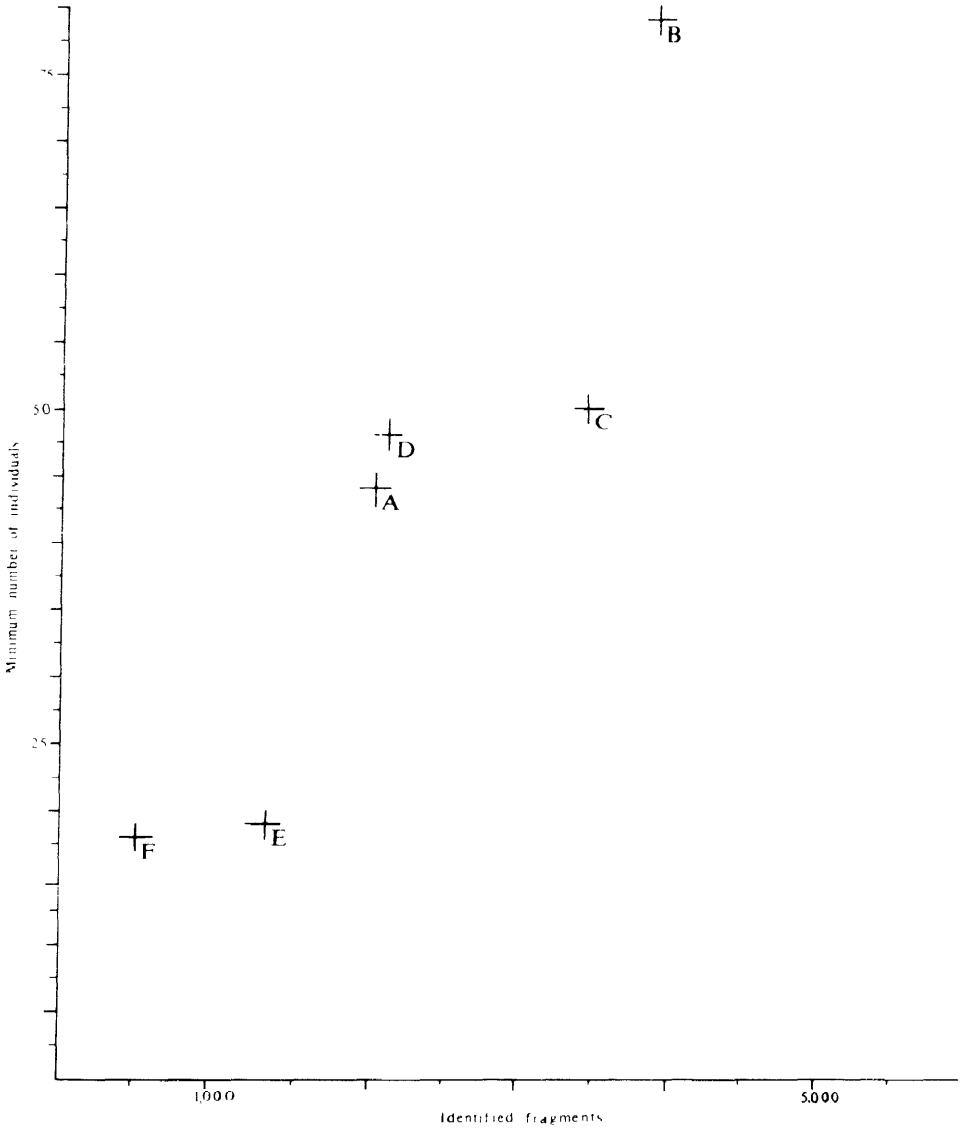
c

e

Fig 17,13 Deer antler: a) Pedicle showing sawing; b) Antler shaving removed with chopper or knife; c) Atypical antler beam; d) Short antler, probably damaged; e) Possible growing antler fragment



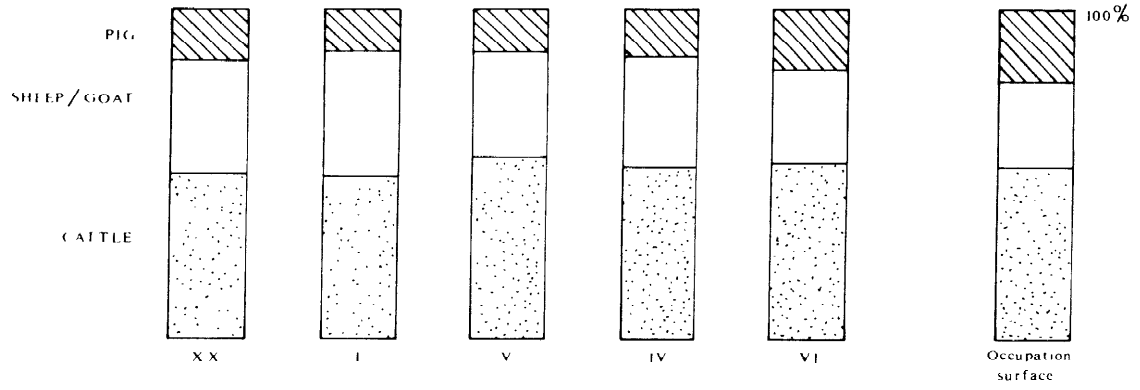
a) Relationship of fragment count and weight in Sheep/Goat



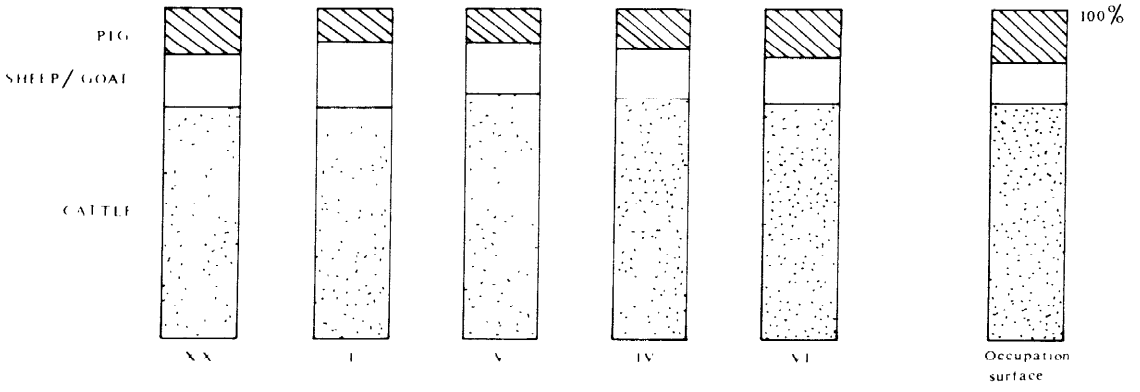
KEY
A - I
B - IV
C - V less F16
D - VI
E - XX
F - Surface

b) Relationship of fragment count and minimum numbers (mandibles) in Sheep/Goat

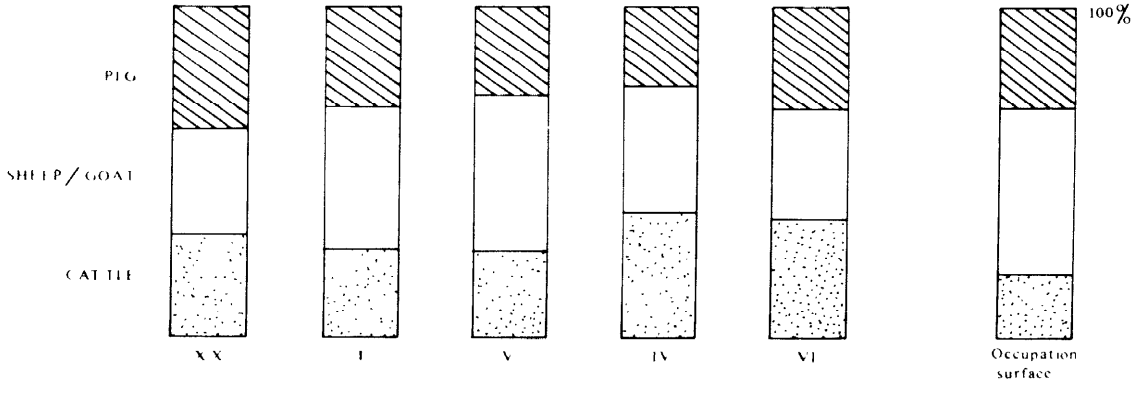
Fig 17, 14 The three methods compared for sheep/goat



3) Relative Frequencies from Fragments



b) Relative Frequencies by Weight



c) Relative Frequencies by Minimum Numbers (mandibles)

Fig 17,15 relatively frequencies site by site

substantially higher than those calculated on the basis of the sites. In the smaller samples from the pits greater divergencies may be expected, and on the whole the ratios show more fluctuations as the pits decrease in site. But there are several significant exceptions which may repay further study.

Lastly, the data front the occupation surface were examined and then compared with the results from the pits as a whole. Such occupation material forms only 5% of the Melbourne Street animal bone, yet it may be the only part which can be separated from the rest in terms of its Saxon significance, and this gives it an interest of its own.

The surface material was plotted on a grid but showed no particular correlation with the road or the structures found in the area. Bones had certainly not been used to dry out the road. as they had been on the paths at Haithabu (Reichstein & Tiessen 1974, 14); the 'Hamwih' road was of good local gravel and seems to have served its purpose well.

In a comparison of the surface material with the overall results from the pits. unidentified material is slightly up and the average fragment weight for each species slightly down (drastically so for horse, but this may be discounted as due to many small pieces of rib). These changes may link with the somewhat poorer preservation of bones which had not been left in the protection of the pits. The occupation surface shows a shortage of goose and fow 1. and a complete lack of other birds: this, too. may reflect the greater hazards of preservation. Deer and dog are found in reasonable proportions as compared with the pits, and cat fragments appear in good numbers.

Of the three main domestic animals, cattle come very close indeed to the main Melbourne Street average both by fragment count and by weight, 52.3% for fragments (52.5% for whole site), and 71.% by weight (72.1% for whole site). Sheep, goat and pig differ from the mean and differ more markedly than they have done anywhere else: pig is up to 21.9% by fragment count, from the mean of 15.3%. and sheep/goat drops from 32.1% to 25.3%.

What was left on the occupation surface was presumably fairly late, and it is possible that pig was relatively more important in the later days of 'Hamwih'. But it is more likely that the extra pig bone was found because more was left lying around the surface than was buried in the pits. If this is so, the specific ratios. based overwhelmingly on pits, would underrepresent the contribution of the pig to the animal economy of 'Hamwih'.

The point of greatest significance in these comparisons is the steady ratio of cattle in contrast to the greater change\ in the proportions of sheep and pig. A decline in pig is often taken as a sign of a decline in rough woodland and a measure of the clearance that has been achieved (see, for example, Noddle 1975a. and for documentary evidence from the continent, Latouche 1967). At Haithabu, however, the proportion of pig was more stable, but there was a marked decline in sheep. and also a conspicuous increase in cattle which is seen as part of a phenomenon of the consolidating of urban economy in the Middle Ages, *dir Verrindeung der Städte* (Reichstein & Tiessen 1974. 16). The greater consistency of the cattle at 'Hamwih', and the fluctuations between sheep and pig. may require some more complex explanation. It should soon be possible to tell from the evidence of pot and other finds whether these fluctuations correspond to changes in time; for the moment one must keep open all possibilities. and these include a specialization between the pits, either in long-term patterns of use, or simply in accordance with the season in which they happened to be filled.

In general. the results between the sites show consistency to the point. not of dullness, but of general reassurance. Within Melbourne Street there are differences between pits and a measure of variety. yet a general feeling of consistency and little topographical differentiation.

Is it right that these Melbourne Street bones, though an entity in themselves. should be taken as standing for 'Hamwih as a whole? The example of Manching (Boessneck *et al* 1971, 5-6) suggests that when the pattern of all the finds gives unity throughout a settlement, then the bone results from different areas within that settlement may indeed differ a little between each other but are likely each to be in reasonable harmony with the settlement as a whole. Certainly the Melbourne Street sites show a good range of other finds, and if the Manching experience is a valid generalization then it might be expected that the preliminary conclusions offered on 'Hamwih' bone will be supported by the rest of the material when this is tested more fully later on. But for the moment one must be cautious. A quick inspection of the rest of the excavated bone has shown a more specialized hone-working site away from Melbourne Street, and another area which may be richer in horse and pig and which may produce some rather larger measurements. This should clearer when the next programme of work is under way. Thee detailed quantification achieved so far will provide a clear standard against which subsequent material may be set, and any significant changes should be detectable at once.

Domestic mammals

Horse

The horse is poorly represented at 'Hamwih'. It forms only 0.1% of the main domestic animals when assessed by fragment count, 0.5% by weight. and 0.7% by Minimum Numbers; even the weighting of the Minimum Number ratio to allow for the longer impact of older animals on the living scene, or for the extra meat weight of the larger- spectes, brings its share to no more than 2.8% and 1.7% respectively.

If one may judge by so small a sample, these were quite large ponies. A calculation of withers heights by Kiesewalter's factors (quoted in von den Driesch & Boessneck 1974. .333) gives a figure of 1.371 m from the lateral length of a metacarpus. and one of 1.369 m from the greatest length of a femur. Another femur, in its main essentials whole, is unfortunately broken at the trochanter. but this bone comfortably outstrips the other at every point and a proportionate calculation based on the lengths of the two femora from their respective capita (360 mm and 370 mm) gives a withers height of 1.407 m. As a measure of caution it is simply suggested that the second animal probably reached 1.40 m. (A modern comparison sets 14 hands. or approximately 1.42 m, as the line between a pony and a horse.) The bones are generally of a good width, in particular the larger femur, a humerus, and a radius, and these would probably have come from animals of a strong and heavy build. The complete metacarpus is proportionally more slender. The wider bones are likely to have come I from males, the metacarpus from a female, and if this were so the horse measurements would suggest a homogeneous group.

The size of the 'Hamwihl' horses may be set against withers heights of 10-14 hands (1.02 m - 1.42 m) for Iron Age material from Wessex (Harcourt 1975). It corresponds with the higher figures front Haithabu, where the range is from 1.30 m to 1.42 m (Reichstein & Tiessen

1974, 41). In the small sample from 'Hamwih' there is certainly no suggestion of two distinct horse groupings as were found at Manching, where on Keisewalter's factors the main group averaged only 1.25 m, but where there were also some much larger animals in the 1.40s and lower 1.50s (Boessneck *et al* 1971, 201).

It is hard to estimate precisely the age of the horses. It may be said with confidence that there is no trace of immaturity either in the bones or in the teeth. Three mandibles show good wear but their dentine pattern is distinct; in the remaining two this pattern has been lost and the biting surfaces are concave. which must have brought the animals towards the end of any useful life. The single surviving incisor (upper middle, second) has lost all trace of infudibulum and its table, worn triangular, is equal in width and in length. In modern terms such wear would mean an animal of approaching twenty years (Silver 1971, 259; Duerst 1930, fig 52).

The signs of arthritis and exostosis already noted on the lower limbs fit well with this picture of age, and may have resulted from years of hard use.

The total absence of young animals is interesting. If horses were bred and reared extremely successfully pits, then either they were reared extremely successfully throughout their early years or else the bones from any casualties were disposed of somewhere else. Presumably the horses were bred away from the town. and did not appear in 'Hamwih' until they had reached an age most suited for a particular working life.

The absence of young animals could also reflect on the problem of the human consumption of horses, for if these had been eaten regularly the bones of some young animals would surely have found their way into the pits. This question of the eaten of horse is complicated. The two whole femora found in so small a sample suggest very strongly that the marrow at least was ignored. And it is to be remembered that Theodore of Tarsus prohibited the eating of horseflesh (Levison 1946, 101). This was not a prohibition based on scruples of tenderness: horseflesh along with that of badger and of various other animals. was simply held to be unclean.

Yet if horses were not eaten, why were their bones in the pits? There was no particular concentration on one part of the body. Mandibles give the highest number of individuals (5), but this ranking is common and springs from the distinctiveness of teeth. Femur, metacarpus, and the first phalanx give three individuals each, radius and patella two, and other bones no more than one. Head, vertebrae, ribs, limbs, and pelvis are all represented, apparently indiscriminately, in this small collection of bones. And the fragments were distributed one or two at a time and quite evely over the sites. Only Site XX, the smallest site, had none at all. The surface occupation seemed to have more than its share (04% as against the mean of 0.1%), but this included several pieces of rib found in close proximity which explained the apparent excess.

The pattern of cuts differs greatly in style from that of butchery in cattle, but there are cuts on the vertebrae, probable slicing of the mandibles, and deep and positive chops on a tibia and a metatarsus; the animals had clearly been dismembered.

One horse fragment showed a different sign of use: Site I produced a distal radius which had been neatly sawn and which must represent the cut-off end, discarded when the flat expanse of shaft was being prepared for working (Fig 17, 12d).

But the ultimate use of the carcase is of less importance than the use of the animal in life. Horses were valued in many places for their great advantages in war (see, generally. Bökönyi 1974 and, for early medieval Europe, White 1962), but this should not normally have been a factor for the 'Hamwih' traders. Nor was there any shortage of cattle for ploughing or for urban traction. The introduction of the effective hard horse-collar has been much discussed: White in particular seeks an early date for its introduction, which he sees as corresponding with the expansion of strip farming in north-west Europe, but he cannot date the hard collar before the 8th to 9th century among the Germans, and considerably later over here. This would not have been in time for the 'Hamwih' horses, and without the better harnessing provided by the collar there was no reason to prefer horses to cattle for the plough.

It is suggested, therefore, that the 'Hamwih' horses were used mainly as mounts and as pack animals, and possibly also for carting. They must have been expensive investments and were kept to a considerable age; whether they served as status symbols may at the moment only be guessed.

Cattle

It has been shown in the general discussion of results that cattle were of the greatest significance among the domestic animals of 'Hamwih': although by Minimum Numbers their figure of 211 ranked second to the sheep/goat total of 265. they had a clear lead in the fragment count (23,896, or 52.5%) and a massive one by weight (5137.9 kg, 72.1%). These fragment and weight proportions were notably steady between the different sites, and the general cattle predominance was also evident in the great majority of pits.

It has been shown that the cattle lived to a good age. About a quarter mere killed in late adolescence, but once this stage had passed many beasts reached full maturity and survived to wear their teeth heavily, probably over many years. The evidence from pathology supports this good survival, showing healthy beasts whose main (and rare) troubles probably stemmed from use and age. Even the badly damaged mandible (above. p 92) came from a mature animal which then survived prolonged distortion to its teeth.

Cattle withers heights were calculated on Fock's figures for the metapodia. using the mean factor of those for cows and bulls (for the metacarpus. x 6.125: for the metatarsus. x 5.45. as recommended in von den Driesch & Boessneck 1974, 336).

The figures calculated from the metacarpus are affected by one bone which is very long indeed (224.8 mm, against a mean of 189.7 mm and a range for the remaining bones of 172.0 to 208.0). So distinctive was this bone that a check was made on the measurements of Bos primigenius, but Jewell's (1962) illustrations of Bos primigenius metacarpi from Star Carr and Snail Down all reach at least 250 mm: and the general texture of the bone fits with the rest of the 'Hamwih' material and in every anatomical feature save length it seems wholly consistent with the group. It is therefore accepted as domestic. It may perhaps have come from a castrate where the phenomenon of delayed epiphysial fusion (and consequently of a longer period of grow th) was carried to excess.

The mean withers height from the metacarpi works out at 1.162 m, with a range of 1.053 m to 1.377 m; from the metatarsi the withers heights average 1.154 m. and the range is from 1.065 to 1.243 m.

Matolesi (1970. 118) alone has produced factors for calculating withers heights on the basis of the main long bones. 'Hamwih has one single whole fused tibia, which gives a withers height of only 1.017 m, and two radii which produce withers heights of 1.051 m and 1.071 m.

It is strange that, as compared with the metapodia, these bones give figures so low.

Three explanations may be offered. The first is that Matolci was working with Hungarian steppe cattle which may well have had somewhat different proportions from those of western European beasts. The second is that the calculated ranges from the metapodia have been somewhat narrowed by using the mean factor for cows and bulls. And yet there remains the coincidence that the three figures from radius and tibia are all so low. There could be some significance in the fact of their preservation, when out of a minimum number of more than 250 fully fused long bones all the rest had been broken or cut. The third possibility is that they were the very smallest bones, least likely to have good supplies of marrow.

A comparison with Jewell's (1962) survey of changing cattle sizes in Britain through prehistoric times shows that 'Hamwih' came centrally within the range of that for Roman cattle in this country. It is safe to say that the 'Hamwih' animals were maintaining the general improvement ascribed to the Romans with their introduction of new types or breeds of cattle, an improvement recently confirmed for Portchester by Grant (1975). Jewel1 also gives comparisons of metatarsal and tibia widths, which may give some indication of build; after the marked fall in cattle sizes in the Bronze Age there had been fewer changes in width than in height, but the 'Hamwih' material again fits closely inside the Roman range. Many more sites must be published before tentative conclusions from 'Hamwih' could be turned into certainties applying to the country as a whole; but on their showing at 'Hamwih' the Saxons were very successful with their cattle.

The good size is borne out by a comparison with Haithabu, which, like 'Hamwih', was an international port. Here the cattle were smaller, with a mean of 1.09 m for withers height, and a range which dropped as low as 0.90. It seems likely that cattle increased both in relative importance and also in height during the span of Haithabu's existence (Reichstein & Tiessen 1974), but 'Hamwih' from the start had cattle which could compare with Haithabu in its prime. Since 'Hamwih's' foundation was at least two centuries earlier than that of Haithabu. this was a notable achievement.

The sexing of the cattle offered problems. Pelvic bones were rejected: some strong acetabula could be taken as male, some lighter ones as female, but quantification seemed unreliable since there was no way to be sure, among the many fragments, how far the presumed lighter build of the female could have biased the sample by a greater tendency to break. Sexing was therefore attempted only on the basis of the horn cores and of the metapodia.

A histogram for the basal circumference of the horn cores, excluding those which were apparently juvenile, gives three main groups (Fig 17,16a). One would like to distinguish these as male, female, and castrate. yet a separation on grounds of texture and shape gives completely different results- These differences are taken to be of potentially greater importance. The majority of the cores (70.6%) are of short or medium length, slender, fairly smooth on the surface, and gently twisting at the ends, and these are probably from females, On measurement they distribute as in Fig 17,16c. The rest are thicker, wider, and often with deep grooves and ridges on the surface: this group could have come from males, either castrated or entire (Fig 17,16b). They are similar in appearance to the ox cores published for Lauriacum (Baas 1966. plate l), but there were inevitably bulls in the herds, and presumably also in the pits, and it is likely that their horn cores would also be included in this second, heavier group.

If these visual distinctions in the horn cores are indeed sex-linked, the groupings revealed by metrical analysis in Fig 17, 16a might represent some general separation of breeding communities, with both male and female in each.

For the metacarpus, distal width/length indices were plotted against the length itself. The one exceptional bone comes out appropriately in isolation, and the rest fall into two distinct concentrations (Fig 17, 17). The solitary giant is in any case assumed to be from a castrate. The larger of the two concentrations, those bones with the slender proportions, are taken to be from females, and the group of sturdier bones to be from males. For the moment it is left an open question whether the latter were castrated or entire. A very similar distribution has been published from Skedemosse, where 72.7% were classed as females, and of the remainder only one individual was classed as a castrate (Boessneck et al 1968, 57).

There is a surprising correlation between the ratios given by the horn cores and those from the metacarpi. In each case the presumed females are near to 70% (70.6% and 68.0% respectively). It is reasonable that larger and heavier horn cores should correlate with sturdier front legs: both would fit the male concentration of weight on the front part of the body. The only point at issue is whether these males had been castrated.

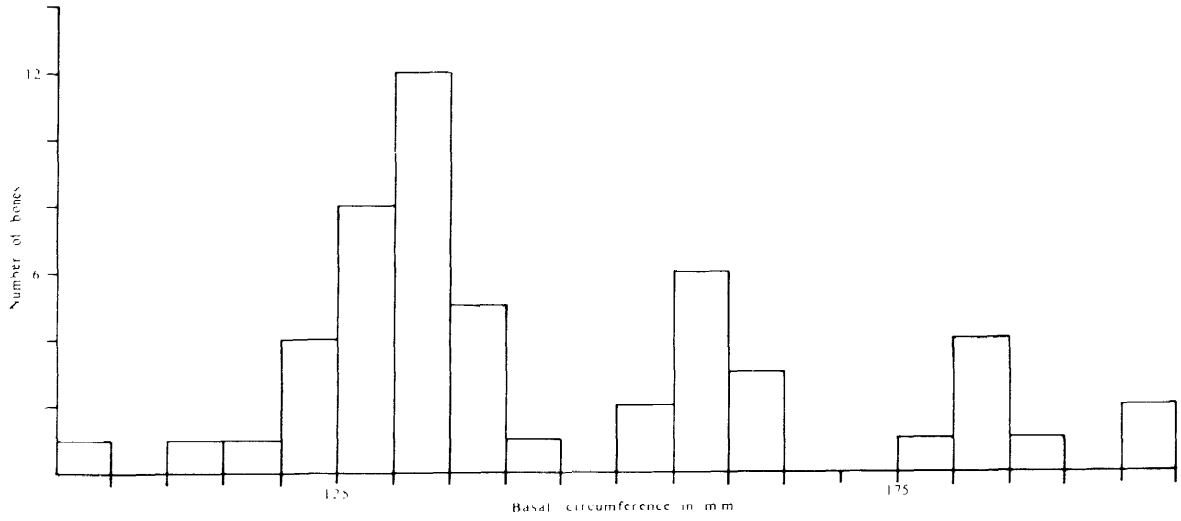
Reassured by the texture similarities with Lauriacum and elsewhere, and remembering the many references to oxen in Saxon literature and laws, we assume that this second group of animals (some 30%) represents mainly castrates, although it may also include some bulls.

Since 70% of the mature animals were female, the great majority of animals slaughtered at a younger age were probably male.

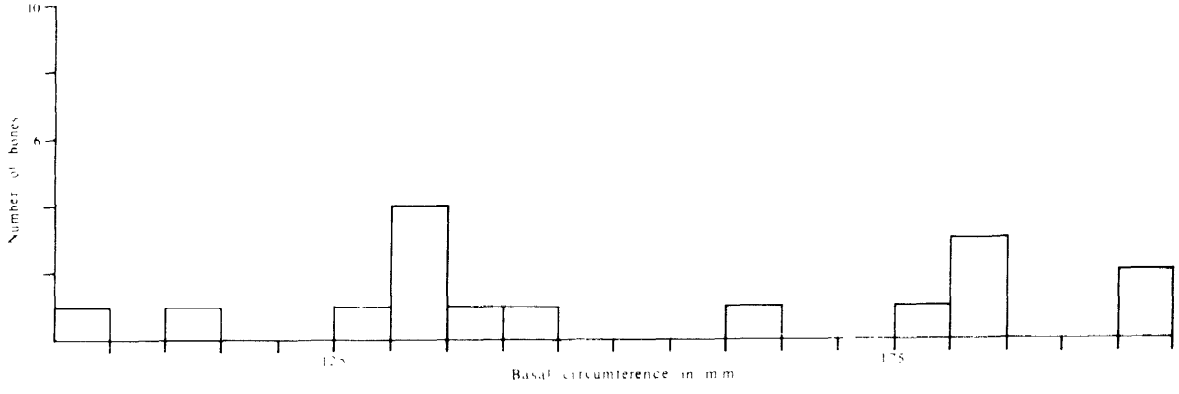
A check was made on the presence of the different parts of the body. Mandibles were well to the fore in the Minimum Numbers calculated from the different bones (209 as against 133 for the next bone, radius). This good representation distinguishes 'Hamwih' from, for example, Haithabu, where the relatively low mandible ranking has been taken to mean that cattle were often slaughtered outside the settlement and brought in after the heads had been trimmed away (Reichstein & Tiessen 1974, 23). Chaplin, on the other hand, sees the large number of cattle mandibles at the Treasury site in London as evidence for a farm where the beasts were killed, trimmed, and dispersed (Chaplin 1971, 136). Neither suggestion is made for 'Hamwih', It seems clear that cattle were slaughtered and used on the spot and that the high number of mandibles may be explained by the easier differentiation between left and right.

At the other end of the table, femur and ulna give the lowest readings (90 and 70 respectively). This need not be significant. Of the three sites quoted in the Haithabu report (Feddersen Wierde, Elisenhof, and Haithabu itself) these two bones consistently give the lowest. It is just possible that there was some process of differential use, common to all the sites; but it is far more likely that these two bones. both late-fusing and both at vulnerable points when it comes to dismembering the carcase, are particularly badly preserved.

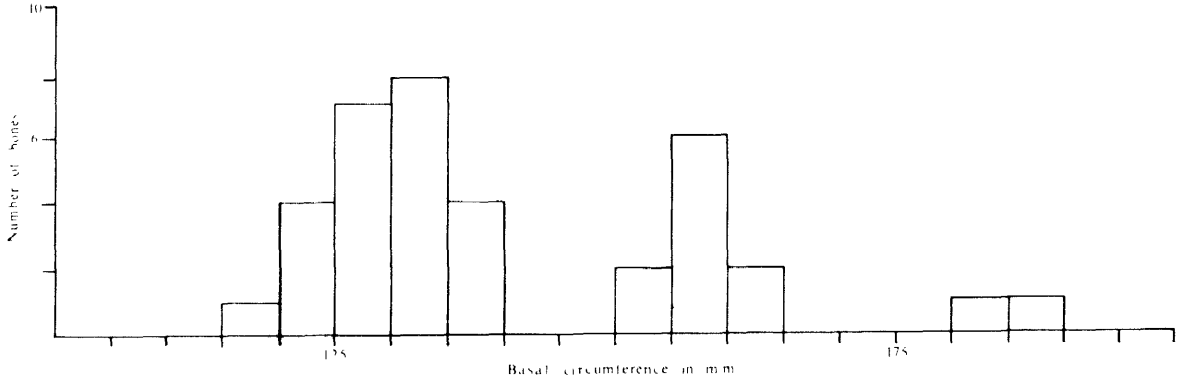
The distribution of bones by fragment count cannot of itself be relied upon to identify shortages, since it does not take into account the relative fragmentation of the bones, but it can provide a good check on the general consistency and in fact a steady pattern of cattle use emerged between the sites. There was also a good consistency between the pits as a whole and the



a) Total



b) Probable Ó Ó and Ó Ó on texture and general appearance



c) Probable on texture and general appearance

Gig 17, 16 Distribution of cattle horn core basal circumference Key: ♂male; ♂castrate male; female

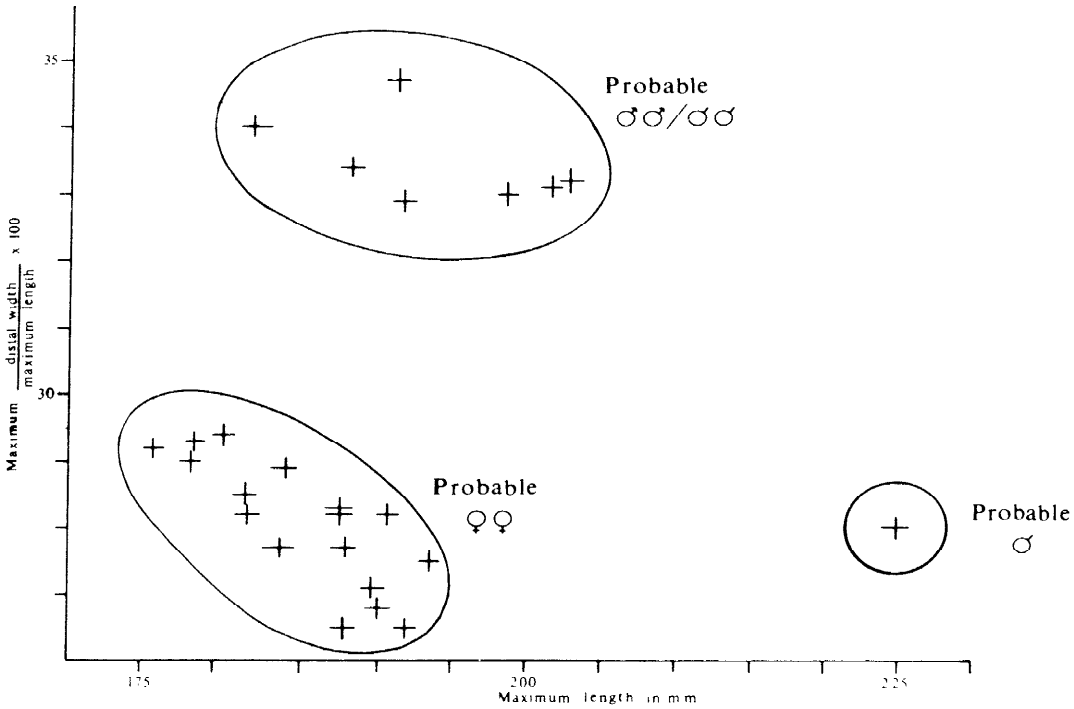


Fig 17, 17 Cattle metacarpus. distal width index against length

occupation surface, except for an occupation shortfall in mandibles. This might be the chance of a smallish sample, or else the result of a quicker disposal of the mandibles directly into the pits. Since the pits had a good quota of mandibles, the lack on the surface above them and around them cannot reflect on the slaughter itself.

We have, then, a picture of a great many cattle reaching 'Hamwih' on the hoof. But animals from a distance would in fact have to travel live to ensure that their meat was fresh, and one would need to postulate extensive droving unless there were considerable grazing grounds nearby.

The arguments for a wide catchment area are the large size of 'Hamwih', which would inevitably have drawn heavily on the resources of the land both for its own supplies and for the general provisioning of the port, and the evidence from the horn cores, which may preclude a closed breeding community. But nearer pastures would be chosen first, and Monk (below, p 132) points out that there are charter references to meadows up the Itchen. One should assume, pending further work, that although a fair proportion of the cattle might have been driven into 'Hamwih' from a distance, a very substantial number were reared within a few miles of the town. This is important, for the cattle were generally long-lived and even before their death would have been making an economic contribution over many years.

Monk found evidence of hay and also perhaps of litter and these could well suggest stalling. Any such stalling need not have been a regular response to winter conditions, for the climate is at present very mild in the area and it may well have been as good or even better in Saxon times. Stalling and hay could also suggest occasional extra nourishment for milch cows, the fattening of meat animals before slaughter, or the keeping of animals away from their usual grazing, for particular uses round the town.

Some cattle were killed at the best age for eating-22.3% of the whole were killed shortly before the lower third molar began to come into wear. at about two and a half years in modern terms. This would be the best time for an animal to be both large and tender, and the most economical in the ratio of meat produced to the amount of foodstuffs consumed.

But many more (46%) lived through to full maturity, with every epiphysis fused and with all teeth fully in wear. The high proportion of females would constitute the breeding stock, and with so many cows one must assume some surplus of milk. The Itchen meadows would have been excellent pasture to encourage a reasonable yield.

The other great use of the living animals would have been for traction. Certainly there would have been ploughing: it has already been suggested (above, p 105) that horses did little of this work, and there were many cattle for the purpose. There may have been more mature cattle than would have been needed simply for ploughing, but traction would also have been needed in the working life of the port, and perhaps for transport as well.

Dung would have been a further and important product of the living animal, and would have been of prime value in arable areas. Buckland *et al* (1976) have shown, however, that dung was not always taken out of 'Hamwih' to the fields; they have suggested uses such as a mordant in dyeing, or an ingredient in daub or cob, for which it might have been on occasion retained.

After death the cattle would have had a new range of uses. Manifestly they were eaten, with the flesh often stripped from the bone and the bone then chopped for

marrow. The clean cutson on the long bones, and their taut bone-fits even after so many years, may help to confirm that at least somc of them were chopped when fresh and not after softening or stewing and that once the bones had been chopped they were thrown away quickly and not cooked out of shape.

Extensive use of cattle bone was probably made for the manufacture of bone objects, a few examples of which wcrc described in the butchery and working section, as cattle were the commonest large species available.

Tanning, and perhaps the preparation of parchment, could also have been important but at the moment such uses may only be prcsumed. There is. for example, no clear concentration of phalanges in any one place, which might have indicatcd a specialized tannery, nor a general dearth elsewhere. Scrapers such as ribs (Coles 1973, 130) have not been recognized; nor have tanning-pits been idcntified, though some of the polishing stones were probably used for rubbing leather. Preservation of leather is very poor at 'Hamwih', but a busy port, a centrc of activity based on a solid cattle economy, would not have wasted the hides.

The final picture is of cattle as the predominant animals of 'Hamwih'. While more work on the chronology of the pits may produce some temporal trcnds within the limited fluctuations of the cattle ratios or within the graduations of their measurements, it would take a strange and drastic revelation to oust them as the main factor in animal husbandry or to dispute their general maturity or their health and good size. If the be-cattling of the towns was an accelerating movement in the Middlc Ages, as is claimed on the Continent at least (Reichstein & Tiessen 1974. 16). 'Hamwih' as one of the earliest medicval towns started at a remarkably high level. And even if 'Hamwih' dwindle in prosperity before its final desertion, the evidence of the Melbourne Street sites suggcsts that cattle retained their importance to the end.

Sheep and goat

The problem of distinguishing sheep from goats has often been discussed. The investigation of Boessneck *et al* (1964) was of great use for the 'Hamwih' material, and yet problems remained. Some of the anatomical features which distinguish goat bones are some extent also linked with increase in size and maleness so that the mixture one presumably has of sheep, goat, males, females, and castrates gives an elaborate muddle without even taking into consideration the part played by individual variation and age.

The overall conclusion was that sheep goat separation was best made at one sitting for each type of bone: the second stage of the 'Hamwih' analysis proved to be an ideal time. The most useful method evolved was to spread out all the bones and to complete a check list of the key anatomical differences, and also to record a spot decision on general appearance. Ideally two workers worked separately and compared their results so that hard cases were brought into prominence. It was often found that one particular feature did not agree with the rest, and by sheer weight of other evidence it was then decided that some of these inconsistent features could not be reliable for the distinction of the 'Hamwih' sheep and goats.

It was found that somc bones can be distinguished with confidence, cithcr whole or in fragments (horn cores, radius. metapodia); others may he reliable, but only whole. or if certain key features arc present on the fragments (humerus, cranium, femur); others can only be separated by a subjective impression which was rejected as being unsure.

It seems clear from the bones where confidence is greatest that goat was present at 'Hamwih' in much smaller quantities than sheep. A scatter diagram for the width of the distal metacarpus plotted against the length gives a clear separation which coincides with other anatomical distinctions (Fig 17,18). The numbers obtained are 7 goats and 56 sheep: a ratio of 1 to 8. Minimum numbers from the radius give 11 and 201 or 1: 18. (Horn cores present special problems which will be discussed below.)

The material which could not be positively distinguished is likely, therefore, to have come very largely from sheep. The method adopted in presenting this report has been to refer to all sheep and goat material jointly as sheep/goat; to distinguish from within this total the certain goat material (in brackets); and to give the firm opinion that the rest must come, overwhelmingly but unquantifiably, from sheep.

Since certainty of distinction did not seem possible with the mandibles, sheep and goat were combined for the Minimum Number ratio. Together they give the highest number of individuals among the main domestic animals (265, or 39.4%). They provide a joint total of 14,606 fragments (32.1%) of which only 130 are positively identified as goat. The joint weight of the material comes to 128.1 kg (15.7%). of which 0.7 kg is certainly goat.

For the assessment of height it is advisable to use only bones which have been securely identified to species. The sheep factors used are those put forward by Teichert (1975, 63) for prehistoric and early historic sheep. Haak's (1965) figures for Merino sheep have been used by other workers and are therefore useful for comparison.

The sheep bones which remain entire and fully-fused in good numbers give a very consistent result: from the radius, a mean withers height of 0.617 m, from the metacarpus 0.618 m. from the metatarsus 0.613 m. with a total range from these bones of from 0.535 to 0.709. The rare whole tibia and femur fit this pattern well. at 0.613 and 0.635 respectively. The five humeri, however, arc well below it, with a range of 0.501 to 0.574. The final mean. on 184 bones, is a withers height of 0.614 m. and a range of 0.501 to 0.709. Although the sample of humeri is limited there is a definite suggestion that in 'Hamwih' sheep this bone is proportionately small.

Thc 'Hamwih' sheep were certainly larger than Wessex material from the Iron Age, which usually gives withers heights of 0.50 m 0.60 m. But they were smaller than those of Haithabu (Haak's figures give 0.612 for 'Hamwih' 0.64 m for Haithabu). The contrast is not great. Yet sheep were the preponderant species at 'Hamwih' as against their ratio of only 21.2% at Haithabu, and it is significant that they should have been kept in such high concentration when, alone of the main domestic mammals, they wcrc relatively small in size.

Not only were they small in height: they were also lightly built. Comparison of widths of the main long bones between 'Hamwih' and Haithabu shows that the 'Hamwih' sheep were proportionately slight. They young sheep may have been eaten with appreciation for their tenderness as lamb, but no animal, young or old. would have produced a substantial quantity of meat.

The pattern of ageing (see Fig 17,2c) confirms that there was indeed a group of animals killed young and presumably for eating: 19.2% of the sheep/goats died beforc the lower second molar had begun to come into wear, which happens at just under a year in modern terms. Next, tooth and fusion evidence both show a concentration of animals killed at some three to four (modern) years, and this group is harder to explain.

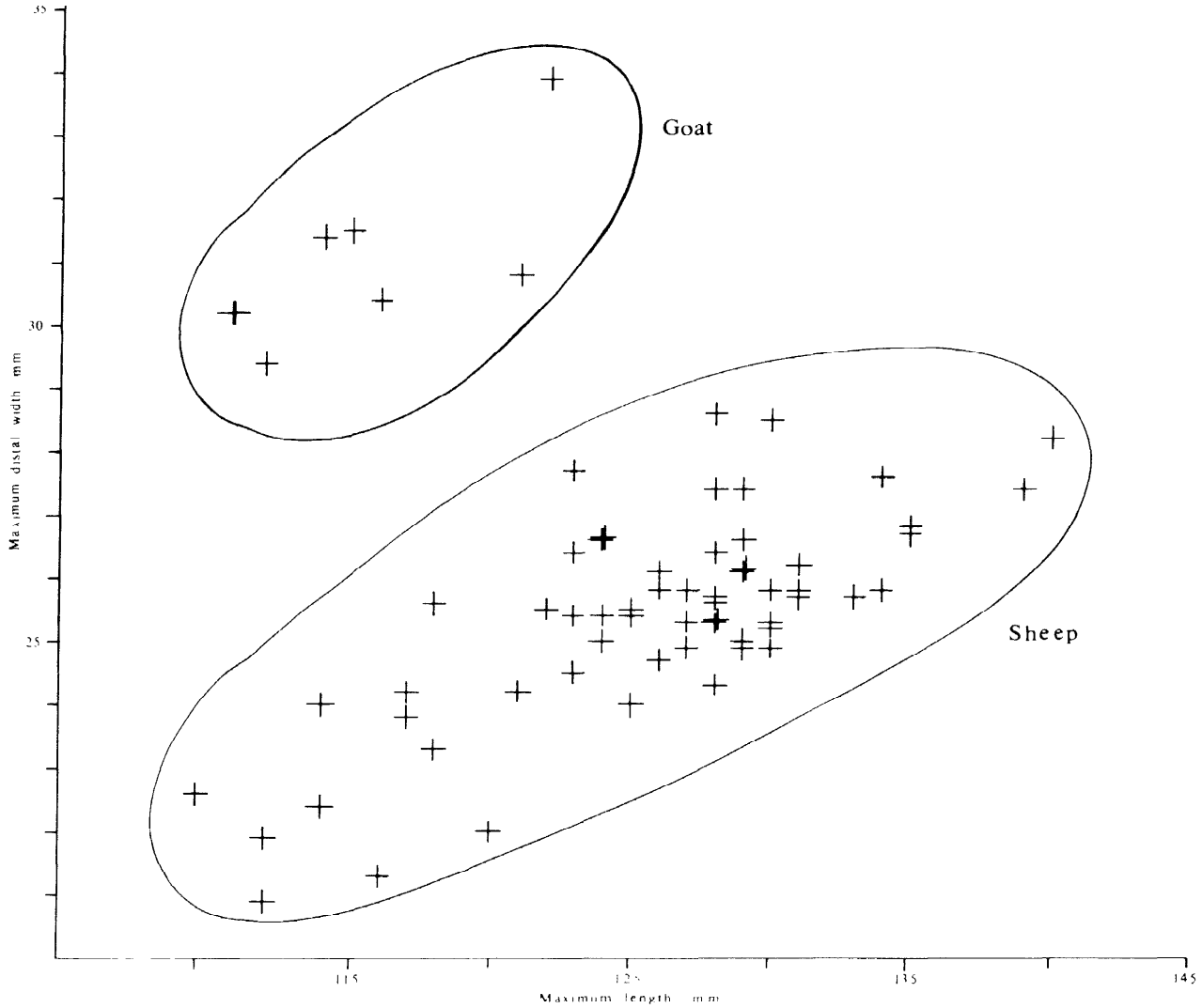


Fig 17, 18 Sheep/goat metacarpus, distal width against length

Animals kept for meat would have reached their peak sooner, while those kept for wool would have several productive years ahead. Perhaps this would have been a culling of the less successful ewes at the start of a new breeding season or of entire males not needed for breeding.

More than a third of the sheep and goats had their molars all fully in wear and in every sense they were fully mature. 9% of all mandibles came from animals still further advanced in years as assessed by the wear on the teeth. Evidence from pathology gives several examples of arthritis or related conditions (see above, p 92), which may also be an indication of age.

The large number of mature animals means an economic concern with factors other than meat. Dunging of arable fields was probably of great value, and sexing may throw light on the relative priorities of breeding, milk, and wool.

This sexing was carried out on the horn cores. Goat and sheep were so clearly distinct that they were of course treated separately. Out of 213 sheep cores, only 16 (7.5%) are certainly from rams, and the rest form one single group in general proportions and in shape. It is assumed that this group includes both ewes and wethers, since no hornless crania were found and since many cores from this group (48, or 22,5% of the whole, see p 92 in the section on pathology) show signs similar to those identified by Hatting (1975) as evidence of under-nourishment, changes to which the less robust cores of castrates seem to be particularly prone. It is of course very likely that many of the unmarked cores were also from castrates, those which had tougher horn cores or which had been rather better fed.

Such a sex pattern gives too high a proportion of male castrates for milk to have been the prime use of the flocks. The age pattern has already provided a considerable number of animals that were not kept mainly for their meat. It is therefore postulated that wool was of great importance at 'Hamwih'. In view of the large numbers of sheep that were kept, this concentration on

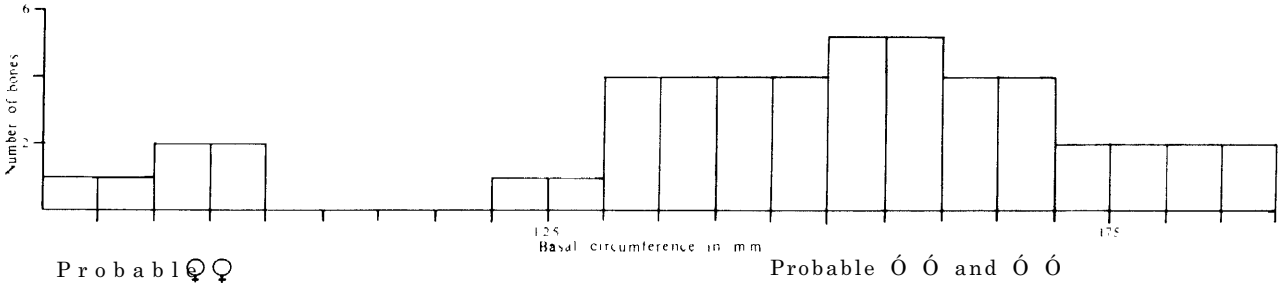


Fig 17, 19 Distribution of gout horn core basal circumference

wool is certainly significant, particularly since it seems to be chronologically quite early. Britain had been noted for its cloaks in the 5th century, at the time of the Theodosian Code, and Mercia was exporting cloaks to Charlemagne in the later 8th century. It is perfectly reasonable that there should have been wool flocks in southern England, but any closer dating of trends could be important.

The pattern of consistency could provide some clues. Consistency in the distribution of bones of the body shows no surprises, neither by fragment count nor by Minimum Numbers. But distribution between the different sites produces particular changes in the ratio of sheep to pig (see Fig 17,15). Site I has more sheep than the others: 37.7% are sheep or goat by fragment count, and since the ratio of securely identified goat is standard for the site at 0.3% the supposition must be that the higher value was caused by a greater concentration of sheep. Site VI was lower in sheep and more plentiful in pig.

It seems that Site I, with the greater proportion of sheep, had more than the average proportion of young ones. There may therefore be no particular correlation in terms of dating or of wool. but the question is of great significance and the forthcoming computer studies could he revealing.

The slender and possibly undernourished sheep are the more notable by contrast with the stouter and stronger proportions of the other domestic animals and one wonders how and where the sheep were reared. There would have been a variety of habitats suitable for sheep near 'Hamwih', including the higher parts of present-day Southampton and. perhaps, saltmarshes nearby. Chalkland, more commonly associated with sheep. is to be found a few miles to the north. If 'Hamwih' were an important centre fur wool and cloth, sheep could have been reared some way away and been driven in for slaughter. This might perhaps explain the contrast in the standard of nourishment and in physique between the sheep and the other 'Hamwih' animals.

Whether or not the many sheep spent their lives in the near neighbourhood of 'Hamwih', they were there at death. It was 'Hamwih' that would have their final shearing, and 'Hamwih' that would have their meat. The use of their skins (eg for parchment) can only be presumed, but horn cores and some other bones show definite signs of working. This mould add to the wealth of the town.

Goat

The earlier discussion dealt with sheep specifically, or with sheep/goat where distinction was impossible. This section deals with certain goat. The proportion of goat was consistent throughout at 0.3% of identified fragments. The goats were somewhat larger than the sheep, with a mean withers height of 0.676 m and a range of from 0.644 to 0.702 m. The highest figure is in fact just below the greatest height for sheep of 0.709 m, but the range itself is much smaller: this could be due to the far smaller sample (13 instead of 184) on which the figures were based.

The bones were also generally wider. This was true not only of the metapodia where the basic proportions differ between the two species; the minimum shaft width of the radius, for example, gives a mean of 20.4 mm for goat as against only 17.3 for sheep.

Ageing could not be differentiated between sheep and goat. The mandibles had to be treated jointly: and the metapodia. the only bones which are sufficiently distinctive in their proportions to be confidently identified between the species from quite an early age, gave a goat fusion rate of 68.9% as against 66.6% for sheep.

Sexing for goat was attempted on the basis of the horn cores. which fall into two very definite groups (Fig 17,19). The distribution of these by metrical analysis follows very closely the Haithabu distribution for their sabre-shaped horns. ('Hamwih' has nothing to correspond with their straight ones.) The instinctive judgement is that the discrete group of smaller cores, like those at Haithabu. are best regarded as female (Reichstein & Tiessen 1974, 41).

This leaves a very high proportion of males. It is said that castrate goats commonly have even stronger and larger horns than the males (eg Noddle 1975a), and the assumption is that the larger group, those with the greater basal circumferences, would include both castrates and entire males. But the proportions are unbalanced as between female and male (12%:88%). Perhaps females were often killed young and their bones then lost in the general sheep/goat unfused group; yet the metacarpus, at least is distinctive, and 'Hamwih' metacarpi bear no relation numerically to the horn cores. Alternatively. it might not be that 'Hamwih' female goats are strangely lacking: it is suggested instead that the males or castrates present in the pits do not all represent goats born or reared in 'Hamwih' itself, but come also from animals that lived out their lives some way away and whose horns were cut off and brought into 'Hamwih' for working in the town.

There would appear to have been no general shortage of horn in 'Hamwih', but goat horn may have been sufficiently prized to be brought into the town for specialized working while the rest of the carcase was left behind.

Pig

Pig too was present in 'Hamwih' in strength. Though coming distinctly behind cattle and sheep in numbers of identified fragments (6,953, or 15.3% of the main

domestic animals) and in weight (94.8 kg, or 11.6%). the pig nevertheless left a good many mandibles, which bring it well up in the Minimum Number count: with at least 192 individuals it reaches 28.5% of the main domestic animals. coming some way behind sheep/goat (39.4%) but reasonably close to the cattle figure of 31.4%.

It has been shown that pig bones were left in a higher proportion on the occupation surface, and that both in number and in weight less bone was found for the Minimum Number of pigs than was recovered for cattle or for sheep. It is possible that pig is underrepresented in the main ratios, which are based overwhelmingly on pits.

The pigs were domestic. All the lower third molars, usually taken as a key indication of domesticity, come well inside the accepted domestic range: the largest is 34.0 mm. and the mean 30.5 mm. Similarly the upper third molars are small, with the largest of these only 33.0 mm (mean 28.8 mm). Male canines are sharply curved. The bones form a homogeneous group, with the exception of one very large femur. This so outclassed the rest that it must be rated as perhaps from a wild animal; alternatively, it could have come from one of the few male pigs that survived to full maturity (for measurements see separate *Statistical Appendix,* SARC 1977).

There were few whole long-bones that had fused completely, and height calculations (based on Teichert's 1969 figures, as advocated by von den Driesch & Boessneck 1974) had to be made on a very small sample. Withers heights range from 0.632 to 0.778 m, plus a figure of 0.836 from the exceptional femur. The mean is 0.723 m, or 0.715 excluding the large femur.

A comparison with Haithabu shows that 'Hamwih' pigs were large. The Haithabu pigs ranged from 0.591 m to 0.721 m, with a mean of 0.676 m. The 'Hamwih' pigs were in fact larger than the 'Hamwih' sheep. This is explained in part by the fact that the measurement is calculated to the withers. from where a pig's neck and head commonly point down. whereas- sheep would normally point up; it is explained in part by the-different proportions of early pig from those of today. with early pigs having somewhat slighter bodies and longer legs.

But the 'Hamwih' pigs were not skinny: to set their bones against those of the sheep suggests that the pigs were far stronger and more heavily built, and to compare the shaft widths of 'Hamwih' and Haithabu pig bones gives 'Hamwih' the wider bones throughout. Pigs, with large litters, a quick rate of growth, and accommodating appetites, could have been an important source of fresh and preserved meat. and the stout 'Hamwih' bones would have been able to support a solid quantity of flesh.

The use for meat is confirmed by the pattern of ageing. Epiphysial evidence shows that 28.3% of the first fusing bones are still unfused. 73.6% of the middle group, and as many as 93.3% of the latest. This would mean that nearly a11 the pigs were killed before they reached full size (some 3½ years in modern terms), after which time it is no longer economical to keep an animal alive and fed unless it supplies something other than meat. Many pigs had in fact been killed before they reached this point. The large litter size means that the breeding stock may have been numerically quite small and yet have provided a surplus of young pigs- for meat.

A study of tooth eruption and wear seemed at first to give different results in the later age-groups (see above, p 91), since 26.6% of the pigs had their teeth fully in wear. and 12.0% of all mandibles appeared to be very worn indeed. This immediately suggested age structure not far behind that for cows or sheep. But it has been shown that a good many very young mandibles must have been lost, which would affect the proportions of the rest; and the great fluctuations in the early stages of molar wear in pigs prevent one from placing much confidence in any assessment of their wear later on.

Male and female distinction is clear from the canines. Females outnumber males (76.5% to 23.5%) in the later stages of tooth wear, and this would fit with breeding needs.

Sexual dimorsphism is so marked on the canines that one would expect these teeth to give evidence for or against castration. but the fact that male canines continue to grow throughout life complicates the issue and metrical analysis has not been attempted. Castration might have been likely as it is said by some to improve the flavour of the meat of the male (Turton 1962, 452). and linguistic evidence suggests that it was common in Teutonic and Saxon lands in that period and perhaps before. The old word 'barrow' for a castrated boar comes from the Old English 'bear' which is linked with a presumed Old Teutonic word and with Old High German (Shorter Oxford Dictionary and Webster's Dictionary).

The Minimum Number distribution of bones shows no surprises. As with all the domestic species, mandibles are clearly in the lead. Scapula is next: this is a very common survivor for pig. Then come the four major long-bones, with humerus and radius somewhat ahead of femur and tibia. This may show some loss from the Melbourne Street pits of hams which could have been used for provisioning, possibly at sea. (It has been argued for the other species that a low femur count is to be expected; with pig, however, so many bones are unfused that. femurs might be at no great disadvantage.) The smaller bones come last. Distribution by fragment counts is reasonably uniform.

Distribution between the sites and between the individual pits has been discussed in the section on con sistency. It is particularly intersting that the pig and sheep ratios have suffered the greatest changes, and have done so as between themselves and against the background of quite constant proportions for cattle. For the moment one can speculate on the causes of any changes. Differences could be seasonal, if sheep and pigs tended to be killed at different times of the year, and if pits were quickly filled; they could reflect the taste, or the economic necessities, of household or of other local groups: or they could have reflected some significant changes over a period of years. A further study of this is one of the most interesting problems to be tackled next. certainly in conjunction with other specialist reports and perhaps with the help of a computer.

The autumn right of pannage was of continuing importance in the Middle Ages. Latouche (1967), on Carolingian cartulary evidence, suggested that pigs are at their most useful when there is still scrub and rough woodland to be cleared, and that as more and more of this land is brought into cultivation so pigs corrcs-pondingly decrease. Such a change would presumably bc noticed most especially in wholly rural areas, though in earlier times no site could be far from being rural.

It is possible, however, that at 'Hamwih' pigs were often kept tied. The two damaged tibia (Figs 17.7b and 9c), the one with a serious fracture and the other with a probable abscess, could both have been harmed by some form of restraint applied to a hind leg. Two accidents arc a small number from which to interpret an economy, but perhaps one could adduce as further possible evidence the dearth of a wild strain among the domestic pigs. It seems reasonable to think that if pigs had indeed been let loose in rough woodland in any signiticant numbers or for any significant time some trace of wild boar, other than the one great femur that is by no means conclusively

wild, would have found its way into the stock.

Further analysis of the 'Hamwih' evidence may bring new illumination. But it is cautiously suggested that the pig was not simply an indication of a rural and frontier economy, but that even in a more urban environment it could play a distinctive and valuable role.

Dog

There arc eight features in which dog bones occurred, none being from Site XX. Two bones were of puppy and two features contained several bones each, of quite large adult animals. Since these bones were recovered, some whole skeletons of dogs have come to light in 'Hamwih' and a more complete description of the dog material must await analvsis of this. The bones here are similar in size and build to the whole dogs but there are no skulls. The whole dogs fit into the upper part of Harcourt's (1974) suggested double distribution for Anglo-Saxon dog measurements.

Cat

There were 22 occurrences of cat bone, often only one or two bones per feature. These were in all five sites and the cumulative. pit by pit, Minimum Number count suggests 27 cuts and three kittens, For a small animal this count is probably more meaningful than a Minimum Number for Melbourne Street as a whole. Using fusion data (Habermehl 1961), four of the cats were reckoned to be at least a year old \vhereas 11 others were at least 8½ months old. Four were younger than this but still not far off adult size whereas the three kittens were about half-size in long-bone length when compared with adult cat bones.

Further analysis of cat bones will be carried out when more material is available but preliminary impressions suggest that these are all from domestic cats. They are not particularly long-limbed and while nowhere near as large as the wild cat, *Fe/is silvestris* Schreber. which may well have been living in the area in Saxon times. some of the bones are quite stocky. The anatomical feature on the femur recognized by Ehret (1964) for domestic cats at Magdalensburg does not appear to work for the 'Hamwih' cats which are like wild cats in this bone. There is also a pair of mandibles in Site VI which, although small show anatomical similarities to wild cat (Kratochvil 1973). Further analysis should prove of interest.

Wild mammals

Deer

Only red deer and roe deer have been identified with certainty. A considcrablc effort is being made at all stages of the work to ensure that deer fragments are missed as little as possible and that the likely deer species art' distinguished from one another (red deer and fallow deer in particular). This is important because 'Hamwih' provides a large sample of Saxon material without later medieval contamination and could provide evidence of the pre-Norman deer situation.

It is essential to have a variety of modern skeletons for this work and our collection was not extensive enough at the beginning. Even the large comparative collections do not always have the immature specimens that are needed for archaeozoological work.

Red deer, Cervus elaphus L.

Only 76 fragments of this species were identified: three of the postcranial bones give good specific identification. There are two pedicels and 64 fragments of antler included in this total so posteranial bones are scarce. Taking each feature as a unit and scoring only pedicels and posteranial bones this represents a minimum of 11 animals, at least two of them stags.

All antler fragments could have come from shed antler but the two pedicles are sawn throught where the antlers have been removed, and are still attached to pieces of cranium, so at least two antlers used in 'Hamwih' must have been removed from carcases.

The distinction between fragmentary remains of *Cervus elaphus* and the smaller fallow deer, *Dama dama* (L), is fraught with problems. the palmate antlers of the latter are the only certain clues. Small fragments large antler tine may not be distinguishable to species. the antler fragments were carefully compared with modern antlers and it was decided that all fragments large enough to be diagnostic had come from red deer. Almost all were worked and the majority were tine fragments, or small pieces of beam at the junction with a tine, or finished antler objects.

Several atypical antler fragments were found which looked unlike any comparative material we could find and these are illustrated in Fig 17,13. The first (c) may be an unusally flattened piece of red deer beam, for antlers are notoriously variable, being subject to control by hormone levels during their growth when injury to antler or reproductive system can affect their shape. The second (d) may be a piece sawn off a damaged. short antler, and the third (e) could be from a growing antler in velvet. If it were in velvet a stag would museum speciments are normally from deer shot tin the season. The porous condition and lack of sculputuring on several other pieces could also be explained if they were from antlers in velvet. If it were in velvet a stag would have been obtained from April to July in what becomes the close season in communities with a code of hunting. Presumably such antler would be of little use for working and yet it has been sawn across.

Posteranial distinctions between the differents spceies of deer too often seem to rest upon size because anatomical distinctions have not yet been worked out or written up. The posterianial bones of larger deer found in Melbourne Street are considered to be those of red deer. Had they been small enough to come within the fallow deer range it is doubtful whether this alone would have been sufficient to justify the recording of this species as present, and it is not difficult to throw doubt on many earlier archaeological identifications of fallow on one or more of the following grounds:

1 only undiagnostic fragments of antler represented
2 identifications based on size with an inadequate grasp of the very large range of size within *Cervus elaphus*
3 bones fragmentary and ephysical information therefore lacking. this means that some small bones which are identified as fallow may in fact be from immature specimens of red deer
4 anatomical criteria which might distinguish fallow from red assent or eroded

We could not prove any evidence of fallow deer but with so few deer bones in the sample it will be interesting to see whether further material from 'Hamwih' supports this. An up-to-date picture of our knowledge of the history of fallow deer in Britain is given in a recent book by Chapman and Chapman (1975, 49). which summarizes present evidence as suggestig that the species was introduced into Britain by the Normans. It has been found in the 1250-1350 AD levels of excavations by Platt in the nearby later medieval areas of Southampton (Noddle 1975b).

There is a further complication which should be borne in mind. Most of the Saxon animal bones is from

domestic species. The small amount of roe and red deer bone and the absence of other wild mammals suggests that these were not much exploited, or that their remains were butchered elsewhere. We cannot rule out the presence of these wild species, including fallow deer, in the surrounding environment. Post-Conquest sites may yield such overwhelming fallow deer evidence for another reason-a closer association between man and fallow deer along the lines of Norman practice. This different way of keeping the animal does not necessarily mean that it was introduced by them; although presumably it was introduced by someone at some time as the native form appears to have become extinct during the Palaeolithic.

Roe deer, *Capreolus capreolus* (L.)
Like the red deer evidence that for roe is scanty; only eight fragments were recorded. These are all accurately identifiable to species and include a cranial fragment of a doe and one of a buck with antler attached. Roebuck antlers are small and of limited use therefore for working. so the main reasons for capturing this species would be for skin, meat, and sport. Like the red deer finds these were scattered throughout the area. With each feature taken as a unit, finds represent a minimum of seven animals, with at least one buck and one doe.

Absence of rabbit and rat
In order to assess the pre-Norman situation in the same way as for deer, the material from the Melbourne Street excavations was minutely searched for evidence of rabbit, *Oryctolagus cuniculus* (L.) and rat, eg *Rattus rattus* (L.), in the Saxon levels. The only rabbit bone was a humerus found in F3. Site I, a pit which had suffered contamination from later brickearth digging. No rat bones were found.

As large quantities of small bones survived in Site V, F16, the absence of rabbit and rat seems to be striking evidence for their introduction at a later date. There are rabbits and rats from the post-1250 levels of medieval Southampton (Noddle 1975b) and a ferret skull was also found there. Close scrutiny for ferret remains in answer to Owen's plea for archaeological material (Owen 1973) has produced no result so far from 'Hamwih'. Absence of rabbit and ferret from this material appears to support Owen's hypothesis that the Normans introduced both species together with their system of warrening. The black rat, *Rattus rattus* (L.), is often said to have appeared in Britain with returning Crusaders, possibly in the late 12th century. But these are all difficult species; the rabbit and rat are insidious modern burrowers, the former to great depths, and the ferret is difficult to distinguish from its native wild relative, the western polecat, *Mustela putorius* L.

It is important that the archaeological basis for any pre-Norman rabbit records be rigorously assessed.

Small mammals
Nothing of great zoological significance was found. The only definite identifications are of two common species, the Boodmouse, *Apodemus* sp., and the short-tailed vole, *Microtus agrestis* (L.). Unfortunately some fragments that look very like house mouse are so small that we shall delay adding it to our list for 'Hamwih' until better evidence appears. This species is known in Wessex as early as the Iron Age (Harcourt 1975), so its presence at 'Hamwih' would not be surprising.

Whale
There are five fragments of bone, apparently worked, which have had most of the compact bone wall removed and are therefore mostly of porous, trabecular bone. They arc probably fragments of whale bone and occur in three places in Melbourne Street, three fragments from Site IV and one each from Sites V and VI. It is not possible to say from which species they are derived. There is sawing on all of them and one fragment shows some burning.

Birds
A total of 1,460 bird bones and fragments was present, 1.200 of which were identifiable. In most pits l00% of the material was identifiable, as bones were complete and few in numbers. Of the 88 features containing more than 20 bones, 78 contained at least one bone of goose or fowl.

Assuming the fowl and goose to be domestic and the ducks to be wild (see details in relevant sections below), the proportions of wild to domestic bird fragments are given in Table 17,6. for the sieved samples in Site V, F16, and for the rest of Melbourne Street.

TABLE 17,6): Domestic/wild percentages for identified fragments

	Domestic birds	Wild birds
Site V. Feature 16	92%	8%
Other Features	97%	3%

About 48% of all the bird fragments in the F16 samples were minute and not identifiable to species so that the figures above only apply to about half the F16 fragments and include all possible identifications made. even tentative ones and those thought to be immature fowl, The figures show a slightly higher proportion of wild birds in the sieved material and. in the species, breakdown (Table 17.7). show a higher proportion of chicken and a lower proportion of goose than for the rest of Melbourne Street (Table 17.8). This is predictable as sieving would be expected to retain smaller fragments more satisfactorily than conventional digging, and domestic fowl and the majority of wild species found would tend to yield smaller fragments than geese.

The sieved samples showed better recovery of some parts of domestic fowl than conventional methods, especially furcula (wishbone). vertebrae,, terminal bones of the wing. and toe bones.

Domestic fowl
This is the most common bird. The work of Bate (1934), Lowe (1933), and Erbersdobler (1968) and modern comparative material were all used to check for related birds (capercaillie, blackcock, pheasant, and peacock), but the diagnostic fowl bones were all those of domestic fowl. Bones labelled 'probable fowl' in Tables 17.7 and 17,X are either undiagnostic parts or immature bones.

The fowl bones were compared for build with a number of modern fowl and a group of 13th century domestic fowl from Romsey (Coy & Winder 1975). The range of size in the Saxon birds was large and much wider than the Romsey sample. The smallest birds compare with what we today call bantams, whereas the largest are comparable to some modern laying fowl. It is not possible to say whether these various sizes of fowl were contemporary.

There are a few bones of large size judged to be immature by the porous and unformed nature of the joint surfaces. The possibility of caponization must be recognized. Despite the problems of castrating a bird the technique is quick and of great value, once learned. The inhabitants of 'Hamwih' must have possessed very sharp knives-judging by the fine marks they made on bones— and they seem to have castrated sheep.

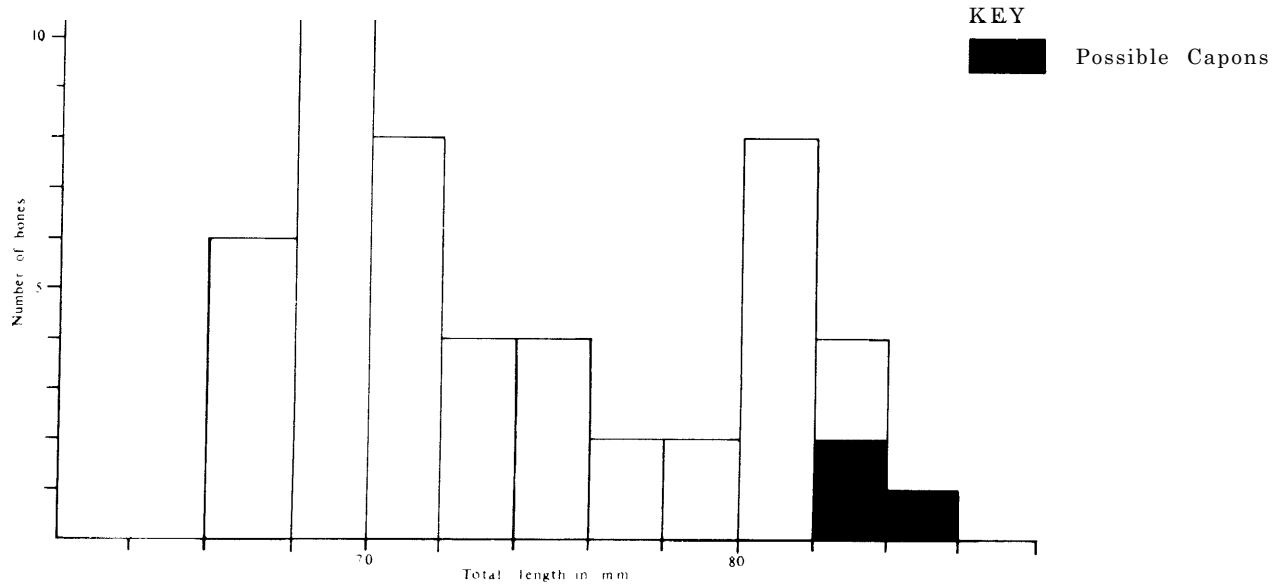
TABLE 17,7: Distribution of bird bones, Site V, Feature 16

Skeletal element	Domestic fowl	Probable fowl (some immature)	Goose	Ducks	Great northern diver	Buzzard	Woodcock	Crow	Thrushes	Starling	Small passerines	Unidentified fragments	TOTALS
Cranial		2											2
Mandible			3				1	1					5
Sternum	4		1					1					6
Furcula	12												12
Coracoid	14		3						1				18
Scapula	9												9
Humerus	13	3	2							1	1	1	21
Radius	6	2	1										9
Ulna	10	3	3	1				2					19
Carpo-metacarpus	8		1										9
Wing phalanges		2	4										6
Sacrum		2	2										4
Other vertebrate		14	6										20
Ribs		8	4										12
Pelvis	1	6											7
Femur	19		5					1					25
Tibio-tarsus	22	2	8		1								33
Tarso-metatarsus	14	2	7	1		1		2	2	3	1		33
Foot phalanges		23	7									10	40
other		2										250	252
TOTALS	132	71	57	2	1	1	1	7	3	4	2	261	542
	203												

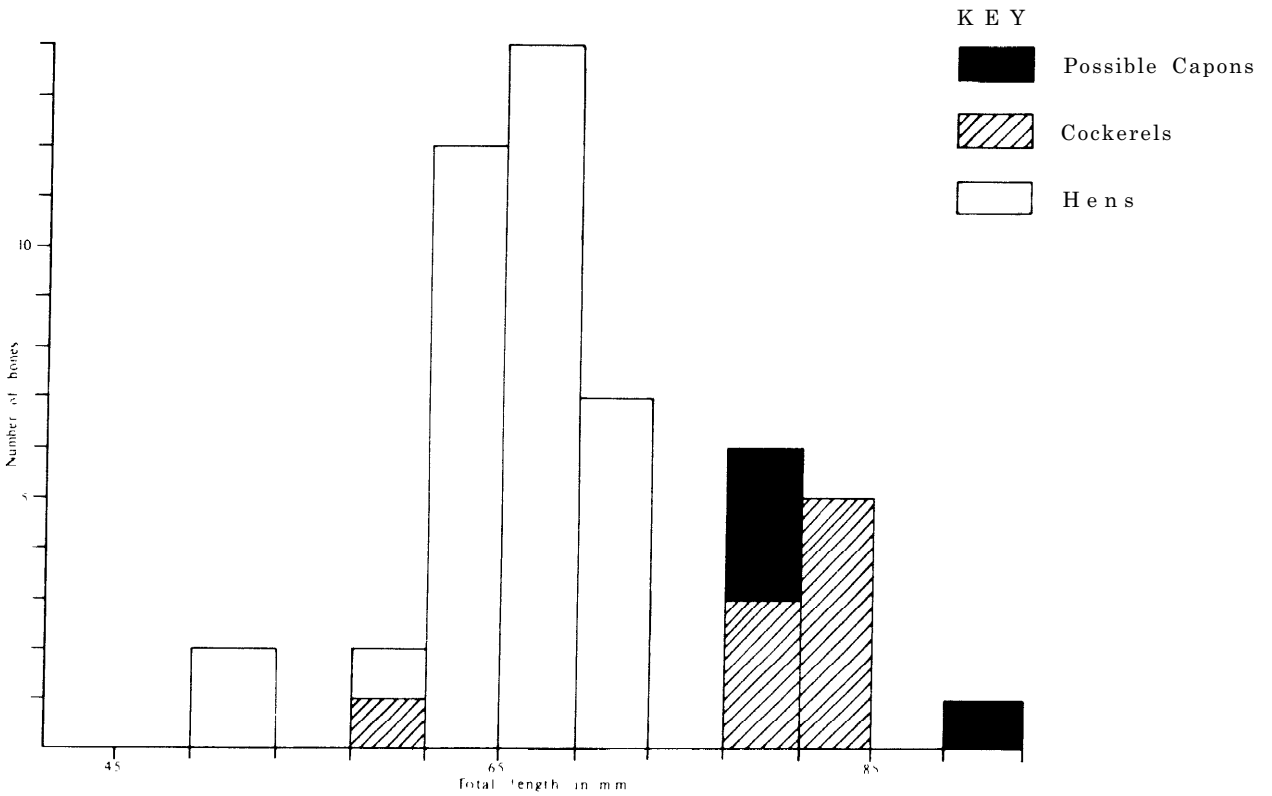
Underlined figures show high values compared with the rest of Melbourne Street.

TABLE 17.8: Distribution of all birds, other features

Skeletal element	Domestic fowl	Probable fowl (some immature)	Goose	Duck (cf mallard)	Duck (cf wigeon)	Teal	Great northern diver	Herring gull	Great black-backed gull	Woodcock	Jackdaw	TOTALS
Cranial		2	2	1								4
Mandible		1	11									12
Sternum	9	2	8									19
Furcula	6		13									19
Coracoid	39	9	18	3					1			70
Scapula	15	3	13	1								32
Humerus	58	4	56	2	1					1	1	123
Radius	18	6	18		1	1	1	1				46
Ulna	52	4	25	1				4				86
Carpo-metacarpus	10		12	1								23
Wing phalanges			2									2
Sacrum		6	9									15
Other vertebrae		3	1									4
Ribs		7	5									12
Pelvis	7	7	3									17
Femur	96	10	26	3								135
Tibio-tarsus	108	20	42		1							171
Tarso-metatarsus	74	19	24									117
Foot phalanges		2	9									11
TOTALS	492	105	296	12	3	1	1	5	1	1	1	918
	597											



a) Lengths of domestic fowl femora



b) Lengths of domestic fowl tarso - metatarsi

Fig 17, 20 Frequency distributions for fowl leg bones

Many of the bones show a double distribution when frequency histograms are plotted. Results for femur (the largest sample) are shown in Fig 17,20a; humerus is similar but shows two very small birds spreading the distribution a little further. The Romsey 13th century fowl (probably all hens) compared very well with the left hand distribution in Fig 17,20a. The right hand distribution in Fig 17,20a probably consists of capons and cockerels. though in what proportions we do not know. Some clues may be gained from study of the tarso-metatarsus bones (which bear spurs in males) and Fig 17,20b graphs these. Unfortunately tarso-metatarsal lengths do not always fit birds into the same size groups which hold for the other bones, so the peaks on the two graphs may not be really comparable, but this graph does show that generally birds suspected of being male because of spur evidence are longer in the tarso-metatarsus, suggesting that the double distribution in femur may be a sex-related one rather than a difference in types. Fig 17,20b also shows some very small 'bantams' to the left of the graph, one of which was a male, showing that a bantam distribution may be underlying the bimodal distribution of male and female.

Whether these very small fowl were selectively bred as a bantam strain and the bantam quality inherited we cannot yet tell. The small size could be a rare genetic freak which was not exploited, or the result of malnutrition, but many of the smallest fowl do have very stocky bones and one was a cock with a strong spur. These small birds and the capons are present throughout the Melbourne Street sites and further analysis should prove of interest.

It must be stressed in discussing the large left hand distribution of hens in Fig 17,20b that only eight of the 48 unmeasured fragmentary and immature metatarsi (not included in this graph) were definitely female, so that most could have been from cockerels killed for food, many of them while young and tender.

Goose

This is the second commonest bird. Goose skeletons have been subjected to analysis by Bacher (1967), but few distinguishing features were found for specific separations. Using this work and modern comparative material, it was not possible to state certainly that the Melbourne Street geese were domestic birds. They are of large size and if not domestic could only really be from the grey lag goose, *Anser anser* (L.) (their wild relative), or the bean *goose, Anser fabalis* (Latham). The area is not famous for large numbers of wild grey lag, nor was it in Colonel Peter Hawker's day (quoted by Kelsall & Munn 1905); nor did Hawker think the grey lag a particularly palatable goose (Hawker 1830). Modern grey lags are often escaped or half-bred feral ones and their taste may not be a reliable indicator. We think these bones were most likely to have been from domestic geese.

The measurements taken (417 in all) mostly fit the range described by Bacher for *A.anser* but in the wing measurements there are 14 measurements below the *A.anser* range. Eight of these come within Bacher's ranges for both domestic geese and *A.fabalis,* but the remainder are even smaller, and there is a possibility that these were from a smaller goose species. There are two measurements outside the range which fit domestic goose or bean goose. These facts show that there can be great differences in the proportions of different species, for normally the measurements of bean goose are slightly below those of grey lag, but on some bones this is not so (see separate *Statistical Appendix,* SARC 1977).

In the leg there are ten measurements which are greater than the *A.anser* range from Bacher (they are also too big for her *A.fabalis* range), but within the range for domestic geese. Four other measurements are even bigger than the domestic range given. The most significantly different measurement is the distal width of tibio-tarsus and a histogram of this measurement shows the situation (Fig 17,21). This is a difficult measurement

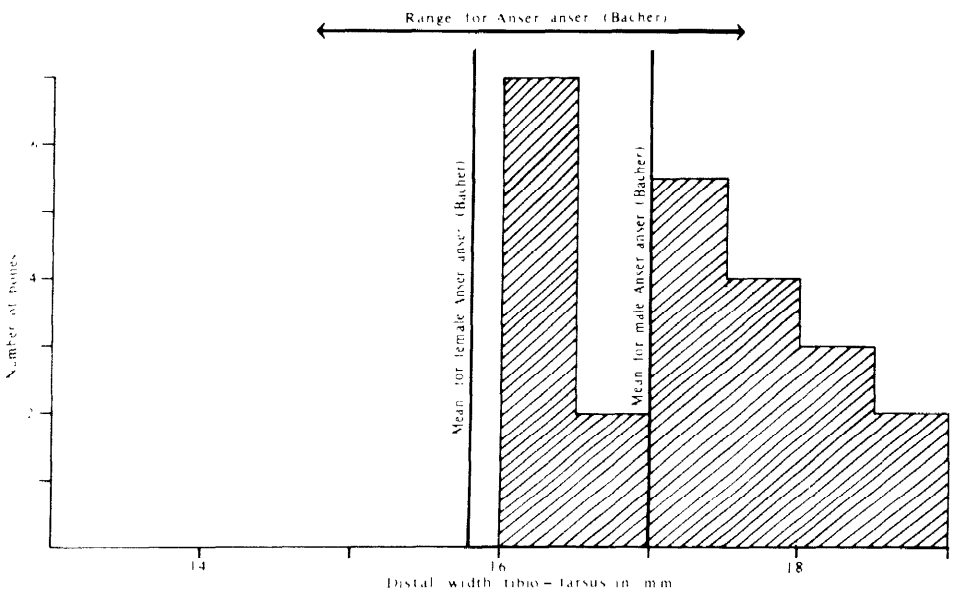


Fig 17, 21 Frequency distributions for goose distal tibio-tarsus

to take consistently but we have tried to take it in the way given by Bacher. It is not a good measurement. Minimum width of diaphysis of tibio-tarsus also seems occasionally higher and there are two metatarsal measurements outside the *A. anser* range-one for maximum length and one for minimum width diaphysis.

Domestic geese at this time may not have been very different in appearance from their wild ancestor and more like some grey lags kept in captivity today, or recently escaped. They may have tasted better than wild grey lags. There is no evidence that the domestic grey lags were unable to fly. so we assume that they either did fly in and out of 'Hamwih' freely or were attracted to stay by available food, or a mixture of the two. Fragments of goose bone were mixed with domestic mammal and fowl debris throughout the pits, a further indication that these were likely to have been domestic geese.

There are no really immature goose bones. This could be used as evidence for their being wild, but it might be less likely for immature geese to be deliberately killed than immature chickens because a mature goose yields such a lot of meat. The smaller, more common chickens would be more likely to be accidentally killed, or a young cockerel used to provide tender meat. Presumably geese were also fewer in number, more able to defend themselves against dogs and cats. and of greater value for down.

Other birds

The other bird finds are few and are included in Tables 17.7 and 17.8. All wild bird bones came from pits rather than surface occupation levels.

There were 15 fragments assigned to wild mallard, *Anas platyrhynchos* L., all of which could equally well have been from domestic versions of this duck. Bones marked 'cf wigeon' (3 specimens) are of smaller ducks comparable to the wigeon, *Anus penelope* L., in size. The work of Woelfle (1967) on the comparative anatomy of ducks, and modern material were used to sort out these bones but the few specimens from Melbourne Street often lacked the important anatomical features for distinction to species. There was one bone of teal, *Anus crecca* L. Mallard, wigeon, and teal are the three most steadily recorded wildfowl in this part of Hampshire and bad weather elsewhere in winter can bring them in in very high numbers (Taverner 1962). They would not only be found offshore but would use any available shallow water area where suitable food was to be found both on seashore or in marsh or freshwater,

Woodcock, *Scolopax rusticola* L., would have been widespread in many different habitats and, like the duck, good eating.

The herring gull, *Larus argentatatus* Pontoppidan (more likely here than *Larus fuscus* L., the lesser black-backed gull, from which its bones are indistinguishable) is often a shoreline scavenger. Both it and the great black-backed gull, *Larus marinus* L., might have been attracted to 'Hamwih' by waste from fishing. Alternatively, L. *murinus,* like the buzzard, *Buteo buteo* (L.), may have sometimes attacked domestic fowl-they may even have been caught in the act. The gulls and the crows *(Corvus* cot-one, carrion or hooded crow, and *Corvus monedula* L., the jackdaw) may have been attracted to the settlement by rubbish and the eggs of domestic fowl.

The great northern diver, *Gavia immer* (Brünnich), is occasionally seen inshore now in the area and is likely to have been a chance find. They are sometimes rather inquisitive and may swim close to the shore: Cohen and Taverner (1972) suggest about 30 as the usual number of winter records now for Hampshire. An almost whole skeleton of this species was identified by Eastham from Portchester Castle (Eastham 1975).

There were four bones of starling, *Sturnus vulgaris* L., one of song thrush, *Turdus philomelos* Brehm, and two which were tentatively assigned to the related redwing, *Turdus iliacus* L., a winter visitor to Britain. The thrushes especially would be good to eat. One of the small passerine bones was possibly from a wagtail but the others were impossible to take to species.

Butchery of birds

Most marks of butchery or mat removal on bird bones were probably made with a very sharp knife. They consist of fine cuts t the joints, which can sometimes s seen with the naked eve, and series of parallel seratches often on the shafts of the bones which usually have to be checked with a lens. As this is a tedious and time-consuming process it has not been done for all the bones so far but of 71 chicken humerus fragments examined very carefully all but 13 showed cuts and knife-scrapes, often in several places on the bone. Probably most of he chicken. goose, and duck bones have knife marks. They were also found on the bones of a crow. a thrusth, and the great northern diver. The fine scrapes suggest that meat was removed with a sharp knife: it was probably used to transfer meat directly from bone to mouth.

The buzzard. gulls, and jackdaw had no knife marks on their bones and this fits the fact that they are none of them especially palatable, and yet one would not expect crow or great northern diver to have been eaten on this basis. Some species do vary somewhat in palatability according to their habitat (probably as a result of their diet).

Thanks are due to Mr Graham Cowles, of the British Museum Bird Section at Tring, for his support at all stages of the bird work.

Amphibians

Material from Site V. F16, yielded a bone of a large toad, the only likely contender being the common toad. *Bufo bufo* (L.). and some bones of frog, *Rana* sp. There were several bones of amphibians which were not identifiable to species as they belonged to immature specimens or were fragmentary.

Fish

Over 4,000 fragments of fish bone have been examined and to date 983 of these have been identified. Most of the rest is probably not identifiable. Most fish bones are from Site V, F16, but there is a small concentration from Site IV, F2.

Finds from Fl6 include some extremely small vertebrae of eel, and fish scales. and it is likely that such preservation would rarely occur. When further controlled sieving has been carried out on samples from 'Hamwih' we may be more able to say how much of this remarkable sample from F16 is due to unusually good preservation and how much to the process of sieving ing itself.

Mr A Wheeler. of the Fish Section, British Museum (Natural History), London, gave help and encouragement, without which no identifications would have been possible. Extensive use has been made of Wheeler's (1969) book and ideas to write the general notes below, but any blame for inaccuracy will be accepted by Jennie Coy. We are also indebted to Mr Wheeler for access to information on fish sizes and weights.

Most of the identifications were made from vertebrae but, as some were excellently preserved, specific

identifications could be made with some confidence; less well-preserved fragments were then sorted out and it was considered that many of these were assignable to species.

Like all archaeozoological identification the work depends on knowing a large number of shapes and spotting small diagnostic fragments in a mass of debris which is mostly non-diagnostic. There may be important things which we have missed and further study of this, and new, fish material could well produce a longer species list or a different bias.

List of fish species found at Melbourne Street

Cartilaginous fishes

Thornback ray	*Raja clavata* L.
Sting ray	*Dasyatis pastinaca* (L.)
Two uniden tified vertebrae	

Bony fishes

Salmon	*Salmo salar* L.
Eel	*Anguilla anguilla (L.)*
Whiting	*Merlangius merlangus (* L.)
(Pollack)	*Pollachius polluchius* (L.)
Cod	*Gadus morhua* L.
Bass	*Dicentrarchus labrax (L.)* + scales
Scad (horse mackerel)	*Trachurus trachurus (L.)*
Gilthead sea bream	*Sparus aurata* L.
Mackerel	*Scomber scombrus* L.
Grey mullet sp.	*Mugilidae* + scales
Flounder	*Platichthys flesus* (L.)
Plaice	*Pleuronectes platessa* L.

Flatfish

Much of the fish debris in Pit F16 is the remains of flatfish. These have characteristic vertebrae, and also produce a large proportion of undiagnostic but stout rays and spines which support their strong flat bodies.

Careful examination of jaws and other diagnostic bones indicated the definite presence of plaice and flounder. All the other flattish remains have been called 'flatfish' and could all be flounder or plaice.

Flounders and plaice are both caught today in this part of the Itchen. Adult flounders feed on molluscs and could have been attracted to the areas of oyster and mussel which we can assume from Jessica Winder's account to have been available. Both could have been caught on hook and line or in shallow areas where they come in to feed. They might have been caught in a variety of ways as the tide ebbed. On a larger scale, nets may have been used to prevent their retreat with the tide. leaving them trapped above low water mark and easily picked up.

Flounders

These may well have been locally common and particularly susceptible to the above method of trapping. They hey are more tolerant of freshwater than plaice. Their frequent occurrence in Roman Winchester, eg from recent excavations in Hyde Street by Ken Qualmann (Coy 1976). suggests that they may have been fished far up the Itchen. Modern opinion is that they are slightly less palatable than plaice but they are of great importance as a food fish in the Baltic where plaice are rather scarce. Judging by the weights of some modern specimens the 'Hamwih' flounders ranged from below 50 g to over 400 g (with lengths ranging from below 200 to over 300 mm).

Plaice

A few hones thought to be diagnostic of plaice were determined, suggesting fish of a similar size to the flounders.

Rays

The two rays found- thornback and sting ray-were most likely to have been stranded either naturally or by man's intervention as for flounders and would be far less common catches. The former breed inshore and the latter may have been attracted to shellfish beds. The thornback grows to a width of 610 mm and is now of commercial- importance but the sting ray, which can grow much larger, is not valued as food now.

in addition to these two records of cartilaginous fish, some very worn elasmobranch vertebrae, not identifiable to specie, were found. It is likely that any kin d of fishing here would have produced dogfish and that their skeletons did not usually survive.

Eel

The common eel showed the greatest frequency after flatfish. Apart from nine jaw fragments all the pieces of eel identified are vertebrae. Eels are often nocturnal in estuaries and rivers for large parts of the year and migrate in autumn downriver in large numbers as silver cels. They may be caught on hooks,-in traps, with nets, or with spears. Thomazi (1947) illustrates hooks, harpoons, and spears made from all kinds of material including flint, bone, tooth, bronze. iron, and wood. He also stresses the early use of lines and nets. Such a good position in the estuary might have made a permanent and large scale trapping system for eels worthwhile: see Tesch (1973) for a discussion of the use in northern Europe of eel traps. netting systems, and anchored nets in rivers. Osiers were used more recently in Britain for making eel traps and fixed devices known as eel bucks.

The vertebrae found vary considerably in size. Many of the trunk vertebrae match corresponding vertebrae on a modern eel skeleton with a length of 615 mm (weight of fish 381g). Others were from slightly smaller eels and some from much larger ones for which we have so far no comparable modern material. The caudal vertebrae vary so much in size along the length of the eel (each eel having over a hundred vertebrae) that the size of these was of less significance and it is virtually impossible to assess the number of eels represented from them. A wide range of size is what we would expect as eels of all ages could probably be caught by all all available methods. Eels are very good to eat. and were popular in Saxon times.

Bass and grey mullet

Bass and a species of grey mullet were also identified and, like the fish mentioned so far. are common in estuarine conditions. Bass travel well up rivers in summer. A bass represented in Site IV. F13 was quite large-the bones were considerably larger than those of a modern one with a skeleton length of 460 mm, as was as that in Site IV. F3522. That in Site IV. F2 was much smaller. probably only half the size of the modern one quoted above. The bass bones in F16 represented at least three sizes of bass: small like that in F2, very slightly larger than the 460 mm specimen, and large like that in F13.

The grey mullet bones have not yet been identified to species hut were slightly larger than those of a modern specimen with a skeleton length of 340 mm. Presumably both bass and mullet could have been hooked or caught in fixed nets. Mullet have also been identified from Roman levels at Winchester (Pauline Sheppard, pers comm) and from Sparsholt Roman Villa (Johnston forthcoming).

Scales of bass and mullet were found in F16 and further evidence on the age of these fishes and the quality of their growing seasons may be gained when they are studied in more detail.

Horse mackerel or scad
There were at least three individuals of this rather bony fish in Site V, F16. According to local fishermen they normally occur further out and are not caught in the ltchen estuary now.

Cod and relatives
Members of the cod family also occurred. Bones representing large cod more than a metre in length (probably weighing about 6.34 kg gutted) were in Site IV, F2: Site IV, F150: Site V. F14; and Site V, F16, A vertebra representing a slightly smaller cod comparable with modern specimens of about 0.85 m (probable weight 3.5 kg) was in Site V, F34. Bones of whiting in site V, F16 represented fish weighing about 300 g. There was a possible pollack in F16 but the evidence is not good.

Mackerel
Eleven vertebrae in Site V. F16 were of true mackerel. *Scomber scombrus* L

Salmon
This is a fish which can live in both fresh and salt water. A skull bone from F16 suggests a fish slightly larger than a modern example weighing 9lbs (4 kg). This could have been a fish returning after at least a year at sea to spawn in the Itchen, or returning to the sea after spawning.

Gilthead sea bream
This is an unusual archaeological record as it is not a common fish, although occasional modern records are known from the Southampton area.

Conclusions

The domesticated stock
We cannot know to what extent the Saxons at 'Hamwih' depended upon meat and to what degree they consumed plant products and the secondary products of their livestock. like milk and eggs. With such consistent and closely domesticated animals, with a little evidence which may suggest tethering. and with no real evidence of crossing with wild progenitors, we can, however, assume that the inhabitants of 'Hamwih' lived close to their animals and were successful stock-raisers. The surrounding environment would have provided a diverse and fertile area sheltered from the worst Minter weather, with a long growing season compared with much of Britain, and an adequate rainfall. The fact that animals were usually brought through several successive winters is not surprising here and we must look for explanations other than winter cull for any large-scale dip in kill-patterns.

There is no specialization on one species: sheep, cattle, and pigs (in that order) are the commonest individuals with domestic fowl and geese also of some importance. Neither can we suggest a great concentration on any one particular function of these species. Sheep may not have been of much value for meat but otherwise it is most likely that all possible uses of the major animals were exploited; only further analysis will show whether the bias changes with time.

Cattle bones predominate both by number and by weight. coming from animals that mostly lived to a good age; with a mean withers height of 1.15- 1.16 m these cattle were by modern standards small, but they were comparable in height with those found in the Roman period in Britain. One exceptionally long metacarpus probably came from a bullock.

Sheep were the most numerous species when Minimum Numbers were calculated (and this fact argues for the retention of Minimum Numbers as a method, since the information is significant and could have been found in no other way). With a mean withers height of 0.61--0.62 m these animals were small; they were also lightly built and there is some evidence that, alone among the main domestic animals of 'Hamwih'. they may have been undernourished. There is a probability of castration and therefore of the importance of wool.

Goats were scarce. Only male horn cores are found in good numbers and it seems likely that many of these were brought in. for working, from outside.

Domestic pigs played a valuable role in 'Hamwih'. Whilst exploitation of wild boar must remain a possibility. the evidence for this is not conclusive.

Exploitation of wild species
This bone collection does not give a picture of dramatic exploitation of the environment. or of a people with a hunting ethos. The explanation for the lack of deer and fur-bearing species may he a sociological one rather than that often given-that the area had been 'hunted-out'. Neither do they seem to have been adventurous fishermen. Most of the fish could be caught now from the modern shingle bank of the ltchen estuary where 'Hamwih' was sited. We need artefactual evidence before we can say what methods were used but hook and line. nets, and traps are all likely, and there would not be the necessity for even small boats. The most abundant fishes were eel. flounder. bass, and mullet. These and the salmon could all have been caught in intertidal traps or kiddles (V-shaped fences built on the shore, their points ending in bags or traps) which could be made of timber uprights and bendable twigs such as osier. These, once set up, would fish every tide anti would demand very little work. In the absence so far of tar-g: amounts of sea fish (eg cod. pollack, mackerel, sead, and gilthead) it is sugested that the sea fish we have might even have been imported, but further work may give a different picture. Jessica Winder (see Marine mollusea report) presents conclusions on molluse-gathering which fit into this picture of the Saxon way of life. There is similarly no evidence of large-scale wildfowling although it is highly probable that the area was an important overwintering one for certain birds.

Just as we cannot know to what extent eggs and milk were consumed (no eggshell has been found preserved so far) we cannot really assess the role of fish in the diet without further controlled sampling or analysis of samples already taken on sites subsequently excavated. Cartilaginous fish, such as dogfish, might commonly have been caught at 'Hamwih' but their skeletons would not often survive. Crustacea, such as shrimps, may also have been an important dietary addition which has left no archacological evidence.

The problem of differential survival which has been behind much of the methodological explanation in this account may in this way be giving us a false picture--one of almost total dependence on domestic stock. But even if it were to be a false picture we can securely say that *vigorous* exploitation of the environment was never the case. If there was. say, a particularly low tide, a stranded whale. or a great northern diver diverted to Southampton Water, the Saxons were ready to exploit it; but probably there was no need to put themselves out to do so. With such a varied and rich environemnt it would not have been difficult to obtain a varied and adequate diet.

Methods
We have felt justified in detailing our methods for two main reasons. First, archaeozoological methodology in Britain is in a state of rapid evolution and it is a matter of some debate as to whether Continental methods are always applicable to British material. We make no ex-

cuses for frequent references to German work as there is little point in inventing our own procedures when suitable methods have been in use in another language for twenty years. We have suggested some ways in which British material differs and some new ways in which analysis might take place. Secondly. we are not justified in extrapolating from the bones in pits to a reconstruction of Saxon economy without a full realization of the 1ikely errors.

The analysis presented here can now serve as a reference point for comparative work on other towns, on the rest of 'Hamwih', or on later medieval Southampton. It is now easier to identify those parameters which might form a basis for quick comparisons, and those which could be left out in the interests of cost-effectiveness.

What could now be learnt from further analysis? Controlled sampling and a time-consuming study of fragmentation will both he needed for a fuller picture of differential preservation, a picture which is needed in its turn if we are to know how the pits were filled. To plot, for all features, the many factors needed in analysis (including fragmentation, butchery, preservation. colour . . .) would require detailed coding and computer sorting, things which happily are now being planned for SARC. It would also require the accumulation during excavation of far more detail than excavators normally gather in connection with animal bone; this, too, seems possible with the good site/bone-room cooperation already in existence.

Such arc our present priorities in the attempt to elucidate further the ways in which the people of 'Hamwih' used the resources of their environment to meet their particular needs.

Acknowledgements

W c thank the Trustees of the British Museum (Natural History for use of the collections. Those on whose expertise we have mostly drawn are mentioned in the relevant sections.

Of the many others who have helped on our ideas and smoothed our path we should particularly like to thank Philip Armitage. Don Bramwell, Geraldine Done. John French, Roger Jones. and Barbara Noddle.

Special thanks should go to Nick Bradford, of the Department of Archaeology. Southampton University. for his generous anti painstaking work on the photographs.

18 The marine mollusca

by Jessica Winder

This survey was begun while the writer was working at the Department of the Environment Faunal Remains Project, Southampton University, and was intended to be a pilot study to assess whether detailed analysis of archaeological oysters was worthwhile. The large quantity of oyster and other shell suggested that 'Hamwih' was an ideal site to assess marine mollusc significance in terms of eg meat value. and to search for evidence that would indicate the method of collection. the exact origin of the oysters, and the techniques of opening the shells and cooking the meat.

Work has been carried out in the past on prehistoric shell middens in various parts of the world by both archaeologists and zoologists. There is abundant literature on all aspects of oysters and oyster culture. Methods have also been published for extrapolating data from modern marine molluscs to interpret shells from middens. This report on Saxon shells from 'Hamwih' is an attempt to use and adapt the known archaeological and zoological approaches to the study of marine molluscs, particularly oysters, in relatively small historical deposits.

Full details of the methods adopted are to be published elsewhere (Winder, in preparation) and anyone setting out on an oyster study is welcome to approach the writer for more information as the work described here suffered serious setbacks which could easily be avoided by other workers if they are aware of the problems involved. Not included here is the procedure used for washing the shells and it is suggested that much information is often lost when shells art' washed without prior advice from a mollusc specialist.

A full account of the age assessment methods used for oysters has also been omitted, as have all data obtained from modern molluscs-some of which is used to arrive at certain conclusions in the text. These will also be discussed elsewhere.

Age-grouping of oyster shells

The oyster shells were identified as right valve or left, then aged and counted. Age-group was carried out by counting the number of annual growth bands. Each band of wide lines plus close lines is the result of one year's growth (see Fig 18, 1). In a well preserved oyster shell the bands are easy to count but in worn specimens they may be obscured. Oyster shell\ aged by this method are available for inspection at SARC and Fig 18.2 gives some idea of these age groups.

Ageing may be considered a subjective process complicated by many factors. not least the state of preservation of the archaeological shells. Size groups would be more accurate than age groups for meat assessment where shells are well preserved. Ageing is more useful when considering exploitation of an oyster population.

Meat assessment from oyster shells

It was initially decided that once age groups were established the average meat weight for oysters of a given age would be calculated by measuring the internal volume of a sample of shells in each age group volume in en cc obtained by filling the cupped left valve with water (deemed to be equal to the volume that had been occupied by the flesh of the oyster) was to be converted directly to grams meat weight, taking the density of oyster flesh as unity for the purposes of this project.

This initial idea was abandoned for a number of reasons, the most obvious of which was the impossibility of measuring internal volumes on unpaired and damaged archaeological shells, That the volume of the cupped valve in not always equivalent to the internal volume of an oyster can be seen from Fig 18.3a.

Measurements and weights of modern oysters were then analyzed in the hope of finding some regular relationship between shell dimension and meat weight, but no usable pattern emerged and, in view of this and the difficulty of accurately measuring the 'Hamwih' shells, it was decided to use and *average wet meat weight* for meat assessment. Data from 86 modern oysters, supplied by the Fisheries Laboratory at Burnham-on-Crouch, provided an average wet meat weight per oyster of 7.5g but with a range of 1.2 to 35.3g and a standard deviation of 5.3g. Such an enormous range of meat weigh might also have been encountered by the Saxons as oysters of a wide variety of ages and sizes had been taken.

The average wet meat weight was then multiplied by the minimum number of individual oysters represented by the archaeological shells to give a total meat weight for each site, shown in Table 18. 1.

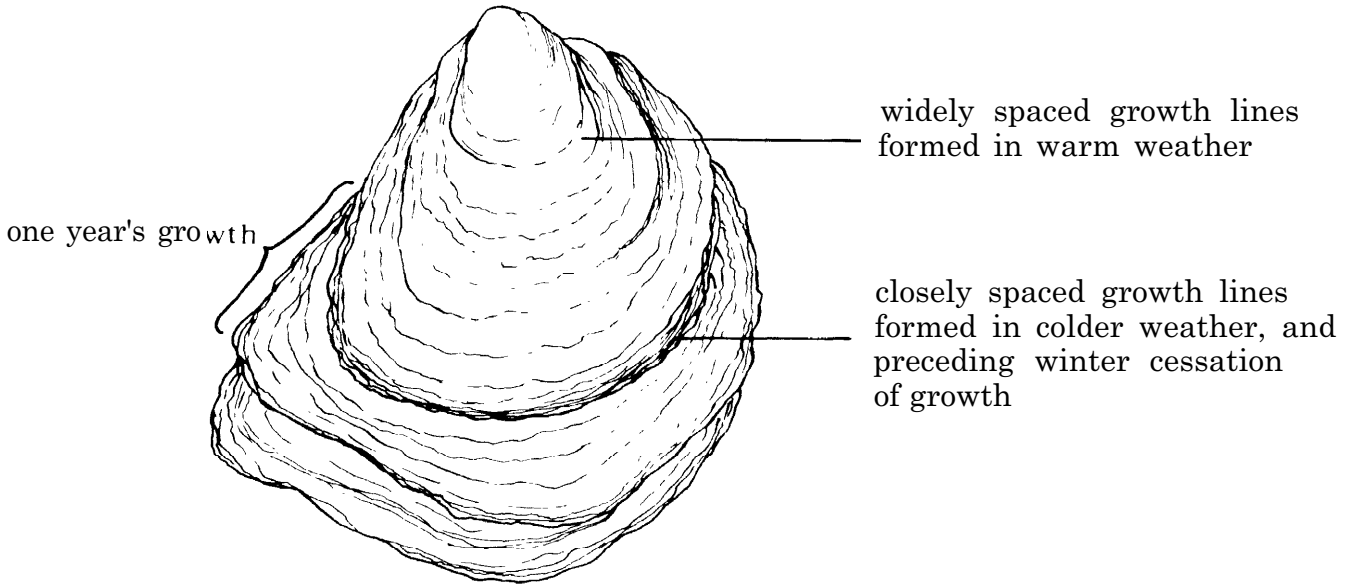


Fig 18, 1 Diagram of outer surface of the right valve of an oyster showing growth lines

TABLE 18,1: Marine mollusc meat weight assessment for Melbourne Street Sites IV, V and VI

Site	*Min no oysters*	*Average wet meat weight**	*Minimum weight**	*Maximum weight**
IV	9,673	72,295	21,312	123,279
V	476	3,558	1,049	6.066
VI	1,537	11,487	3,386	19,588
	Min no winkles	*Average cooked meat weight*		
IV	2,050	2,050	1,422	2,719
V	167	167	116	222
VI	703	703	488	932
	Min no cockles	*Average cooked meat weight*		
IV	39	68		
V	4	7		
VI	*16*	28		

*All weights in grams. Although means and standard deviations are given to one decimal place in the text they are uncorrected during all calculations.

The minimum and maximum weights for oysters and cockles in Table 18.1 are calculated using the standard deviations obtained from the modern meat weights. Using the above method of weight assessment, it was only necessary to sort the valves into left and right and count, the maximum (either left or right) giving the minimum number of individuals. The large possible range of meat weights obtained this way really does illustrate how much the amount of food in an oyster may vary.

Data from a series of samples of modern oysters taken only from the Solent and nearby localities (not all of the 286 oysters in the Burnham sample were from this area) might have given a more precise average weight to be used for determination of oyster meat weight for shells from archaeological sites in Southampton, but this was not possible for this report.

Table 18,2 gives the percentage meat weight contribution of oysters, winkles, and cockles.

TABLE 18,2: Percentage meat weight contributed by oysters. winkles. and cockles respectively

Melbourne Street sites-'Hamwih'	IV	V	VI
Total mollusc meat weight in g	74,413	3,732	12,218
% oyster meat	97.1	95.3	94.0
% winkle meat	2.8	4.5	5.8
% cockle meat	0.1	0.2	0.2

Meat assessment from winkle shells

The edible winkle shell *(Littorina littorea* (L.) was the most abundant shell recovered after the oyster. It occurred on all three sites. The winkle shells were more robust than those of the oyster so that measurements and weights could be taken from the better preserved specimens for comparison with modern examples. Modern winkles from Kimmeridge Bay. Dorset, were used in attempts to find a correlation between either shell size or shell weight and the cooked meat weight of winkles.

It was hoped that meat weight for archaeological shells of known dimensions could be read from a graph of shell dimension against cooked meat weight, but when the figures were plotted there was apparently little positive correlation so that the graph could not be used in the intended manner.

The thick-shelled Kimmeridge Bay samples were not exactly comparable with the 'Hamwih' winkle shells. Ideally, samples would need to be taken from various localities of different exposure at different seasons to find a more comparable set of specimens or obtain an average set of figures. In view of these findings, a similar stratagem to that used with the oyster shells was adopted. The average meat weight of the Kimmeridge Bay specimens

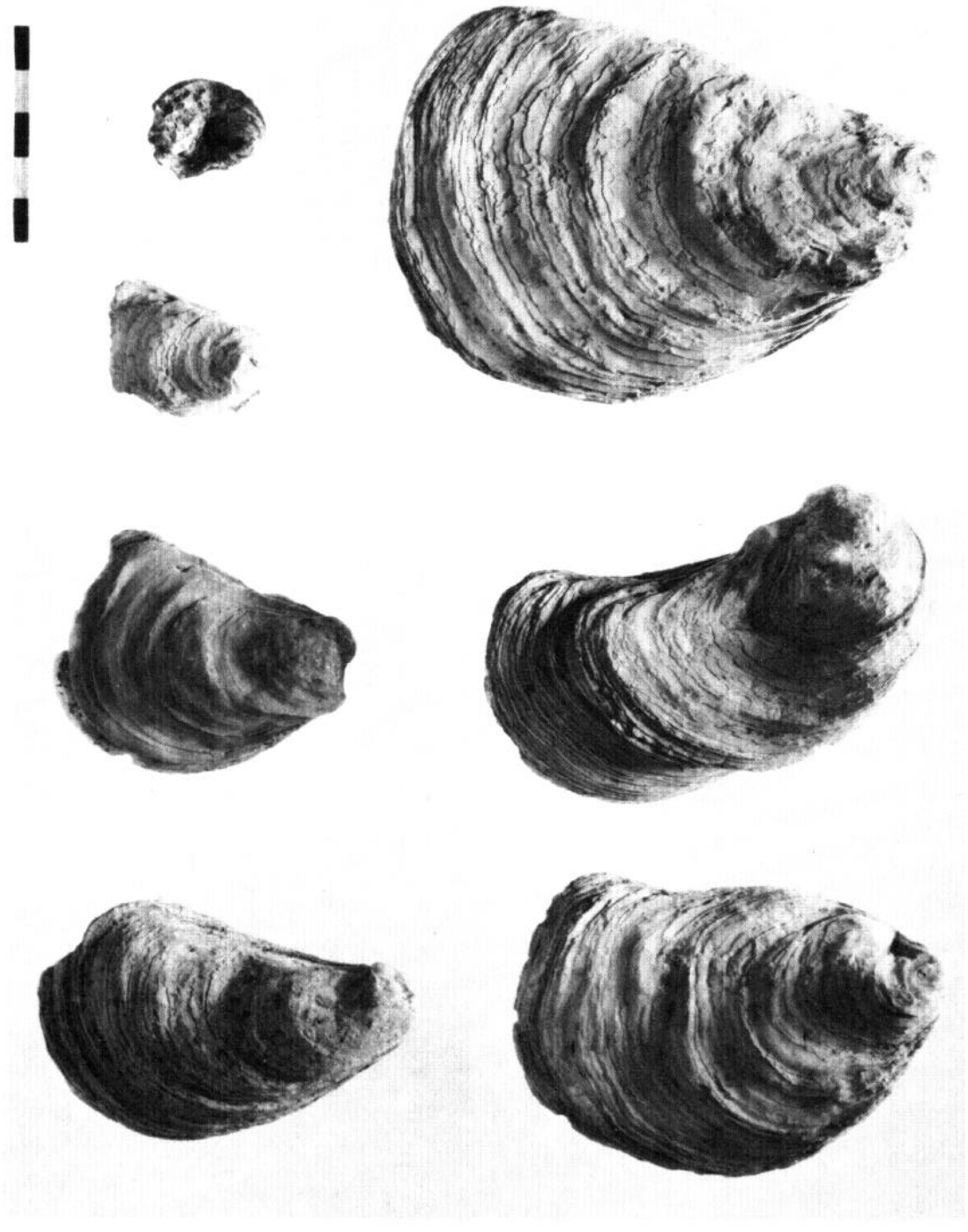
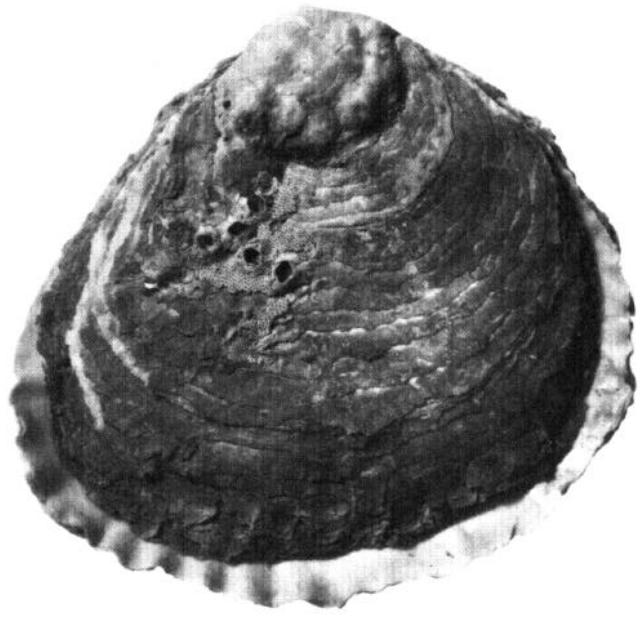


Fig 18,2 Age groups of oyster shells: left side, one to four; right side, seven to five. Scale 2:3



a

b

Fig 18,3 a) Surface view of modern oyster, right valve seated within the margins of the left valve showing that the volume of the cupped valve is not equivalent to the internal volume of an oyster. Scale I: I; b) Cut marks on an oyster. Scale 7:1

was calculated. It came to 1.01 g and this was multiplied by the number of winkle shells on site to obtain the estimate of meat weight given in Table 18,l.

Intersite comparisons of winkle shells

A study of the standard error of difference of various dimensions of the archaeological and modern winkle shells showed, as expected, that the height, width, and shell weight of the Kimmeridge Bay and 'Hamwih' winkles were significantly different.

The average shell weight is lower in an archaeological shell, even if the thickness of that shell is comparable to a modern shell, due to decomposition of the organic constituents and leaching of minerals during burial.

Comparisons between the archaeological sites showed that there was a significant difference in height of winkle shells between Sites IV and VI, and V and VI, but not between IV and V. indicating that Site VI samples differed. Since the apex of the winkle is often rounded by erosion during life or damaged during burial leaving only the delicate columella by which height can be measured, it may be wise to ignore findings about shell height.

In width there was a significant difference between Sites IV and V. and IV and VI. but not between V and VI, indicating a true difference in width in Site IV shells. They were slightly narrower. In shell weight, Site IV shells also seemed lower. This may be attributed to a longer period of burial or different conditions of burial besides different original weight.

This apparent difference in Site It winkle shells might be a result of using a larger sample (89 compared with 45 and 50). but the mean and standard deviation for height, width, and shell weight are all slightly less than for Sites V and VI. The lower average shell weight on Site IV winkles might be a result of longer burial; the lower average height a factor of damage during life or burial. The shell width would not be altered so easily during life or burial. It must be concluded that Site IV winkle shells are smaller than those from Sites V and VI which may indicate collection from a different locality or reflect selection of different preferred sizes.

Other molluscan species

The frequency of these is shown in Table 18.3.

Cockle (Cerastoderma edule (L.))

The Fisheries Laboratory at Burnham-on-Crouch provided meat weight figures for 130 cockles from the Burry Intlet. South Wales, giving an average cooked meat weight of 1.73 g. which was used to obtain an estimate of meat weight represented by cockle shells on all three sites (Tables 18.1 and 18.2).

Edible whelk (Buccinum undatum L.)

The average meat weight of modern whelks is not available at the time of writing this report. The meat in one whelk may be equivalent to many smaller molluscs. So, although only a few shells were found. their contribution to the shellfish diet should not be underestimated.

Mussel (Mytilus edulis L.)

Few mussel shells either intact or in fragments were recovered from these sites. The specimens collected are not representative of the numbers that were present. Mussel shells are recorded in small numbers from predominantly oyster shell layers all sites. Only presence or absence was recorded for each feature on Site IV because mussel shell recovery seemed to have been accidental; shells usually occurred embedded in the mud attached to the oyster shells. The mussel shells are therefore omitted from the table of molluscan species present on Site IV. The numbers of mussel valves recovered from Sites V and VI were recorded but are known to be unrepresentative since section drawings of F21 and F34 of Site V and F8 of Site VI show distinct layers of mussel shells from which samples were not taken (neither were the umbonal fragments counted). The above species are edible. It is not certain that the other species described below were eaten but a note was made of their presence in the hope that this information (together with the infestation information in the nest section) might eventually make it possible to link oyster samples with a particular habitat and possible locality (Cole 1956a. 33, plate 21; Cole 1956b).

TABLE 18.3: The relative abundance of the different species of marine mollusc *other than oysters* from Melbourne Street Sites IV, V, and VI.

Species in order of abundance	Site IV Min nos	Site V Min nos	Site VI Min nos
Littorina Littorea (L.)	2050	167	703
Cerastoderma edule (L.)	39	4	16
Buccinum undatum L.	39	5	1
Nucella lupillus (L.)	26	4	0
Chlamys (Chlamys) varia (L.)	7	0	2
Littorina saxatilis (Olivi)	6	0	1
Anomia ephippium L.	5	0	1
Ocenebra erinacea (L.)	5	1	0
Patella spp.	5	1	0
Nassarius reticulatus (L.)	3	0	1
Venerupis decussata (L.)	2	2	1
Dentalium vulgare (da Costa)	1	0	0
Littorina lutoralis (L.)	1	0	0
Pecten maximus (L.)	0	0	1
Tellina spp.	1	0	0
Venerupis sp.	1	0	0
Mytilus edulis L.	present	6	35
Total numbers	2191	184	727

The numbers of valves have been divided by two to give the minimum numbers of individuals for each bivalve species. *Mytilus edulis* L. numbers have not been included in total because this species is known to be underrepresented.

Rough tingle or sting winkle (Ocenebra erinacea (L.))

This is the native British species of oyster drill which is a predator of oysters.

Dog whelk (Nucella lapillus (L.))

This is another predator of oysters and other molluscs.

Netted dog whelk (Nassarius reticulatus (L.))

This species is a scavenger. feeding on dead or decaying animals.

Saddle oyster (Anomia ephippium L.)

A few saddle oyster valves were found. This species lives attached by means of a chalky stalk called a byssus which extends from the body through an opening in the tower valve to stones and mollusc shells, including live oysters. the byssi attached to oyster shells are more frequently recorded than the valves themselves in the 'Hamwih' material. The shell is fragile and its fragments may be overlooked in the debris of each bag of shell, being

mistaken for the thin layers of oyster shell which often become detached. The saddle oyster might be wrongly identified as a young oyster, which it resembles. It can usually be distinguished by its slightly convoluted shell, browny irridescent interior, and possession of a group of adductor muscle scars.

Variegated scallop (Chlamys (chlamys) varia (L.))

Specimens of this shell may have been eaten or collected because of their attractive appearance. This might also account for the presence of a single elephant's tusk shell *(Dentalium vulgare* (da Costa)). Occasional contributions to the food were the flat periwinkle *(Littorina littoralis* (L.)). rough periwinkle *(Littorina saxatilis* (Olivi)) (Heller 1975), limpets *(Patella* spp.), great scallop or escallop *(Pecten maximus* (L.)), tellins *(Tellina* spp.) and carpet shells *(Venerupis decussata* (L.)).

Study of this material led to the conclusion that the occurrence of small mollusc shells in the Hamwih samples was unrepresentative of the non-oyster shell content of each layer. Smaller molluscs had been selected by eye or included by accident with the oyster shells eg in mud. This means that if a consistent record of other marine Mollusca is being made to aid oyster studies it is imperative to take block samples from all oyster-containing layers.

Infestation

A note was also made of different types of infestation affecting the oyster shells for all layers and features. It was hoped that this might also help in finding locality or origin of oysters. *Polydora hoplura,* for example, is a polychaete worm that is most prevalent in oysters laid in soft ground near head waters of creeks and inlets where warm, still conditions prevail, as in the south-west and west of England, whereas *Polydora ciliata* prefers oysters on hard, sandy. or clay grounds particularly in shallow water which may become very warm in summer, eg the Whitstable grounds.

Quantifying the incidence of particular types of infestation was time-consuming and had to be abandoned, but a record was kept of the types of infestation and encrusting organisms that occurred. These were the drill holes left by the dog whelk *Nucella lapilius* (L.), the encrusting tube worm *Pomatoceros triqueter* and various Polyzoa or sea mats, and acorn barnacles *(Balanus balanoides).* The boring sponge *Cliona celata* was a common cause of damage as were the polychaete worms *Polydora hoplura* and *Polydora ciliata* (for detailed accounts of these pests see Hancock 1974). Further details and photographs of examples found amongst the 'Hamwih' oyster shells will shortly be published elsewhere.

Methods of opening oysters and cooking them

Hinges showed no signs of damage caused by opening but the margins of the shells which might have shown traces of opening techniques were very poorly preserved. Some possible cut marks are illustrated in Fig 18,3b.

Notches on the margins caused by opening have since been demonstrated elsewhere in well preserved oysters that were collected as an undisturbed block and washed at the time of examination. This shows that there is a case for controlled block sampling on sites with large deposits of oyster shells.

No evidence has been found so far which gives any clues to possible methods of cooking oysters.

Methods of collecting oysters

Methods of collection can only be inferred. No objects which could be identified as specialized oyster equipment were discovered on the Melbourne Street sites but none would be necessary if the oysters were collected from the shore below low water of ordinary spring tides when the natural beds in estuaries are exposed (Yonge 1960, plate XI).

Indirect evidence that oysters were collected at intervals when tides permitted is the discontinuous way in which the shells are distributed in the rubbish pits. If boats had been used, it would be expected that more shells would occur in a more regular manner, Mussels are recorded in distinct layers (eg Site IV, F21 and F34; Site VI, F8) and it is likely that these were available for cropping as an alternative to oysters when the tides did not expose the oyster beds.

It is known that the Romans introduced oyster culture to Britain (Yonge 1960, 23, 148). It is likely that cultivation was not the elaborate practice carried out in Italy but regular collection from a natural population and storage of the oysters prior to marketing in special pits dug at the high tide mark on the shore. Evidence that this practice had continued into Saxon times was sought (Yonge 1960, 153) but no structures which could be associated with oyster exploitation have been discovered.

The sizes of oyster shells in any particular group found together during excavation would be similar if the oysters had been cultivated, since brood oysters of the same year are laid out to fatten together. (NB Similar size in shell might also reflect selection of preferred sizes from a natural population.) The ageing data for Site IV shells when plotted as histograms for some features showed that a wide range of sizes occurred in each feature or layer of a feature. Even if ageing is considered inaccurate the groups can be regarded as size groups. Fig 18.4 shows a typical result, from Site IV. F3520.

Some features show an even wider range of sizes from one year olds (which were approximately 20 mm in diameter) to seven and eight year olds (of approximately 100 mm diameter). Most shells occurred in the middle of the range, ie about three or four years old. This is the size favoured for marketing in Britain today. The shell is not so thin that it will break on opening, and the meat is tender enough to be eaten raw. Larger oysters would probably require cooking or at least cutting up.

In a cultivated population of oysters the shells would be separate. not adhering in groups, because spat oysters would be detached from the cultch on which they had settled prior to laying out for fattening. This ensures that

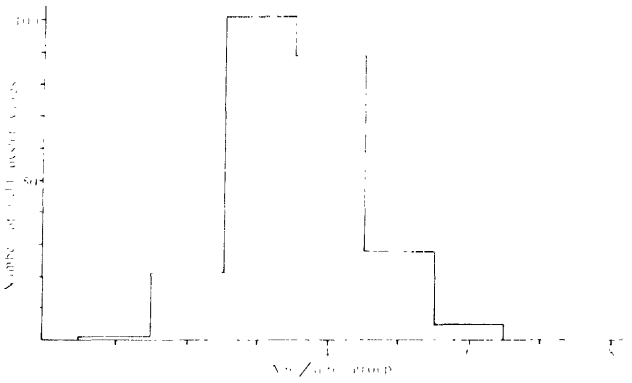


Fig 18, 4 Histogram of age/size groups for Site IV, F3520

each oyster can grow unhindered. A cultivated oyster has a typically neat, round shell. In a native population of oysters, the conditions arc more crowded. Many spat compete for growing space on empty shells and on living oysters, and this results in odd shapes and sizes such as the shells found at 'Hamwih'. Some of the 'Hamwih' shells were so elongated that they superficially resembled the Portuguese oyster *(Ostrea angulata* Lamark), or the American oyster *(Crassostrea virginica* (Gmelin)), both modern introductions.

Conclusions

The oysters eaten in 'Hamwih' were most likely to have been collected from a natural population occurring on the lower shore somewhere along the Solent when the tides were suitable, and were a significant source of protein. The nutritional value of oysters should not be underestimated (Cole 1956a. 41). Oyster meat has a similar composition to milk but has less fats and more proteins and carbohydrates. Vitamins A, Bl, B2. C, D. and PP are also present. Vitamin A is absent from the meat of fish and mammals (except fish liver).

There is no reason to believe that *Ostrea edulis* L. in Saxon times was significantly different from modern oysters. If measurements of meat weight and internal volumes of modern oysters from an appropriate locality were made over a twelve month period. this information could lead to a more accurate determination of meat weight for oyster shells with known internal volume. Although internal volumes could not be measured on material from these particular sites because the shells occurred separately, careful examination of a block sample from a large deposit on a site elsewhere revealed that oyster valves did remain in pairs from which it is probable that internal measurements can be made.

For the 'Hamwih' and similarly preserved material it seems best to base meat weights on an overall average figure obtained from modern oysters in a locality near to the site. Oyster shell weight. volume. size, and growth are irregular and difficult to tie up with meat volume or weight but this is not necessarily the case with other marine bivalves or gastropods. An examination of modern molluscs for shell meat relationships could be rewarding.

Assessing shellfish meat weight and deciding what contribution this has made to the diet has little significance unless the standard of recovery is known. and it sampling has occurred, what techniques were employed. Meat weight assessment was attempted only for oyster, winkle, and cockle shells out of a possible eighteen species recorded because these occurred in the greatest numbers and were obviously the main components of the shellfish intake, in addition to mussels which also occurred in large numbers of fragments but which were not always recovered.

The study of marine shells at 'Hamwih' is vital to the interpretation of the sites since shells represent an undomesticated source of animal protein in a community that is shown in the Animal bones report to have relied heavily on domesticated animals and in which hunting and wildfowling activities were minimal. Like some of the suggested fishing activities, collecting molluscs from the shore would not involve great expenditure of time or effort.

This pilot study has shown that marine mollusc remains may give a wide variety of archaeological evidence and that with a great deal more work (not least ecological work on modern molluscs) it may eventually be possible to say more about the way in which shellfish food was collected. distributed, and exploited in Britain in the past.

Acknowledgements

1 should like to thank the following people for their assistance in the production of this report on the marine mollusc shells from 'Hamwih': Dr D J Alderman for his advice and information regarding modern oysters and their culture; Mr Nick Bradford, of the Archaeology Department at Southampton University, for his kindness anti help with the photographs; Jennie Coy, of the Faunal Remains Project, for her never-failing encouragement; Dr P E Davidson, at the MAFF Fisheries Laboratory in Burnham-on-Crouch, who kindly provided measurements and weights of modern oysters and cockles; Dr Peter Mordan, of the British Museum (Natural History), who advised me of recent developments in the taxonomy of certain species; Mr B L Nixon, of the Poole Oyster Company, for information and advice regarding oyster culture and also for specimens; the Purbeck School in Wareham, in particular Mr David McPherson, Head of Biology, who allowed me access to facilities and equipment; and last, but not least, Mrs Pat Symonds who so patiently and efficiently helped me to wash and age 9,673 oyster shells.

19 The seed remains

by *M Monk*

The possibility that evidence about diet and environment can be deduced from surviving botanical remains in archaeological deposits has long been recognized. The application of this principle to early medieval archaeology has not yet been achieved on a systematic basis, but work is now in progress on a number of sites. The writer was financed as an SARC research scholar, 1973-6. to undertake an investigation into the botanical data recoverable from the sites in the Saxon port. This research is discussed in the writer's University of Southampton MPhil thesis.

Excavation of the Melbourne Street sites, except XX, had been completed before the research was begun, but samples had been taken by the excavators for future processing, and are considered in this report. None from Site I had survived storage adequately for analysis to be undertaken satisfactorily.

The writer records with deep gratitude the constant help and advice which he has received from Dr J M Renfrew throughout the project.

SARC IV, F15

The sample

Only one sample preserved from Site IV, from F15, produced any significant amount of material. It was floated for the seeds using the paraffin method (Renfrew, Monk, & Murphy 1976, 18-20). The surviving sample demonstrates the inadequacy of conventional recovery methods.

TABLE 19.1

Seed list	*Bottom of pit in woody substance*
Thalictrum ef. *flavum* L. (common meadow rue)	1
Chenopodium ef. album L. (fat hen)	1
Bupleurum ef. *tenuissimum* L. (hare's ear)	1
Rumex sp. L. (the docks)	1
Urtica dioica sp. L. (stinging nettle)	3
Labiatae ef, *Mentha* sp. L. (the mints)	1
Sambucus nigra L. (elder)	6
Juncus sp. L. (rushes)	15
Carex sp. L. *Scirpus* sp. L. (sedge family)	1
Gramineae (the grass family)	1
Unidentified	2

Description

The sample of seeds/fruits presented here shows little more than the presence of these species, but the material from the other Melbourne Street sites shows that it is not untypical. The species here are characteristic of a damp ground habitat *(Carex sp./Scirpus* sp.; *Juncus* sp.; *Thalictrum* cf. *flavum;* and *Mentha* sp.). However, a disturbed and nitrogenous ground is indicated from the presence of *Chenopodiurn* cf. *album* and *Sambucus nigra.* The only unusual species compared with the other material from the Saxon sites in the area is the presence of the saltmarsh plant, *Bupleurum* cf. *tenuissimum.*

SARC V, F16

The sample and method of recovery

One of the pits, F16, was taken as a special case by Messrs A Vince and C J Arnold, then undergraduate students of Southampton University, Department of Archaeology, to carry out a recovery experiment. I am grateful to them for the information on their method and for their early interest in the retrieval of environmental material from the Saxon excavations in Southampton.

The experiment was undertaken to see if more information could be retrieved from the archaeological deposits than by conventional manual excavation alone. Different methods of sampling and recovery were adopted in order to provide a comparative basis for future work aimed at the recovery of as much small-scale material as possible. Although the experiment was only completed in part, it demonstrated that the recovery of both artefactual and environmental material could be improved but at a considerable cost in time unless a sampling programme was adopted for specific material. As a result. a more organized sampling technique was adopted for the recovery of plant remains and sieving was adopted for the more efficient recovery of other small materials like the smaller animal bones.

A brief description of the method

Two types of sampling technique were adopted on a specific non-random basis. In the first instance a 100 mm^2 column that went through the centre of the quadranted pit was marked out and 100 mm cubes of soil were extracted at appropriate points down its length. The resulting soil samples were then put into water to float off carbonized plant remains which were caught in a 600 micron mesh sieve. The residue (or that which did not float) was washed through a 1 mm mesh. Although there were variations in the number of seed remains recovered from different samples from different points in the pit. the actual numbers of seeds involved were too small to see how significant in terms of distribution these variations were. To make a comparison with the results of this column sampling technique, two large block samples of 8000 cc each were also taken from each of the two main layers in the pit (see section, Fig 6,6). the grey-brown soils of the upper layers, and the dark grey clays of the lower.

Several sieve mesh sizes were used in the recovery procedure. For flotation the most efficient mesh size used to recover identifiable material without loss was 300 microns. The mesh size that seemed most appropriate for washing or water sieving the residues was 2.4 mm. Carbon tetrachloride was tried as the floating medium but it was no more efficient than water. Several problems were caused by the clay in the deposits. Either the soil sample had to be dried before flotation or it had to be steeped in hydrogen peroxide or soaked overnight in Calgon. These methods had varying degrees of success in assisting flotation. The clay also clogged the sieves but no way round this was found.

Results of the method and recommendations

Large quantities of material were recovered from the residues and these included both artefactual material like glass. metal objects. and pottery, and environmental material, in particular large and small mammal, fish, and bird bones, and land and sea molluscs, discussed in the other specialist reports.

The block samples from the major lower layer produced more seed material than the whole of the column sample. The block samples from the upper layers did not produce any seed material. Some indication of this concentration of seed material in the lower layers of the pit is also indicated in the material from the column as it is compiled in the seed list (see Table 19.2. the list of material under the 1. 10-1.30 m column). In section the lower layers of the pit showed a more marked concentration of carbonized material than elsewhere in the pit and, indeed, many of the species of seeds from this later proved to be carbon-

TABL.E 19,2: SARC V, F16

Seed list

	Column 0.70-10 m	*Column 1.10-1.30 m*	*SE Quad L 19-35*	*SE Quad L17 (lower)*	*NW Quad L17*
Triticum aestivum ef. *aestivo-compactum*- Schiem. (bread wheat/club wheat)	2	-	1	23	-
Triticum ef. *spelta* L. (hulled wheat (spelt))	-	-	-	2	-
Triticum sp. L. (wheat)	-	-	-	1	4
Hordeum ef. *vulgare* L. (six-row barley)	-	-	-	1	- - -
Hordeum sp. L. (barley)	3	-	-	6	1
Avena sp. L. (oats 'group')	1	-	-	1	-
Cereal grain frags	1			8	
Brassica sp. L. *Sinapis* sp. L. (cabbage/mustard 'group')	-	-	2	-	-
Chenopodium ef. *album* L. (fat hen)	-	4	-	6	-
Rubus ef. *fruticosus* L. *sensulato* (bramble, blackberry)	-	4	-	83	-
Rubus ef. *idaeus* L. (raspberry)	-	7	-	7	-
Rubus sp. frags	-	*	-	-	-
Prunus spinosa L. (sloe)	-	3	-	-	-
Prunus domestica subsp. *insititia* (L) CK Schneid (bullace)	-		-	8	-
Prunus ef. *avium* (wild cherry)	-	1	-	-	-
Prunus sp. L. (the 'plum group')	-	2	-	-	-
Prunus sp. L. frags	-	*	-	*	
Crataegus momogyna Jacq. (hawthorn)	-	-	-	1	-
Pyrus sp. L. *Malus* sp. L. (apple or pear)	-	-	-	6	-
Pyrus sp. L *Malus* sp. L. (apple or pear) frags	-	-	-	*	-
Rumex sp. L. (the docks)	-	-	-	1	-
Ballota migra L. (black horehound)	-	-	-	1	-
Corylus avellana L. (hazelnut)	-		-	1 frag	-
Sambucus migra L. (elder)		1	-	12 + 1 frag	3
Sambucus sp. L (elder 'group')	-	-	-	2	-
Undentified nut frags	*	-	-	-	

ized. It was therefore demonstrated that the layers in a pit could show significant differences in distribution, and that block samples taken only from seemingly significant layers would not always give a sample of material representative of a pit as a whole. It was therefore decided that the column sample should be increased in size to give a larger sample of seeds, but that it should also be related to the archaeological layering. Particular layers that were not adequately sampled by the column method could be block sampled if necessary. Subsequent sampling for plant remains from the excavations in Southampton was carried out on this basis, and the recovery of the seeds was carried out by hand flotation methods in water and paraffin using the recommended 300 micron mesh.

Description and interpretation

For simplicity, the seed remains recovered from the different samples in the column have been lumped together in two units; those found in samples from a depth of 0.70-1.10 m in the pit and those from 1.10-1.30 m. The mesh sizes used in the recovery have also been ignored in the presentation of the data.

In the washed residues of soil sample from the SE quadrant in the lower layer a number of curious objects that could be described as 'fossils' or casts of seeds and other possible parts of plants were recovered. Helbaek. while working in the Near East (Helbaek 1969). discovercd similar material and suggested that it was due to the percolation of ground water loaded with gypsum passing through a calcareous deposit causing a kind of encrustation on the plant remains. This would build up through time (rather like the formation of stalagtites and stalagmites), harden around the object, and maintain its shape long after the decay of the organic substance. The mechanism for the creation of this material from Southampton cannot as yet be fully explained. It is possible that there was water percolation through a localized calcareous deposit, like a concentration of oyster shells above the material. although it is difficult to explain how the gypsum could get into the water. It also cannot be proved that this material was contemporary with the occupation (it could. perhaps. be of geological origin), though the only adequately demonstrable seed specimen is a cereal gram, possibly, of wheat, *Triticum* sp. Because of the doubt in identification, this material has not been included in the seed lists and further work is necessary to explain this curious fossilizing process.

The rest of the seeds and fruits in the lists are of plants that are mostly of dietary use to man and were probably being exploited by the Saxons. One species that does not fall into this category is *Ballota nigra* (black horehound), which is a common wayside and hedge bank plant today. There are also three plant genera that, although some of their species have been of dietary significance, are probably not present as food remains. These are *Rumex* sp. (the docks). *Brassica* sp. /*Sinapis* sp. (members of the cabbage and mustard family). and *Crataegus monogyna* (hawthorn). These types could be characteristic of waste ground, damp ground, and scrub respectively. The possible scrub element in the vegetational source of the material could also be deduced from the presence of fruit stones and pips of *Prunus spinosa* (sloe), *Prunus domes-*

tica subsp. *insititia, Pyrus sp./Malus* sp. (the pear and apple group-in fact the examples. though difficult to separate to species here. are more likely to be of crab apple, *Malus sylvestris),* and *Sambucus nigra* (elder). Since such 'wild' fruits were probably being collected for dietary or industrial purposes by the Saxons on a systematic basis from the area, few deductions can be made about vegetation in or near the site, although it is worth noting that the modern scrub vegetation on the Itchen near the site of 'Harnwih' is characterized by these same species (Townsend 1883). As the separate identifications of *Pyrus communis* (pear) and domesticated varieties of *Malus* sp. cannot be made easily on the basis of sub-fossil pips. orchard husbandry cannot be implied. There is, however, one example of *Prunus avium* (cherry) which was introduced by the Romans as an orchard plant but, by this time. could well be a naturalized escape. Although it is again difficult to demonstrate from the plant remains alone, the Saxons probably systematically exploited the wild fruits from the scrub and forest margins. Bramble and wild raspberry pips were found preserved (their hard testas being resistant to chemical and bacterial decay) and may also have been collected from scrub margins close to the site to be included in the diet as a food or beverage. Alternatively, the material could be industrial rather than food waste, from an activity that required the juices of fruits as additives. for example, dyeing or tanning (cf *Sambucus nigra* at York (Buckland, Greig. & Kenward 1974)).

The remaining species listed are of carbonized cereal grains, which comprise one of the largest groups of carbonized seed remains from a single context so far excavated from the Saxon town. They are made up of mainly *Triticum aestivum aestivo-compactum* (bread/ club wheat). These two species are difficult to separate on their grain morphology alone, especially when deformed by carbonization, but generally the grains of club wheat are shorter and more rounded. The measurements of length (L). breadth (B), and thickness (I) are given (Table 19.3) and ratio L B is given to indicate the more rounded types (L B for club wheat is approximately l.l-1.8 and bread wheat 1.8-2.2 mm). The average size is L4.3, B2.75, T2.23mm. These wheats are known as naked wheats, as they thresh clean from their glumes and do not, therefore, have to be parched before threshing as the hulled species do. Most of the material would have become carbonized as a result of accidents during drying, burning of straw, or accidental burning in a hearth prior to grinding.

There are also two possible examples of *Triticum spelta* grains, a hulled wheat with typical narrowness and steep dorsal back. These were possibly contaminants of the wheat crop, as were also perhaps the other species of cereal grains present, *Hordeum* sp. (barley), *Hordeum* cf. *vulgare* (six-row barley). and *Avena* sp. (one of the oat family, but impossible to assign to a species without a flower base). The average measurements and the other measurements for these are given in Table 19,3. Although they could be interpreted as contaminants of a predominant *Triticum aestivurn aestivo-compactum* crop, they were probably also being cultivated as crops in their own right. as their presence, in particular *Hordeum* sp. (barley), at other sites in the Saxon town suggests. If this material represents accumulations from the results of a single cropping, then the absence of carbonized weed seeds and straw fragments would suggest that the crop had been quite efficiently cleaned before carbonization. It is, however, just as likely that the material accumulated for some time before being deposited in the rubbish and, therefore, is not the result of one harvested crop. The other archaeological evidence present does not help solve this, although the possibility of seasonal deposition of oysters in some pits should be borne in mind (see Marine mollusca report).

There is very little published evidence from the ethnobotanical record for the Saxon period in Britain and it is important to establish the presence of certain species. The interpretation can only be very tentative pending the publication of further information both from this site and others.

TABLE 19,3: Cereal grain measurements: SARC V, F16

	length (L) mm	*breadth* (B) mm	*thickness* (T) mm
Column 0.70-1.10 m			
Triticum aestivum	5.0	2.8	2.0
aestivo-compactum Schiem.	3.3	2.0	1.3
Average	4.15	2.4	1.65
Hordeum sp. L.	5.0	2.8	1.8
	4.9	1.9	1.7
Average	4.95	2.35	1.75
SE Quad L17			
Triticum eastivum	5.1	3.0	2.9
aestivo-compactum Schiem.	4.1	3.0	2.3
	4.0	3.0	2.0
	4.8	3.0	2.4
	4.8	3.0	2.0
	3.8	2.0	1.8
	4.0	3.4	2.3
	3.7	2.2	1.9
	3.8	2.1	2.0
	4.0	2.6	2.1
	4.0	3.0	2.1
	4.3	2.9	2.1
	4.8	2.6	2.0
	4.0	2.8	2.8
	4.1	2.8	3.2
	4.5	2.3	1.9
	4.8	3.0	2.4
	4.8	2.9	2.0
Average	4.3	2.75	2.23
Hordeum of *vulgare* L.	4.5	2.0	2.4
Hordeum sp. L.	5.0	3.0	2.3
	5.2	3.0	2.4
	5.6	2.8	1.9
	4.5	2.0	1.7
Average	4.96	2.56	2.14
NW Quad L17			
Hordeum sp. L.	5.0	2.4	1.8

SARC VI

The method of sampling

Two typical pits from Site VI were chosen for examination because they might yield material to assist in the interpretation of the environmental conditions on the site during its occupation. Column samples of 200 mm x 200 mm square section were taken from the centres of their exposed sections. The volumes of these samples were assumed to have a constant relationship to the volumes of deposit in each layer. The soil samples were then systematically floated. Layers l-h in F30 (section, Fig 7.2) and layers l-7 in F39 were floated by hand in water to extract the plant remains. Layers 7-8 in F30 and layers 8-10 in F39 were floated in paraffin as these deposits contained organic material preserved in anaerobic conditions.

The plant remains (Tables 19,4 and 19,5)

Layers l-6 in F30 and 1-7 in F39 contained charcoal but no pieces were large enough to identify. Layer 2 in F39 contained much oyster shell and other marine and terrestrial mollusca, and three carbonized cereal grains of *Hordeum* sp. (barley). Two further individuals of carbonized grain were identified. From F30 layer 2 a grain of *Hordeum* sp. (barley) and from layer 7D/E one example *of Triticum* sp. (wheat) were identified. The most productive samples in both deposits were from the lower, organic. layers. A substantial number of the seeds recovered from these deposits were identifiable (see lists). The nature of the organic deposit could not be identified by observation nor were there enough insect fragments to permit conclusions about it.

From the habitats of the substantial numbers of seeds identified several hypotheses can be suggested about the plant ecology of the site and its environs, and perhaps about the nature of the deposit.

Interpretation

The habitat data indicate two dissimilar plant regimes. The first species group is typical of waste and disturbed nitrogenous ground in an open habitat in close proximity to a settlement. Examples of this group include *Urtica dioica* (stinging nettle), *Chenopodium album* (fat hen), *Atriplex* sp. (orache), *Silene* sp. (catchfly), *Papaver rhoeas* (field poppy), *Polygonum aviculare* agg. (common knotgrass), *Sambucus nigra* (elder). The second habitat group is represented by those species that prefer damper conditions and situations within short distances of slow flowing rivers. The particular members of this group represented here include the following: *Carex* sp. (the sedges), *Juncus* sp. (the rushes), *Typpha* cf. *angustifolia* (bulrush reedmace), *Alisma* cf. *plantago-aquatica* (water plantain), *Ranunculus* sp. (buttercup), *Rumex* sp. (the docks), *Lycopus europaeus* (gipsy-wort) and *Conium maculatum (hemlock).*

It is possible that these damp land species do not represent material derived from the immediate environment of the pits. Rushes, for instance, were collected in the past for thatching roofs in some areas of Ireland (Evans 1957, 56) and for strewing over floors in the medieval period. It should be remembered, however, that one single rush plant can produce at least as many seeds in one season as have been identified. Unfortunately such problems as differential representation of species due to the greater variation in their seed production can create sample bias as much as can differential preservation of different species.

Despite these very real and somewhat uncontrollable constraints, some further suggestions can be put forward to explain the deposit. For the European mainland, the

TABLE 19,4: Seed lists: F30

Species	*No of individuals*			
	Layer 2	*Layer 7D/E*	*Layer 7E*	*Layer 8*
Triticum sp. (wheat)	—	1	—	—
Hordeum ef *vulgare* (barley)	1	—	—	—
Ranunculus ef. *repens* L. (creeping buttercup)	—	—	—	
Papaver ef. *argemone L.* (long rough-headed poppy)	—	—	—	2
Papaver ef. *rhoeas* L. (field poppy)	—	—	—	104
Cochlearia officinalis L. (common scurvy-grass)	—	—	1	—
Hypericum p *perforatum* l. common St John's worth)	—	—	—	2
Hypericum sp L. (St John's worth)	—	—	4	—
Silene sp. (catehfly)	—	—	1	—
Arenaria serpyllifolia L. (thy me-leaved sandwort)	—	—	—	2
Caryophyllaceae	—	—	2	—
Chenopodium ef. *album* (fat hen)	—	—	11	91
Chenopodium ficifolium Sm (fig-leaved goose-foot)	—	—	—	2
Atriplex sp. (orache)	—	—	—	21
Chenopodiaceae sp.	—	—	—	2
Rubus ef. fruticosus L. sensulato (bramble)	—	—	—	1
Potentilla sp. (cinquefoil)	—	—	—	2
Drosera ef *rotundifolia* L. (sundew)	—	—	3	—
Polygonum aviculare agg. (common knotgrass)	—	—	1	—
Polygonum persicaria L. (persicaria)	—	—	3	10
Polygonum convolvulus L. (black bindweed)	—	—	1	—
Polygonum sp.	—	—	5	—
Rumex ef. acetosella (sheep's sorrel)	—	—	—	10
Rumex ef. *acetosa* L. (common sorrel)	—	—	—	1
Rumex sp. *crispus* (curled dock)	—	—	—	1
Rumex sp. *obtusifolius* (broad-leaved dock)	—	—	—	1
Urtica dioica (stinging nettle)	—	—	—	53
Lycopus europacus L. (gipsy-wort)	—	—	—	1
Galeopsis tetrahit L. (common hemp-nettle)	—	—	—	1
Labiatae sp.	—	—	—	1
Sambucus nigra L. (elder)	—	—	—	1
Anthemis cotula L. (stinking mayweed)	—	—	—	1
Juncus sp. (the rushes)	—	—	7	129
Typha ef. *angustifolia* L. (lesser reedmace)	—	—	—	1
Carex sp. (the sedges)	—	—	—	2
Bromus sp. (brome)	—	—	—	1
Unidentified	—	—	—	1

TABLE 19,5: Seed lists: F39

Species	*No of individuals*		
	Layer 2	*Layer 9*	*Layer 10*
Hordeum sp L. (barley)	2	—	—
Gremineae (carbonized cereal grain)	—	—	1
Papaver cf. *rhoeas* (poppy)	—	—	23
Brassica sp. L. *Sinapis* sp. L. (wild cabbage/mustard group)			4
Cruciferae	—	—	1
Chenopodium cf. *album* L. (fat hen)	—	—	36
Chenopodium sp. L.	—	—	4
Atriplex cf. *hastata* L. (hastate orache)	—	—	12
Malva sp. (mallow)	—	—	1
Drosera cf. *rotundifolia* (sundew)	—	—	1
Aethusa cynapium L. (fool's parsley)	—	—	1
Conium maculatum L (hemlock)	—	—	1
Polygonum cf. *aviculare* agg. (?common knotgrass)	—	—	2
Polygonum convolvulus L. (black bindweed)	—	—	1
Polygonum sp. (persicaria)	—	—	2
Urtica dioica L. (stinging nettle)	—	1	2
Verbena *officinalis* L. (vervain)	—	—	1
Anthemis cotula L. (stinking mayweed)	—	—	4
Alisma cf. *plantago-aquatica* L. (water plantain)	—	—	1
Juncus sp. (the rushes)	—	60	1607
cf. *Lemna trisulca* L. (ivy duckweed)	—	14	97
Typha cf. *angustifolia* L. (lesser reedmace)	—	—	2
Carex sp. (the sedges)	—	—	2
Gramineae (grasses)	—	5	16
Unidentifiable	—	—	28

Of the seeds identified only three can claim to be the first 'fossils' discovered from Saxon deposits. These are *Typha angustifolia* L. (bullrush reedmace) and *Arenaria serpyllifolia* L. (thyme-leaved sandwort), from F30, layer 8. as well as *Drosera cf. rotundifolia from* F39, layer 10 anti F30, layer 8. All the other species listed above have been previously identified in deposits of this date either from Hungate. York (Godwin & Bachem 1959). Lloyds Bank, York (Buckland, Greig, & Kenward 1974). or St Neots (Burroughs & Godwin 1969).

Braun-Blanquet school (3rd edition, 1964) worked on the preferences of different species in their choice of habitat, and suggested distinct social groups of plants having characteristic habitats. Unfortunately, this approach has not been applied to the study of modern plant geography in the British Isles. The school of thought prevalent in the British Isles is that of Tansley, who put forward a far more generalized model for plant geography which was more related to observed habitat conditions, particularly soil conditions, than to plant associations. Tansley's thesis (1939) did not include any studies of vegetations associated with humanly adapted environments, unlike Braun-Blanquet's work. Because of this deficiency in Tansley's work, and because his approach considers the habitat before considering the plants associated with it, any deductions about vegetations based on plant remains from former human habitats have to be made with caution until the Braun-Blanquet method has been applied to the modern vegetation of the British Isles. However. there is likely to be some consistency between those groups of plants associated with humanly adapted environments in the British Isles and those plants of similar habitats on the Continent. Two of Braun-Blanquet's synanthropic groups are closely represented in the seeds recovered from the excavations in Southampton. The first group is characterized by the *Atriplex/Chenopodium* species and is typical of dung heaps. The other group is typified by the *Polygonum* and *Papaver* species and is a weed vegetation of crops and is also found on field margins and close to well trodden areas like paths. All these species are characteristic of areas that are highly nitrogenous. The results of the studies made on another group of pits on SARC Site IX, with a similar though greater quantity of preserved organic material (Buckland, Holdsworth, & Monk 1976) would appear to suggest. from habitat data of the insect and parasite remains. that the deposit had accumulated with animals manure. It is possible that the deposits from F30 and F39 could be interpreted in the same way, the plant material being collected from nearby field margins or 'meades' and used as litter or hay for stalled animals. There are references to meadows and to 'meades' in the local late Anglo-Saxon land charter bounds of the estates of North Stoneham, 3½ miles north along the river Itchen, and Nursling, 5 miles NNW from the sites along the lower Test (Grundy 1927). It seems likely that the agricultural importance of such areas was realized and the hay crop was essential for feeding livestock during the winter. On the other hand several of the seeds indentified from these deposits are poisonous if eaten by animals in large enough quantities (HMSO Bulletin 161, 1968). These injurious species include *Polygonum persicaria,* P *Hydro* piper, all the *Hypericum* species (which are of ten found in hay and are still dangerous in this state), *Conium maculatum, Papaver rhoeas,* the *Rumex* species, some the species of the *Brassica* sp. *Sinapis* sp. group, *Arenaria serpyllifolea* (which remains poisonous even after storage in hay), and *Aethusa eynapium*. None of the seeds of these species were found in large quantities except *Papaver rhoeas*. It is unlikely that the stock would have purposely fed off these plants, particularly as several of them have a distinctive and distracting odour. It is possible these seeds represents the residue of a hay crop abandoned because of the infestation of noxious plants, but it is probably more likely that this material was collected use as litter in the animal stalls. None of the plants could be considered unusual to sites and all could have been collected locally from the surrounding vegetation.

Drosera cf. rotundifolia (sundew)
The various species of sundew all grow in peat bogs, usually around pools and among *Sphagnum* moss. Such a habitat would be destroyed by human interference since the concomitant increase in nutrients would permit the growth of a more weedy vegetation which would outcompete the sundew. The latter is able to survive in such a poor habitat as it gains nutrition from insects caught on its sticky leaf surfaces. The sundew does not. therefore. represent part of the local vegetation in Southampton but rather plant material brought into the town, probably from the New Forest which offers the nearest suitable habitat requirement.

The poor nutritional value of the sundew habitat makes it unlikely that it was introduced to Southampton by grazing animals; furthermore, because of the extreme fragility of the sundew seeds they are unlikely to have survived the digestive tract of an animal. A more acceptable explanation is that the sundew was brought into Southampton with *Sphagnum* moss, perhaps as packaging (Seaward & Williams 1976) or even for use as a forerunner of toilet paper.

The absence of *Drosera* in the sub fossil record has been commented on in both British (Godwin 1956) and Continental literature. and although they are small and fragile so arc *Juncus* seeds which survive in plenty; however, sundew does have a rather restricted distribution and a small seed production which may account for its absence. I am indebted for the identification of this species to James Greig of Birmingham University, Department of Botany.

20 Summary
by Philip Holdsworth

One of the greatest problems in attempting even a brief summary of the Melbourne Street sites is the absence of any means of establishing an internal chronological sequence other than by the physical relationships of individual features. The coarse ware pottery seriation devised by Richard Hodges (Pottery report, p 54) may help to overcome this difficulty in the future but as yet it is not sufficiently refined to do this independently. In the meantime comparisons of rclative density of occupation or of land utilization of widely spaced areas at any moment in time is impossible.

At Melbourne Street, the Site XX graves, with their interesting implications, and the Site IV pre-road features, indicate activity in this area of 'Hamwih' from its earliest days. which intensified after the road had been laid down. n. Although the ebb and flow of activity cannot be measured, the presence of Class 5 vessels (Pottery report, p 55) suggests that the abandonment of this area took place no earlier than the general abandonment of 'Hamwih' itself. The main period of occupation at Melbourne Street would seem to have been during the occupation of the houses laid out in alignment with the road. After their destruction or collapse, the pits testify that occupation of some nature certainly continued but there is no evidence for rebuilding within the old tenements. It may have been that later buildings were constructed outside the excavation area which then served as the backyards of such subsequent structures.

The structural evidence from Sites IV, V, VI, and XX largely comprised stake-holes set within continuous shallow trenches. This technique of construction is a common feature of Anglo-Saxon buildings. examples having been found at North Elmham. Norfolk (Wade-Martins 1970), and Portchester. Hampshire (Cunliffe 1976).

Although no complete ground-plans were recovered, the fragmentary evidence from Sites IV, V. and VI provides a reasonably coherent picture of the layout of this part of the Saxon town. The dominant feature undoubtedly became the east-west road with buildings aligned to it on either side. Building 3(Site IV) was within a tenement which contained the dwelling, rubbish pits, latrine pits, and wells. Most of these features contained animal-bone, representing food refuse, large amounts of pottery, fragments of quern stones, and other objects of bronze, iron, and bone. To the north of building 3 were a number of smaller, presumably ancillary, buildings. The layouts of all the excavated structures are largely parallel and complementary, but although this might suggest that they were contemporary, it might have been caused because the continued use of the road ensured uniformity until the complete abandonment of the town.

The surviving artefacts reveal the nature of the Melbourne Street occupation to have been predominantly domestic in characte. The evidence for iron-working throughout the sites was slight-indeed, the indirect evidence for textile production, such as spindle whorls, pin-beaters, and loomweights, was surprisingly small if most houses could be expected to have possessed a loom.

The enlightened approach to the study of the animal remains has provided much additional information about the economy of 'Hamwih'. The low proportions of wild species to domestic animals which formed part of the diet show quite clearly that the population of 'Hamwih' was well supported by the efficient exploitation of the agricultural capacity of the surrounding region; the economic roots of the community were firmly planted in animal husbandry and the land. It has been suggested that cattle were brought on the hoof from some distance to the settlement (Animal bone report. p 108); was this done on an *ad hoc* basis by individual farmers or was there some formal organization of the hinterland? Could the rural economy of pre-'Hamwih' Wessex simply have adapted itself to supply the largest, most densely populated town in 8th century England?

The organization of the bishop of Winchester's Chilcomb estates around Winchester (Biddle 1976, 256-7). the recognition of the probable existence of other such 'multiple estates', for example at Malling, Sussex (Jones 1976). and the renders in kind detailed in the laws of Ine as owing to the royal vill (Sawyer 1976, 5-7), show that the organization which would have been necessary to supply 'Hamwih' with its needs already existed- in southern England. The new town may also have stimulated the development of farms in its immediate vicinity such as those-postulated around contemporary London (Haslam 1975. 225). Nielsen (1976) has suggested that the late Viking fortresses at Fyrkat and Trelleborg were provisioned from large estates--'great farms'-and that Haithabu was probably supplied from a similar source. Corroborative evidence from Haithabu in the form of mass slaughtering of cattle outside the settlement tends to support- this view. Although the 'Hamwih' evidence points by contrast to local slaughter. the possibility that the Itchen port was to some extent supplied with its food and raw materials from formally organized rural centres remains a tenable hypothesis.

That the apparent prosperity of 'Hamwih' is not reflected in the quality of the small finds and decorative objects is often noted-with surprise. The reason for this may be that the town created wealth for the merchants who used it, but that they did not invest in the town as the merchant-burgesses of medieval Southampton were to do (Platt 1973, 39-43). The evidence of artisan activity. and the structural solidity of the buildings, implies that 'Hamwih' was more than just a seasonal trading centre,

but it was not a centre of wealth like the later towns of comparable size. The profits made through trading at 'Hamwih' may have been taken out of the town and not invested in property or local industry. Towns in the immediate post-Roman period cannot be expected to have operated like those of the later Middle Ages, and no hypothesis that can be applied to any other settlement in England can be applied to 'Hamwih' without rigorous analysis. It is for this reason that research continues, so that the results of the excavations can continue to illuminate our knowledge of early medieval society.

21 Sommaire

Ce tome represente le premier rapport complet à propos des fouilles du port post-Romain à Southampton, sur la côte sud de I'Angleterre, qui s'épanouissait durant les huitième et neuvième siècles après J.C. On a decouvert que le port se trouvait au bord d'une rivière et que son ancien nom était Hamwic ou Hamtun, l'appellation diffèrait si l'on considerait son rôle commercial ou administratif. Les fouilles ont mises à jour une route de gravier, les vestiges de bâtiments rectangulaires construits en bois, deux tombes. des fosses, et des puits. La céramique était fabriquée localement, une partie probablement a l'intérieur du chantier, mais un grand nombre de céramiques fut aussi import&es du nord de la France plutôt que de la bouche du Rhin. Des quantités énormes de verre furent aussi importées, mais leurs formes sont différentes de celles trouvées en Scandinavie. Deux pieces de monnaie étrangéres nous fournissent encore la preuve des rapports d'outre-mer, mais il est probable que d'autres matières étaient fabriquées sur place, sauf les objets dans les tombes. Les os d'animaux nous démontrent la force de l'économie locale agricole parce que le port était approvisionné en bétail florissant, des moutons, des cochons, des chèvres. et quelques chevaux, mais les animaux sauvages n'étaient guère mangés. Les mollusques jouaient un rôle important dans l'alimentation. ainsi que les céréales dont la plus importante était le blé.

Southampton était un des grands centres commerciaux du Nord-Ouest de 1'Europe avant I'époque des Vikings, ayant done un rôle similaire á celui de Dorestad, Quentovic, et Haithabu. La recherche apporte des éclaircissements sur son histoire.
(traduit de I'anglais par Stephen Walker)

Zusammenfassung

Dieser Band enthalt den ersten vollständigen Bericht über die Ausgrabungen des nach-römischen Hafens bei Southampton, an der Stidkuste Englands, der im 8. und 9. Jahrhundert A.D. blüte. Der Hafen lag am Flussufer, und der damalige Name war Hamwic oder Hamtun, je nachdam man seine Handels- oder Verwaltungsrolle betrachtete. Bei den Ausgrabungen entdeckte man eine Kiesstrasse, sowie Spuren rechteckiger Holzgebaude, zwei Gräber, Gruben, und Brunnen. Tongefässe waren in der Nähe hergestellt worden, einige wahrscheinlich im Ort selbst, aber grosse Mengen sind such eingeführt worden, und zwar mehr aus Nordfrankreich als von der Mündung des Rheins. Ebenso sind grosse Mengen Glas importiert worden, deren Formen sich von dem in Skandinavien gefundenen Glas unterschieden. Zwei ausländische Münzen waren weiterer Beweis fär Uberseeverbindungen, aber ausser den Grabfunden wurden andere Gegenstände wahrscheinlich örtlich hergestellt. An den Tierknochen erkannte man die Stärke der lokalen Landwirtschaft, denn der Hafen wurde mit gutgewachsenem Vieh, Schafen, Schweinen, Ziegen und einigen Pferden beliefert, aber Wildtier wurde kaum gegessen. Schellfisch spielte in der Diät eine wichtige Rolle, sowie Getreidc, hauptsächlich Weizen.

Southampton war vor der Zeit der Vikinger eines der wichtigsten Handelszentren Nordwest-Europas und hatte eine ahnliche Bedeutung wie Dorestad, Quentovic, und Haithabu. Forschungen tragen weiterhin zur Aufklärung seiner Geschichte bei.
(Ubersetzt von A Elborn)

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Abbreviations used
AS-Anglo-Saxon; M + EM-Migration and Early Medieval