

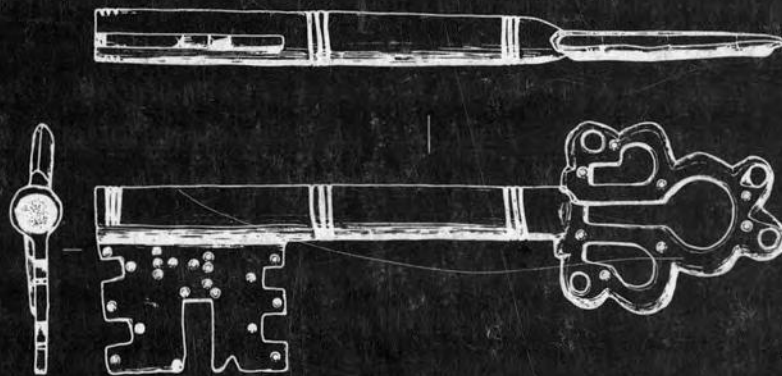
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12. THE HUMAN BONES

by Calvin Wells and Helen Cayton

I. DISCUSSION OF THE HUMAN SKELETAL REMAINS

by Calvin Wells

INTRODUCTION

This report on the human skeletal remains from North Elmham is divided into two parts. In this chapter there is a discussion of the skeletal remains and then in Chapter 13 a description of each inhumation is given, but this is very brief and is chiefly designed to draw attention to anomalies and abnormalities in the material. In order to display the general state and composition of the cemetery, insofar as it has been excavated, a thumbnail indication of what each burial contains has been included but no attempt has been made to compile a detailed catalogue of all surviving bones.

In Part I of this chapter the inhumations are discussed with a view to identifying any pattern which may emerge from them and to make such inferences as appear to be justified by the evidence. Here a caveat is needed. Much, indeed most, of the remains are in very poor condition. Archaeologists are no doubt familiar enough with the grizzling of anthropologists who, all too often, have good reasons to lament the ravages which have been wrought upon potentially interesting skeletons by centuries, by soils and by the denizens of both. These ravages may be catastrophic and destroy virtually the entire burial and all the evidence it could have yielded. The situation at North Elmham is less disastrous but bad enough: no skeleton is complete and few are nearly so. This means that many conclusions which might have been firmly drawn can now be only tentatively ventured.

The evidence can be treated, broadly speaking, in two ways: either the most rigid restraint may be imposed on any speculations based upon it or the imagination may be given freer rein to pursue more airy but less certain conjectures. The first approach reduces the likelihood of proffering absurd theories but at the expense of being imaginatively sterile. The second risks losing likelihood in fantasy but may kindle sparks of rewarding insight. This report does not hesitate to follow the second course. As a result, various suggestions will be found in it which have, so far, only slender evidence to support them. I hope that many of the inferences drawn here are valid but even if every one is wrong it would not matter provided it is always remembered that these are inferences, not logical deductions - still less observed facts. They are put forward in the hope that they will stimulate better ideas and encourage further research. They will do harm only if treated as axiomatic.

It should be noted here that, because the descriptions of the inhumations in Chapter 13 do not contain a complete inventory of all bones, it may occasionally happen that fragments have been referred to (or taken account of) in this Chapter which are not specifically mentioned or described in the next. In other words, the descriptions of the burials may not always be the sole source of information for details given in this section. It is important to note this lest it should appear that there are discrepancies between the two parts.

ACKNOWLEDGEMENTS

The author's thanks go to Dr. Peter Wade-Martins for having invited me to examine these bones and for having been ever ready to discuss problems arising from them; to Miss Barbara Green for helpful comments and information; to Dr. G.D. Hart for having compassed the unenviable task of trying to establish the blood groups of these people; to Dr. Brian Maxwell for his radiographs of the pathological specimens and the Harris's lines, and for having advised me on the diagnosis of dubious specimens; and to Mr. Hallam Ashley and Dr. Peter Wade-Martins for their excellent photographs of these uncomely bones.

I owe an especial debt of gratitude to Miss Helen Cayton. Whenever I wondered if a skeletal hint might be blessed with textual support I turned to her for guidance, wot-cunning and starcraft. She never failed to lighten my darkness, bearing my importunity with unruffled good humour. Without her help I would not have guessed that Percival Pott's ideas about how to set a fracture were already a thousand years old; still less would I have dared to import a negress from the Niger. There is much more of Helen Cayton in these pages than this meagre 'credit' would suggest.

NUMBER OF BURIALS

Unlike many sites, where mass burials have taken place or chaotic and widespread disturbance of the inhumations has occurred, the number of skeletons excavated at North Elmham presents no great problem.

Although post-inhumation soil erosion and other factors have left many of the skeletons incomplete, it is clear that, in general, what the excavator describes as a 'Burial' is, indeed, the remains of one individual and no more.

In a considerable number of these 'Burials' some duplication of bones is present so that it is obvious that part of a second, or even third skeleton is mixed with the main inhumation. But this very seldom amounts to more than one or two duplicate bones or fragments thereof and these may easily be explained as the result of slight soil disturbance, the activities of burrowing animals or the closeness of adjacent inhumations. These odd, extra bones are assumed to have come from some nearby burial and are not counted as separate individuals, as if they were complete skeletons.

Occasionally, the duplication of bones is much more extensive and may include representative fragments from most parts of two bodies. When this has occurred, clear duplication of individuals is obvious and the burial is assessed as representing two persons. Ten inhumations are of this type.

The excavators have produced burials numbered from 1 to 197, minus eleven gaps in the series, i.e. 186 graves. When the ten double inhumations are added, 196 skeletons can be firmly identified. There are ten others which, for various reasons, are not located on the site plan ¹. They are all extremely scrappy and none contains more than a handful of bones, yet they were not recognizably part of any other burials. As they have some slight interest in terms of the osteology of the group, they are included here and are distinguished by letters. This brings the number of 'skeletons' to a total of 206 and it is these which form the basis of this report.

SEX

Usually the sex of Anglo-Saxon skeletons can be determined without great difficulty. This is another way of saying that sexual dimorphism in Anglo-Saxons was well marked and, therefore, that the metric and non-metric overlap between males and females was relatively low. To take advantage of such sexual dimorphism, however, it is necessary to have good preservation of the key anatomical pieces. These are, of course, the

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pelvis, the skull, the clavicles, etc. Unfortunately, some of the remains from North Elmham were either lacking these diagnostically important features or, if present, they were in such poor condition as to be ambiguous or valueless. In spite of this uncertainty, a diagnosis of the sex appeared to be justified in the great majority of adult inhumations. It is felt that with few exceptions, determination of sex under the age of twelve years is always uncertain and even under the age of eighteen it is often unreliable unless the skeletons are in perfect condition.

Of the 167 identifiable adults here, nine (5.4%) were unsexable. Eight (4.8%) were assessed as 'probables', of which six were '?female' and two were '?male'. The remaining 150 individuals were given a firm sexing, eighty (53.3%) being male, seventy (46.7%) female. (If the 'probables' are assumed to be correct there are 158 burials of which 51.9% are male, 48.1% female).

The more reliable figures of eighty males and seventy females give an incidence for the sexes which is not unusual. It implies a sex ratio which can be accepted as within normal biological limits for a small community, given the uncertainty which must always be inherent in sexing ancient and defective material. It is at least clear from these figures that, unlike some groups, no significant proportion of the men was dying and being buried away from their home area. Excess of male over female skeletons is sometimes explained as due to the greater resistance to post-inhumation erosion which is shown by the sturdier male bones, as contrasted with the lighter female ones. This has, perhaps, some limited validity and in this connection it is worth remembering that the North Elmham soil is very destructive to bone, a quality which it shares with most parts of East Anglia. But it is doubtful whether the sex ratio as found here can be wholly accounted for by differential disintegration. There were a number of juvenile deaths occurring throughout childhood, especially in the two to eight year period. There is also some evidence that girls were fed less well than boys and it is possible that these two findings are related. The greater number of men in the community may be because of a higher death rate among girls in the first half of childhood.

The distribution of the sexes is close to random scatter throughout most of the cemetery and does not indicate any sexual apartheid such as N.-Gejvall found at Westerhus. Several pairs of adjacent or overlapping graves occurred in which a male and a female were found. This might hint at the possibility of married couples being buried together but, with approximately equal numbers of the sexes, groupings of this kind would often occur by chance. Their frequency at North Elmham is not high enough to be unequivocally significant.

One interesting feature is that towards the southern end of the cemetery (Fig. 192) there is a concentration of males which occurs nowhere else in the burial ground. Of the twenty four sexable skeletons here, twenty two are males. This might imply that, at least in this part of the complex, there was an enclave reserved for monastic and priestly use or perhaps for men who were heads of distinguished families.

AGE

As with the diagnosis of sex, the determination of the biological age at death from a skeleton depends upon the availability, in good condition, of certain key osseous elements.

Throughout childhood and adolescence, a narrowly accurate assessment is easy to obtain provided the teeth are present and the extent of epiphyseal union is observable. After the epiphyses have fused it is much more difficult to estimate age and the results become progressively more inaccurate as age advances. The best known traditional method is that which depends on the extent of fusion in the cranial sutures and, in the past, determinations within very narrow limits were often made using this criterion. Today, this method is much discredited. It is now known that extensive, or complete,

sutural fusion may occur in quite young adults and also that negligible synostosis, or none at all, may be found in the skulls of senile persons.

At present the most reliable feature for estimating the age of adults appears to be the symphyseal surface of the pubis (Todd 1920). Unfortunately, this is a structure which is often unavailable owing to damage or decay.

The wearing away of the enamel and dentine of human teeth is now accepted as a biological phenomenon, its degree being correlated to a marked extent with increasing age. Hence, the amount of dental attrition may be used as a rough estimate of a person's age at death. By comparing the degree of attrition on each of the molar teeth (that is, by establishing an attrition gradient) A.E.W. Miles (1962) has greatly refined this technique. A disadvantage of dental wear as an indicator of age is that it varies in different populations depending on diet, the use of teeth as tools and other factors. The molar gradient method needs to be used against an established pattern for each population which is being considered.

Many other indicators of age are available, but each is imprecise and even when all are available in one skeleton, no great accuracy is obtainable. These indicators include: the appearance of the scapula, the radiographic state of the proximal end of the humerus, sternal and rib changes, modifications of the cranial vault, various pathological or involutional changes, e.g. in the vertebrae, and alterations in the microstructure of bone. In estimating the age of these North Elmham individuals the greatest weight has been given to the state of the pubic symphysis. Whenever an estimated range narrower than seven or eight years is recorded for an adult older than twenty five years, it will usually be based on this feature. In the absence of the pubis the estimate will be a broader one, increasingly so if dental evidence is also absent and especially with advancing years. Sometimes almost nothing is available except cranial sutures. When this is the case they may still be used provided their limitations are understood. As noted above, for any individual skeleton they are likely to be unreliable. However, it remains true that there is a well marked general tendency for increasing sutural fusion to proceed with increasing age. An assessment based on this feature in a group of 100 skeletons gives, therefore, more approximately correct estimates than wildly wrong ones ... and this by a substantial margin.

Estimates of age have been made for 206 individuals at North Elmham. Of these, thirty nine (18.9%) were found to be children or adolescents under the age of eighteen years. This is not an exceptional figure and it strongly suggests that we are dealing with a normal biological population which has not been artificially selected in any way. This proportion of children, almost a fifth of all burials, contrasts markedly, for example, with a group of seventh-ninth century inhumations from Martyrs' Bay, Iona (Wells in press). At that site, from about 110 burials, only one adolescent bone was recorded: all the rest were fully adult. This together with the fact that females greatly outnumbered males, left no doubt that it was a population which had been artificially selected in some way and bore no resemblance to a normally balanced biological group.

At North Elmham, of the 167 adults, forty one (24.5%) were so defective that their ages could be assessed only as 'Adult'. Of the remaining 126, two could be estimated only as '25+'. This left two '?males' and sixty two males, one '?female' and fifty nine females to whom narrower but various age ranges were ascribed. It is on the basis of these 121 firmly sexed skeletons that the mean age at death has been estimated for the group. Where an age range has been given to an individual (i.e. virtually every burial) the mean of the two extremes has been taken as the age at death for calculating the group average. For example, Inh. 86 was estimated to have died between forty and sixty years but, for calculating the average for the group, the mean of these ages (fifty years) has been allotted to him. In the case of Inh. 69, recorded as dying in the twenty four to twenty seven year range, $25\frac{1}{2}$ has been used. Inevitably this method has defects. It

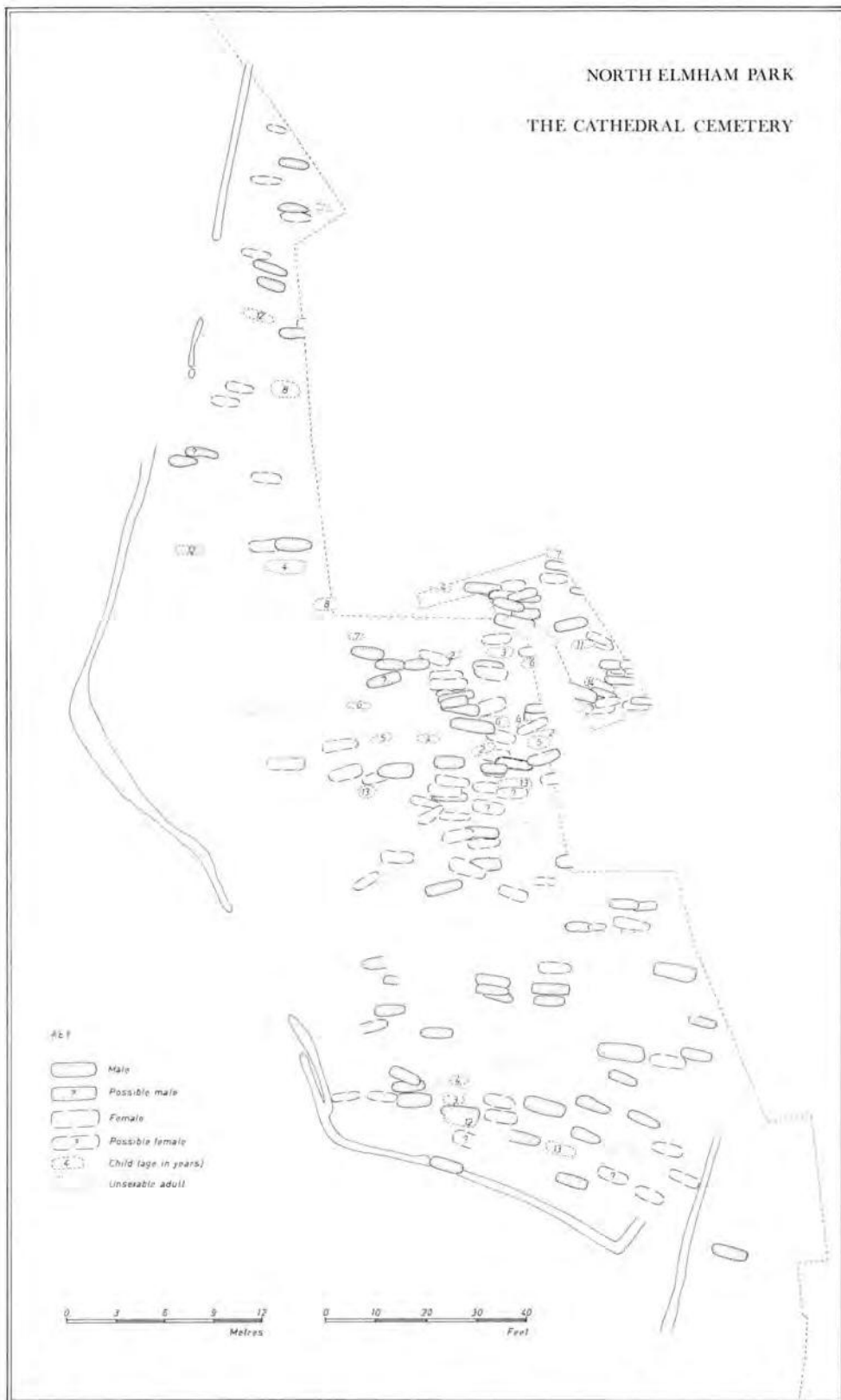


Fig. 192. A plan of the excavated area of the North Elmham cathedral cemetery showing the distribution of adult males and females and children. Scale 1:400.

almost certainly raises the group average by a substantial, though unknowable, amount. This is because when, for a defective skeleton, it seems probable that death occurred at about the age of twenty eight, the upper range limit may have to be extended to forty or more in order to ensure that the cover is adequate, whereas it is likely that there will be no need to extend it downwards to less than twenty five years, because epiphyseal evidence may leave no doubt that the person was at least that age.

When the material is treated in this way the sixty two males are found to have a total life span of 2370 years, giving 38.2 as the mean age at death for the men. The fifty nine women total 2113 years, which gives a mean age of 35.8 years or 2.4 years younger than the men. (The mean age for men and women combined is 37.0). It must be emphasized that these figures do not give the mean age at death of this population: they express the age at death of only those members of the community who had already survived to the age of eighteen years.

Two features attract immediate attention here. Firstly, the women die younger than the men, as is normally found in all early populations, but the difference here of 2.4 years is smaller than is often found. In other Anglo-Saxon groups a difference of four to five years is more common. At Red Castle, Thetford, from a burial ground of about 85 persons the mean age at death was: men 38.1, women 30.4 - a difference of 7.7 years (Wells 1967a). This disparity between the sexes is traditionally explained as the result of the women being subject to obstetric hazards. There is compelling evidence, however, that this is at best an incomplete explanation. As suggested elsewhere, differences in nutrition and vital reserves may be more important. If the childbirth explanation is considered it will be realised that three principal classes of obstetric abnormality are likely to lead to maternal deaths:

1. Difficult labour due to pelvic contraction or deformities;
2. Puerperal infection due to unskilled interference during or after the labour;
3. Haemorrhage (caused by a variety of conditions, none of which would be recognizable in skeletal material).

It can be said that no pelvic malformation likely to have an adverse effect on parturition was definitely identifiable here although lesions were found in adults which might have been the product of their own difficult birth, e.g. Inh. 2 (♀) (Plate LXXIV). Fragments of a few pelvises, such as the very small woman Inh. 5, might betray the obstetric abnormality known as a 'generally contracted pelvis' and a few women had some pelvic features of the android type, which would be liable to lengthen their labours, but these are indefinite and never severe. Nor was there any evidence of puerperal infection although it must be admitted that this would only rarely be recognizable in bones. (It was tentatively diagnosed at Red Castle).

The second fact to be noticed is the relatively high mean age at death for the combined adults at North Elmham: 37.0 years. At Red Castle the mean age of the combined sexes was 33.9; at the Late Saxon site of St. Catherine, Thorpe, it was 34.1; and for the Middle Saxons of Caister-on-Sea it was 34.7. (These examples are selected because they were all done by the present author, using identical criteria of assessment).

The mean age of all children's deaths is 6.6 years which is significantly higher than at Red Castle, where it was only 2.6 years. If these figures can be accepted they indicate a better level of health among the North Elmham children, an indication which is supported by evidence from the number of Harris's lines in the two groups. However, the survival of infant burials depends so delicately on soil conditions that there is always uncertainty as to how completely these inhumations have been recovered. At Red Castle, 28.2% of the burials were under eighteen years of age, as compared with only 18.9% at North Elmham. It is possible that more juvenile burials were destroyed by adverse soil conditions here but there is no evidence that this is so and the presence of well preserved bones of a newborn infant (Inh. 120) proves that the most slender osseous material

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could survive. Table 17 shows the distribution of children's burials by age at the two sites.

TABLE 17. AGES OF JUVENILE DEATHS

Age	North Elmham		Red Castle	
	Number	%	Number	%
0 - 2	3	7.7	14	58.3
2 - 4	10	25.6	4	16.7
4 - 6	6	15.4	3	12.5
6 - 8	7	17.9	2	8.3
8 - 10	1	2.6	0	0.0
10 - 12	1	2.6	1	4.2
12 - 14	6	15.4	0	0.0
14 - 16	1	2.6	0	0.0
16 - 18	3	7.7	0	0.0
?	1	2.6	0	0.0

It shows remarkable differences between the two cemeteries. At Red Castle nearly three fifths of the juvenile deaths occur in the first two years of life as compared with only about a twelfth at North Elmham. And in contrast to these 58.3% deaths in the first two years at Red Castle, 58.9% of the North Elmham deaths fall in the two to eight year range. Before the advent of pasteurization and sterile tinned milk, a high proportion of infant deaths was due to the inability of mothers to feed their children. If lactation failed, the babies had to be given goat's or cow's milk as an alternative. This was invariably contaminated with a multiplicity of micro-organisms and led to a high infantile death rate from dysentery, gastroenteritis, tuberculosis and other diseases. In view of the relatively low death rate in the North Elmham infants we may wonder, therefore, whether their mothers were better breast feeders than the Red Castle women. It is not difficult to envisage various factors which might bring this about. Alternatively, it is possible that North Elmham cows and byres were cleaner than Thetford ones, but it is hard to imagine that dairying techniques could be sufficiently different between the two villages to account for the gulf in infant mortality. After the age of two years, perhaps long before, it is likely that the children were more or less completely weaned.

The peak of mortality reached in the two to four year period slowly subsides over the next eight years. A second, well marked peak occurs in early adolescence. This leaves the eight to twelve year period as the healthiest in the lives of these children. Of the total juvenile deaths, one quarter occur in adolescence. This, too, is very different from Red Castle where a most remarkable feature of the site was the complete absence of adolescent skeletons. It is true that, with only about 85 burials there and no more than 206 at North Elmham, we have only small numbers to work on but they are by no means negligible and it is difficult to believe that these sharp differences between the two populations are without meaning in terms of their social or cultural behaviour.

Table 18 shows the distribution of adult deaths by sex and decade.

This shows that male deaths proceed steadily over the first two decades of adult life and only after this does a clear deterioration set in, so that more than half their deaths are delayed until the thirty eight to forty seven year period. For the women, the first decade of adult life is rather better than for the men, perhaps because they led a more sheltered, less vigorous existence, but soon after their mid-twenties this lull is followed by a rapid decline in health and a rise in mortality so that nearly three quarters of their deaths occur in the next two decades, with more than 40% in the first half of it. Rather than search for any specific diseases to account for this it may be more accurate to see it as the cumulative effect of slight under-nourishment as compared with the men.

TABLE 18. AGE DISTRIBUTION OF ADULT DEATHS

Age	♂		♀	
	Number	%	Number	%
18 - 27	13	20.9	9	15.2
28 - 37	12	19.3	23	38.9
38 - 47	32	51.6	21	35.6
48 -	5	8.0	6	10.2

In a male-dominated society, such as the Anglo-Saxons were, the boys may have been more valued than the girls. Especially in times of famine the boys and men, as suggested elsewhere in this report, may have taken the pick of the food and a few decades of this could have led to some degree of malnutrition among the women, one manifestation of which may have been the sudden deterioration of their health which we find here.

STATURE

Enough limb bones have survived in measurable condition to give an estimate of the range of individual statures and the average for the group. For this estimation, the reconstruction formulae of Trotter and Gleser (1958 for men; 1952 for women) have been used. It is important to realize the limitations of these formulae. They were constructed on the basis of modern white Americans of known stature and there is no way of knowing how suitable they are for use on British Late Saxons, whose living heights are unobtainable. It is certain that they must be inaccurate to some extent, but how closely they approximate to the correct figure cannot be guessed. They may, on average, give a result only a few millimetres from what was the person's true height but, for all we know, they may be wrong by 40 or 50 mm. With luck, the error may be no more than 25 mm and if this is so we should be thankful that it is no worse.

In calculating the North Elmham statures according to these formulae the result has been expressed just as the mathematics produced it, to a tenth of a millimetre, but it would be starry-eyed fantasy to suppose that they really represent an accuracy of this degree.

A total of 84 adult reconstructions was obtained: 45 male, 39 female. Table 19 shows the means and range for the two groups.

TABLE 19. STATURE: MEANS AND RANGE

Sex	No.	Mean	Range
♂	45	1721.3 (5' 7 $\frac{3}{4}$ ")	1623.1 - 1807.4 (5' 3 $\frac{3}{4}$ " - 5' 11 $\frac{1}{4}$ ")
♀	39	1574.5 (5' 2")	1424.1 - 1697.5 (4' 8" - 5' 6 $\frac{3}{4}$ ")

There is little that need be said about these figures, which do not greatly differ from those of other Anglo-Saxon communities in East Anglia. The difference between the male and female means, 146.8 mm (5 $\frac{3}{4}$ in), is rather greater than is usual today and may be another expression of the relative malnutrition of these women which is suggested elsewhere in this report, but similar differences occur in other early populations. In the Romano-British group from Trentholme Drive, York, the male mean stature exceeded that of the females by six inches (Warwick 1968). But, there, it was likely that many of the men were racially different from the women. Here, as suggested below, a few of the women may have been from an alien population but the evidence for this is thin. The range covered by the men, 184.3 mm (7 $\frac{1}{2}$ in) is unremarkable. The rather greater range of the women, 273.4 mm (10 $\frac{3}{4}$ in) is less usual but by no means exceptional. It is only slightly in excess of what was found in the women of the Trentholme Drive, York, cemetery.

MERIC AND CNEMIC INDICES

These features may be considered together although it is uncertain what functional relationship they have to each other, if any. They express, respectively, the degree of antero-posterior flattening of the proximal end of the femoral shaft and of side-to-side flattening of the tibial shaft. In measuring the antero-posterior diameter of the femur, the least value on the shaft just distal to the lesser trochanter is recorded, taking care to avoid including the upward extensions of the linea aspera. The transverse diameter is taken at the same level on the bone. The Cnemic Index is measured at the level of the nutrient foramen.

When the Meric Index is less than 75.0 it is described as hyperplatymetric; from 75.0 - 84.9 as platymetric; from 85.0 - 99.9 as eumeric. The Cnemic Index is classified as: x - 54.9 hyperplatycnemic; 55.0 - 62.9 platycnemic; 63.0 - 69.9 mesocnemic; and 70.0 - x eurycnemic.

Much has been conjectured about the significance of platymeria and platycnemia. Because both conditions tend, in general, to be more common in prehistoric populations (and modern primitive peoples) than in peoples of the advanced civilisations, it has been supposed that they are a response to the habit of squatting. This is difficult to sustain. In many populations and individuals, as at North Elmham, the two conditions appear independently of each other. Often, in known squatters, neither is present. Sometimes one or both may be present in non-squatters. Other theories propose that platymeria is a mechanical response to stresses on the femoral shaft; that it is a physiological device to economize in the use of minerals for bone formation; or that it is a reaction to various pathological conditions. The relevance of these theories to the North Elmham material is ambiguous. Platycnemia is sometimes said to be especially associated with retroversion of the tibial head. In some populations both conditions are found more often and more developed in the left limb than the right. The cause and significance of platymeria and platycnemia are probably complicated. No clear help in the elucidation of this problem is given by the material from this site and nothing more will be done than to record the following data:

TABLE 20. MERIC INDEX: MEANS AND RANGE

Sex	Means			Range
	L.	R.	L. + R.	
♂	75.2(41)	71.4(45)	74.8(86)	57.1 - 91.4
♀	72.5(36)	71.7(36)	72.1(72)	56.3 - 83.7

TABLE 21. MERIC INDEX: DISTRIBUTION

Sex	Hyperplatymetric		Platymetric		Eumeric		Total
	No.	%	No.	%	No.	%	
♂	45	52.3	38	44.2	3	3.5	86
♀	48	66.7	24	33.3	-	-	72

TABLE 22. CNEMIC INDEX: MEANS AND RANGE

Sex	Means			Range
	L.	R.	L. + R.	
♂	69.5(37)	68.9(36)	69.2(73)	55.1 - 81.8
♀	70.7(28)	71.1(26)	70.9(54)	56.7 - 94.1

TABLE 23. CNEMIC INDEX: DISTRIBUTION

Sex	Platycnemic		Mesocnemic		Eurycnemic		Total
	No.	%	No.	%	No.	%	
♂	5	6.8	35	47.9	33	45.2	73
♀	4	7.4	23	42.6	27	50.0	54

SQUATTING FACETS

At the distal articular surface of the tibiae a small extension of the joint surface, in an anterior and upward direction, is occasionally found. This feature most commonly occurs in persons and races who spend much of their time crouching hams to heels and it is, therefore, known as a 'squatting facet'. At North Elmham the relative part of the bone survives in 159 tibiae and of these 100 (62.8%) have these facets.

Some anthropologists have expressed doubts as to the cause of squatting facets and suggest that they are not due to adopting a crouched position because they occur on the foetus in utero. But the presence of this condition in the embryo is, itself, due precisely to the attitude of the developing child. Its antenatal position is one of squatting and the feature is then retained or lost depending on whether squatting continues after birth or is exchanged for chair sitting. How much squatting, and for what purposes, is necessary to produce or retain these facets is at present unknown. In modern bones from western Europe they are rare, but do occur sporadically. In primitive or earlier populations they may be found with frequencies up to 100%, as among the seventh-ninth century group from Iona, where every tibia had a large, clearly defined facet (Wells, in press).

The present series is interesting for the marked difference in the incidence of squatting facets between the sexes. In eighty four male tibiae thirty four (40.5%) have them. In seventy five female tibiae 66 (88.0%) have them. The difference is significant and must raise the question as to its cause. That only two fifths of the men have these facets suggests either that chairs or benches were fairly freely available and that sitting, as opposed to squatting, was the normal position of rest for the majority or, alternatively, that the men did not much practice occupations which demanded the squatting posture. That these facets are absent in only 12% of the women might suggest that the use of stools, etc. was a masculine prerogative. Perhaps seats were in too short supply to be regularly available to women or it may have been considered presumptuous for women to aspire to such comfort. But a simple stool or chair needs negligible skill to make, where timber is abundant, so this explanation seems implausible. Perhaps women carried out much of their day's work in a squatting position: crouched by the cooking pot, kneeling to scrape skins or genuflected beside their babies' cribs. As further perspective to these figures it is interesting to compare findings from here with those of the Romano-British burials from Trentholme Drive, York. At that site only five women were indentified as having squatting facets and none was found in the men. Unfortunately, it is not stated how many tibiae were available for inspection of this feature, but other evidence in the report suggests that this bone was preserved in about 200 persons.

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Squatting facets may be conveniently grouped according to their size by measuring the maximum vertical extent of the facet from the inferior margin where it turns back to ascend again as the normal articular surface of the ankle joint. Three degrees are adopted here: 1 - the height of the facet is $x - 1.9$ mm; 2 - it is from 2-4.9 mm high; 3 - it is 5.0- x . Tables 24 and 25 show the occurrence of these degrees in males and females.

TABLE 24. SIZE OF MALE SQUATTING FACETS

Degree	1	2	3
Number	16	11	7
%	47.1	32.3	20.6

TABLE 25. SIZE OF FEMALE SQUATTING FACETS

Degree	1	2	3
Number	9	32	25
%	13.6	48.5	37.9

It will be seen that, in addition to being more common in women, these facets tend to be larger in females than in males, though not as obtrusively as at some other sites such as Monkwearmouth (Wells, in press) and Caerwent (Wells, in press).

PHYSICAL TYPE

It will be seen from the notes on individual inhumations in Part Two that these burials are mostly in poor condition. The material is often fragmentary and deficient, whilst what survives is frequently much eroded by the assault of soil and its contents. Of 206 burials only twenty seven are well enough preserved to be measurable with any reliability and many of these are incomplete. In view of this it would be quite valueless to attempt an elaborate statistical analysis, since the group is far too meagre to support it. Indeed, a cynic is tempted to wonder if the vast potential and sophisticated mathematics of modern computer analysis is not sometimes strangely misapplied to data, such as these, which are themselves inadequate or unreliable. Be that as it may, a further justification for omitting any analysis is that there seems to be little which is exceptional about these people: they fit quite well into the general pattern of other Anglo-Saxon groups in this country. The matter would be different if we were dealing with a relatively unknown enclave of palaeolithics.

Tables 26 to 30 briefly summarize the distribution of a few cranial and facial indices for males and females combined.

TABLE 26. 100B/L (CRANIAL INDEX)

Class	Range	No.	%
Dolichocranial	$x - 74.9$	19	57.6
Mesocranial	75 - 79.9	14	42.4
Brachycranial	80 - x	-	-

TABLE 27. 100H/L (HEIGHT-LENGTH INDEX)

Class	Range	No.	%
Chamaecranial	x - 69.9	13	72.2
Orthocranial	70 - 74.9	5	27.8
Hypsicranial	75 - x	-	-

TABLE 28. 100H/B (HEIGHT-BREADTH INDEX)

Class	Range	No.	%
Tapeinocranial	x - 91.9	8	44.4
Metriocranial	92 - 97.9	7	38.9
Akrocranial	98 - x	3	16.7

TABLE 29. 100NB/NH (NASAL INDEX)

Class	Range	No.	%
Leptorrhine	x - 46.9	11	57.9
Mesorrhine	47 - 50.9	5	26.3
Chamaerrhine	51 - x	3	15.8

TABLE 30. 1000₂/0₁ (ORBITAL INDEX)

Class	Range	No.	%
Chamaeconch	x - 75.9	4	20.0
Mesoconch	76 - 84.9	12	60.0
Hypsiconch	85 - x	4	20.0

It will be seen that the North Elmham people were a long- to medium-headed group, with a lowish head height, long narrow noses, and with eye-sockets of medium proportions (Plates LXXVI; LXXVIII). The substantial Middle Saxon burial grounds from Burgh Castle, Suffolk and Caister-on-Sea, Norfolk, though not yet fully analysed, are of a closely similar physical type. The North Elmham people are also of the same general type as the Anglo-Saxons from the well known cemeteries of Bidford-on-Avon, Warwickshire and of Burwell, Cambridgeshire, although they are distinguished from them by slightly longer and lower heads, narrower noses and greater variability.

An outstanding characteristic of the British Iron Age skull was its lowness relative to its length. The feature continued into the later sub-Roman peoples and the fact that nearly three quarters of the North Elmham group are low headed in this way (chamaecranial) probably betrays their relationship to - and partial descent from - the old indigene population. In this respect there is no great difference between the men and women of North Elmham and there seems little reason to suppose there would be. But at the Late Saxon and early Medieval site of Thetford St. Mary (about two kilometres from Red Castle) an unusual difference was found between the male and female skulls. The males were fairly close to those of North Elmham and fitted into the normal Anglo-Saxon pattern, whereas the women's skulls were distinguished by having a greater breadth relative to length and height. The difference was sufficient to suggest that, to some extent, these men may have been getting their wives from a group which was foreign to

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the area. If so, the brachycranial Red Castle people may have been an ultimate source and at least partly ancestral to the Thetford St. Mary women. Unfortunately, post-excavation loss, damage and confusion amongst the St. Mary's skeletons make their status impossible to determine with full confidence. But we are given a strong hint that some interesting interrelationships existed between these various East Anglian populations. Tables 31 to 36 give a few standard measurements and indices of the best preserved skulls and long bones, together with their means.

The limb bones of these people are not especially thick or robust in relationship to their length: they impress by linearity rather than massiveness. But markings for tendon and muscle attachments are usually strongly developed and we may picture the group as being mostly lean and muscular, probably with little surplus fat, and with a lithe, upright bearing until the onset of arthritis stiffened and bowed them. Their wrists and ankles were compact and slender; their hands strong, with a powerful grip.

It is worth noting that they were of a very different physical type from their contemporaries a few kilometres away at Red Castle, Thetford (Wells 1967a).

A special problem is set by Inh.5 (Plates LXXVII; LXXIX). This is the skull whose characters leave little doubt that it comes from a negress or a woman with predominantly negro genes on her chromosomes. This unexpected find demands an explanation of how such an exotic person could have reached such a homespun community and the problem is not one of easy resolution.

It will be recalled that in the Romano-British cemetery of Trentholme Drive, York (Warwick 1968), at least one skull and several skeletons were found to have negroid affinities. Although this, too, was unexpected it was less difficult to explain. York was a garrison town and the men in that cemetery were of mixed racial origin and apparently ex-soldiers of the Roman legions. Native British, Gauls and Armenoids were distinguishable there and it needed no great leap of the imagination to accept the presence of a few negroes, or at least negroids, with negro genes not greatly diluted. In tenth-century rural Norfolk, far from the burning sands of Fez, no such ready acceptance of a dusky Venus seems possible. Probably at no time in the past two millennia had England been so isolated from the ebb and flow of Europe and beyond. However, Miss Helen Cayton has pointed out that a flourishing trade in black slaves existed during the ninth to eleventh centuries and its ultimate eddies may well have washed this lady on to East Anglian shores. There was, at this time, a prosperous Kingdom of Ghana between the Senegal and Niger rivers and its capital, Kumbi, was the largest market in the Sudan, where merchants from all over the Maghrib used to gather. Ghana's wealth was derived from gold and slaves. Merchants from the Maghrib al-Aqsa and Wargla, the capital of Mzab, made the long and perilous journey across the Sahara to buy negro slaves, for whom there was an eager demand in the north. Kumbi was renowned for its slave market, which was kept supplied by raids on the more primitive bush tribes to the south. The trading route went from Ghana to Sijilmasa, north to the coast and thence to Spain; or eastwards through Kairwan to the Moslem orient and eventually to Constantinople and the Caliphs, where demand was brisk. Despite political animosities, trading contacts between western Europe and the Moslem world were extensive, at least from the Carolingian period, when coloured fabrics and embroidered silks were imported into the empire. The Saxons were involved in this trade and as early as the eighth century an English merchant named Botto was settled at Marseilles. The slaves imported into Spain were not all from North Africa; many came from Europe, especially the Slav areas, and a well-worn slaver's route ran through France to Marseilles, Italy, North Africa and Spain. Between 912-961 the number of Sakaliba (Slavonic) slaves rose from 3,750 to 13,750 in Cordoba alone. The merchants of Verdun were prominent in this trade and there is no doubt that a two-way traffic developed: white slaves being sold to the corsair chiefs of Barbary, whilst blacks were ravished north to the dark forests of Rhaetia. As Miss Cayton remarks, "There seems to be enough evidence of contact with negro slave-owning communities to explain

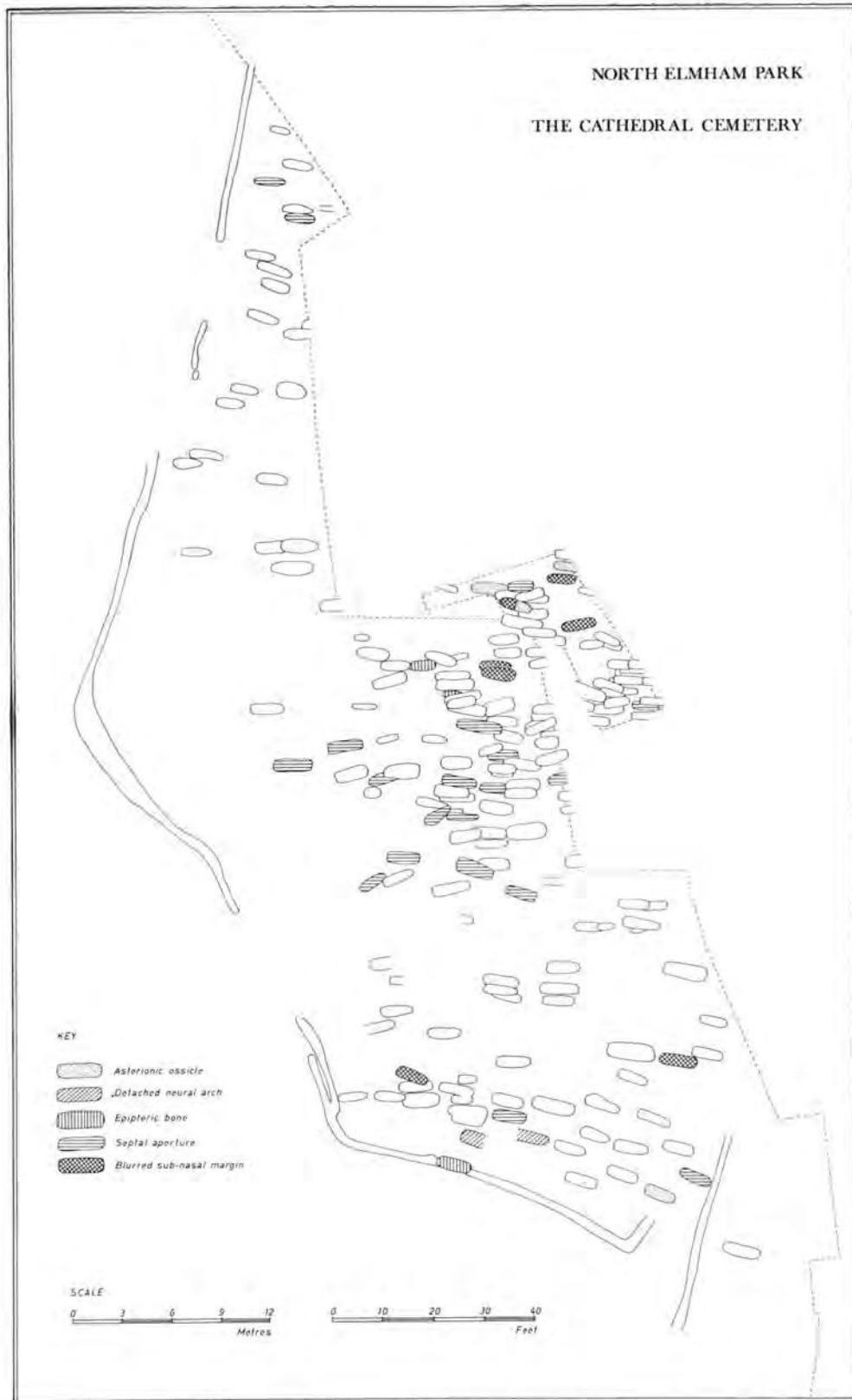


Fig.193. A plan of the cemetery showing the distribution of particular characteristics as shown in the key. Scale 1:400.

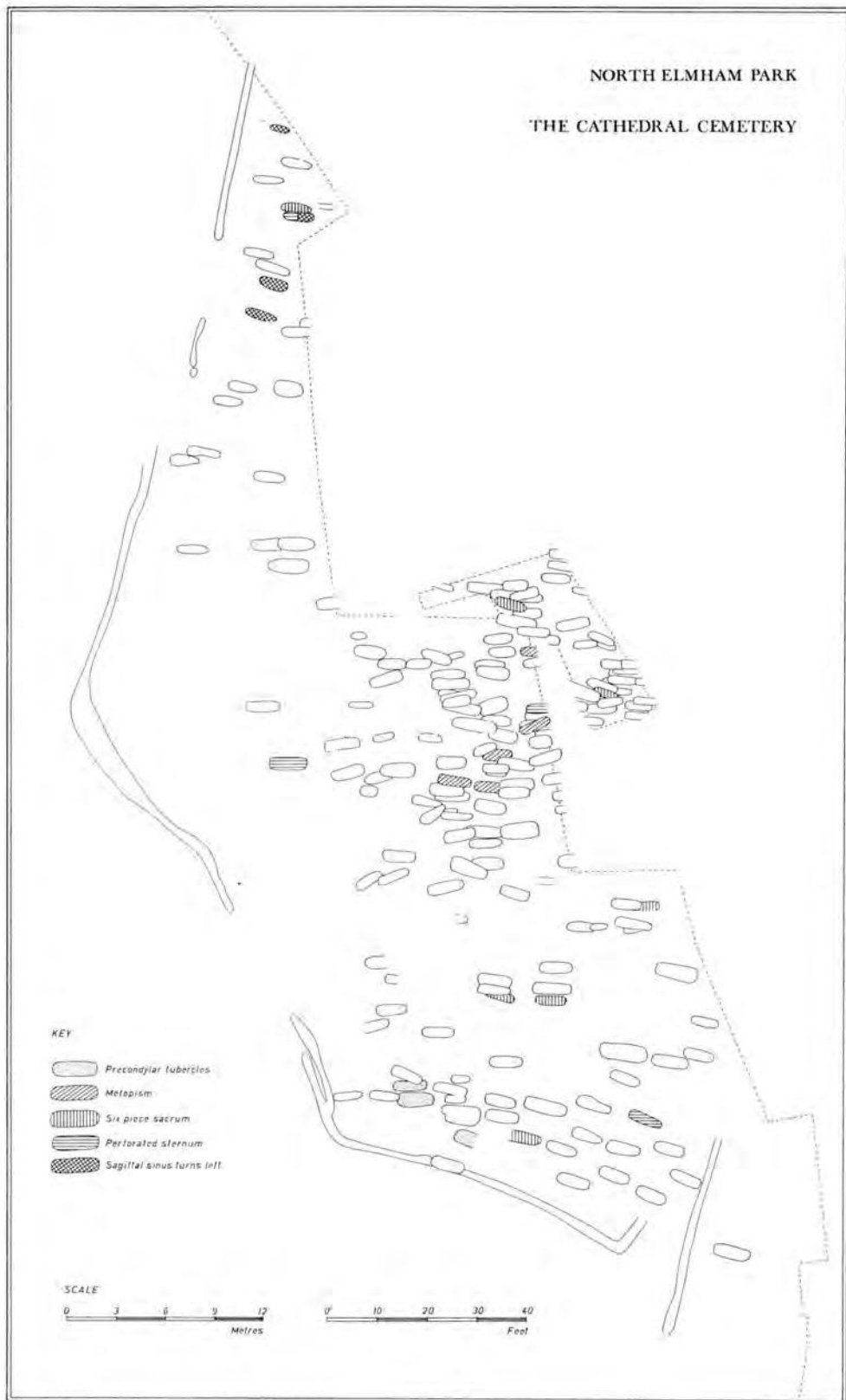


Fig. 194. A plan of the cemetery showing the distribution of particular characteristics as shown in the key. Scale 1:400.

how an English merchant could have acquired a negro slave, and as well as direct contact one could, of course, be obtained via several intermediaries. As well as Spain, Italy is a possible source. In the eleventh century the Italian trading cities were already actively trading in North African ports, and English trade with Italy seems also to have been extensive, since an Italian trading document, apparently negotiated when Cnut was in Rome for the coronation of the Holy Roman Emperor, Conrad II, in 1027, makes special arrangements about the customs duties paid by English traders coming to Pavia. Pavia itself was a centre of international trade of modest dimensions, where presumably it was also possible to obtain a negro slave". Further evidence is the record of a Viking raid, in 862, on Spain and North Africa, which took large numbers of captives, among them negroes. Many were disposed of fairly quickly, but some of the negroes were taken back to the Viking settlement at Dublin, where they were known as fir gorm (blue men) or blamenn (black men).

The extent of early travel movements is apt to be overlooked. Miss Barbara Green has kindly drawn my attention to the record of two typical Anglo-Saxon beads, with close parallels in the British Museum, which were found as far away as the East African coast, one near Dar es Salaam, the other further south at Kisiju.

How this particular negress came to North Elmham must remain an unsolved perplexity. Miss Cayton points out that by the eleventh century Vikings were settlers in Norfolk, rather than raiders, and she is more likely to have come through an established trade route than from an isolated foray. Why she is here, is equally elusive. Perhaps she was, indeed, a full-time branded slave girl. Perhaps she was a waif bought by a local magnate who hoped that the charms of this little black pearl (at 1424 mm (4ft 8in) she was the smallest woman of the village) would give him status as a collector of living 'Fabergé' jewels by titillating the curiosity of his neighbours. Or maybe she was the fancy of a merchant bringing home 'A Souvenir from Cordoba' for his wife; or even a thegnly effort at keeping up with the Caliphs. All that can be said with assurance is that within the channels of these tattered bones, warm and living blood once throbbed with the tides of human passions, pains and hope.

PATHOLOGY

It cannot be too often or too strongly emphasized that the pathology of a group of people is never randomly produced. It reflects, sometimes very closely, the environment in which they live, the geographical and climatic influences which bear on them, the pressure of competing or co-existent forms of life, their behaviour in the environment, their patterns of dress, houses, tools, weapons and much else. This being so, the study of the accidents and diseases which afflict a people can reveal more about their living circumstances than any evidence except the most detailed written descriptions based on direct observation. It is this intimate relationship between pathology and patterns of living which makes the study of ancient disease both imperative and rewarding (Wells 1964a).

CONGENITAL AND DEVELOPMENTAL VARIANTS

Only minor anomalies are found at North Elmham and these are few.

Six skulls (one male, five female) are metopic: that is, the suture which up to the age of six to eight years divides the frontal bone into two halves has persisted into adult life. Metopism is usually found with frequencies in the 6-12% range. The fragmentation of many skulls here makes an accurate estimate impossible but it seems likely that its occurrence is within the usual range. It is a character of little significance.

Wormian bones are small ossicles which occur within cranial sutures, the suture dividing to encompass the intrusive island of bone. They are probably inherited as dominant genetic traits, but there is uncertainty about this. Their frequency varies



Photo by Hallam Ashley

Plate LXXIV. Inhumation 2 showing the undeveloped L. humerus and ulnar fragment. The normal (♂) R. humerus shown for comparison is not from this inhumation.



Photo by Hallam Ashley

Plate LXXV. Inhumation 2 showing extensive cupping of the bases of five phalanges, deformity of their heads and arkylosis of a middle and distal pair.

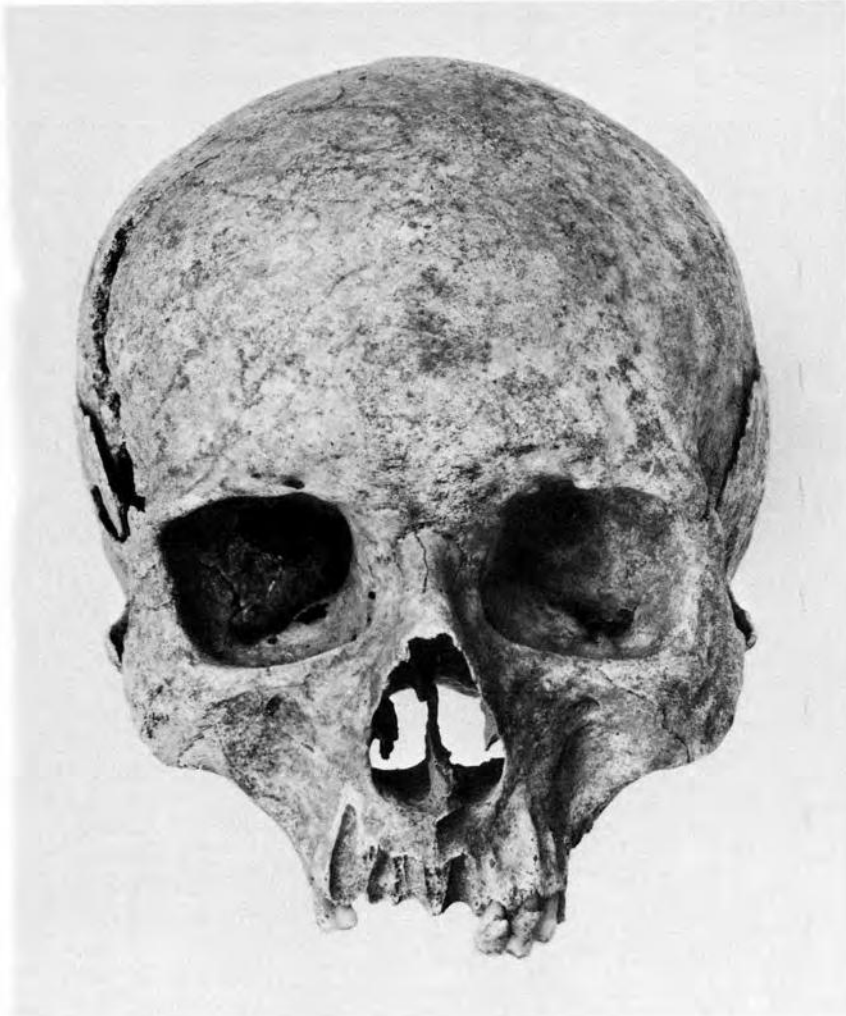


Photo by Hallam Ashley

Plate LXXVI. Facial view of Inhumation 103; a typical North Elmham Anglo-Saxon. The nose is narrow, long and has a high bridge.

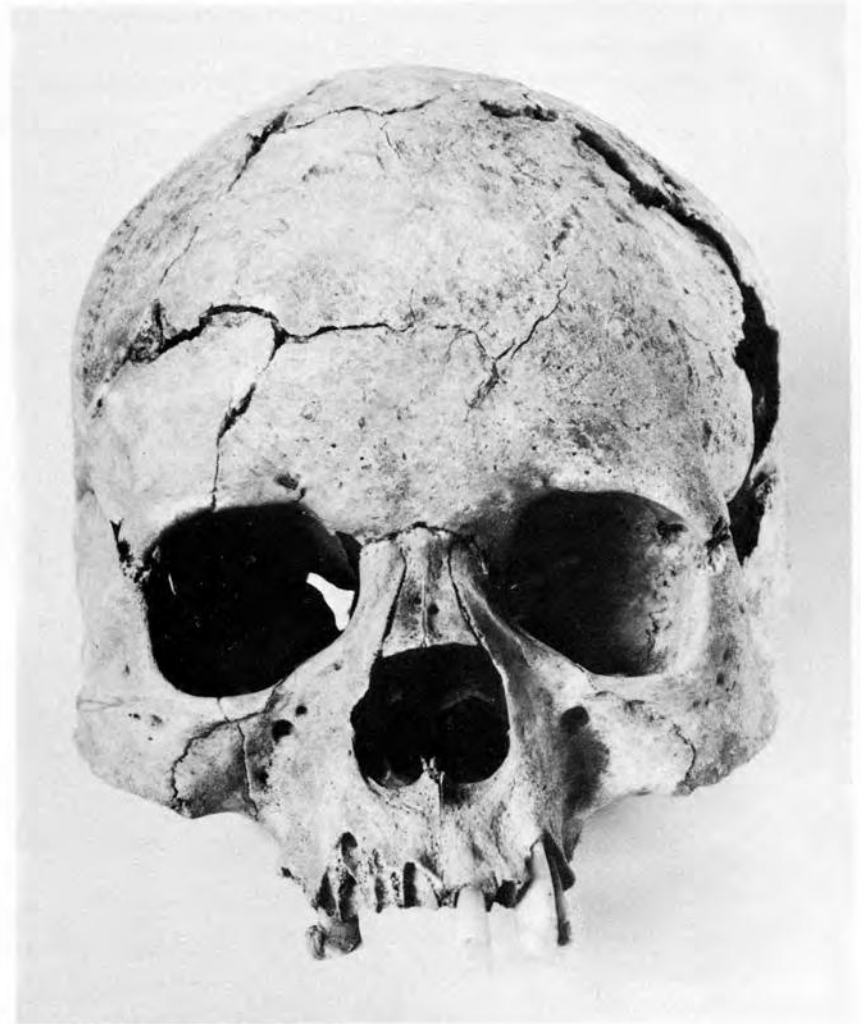


Photo by Hallam Ashley

Plate LXXVII. Skull of Inhumation 5 showing short and broad nose, complete side-to-side flatness of nasal bones and slight sub-nasal guttering. Compare this with Plate LXXVI.



Photo by Hallam Ashley

Plate LXXVIII. Lateral view of Inhumation 103. Note the prominence of the long narrow nose, the absence of sub-nasal prognathism, the long and rather low skull and its tuber occipitale.

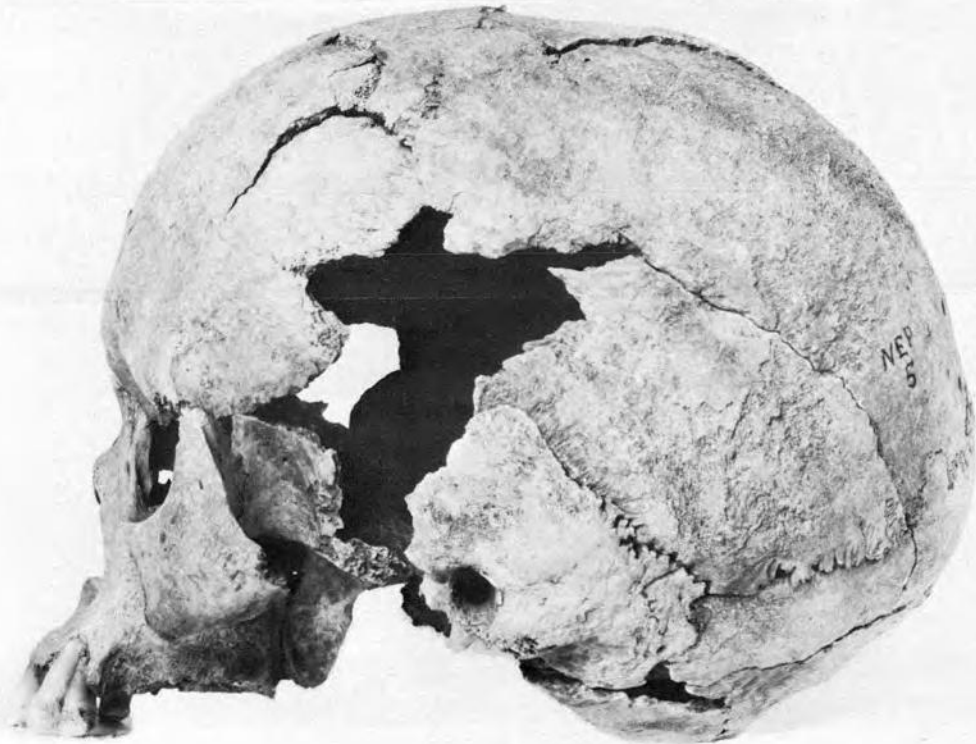


Photo by Hallam Ashley

Plate LXXIX. Skull of Inhumation 5 showing concavity of nasal bones from above downwards and sub-nasal prognathism. Compare this with Plate LXXVIII.



CB(1) 28

Plate LXXX. Inhumation 159 showing synostosis of the R. sacroiliac joint.

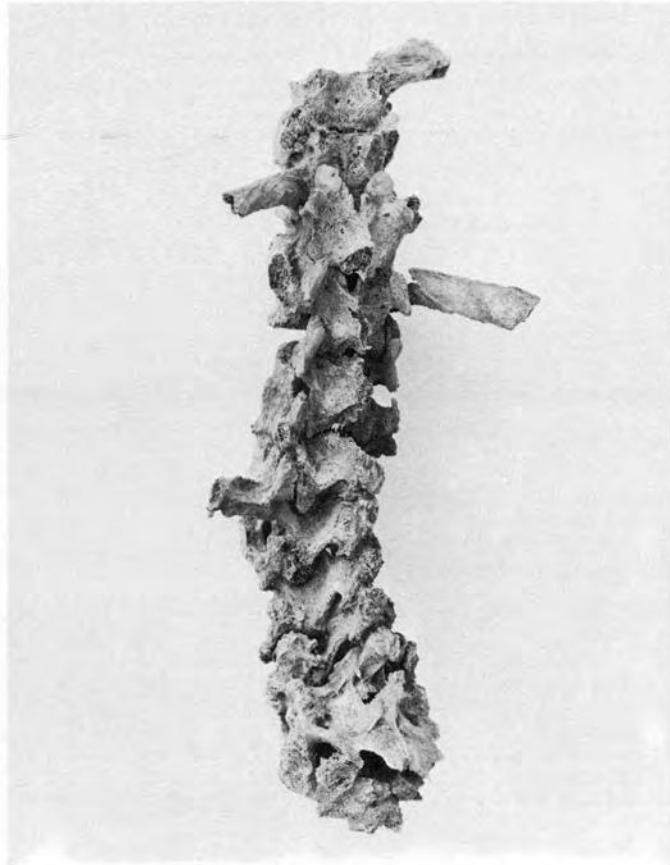


Photo by Hallam Ashley

Plate LXXXI. Inhumation 26 showing osteoarthritic ankylosis. At least thirteen vertebrae and seven ribs were fused together in this process. The specimen is much damaged by soil erosion.



CC(1) 19

Plate LXXXII. Inhumation 103. L. 1st metatarsal showing severe osteoarthritis, with eburnation, of its head.

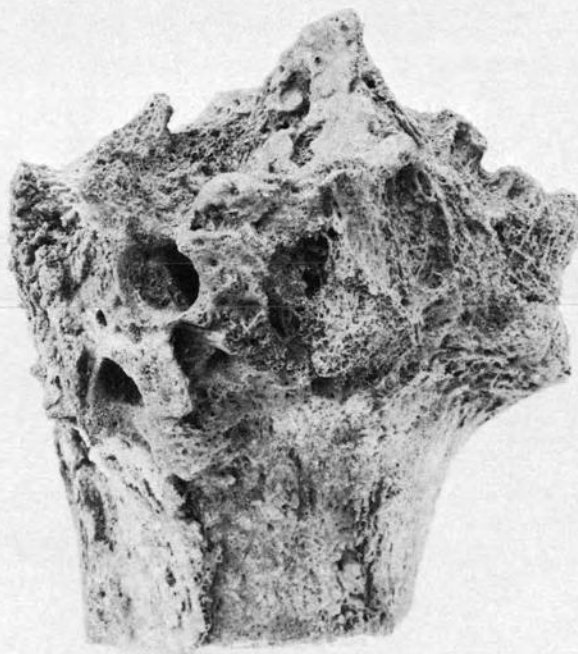


Photo by Hallam Ashley

Plate LXXXIII. Inhumation 10. Postero-lateral view of L. tibial head showing extensive remodelling, osteophytes and shallow sinuses.



CC(1) 3

Plate LXXXIV. Inhumation 162A. Osteoarthritis, with eburnation of the distal articular surface of the humeri.

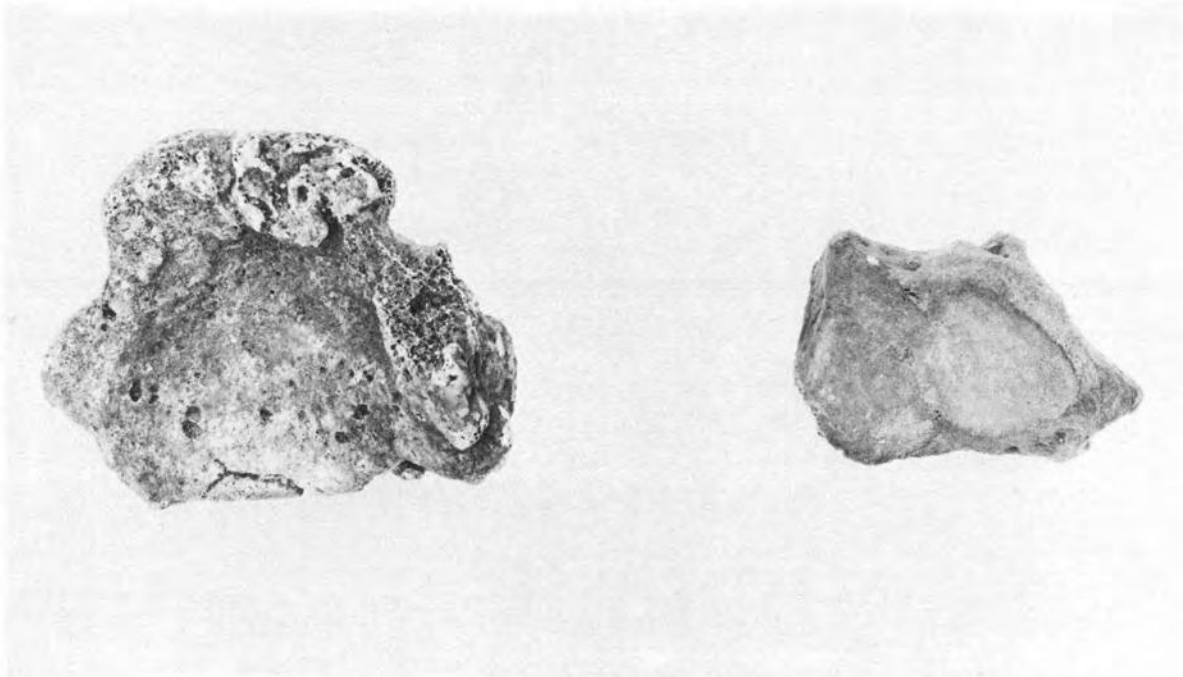
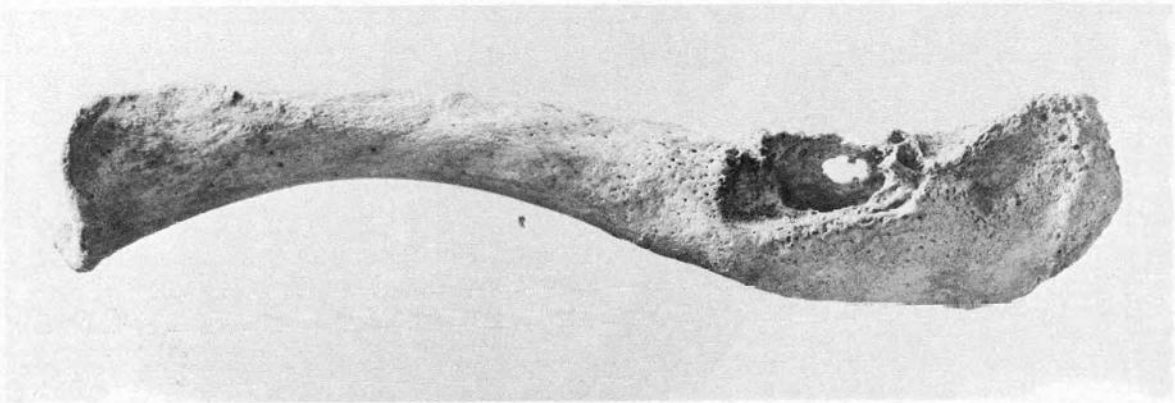


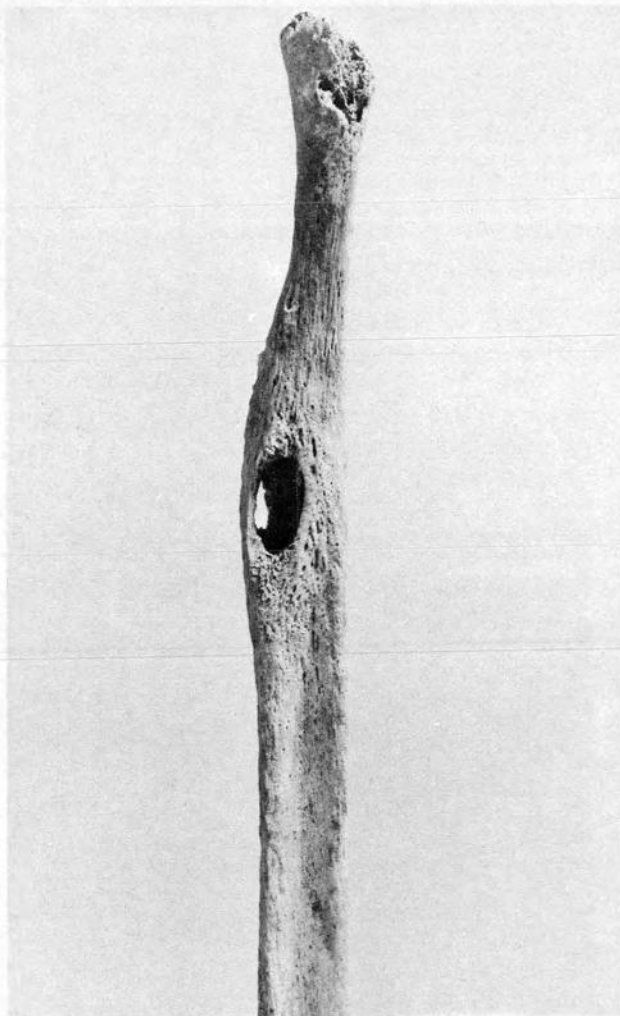
Photo by Hallam Ashley

Plate LXXXV. Inhumation 50. The distal articular surface of the R. radius showing severe osteoarthritic changes, alongside a normal radius for comparison.



CC(1) 10

Plate LXXXVI. Inhumation 74(a). Superior surface of R. clavicle showing infective cavitation of its lateral third. This is probably due to osteomyelitis.



CC(1) 13

Plate LXXXVII. Inhumation 74(a). Proximal half of L. fibula showing osteomyelitic cavitation of the shaft, with surrounding periostitis.



CC(1) 15

Plate LXXXVIII. Inhumation 86. Inferior surface of L. clavicle with extensive osteoarthritis of its sternal end.



CC(1) 6

Plate LXXXIX. Inhumation 171. R. ilium showing an exostosis, probably traumatic, of its anterior superior spine.



Photo by Hallam Ashley

Plate XC. Inhumation 171. Skull showing two wounds. One has cut through the R. temporal and parietal bones; the other has cut through the base of the R. zygomatic process and has truncated the tip of the mastoid process.

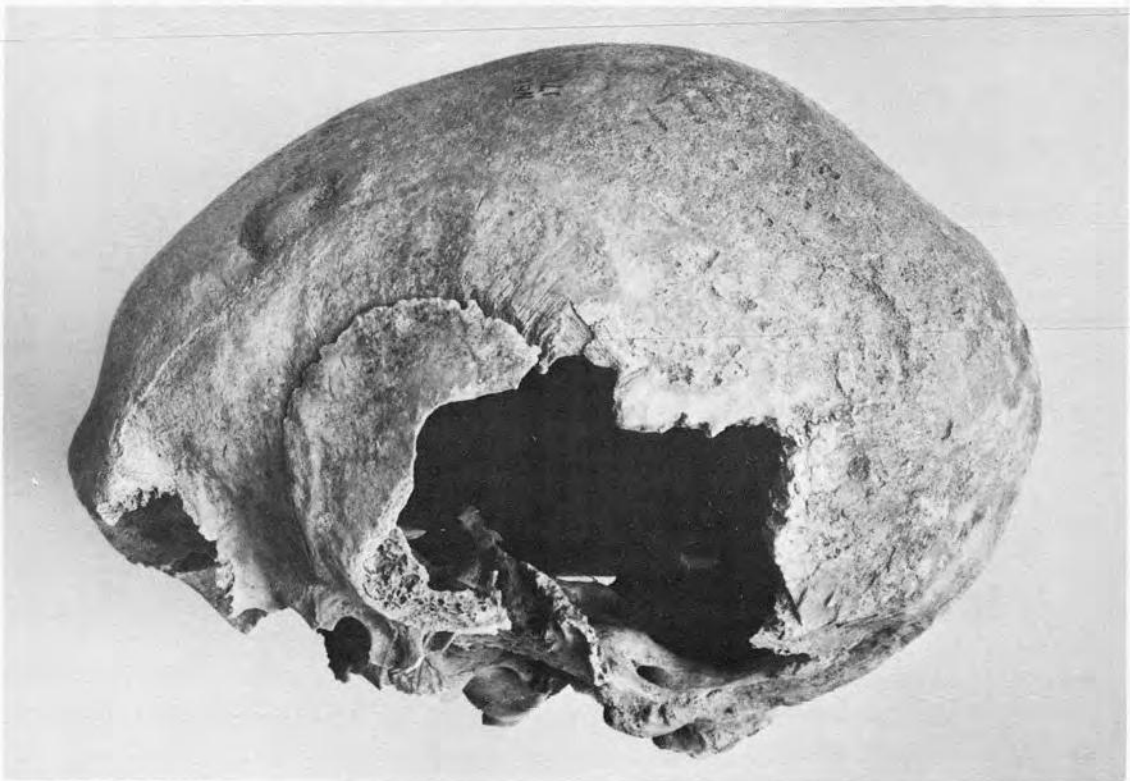


Photo by Hallam Ashley

Plate XCI. Inhumation 171. Skull showing incised wound which had cut through the L. temporal squama from front to back. Posteriorly it has made a small incision in the occipital bone.

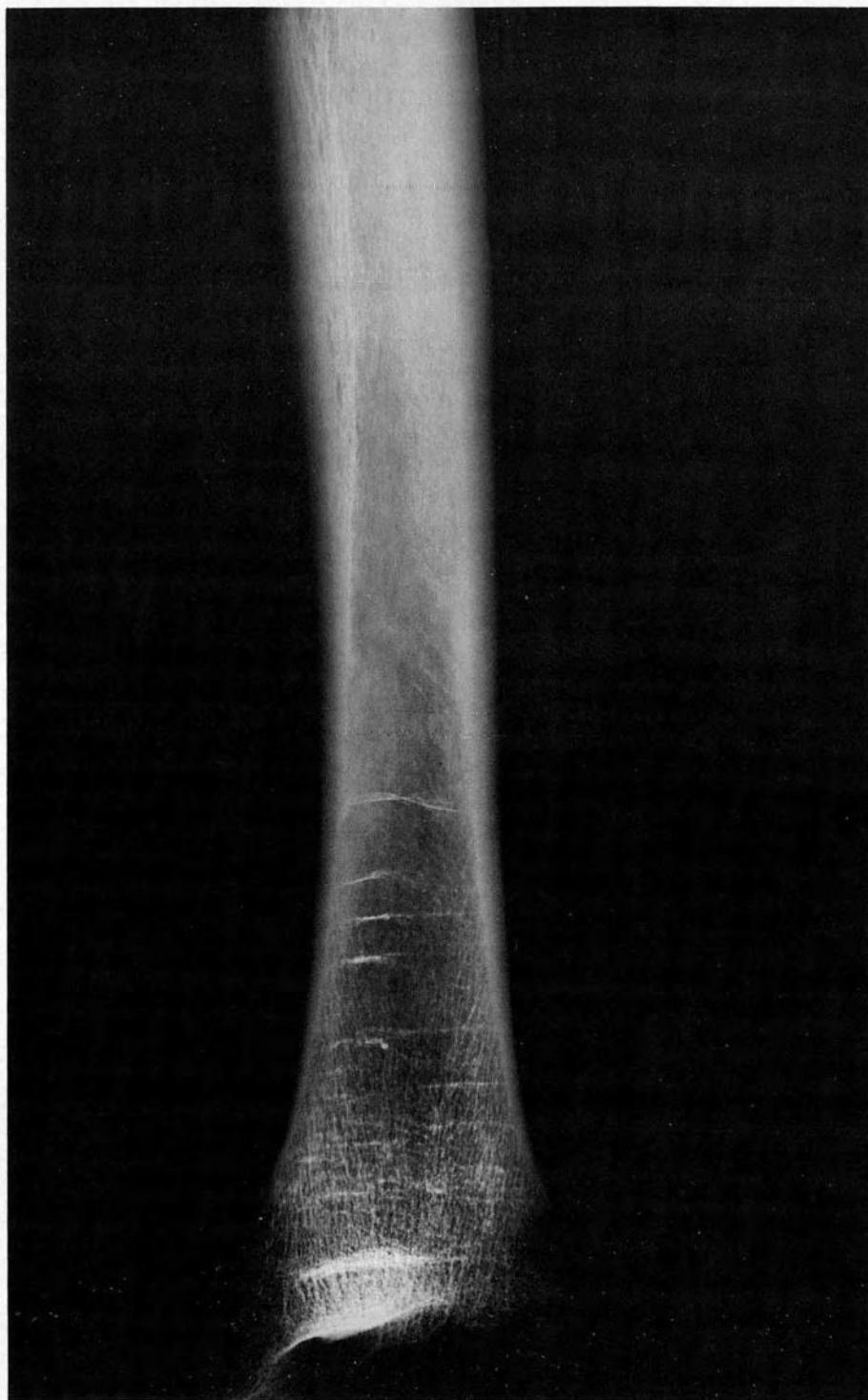


Plate XCII. Inhumation 157. Radiograph of distal third of L. tibia. The white radio-opaque zones across the medullary cavity are Harris's lines. Nine are clearly visible.

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greatly in different populations and in different cranial sutures. They are best known in the lambdoid suture between the occipital bone and the two parietals. Of the North Elmham group, at least six skulls (two male, three female, one ? sex) have them in the lambdoid suture. In all but one case they are multiple, there being twenty of them in all. One of the women (Inh.108) who has three wormian bones in the left half of the lambdoid also has one in the sagittal suture.

Epipteric bones are a form of wormian or intersutural ossicle occurring at the pterion, the region where the parietal bone meets the great wing of the sphenoid. These, too, are probably genetically controlled although little is known about them. One is present on the left side of Inhs.84 (female) and 99 (male). Inh.171 (male) has one bilaterally, each of which is about 17 mm in diameter. In Inh.135 (male) the superior part of the occipital bone is separated from the rest of it and is further divided suturally to form a bipartite Inca bone.

Palatal torus, a raised ridge of bone lying in the mid-sagittal plane of the palate, is present in two persons: Inhs.174 (male) and 183 (female).

Post-cranial anomalies are few and trivial here. Perforation of the sternum is found in four cases (two male, two female) and this, too, is probably a genetic variation. In nine persons (eight male, one female) the sacrum has six segments instead of the usual five. When this happens it is not uncommon to find that one of the higher vertebrae is lacking, e.g. that only four lumbar or eleven thoracics are present. Of the nine instances here, the spinal column is too defective to assess in five; in three it can be seen that elimination of a higher vertebra has not occurred; whilst in the remaining one only four lumbar are present. Other developmental anomalies of the column include two cases of spina bifida. One (Inh.177) involves the L4, L5 and S1 segments. In the other (Inh.157) there is some doubt as to whether it is a true spina bifida of L5 or a detached neural arch which has failed to survive. There is still uncertainty about the cause of detached neural arch, whether primarily developmental or traumatic or a combination of the two. It is, however, quite a common condition which especially affects the last lumbar vertebra (L5). In this series, apart from the debatable Inh.157, it is found in Inhs.5 (female), 119 (male) and 163 (male). In Inh.153 (male) the neural arch of L5 is anomalous and its R. transverse process has an irregular articulation with the ala of the sacrum. Inh.157 also has a small accessory rib fused to the left side of the L1 vertebra.

There is complete synostosis of the L. sacroiliac joint of Inh.159 (male) (Plate LXXX) but, since the L. ala of the sacrum is normally developed in this case, this presumably did not occur until growth of the bone was complete, i.e. it is not an example of Naegele's pelvic deformity and should be classed as a form of spondylitis.

In Inh.86 (male) the R. scapular notch has been converted to a foramen by ossification of the superior transverse scapular ligament.

Perforation of the olecranon fossa of the humerus (into which the olecranon process of the ulna moves when the elbow joint is extended) is a well known anatomical variant. These 'septal apertures' range in size from pinpoint to 15 mm in diameter and occur in different groups with frequencies ranging from 1.0-50.0% or more. In this series it is possible to inspect 184 humeri for this feature. Table 37 shows the findings.

TABLE 37. NUMBERS AND FREQUENCY OF OLECRANON PERFORATIONS

Sex	♂	♀
No. of humeri	96	88
No. of perforations	2	18
%	2.1	20.4

Opinions differ as to whether 'septal aperture' is due to a genetic trait, to functional factors or to some combination of causes. No convincing explanation can be offered for the marked differences in its frequency between the men and women here.

Inh.20, a child eleven to twelve years old, has a strongly developed third trochanter on its L. femur. This feature is weakly present in a few other burials.

No very remarkable conditions have been found among these anomalies. They suggest, from their kind and overall incidence, that the North Elmham population drew on a fairly extensive gene pool, with nothing to indicate close inbreeding. In this they contrast sharply with some populations such as their near contemporaries from Martyrs' Bay, Iona, or the epipalaeolithic group from Taforalt in Morocco (Ferembach 1962). The absence of such developmental abnormalities as cleft palate suggests that diseases such as rubella, which in pregnant women may damage the foetus, were absent or uncommon, though this must not be exaggerated in view of the small numbers available here.

Although there is nothing especially remarkable about the overall incidence of any anatomical variants when assessed in terms of the total population here, a few suggestive facts can be obtained from them.

When these different traits are plotted topographically against the individuals showing them, they are not all found to be randomly scattered throughout the cemetery. A few of them are limited to well defined areas of the burial ground or to closely adjacent inhumations. Thus, the only four skulls in which the sagittal sinus turns left lie in neighbouring graves, within a radius of six metres, at the extreme northern corner of the cemetery; the three examples of occipital precondylar tubercles are also in adjacent graves, within a radius of about three metres, at the southern end of the complex. Three quarters of the blurred subnasal margins and four fifths of asterionic ossicles both lie in one small area within a radius of no more than six metres. Five of the six metopic skulls are grouped equally, closely, whilst fourteen of the twenty septal apertures lie within a radius of less than eight metres - and the excavated portion of the burial ground covered almost 12,000 square metres. In a few instances, closely grouped inhumations may show more than one of these 'non-metrical' variants. This applies to Inhs.19 and 22, both of which have asterionic ossicles and blurred subnasal margins; also to Inhs.88, 114 and 121, which have septal apertures as well as being metopic and are less than two metres apart.

The available evidence is too scanty to afford statistical reliability but it encourages us to ask whether such closely grouped inhumations as 23, 32, 63 and 72 (sagittal sinus turning left); 151, 165 and 177 (precondylar tubercles); or 3, 9, 19, 22, 104 and 105 (blurred subnasal margins, plus asterionic ossicles in 19 and 22) may also have been fairly close blood relations, perhaps buried in 'family plots'.

Likewise it seems reasonable to suspect that, within a broad Anglo-Saxon physical type, different parts of the cemetery may have housed populations which were drawing on fairly distinct gene pools. If so, we may be dealing with some sort of burial 'catchment area' in which different enclaves served as interment sites for populations coming from widely separated regions of East Anglia.

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Whilst suggesting this, on the basis of the distribution of these anatomical variants, it must not be overlooked that many other non-metrical characters are present but occur with what is apparently random scatter. Excavation of a cemetery four times as big as this one would probably go a long way towards solving these problems.

CRIBRA ORBITALIA

Cribra orbitalia is a condition in which a fine punctate or reticular pitting occurs on the roof of the eye socket. Its cause is unknown, though prolixly debated. Infections, deficiency diseases, blood dyscrasias and other factors have been incriminated but no agreement has been reached, although iron deficiency anaemia has strong evidence to support it.

Its frequency varies greatly in different populations: 5.0-15.0% is a common range but it may be almost absent or occur with a much higher incidence. In many groups it is more common in the skulls of children than in adults, but again opinions differ as to whether this indicates a tendency for the disease to progress towards spontaneous cure or is to be interpreted as some kind of lethal episode in these children.

Five cases of cribra orbitalia occur at North Elmham. It is of slight degree in Inhs. 56 (male), 195 (female) and 111 (a child); moderately severe in Inhs. 19 (female) and 121 (female). Only the L. orbit survives from Inh. 56. In the other four, both orbits are present and affected, and this bilaterality is the usual, but not invariable, finding. Despite the uncertainty about its precise cause, there is some evidence that it is associated with general ill health. It seems to be very rare in modern Europeans but this may merely be due to the fact that no-one looks for it. Further speculations about its aetiology should be tempered with the recollection that it is a disease which has been found in other primates.

NEOPLASMS

Very few new growths are identifiable at North Elmham.

Inh. 171 (male) has a small 'button' osteoma on the L. femur. In Inh. 8 (male) a R. mid rib has an osteomatous thickening (C.8 x 20 mm) of its body. Both these are certainly benign. A small tumour, about the size of a hazel nut, is present on the much eroded distal end of the L. fibula of Inh. 197 (female). Its status is uncertain: it is almost certainly an organized blood clot from a torn interosseous membrane although it could also be an osteitic thickening of the bone from a small inflammatory lesion. It is mentioned here because it does not seem possible to exclude with complete certainty an osteomatous origin for it. Radiography of the structure is ambiguous.

Malignant growths are not often found in early skeletal material and the Anglo-Saxons are no exception to this. Small 'ivory' or 'button' osteomata, however, are common, especially on the skull. Their rarity in these North Elmham people is somewhat unusual.

OSTEOARTHRITIS AND OSTEOPHYTOSIS

The commonest disease of the North Elmham population was osteoarthritis. This has fortunate advantages for the archaeologist whose task it is to reconstruct the way in which the community lived. The causes of osteoarthritis (which is quite distinct from rheumatoid arthritis) are undoubtedly complex and still inadequately understood. It is certain, however, that in part - and probably to a predominant extent - it is an expression of some kind of stress or strain. This may be the result of a single episode such as a fracture involving a joint or, far more commonly, the product of repeated minor injuries or strains such as the many occupational hazards of manual workers. It is a condition which reflects what may be called the 'wear and tear' of joints.

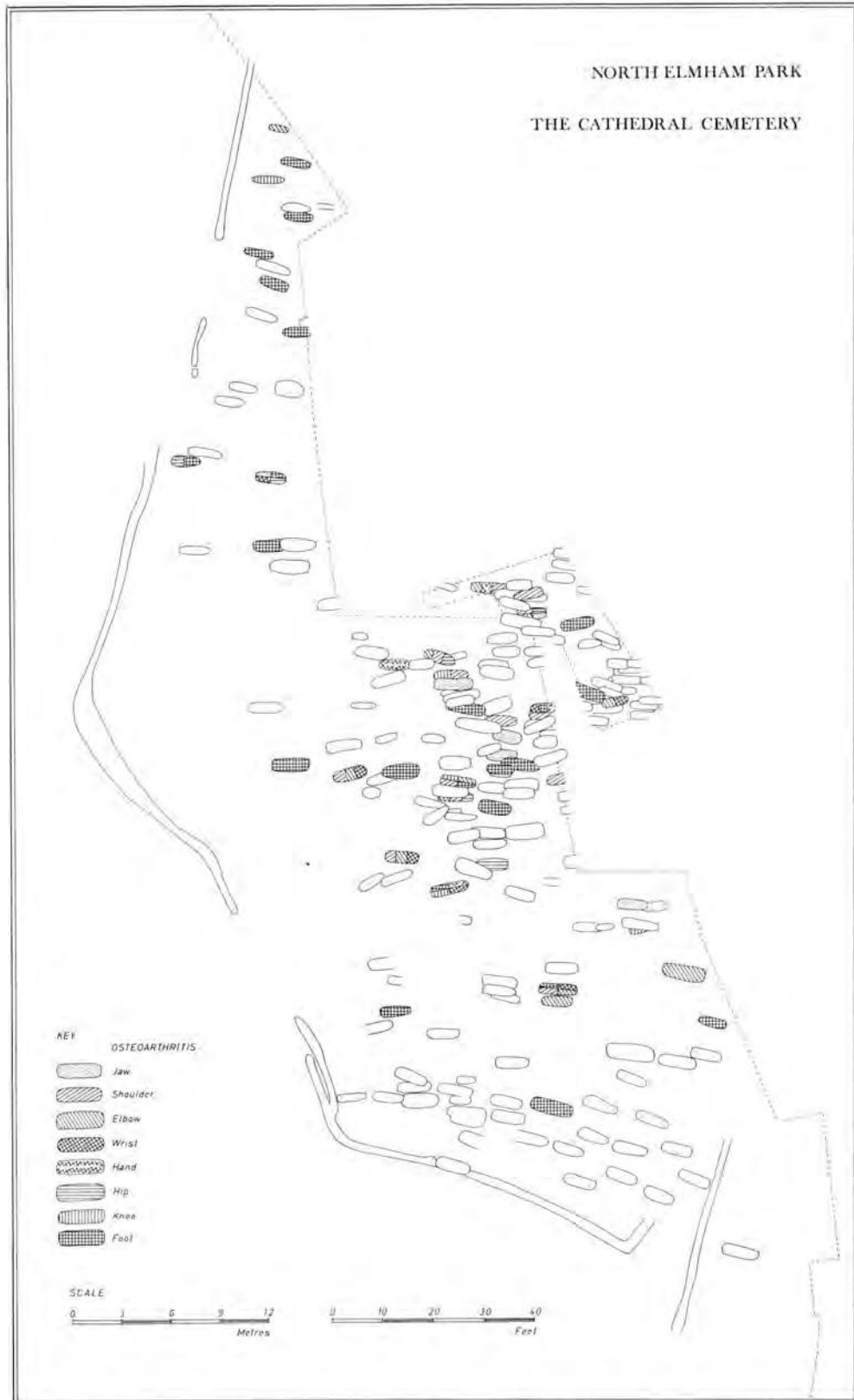


Fig.195. A plan of the cemetery showing the distribution of osteoarthritis.

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Osteoarthritis consists essentially of two processes: a destruction of the cartilage and, later, the bony surfaces which form a joint; and the proliferation of new, irregular bone (osteophytosis) in some proximity to the affected joint. We need not be concerned here with a more refined description of the micro-pathological changes which take place.

As has been said, osteoarthritis is the commonest disease found at North Elmham and its site of election is the vertebral column. In this position we must recognize two rather different conditions which, nevertheless, appear to be functionally related. True osteoarthritis of the spine occurs on the posterior intervertebral articulations. From the axis (C2) vertebra downwards, each bone has four of these articular facets - a L. and R. superior and a L. and R. inferior. The disease may affect any one or more of these facets. There is, however, a somewhat different condition which is often found in the spinal column. The bodies of the vertebrae, which are normally kept apart by the intervertebral discs of cartilage, may develop fringes or jagged shelves of newly formed bone from either their upper or lower margins; sometimes from both. These outgrowths are called osteophytes and, for anatomical reasons which need not be discussed here, this condition of osteophytosis is commonly distinguished from osteoarthritis, although the two are closely related in terms of cause, pathology and effects.

In examining the North Elmham vertebral columns these two conditions, osteophytosis and osteoarthritis are coded respectively as OP and OA, with the additional letter C, T or L to indicate whether the affected bones are in the cervical, thoracic or lumbar level of the spines.

Parts of 112 adult vertebral columns have been coded in this way but, unfortunately, almost all are incomplete, most of them extremely so. Many of these spines are represented by only three or four vertebrae, or even a single defective bone. A consequence of this is that although the presence of osteophytosis on even a solitary vertebra establishes the fact that the person from whom it came had the disease, its absence from a dozen or even twenty surviving bones does not mean that he did not have it, since it might have been present on the ones which are missing. It also happens very commonly that even if a vertebra is present, its posterior articular facets may be too damaged to decide if they were arthritic or the margins of its body may be eroded beyond hope of recognizing osteophytosis. In other words, a negative finding on incomplete columns is of little value in excluding the disease - progressively so as the incompleteness increases. With this caveat in mind, the following brief summary is offered.

If the 112 spinal columns were complete and numerically normal, a total of 2688 vertebrae should be available for inspection. Post-inhumation damage and loss has reduced this number so that only 1186 could be examined for osteophytosis, which was found to be present in 516 (43.5%). But the distribution is not evenly spaced and the frequencies at different levels are shown in Table 38.

This shows that the cervical vertebrae are the least affected by osteophytosis, which is at its peak in the lumbar region. By contrast, arthritis of the posterior articulations, which is also recorded in Table 38, is most frequent in the cervical, least in the thoracic, region.

Less than half the vertebral column has survived from 101 persons, of which seventy three (72.2%) have osteophytotic changes. It seems likely that if all potential vertebrae were present, at least 90% of this population would be found to have this disease. In effect, most of these people would appear to have had some degree of it by their mid-twenties. There is little difference in its frequency between the men and the women (which is inevitable when the total incidence is nearly 100%) but it does seem to be distinctly more severe in males than females.

TABLE 38. DISTRIBUTION OF VERTEBRAL OSTEOPHYTOSIS AND OSTEOARTHRITIS

		Level			Total
		Cervical	Thoracic	Lumbar	
Osteo- phytosis	No. of vertebrae	251	639	296	1186
	OP present	91	267	158	516
	%	36.2	41.8	53.4	43.8
Osteo- arthritis	No. of vertebrae	195	610	292	1097
	OA present	59	114	82	255
	%	30.2	18.7	28.1	25.6

For osteoarthritis the corresponding figures are forty two (42.0%) of spines attacked out of 100 which could be examined. But, again, with less than half the possible number of bones surviving, this must greatly under-estimate the true frequency of the disease. A rate of 60% for the adult members of the community would probably be a conservative estimation. Only four complete spines show no evidence of either of these two conditions.

When we look for the types of stress which could account for the high frequency of this disease there is plenty of choice. Heavy work such as tree felling, house building and humping weighty loads would explain its presence in the men; agricultural work on refractory soil - hoeing, digging, planting, etc. - and also carrying substantial loads, would produce it in the women. These factors would take greater toll if, as is likely, they became operative in the early teens or even in childhood. Many other contributory causes of torsional or jarring strains of the spine would aggravate the disease and produce the picture which emerges here. In the females some of the most severe of their arthritic changes occurred in the neck and this may, perhaps, have been due to a custom of carrying water buckets and other heavy weights on their heads.

On the other hand, it should be noted that, although almost every adult was affected, the severity of the disease was much less than in many early groups. It is commonplace to find osteophytosis so advanced that many consecutive vertebral margins are coalesced into a rigid, immovable 'poker spine'. Often a number of posterior articulations become fused in a similar way. Both are rare at North Elmham. The much damaged spine of Inh.26 (male) was severely affected, with ankylosis of at least thirteen vertebrae (Plate LXXXI) but, apart from this example, intervertebral synostosis is limited to only an occasional pair of bones, usually cervical, as in Inhs.2 (female), 88 (female) and 157 (male).

It is probable that some slight predisposition to vertebral strains was present at North Elmham as a consequence of their being moderately tall people. In modern clinical practice, the long slender torso is more liable to various complaints involving the back, than is the short thickset person. This is partly due to simple mechanical causes. It is reasonable to see the high incidence of spinal troubles at this site as an indication that these were a slender, ectomorphic people, rather than more burly meso- or endomorphic types.

The expression of back strain is not limited to the two conditions we have discussed so far. Virtually the whole weight of the body, and anything which is carried in the arms or on the shoulders, is transmitted through the sacroiliac joints. Partly as a result of our relatively recent adoption of the upright, bipedal posture, these joints remain amongst the most inefficient engineering structures which can be found anywhere in the body. They

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are, therefore, vulnerable to trauma and may respond to it by 'slipping' or becoming arthritic. The slipped sacroiliac joint (subluxation) is almost impossible to recognize in archaeological material but at North Elmham several of the joints, e.g. Inhs.27 (female), 86 (male) and 88 (female), show extensive osteoarthritic lesions, which reinforce the vertebral evidence of heavy use of their backs. Inh.159 (male) has complete fusion of the R. sacroiliac joint, a condition sometimes described as spondylitis (Plate LXXX).

A further extension of these pathological changes is the involvement of the heads and transverse tubercles of ribs at their articulation with the vertebrae. This is one of the commonest findings at North Elmham and although its frequency is difficult to estimate owing to the post-inhumation fragility and disintegration of ribs, it is likely that at least 50% of the adult population suffered from this condition to some extent. In many of the burials, e.g. Inhs.25 (female), 59 (female) and 88 (female), the changes were extensive and fairly severe. As a final gross development of the condition, several ribs may become completely fused to the vertebral column, as in Inh.26 (male). When this happens, movement in the affected ribs is obliterated, the intercostal muscles are immobilized, respiration is restricted to diaphragmatic breathing, and great functional limitation with diminution of vital reserves must follow.

These arthritic changes of vertebrae and ribs are by no means the only spinal pathology to betray the ravages of heavy toils. This is an appropriate place at which to digress in order to discuss another condition.

As age advances, the intervertebral discs become hard, shrink and lose their elasticity but in young people, especially in children and teenagers, the discs consist of a tough but soft elastic envelope or capsule, which surrounds a gelatinous, almost fluid, nucleus. If heavy compression is imposed on the spinal column, especially from weight bearing and violent forward bending, some of the fibres of the capsule may rupture and the inner part of the disc, with its gelatinous nucleus pulposus, becomes herniated through the outer layer. It then presses upwards on to the inferior surface of the body of the vertebra above it or downwards on to that below it, according to the site of the rupture. Pressure of this extravasated mass then leads to the development of a shallow depression as it extends into the spongiosa of the adjacent vertebral body, especially, perhaps, where remnants of the notochord have left a focus of weakness. These depressions are known as Schmorl's nodes and the majority of them probably develop during the teenage period.

A Schmorl's node may be a solitary feature or there may be many of them in a column, depending on the amount and type of trauma it has borne. Well developed nodes occur in at least sixteen persons at North Elmham and they seem to be incipient in several others. There is, however, a marked difference between those found in the females (e.g. Inhs.75 and 108) and those in males (e.g. Inhs.33, 50 and 165). They are more common in the men than the women, and are more often multiple when they occur. Of the sixteen well developed cases to which reference has just been made only five are female, with an average of 1.8 nodes per woman; eleven are male, with an average of 6.7 nodes per man. This shows that the boys and youths were given much heavier work to do than the girls and it suggests that they were set to this work considerably earlier - perhaps at an age when the young maidens were being taught such relatively light tasks as cooking, weaving, dressmaking and pottery, or were sent out as shepherdesses, goose girls and herb cullers. A further indication of the strains imposed on the boys is the fact that many of their Schmorl's nodes are larger and deeper than any of those found in the women's vertebrae.

After the spinal column, the next most common site of election for osteoarthritis at North Elmham is the feet. Although many of the feet in these inhumations are extremely defective or entirely absent, at least twenty six persons show well marked arthritic changes. The disease may be limited to a single joint or widely scattered throughout the

tarsus and metatarsus. When limited to only one joint the articulation between talus and calcaneus is often affected. At least twelve persons show arthritis in this position, equally distributed between men and women, with changes ranging from slight lipping of the joint margins to severe erosion and eburnation of the bone, as in Inhs. 59 (female) and 71 (female). The cuboid and the navicular are also affected in several of these people but any of the tarsal bones may be involved.

Osteoarthritic change also occurs in the metatarsals and, when it does, the site of election falls heavily on the head of the first metatarsal (Plate LXXXII). Eighty six of these bones survive, of which 22 (25.6%) are affected, the changes again ranging from slight to severe, with eburnation. The frequency with which the disease occurs is identical for males and females. In the more severe cases, the base of the hallucial first phalange may be involved (e.g. Inh. 103). These osteoarthritic changes show that severe strains were imposed on the feet of the North Elmham people. The soil here is fairly heavy and, especially when baked hard by drought or sodden by much rain, it demands great effort to work it. The combined effects of standing flat footed to hoe weeds, kicking at spades or delve the seed trenches, constantly walking across rough fields, stumping around in clumsy boots and often stumbling over clods of unbroken clay, must have produced a myriad of minor traumatic episodes, whose cumulative effect was the osteoarthritis we now find.

It is interesting, and somewhat surprising, that despite the extent of these tarsal and metatarsal changes, the ankle joint (that is the articulation between the tibia, fibula and the superior surface of the talus) shows almost no arthritic alteration. It is uncertain why this should be so. The ankle is a simple hinge joint and, though extremely strong, it is one which is 'sprained' more often than any other. The trochlea of the talus fits into a deep mortice between tibia and fibula and it is this, with the strong ligaments and tendons around it, which gives the ankle joint stability. The intertarsal joints have less intrinsic mobility, but are less stable mechanically. This renders them susceptible to repeated strain and trauma. Although the spinal changes suggested that the North Elmham men were bearing a heavier load of injury than the women, this is not reflected in their feet. Whatever the reason may have been, it is clear that the women's feet took as much punishment as those of the men.

When there is abundant evidence of extensive use and injury of the feet, as at North Elmham, it is common to find that the knee and hip joints also show arthritic changes from associated trauma. But at this site the hip joints are affected in only seven persons. Most of these cases are mild but in Inh. 56 (male), it is severe, with extensive lipping and eburnation of the femoral head.

Arthritis of the knee joint is even less common. Apart from the special case of Inh. 10 (Plate LXXXIII) it affects the femoral condyles and tibial head in only two instances, although the patellae of four others have some osteoarthritic changes. There is no unequivocal reason to account for the seeming disparity here between much arthritis of feet but little in hips or knees.

When the upper limbs are considered, a well defined pattern of osteoarthritis is found. The head of the humerus is affected in at least seven inhumations, and the glenoid articular cavity of the scapula in a further five. Most of these are very mild, some might be described as hardly more than incipient, but it is occasionally severe as in Inhs. 100 (female) and 126 (female). It occurs about twice as frequently in males as females.

Arthritis of the elbow is found in at least a dozen persons. At these joints the changes are commonly severe, with all three component bones showing extensive lipping and eburnation: e.g. Inhs. 44 (male) and 162A (male) (Plate LXXXIV). At the wrist joint similar changes are found in a minimum of thirteen persons (Plate LXXXV) and in five there is also well marked osteoarthritis of metacarpals.

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In all, the upper limb shows osteoarthritis, commonly multiple, in twenty four persons, of whom fifteen are males and nine are female. In general, the condition is considerably more severe in the men than the women, especially at the elbows and wrists. The total evidence here indicates vigorous use of the arms and hands, presumably from an early age. The effort of doing heavy digging, tree felling, ploughing and other farm work, together with such special occupations as carpentry and metal working, would be enough to explain what is found. The incidence of osteoarthritis of the shoulder is high by modern standards and suggests, perhaps, that some occupation involving torsional strains may have been practised. The carpal and metacarpal disease could easily result from misdirected blows with a hammer, but the gnarled fingers of country labourers are even today a common sight and no narrowly specific injury need be sought to explain them.

Free and vigorous use of the arms is closely associated with the range of movements which are possible in the shoulder-girdle. Weight carrying, raising or lowering the shoulder joint, forward thrusts of the arm and many other movements involve various parts of the shoulder-girdle and this is reflected in what is found at North Elmham. The sternoclavicular joint (which is the only point of articulation of the shoulder-girdle with the trunk) or the acromioclavicular joint (which plays an important part in movements of the clavicle, scapula and humerus) show osteoarthritic changes in at least nine persons. All of these are males and this, in conjunction with their higher frequency of arthritic shoulders as noted above, is a clear indication that the really heavy load bearing, shoving, heaving, tugging, chopping, etc. was normally allotted to the men. A division of labour such as this has an alluring obviousness about it, from the standpoint of our own society today. We must not take these arrangements for granted, however, in early or pre-historic populations. A quite superficial knowledge of ethnology suffices to reveal that there are a number of modern primitive tribes and societies where many or most of the heavy physical tasks are deemed to be women's work, not men's. The practices of ancient or exotic communities should be established from the evidence, not based on assumption (Wells 1971a).

Only one other site of osteoarthritis need be mentioned: the temporomandibular joint. In ten persons the condyles of the mandible show changes which range from slight lipping of its margin to advanced flattening and erosion of its crown. This reinforces the evidence, given by extensive attrition of the teeth, that these people had a tough diet which needed resolute chewing. The incidence of this condition shows a well marked sexual difference: two of the cases are in men, eight in women. In general, female mandibles are lighter and less sturdy than those of males and it is possible that the daintier female jaw was more susceptible of injury and chronic strain than its male counterpart. But, on the whole, it is likely that any such increase of susceptibility was compensated by the lesser champing power of the women's muscles of mastication: the *M. temporalis*, *M. masseter*, etc. If this were so, it would suggest that their higher incidence of temporomandibular arthritis was the result of having to cope with a tougher diet than the men. There is some indication from other Anglo-Saxon sites, also, that this may have been the custom. In a male dominated society, which these people surely were, the boys may have been more highly valued than their sisters. As the potential warriors, heavy workers and prestige bearers, they may, from an early age, have been given the choicest and most nutritious food. If this habit had continued into adult life we should expect that the man's prerogative was first pick at the most tender and succulent morsels of meat, the most full-bodied cut from the loaf, the riper and more luscious fruits, the fatter and juicier roots or berries. Relegated to second place in the food queue, the women would have to munch, as best they might, the tougher, stringier meat, stale crusts, the least ripe fruits, the most fibrous of the roots and the most pip-filled berries. This sorry lot may not have befallen the women daily, but probably it was the rule in seasons of scarcity and times of famine. But such seasons and times of dearth were far from rare and it would take no more than this to produce their higher incidence of arthritic jaws. However, other possibilities must be borne in mind. The use of teeth and jaws as tools may lead to severe arthritic changes at the temporomandibular joints: a well-known example

is the Eskimo bow-drill which is held in the mouth. But tool using of this kind almost always leads to characteristic patterns of tooth wear which are not found here, so it seems safe to infer that diet is the essential cause of these joint changes.

The total evidence given by the osteoarthritis and osteophytosis at North Elmham leaves no doubt that these people led a strenuous, physically demanding existence and that this probably began in late childhood or their early teenage. The overall pattern of the disease is very similar to what was found at Red Castle, Thetford: minor differences between the two sites are likely, in part, to be due to the relatively small numbers of burials which are available.

Mrs Sonia Hawkes has kindly pointed out that it is a fallacy to discuss the North Elmham people too exclusively in terms of peaceful agricultural labour, as though they lived like a kind of idyllic Thomas Hardy or Mary Webb community. Although spears, shields and bows are absent from their graves, she rightly stresses that, like pagan Saxons before them, anything up to 50% of the males were weapon-bearing freemen. And that, among the stresses and strains producing arthritic lesions, one must reckon with much combat practice and even the occasional battle. For boys this would probably begin at the age of twelve years - the age at which weapons start to appear in pagan graves. If much of adolescence was spent in learning to throw a spear to perfect accuracy, against the possibility of involvement in actual warfare, the jerking and torsional strains imposed on young arms, spines, pelvic and leg joints, could have laid a foundation of trauma on which a craggy osteoarthritis might be built with advancing years. There is no doubt that some of the North Elmham lesions, especially perhaps the arthritic shoulders, can be attractively explained by inferring a martial training of which the graves are silent. The absence of swords and spears need not imply that they had all been beaten into plowshares and pruninghooks. This is discussed in further detail below (section on Muscular Development).

A few other clues remain to be extracted from these diseases.

If the individual cases of arthritis are plotted against the burials, they are found not to be randomly scattered throughout the cemetery. Vertebral arthritis and osteophytosis are distributed fairly evenly, especially when the mildest cases are considered, but arthritis of the limb joints reveals some regional concentration. Fig. 195 records its distribution for shoulder, elbow, wrist and hand joints, also for hips, knees and feet. It shows that burials from the area within the dotted line were unaffected by arthritis, except for one example in the feet. In the rest of the cemetery there is a widespread scatter of the disease, several of the skeletons being affected in two, three or more joints. Among the firmly sexable individuals within the dotted line there is a preponderance of males, who out-number females by 17 to 8. This makes it even more remarkable that so little arthritis is found in these persons. When it is remembered that osteoarthritic lesions of the shoulders, wrists, hands and knees, etc. are likely to be the result of vigorous, indeed violent, use of these joints, the absence of this pathology from one group of burials suggests that these individuals were of a favoured, more leisured class - a fortiori because most of them are males.

The solitary case of arthritis of the feet in that area might be the result of occasional tarsal strains or sprains when walking across rough country. The absence of it in the limb joints, including the hands, of other persons here, suggests that whoever these people may have been they were not the house builders, tree fellers, ditchers or horse breakers of the community. Was this, perhaps, a part of the cemetery largely reserved for monkish scribes and literati, who pushed pens rather than ploughs, or for upper crust thegns and their pampered kin? Here, again, is a question that can only be asked not answered but the accumulation of small wisps of evidence such as this points to some such interpretation.

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The additional absence of arthritic jaws from this part of the burial ground may further suggest that these persons enjoyed a slightly more tender and succulent diet than the harder tack which seems to have prevailed among the people who came to rest in other areas of the cemetery.

INFECTIONS

Apart from a few diseases, such as leprosy, which produce a well-defined syndrome of pathological bony changes and a few, such as paradontal abscess or osteomyelitis, where the evidence is relatively unambiguous, infections tend to be difficult to recognize in ancient burial grounds. North Elmham is no exception to this. A number of inflammatory and reactive lesions are found but their status is uncertain and often made more puzzling on account of postmortem soil erosion adding an overlay of 'pseudopathology' to an already ambivalent situation.

One of these problem cases is Inh.176 (male) in which the R. radius is 38.7 mm longer than the left. It is also much stouter. So, too, is part of a R. ulna when compared with the left one. Perhaps poliomyelitis would be the most likely condition to account for these discrepancies between the two sides but, in the inevitable absence of any history of this case, other possibilities cannot be excluded. A not very severe congenital hemiplegia or some other birth injury such as an Erb's paralysis could have produced the same result and, in this much damaged skeleton, no sure way of deciding between rival diagnoses is available. Some differences between the L. and R. femora and tibiae exist but they are very slight and confuse, rather than clarify, the picture. A further difficulty is that it is just possible that the discrepant upper limb bones are not from the same skeleton. Remains of two persons may be mixed here, in which case we are merely contemplating a chimera, not a disease. On balance it appears probable that the two sides are from the same individual but, even so, it would be incautious to press for a diagnosis. This inhumation admirably illustrates the problems which harass the osteologist and render opinions expressed on skeletal remains fraught with uncertainty.

In Inh.24 (male) the shafts of four hand phalanges are roughened by some form of periostitis. Again it does not seem possible to assert that this is due to an infection, although it probably was. Traumatic periostitis is a fairly likely alternative, whilst such conditions as frostbite or Raynaud's syndrome cannot be excluded with confidence.

Inh.197 (female) has extensive osteitic thickening in the shaft of the L. femur. The condition does not at all resemble Paget's disease and is surely an infective process. Radiography confirms that it is due to a chronic osteomyelitis although there is no sequestrum or fistula into the medullary cavity. The L. fibula of this inhumation is also similarly affected which suggests that the infection was more widespread than can be recognized now, in view of the defective nature of the remains.

A highly probable example of osteomyelitis is Inh.74 (female). Here the R. clavicle has a well marked area of periostitis in its lateral half, surrounding a multilocular irregular cavity in the bone (Plate LXXXVI). The L. tibia and fibula also reveal extensive osteitic thickening and both have a cavity in the bone which is likely to represent an osteomyelitic abscess (Plate LXXXVII). Unfortunately these remains, also, are poorly preserved and an adequate view of the pathology is impossible. The evidence is strongly in favour of this being an infection but it would be unwise to guess what the causal organism might be. Even its infective origin must retain a shred of doubt: the possibility that these cavitations were due to a cystic bone disease, though remote, cannot be excluded without a lingering wisp of uncertainty. As always, when no possible history can be obtained from the patient, firm diagnosis of ambiguous changes such as these presents insuperable difficulties. The likeliest solution here, however, must remain a staphylococcal or some other infection.

Inh.10 (male) is yet another one to offer perplexing problems. This, too, is a severely damaged and defective skeleton. Its outstanding feature is a grossly disorganized L. tibial head, with jagged outgrowths of bone into the knee joint, associated with shallow sinuses (Plate LXXXIII). Fragments of the shaft and condyles of the L. femur were also involved in this process, as was the L. patella, but apart from a trace of osteoarthritis the R. limb seems to have been normal. Osteomyelitis is again a possibility but, as far as these damaged remains permit one to judge, a primary focus in the knee joint might be more likely. If this were so, septic arthritis from a penetrating wound would perhaps be rather more likely than tuberculosis. Extension of the disease from the joint has left a severely thickened proximal tibial shaft and, as far as can be seen, of the femur also. Clinically, severe interference with function must have resulted and aesthetically, the limb must have been monstrous to see. This may be connected with the fact that this was the only skeleton at North Elmham which was buried facing west, not east. It is possible that this man's disease was thought to be the just reward of some dire misdeed; that he was the victim of elf-shot, the 'wyrn' or the flying venom and that, as one who had incurred the wrath of supernatural powers, he was unfit for orthodox Christian interment.

Finally, there remain ten burials which show a type of lesion that is commonly found in Anglo-Saxon material. The affected bones are the tibiae and fibulae. The lesions consist of a rough longitudinal 'graining' or striation of the shaft, with a scatter of minute pitting on the surface, slight thickening of the cortex and a lumpy or nodular profile when this is extensive. The lateral surface of the tibia is often as severely affected as the subcutaneous surface but, usually, the posterior surface is rather more lightly attacked. When both limbs are available, it is usually found to be bilateral and the amount of shaft involved is seldom less than a third of it, often more than two thirds. Small localizations of it are rare. The condition is clearly some kind of periostitis and osteitis but it is very difficult to decide what produced it. The occasional narrowly localized example might be due to chronic infection under an indolent varicose ulcer or some similar open lesion. But this can explain only an insignificant proportion of them and no case of this type occurs in the North Elmham people. Small, numerous and often repeated minor traumata need to be considered but the general tendency towards bilateral symmetry, the regular involvement of the lateral tibial surface almost as extensively as the medial surface, and the not infrequent presence of identical lesions, posteriorly make it difficult to see this as a direct result of barking the shins on tools, fences or other objects in the course of their daily work. There is no doubt that certain infections, especially chronic ones such as leprosy, may produce lesions apparently identical to those under consideration. But leprosy has other distinguishing features and no case of it has been identified with certainty at North Elmham, although it was present at the same period in the Late Saxon cemetery of St. Catherine, Thorpe, Norwich and became plentiful in the county, for example at Norwich and South Acre, in medieval burial grounds (Wells 1967b). Some primary disturbance of circulation, such as endarteritis obliterans or a deep thrombotic episode, also needs to be considered but any possibility of a gangrene, as from frostbite, diabetes, etc., is ruled out by the normality of the feet and toes in the affected persons. Of the ten cases, one is unsexable, one is female and eight are males. Any explanation of the condition should take into account this preponderance of men, which is also found in other cemeteries such as Burgh Castle and Caister-on-Sea. The disease could, perhaps, be a sex linked one such as haemophilia but it does not seem to be convincingly genetic in origin and, if it were, we might expect fewer females to have it than is actually the case. As already suggested, it does not appear likely that it is due to misuse of any kind of tool and it is not easy to imagine what other essentially masculine occupation might account for it.

There is a possibility that it might result in some way from a form of dressing peculiar to the men, some sort of tight cross-gartering for example, but the evidence is insufficient to support or refute this suggestion. It is at least possible that this periostitis was due to some condition which no longer exists and was restricted to a few early

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populations. Even today there is a curious disease, St.Helenian fever, that is characterized by inflammation of the legs, but which is limited to certain families on the island of St.Helena. No examples of the North Elmham lesion are found in children or adolescents. If it had begun in childhood in any of these cases we might expect to find some interference with the general health of those affected, which could show itself as an overall stunting of growth. But the mean length of the femora (457.4) and tibiae (378.7) of the eight men who show the disease is just in excess of the average for all the males of the North Elmham population, though not significantly so.

It is a pathological process which deserves much greater attention than it has so far received but, at present, any definite assertion as to its cause is almost certainly premature.

Considering the total evidence given by infective processes at this site (if they are all infections) suggests various conclusions: (a) There is no clear evidence of such specific diseases as leprosy, tuberculosis or syphilis although they cannot be excluded with complete certainty. (b) The incidence of any infections (apart from dental abscesses) is low and most of those which occur seem to be mild. (c) The incidence is higher in men than women, which suggests an explanation in terms of occupation or dress, rather than diet. (d) Bone infections of children, which are extremely common in eighteenth-nineteenth century burial grounds, are not found here and this indicates an overall level of nutrition which was abundant enough to give the growing youngsters adequate resistance and reserves of vital energy. (Though, in this context, we cannot know anything about the incidence of juvenile dysentery, pneumonia or other soft tissue lesions). (e) These people were farmers and extensive stockbreeders so it is worth noting that diseases which they might have contracted from their animals are not identifiable here. These would include bovine tuberculosis, brucellosis and actinomycosis.

FRACTURES

At least eighteen persons (eleven male, six female and one ?female) and possibly six others appear to have fractures.

Ribs are the most commonly broken bones here and occur as single fractures in Inhs.56 (male), 62 (male) and 86 (male); Inhs.89 (female), 160 (male) and 123 (?female) each have at least two broken ribs; Inh.194 (female) has at least eight, 4 L. and 4 R. This gives a total of seventeen rib fractures in seven individuals. In accidental falls and in antero-posterior crushing injuries of the thorax, ribs tend to fracture in their posterior third, near the angle, as occurs in the man Inh.86. However, several of these North Elmham fractures occur in the middle or anterior part of the bone (e.g. Inhs.62 and 160) and this tends to be rather more characteristic of direct violence from a narrowly localized blow from fist or club. In these cases we may reasonably be inclined, therefore, to suspect deliberate aggression, but the proposition must not be too strongly asserted since such fractures easily result from falls onto projecting corners of tables, etc. Multiple bilateral rib fractures, as in the woman Inh.194, very strongly suggest severe antero-posterior compression of the chest, as from being crushed under a falling tree or a waggon wheel. They are also well known to have occurred during the flurry of rape.

Broken large limb bones are uncommon here. No fractured humerus, femur or tibia can be identified, but there are three fractured fibulae. In Anglo-Saxons and some other early groups this is one of the commonest of all fractures. It is usually due to stumbling in such a way that the foot is strongly inverted at the ankle. At Red Castle, Thetford, 14% of surviving fibulae had this type of (Pott's) fracture and it was thought that constantly walking and working over rough, previously untilled, soil was a likely cause. Clumsy footwear might also have contributed to this high frequency. At North Elmham this injury was much less common. Its frequency was two (2.8%) out of seventy two male bones and one (1.7%) of sixty females - a combined incidence of only 2.3% for

the group. This much lower frequency may imply that these people were, in general, working on smoother fields and seed beds than the Thetford folk; that they wore less clumsy footwear and so were less liable to stumble; that they had more extraneous support for their legs as, for example, from a fashion of effective cross-gartering; that they were physically fitter and normally had better muscle tone in their calves; or even that they got drunk less often.

A Colles' fracture is one through the distal end of a radius, about 2-3 cm proximal to the wrist joint. It is classically produced as a result of accidentally falling forwards onto an outstretched hand, with the palm downwards. Where many Pott's fractures of the leg are found, it is common to find a Colles' fracture occurring in a radius of the same person: he stumbles, cracks his fibula and, in trying to mitigate his fall, fractures his wrist. With the low incidence of broken legs at North Elmham we should not expect to find many Colles' fractures caused in this way. Nor do we. Only one broken radius is identifiable (Inh.78) out of 151 which survive, an incidence of 0.7%, and in this case the state of the leg bones is uncertain because only fragments are preserved. This fracture could be due to a fall at work, a drunken tumble from over indulgent quaffing of home brewed mead, or some similar mishap.

In a somewhat different category is the fracture in the distal third of the R. ulna of the woman Inh.109. This could undoubtedly be due to a simple accidental fall, but in a substantial proportion of such cases they are due to being struck on the raised forearm when trying to ward off cudgel blows to the head - the so-called 'parry fracture'. The present example may have been caused in this way.

Another fracture of uncertain significance is the L. clavicle of Inh.157 (male). A break such as this is commonly produced by falling heavily onto the point of the shoulder: it is well known as a result of slipping on a patch of hard icy ground. Alternatively, it may be due to the direct impact of a club. The blow is usually aimed at the head, the victim seeks to evade it by side-stepping, he fails to move fast or far enough, and the club falls to shatter his collar bone. In the present instance the evidence would seem to leave either explanation equally probable.

Fractured fingers are highly typical of modern industrial societies and the maladroit use of machinery. They also occur anciently and are found at North Elmham. Inh.166 (male) has a well healed fracture of a proximal phalange of a finger. It is soundly healed, but there is some slight deformity of the bone. Inh.188 (male) has a small spur of bone on the volar surface of a middle phalange. It cannot be definitely asserted that this did not arise from the healing of a slight hair-line fracture but on balance it seems more likely to be secondary to a damaged tendon or periosteum. Radiography, as so often in long buried remains, fails to resolve the diagnosis owing to post-inhumation changes in the texture and microstructure of the bone. In Inh.55 (male) there is slight thickening of the head of a first metacarpal and the heads of two phalanges. Changes of this kind are not uncommon as a result of periostitis and callus formation around hair-line fractures, but they can also follow infections and other lesions of the finger. Radiography does not help in this case either and the diagnosis must remain ambiguous. Inh.13 (male) has a proximal and a middle phalange fused together at an angle of about 110°. Phalangeal ankyloses are typical of leprosy and other infections, but in this case there is no trace at all of any infective process and the condition is likely to have been the result of one or more hair-line fractures which involved the interphalangeal joint surfaces and subsequently gave rise to an arthritic synostosis.

Characteristically, all these finger lesions are in men and this is presumably due to the rougher use of their hands, as compared with the women. Each of the conditions just described, even if it is not a fracture, could be the result of single or repeated episodes of trauma, such as the clumsy use of a hammer or the nipping of fingers between pieces of timber while house building, etc. They might also be due to deliberate aggression

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such as a smart rap on the knuckles from a stout stick.

Two persons, also both men, have foot fractures. In Inh.95 a L. (? 2nd) metatarsal has a well healed break of its shaft and Inh.193 has a fractured L. 5th metatarsal. This, too, is soundly healed, but there is extensive deformity. Metatarsal fractures rarely occur from deliberate aggression. They are likely to be due to dropping a heavy weight on the foot, being trampled by horse or ox, falling from moderate heights or occasionally as a result of excessive walking - the so-called 'march fracture'.

Another and more serious possible fracture which is also likely to have been accidental is found in Inh.59 (female). The body of the T12 vertebra is anteriorly wedged and it is likely, but not quite certain, that this was due to a compression fracture. Falling from a height or being partly crushed with exaggerated spinal flexion under a collapsing roof or lintel could explain such a finding. In this event additional spinal damage would be expected and this woman does, in fact, have fairly extensive osteophytosis and osteoarthritis of the column, together with arthritic changes in the heads of five ribs and the articular tubercles of seven. It should be said that the probability of tubercular or other infection accounting for the collapse of this vertebra seems slight, though a simple involutional degeneration cannot be excluded with certainty. In Inh.1 (female) a partial collapse of the body of the L5 vertebra, with severe osteophytosis, seems more likely to be a chronic disintegration of the bone from repeated stress episodes than the result of a single traumatic event.

The extensive injuries of Inh.150 (male) must also remain ambiguous. The position and mobility of the scapula serve to make fractures of this bone rather uncommon. When they occur, they are usually due to severe direct violence. The injuries to this man's R. scapula might be due to crushing beneath a falling tree or roof, but they could equally well result from a very handsome drubbing with a heavy cudgel. The possibility of open, penetrating wounds of both scapulae cannot be entirely eliminated here.

It is unfortunate that the L. ischial ramus of Inh.123 (female) has been much obscured by post-inhumation erosion and breaking. It seems almost certain that the bone was fractured and repaired by a substantial mass of callus, but in the absence of a better view of the lesion it is difficult to evaluate. Fractures in this position were far from common before the days of high speed traffic accidents, but they can occur from various forms of crushing or from falling heavily upon a fence rail, tree branch or similar object with the legs astride.

Finally, there are four inhumations, Inhs.8 (male), 14 (female), 78 (female) and 116 (female), which have each lost one or more central incisors and there is a certain amount of evidence to suggest that this was due to trauma rather than dental or alveolar disease. If so, the injury may equally well have been accidental from falling on a table edge or deliberate from a well directed punch in the mouth. But the differential diagnosis between trauma and periodontal disease is often impossible to make and in none of the present cases is the evidence unequivocal.

In describing this assorted medley of fractures, a few suggestions have been offered as to possible ways in which they could have occurred. Most, if not all, are ambiguous to some extent and the best that can be done is to glance at a range of unconfirmable 'likelihoods'. Taking an overall view of these lesions does not suggest that these people were unduly truculent or aggressive. Disregarding the very dubious evidence of the lost incisors, there are only two cases where aggression seems to be the most probable explanation: the parry fracture of Inh.109 and the smashed scapula of Inh.150. Some of the broken ribs also have a high likelihood of being so caused. The collar bone is considerably less probable and all the rest are far more likely to be due to accident than to malice.

One possible exception here is the fractured phalange of Inh.166. This man might easily have broken his finger in the act of punching some else. However, in this context we must note the total absence of two injuries which are commonly found in communities where much fisticuffs are indulged in: the fractured nose and the broken jaw. At Red Castle the people did not appear to be an especially bickering group yet, in twenty five well preserved faces, three (12%) had broken noses. On the whole, therefore, the evidence at North Elmham suggests that, although they were an active and vigorous community, they were more likely to settle their differences by shouting than punching.

TRAUMA OTHER THAN FRACTURES

It seems possible here to recognize trauma as the cause of a number of lesions which do not involve fractures. In this category are a group of cases which, despite considerable variation, were probably caused in broadly similar ways. These cases mostly show one or more small exostoses, usually near a joint, or sometimes an irregular, narrowly circumscribed roughness of the bone. Nearly all these lesions occur at the place where a ligament or tendon is attached to the bone and are probably due to a violent strain. This would tear some of the fibres of the ligament, slight bleeding would take place into it, with subsequent clotting of the blood and eventual ossification of the small haematoma thus formed.

In five of these cases, Inhs.18, 82, 95, 98 and 190, the foot is affected and shows tears of the talofibular, bifurcated or other ligament. In four cases, Inhs.18, 82, 152 and 197, the distal end of the tibia or fibula is affected, apparently due to tearing of the crural interosseous membrane. All these nine injuries could result from severe wrenching of the ankle or tarsal joints when stumbling over rough ground or lurching drunkenly into unheeded pot-holes and ditches.

Inh.86 has osteoarthritic changes of the L. sterno-clavicular joint (Plate LXXXVIII), but there is also an exostosis in the form of an organized blood clot on the adjacent manubrium sterni, which suggests that it was due to tearing of the joint capsule during the course of some extremely violent movements of the arm or shoulder-girdle. Another sequel to vigorous arm movement can be seen in Inh.8, which has irregular roughening and thickening of the infraglenoid region of the L. scapula. This was probably caused by tearing some of the fibres of origin of the Triceps brachii muscle.

Two individuals, Inhs.171 (Plate LXXXIX) and 190 have puzzling lesions adjacent to an anterior superior iliac spine. Both are described in Part Two of this report. The balance of evidence inclines towards a diagnosis of torn ligaments, perhaps with some avulsion of a flake from the surface of the bone.

Inh.188 has a small spur of bone on the volar surface of a 2nd phalange of a finger. This is at the site of insertion of part of the tendon of the M. flexor digitorum sublimis and probably results from a tear of the tendon fibres. This could be due to the violent wrenching open of the closed fist as in trying to restrain a bolting horse or awkwardly letting slip a heavy building timber.

The total evidence of all these injuries very strongly reinforces what can be inferred from the distribution of fractures and osteoarthritis among these people. It shows that they led rough, energetic lives and were subjected to heavy stresses which were especially focussed on their feet and arms. There is plenty of evidence at North Elmham that the women must have done a substantial amount of hard physical work, but the osteoarthritic changes show that the really heavy work of the community was done by the men. The evidence of these torn tendons also supports this conclusion: every one of the fifteen lesions described in this section occurred in a male.

The irregularity and roughness of the sacro-coccygeal articulation of Inh.22 (male)

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could equally well have been due to a heavy fall on the bottom or - what was no doubt as common in Anglo-Saxon parlance and practice as in modern times - a well directed kick up the arse.

OSTEOCHONDRITIS

Five individuals show lesions which may be described as osteochondritis dissecans, although they are not a homogeneous group.

Inhs.30 (male) and 32 (female), both fully adult, have the condition which is sometimes referred to as anterior epiphyseal dysplasia. It is a defect of the superior margin of a lumbar vertebra: L5 in Inh.30, probably L3 in Inh.32.

Inh.63, an adolescent about twelve years old, and Inh.121 (female), aged twenty four to twenty six, have typical cavitation lesions of the medial femoral condyle.

Inh.188 (male) has a small cavity on the proximal articular surface of each 1st metatarsal.

Some uncertainty still exists as to the cause of the different types of osteochondritic defects. At least in part, they may be taken to indicate a response to stress situations.

MISCELLANEOUS

There remains a small medley of pathological cases which fall into no well defined single class.

Extensive roughening of the floor of both maxillary antra is present in Inh.30 (male) and Inh.104 (male). This is due to chronic sinusitis, probably with a long-standing accumulation of pus in the cavity. In some early populations maxillary sinusitis is a common finding and, in north west Europe, was perhaps due to the nasal irritation caused by living in low, smoke-filled huts and huddling around a central fire hearth, with the aggravation caused by much droplet infection in cold, damp climates. Owing to bone damage it is possible to inspect the interior of thirty seven antra from North Elmham and no other infected example is found. The two cases noted above give a sinusitis incidence of 5.4% which seems not to be high by Anglo-Saxon standards. It may be tentatively inferred, therefore, that even though these people had central hearths they usually managed to maintain enough ventilation in their living rooms to prevent excessive paranasal irritation from smoke and its by-products. The village itself was probably sufficiently well drained and wind swept to ensure that its inhabitants were not living in a constantly damp and fog filled atmosphere. What circumstances led to these men's sinusitis cannot be determined, but we may wonder whether it could be occupational: neither of them seems to have had the physique or appropriate muscle development for a smith, but they might have been stokers of pot kilns or the menials of the community to whom especially dirty and dusty jobs were allotted.

The range of footwear used by Anglo-Saxons is still not fully known. In modern British feet one of the most common abnormalities is hallux valgus, the lateral deviation of a big toe, often associated with bunions. This condition is especially due to wearing unyielding shoes which are too narrow and the rarity of the deformity in Anglo-Saxon feet is conclusive evidence that most of their footwear allowed plenty of room for the toes to spread themselves uncramped and to retain normal flexibility when walking. But sometimes hallux valgus is found and, at North Elmham, Inh.103 (male) shows it. We can infer from this that just occasionally some kind of boot or shoe was worn which did crowd the toes together and led to the deviation found here. At least, in modern populations there is a general tendency for hallux valgus to begin and often become well established, in young people. It is common in teenage girls who find themselves trapped between their vanity and the pinch of fashion. If this man had also developed it when young, and there is

some evidence that this may have been so, we might toy with the idea that his family were exceptionally poor members of the community and that he spent his childhood and adolescence having to wear old shoes long after they had become too small for him.

Inh.153 (male) presents a somewhat different picture. Both his 5th metatarsal bones are more bowed than is usual: their shafts curve medially towards the other toes. There is no suggestion of any pathological change here and it seems likely that the deformity is due to the habitual use of an unduly tight sandal strap or some other form of constrictive binding.

Inh.8 (male) has very marked forward bowing of the sternum. This may be associated with a 'pigeon chest' and is sometimes a sign of rickets, but in this person no such pathology is present. He was a powerfully built man, with strongly developed muscles.

The asymmetrical face of Inh.116 (female) is described in Part Two. It suffices to repeat here that this was probably a developmental oddity of no great significance. Two other examples of asymmetry may be noted. Both Inh.11 (female) and Inh.124 (male) show well marked plagiocrany - that is an oblique flattening of the posterior part of the skull. This was an obtrusive feature of the crania from Red Castle, Thetford, where it was certainly not due to disease or to any deliberate deformation of the skull. It was thought to be the result of cradle decubitus. The babies were probably strapped into their cribs or onto cradle boards to keep them snug and still. When this happens a child usually turns its head slightly to one or other preferred side and by habitually maintaining this posture gradually flattens the occiput on that side. Although this custom cannot be recognized as at all common in the North Elmham community, it is likely that a few babies, these two included, were treated in this way, perhaps by over-solicitous mothers or in families where the mother was a foreign girl who had imported the practices of her own cultural group, (possibly Frisian, which is what the Red Castle people may have been). In this connection it may be noted that Inh.124 stands rather apart from the rest of the population in having a slightly 'pinched in' appearance of the antero-inferior region of his parietal bones. It is not too far fetched to suppose that he could have inherited this from a 'foreign' mother. Inh.11 has no very exceptional cranial features apart from being somewhat heavily built for a female. (She can be confidently sexed from her pelvis and other bones). But she is unique here in having femora whose greatest length is from the medial condyle to the tip of the great trochanter - not, as is usual, to the head of the bone. There is no trace of pathology in her femora and this feature, too, may be one which she owes to genes inherited from a foreign mother.

Inh.122 has a low projection on the shaft of the L. femur, of the kind which I have described elsewhere as an eminentia intervastum (Wells 1971b). It is of uncertain origin but may be due to repetitive muscle movements, as in the rhythmic hoeing of seed beds.

Finally, Inh.127 (female) has a much roughened R. ischium at the site where a bursa underlies the tendon of the hamstring muscles. This rugosity closely resembles the changes seen in 'weaver's bottom'. Whether, in this woman, it could have been the result of sitting long hours at her loom is impossible to determine. Probably the technique and apparatus of Anglo-Saxon weaving was far less likely to produce the condition than the heavy looms of the eighteenth century. It is not limited to weavers and may be found as a result of any work which involves what may be described as 'traumatic sitting'. Coachmen, waggoners and bargees are liable to suffer from it and it may also be due to a single episode such as falling heavily on the rump, especially when the victim has little meat on his buttocks to pad his fall. In the present case there is no way of deciding which of these possible causes is most likely.

CAUSE OF DEATH

The cause of death can be recognised with certainty in only one of the 206 individuals

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discussed here: Inh.171. This man was hacked to death by at least three sword or axe blows to the skull (Plates XC; XCI), one on the R. arm and one which cut into his neck severing his R. carotid arteries and jugular vein.

Apart from this, no other lesion appears to have been a likely direct cause of death. Osteomyelitis is commonly fatal but in Inh.74 the affected bones seem to have healed well and the disease looks as though it had subsided. Some doubt must remain here because the skeleton is defective and we cannot know whether she eventually died from an associated blood infection. Inh.197 is ambiguous. It had a severe infection, probably osteomyelitis, and this may have led to death from chronic toxic absorption. If it were not the immediate cause of this woman's death, it could hardly have failed to be contributory. The same can be said of Inh.10 (Plate LXXXIII) the man with the grossly disintegrated L. knee joint. Inh.2 is doubtful. This woman had a severely atrophic arm and hand, but it is possible that the disease had become inactive long before her death (Plates LXXIV; LXXV).

Any other pathological conditions at North Elmham, such as the extensive osteoarthritis of the vertebrae and ribs, the paradontal abscesses, etc., can hardly have been more than contributory to the shortening of life span, not directly responsible for any deaths.

ABSENT DISEASES

Finally, it is worth noting the absence of certain diseases, some of which are found among populations contemporary with the North Elmham people or which became common later.

The apparent absence of leprosy, tuberculosis and syphilis has already been mentioned, but must be treated with some slight reservation. For example, it seems impossible to exclude tuberculosis with irrefutable certainty as the cause of the diseased knee of Inh.10 or the L. sacroiliac irregularity of Inh.33, though in both cases this diagnosis is highly improbable. Equally, a few of the periostitic tibiae and fibulae might conceivably be leprosy, in spite of extremely strong evidence to the contrary.

No trace of rickets was found in any bone and this must imply that they had plenty of vitamin D in their diet, presumably from animal fats, and that they spent much time in the open air where they could absorb ultra-violet radiation. In this they are typical of other Anglo-Saxon communities. Scurvy, too, is a disease which hardly existed in Britain before the Norman conquest and no trace of it can be found at North Elmham.

Congenital dislocation of the hip and Perthes' disease are also absent, though both have been recovered from burial grounds within a few miles of this site. The absence of cleft palate has already been noted. No part of any weapon, arrowhead or spear point has been recovered from this skeletal material and only Inh.171 (Plates XC; XCI) shows clear evidence of aggressive wounding.

The sum of this evidence shows that these people were, by the standards of their time, relatively healthy and long lived. They evidently had a diet which for the most part was adequate in quantity and kind to keep them free from deficiency diseases and to give them enough energy to undertake vigorous physical work. But the situation was precariously poised and the women, especially, may have suffered from some general malnutrition. The work of the community, though clearly strenuous, was probably only rarely so excessive as to do them severe injury or substantially to shorten their lives. The absence of a number of congenital defects which are thought to be due to recessive genes or to dominants with incomplete penetration, suggests that they drew upon a wide gene pool which was, in addition, free from many and gross abnormalities. Temperamentally, as far as we can tell, they seem to have been a reasonably relaxed and peace-loving com-

munity - though clearly capable of flashes of violence - and to have been not greatly molested by enemies.

TEETH

NUMBER OF JAWS AND TEETH

Most of the jaws from North Elmham show postmortem damage to some extent. Although this often makes them unsuitable for measurement it does not necessarily greatly affect their value as a source of information about the teeth. Adult jaws surviving from this site, in a state useful for dental study, comprise thirty six maxillae and forty seven mandibles from males, forty seven maxillae and fifty two mandibles from females: a total of 182 jaws. There are also a few jaws from unsexed individuals which are excluded from present consideration.

These 182 adult jaws should, with normal dentition, give a total of 2912 identifiable tooth positions. But owing to damage and defects only 2506 tooth positions are recognizable. In forty nine of these (of which all except two are third molar positions) the tooth has remained unformed or unerupted. This leaves 2457 positions which had contained erupted teeth and from these, 608 have been lost postmortem. There has also been a considerable antemortem loss, totalling 272 teeth (11.1% of those which had erupted). This leaves 1577 surviving teeth.

TOOTH LOSS

Tables 39 to 42 show the number of identifiable positions for each tooth, together with the numbers and percentage lost from each position. Tables 43 to 45 gather these data for the sexes separately and combined.

From these tables it can be seen that the antemortem tooth loss in women (12.1%) is somewhat higher than in men (9.8%). When it is remembered, also, that the women were dying rather younger than the men it may suggest that this difference in tooth loss is yet another expression of the overall lower standard of women's health at North Elmham, as compared with that of the men. And because a good functional dentition has selective value for survival in many societies - including, probably, the Anglo-Saxons - the loss of these teeth would itself have led to further deterioration of the women's health.

The frequency of teeth lost antemortem for men and women combined, 11.1%, may be compared with a rate of 15.9% at the Late Saxon site of Red Castle, Thetford, about 40 km from North Elmham (Wells 1967). It is uncertain why the North Elmham people should have had this lower rate. The general standard of health at Red Castle seems not to have been any worse than at North Elmham, although the Red Castle women died somewhat younger than the present group.

In a wider setting the North Elmham rate is also seen to be low compared with a rate of 17.1% in 6427 possible tooth positions from pooled British sources ranging from the fifth to eleventh centuries (Wells, unpublished). By contrast, in 12,061 French neolithic teeth, Hartweg (1945) found only 344 (2.9%) antemortem losses. By the eighteenth to nineteenth centuries a very much higher rate was the rule: from 1578 erupted teeth among a group of this date in a Norwich burial ground a few kilometres east of North Elmham, Wells (1968) found 534 (33.8%) antemortem losses.

The distribution of tooth loss at North Elmham is not especially noteworthy. From the tables it can be calculated that the first mandibular molar is the most vulnerable tooth with a 25.0% loss during life. The relatively high loss shown for third molars in these tables may be partly illusory. It was not always possible to be certain whether an absent tooth in this position was due to its having been lost antemortem or whether it had never formed in the jaw, especially when the bone showed post-inhumation damage. It is

TABLE 39. MALE MAXILLARY ANTEMORTEM TOOTH LOSS

Tooth	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
I.P.	21	28	31	33	33	32	31	31	30	30	31	31	31	28	29	24
A-M.	5	2	5	1	2	-	-	-	-	-	-	1	1	7	7	7
%	23.8	7.1	16.1	3.0	6.0	-	-	-	-	-	-	3.2	3.2	25.0	24.1	29.1

TABLE 40. FEMALE MAXILLARY ANTEMORTEM TOOTH LOSS

Tooth	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
I.P.	24	38	39	40	40	39	40	39	36	36	37	37	37	34	31	26
A-M.	1	6	8	5	2	2	4	4	3	4	3	2	5	8	6	3
%	4.1	15.7	20.5	12.5	5.0	5.1	10.0	10.2	8.3	11.1	8.1	5.4	13.5	23.5	19.6	11.5

TABLE 41. MALE MANDIBULAR ANTEMORTEM TOOTH LOSS

Tooth	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
I.P.	41	45	45	44	45	44	43	42	40	42	43	42	42	43	42	38
A-M.	11	10	9	4	-	1	1	3	5	2	2	2	3	9	7	7
%	26.8	22.2	20.0	9.1	-	2.3	2.3	7.1	12.5	4.7	4.6	4.7	7.1	20.7	16.7	18.4

TABLE 42. FEMALE MANDIBULAR ANTEMORTEM TOOTH LOSS

Tooth	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
I.P.	33	47	49	48	47	47	48	47	48	48	48	47	47	47	46	32
A-M.	6	11	14	5	1	1	2	6	6	3	1	1	4	14	11	6
%	18.2	23.4	28.5	10.4	2.1	2.1	4.2	12.7	12.5	6.2	2.1	2.1	8.5	29.7	23.8	18.7

TABLE 43. TOTAL MALE ANTEMORTEM TOOTH LOSS

I.P.	1155
A-M.	114
%	9.8

TABLE 44. TOTAL FEMALE ANTEMORTEM TOOTH LOSS

I.P.	1302
A-M.	158
%	12.1

TABLE 45. TOTAL MALE PLUS FEMALE ANTEMORTEM TOOTH LOSS

I.P.	2457
A-M.	272
%	11.1

N.B. In the above tables I.P. = identifiable tooth positions; A-M. = antemortem losses.

possible that a number of suppressed third molars have been mistakenly assessed as having been shed during life.

Of the central incisors, 8.5% have been lost antemortem and there is evidence that at least some of these were traumatic in origin, perhaps from falls or blows in the face. If deliberate aggression played any substantial part in these losses, it is notable that the total number of persons with lost central incisors where this might have been the cause, is six or seven women, as against only one man. It may be that this is an interesting social document bearing on the relationship of the sexes and the patterns of behaviour between them. Unfortunately, no proof is possible.

The general cause of antemortem tooth loss is not fully understood. It is definitely unsafe to assume that, because a tooth has been shed, it was necessarily - or even probably - carious. Many, no doubt, are lost as the result of alveolar infection, with resorption and recession of the bone, sometimes with a periodontal abscess around the tooth and contributing to its loosening, sometimes limited to alveolar osteitis.

DENTAL DECAY

Tables 46 to 52 show the distribution and frequency of carious teeth.

Of the 1577 surviving teeth in adult sexed jaws 102 (6.4%) are carious. In contrast to the considerable difference in the incidence of antemortem tooth loss between the men and the women at North Elmham, the frequencies of caries (male 6.8%, female 6.1%) do not differ significantly. But whereas the difference between antemortem tooth loss from all maxillae (9.8%) and all mandibles (11.8%) is only slight, the difference between the overall caries rate for maxillae (4.4%) and for mandibles (7.8%) is proportionately much greater - which is, of course, a common finding. Again the most vulnerable tooth is the mandibular first molar with a decay frequency of 20.0%.

Caries rates vary considerably between populations, even those which are close in space and time. This is well shown by comparing the North Elmham teeth with those from

TABLE 46. MALE MAXILLARY CARIES

Tooth	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	Total
No. of teeth	10	21	21	28	25	22	16	7	11	15	25	24	24	19	20	14	302
Carious	-	3	2	-	-	-	-	-	-	-	-	-	1	3	4	2	15
%	-	14.3	9.5	-	-	-	-	-	-	-	-	-	4.1	15.8	20.0	14.3	4.9

TABLE 47. FEMALE MAXILLARY CARIES

Tooth	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	Total
No. of teeth	16	25	24	25	30	25	16	11	9	13	21	26	25	24	21	17	328
Carious	-	1	2	1	1	-	-	-	-	-	1	2	2	3	-	-	13
%	-	4.0	8.3	4.0	3.3	-	-	-	-	-	4.8	7.7	8.0	12.5	-	-	3.9

TABLE 48. MALE MANDIBULAR CARIES

Tooth	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	Total
No. of teeth	26	34	33	38	37	34	27	14	14	25	30	34	37	30	34	29	476
Carious	5	7	10	3	-	1	-	-	-	-	-	-	1	3	5	3	38
%	19.2	20.6	30.3	7.8	-	2.9	-	-	-	-	-	-	2.7	10.0	14.7	10.3	7.9

TABLE 49. FEMALE MANDIBULAR CARIES

Tooth	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	Total
No. of teeth	20	31	28	39	39	38	29	16	16	25	33	36	37	29	32	23	471
Carious	6	5	4	3	-	-	-	-	-	-	-	1	2	7	5	3	36
%	30.0	16.1	14.2	7.7	-	-	-	-	-	-	-	2.8	5.4	20.6	15.7	13.0	7.2

TABLE 50. TOTAL MALE CARIES RATE

No. of teeth	778
Cariou	53
%	6.8

TABLE 51. TOTAL FEMALE CARIES RATE

No. of teeth	799
Cariou	49
%	6.1

TABLE 52. TOTAL MALE PLUS FEMALE CARIES RATE

No. of teeth	1577
Cariou	102
%	6.4

Red Castle, Thetford, where of 638 adult teeth only ten (1.5%) were carious. Other caries rates are: 11.4% for Romano-British (Emery 1963), 4.4 for Romano-British (Cooke and Rowbotham 1968); 8.1 for English Early Saxons (Hardwick 1960); 5.2 for Merovingians (Gröschel 1937); 12.5 for Belgian Frankish (Brabant 1963); 19.7 (male) and 31.3 (female) for eighteenth-century England (Krogman 1938). As with antemortem tooth loss, the reasons for these differences in frequency remain largely conjectural. Diet, undoubtedly, plays a large part but the precise factors involved are not fully understood. Protection against decay is partly related to an adequate intake of fluorine. Where this is low in the drinking water, it may still be obtained when there is abundant fish in the diet as, perhaps, at the Frankish site of Coxyde in Belgium, where in 12,330 teeth a caries rate of 4.7% was found (Twisselmann and Brabant 1967). Also at the seventh-ninth century site of Martyrs' Bay, Iona, where the low rate of only 0.4% was found (Wells in press).

There is a well-established relationship between the amount of caries and the general pattern of diet. Amongst predominantly hunting peoples, with diets rich in meat, low caries rates are the rule; with increasing consumption of cereals - especially when cooked as soft mashes - progressively more decay is found. High intakes of refined flour and sugar are further items of cariogenic importance.

It seems likely that the North Elmham people had fairly abundant supplies of meat. As agriculturists, they certainly produced grain and milled it into flour, but there is no firm evidence about how this was processed. Bread was presumably made, but its consistency is uncertain and may well have varied. To what extent flour was used in other dishes and how much grain was consumed as porridge, mashes or frumenty is also obscure. The overall dental evidence suggests that they had a fairly well-balanced diet as far as its carbohydrate-protein ratio was concerned.

In adult, sexed skulls at North Elmham there are 102 caries cavities of which twenty six (25.4%) are occlusal, sixteen (15.7%) cervical, forty eight (47.1%) interstitial and twelve (11.7%) are not determinable owing to the advanced destruction of the tooth. In many early groups the proportion of occlusal caries is less than this: at Trentholme Drive, York, it was 19.0%, whilst in modern populations it may often be much higher. Of the interstitial caries cavities twenty nine (60.4%) are on the posterior teeth - a low

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figure - and nineteen (39.6%) are on anterior teeth. At Trentholme Drive the respective figures were 65.7% and only 1.9%.

In a further ninety loose teeth from North Elmham (twenty eight incisors, eight canines, twenty five premolars and thirty nine molars) only one, a maxillary M3, was carious.

Juvenile specimens are not well preserved at this site. Twenty children have surviving jaw fragments and these retain 242 teeth, two (0.8%) of which are carious.

PERIODONTAL DISEASE

At North Elmham the amount of periodontal disease is distinctly less than in some other populations in the region. Fifty one periodontal abscess cavities are scattered among the 2506 identifiable tooth positions and these are distributed among only twenty three individuals. As noted above, 182 adult jaws of estimated sex have survived. Thirty six of these consist only of an isolated maxilla or mandible, or some part thereof. In seventy three instances both maxillary and mandibular portions of the same skull are present, but of these thirty seven are incomplete. This leaves only thirty six individuals (16 male, 20 female) in whom the full thirty two possible tooth positions are identifiable. Thirteen (36.1%) of these persons had periodontal abscess cavities: eight men with eighteen between them and five women with nine. However, most of these cavities are very small, often nothing more than a slight absorption of bone around a tooth root. A few may, indeed, be post-inhumation artifacts from soil erosion. There is, moreover, relatively little alveolar osteitis, paradontosis or bone recession here, although it must be noted that a few of the jaws do have quite large abscess cavities and some also show extensive alveolar infection, with loss of interdental septa. The stink of halitosis, if uncommon, must have been well enough known in the community.

An extremely common cause of periodontal abscess is the attrition of teeth to the extent of opening the pulp cavity. Infection invariably follows and many of the examples at North Elmham were probably due to this.

At Red Castle, Thetford, at least a third of the population suffered from unambiguous periodontal abscesses which were often severe and associated with gross alveolar changes. These abscesses were often multiple and this severe degree of periodontal disease is almost certainly one of the reasons for the higher rate of antemortem tooth loss which occurred there.

In several hundred Anglo-Saxon burials from Caister-on-Sea, Norfolk and Burgh Castle, Suffolk, incidences closely similar to that of Red Castle were found (Wells unpublished). By contrast, at Eriswell, Suffolk, (only 45 km from North Elmham) among thirty three sixth-century Anglo-Saxons, periodontal disease was almost absent (Wells unpublished). The reason for this contrast is obscure and raises the question of what differences of diet, water supply or other factors may account for it. As far as water is concerned, it seems improbable that there was much variation in their drinking supplies throughout the region. It is likely that soft rainwater from shallow wells and small pools provided most of it. The deep well and cistern of North Elmham were exceptional structures, but may not greatly have influenced the chemical composition of what was being drunk, beyond increasing its hardness and giving it a deeper colour from ferruginous contamination. In any case, they had fallen into silted disuse long before the time of the skeletons we are now discussing.

Periodontal abscesses regularly develop around a tooth when its pulp cavity has been opened by attrition or fracture, but they are sometimes due also to spicules of bone, husks of grain and other foreign matter becoming impacted between the tooth root and the surrounding fleshy or bony gum. It is possible that techniques of food preparation at North

Elmham tended to keep such intrusive matter to a minimum. Perhaps fish, with its bones and scales, was consumed less or not at all here, but in relative abundance at the other sites. This would be expected at Caister and Burgh Castle since both villages were on the then estuary of the river Yare, whilst Red Castle was within a few yards of the Wave-ney, a river which even in the nineteenth century was still renowned for its plentiful stocks of salmon and other fish.

UNERUPTED TEETH

As noted above, forty nine teeth are unerupted, forty seven of them being third molars out of 286 identifiable M3 positions: an incidence of 16.4%. There are 137 M3 positions in male jaws, with thirteen (9.4%) unerupted, and 149 in the females, with thirty four (22.6%) unerupted. The higher incidence of this condition in the women has been observed in other populations, e.g. a medieval group from Clopton, Cambridgeshire (Tattersall 1968). The combined male and female maxillary rate of suppression is 13.6%; the mandibular is 18.1%.

A maxillary canine and a mandibular R. first premolar, both in females, have failed to form in the jaw. One other case should be noted, that of Inh.155, in which a deciduous L. canine is retained in the mandible of a nineteen-year-old woman. Through a defect in the bone, the permanent canine can be seen lying unerupted, deep in the jaw.

ABNORMAL FORMATIONS

Apart from their suppression, third molars do not show any strong tendency to abnormality. Fused roots are common; some teeth are reduced in size; a maxillary R. M3 has developed as a small peg; but no gross malformations are present.

This applies also to the rest of the dentition in these people. Their cusp pattern is essentially normal with maxillary molars M1 to M3 usually having 4, 4, and 3 or 4 cusps respectively; the mandibular series having 5, 4 and 4, with no especially noteworthy variants of form or number of cusps. As far as can be estimated 7.5% of maxillary first molars have a Carabelli cusp, which is not an exceptional rate. Only minor variants of tooth shape occur and there is no evidence of shovel incisors or barrell lateral incisors, etc. Slight overcrowding, mostly of anterior teeth, occurs in a few of the jaws (e.g. Inhs.127, 133 and 138), but is never extreme. Inh.122, an adolescent, had a supernumerary tooth (lost postmortem) in the R. half of the mandible: its 2] and 3] are ill placed whilst the empty socket lies between them and a normal 4], with all posterior teeth in place. Inh.28, an adult female, has a supernumerary socket between the maxillary R. central incisor and canine, with 5] and 6] typical bicuspid, 7] a normal first molar and no other tooth developed behind it. In two males (Inhs.62 and 95) a well marked diastema is present between a mandibular canine and first premolar. This relative lack of deformity and malposition of the North Elmham teeth suggests good functional use of the chewing apparatus from an early age and the absence of any serious abnormalities in that part of their gene pool which influenced their dentition.

ENAMEL DEFECTS

Irregularity of individual teeth, in the form of ridges or pits, is common here although most examples of it are slight. This is the condition of enamel hypoplasia. It is due to adverse influences of many kinds affecting the formation of a tooth during early stages of its development within the jaw. Malnutrition, infections such as gastroenteritis, bronchitis, measles and other exanthemata, chronic skin diseases, etc., occurring in childhood may lead to hypoplastic defects. About half the jaws at North Elmham show this condition and usually several teeth are involved. This is a high incidence when compared with some other early groups such as the Trentholme Drive, York, Romano-British people where only five dentitions had it out of an unspecified number of skulls, presumably several dozen. But this is a feature where different observers use different

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criteria of diagnosis and its assessment is influenced by much subjective variation.

Today, the commonest teeth to be affected by enamel hypoplasia are, in descending order of frequency, the central incisors, lateral incisors, first molars and canines, with the remaining teeth only rarely attacked. At North Elmham the canines are affected most often, with the second molars next in frequency, followed by the lateral incisors, second premolars, first molars and the remaining teeth. This suggests that, whereas modern hypoplasia usually results from some disease which attacks the child during the first eighteen months of life, at North Elmham it is more commonly due to illnesses in the two to four year period. No specific disease is identifiable which might be incriminated here, but some additional support is given to the suggestion by the high number of juvenile deaths which occur in that age range, as shown in Table 17. A similar pattern has been found in other early populations, such as that at Martyrs' Bay, Iona.

TOOTHWEAR

The extent to which the biting surface of teeth becomes worn varies greatly in different populations. The factors controlling dental attrition are complex but, in general, there is a broad relationship between its extent and the toughness and abrasiveness of the diet. Elaborate assessments of tooth wear have been devised but for the North Elmham material a simple categorization has been made into four degrees: 1 - in which the enamel and cusps are worn down with no more than one or two small uncoalesced exposures of dentine; 2 - in which separate areas of exposed dentine have coalesced, most of the occlusal enamel is worn away but with no more than an occasional small concavity of the occlusal surface; 3 - in which extensive concavity of the tooth surfaces is present, with considerable reduction in crown height but with these changes often somewhat compensated for by proliferation of secondary dentine; 4 - extensive destruction of the crowns of the teeth, opening the pulp cavity and often with the roots left separately exposed. Briefly, the four degrees may be referred to as: slight, moderate, severe and gross. No attempt is made here to deal separately with each tooth: the general pattern of the jaw is used instead. This lacks minute precision, but is amply sufficient for the purpose of this study.

Coded in this way, the attrition has been assessed as Slight in 20% of jaws, Moderate in 15%, Severe in 55% and Gross in 10%. Attrition recorded as 'slight' was virtually restricted to juveniles and a few of the youngest adults. It is especially noteworthy that some of the deciduous dentitions were heavily worn, with much of the molar crowns eroded away, before being replaced by the permanent teeth - which, themselves, might have their cusps worn completely flat within a year or two of eruption.

The balance of this evidence leaves no doubt that heavy tooth wear was the rule and that the diet was mostly tough, coarse or abrasive. The presence of grit in flour, from grinding corn in querns of Niedermendig lava, may be a contributory factor here, as it has often been at other early sites.

An additional feature at North Elmham is the very heavy wear on the incisor teeth, indicating that edge-to-edge biting was more common in these people than the overbite occlusion which is the rule today. This edge-to-edge bite was itself largely the result of the heavy attrition of the posterior teeth, which often resulted in a combined reduction of crown heights of 3-4 mm and was usual by the age of thirty.

No regularly recurring pattern of attrition was found which might have indicated that the teeth were used as tools or for special occupational purposes other than mastication.

CALCULUS

Deposits of calculus, or tartar, occur on many but by no means all dentitions at this site. Two common types of calculus are recognized: supragingival (or salivary) and

subgingival (or cerumal). Supragingival tartar is due to precipitation of salts from the saliva and is heaviest on tooth surfaces opposite the salivary ducts, i.e. the buccal surfaces of maxillary molars and the lingual surfaces of mandibular anterior teeth. Subgingival calculus usually forms in cases of periodontal disease by calcification of epithelial debris in the gingival crevices. It is attached to the necks and roots of teeth and is not common in healthy, vigorous mouths.

Probably about half the North Elmham jaws are affected, usually by supragingival accretions, but tooth loss before and after death inevitably leaves the position open to doubt. Whatever the cause of these deposits they are normally reduced by determined efforts to clean and brush teeth. No evidence of any active practice or oral hygiene is detectable here and the tartar, when present, can be described as slight in about 45% of cases, moderate in about 20% and extensive in 35%. In contrast to what is usually found in modern jaws, it tends to affect many or most teeth in a jaw and is often of mixed labial, buccal and lingual distribution, although the palatal face of maxillary teeth is often spared. In some early populations, tartar is much more common and more severe than at North Elmham and it is likely that the relatively mild extent of it here is partly responsible for periodontal infections being also not very severe, as noted above.

The evidence from tartar gives further support to the assumption that tough meat and coarse bread supplied a large part of their diet and that little was eaten in the form of soft paps or porridges.

SUMMARY

The total dental evidence at North Elmham shows that in these people the chewing apparatus was well developed and maintained in good condition by efficient functional use. The jaws were large enough to carry the teeth without undue overcrowding and the alveolus arose from a bone which was sturdy enough to support the demands made on it in the course of masticating a tough diet. Dental attrition was heavy, but decay and periodontal disease remained at a low level until erosion of the crowns opened the pulp cavity and led to secondary infection of the alveolus. Occlusion was mostly normal with edge-to-edge bite developing as attrition progressed. Genetic defects were few and of little consequence. Calculus tended to be widespread, but was seldom severe although no evidence of oral hygiene was found. Dentistry, if practised at all, was presumably limited to the extraction of carious and painful teeth.

PARITY

Advances have recently been made in estimating, from the pelvis, how many children a woman has borne. The method is still in its infancy and much refinement and application of it will be needed before we can be sure that it yields reliable results. It is a device of great potential. In many soils, infant and juvenile burials survive badly or not at all and if, instead of relying on the recovery of such evanescent atomies, it were possible to estimate a woman's fertility from her pelvis, this would greatly extend our knowledge of the dynamics of ancient populations.

In seeking to apply this technique to the North Elmham people we are, once again, dismally thwarted by the poor condition of most pelvises. The essential diagnostic structures are on the pubic bone and involve the areas adjacent to the symphysis, both on the ventral and dorsal surfaces; and also around the preauricular groove of the ilium. These parts of the pelvis are far from being the most resistant to decay and, even when the symphysis has survived to give evidence of the woman's age, it does not follow that enough of the surrounding bone is preserved to establish her parity.

In only nine cases here is there sufficient evidence on which to estimate how many children the woman had produced. The results are given in Table 53.

TABLE 53. NUMBER OF BIRTHS PER WOMAN

Inh.	57	59	74	94	108	109	127	191A	197
Age	40/50	40/50	35/60	32/40	40/60	35/50	35/45	23/35	30/35
Parity	5-7	2-3	3-5	2-4	7-9	3-4	3-4	3-5	2-3

With the present uncertainty of the method it would be incautious to make narrower estimates than those given above. If the mean average of the figures for each person is taken, a total of thirty seven children would have been borne by these nine women: an average for the group of 4.1 each. This does not seem an improbable number. The popular notion that, in the absence of modern contraceptive techniques, each woman would produce a dozen or twenty children is proved fallacious by many lines of evidence which need not be discussed here. Even if it were true, there is no reason to suppose that the North Elmham Anglo-Saxons did not practise contraception. They probably did: and it may have been quite efficient. There is also a spontaneous abortion rate for any population of women, a rate which is independent of any deliberate attempts to terminate unwanted pregnancies. What this spontaneous abortion rate may have been cannot be determined but it is unlikely to have been much less than 20%. This would then bring their average parity up to five births per woman. A further addition needs to be made because, if the mean of their individual age range is taken, at least three of them could probably have looked forward to several more years of reproductive life. In this case their average parity may have been about six.

It has been estimated that the mean age at death for all women who had reached eighteen years of age was 35.8. Even with the recent fall in the age of menarche which has characterized European-type societies, pregnancy tends not to occur in early adolescence owing to the absence of ovulation. In primitive and tribal societies, such as those which are found over most of Africa and all of New Guinea, the onset of menstruation is consistently later than in western Europe (occasionally by several years) and adolescent pregnancies are correspondingly delayed. This probably applied to the Late Saxons and, if so, it is unlikely that many of these girls would have begun to reproduce before the age of eighteen. Thereafter they would have, on average, about eighteen years of reproductive life and, if six children was their average parity, this would imply a pregnancy about once every three years. Modern primitives not infrequently show a similar spacing. Even if contraceptives are not used, the frequency of conception is likely to be reduced by the tendency for ovulation to be inhibited or much reduced during periods of lactation. These commonly exceed two years.

It is most regrettable that the few estimates of parity which are available here are insufficient to use for extensive palaeodemographic purposes.

EVIDENCE OF SURGICAL TREATMENT

When examining ancient skeletal material it is occasionally possible to recognize that some kind of surgical operation or treatment had been given to an injured or diseased person. North Elmham offers no such evidence.

Two operations may be dismissed at once. No fragment of skull shows the slightest trace of trepanning; no limb or digit gives any hint of amputation.

There are, however, three situations in which medical assistance must surely have been often demanded: childbirth, toothache and broken bones.

Before the invention of the obstetric forceps, the most rewarding abnormality of childbirth, as far as surgical intervention was concerned, was probably the assistance of

protracted breech deliveries. The special difficulty which would require and benefit from manipulation would be the freeing of the baby's arms if they became extended alongside its head and jammed its passage through the pelvis. It is precisely this manoeuvre, and the associated hasty dragging on the already delivered legs and trunk, which is likely to damage the brachial plexus and the main nerve supply to the arms. The result is an injury to the upper limb known as Erb's paralysis. There is certainly one case (Inh.176) where this syndrome could be a possible explanation of the inequality of the two arms and it may be that at the birth of this man his mother had writhed through the long agony of an obstructed breech delivery.

As Shakespeare pointed out 'there was never yet philosopher that could endure the toothache patiently', (*Much Ado About Nothing*, v.i.35). The North Elmham people were not philosophers and were probably disinclined to be patient, so it may be assumed that the rage of toothache drove them to seek solace, not only in mead and mandragora but in dentistry as well. Dental fillings do not occur here nor do artificial teeth, which were probably unknown to village Saxons. But it is likely that tooth extraction was practised. Often, no doubt, a rocking molar lingered in the jaw until alveolar absorption left it so loose that the sufferer could lift it from its socket with thumb and forefinger. Sometimes fiercer measures would be screamed for and then the dentist-leech would come with pincers to extract the torment. If this were done before a tooth was much loosened, the need for merciful haste and the lack of anatomical knowledge must not infrequently have led either to breaking the crown of the tooth, with subsequent inability to extract the roots, or to fracture of the alveolar margin alongside the tooth. There are, at North Elmham, a few cases where roots are left in the jaw, but no crowns are present. Some of these are probably the result of severe attrition but others may have been due to breaking the crown in attempts to pull out the tooth. In several other jaws, where there has been antemortem loss of teeth, the alveolus shows an unusually extensive loss of tissue without there being any periodontal abscess cavity to account for it. Some of these may have been the result of fracturing a strip of bone away from the margin of the tooth socket, with later absorption of the detached fragment. Neither of these suggestions can be proved, but both have a moderate likelihood.

Turning from problems of dentistry to consider broken bones in other parts of the body, a few comments may be made. In many ancient burial grounds, fractures are found in which repair has been accompanied by gross displacement of the fragments and permanent deformity of the bone. This may happen even when the wound has healed solidly within the mass of newly formed callus. None of the North Elmham fractures is deformed or distorted in this way, which might suggest that skilled surgical treatment was available, with nimble setting of the broken bones and competent splinting and after care. But the fractures which typically involve gross displacement and grotesque repair are the oblique and spiral breaks of humerus, femur and tibia-with-fibula. None of these occurs at North Elmham. The only fractures present here are ones which commonly occur with little or no displacement and the fact that eventual deformities are few and slight, need not imply that skilled leeches have set them, but only an absence of much deformity at the moment when they happened. Anyone with experience of broken bones will know how the great majority of fractures, other than major limb bones and a few special exceptions, could be left to repair themselves with only slight distortion or ultimate impairment of function. There is hardly a fracture at North Elmham which gives any impression of having benefited from surgical skills. No doubt the patients often demanded some sort of attention from their doctors, if only a rough splint to ease the pain of a cracked fibula, but they would have recovered just as well without it. In this respect, North Elmham reinforces the evidence from other Anglo-Saxon sites that bone setting was an unsuccessful speciality of their leeches. This, as far as major limb bones is concerned, was almost inevitable because one of the effects of severe transverse or oblique fractures of these bones is to cause an intense spasm and contraction of the surrounding muscles. This draws the distal fragment of the bone proximally to overlap the rest of it. Only if this muscle spasm is overcome can the bone be adequately extended and set. This was almost impossible to

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achieve before the days of anaesthetic relaxation and it accounts for the frequency of gross deformity in ancient healed fractures. It is commonly believed that Percival Pott (1714-1788), the eponym of the fibular fracture, was the first to emphasize the need to overcome muscle spasm before trying to reduce fractures. However, it is clear that the Anglo-Saxons had already appreciated this need and even sought to achieve it, albeit by inadequate means. This is shown by the following extract from Cockayne's Leechdoms, wortcunning and starcraft of Early England: 'In the case of many a man, his feet shrink up to his hams, work baths, add tares and cress and small nettle and beewort, put hot stones well heated in a trough, warm the hams with the stone bath, when they are in a sweat, then let him, the patient, duly arrange the bones as well as he can, apply a splint, and it is so much better the oftener the man bathes with the preparation' (Cockayne 1864-6, sect.xxvi, 69).

MUSCULAR DEVELOPMENT

An extremely important function of skeletons, whether exo-, as in molluscs, or endo-, as in vertebrates, is to provide attachments for muscles. The site of these attachments is usually marked by some ridge, roughness, tuberosity or pit and, because bone is an extremely plastic tissue, the extent to which these features are developed is related to the development and power of the muscles attached to them. It is common knowledge that the rugosity of bones is independent of their size: small persons may have huge attachments for their muscles and tendons, large people not infrequently have smooth skeletons with weak muscle markings. For this reason it is possible, by studying the relative development of different muscle markings throughout the body, to infer which muscles were most used and, therefore, what movements were most commonly employed. Unfortunately, the versatility of such joints as the shoulder and the hip, the multi-purpose function of certain muscles or muscle groups, seldom allow us to be minutely precise in determining what movements were carried out. Indeed, in most early communities it must have been unusual for persons to have been restricted to a few narrowly specialized activities. However, if this is borne in mind, a careful study of a skeleton will often justify a range of possible conclusions about the occupations of its former owner.

No attempt will be made here to analyze all the North Elmham skeletons: many of them are too incomplete to give reliable information. But a few representative and contrasting examples will be given in the hope that they will show the usefulness of the method. This approach has been almost wholly neglected by palaeo-pathologists although its potentiality was revealed ninety years ago by the distinguished surgeon and anatomist Sir W. Arbuthnot Lane (1887). He was given the problem of dissecting a corpse with the express purpose of finding out what the man's occupation had been. From his superb knowledge and understanding of anatomy, Lane showed that the man had spent much of his working life in a job that entailed bending forward, reaching out with his arms, straightening his back, half turning and throwing something over his left shoulder. In fact, the man had been a coal trimmer who worked in ships' bunkers and carried out precisely the range of movements which Lane had been able to infer. More recently, Desse (1975) has studied the skeletal changes, especially those of the vertebral column, which are characteristic of cyclists, footballers, skiers, wrestlers, carpenters, sawyers and tile layers. He thinks he can infer the dominant movements performed by a person from the appearance of his bones.

The brief comments recorded here are limited only to male burials.

Inh.61 was an extremely powerful man. Most of his skeleton was well preserved and it is clear that all his muscle groups were very strongly developed. Powerful trunk, shoulder and hip muscles were matched by similarly sturdy limbs, including his hands. It would be difficult to select one region or muscle system as being more developed than another and he can most reasonably be seen as some sort of general labourer who

applied himself to a wide range of strenuous work. Perhaps he was a small farmer who, round the seasons, was committed to the endless variety of heavy tasks which his livelihood entailed. He had mild vertebral arthritis at three rib articulations and some scattered osteo-phytosis of the spine which would be consistent with such an occupation. That he had virtually no other arthritic joints in spite of his physically vigorous life suggests not only that his musculature was sturdy enough to buffer his joints from excessive trauma, but also that he probably habitually worked at a moderate, smoothly rhythmic pace, avoiding sudden strains and unduly violent wrenches. We may wonder whether he was a burly Samson of phlegmatic temperament and orderly in his movements.

At the other extreme, Inh. 157 is distinguished by an overall lack of muscularity, which is especially noticeable in his trunk and arms. There can be no doubt that he spent little, if any, time on agricultural or other physical work and he can most plausibly be seen as either a wealthy man, living in idle ease, or as a craftsman engaged in some very light occupation such as the making of jewellery. Perhaps he was the scribe or bard of the community. He had certain congenital spinal defects, but whether his unvigorous life was a consequence of them is open to doubt. His weak physique may have encouraged stronger men to vent their aggressions on him. He has what is sometimes called a 'dodge' fracture of the left clavicle. This is a fracture caused by a blow from a club aimed at the victim's head, usually by a right-handed attacker. The victim dodges the blow, but too late and too little, and the weapon, though missing the head, falls on the clavicle instead.

Burial 98 was a young man of an overall sturdy build, but with especially strong thigh, leg and foot muscles. He also had extremely powerful Pronator teres and Pronator quadratus muscles in both forearms. These are the muscles which turn the hand on the forearm and must be strongly used when heaving or turning an object from side to side against resistance. His Flexor digitorum profundus, an important muscle in giving a powerful hand grip, was also unusually well developed. This combination of strong legs with powerful forearms and hands suggests that he may have specialized as a ploughman. The Schmorl's nodes in his vertebrae, the early arthritis in his right foot, and the evidence of an overstrained talofibular ligament in both feet would be admirably compatible with such a role and must add to the likelihood of the conjecture.

Burial 50 also had extremely powerful forearms and hands, with sturdy shoulders, although his lower limbs were less massively developed than those of Inh. 98. A possibility is that he was a blacksmith, wielding heavy hammers and pincers as he worked the refractory metal. Once again, the associated pathology gives strong support to this suggestion. Osteo-arthritis of the only surviving shoulder and of the left wrist, and gross arthritis of the right wrist and all surviving metacarpals typically result from the jerk and concussion of repeatedly crashing hammer on anvil. The additional Schmorl's nodes, arthritis and osteophytosis in his spine and ribs could be due to strenuous swaying movements of his trunk when undertaking especially heavy tasks.

Inh. 86 has enormously developed deltoid tuberosities on his humeri, and powerful Pectorales majores, Subscapularis muscles and the Supra- and Infraspinati. The Deltoid is a strong elevator of the arm and also contributes importantly to swinging the arm backwards and forwards and to rotary movements of the shoulder joint. The other four muscles rotate the humerus and draw the arm towards and away from the thorax. If we seek the most likely lumberjack among the North Elmham men, Burial 86 would be the first choice. A life spent swinging an axe to fell trees, and then dragging or lifting heavy lengths of their boles, would explain the exaggerated development of his shoulder girdle muscles. The osteoarthritis of his right shoulder, which affects both scapula and humerus, and the evidence of sterno-clavicular trauma, give substantial support to this suggestion. So, too, do his arthritic elbows and feet which could be due to the sway and jarring inseparable from axing trees, whilst his severely affected spinal column may admirably reflect the strain of dragging and humping weighty logs.

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Inh.56 also had exceptionally well developed musculature of his Pectorales majores, Subscapularis, Deltoids, Brachialis, Flexores carpi radialis and ulnaris, and the Flexores digitorum. This indicates vigorous use of shoulders, arms and hands. Perhaps he, too, was a woodcutter. In his case arthritis of the right shoulder, both hips, left foot and extensive spinal changes would again support this diagnosis. It is interesting, and perhaps more than coincidence, that both this man and Burial 86 had a fractured rib: each could easily have resulted from his job.

Inh.13 was a powerfully built man with especially strong Pronators of his forearms which, as in the case of Burial 98, might point to his being a ploughman. He had extremely large hands and feet, a condition which is sometimes said to be a response to violent strains and jerks made upon them. If so, it is possible that he was a horse-breaker. His metatarsal arthritis with eburnation, and his Pott's fracture, might well be due to having been much dragged and jolted whilst training high spirited animals.

Finally, Inh.95 was a very lightly built man with no great development of his arm or trunk muscles, but with very strong attachments of his Soleus, Gastrocnemius, Tibiales anterior and posterior, and other leg muscles. These are all muscles which are used in quiet, steady walking over hill and plain, and this may have been a man whose job kept him tramping around the country, perhaps as a shepherd, drover, waggoner, wandering pedlar or tinker.

It would be too much to expect that each of these inferences is wholly correct though, cumulatively, they gain in plausibility by being closely paralleled by similarly moulded skeletons from other early burial grounds, e.g. Worthy Park, Hampshire. To achieve greater precision we should need skeletons which are more complete and less eroded than most of the North Elmham ones. But if we are alert to the possible margin of error in these conclusions and are prepared to accept a range of likely occupations for each person, rather than a narrowly exclusive one, we can do much to lift them out of their misty anonymity. They become almost as real as the coalman, the bank clerk, the truck driver or the professional footballer whom we meet at the local pub.

There is, however, additional need for caution in considering the above suggestions. As already noted, the absence of weapons from the graves need not imply that these people did not frequently use them in training practice and occasionally in war. To what extent may their muscle development and their arthritis have been due to the regular use of a spear, seax or shield? This question can only be answered cautiously. The right shoulder and arm of Inh.86 would seem to be admirably adapted to hurling spears, but the muscles of his left side were almost equally well developed and it is unlikely that he was ambidexterous in the use of his weapons. Perhaps a two-handed use of a sword could explain what is found, but the position of most sword wounds in Anglo-Saxon skeletons suggests that their normal fighting drill was based on simple dextrality and not on a two-handed technique - to which their swords would, indeed, be ill adapted.

Burial 50 might also have acquired some of his muscle power from the extensive use of spear and sword. It is less certain that his arthritis would confirm this. The smooth, continuous flow of movement inherent in the projection of a spear or the sweep of a sword is far less conducive to the onset of arthritic changes than the severe and repeated jarring which is inseparable from hammering iron on anvil or crashing an axe into a standing oak ... even if we are prepared to accept that an Anglo-Saxon warrior split as many skulls as a blacksmith made nails.

There can be no doubt that weapon training from an early age would develop strong muscles and that these would mould the bones to reveal their presence. (Though precision rather than power may have been the principal aim of training). Much depends on the amount of time spent in the activities and the exact anatomical location of their effects. It is also important to consider the resistance encountered by each muscle.

In fencing, the arms and trunk are vigorously used, but not against strong resistance and the resulting development of skeletal muscle ridges is slight. In rowing or weight lifting, the muscles meet great resistance and the bone response may be enormous. It is true, of course, that the use of weapons may produce not only ridges, etc. at their areas of attachment, but also arthritic changes in the joints most stressed by their use. Specifically in the case of spears, it has been noted by Haney (1974) that in prehistoric Californian Indians 'atlatl elbow', a form of osteoarthritis due to the use of a spear-thrower, became less frequent in later periods and she interpreted this as due to an increase in technological efficiency and the spread of agriculture at the expense of hunting. But it is important to note here that atlatl elbow was in fact due to hunting, an almost daily occupation, whereas Anglo-Saxon weapon training was probably sporadic and actual warfare undoubtedly so.

In parenthesis, it may be noted that compared with many early populations, the Anglo-Saxons were a tall people whose overall linearity gave them long, thin muscles rather than short, thick ones. To make the most effective use of a spear, a long arm and forearm, adapted for speed leverage, are needed. In general this is what the Anglo-Saxons had and what they showed in common with other typical spear users such as the linear Nilotics, Masai and Australian aborigines. By contrast, to use a bow to best effect demands a stocky physique, adapted for maximum power leverage, arising from a short, strong arm and forearm, a broad chest and a thick shoulder girdle. It is not without significance that the most efficient bowmen were found in the Mongoloid races, among peoples of thickset, non-linear build: the mounted archers of the Steppes became the scourge of Europe and the East, whilst the short, Turkish bow, adapted to the anatomy of its users, attains a greater maximum performance than longer and heavier weapons. It is further noteworthy that the compelling facts of body proportion and physique led the East African Nilotics to reject the bow as unsuited to them, despite their knowledge of it. This may have applied also to the Anglo-Saxons. Conversely, when thickset people adopt the spear or lance, as the Eskimo eventually did, they often use it in conjunction with the atlatl or spear-thrower, thereby attaining an artificial linearity denied them by nature.

In these circumstances, the principle of selection in body build obtains: a certain shape inclines its possessors to a certain range of activities, and practising the range further develops the shape. What has been said about occupational possibilities for some of the North Elmham individuals must be seen in the context of these principles, against a background of the modal Anglo-Saxon physique and the functional behaviour appropriate to it.

HARRIS'S LINES

A method has been devised (Wells 1961; 1964b) to give some indication of the amount of illness suffered by the children of early populations and the age at which these illnesses occurred.

At each end of the long bones of the limbs there is, during childhood, a cap of bone (the epiphysis) which is separated from the main shaft (the diaphysis) by a plate of cartilage. Throughout the growing period, elongation of the bone takes place by the deposition of osseous materials from these cartilaginous plates onto the diaphysis. Eventually, epiphyses and diaphysis fuse into a single bone of adult pattern and no further lengthening can take place. If, during its years of growth, a child is attacked by some illness or undergoes extended periods of starvation, this normal process of elongation of the bone is interrupted until, with recovery or return to normal diet, it resumes its former activity. After one of these episodes, a line of calcification is left across the bone at the site of the epiphyseal cartilage and may thereafter be recognized in a radiograph. These calcified zones are known as 'Harris's lines of arrested growth' (Plate XCII). With certain reservations they tend to persist indefinitely and the number which can be seen in an adult bone records, therefore, the number of illnesses which were severe enough temporarily to

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arrest growth during the years of childhood. Moreover, their distance from the ends of the bone can be used to estimate the ages at which these illnesses occurred.

Experience shows that the tibia is the most useful bone to examine for this purpose and much variation is found between different populations. Table 54 shows the average number of Harris's lines per person at North Elmham and in a few other early groups.

TABLE 54. AVERAGE NUMBER OF HARRIS'S LINES PER PERSON

Site	Period	Average number of lines
Crichel and Shrewton	Bronze Age	0.8
Martyrs' Bay, Iona	Seventh-Ninth century	0.9
Shouldham Priory	Medieval	1.6
Red Castle, Thetford	Late Saxon	1.8
St. Catherine's, Thorpe	Late Saxon	2.2
Thornham, Norfolk	Early Saxon	3.4
Caister-on-Sea, Norfolk	Early Middle Saxon	5.1
North Elmham Park	Late Saxon	1.1

It can be seen that the North Elmham people had relatively healthy childhoods, which were distinctly better than their nearby and contemporary neighbours at Red Castle and St. Catherine's, Thorpe, whilst the earlier group from Caister-on-Sea had almost five times the amount of childhood illness that is found here. In all, fifty five tibiae had fifty nine lines between them to give the average of 1.1 per person but it is most unfortunate that, because of the soil in which these burials took place, many tibiae were useless for radiography owing to the presence of silt in the medullary cavity and the destruction of their internal anatomy. It is especially interesting that at North Elmham a clear sexual difference in the frequency of Harris's lines is found. In thirty one males the average was 1.4 per person, in twenty four females it was 0.6. This preponderance in males was not found in any of the other populations listed in Table 54 and its presence here challenges interpretation. Hippocrates records that the incidence of mumps was higher among the boys, who congregated in close physical contact in the public gymnasia, than among the girls, who remained secluded in their private homes and gardens. No doubt this applied to other infectious diseases that were transmitted in a similar way to mumps. But although infections of this kind frequently do produce Harris's lines, we cannot ever tell from the appearance of the line that they are the actual cause in any given case. It is possible that these North Elmham children behaved like Ancient Greeks, with boys more constantly gregarious than girls, but there seems to be no textual evidence of this here or elsewhere and the more or less equal incidence of Harris's lines in Anglo-Saxon communities other than at this site argues against the suggestion. A theoretical alternative would be the presence of some disease which, from its nature, attacked the boys twice as frequently as the girls. This seems an even more difficult idea to sustain, but should not be dismissed on that account. If it is postulated that the boys were more susceptible to disease and reacted to it more severely than the girls, we must inevitably wonder why ... and no easy answer presents itself.

A hint may be obtained from the age distribution of the lines, which is shown in Table 55.

TABLE 55. AGES, BY LUSTRA, AT WHICH HARRIS'S LINES WERE FORMED

Sex	2-6	7-11	12-16
♂	10.0%	42.0%	48.0%
♀	11.1%	66.7%	22.2%

This shows that the girls, after a healthy early childhood, get two thirds of their total juvenile illness in the seven to eleven plus age period although, as noted above, the total amount of illness they experience is extremely low. By contrast, the boys get nearly half their total illness after the age of twelve years and, although they too were healthy by comparison with children at Thornham or Caister-on-Sea, we have seen, nevertheless, that they had more than twice as many growth arresting episodes as their sisters. The implication is that some change in their lives in early adolescence led to an upsurge in morbidity that did not affect the girls. It seems possible that at this age they were first exposed to something approaching the full rigours and physical demands of adulthood. Perhaps, by the age of twelve years, childhood was deemed to be over for the boys and, although not yet physiologically ready for it, they were made to do work which was too exacting for their strength and vital reserves. If so, many of them may have contracted such diseases as acute bronchitis or pneumonia from exposure in the winter fields, dysentery from excessive cowherding, and septicaemia as a result of frequent infected wounds from heavy manual work with clumsily handled tools - and all this at an age when the girls were still relatively sheltered, learning the domestic skills of cooking, baby tending, dressmaking and other such tasks of little hazard.

Unfortunately, these suggestions must be viewed with extreme circumspection owing to the relatively few bones suitable for study. It is to be hoped that a more numerous series, in better preservation, may be found which will show a distribution similar to the North Elmham one, but with the authority conferred by several hundred bones rather than a few dozen.

It must also be remembered that in any adult bone a Harris's line is always 'ancient history' in the life of that person. In a man of fifty two it must record a transient illness which happened at least thirty five years earlier. In other words, identifiable lines of arrested growth invariably reveal an adverse episode which progressed to recovery. A higher number of lines in men than women does not by itself, therefore, mean anything more than higher morbidity at some period of childhood. It does not necessarily imply that, after recovery, these North Elmham men were any less healthy than the women who (some years previously) had enjoyed greater freedom from chicken pox, gastroenteritis, influenza or whatever may have been the cause of their Harris's lines. Because of this, it should not be assumed that the lower number of lines acquired, in childhood, by these women left them healthier than the men once they had reached maturity. As noted elsewhere in this report, there is evidence that the women soon became less healthy than the men.

In discussing the age distribution of deaths among these people, a minor peak was detected in early adolescence (Table 33). In view of the evidence of their Harris's lines, it may be wondered whether this reflects the death of those males who did not recover from the hazards which have been suggested as likely to beset them when first put to the rigours of adult work and exposure.

If this is the case, it is just one more example of what has been found repeatedly during the examination of these burials: although each line of evidence and its likely implication may carry considerable uncertainty, the various inferences derived from them converge and reinforce each other. The sum of the different evidences available here gives a much more persuasive picture of the overall situation than can be inferred from even its most compelling parts. The strength of this report lies less in the bricks which build it than in their mutual bonding and coherence.

A NOTE ON THE CONCENTRATION OF LEAD SALTS IN THE NORTH ELMHAM PARK BONES

During the time when the North Elmham skeletons were being examined, the subject of lead concentrations in ancient bones and the possible effects of plumbism in early popula-

tions became of topical interest. This was largely due to an increasing awareness of lead pollution and its biological consequences in modern environments. It has, of course, long been known that in the pre-classical and classical world many peoples, but especially the Romans, were exposed to the risk of high intake of lead. A numerous labour force was engaged in mining it. For the general population, wine was often made and kept in lead pots; so were their sweetening agents; lead vessels were commonly used in the preparation of food, which may then have been served on platters of various lead alloys. In many areas, water was brought to houses and to public drinking fountains in lead pipes. Several early medical writers describe what are almost certainly the toxic manifestations of plumbism and it is likely that this disease was common in many parts of the classical world. Indeed, Gilfillan and other writers have suggested that the collapse of the Roman empire was brought about, at least in part, by chronic and widespread lead poisoning. When we move beyond the spatial and temporal frontiers of the oikoumene we know much less about the processing and uses of lead among early peoples, but it is certain that some populations were exposed to it.

As part of an on-going survey of lead concentrations, in skeletons ranging from the neolithic period to the nineteenth century, 100 samples of bone - representing ninety six individuals - were analysed from North Elmham Park ².

Fig. 196 shows the distribution and Pb concentrations of the specimens which were examined from this cemetery. They range from thirty three to 389 parts per million, with an average for the group of 127 ppm with no significant difference between males and females. This is not a wide range and would have been substantially less but for the presence of one skeleton (Inh.171) having a much higher value than the rest. On Fig.196 is a histogram plotting the number of skeletons to fall in grades rising by 25 ppm. It shows that 82% of the specimens contained 51-200 ppm. The upper limit for normal modern bones seems to be of the order of 100 ppm. At North Elmham 64% exceeded that level, but this need not imply that the affected persons suffered from toxic symptoms. Bone Pb up to 200 ppm, mostly as phosphate, has been reported in adults with no adverse clinical effects. From four of the burials (Inhs.1, 18, 78 and 125) two samples were submitted. The greatest difference between the pairs of samples from any of these four skeletons was 40 ppm - a negligible amount, since in clinical studies it is not unusual to find a two- to-fivefold variation in bones from one individual.

The North Elmham average and range may be compared with those of a few other groups of various dates. For each of the following populations the mean value is followed by the range in brackets:

Iron Age or Romano-British:

Owslebury, Hants.	77 (7-142)
Cirencester, Gloucestershire	223 (93-504)
Verulamium, Herts.	29 (25-31)
Mundford, Norfolk	40 (24-49)

Post-Roman to Pre-Conquest:

Thornham, Norfolk	31 (26-37)
Iona, Inner Hebrides	43 (28-67)
Caister-on-Sea, Norfolk	76 (50-111)
Thetford, Red Castle, Norfolk	64 (35-224)
Jarrow Monastery, Co.Durham	600 (87-3083)

Post-Conquest:

Shouldham Priory, Norfolk	236 (119-353)
Norwich St. Michael, Norfolk	306 (45-2219)
Norwich St. Paul, Norfolk	3021 (67-45273)

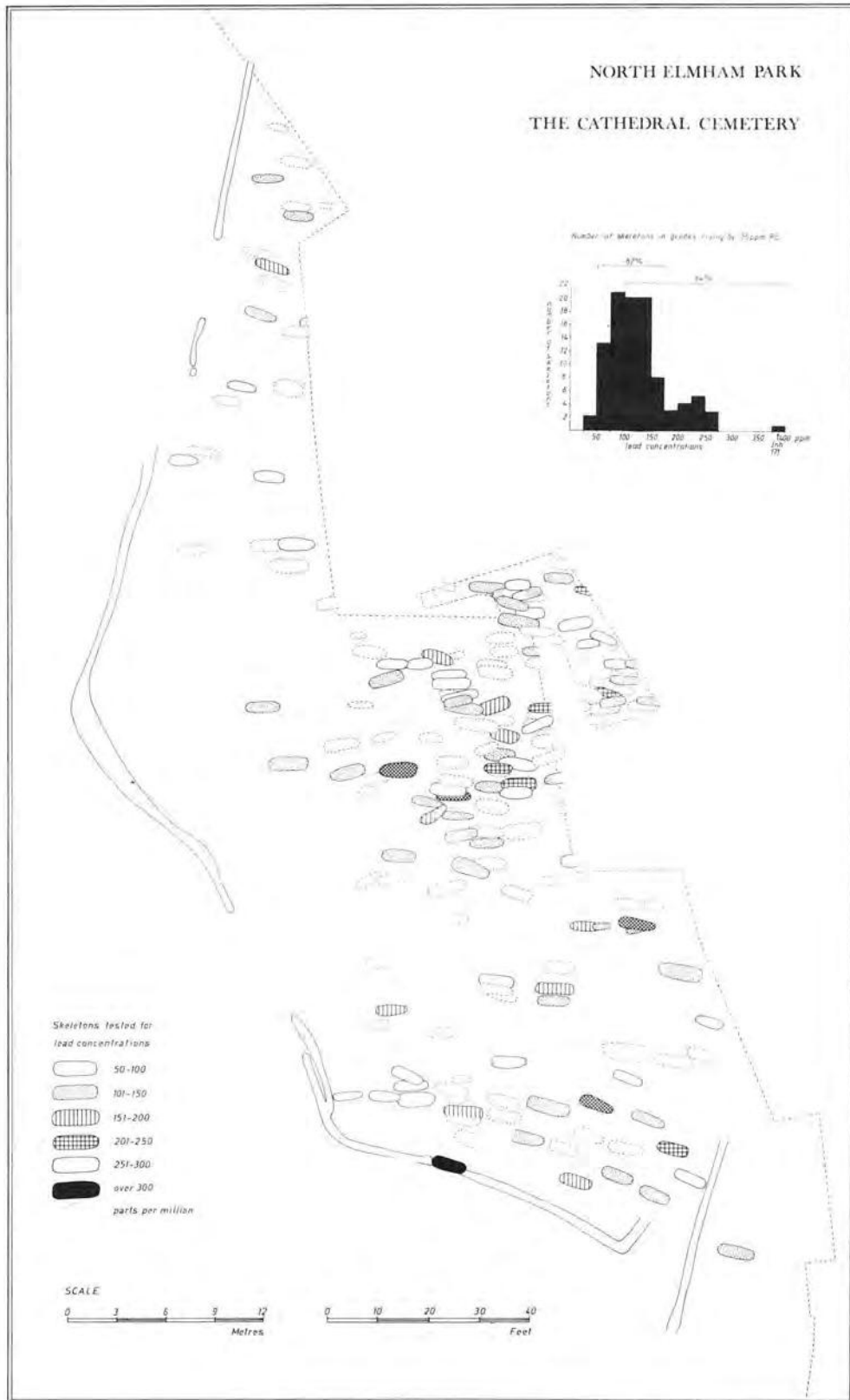


Fig.196. A plan of the cemetery showing the distribution of those skeletons sampled for lead poisoning.

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This is not the place to discuss in detail the significance of these results. Broadly speaking there is a well marked difference between small rural groups such as Thornham, Iona or other sites which average less than 100 ppm and larger urban or semi-urbanized populations such as Cirencester or St. Michaels' which average more than 200 ppm. (It should be noted that the Verulamium and Mundford groups, although of Romano-British date, were isolated communities quite unlike their contemporaries at Cirencester). The improbable average of 3021 in the Norwich St. Paul series is due to the inclusion of one extraordinary skeleton which contained 45273 ppm - i.e. more than $4\frac{1}{2}\%$ of lead in its bones. This could only have resulted from some quite exceptional contamination after death and in this case it seems to have come from a nearby water pipe and perhaps from impurities in its coffin plate. When this freak is excluded, the average falls to a credible 204 ppm.

In most of the groups which have a very wide range of lead levels this is due to a few skeletons with aberrantly high concentrations rather than a broad Gaussian distribution of values. These anomalous specimens are probably due to post-inhumation contamination from nearby lead coffins, lead church roofs, gutters, drainpipes and stray metal objects containing the element, which have become buried in the surrounding soil. But we cannot always know this with certainty and some of them may in fact be the result of ingesting abnormal amounts during life, with possibly fatal results.

The North Elmham skeletons occupy a middle position between the isolated tiny communities such as Mundford and the large urban populations of Cirencester and Norwich. How they came by their lead is an interesting problem which cannot be definitely resolved. Fig. 196 shows that their Pb levels occur with approximately random scatter throughout the cemetery: there is no significant grouping of high, middle or low values in any part of it. This gives some support to the belief that the different amounts found on analysis were the result of real differences of ingestion and retention during life rather than a consequence of post-mortem pollution from the burial ground. How this came about is perhaps more an archaeological than a pathological problem.

BLOOD GROUPING OF NORTH ELMHAM SKELETONS - INTRODUCTION

In an attempt to gain more information about the physical anthropology of the North Elmham people, Dr. G. D. Hart and his associates tried to determine the blood groups of a small sample of the population. His report follows here but, for anyone unfamiliar with haematology, a brief comment may be helpful.

Dr. Hart made extensive preliminary experiments to find the best method to tackle this problem. His technique is fully described, but no one should underrate its difficulties when applied to ancient material, nor fail to appreciate the ambiguity of the results which have been obtained.

Bacteria, viruses, enzymes, seeds, snails and many other dead or alive plant and animal derivatives which occur in soils may permeate the bone and mask the true nature of its residual blood group substances. This means that some of Hart's conclusions are almost certainly wrong. He points out that the high frequency of the B and AB groups in his results differs greatly from what is found in Britain today. However, the fact that these differences have been found may perhaps have microevolutionary significance and one of the most interesting speculations to emerge from Hart's work is precisely this possibility. The source of the B group gene in Western Europe is uncertain. Its high levels today are in East India and Central Asia. Whether it originated independently in Western Europe or was introduced from eastern foci is still unresolved.

If it came from the East, was this brought about by early 'Cro-Magnon' infiltrations, in Bronze Age times, by Avars and Alans, the invasions of Attila, or more recently by

Genghis Khan and Tamerlane? Dr. Hart's work does not solve these problems, but it makes an important, albeit small, contribution towards their ultimate unravelling.

Another point to emerge from his investigations, as he himself stresses, is that future haematological analyses of this kind should be accompanied by detailed studies of the soil in which the burials are found.

ENVOY

As we have seen, these North Elmham burials are too few and too damaged for minute statistical assessment of their racial affinities. Had this been possible - had they been more numerous and complete - we might have learned that they were a fairly typical Anglo-Saxon community; which is what a cursory scan tells us, anyway. To compensate for this deficiency, they offer a modicum of pathology and, as so often happens, this goes far towards disclosing their lives and habits to us. Our inferences and interpretation may not be always accurate, and this must be firmly borne in mind, but by careful attention to the ills and accidents which plagued them, these people come to life in a way which no computerizing of their cranial contours could achieve.

In short, we see a village of men, women and children bustling about their seasonal affairs. With no great effort of imagination, the sights, sounds and smells of tenth-century North Elmham beguile our senses and, in some strange way, lure us briefly to feel that we are part of that vanished throng.

In the frost of dawn, lean sinewy farmers, with creaking arthritic shoulders, hack at the stubborn earth; women bake and brew, crouched by their smoky hearths; smiths hammer at anvils; timberjacks heave. At dusk the distant bleat of sheep and the rumble of a late ox-cart float through the falling twilight. Chattering housewives endlessly talk about a month-old murder; two randy ceorls, in curiosity, plan knowledge of a dark stranger's cunt. The stench of pigs and the halitosis of the swineherd hang pungent upon the still air; the groan of a woman in childbirth mingles with the whisper of a lad and his lass coupling in the hay. Distinctions of class, of task, of vigour, temperament and taste emerge, albeit through a bone, darkly, as their pathology is revealed before us. Their food, their clothes, their time to be born and their time to die come, at least dimly, within our vision. Even a babe in its cradle, turning its head in slumber, cannot elude our tender scrutiny. And if 'tender' seems an unscientific word to appear in an anthropological report, it is, nevertheless, the key to our understanding of these people. To modern computer analysis they are 'n' dry bones with standard errors of standard deviations; to a sympathetic palaeopathologist they are men and women who live again in his imagination and whose fellowship he has been briefly privileged to share.

II. SOME CONTRIBUTIONS FROM THE WRITTEN SOURCES

by Helen Cayton

INTRODUCTION

The suggestions and hypotheses put forward in the previous report on the skeletons from North Elmham can sometimes be amplified or disputed by examining the literary sources for the Anglo-Saxon period. The sources fall into two main groups for this purpose - firstly, the chronicles, histories, lives of saints and so on, which provide general information on social conditions and ways of life, and secondly, the medical texts themselves. The latter consist chiefly of illustrated herbals translated from Latin into English, and containing many plants of Mediterranean origin not found in England, but there are also three texts, collectively known as the Leechbooks, which are English compilations and translations from late Classical sources, and therefore more indicative of English medical skill and knowledge. The texts in English are published in the Rolls series by O. Cockayne (1864-6).

There are of course problems in using both types of evidence. The writers of chronicles and biographies assumed that their readers were familiar with the social background of their narrative and so did not describe it in detail. This means that there are large gaps in our knowledge and many areas where we have very imperfect information. In addition the information we do have usually concerns the way of life of the upper classes of society and one cannot always assume that the peasants buried at North Elmham behaved in the same way as nobility.

Relating the medical texts to the skeletal material presents similar difficulties. The remedies tend to deal with symptoms rather than diseases and any attempts to diagnose what conditions are meant by 'pain in the knee' or 'aching joints' must be even more tenuous than diagnoses made from the skeleton itself. Moreover, many of the conditions described such as fevers, dysenteries, and skin diseases, leave no mark on the skeleton.

In spite of all these caveats there are quite a number of areas where the literary and osteological evidence complement each other. Further research will doubtless reveal more. This report merely suggests some of the more profitable areas for study. It is intended to be read in conjunction with the summary of the human skeletal remains, and for this reason the section headings refer to the relevant sections in the preceding report.

ACKNOWLEDGEMENTS

I wish to thank Dr. Calvin Wells, who asked me to write this report, and who has given me unlimited help and encouragement with it ever since. Also Professor Rosemary Cramp, who has provided much useful advice on various problems.

AGE (p. 249)

The literary sources from the Anglo-Saxon period produce sufficient information for an estimate to be made of the ages of a group of people comparable in size with the burials at North Elmham. The chronicles and histories are concerned mainly with kings and nobles, and the ecclesiastical sources record saints and bishops, so the evidence they provide is inevitably from the upper classes of society. But as one cannot calculate the ages of any other group from the surviving literary material, and since there seems to be little differential mortality between social classes in the Anglo-Saxon period (as will be explained more fully later) ages have been estimated for 200 people recorded in the literature, 100 kings, queens, and nobles, and 100 ecclesiastics³. Unfortunately it is impossible to make any estimate of child mortality, for even royal children who died young were inadequately recorded, and probably many were not recorded at all. It is also difficult to estimate the ages of a significant number of women.

Ages have been worked out in various ways. In some cases the age of the individual is given when his death is recorded, in others the length of reign or episcopacy is known and the date of birth can be estimated fairly accurately, and in others the dates of birth and death are given independently. Some of the ages are thus approximations, but they are not likely to be in error by more than five years, and in many cases they are much closer to the true age of the individual than an estimate made from a skeleton. As with the skeleton material only individuals over the age of eighteen years are included in the group.

The sample of 200 people (181 males, 19 females) lived for a total of 11,435 years, which gives an average age of death of 57.7 years. However, if the group is divided into lay and religious the life expectancy for the ecclesiastics (97 males, 3 females) is found to be 64.6 years, and the life expectancy for the laymen (84 males, 16 females) is 49.7 years. The considerable difference between these two estimates can be explained in several ways. The most obvious difference is that since a man could not become a priest before the age of thirty, and since he could not be a bishop before he was a priest, the life expectancy for the group of bishops is in fact an average based on people who had already survived to the age of thirty, rather than to an age of eighteen. This must raise the estimate by quite a number of years. Moreover, the nature of a bishop's office meant he was less likely to come to a violent end, - only 3% of bishops in the sample suffered deaths by violence, as opposed to 21% of the kings.

The life expectancy of the nobility is thus the only estimate that can be compared with that of the North Elmham population, though in fact there are probably a number of ecclesiastics and members of the bishop's *familia* buried in the cemetery. Even so, the average age of death of the North Elmham peasants (37.0 years) is almost thirteen years lower than that calculated for the kings. This seems a large difference, particularly considering that, as mentioned above, averaging the estimates derived from the bones has raised the mean for the North Elmham group. Furthermore, the archaeological evidence indicates that the community was a fairly prosperous one, with a longer life expectancy than many early groups, where the average age at death is nearer thirty years. There the difference between kings and peasants would be around twenty years; a figure which seems difficult to explain away simply in terms of better nutrition, housing, clothing, and so on for the upper classes of society.

If the male deaths are divided by decade in the same way as the North Elmham males, the results are also striking.

TABLE 56. AGE DISTRIBUTION OF ADULT DEATHS

Age	Number	%
18 - 27	12	14.4
28 - 37	12	14.4
38 - 47	15	18.0
48 - 57	22	26.0
58 - 67	15	18.0
68 +	8	9.5

The table shows a gradual rise in mortality with a peak in the fourth decade, ten years later than at North Elmham, and not so sharp an increase. However, the most noticeable difference is that 53.5% of this group survived past the age of forty seven, as opposed to only 8% of the North Elmham men. It is difficult to explain this big discrepancy, for there is no suggestion in the texts that the nobility lived sheltered, pampered lives free from the rigours endured by the short-lived peasantry. Penda, king of Mercia, died in battle at the age of seventy two in 654; ealdorman Byrhtnoth, the hero of the battle of Maldon, was about seventy at his death, and Ethelbald of Mercia fought battles

well into his sixties, and was still going strong when he was murdered by his bodyguard in 757. This view of a vigorous, upper class, active until well past middle age is difficult to equate with the anthropologists' gloomy picture of the mass of the population dead or debilitated before they reached forty.

The literary estimates can be corroborated however. Byrhtferth's Manual, written in 1011, gives a contemporary estimate of the length of a man's life. He divides life into four ages: childhood up to fourteen years, youth to twenty eight years, manhood to forty eight, and old age to seventy or eighty years. These figures fit very well with the literary evidence. Byrhtferth's statement that old age begins at forty eight and ends at seventy or eighty is borne out in the table, both in the sudden rise in mortality in the decade following forty eight years, and also by the fact that about 10% of the sample survived to seventy or eighty. Though Byrhtferth's divisions of life are based ultimately on Isidore of Seville's Six Ages of Man (Sharpe 1964) the age ranges he gives are not exactly the same, and can probably be taken as fairly accurate for the Anglo-Saxon period. If the majority of people barely lived past thirty-five the common observation of his readers would be enough to prove him wildly wrong. And it should be noted that Byrhtferth's readers would not be bishops (average age at death 64.6 years), but poor clerks who could not cope with the Latin manuals, and who, for the most part, would have come from peasant backgrounds.

It is hard to reconcile all this evidence with the life expectancies in the lower thirties produced by the anthropologists, though there seem to be three ways of making the attempt. One is to assume that for some reason the ages in the literature are incorrect and are being consistently overestimated. Another is to say that since the estimates in the literature come from the upper reaches of society the differences are purely due to disparities in social class. The third is to suggest that the methods used to calculate the age at death from skeletal material are producing results which are too low, and that the estimates derived from the written sources give a more accurate picture.

It is not difficult to determine the ages of a reasonable number of people from the evidence provided in the literary material. Though the Anglo-Saxons were not as obsessed with dates of birth as in modern society, age was of some significance. The age at which a child became a youth, or a boy became a man; the earliest age at which a boy or girl could marry, the age at which a man could become a priest, and so on, were all precisely stated and required that most people must have had a general consciousness of their age at any one time. Moreover, the individuals recorded in the sources are inevitably those of note, and their lives therefore subject to closer record than the average person. The fact that Bede, William of Malmesbury, and other writers refer so frequently to the ages of their heroes at various stages of their lives suggests that age was a matter of interest, if not of importance; and the keeping of calendars and chronicles meant that dates and ages were regularly recorded. It thus seems likely that if a man's age is given at the time of his death or if the dates of his birth and death are recorded, they will probably be accurate, within narrow limits.

The evidence is not always as straightforward as this however, and is sometimes only partial, as for instance when the length of a king's reign is recorded, but the age of the king at his accession is not known. In this case other information such as the age of the parents, the date of the marriage, or the age of any brothers or sisters must be used to make an estimate of the age in question. In most cases it is then possible to calculate ages with a degree of accuracy of ± 5 years, though with a few this must be extended to ± 10 years. Obviously this is less precise than one would hope for, but even ages with a possible variation of ± 10 years are within the range of accuracy accepted for osteological estimates. In general it would seem fair to say that the estimates made from the written sources are probably at least as precise as those made from skeleton material.

Another explanation for the differing life expectancies must therefore be considered - that of the difference in status between the two groups. Not much can be made of this however. When J.C. Russell (1966) examined the population trends in medieval England he compared the life expectancies of the peasants on some Winchester manors with those of fiefholders in the same period (1245 - 1347) and found that there was no significant difference in the age at death in spite of the difference in status. His information came from the list of heriots (paid at death or retirement) from the Winchester estates. By dividing the number of heriots paid each year into the total number of holdings from which they were due he calculated the life expectancy of the peasants at the time they entered their holdings. The fiefholders' life expectancy was derived from the inquisitiones post mortem which record the date of death of the holder of the property, and the age of the heir. It was thus possible, by combining two inquests, to find the age at death.

Anglo-Saxon society showed if anything greater mobility between ranks than the medieval period, and there was no large class of depressed peasantry. The average size of family holdings in the eleventh century was larger than in the fourteenth (Postan 1972, 35 ff) and there were generally narrower distinctions between rich and poor. If, as Russell's evidence suggests, there was little differential mortality between social classes in the medieval period, there should certainly be none in Anglo-Saxon times.

It is also possible to make a more direct comparison between estimates by comparing the life expectancy of the peasants on the medieval Winchester manors with that of the medieval series of skeletons from Wharram Percy. At age twenty the life expectancy of the Winchester peasants was about twenty seven years (Ohlin 1960), and of the Wharram Percy peasants fifteen years (Brothwell 1972). When one considers that the corresponding expectancies for the two Anglo-Saxon groups are thirty years and seventeen years it is apparent that the differences between the osteological estimates and those from the literary material are of the same order in each case.

The estimates in the literature come from various types of evidence, yet support each other well, and there seems no convincing reason to assume they are erroneous. Nor do the distinctions of social class seem adequate to explain the gap between the literary and osteological estimates. The only other possible explanation seems to be that the methods used in calculating age from skeletal material are producing results which are too low, particularly when the skeleton is that of an older person.

For a non-specialist to criticise the techniques of physical anthropologists is a hazardous enterprise. Fortunately, however, some support comes from the anthropologists themselves. In a recent book Gy. Acsadi and J. Nemeskeri (1970) have reassessed the conventional methods for determining age, and developed what they call the 'complex' method of age determination. This is based on age changes in the cranial sutures, humerus, femur, and pubic symphysis, used in combination. The method was tested by examining 105 skeletons of known age and sex, and was found to have an accuracy of 80 - 85% with a margin of error of ± 2.5 years in individual cases.

Using the complex method to re-examine series of skeletons already published by other investigators, the authors produced life tables much closer to the U.N. model life tables than the previous results; and in an important paragraph they write:

'For the sake of control we have made two analyses of a completely excavated cemetery of the 10 - 11th centuries, the Kerpuzta series containing about 400 elements. On the first occasion we determined the ages at death with the usual, 'classical' methods. We studied the closure of cranial sutures, the state of epi- and diaphyses, condition of teeth, and some external morphological features, probably in the same way as Angel analysed the Khirokitia series. Following this, we made another analysis of the series, using the complex age-

determination method described in Chapter III, and had to modify the age distribution drastically as a result. The sharply protruding mode of ages 30 - 34 vanished completely in the new age distribution, and was shifted to the middle adult age, where it was less conspicuous; an adequate number of individuals who died at old age was determined at the same time ...' (Acsadi and Nemeskeri 1970, 190).

In terms of life expectancy the average age at death for this group was calculated to be 47.1 years (Acsadi and Nemeskeri 1970, 251, table 91), very similar to that estimated for the Anglo-Saxons from the literary evidence. Their results suggest moreover that if the North Elmham skeletons were re-examined according to the complex age-determination method, the present discrepancies between the skeletal averages and the literary averages would disappear, and the problem would be solved.

The methods proposed by Acsadi and Nemeskeri have met with a generally favourable reception from fellow anthropologists, and few serious criticisms have so far been made (reviews in *Current Anthropology* 15, 1974, 495-507). It has been recognised for some time that the conventional methods of ageing skeletons have not produced results that are as accurate as one might wish, and the development of techniques which seem to offer greater reliability has been welcomed. The fact that estimates derived from the literary material produces results of the same order seems more than coincidence, and gives added support to their work.

The evidence indicates that life expectancy for the Anglo-Saxons must now be raised from about thirty seven years to about forty nine years, allowing for some variation between groups. An acceptable range might be between forty five and fifty years. This involves questioning a number of assumptions previously made about Anglo-Saxon society, and particularly its demographic aspects. A longer lifespan implies a more productive workforce, and also greater fertility, which in turn means a faster growing population. The change however should be kept in perspective. Even this longer life expectancy means a high mortality, and implies that life expectancy at birth for the Anglo-Saxons was still less than half that of present day society. But it is instructive to know that life for the Saxon peasant was not quite as nasty, brutish, and short as has previously been imagined.

INFECTIONS (p. 273)

The discussion of Inhumation 10 suggested that the reason for his unorthodox mode of interment may have been his diseased knee. This seems to me unlikely. The idea that a disease is the punishment for some sin, known or unknown, is not a common one in Anglo-Saxon literature, especially considering that many of the sources have an ecclesiastical bias; and even when it is suggested as the cause, this does not preclude seeking the intercession of a saint, or more ordinary medical assistance for healing.

The penitentials, too, refute any suggestion that the Church could decide whether a man was to be damned after his death. That in M.S. C.C.C.C.190, which is a mixture of Theodore's Penitential and later eighth and ninth century material, states that even someone who has been excommunicated for his evil deeds is to be allowed to take communion and have the full last rites if he falls ill and seems likely to die before completing his penance⁴. Criminals who have been hanged are also allowed burial in the churchyard and the right to have masses said for their souls, provided that they have made confession before their execution (Thorpe 1840, 312). The idea seems to be that once a man was dead God could deal with him in person and any further attempts to punish him on earth were therefore superfluous.

Moreover, there are unorthodox burials in other Christian cemeteries. At Hartlepool all the graves are orientated north to south, though the memorial stones show the cemetery to be a Christian one (V.C.H. Durham 1905, I, 212), while at Winnall II (Meaney and

Hawkes 1970) and Leighton Buzzard (Hyslop 1963) there is the occasional west to east burial. It is difficult to provide an explanation for any of these, but there is always the possibility of error or mere carelessness in the interment. Maybe the relatives had been drowning their sorrows too vigorously at the wake the night before (as AElfric complains) and when morning came were in no fit state to know which way round they were burying him.

But in this particular case it is impossible to say why the body was buried in this way, merely that it was so.

MISCELLANEOUS (p. 279)

It is suggested above that the reason why the North Elmham people had a moderately low incidence of maxillary sinusitis was because their dwelling houses were kept reasonably free from smoke. Recent work in Scandinavia seems to confirm this ⁵. There experiments in living in reconstructed Iron Age halls found that the smoke from the central fire tended to rise and hang in the roofspace, well above the heads of the people inside - provided that the two opposed doors at either end were not opened too wide and created a through draught. Since at North Elmham the majority of the halls seem to have had only one door, in the side of the building, presumably the avoidance of draughts was less of a problem, and the smoke would have remained above their heads.

In reference also to the idea that a smith might be prone to sinusitis, AElfric's Colloquy has a slightly disparaging reference to the noise, smoke and fire created by his forge. It says the smith 'in his smithy gives us nothing but fiery sparks of iron, and the clamour of beating sledgehammers and blowing bellows' (Garmonsway 1939, 40).

PARITY (p. 290)

An estimate of parity can be made from the literary evidence, though the attempt faces as many difficulties as one using skeletal material. To begin with, because of the nature of the available sources, only royal families are recorded in any detail, and even these are probably incomplete, since children dying in infancy and younger sons and daughters of no particular interest to the chronicler may be omitted. Again, Anglo-Saxon family groups were extended, and kings frequently had two successive wives, and sometimes mistresses, but all children tend to be referred to indiscriminately as the king's sons or daughters. This means that two boys referred to as 'the king's sons' or even as 'brothers' are not necessarily sons of the same mother. Illegitimate children too, are often not clearly differentiated and seem to have been incorporated into the family, though they possibly take a more lowly place than legitimate offspring as regards inheritance. Thus an estimate of the number of children borne by an individual woman may be too low on the one hand, and too high on the other.

However, with these caveats borne in mind, it has been possible to work out the number of children born to twelve women referred to in the literature, and in some cases the period of time during which the family was completed can also be estimated. The results are included in the following table (see p. 309).

As can be seen, these twelve women produced fifty six children between them, an average of 4.6 each. No more than two of them are likely to have been capable of bearing other children, but two additions still have to be made, one to cover miscarriages, and the other to cover unrecorded children. This makes the average parity about six or seven, a figure similar to that estimated from the skeletal evidence.

There is nothing in the Anglo-Saxon medical texts to suggest what might be the average age of menarche, but a Salernitan treatise, attributed to Trotula, and dating probably from the eleventh century, deals with this problem ⁶. The different manuscripts show slight variations in the ages given, but in general, menstruation is considered as

TABLE 57. BIRTHS, MARRIAGES AND DEATHS

	Age at marriage	No. of children	Period of childbearing	Length of marriage
Eanflæd	17	4	644-661	643-70 (s)
Oswiu	31	(2♀, 2♂)	18 years	27 years
Æthelburh		4	--	625-32 (s)
Edwin	41	(2♀, 2♂)		7 years
Seaxburh		4	640-c.655	640-64
Earconbert	c.21	(2♀, 2♂)	15 yrs or less	24 years
Cynewise		6	--	--
Penda		(2♀, 4♂)		
Osburh		5	c.830-849	c.830-c.854
Æthelwulf		(1♀, 4♂)	19 yrs or less	24 years
Ealhswith		5 + ?3	869-c.880	869-99 (s)
Alfred	20	(3♀, 2♂)	12 yrs or more	30 years
Æthelflæd	18	1♀	--	888-911 (s)
Æthelred				23 years
(2) Ælflæd		8	--	c.896-c.918
Edward	20+	(6♀, 2♂)		22 years
(3) Eadgifu		3 or 4	--	920-24 (s)
Edward		(2♀?, 2♂)		4 years
Gytha		7	--	1019-53 (s)
Godwin		(1♀, 6♂)		34 years
Emma		3	--	1002-16
Æthelred	34	(1♀, 2♂)		14 years
		5	1002-18	
		(2♀, 3♂)	16 years	
Emma		2	--	1017-35 (s)
Cnut	c.23	(1♀, 1♂)		18 years
Edith	20+	0	--	1045-66
Edward	42			21 years

(s) = wife survived husband

beginning around the age of fourteen years, while the ages given for the menopause vary between thirty five and sixty years. The Anglo-Saxons probably showed a similar sort of pattern.

According to the seventh century Penitential of Theodore girls were subject to their parents until the age of sixteen or seventeen, and after that age they could not be married against their will (Haddon and Stubbs 1869, III, 83-7), implying that at a younger age

marriages might be arranged for them. The Confessional of Egbert, possibly an Anglo-Saxon compilation of the eighth century, quotes Theodore, but changes the ages to thirteen or fourteen years (Thorpe 1840, 353). Other Penitentials, which are mainly Frankish in origin, also quote thirteen or fourteen as the age of marriage, though Frankish practice generally seems to favour earlier marriage than in England. King Aethelwulf scandalised the West Saxons by marrying as his second wife a thirteen year old Frankish princess, though this would not have been particularly unusual within the Frankish kingdom itself. In any case, even if a few Saxon girls were married at the age of fourteen, it is unlikely that they could have borne children before the age of sixteen or seventeen at the earliest.

When it is possible to work out from the literature how old a woman was at her marriage, the age normally falls in the late teens or twenties. Eanflæd was married at seventeen, and Aethelflæd at eighteen. AElfthryth, Alfred's third daughter, married in her early twenties; Eadgifu, daughter of Edward the Elder, between sixteen and nineteen years, and her three sisters, Eadhild, Eadgyth, and AElfifu in their mid-twenties. With such a small sample any conclusions must necessarily be speculative, but if the sample does reflect the normal pattern of marriage it suggests that on average, a girl's first pregnancy might not be till the age of twenty.

It is much more difficult to try and estimate the age at which the menopause occurred. At least seven of the twelve women included in the table seem to have come to the end of their reproductive life before the end of their marriage, but it is impossible to give any accurate estimate of the number of years this covered because of the defects of the sources. The youngest child recorded may in fact have been succeeded by others who did not survive, and so have disappeared into oblivion. This means that any figures appearing in the column 'Period of childbearing' are only minimum estimates and may be several years too low.

Eanflæd was the only woman whose age could be estimated at the birth of each child. AElfwine, the youngest child, was born when she was thirty-five. There may have been others after him, but the fact that Oswiu had an illegitimate son in the closing years of the marriage suggests that perhaps she may have reached the menopause before the age of forty. This seems young, but thirty five is the same as that given in Trotula's treatise as the age at which menstruation ceases in the 'moderately fat' woman, so it appears not to be unusually early.

The average length of reproductive life for the twelve women comes to sixteen years, though considering omissions, a truer estimate might be nearer eighteen years. With an average parity of six or seven children this would mean a pregnancy once every two or three years, again a figure not dissimilar to that estimated from the North Elmham women. For the individual women in the table the length of time between pregnancies varies from Aethelflæd's one child in twenty three years to AElfflæd's eight children born in fourteen years. According to William of Malmesbury Aethelflæd's family was limited because she was afraid of the pains of childbirth.

'Because of the difficulty experienced in her first, or rather, her only labour, she ever afterwards refused the embraces of her husband, protesting that it was unbecoming for the daughter of a king to give way to a pleasure which after a time produced such painful consequences'.
(Stubbs 1887, I, 136).

Eanflæd's family can be spaced more precisely, since the dates of birth of three of the four children are recorded. Egfrith was born two years after the beginning of the marriage, and, though Osthryth's date of birth is not known, there must be at least a five year gap between either her and Egfrith, or between her and AElfflæd, who was born nine years after Egfrith. AElfwine was born seven years after AElfflæd. Even supposing that there were other children besides those recorded the family is still well spaced out.

Some Contributions from the Written Sources

The medical texts give no hint that any form of contraceptive was used, though considering the length of time between births, it is possible they were made use of. However, abortion and infanticide are commonly mentioned as a means of getting rid of unwanted children. There are several medical recipes for herbal drinks to expel a dead child from the womb, which could equally well be used to dispose of a live one, and all the penitentials prescribe penalties for committing abortions. The Penitential of Egbert begins, 'If a woman kills the child within her with drinks or other things, or kills it after it is born, she is to fast 10 years ...' (Thorpe 1840, 368).

These methods are more likely to have been the recourse of the ceorls who could less well afford extra mouths to feed, than of the royal families and it is noteworthy that Theodore, in prescribing the penalties for infanticide, states that the normal penance is 15 years, but for a poor woman it is only seven years. Half a century after Theodore infanticide was still a problem, and Boniface, the leader of the Anglo-Saxon missionaries to Germany, wrote an outspoken letter to king Aethelbald of Mercia, complaining about his libidinous nature and the fact that he has not even bothered to take a lawful wife. These evil customs are spreading among the English as a whole, and can only result in the sapping of the nation's moral fibre. He goes on:

'It should be noted that under that enemy there lurks another monstrous evil, namely homicide; because when these harlots, whether nuns or laywomen, bring forth an offspring conceived in evil, they for the most part kill them, not filling the churches of Christ with adopted sons, but crowding graves with bodies and hell with unhappy souls'.
(Whitelock 1955, I, 177).

This passage not only suggests that infanticide must have been a fairly widespread custom, but also that if these 'harlots' attempted to use any kind of contraceptive it could not have been very effective!

However, though limiting the population, in a skeletal series infanticides would still be recognisable as births, though in the literary evidence they would not be recorded.

Apart from these drastic measures there are included in the penitentials prohibitions against and penalties for intercourse at certain periods of the year, mainly related to the Church festivals. These periods are the forty days of Lent, Advent, seven days before Pentecost, three days before taking Communion, Sundays, and three months before the birth of a child and forty days afterwards. Since in all these prohibitions cover more than half the year they must have helped to limit conception quite considerably, if adhered to. Some people would no doubt have preferred to perform the penance.

Gregory the Great, writing to Augustine at the beginning of the seventh century, says that couples are not to have intercourse until their child is weaned, and adds:

'A culpable habit indeed has arisen in places between the married pair, that the woman neglects to feed the child that she has borne, and hands it over to others to feed. Now this seems to occur through incontinence only, for they neglect to feed their own babes when they will not live apart from their husbands'. (Colgrave and Mynors 1969, i, 27).

Presumably though, most people would have suckled their own children, and it would have been mainly the upper ranks of society who employed a wet nurse. The more usual custom seems to have been for a family to have a nurse who was a slave, and the seventh century laws of Ine state that a gesithcund man (who appears to have ranked below the thegn in terms of status), was allowed to take with him his reeve, his smith, and his children's nurse when he left his land, suggesting that a nurse was considered a vital part of the household. The Leechbooks give no hint of the age a child was weaned, and unfortunately, quite a large section of the text dealing with problems of pregnancy and childbirth is missing from the manuscript. However, gynaecological treatises surviving

from the thirteenth century imply that a child was normally weaned at the age of two years, and Anglo-Saxon practice was probably much the same. Gregory's extreme views seem quickly to have been dropped in favour of the forty days abstinence after birth prescribed in the penitentials. The fact that a mother was breast feeding her baby would make conception at this time less likely anyway.

Since both the literary evidence and the skeletal evidence have produced similar conclusions it seems probable that, though both samples are small ones, they may be fairly typical. But for demographic purposes one needs to know, not only parity, but also the infant mortality rate, and the sources are of little help here. Though we know that of Æthelburh's four children only Eanflæd, the oldest, survived to adulthood, and that Ealswith had many children who died in infancy, the children who died young had least chance of being recorded, and any estimate made from recorded children would be hopelessly low. The onus of making an estimate of infant mortality thus falls on the skeletal evidence and on the evanescent atomies so poorly preserved.

EVIDENCE OF SURGICAL TREATMENT (p.291)

Judging from surviving medical texts surgery was at a low ebb during the Anglo-Saxon period. Only about six operations are described, though one is a detailed description of an operation on the liver, and there are a few illustrations showing the excision of nasal polyps, cataracts, or hæmorrhoids, which are not mentioned in the texts.

The problems of pregnancy and childbirth are referred to infrequently in the Leechbooks, though the section dealing with these matters in Leechbook II is now lost. It has been suggested by C.H. Talbot (1967, 19-20) that this material was based on Hippocrates' treatise *de mulierum affectibus*, which survives in a manuscript of much the same date on the Continent, and if this is true it implies that the evidence still available to us is not fairly representative of the Anglo-Saxons' knowledge of such matters. However, in what survives there is no suggestion of any surgical intervention in childbirth, though this does not mean it did not occur. In the case of a difficult birth the advice given to speed delivery is as follows,

'Take seed of . . . coriander, eleven grains or thirteen, knit them with a thread on a clean linen cloth; then let a virgin boy or girl take them and hold them at the left thigh, near the natura, and as soon as the child is brought forth remove the leechdom, lest the intestines follow after'. (Cockayne 1864-6, civ, I, 219).

Likewise there are very few references to toothache in the texts, perhaps because it was not considered a great problem. In the *Lacnunga* only two remedies out of 194 deal with toothache, and they are charms rather than remedies. The medical recipes in the other texts seem more concerned with abscesses and infections of the gums than with pain in the teeth themselves, and the remedies consist mainly of herbal drinks, inhalants, and ointments. It may be that the number of remedies is so small because extraction was the normal method of treating toothache but there are so few other sites where it has been suggested that teeth were removed deliberately that this seems unlikely. At Trentholme Drive, a Romano-British site, where 301 skulls and nearly 5000 teeth were examined, 'no systematic attempt appears to have been made to remove unsound teeth . . .' and there were only three cases where it was likely that a tooth had been deliberately extracted (Cooke and Rowbotham 1968, 180). This absence of evidence may be in part illusory, for it is possible that examples have been overlooked or not commented on in the examination of skeletal material. It is thus difficult to come to any positive conclusion.

HARRIS'S LINES (p.296)

The increases in morbidity shown in Table 55 seem easily explicable when considered in conjunction with the literary evidence. Byrhtferth's *Manual*, referred to earlier, records that childhood ends at fourteen years, and other sources, such as penitentials and

Some Contributions from the Written Sources

lives also suggest that fourteen was regarded as the age of maturity. But within childhood itself there was another important division at the age of seven or eight. Bede, in his Prose Life of St. Cuthbert, says that

'Up to the eighth year of his age, which is the end of infancy and the beginning of boyhood, he could devote his mind to nothing but the games and wantonness of children ... he amused himself with noisy games, and further, as was natural at his age, he loved to be in the company of children and delighted to join in their play'.
(Colgrave 1940, 155).

The games Bede mentions are jumping, running, wrestling, and various acrobatics such as headstands and cartwheels. Though girls are never mentioned as participants, an incident in the Life of St. Wulstan suggests that they were often spectators (Peile 1934) and presumably small peasant girls played their own small games while their brothers were involved in more vigorous activities. However, the energetic behaviour of the boys does not seem to have made them more susceptible to disease, since if it had one would expect to find a higher frequency of Harris's lines among the boys at all sites, and not just at North Elmham.

At his eighth year Cuthbert was given into the care of his foster-mother Coenswith. At this age too, Bede joined the monastery at Monkwearmouth under Benedict Biscop (Colgrave and Mynors 1969, v, 24) and Beowulf was sent to his grandfather's hall to be brought up as a warrior (Wright 1957). For the children at North Elmham reaching the age of seven probably only meant that they were expected to help with simple jobs instead of playing games all the time, but these increased demands were enough to cause the sudden rise in morbidity in both sexes at this age.

For the girls there was no other significant change in their way of life until they married and started their own homes, but for the boys the age of fourteen or fifteen meant taking on the full demands of adulthood, including military service, with the resulting drain on their strength. Wilfrid left home at the age of fourteen with a group of armed retainers, and sought service at the court of queen Eanflæd (Colgrave 1927, ch.2). Guthlac was the leader of a warband at fifteen and spent nine years pillaging the Welsh marches (Colgrave 1956, ch.xvi-xix); and before he was sixteen Cuthbert had served in the Northumbrian army and fought in battles against Mercia. Also at this age he was spending whole summers in the hills with the sheep and guarding them at night (Colgrave 1940, bk.1, ch.7, 73).

It is not surprising then, that this was the time at which the boys were most prone to illness, nor even that some of them did not survive the increased stresses to which they were subjected.

**III. EVIDENCE FOR LONGEVITY FROM THE
DOCUMENTARY SOURCES : THE IMPLICATIONS
FOR THE ANTHROPOLOGIST**

by Calvin Wells

Miss Helen Cayton's interesting remarks about the age at death of men and women during the Saxon period paint a very different picture from that which is outlined on the basis of the skeletal evidence at North Elmham and elsewhere.

The historical documents lead her to assess a mean age, for both sexes, at least a decade more than that suggested on osteological grounds. Whence the discrepancy? This question involves too many issues to discuss here but one point is notable. The longevity of these North Elmham people, as indicated by anatomical criteria, is closely paralleled in many other early populations. It seems to be the general consensus of anthropologists that early peoples died at ages roughly similar to those estimated for the men and women of North Elmham. This applies to sites scattered widely through space and time. A few examples are the populations of : medieval Denmark (Møller-Christensen 1958), neolithic Moravia (Jelinek 1964), Bronze Age Roumania (Caramela et.al. 1963), Chalcolithic Anatolia (Senyurek 1957), precolumbian Texas (Goldstein 1953), fourth century B.C. California (Roney 1959), precolumbian Tlatilco (Faulhaber 1965), pre-white Hawaii (Snow 1962) and many others. The anthropological criteria of skeletal age are, for the most part, ultimately derived from the study of recent cadavers of known age at death. A classic example is Wingate Todd's (1920) paper on the estimation of age from the pubic symphysis. Can it be that, for some unknown reason, anthropologists, in applying these modern criteria to early populations, are consistently led to underestimate the duration of life in the archaic groups? We must not be so arrogant as to reject the possibility of this.

The fact that the age at death, as recorded on many thousands of Roman epitaphs scattered throughout the Empire, is broadly in line with the osteological interpretation is interesting but by no means conclusive. Historians have pointed out that the validity of these funerary inscriptions may be open to doubt for various reasons.

Clearly, the assessment of age and longevity is still fraught with problems and perplexities. Miss Cayton will have served anthropologists well if she leads them to review once again the evidence they use and their interpretation of it.

REFERENCES

1. These eleven gaps are: 45, 46, 51, 52, 53, 64, 67, 142, 143, 164 and 173. Numbers 64, 67 and 143 were not used, and the bones from the remaining eight graves were not preserved.
2. Thanks are due to Dr.H.A.Waldron, Department of Social Medicine, University of Birmingham, for organising these analyses and for his helpful advice about them.
3. The sources were: Garmonsway 1953, Colgrave and Mynors 1969, Powicke and Fryde 1961, Whitelock 1930, Stubbs 1887 and Wormald 1933.
4. Published as the Penitential of Theodore chap.xli, 300, in Thorpe 1840.
5. Unpublished information supplied by Professor Rosemary Cramp.
6. Quoted by Post 1971, 83-87.

13. A DETAILED DESCRIPTION OF THE BURIALS

by Calvin Wells

I. METHOD

The measurements, method of measurement, and coding of skulls (including mandibles) follow those of Morant (1922), except for the omission of his categories of doubt '?' and presumed inaccuracy '[]'. Long bones are measured according to the technique of Trevor (1950). Dental coding is expressed in diagrams such as -

R.	- 7 6 5 4 3 0 0	0 2 3 4 5 . . .	L.
	7 6 5 4 3 2 1	. 2 3 . 5 6 ? ?	
	[8] P		C

in which the upper line represents the maxilla; the lower line, the mandible.

1, 2, 3 etc.	= tooth present in jaw
.	= tooth lost antemortem
0	= tooth lost postmortem
[8]	= tooth not fully erupted
-	= tooth not erupted
?	= unknown (jaw damaged)
C	= carious
P	= paradontal abscess

Note that the L. and R. sides of the jaws are reversed in the diagram which records them.

Other details of methods used (assessment of dental attrition, size of squatting facets, etc.) will be found in the relevant section.

Here and subsequently, OP and OA indicate osteophytosis and osteoarthritis; C, T and L are the cervical, thoracic and lumbar segments of the spinal column; the figures show the numbers of affected vertebrae in each segment out of the surviving ones in which the feature can be estimated.

II. LIST OF BURIALS

INHUMATION 1 Female, 35-45.

A very badly disintegrated and defective skeleton about which little can be said. A few very small cranial fragments include part of a R. maxilla. A damaged mandible is also present.

Teeth:

? 0 0 5 4 3 0 0	? ? ? ? ? ? ? ?
- 0 . 0 4 3 2 1	1 2 3 4 5 0 7 -

Attrition is very heavy on all teeth. No caries. Extensive calculus on the labial surface of the incisors. Osteoarthritis is present on the L. mandibular condyle.

Anomalies and Pathology

Both humeri have a supratrochlear foramen. The left is 11.3, the right 8.5 mm in maximum diameter.

OPC	2/4	OAC	0/2
" T	5/11	" T	0/8
" L	2/5	" L	2/5

There has been partial collapse of the body of the L5, with severe osteophytosis of its superior border. There is osteoarthritis with eburnation at the left posterior intervertebral joint between L4 and L5: both bones are eburnated but especially L5.

The wedge shape of the body of L5 appears to be the result of a chronic collapse of the bone rather than a single traumatic episode.

INHUMATION 2 Female, 30-50

A calva; some facial fragments; a mandible; a few post-cranial remains in poor condition.

Teeth:	C	C
	- 7 6 5 4 3 2 1 | 1 2 3 4 5 6 7 -	
	- 7 6 5 4 3 2 1 | 1 2 3 4 5 6 7 -	

Attrition light. Caries is interstitial distally on both teeth. Light deposits of tartar.

Pathology

There is osteoarthritis and ankylosing spondylitis of the C4 - C6 vertebrae. The only other surviving vertebral remains are the ankylosed neural arches of ?T2 - T4 and of ?T5 - T8. A fragment of a L. rib survives which is ankylosed to a vertebral transverse process.

The L. humerus, proximal half of the L. ulna (Plate LXXIV) and six finger phalanges of uncertain side, are present and are grossly deformed (Plate LXXV). The L. humerus lacks its head and part of its distal extremity. Its mid-shaft circumference is 46.1 mm compared with 63.5 mm on a surviving fragment of R. humeral shaft. The distal joint surfaces of the humerus and the olecranon process of the L. ulna have been removed by post-inhumation damage, but enough survives to show that the elbow joint had been grossly deformed and largely destroyed during life. Four proximal, one middle and one distal phalanges of fingers are present and are much deformed. Their proximal articular surfaces are splayed, eroded and deeply cupped. Their distal extremities are irregular, partly eroded by disease and with slight hypertrophic excrescences. The middle and distal phalanges are ankylosed.

The extreme wasting or under-development of the L. humerus indicates a long standing lesion though, by itself, there is not enough evidence to make a firm diagnosis as to its cause. The very deficient skeleton offers little support for any diagnosis that may be proposed. The destruction of the elbow joint strongly suggests an infective process: infantile osteomyelitis would be possible but, unfortunately, the condition is greatly masked by the post-inhumation changes. A few surviving fragments of the R. humerus appear to be normal. Part of the R. clavicle is present. It is very short, lightly built and under-developed. The much undeveloped L. humerus and ulna contrast with the phalanges which, though grossly pathological, are evidently from a hand which was hardly, if at all, any smaller than normal. Their proximal ends resemble the deeply cupped joint surfaces occasionally seen in advanced rheumatoid arthritis or other degenerative arthropathies. This combination of undeveloped humerus with a not much withered hand is sometimes found in congenital hemiplegias, resulting from damage to

side to side and strongly concave from above downwards. There is also a well marked sub-nasal prognathism. The vault is a medium ellipsoid in norma verticalis. The frontal bone rises moderately steeply from a low glabella and negligible supra-orbital ridges. There is a trace of post-coronal sulcus; no tuber occipitale; light muscle markings; very small mastoid processes; smallish orbits and deep canine fossae. The dental arcade is a divergent U-shape.

The following measurements were taken although the amount of reconstruction needed does not permit absolute reliability.

L	178.7	0 ₁	40.8
B	136.2	0 ₂	30.3
B'	100.1	NH	43.7
OH	114.0??	NB	26.4
G'H	64.0	100B/L	76.2
GB	90.7	1000 ₂ /0 ₁	74.2
		100NB/NH	60.4

Unfortunately, the basion is missing. However, the posterior margin of the foramen magnum, with the opisthion, is intact and by postulating an original length of 34.5 mm for the foramen, a conjectural basion point may be devised. From this, reconstructed measurements for LB and GL may be devised. The results are, admittedly, uncertain, but probably lie close to: LB 87.6, GL 90.5. These measurements would then give values for the fundamental triangle of $\angle N 71^{\circ} 17'$, $\angle A 66^{\circ} 36'$, $\angle B 42^{\circ} 07'$ and a Gnathic Index of 103.3. Most of the facial projection appears to be sub-nasal and a tentative estimate gives an angle of about 62° of alveolar prognathism. These figures must undoubtedly be inaccurate, but the overall appearance is very striking and utterly unlike any other skull from North Elmham. This distinctive appearance is strongly reinforced by the flat nasal bones, which are unique for this series of skulls. The combined features of flattened nasals, a nasal index of 60.4 and the high Gnathic Index, gives this skull a strongly negroid character. Fortunately, the nasal bones, vomer and contiguous facial skeleton are perfectly preserved and there is nothing whatever to suggest that their remarkable pattern is the result of fracture or other trauma, nor of any disease process which might produce a 'saddleback' lesion similar to that of congenital syphilis. This skull seems to be quite normal anatomically and must seriously raise the question of whether it could be a true negroid cuckoo in an Anglo-Saxon nest.

Unfortunately, owing to its defective state, the post-cranial skeleton is of only limited help in answering this question. However, the L. Brachial Index, (Length of radius x 100/Length of humerus) is obtainable and shows that the radius is long in proportion to the humerus - a negroid character. The value in this case is 78.2, which is definitely within the negroid range and outside what is normally found for Caucasoids.

Teeth:

8 . . . 4 0 0 0	|	1 0 3 4

Attrition heavy; no caries; extensive tartar on 8].

Pathology

OPT	2/5	OAT	0/6
" L	1/1	" L	1/1

The thoracic osteophytosis is very slight. The lumbar vertebra is probably an L5. It has extensive lipping and a detached neural arch (which is missing) and there is no evidence as to the state of its inferior articular processes. It seems to be very different in character, preservation and appearance from the thoracic vertebrae and it may not belong to this inhumation.

List of Burials

Mild OA is present on the articular tubercles of three out of eleven rib fragments where this feature survives.

INHUMATION 6 Female, adult.

Some very defective and much eroded fragments from most parts of the skeleton. Severely damaged cranial vault and facial fragments which show the dental state:

8 7 6 5 4 3 2 1	
8 0 6 5 4 3 2 1	1 2 3 4 5 6 7 8
C C	

Moderately heavy attrition. The mandibular right 8 has an interstitial cavity mesially; the $\bar{5}$ is the almost completely decayed remains of a retained deciduous molar. Loose teeth present: 2I, 1C, 1P, 2M, none of which is carious. The max. R. M1 has enamel hypoplasia. Slight osteoarthritis is present on both mandibular condyles.

Anomalies and Pathology

OPC	-	OAC	0/5
" T	-	" T	0/10
" L	-	" L	0/4

There is mild osteoarthritis on the transverse articular facet of two ribs.

INHUMATION 7 Child, 7 years.

Part of a much damaged calva; a damaged mandible; three post-cranial fragments. Two milk molars in situ show heavy attrition. No caries; no calculus.

Four wormian bones are present in the lambdoid suture.

INHUMATION 8 Male, 40-60.

A damaged calva and mandible; a few much broken post-cranial fragments. The cranium must have been a blunt ovoid in norma verticalis; there is no tuber occipitale; areas for the attachment of nuchal muscles are strongly marked; the mastoid processes are blunt and craggy.

Teeth:

. 7 0 0 0 0 0 .	. 0 0 ? ? 0 ? ?
-----------------	-----------------

Attrition on the surviving tooth is severe. It is not carious, but has buccal and lingual deposits of calculus. There is evidence of mild alveolar osteitis around the socket of the R. M3. The shed incisors have left little evidence of infection in the surrounding bone - they were, perhaps, lost from trauma rather than dental disease.

Anomalies and Pathology

OPC	1/4	OAC	5/5
" T	0/4	" T	0/7

The articular tubercles of sixteen ribs have survived, one of which has slight osteoarthritis. A middle R. rib has a low osteomatous thickening, about 8 x 20 mm, on the lateral surface of its body. A fragment of L. scapula shows irregular roughening and thickening in the infra-glenoid region: this appearance would be compatible with the after effects of a tear involving some of the fibres of origin of the M. triceps brachii. The body of the sternum is much more bowed anteriorly than usual.

INHUMATION 9 Female, 20-25.

A frontal bone with attached facial skeleton; damaged mandible; a few post-cranial fragments.

The following cranial measurements were available:

B'	83.8	GB	87.3
S ₁	149.0	0 ₁	42.5
S' ₁	112.5	0 ₂	31.3
NH	46.7	100S' ₁ /S ₁	75.5
NB	20.1	100NB/NH	43.0
G'H	69.0	1000 ₂ /0 ₁	73.6

Teeth:

8 7 . 5 4 3 2 0	1 2 3 4 5 . 7 8
8 7 6 5 4 3 0 0	0 2 3 4 0 6 7 8
C C C	C C

Attrition is slight. Caries on the five mandibular teeth is occlusal. The maxillary 1st molars were probably shed only a few weeks before death.

A surviving R. fibular shaft shows a well healed Pott's fracture.

INHUMATION 10 Male, adult.

A few grossly fragmented and damaged pieces of pelvis and limb bones of an extremely powerfully-built person. (Slight duplication of fragments is present).

The outstanding feature of these remains is a severe hypertrophic change in the L. knee joint (Plate LXXXIII), with osteitis of the L. tibia and fibula; also periostitis of the R. tibia. The head of the L. tibia is a mass of osteophytes and sinuses. The head of the L. fibula is similarly affected and also the proximal part of the shafts of both bones. Unfortunately, severe post-inhumation damage prevents a full assessment of the extent of this condition. Small, broken pieces of the distal shaft and condyles of the L. femur show that this bone was also involved. In the absence of a more complete picture there is even more doubt than usual as to the cause of this. Septic arthritis from a penetrating wound of the joint would be a possibility, but the extent of the osteitis of the R. tibial shaft probably makes this unlikely. An arthritis due to some form of internal derangement of the knee (torn cruciate ligament, detached meniscus, etc.) is possible, but the severity of the changes would be unusual for this condition. It is not easy to see this as any form of osteomyelitis: the shafts do not seem to be the main site of the disease and the small fistulae into the head of the L. tibia appear to be unconnected with medullary abscess cavities. The L. patella has also been involved and much deformed by the lesion. The fragmented head of the R. tibia appears to be normal as far as it is possible to judge. The head of the R. fibula is large with an unusually extensive articular area which has slight osteoarthritic lipping around it. The shaft of the bone was, apparently, normal.

INHUMATION 11 Female, 30-35.

An almost complete cranium; most of the post-cranial skeleton in fairly good condition. (Also some duplication, e.g. of atlas and axis).

The skull is an asymmetrical ovoid in norma verticalis. There is considerable flattening of the posterior part of the R. parietal and of the R. half of the occipital squama, probably as a result of cradle decubitus. The skull is fairly heavily built for a female. The orbits are rectangular and set almost level - not obliquely.

List of Burials

Teeth:

		P		
- 7 6 5 4 3 0 0	|	0 0 0 0 5 6 7	-	
- 7 0 5 4 3 2 0	|	0 2 3 4 5 6 7	-	
		P		

Attrition is very heavy. No caries. There is a paradontal abscess around the maxillary L. M1; another around the mandibular L. M1. Some absorption of the alveolar margin had occurred around the maxillary R. M2.

Anomalies and Pathology

OPC	5/5	OAC	3/4
" T	8/11	" T	0/11
" L	5/5	" L	2/5

A Schmorl's node is present on T7 and on L2 vertebrae. Slight osteophytosis on the 1st sacral segment. The femora are well built, with strong muscle markings, but are unusual in that their maximum length is from the tip of the great trochanter to the medial condyle. The extent of this is shown by the following measurements.

	L	R
Great trochanter to medial condyle	442.1	437.8
Femoral head to medial condyle	439.0	433.2
Difference	3.1	4.6

INHUMATION 12 ?Female, adult.

A much disintegrated and defective skeleton which is complicated by duplication of some bones from other individuals. A few cranial fragments include an almost complete mandible.

Teeth:

- 7 . 5 4 0 2 0	|	0 0 0 4 5 0 0 0	-	
		P		

Attrition is gross. No caries. Abscess cavity around the lost L. M1.

Anomalies and Pathology

Early osteoarthritis R. mandibular condyle.

OPC	1/3	OAC	2/3
" T	5/7	" T	0/10
" L	1/1	" L	1/1

INHUMATION 13 Male, 35-55.

Damaged skull; much of the post-cranial skeleton, but almost all bones damaged. (Also slight duplication). This was a very powerfully-built, big-boned man, with unusually large hands and feet, by the standards of this community. The defective cranium was a long ovoid in norma verticalis, with a well-marked tuber occipitale. Mastoid processes long and craggy.

Teeth:

0 . 0 5 4 3 2 0	|	1 2 3 4 5 0 . .	-	
		C		

Attrition is gross. The R. canine has a small cervical caries cavity distally. Mild peridental disease around the shed L. M2.

Anomalies and Pathology

OPT 4/8 OAT 0/4
 " L 5/5 " L 3/5

There is severe osteophytosis of the 1st and 2nd sacral segments and severe osteoarthritis of the posterior lumbo-sacral articular facets of the sacrum.

Schmorl's nodes are present on L2.

There is osteoarthritis, with eburnation, on the heads of both 1st metatarsals.

Synostosis at about 110° of a proximal and middle phalange of a finger. There is a well-healed Pott's fracture of the R. fibula with slight surrounding periostitis.

INHUMATION 14 Female, 35-40.

A few much fragmented and eroded cranial fragments; a few splinters of post-cranial remains, including the pubic symphysis. Damaged jaw fragments show:

? ? ? ? 0 0 . .	. . 0 0 0 ? ? ?
? ? 0 5 4 3 2 .	. 0 3 4 5 . 7 -

There are also 13 loose teeth: 2I, 3P, 8M. Attrition is gross. No caries. Calculus is very extensive on most surviving teeth. There is no sign of alveolar disease around the lost incisors which may have been shed as a result of trauma.

Pathology

OPC 0/3 OAC 0/3
 " T 2/6 " T -

Osteoarthritis is present on the articular tubercles of two ribs.

INHUMATION 15 Male, 35-50.

A few much fragmented scraps of cranial and post-cranial remains. Two jaw fragments show:

? ? 6 5 0 ? ? ?	|
- 7 6 5 4 3 ? ?	|

Four loose teeth are present: 1C, 1P, 2M. Attrition is severe. No caries.

INHUMATION 16 Child, c. 4 years.

Eight damaged post-cranial elements. These include the diaphyses of a R. femur (196.0 mm) and a L. tibia (161.0 mm).

INHUMATION 17 Male, adult.

Four lower limb elements of a powerfully-built man.

INHUMATION 18 Male, adult.

Very defective: about three dozen fragments of ribs, pelvis and limb bones.

Anomalies and Pathology

Early osteoarthritic changes are present on: the articular tubercle of a R. 75th/6th

List of Burials

rib; the posterior margin of the glenoid fossa of the R. scapula; the head of the R. humerus; the R. acetabulum and the head of the R. femur; there are areas of roughening at the distal end of the L. fibula, probably incipient arthritis at the ankle joint, with some evidence of old tears of the talofibular and tibiofibular interosseous ligaments; early osteoarthritis of the calcaneus at the talocalcaneal and calcaneo-cuboid joints.

INHUMATION 19 Female, 30-40.

A skull which lacks its mandible. It is a long pentagonoid in norma verticalis. The frontal bone rises very steeply from negligible brow ridges and has well marked bi-lateral bossing of the metopic region. There is a low tuber occipitale; the mastoid processes are shortish, but fairly sturdy; muscle markings are not strongly developed.

Teeth:

8	7	6	0	?	?	?	?	0	0	3	4	5	6	7	8

Attrition is moderately heavy. No caries.

Bilateral 2nd degree cribra orbitalia is present.

INHUMATION 20 Child, c. 11-12 years.

A much broken and deficient skeleton.

Teeth:

-	7	6	5	4	3	2	0	0	2	3	4	5	6	7	-

The 2nd molars are not quite fully erupted. Attrition light. No caries.

The L. femur survives with only slight damage. It has a strongly developed 3rd trochanter towards the lateral margin of the bone. This, which measures 7.5 x 18.8 mm, has its proximal border about 4.0 mm distal to the lesser trochanter and 11.5 mm lateral to it. It has no separate epiphysis, but it rises about 3.0 mm above the surface of the shaft.

INHUMATION 21 (a) Male, 40-60; (b) Female, 40-60.

There is clear duplication showing the presence of at least two persons here. Most of the surviving fragments are in poor condition and cannot be accurately allotted between the two.

A damaged male mandible shows:

.	.	.	.	0	0	0	0	.	.	.	.	.	.	.	.
								P P							

Remains of abscess cavities are present around C and P1 in the L. alveolus. The R. mandibular condyle is missing but the L. shows extensive osteoarthritis.

Other pathological features include:

OPC	3/3	OAC	1/1
-----	-----	-----	-----

Moderate osteoarthritis of the glenoid fossa of both scapulae; also of the proximal articular surfaces of the R. ulna; also the R. acetabulum.

INHUMATION 22 Male, 30-38.

A severely fragmented skull with damaged mandible; post-cranial skeleton well preserved.

Teeth:

- 7 6 5 4 3 0 0	| 0 0 3 4 5 6 7 ?
- 7 6 5 4 3 2 0	| 0 0 3 4 5 6 7 -

Attrition moderately heavy; some secondary dentine on 1st molars. No caries.

Anomalies and Pathology

OPC	0/4	OAC	0/4
" T	0/12	" T	0/12
" L	0/5	" L	0/5

The T1 vertebra has a spinous process strongly deflected to the right.

There is a six-piece sacrum. The coccygeal vertebrae are fused and there is some roughness at the sacro-coccygeal articulation which suggests the result of ligamentous tearing perhaps from a fall or other trauma such as a kick.

INHUMATION 23 Female, 35-55.

A few much broken and eroded cranial and post-cranial scraps. Two fragments of jaw show:

C
8 7 6 5 4 3 0 ?
8 7 . ? ? ? ? ?
C

There are two loose premolars. Attrition is very heavy. The maxillary caries is interstitial distally; the mandibular M2 is reduced to its roots only. Calculus is present; and enamel hypoplasia on the canine and M2.

Pathology

OPT	4/7	OAT	0/4
" L	0/1	" L	0/1

There is early osteoarthritis of the head of the R. radius.

INHUMATION 24 Male, adult.

Some much damaged post-cranial elements of a very powerfully-built man.

Pathology

OPL	5/5	OAL	0/1
-----	-----	-----	-----

There is osteophytosis of the 1st sacral segment. Four phalanges of a hand show roughness of their shafts, probably from an infective or traumatic periostitis. There is osteoarthritis with eburnation of the R. 1st metatarsal head.

INHUMATION 25 Female, 25+.

A few much fragmented and eroded post-cranial remains.

Pathology

OPC	0/3	OAC	0/3
OPT	7/9	OAT	-
" L	0/1	" L	-

Schmorl's nodes are present on the superior surface of L1 and the inferior surfaces of T11 and L1.

INHUMATION 29 Male, 40-55.

A broken skull; mandible; eroded long bones and a few other much damaged post-cranial remains of a very powerfully-built man.

The skull is strongly built. The frontal bone rises steeply from moderately full brow ridges. The areas for attachment of nuchal muscles are well developed. Mastoid processes are large and rugged. Unfortunately, severe postmortem warping has occurred and no reliable reconstruction of the skull is feasible.

Teeth:

	C										C						
	8	7	6	5	4	0	0	0	0	0	0	3	4	5	6	7	8
	<hr/>																
	0	7	6	5	4	3	2	0		1	2	3	4	5	6	7	8
									C								C

Attrition is moderately heavy. The four caries cavities are all interstitial - mesial in the maxilla, distal in the mandible. Teeth well spaced, no over-crowding.

INHUMATION 30 Male, 40-55.

Very defective: almost all bones are much damaged. The skull is partly reconstructable to reveal a medium ovoid contour.

Teeth:

	0	7	0	5	4	3	0	0		0	0	3	4	5	6	7	8	
	<hr/>																	
	8	7	6	5	4	3	0	1		0	2	3	4	5	6	7	8	

Attrition is very severe with extensive production of secondary dentine. No caries. Calculus is heavy on both jaws. Enamel hypoplasia affects the canines and 1st premolars.

Pathology

OPC	0/1	OAC	0/1
" T	5/12	" T	0/12
" L	5/5	" L	0/5

Slight osteochondritis is present on the superior margin of the body of L5.

There is extensive roughening of the floors of both maxillary antra and this strongly suggests that this man was afflicted with severe and chronic sinusitis.

INHUMATION 31 (a) Male, adult; (b) ?Female, adult.

A damaged mandible and a few much eroded post-cranial fragments from at least two persons.

Teeth:

	<hr/>																	
	8	7	6	5	0	3	0	0		0	0	0	0	5	0	0	0	

Attrition is gross. No caries. Calculus slight on all teeth. Enamel hypoplasia of the canine.

List of Burials

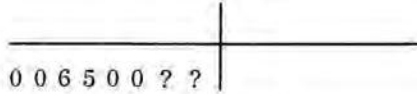
Pathology

OPC	0/2	OAC	0/3
" T	4/7	" T	1/10
" L	4/4	" L	0/5

INHUMATION 32 Female, adult.

A fragment of vault; half a mandible; a few much broken post-cranial remains.

Teeth:



Attrition is severe. No caries or alveolar disease.

Anomalies and Pathology

OPC	0/1	OAC	0/1
" T	2/10	" T	0/10
" L	1/2	" L	-

Osteochondritis is present on the superior margin of the body of a lumbar vertebra (?L3).

Osteoarthritis is present on the head of the talus and on the calcaneus.

There is a congenital perforation of the body of the sternum.

INHUMATION 33 Male, 21-22.

A strongly-built post-cranial skeleton, most of which is in good condition.

Anomalies and Pathology

OPC	0/5	OAC	0/5
" T	1/10	" T	0/10
" L	0/5	" L	0/5

Small Schmorl's nodes are present on the superior and inferior surfaces of all vertebrae from T6 to T12 inclusive.

The sacrum has six segments.

The R. sacroiliac joint is normal, but on the L. there is craggy roughening of the joint surfaces of both sacrum and innominate. It looks like the result of a chronic infective condition and could, perhaps, be the result of tuberculosis of the joint although it may be difficult to distinguish this from chronic osteoarthritis in ancient material. The shafts of both tibiae have a somewhat 'grained' appearance which suggests a low grade periostitis. There is slight bone proliferation and pitting, especially on the lateral surface of the L. tibia down most of the shaft. The R. fibula also has a similar type of graining and a short length of it is thickened by what is almost certainly an inflammatory lesion. It is not clear what, if any, relationship existed between these leg changes and the sacroiliac lesion.

INHUMATION 34 Child.

Two femoral fragments and a few other post-cranial remains. An adult talus and cuboid.

INHUMATION 35 ?Female, adult.

A small fragment of cranial vault; a few fragments of ribs and limb bones.

INHUMATION 36 Female, 30-35.

A few fragments of cranial vault; broken maxillae and mandible; a few disintegrated post-cranial scraps.

Teeth:	C	
	8 7 6 5 4 3 2 0	0 0 3 4 5 6 7 8
	8 7 6 5 4 3 0 0	0 0 3 4 5 6 7 8

Heavy attrition. The caries is interstitial mesially. Extensive calculus. Enamel hypoplasia on C, P2, M1 and M2 teeth.

INHUMATION 37 Adult.

Five fragments of cranial vault and one of rib.

INHUMATION 38 Adults.

This is an assemblage of much eroded remains which cannot be sorted into meaningful parts. Several persons are represented. It probably contains fragments from Inhumation 30.

INHUMATION 39 Adult.

A few much fragmented and eroded post-cranial elements.

INHUMATION 40 Adolescent, 13-15.

Damaged cranial fragments, including maxillae and mandible; most long bones and a few other post-cranial remains.

Teeth:	- 7 6 0 0 0 0 0	0 0 0 0 0 6 7 -
	- 7 6 5 4 3 2 1	1 2 3 4 5 6 7 -

Attrition well advanced on the first molars, otherwise light. No caries. Enamel hypoplasia of the C, M1 and M2 teeth.

INHUMATION 41 Male, 25-45.

Most long bones; pelvic, vertebral and a few other post-cranial fragments of a fairly strongly-built man.

Anomalies and Pathology

OPT	2/3	OAT	0/4
" L	-	" L	0/5

The sacrum has six segments.

INHUMATION 42 Male, adult.

About two dozen much broken and eroded post-cranial elements.

Pathology

There are early osteoarthritic changes of several intertarsal joints. These involve the L. and R. talus, calcaneus and 1st cuneiforms.

List of Burials

INHUMATION 43 ?Female, adult.

A few disintegrated post-cranial remains.

Pathology

The T10-T12 and L1-L3 vertebrae survive. Parts of the anterior surfaces of their bodies suggest that an intra-vitam destructive process may have attacked them. Unfortunately, extensive post-inhumation damage makes it impossible to be certain about the precise cause of this appearance.

INHUMATION 44 Female, 30-35.

A much damaged calva; a mandible; moderately well preserved long bones and a few other post-cranial fragments in poor condition.

Teeth:

0	6	5	4	3	0	0	0	3	4	5	6	7	0
---	---	---	---	---	---	---	---	---	---	---	---	---	---

Attrition is heavy. No caries. Calculus on buccal surface of all surviving teeth. Strongly everted gonial angles.

Pathology

OPT	10/11	OAT	0/11
" L	3/5	" L	2/5

Osteophytosis of S1 segment. Osteoarthritis on three of fourteen articular tubercles of ribs. There is also osteoarthritic lipping and eburnation on both ulnae and radii at proximal and distal radio-ulnar articulations - worse on R. than L.

INHUMATION 47 Female, 30-40.

A fragment of cranial vault; pieces of mandible; a R. clavicle and a few other much disintegrated post-cranial fragments of a lightly-built skeleton.

Teeth:

				0	0	0	4	5	6	7	8		
													C

Two loose molars. Attrition is moderately heavy. The caries on the in situ M1 is interstitial distally.

INHUMATION 48 Male, 35-55.

A dozen small fragments of cranial vault; L. and R. maxillae and mandible (all damaged).

Teeth:

?	0	6	5	4	3	2	0	0	2	0	4	5	6	7	0	
8	7	6	5	4	?	?	?	?	?	0	3	4	5	6	7	8
C					P	P										C

Attrition is severe and much secondary dentine has been produced. The two carious molars have an interstitial cavity mesially. Calculus extensive. A large abscess cavity is present in the mandible beneath the missing R. incisors.

INHUMATION 49 Male, adult.

A strongly-built skeleton. Most limb bones survive and other post-cranial elements.

Pathology

OPT	3/4	OAT	0/2
" L	5/5	" L	0/5

INHUMATION 50 Male, 35-50.

Fragments of calva; a damaged mandible; some long bones and other post-cranial fragments.

The mandible shows:

. . . . 0 0 0 0					|	. 0 0 0				

The missing L. I1 seems to have been shed shortly before death.

Pathology

OPT	8/9	OAT	0/0
" L	5/5	" L	4/4

Schmorl's nodes are present on the superior surface of the bodies of T7, T10 and L5, and the inferior surfaces of T6, T8, T9.

There is osteoarthritis of the heads of two out of nine ribs, and six out of twelve articular tubercles. Osteophytosis is extensive on the S1 segment. Osteoarthritis is slight on the glenoid articulation of the L. scapula and the distal extremity of the L. radius; it is gross, with eburnation, on the distal extremity of the R. radius (Plate LXXXV); and is also present on the bases of three out of three R. metacarpals.

INHUMATION 54 Child, 12 years.

Damaged maxillae and mandible; a few much disintegrated post-cranial fragments.

Teeth:

	[7]	
6 0 4 3 2 0	|	0 2 0 4 5 6 0 -

- 7 6 5 4 3 0 0	|	0 2 3 4 5 6 7 -

Attrition light. No caries.

INHUMATION 55 ?Male, 30-50.

A few scraps of vault; some broken and eroded post-cranial fragments.

Anomalies and Pathology

OPT	2/3	OAT	0/2
" L	0/5	" L	0/5

There is an anomalous, asymmetrical articulation between the transverse processes of the 5th lumbar vertebra and the alae of the sacrum. This is associated with a slight tilting to the left at the L5/S1 junction, with a lumbar scoliosis.

Very slight thickening occurs on the head of a 1st metacarpal and the heads of two phalanges of a hand. This may have been the result of trauma rather than infection.

INHUMATION 56 Male, 43-50.

A severely fragmented skull; a broken mandible; many eroded and disintegrating post-cranial elements.

List of Burials

Teeth:

P																
?	?	.	.	0	3	2	1	0	0	3	0	0
8	7	6	5	0	3	0	.	.	0	3	0	0	.	7	8	
C																
P																

Attrition severe on all teeth. Extensive evidence of alveolar infection in addition to the two abscess cavities. The caries (? occlusal) has removed all the crown and left two isolated roots. Moderate deposits of tartar. Enamel hypoplasia of canine teeth.

Pathology

OPC	3/5	OAC	5/5
" T	9/11	" T	3/3
" L	4/4	" L	1/3

Osteoarthritis is present on the head of one rib, the articular tubercle of another, and on the R. scapula at the acromio-clavicular joint. It is mild on the R. acetabulum and head of the femur. The L. acetabulum is grossly affected, with erosion of its superior margin and ossification of the transverse acetabular ligament. The L. femur is also grossly affected with severe lipping of its head. Mild arthritic changes are present on the L. cuboid.

A fragment of the L. orbital roof shows 1st degree cribra.

There is a well-healed fracture of the body of a middle left rib.

INHUMATION 57 Female, 40-50.

Many very small fragments of skull and post-cranial bones.

Teeth:

?														?	?	?	?	?	.	7	8				
C																									

Attrition is moderate. The caries is interstitial mesially.

Pathology

OPT	1/3	OAT	-
-----	-----	-----	---

Mild osteoarthritis is present on the L. cuboid.

Post-partum traumatic changes on the pubic bones suggest that this woman had had five to seven children.

INHUMATION 58 Child, 8-9 years.

A moderately well preserved skeleton. Jaw fragments show heavy attrition on surviving deciduous teeth and it is already well established on the four permanent molars.

Diaphyseal lengths of limb bones:

	L	R
Hu L1	205.2	207.0
Ra L1	-	159.1
U1 L1	-	175.8
C1 L1	104.6	-

INHUMATION 59 Female, 40-50.

A mandible; many much broken fragments of skull and post-cranial skeleton.

Teeth:

8	0	6	5	4	3	. .	. .	3	0	5	. 7	8
C	P		P								C	C

Gross attrition, with the crowns of all molars completely eroded. Osteoarthritis is slight on the L. mandibular condyle, marked on the R.

Pathology

There is extensive osteoarthritis in this skeleton. It occurs on the heads of five out of twelve ribs, and on the articular tubercles of seven out of thirteen.

OPC	4/5	OAC	0/5
" T	5/5	" T	0/12
" L	3/5	" L	3/5

There is mild osteoarthritis of the L. and R. acetabulum and R. femoral head. It is gross on both tali and calcanei at the sustentacular joint with huge medial flaring of both sustentaculi calcanei. It is mild on the proximal articular surfaces of both naviculars.

There is also gross arthritis with eburnation at the carpal articulations of the L. ulna and radius.

The body of the T12 vertebra is anteriorly wedged, probably from a compression fracture.

Pubic changes suggest that this woman had had two or three children.

INHUMATION 60 Adult.

A few lower leg and foot bones, mostly fragmented.

Pathology

There is slight graining of the medial surface of both tibiae, especially just proximal to the malleolus. It is also present on the distal quarter of the L. fibula. It would seem to be the result of some form of periostitis - probably infective. It is similar to what is sometimes seen in leprosy, which was undoubtedly present in Norfolk contemporarily with the North Elmham population.

INHUMATION 61 Male, 33-37.

A much broken calva; facial fragments; a damaged mandible; fairly well preserved post-cranial remains of a powerfully-built man.

Teeth:

PP					PC										
. . .	0	. 3	2	1	1	2	3	4	5	6	7	.			
. 7	6	5	4	3	0	0	1	2	3	4	5	6	7	8	
C														C	C
P															

Attrition is severe on all teeth except the mandibular L. M3. Caries is distal cervical on the second molars, mesial cervical on the M3. There is some alveolar recession around this tooth. The R. maxillary paradontal abscesses have fused to form a single large cavity. That in the L. maxilla discharged both by buccal and palatal fistulae. Tartar is present on most teeth.

List of Burials

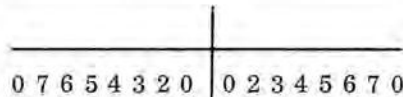
Severe osteoarthritis is present on several vertebrae at their superior and inferior costal facets. The intervertebral facets of the axis are also extensively affected. Both tarsalia show extensive osteoarthritic lipping. This is present on the heads of both tali, with eburnation on the R.; on the R. sub-taloid joint; on the sustentaculum of both calcanei; on both naviculars, with severe eburnation of the R.; on both cuboids, with moderate eburnation of the R., on both 1st cuneiforms; and on both 3rd cuneiforms, with well marked eburnation of the R.

The sternum has a perforation of the body.

INHUMATION 72 Male, 25-27.

A few fragments of calva, a broken mandible and a post-cranial skeleton in fair condition.

Teeth:



Attrition heavy; no caries; tartar is extensive, especially on the labial surface of the anterior teeth.

Pathology

OPC	4/5	OAC	2/4
" T	5/12	" T	0/12
" L	5/5	" L	0/5

Osteoarthritis is present on the superior and inferior costal facets of T9 and T10; also on the heads of three ribs. It is also well marked, with eburnation, on the head of the R. talus.

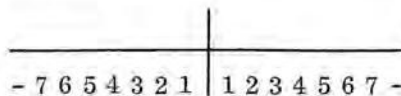
There is a small area of eburnation, without significant osteophytotic lipping, on the distal articular surface of the L. ulna.

INHUMATION 73 Female, 35-50.

A damaged calva, mandible and clavicle.

The calva is ovoid in norma verticalis and is lightly built with weak muscle markings. The mandible is lightly built and compact.

Teeth:



Attrition is very heavy. No caries. Extensive tartar. Enamel hypoplasia on the canines and 1st premolars.

There is evidence of inflammatory disease along the buccal side of most of the alveolar margin with some recession of the bone around both canines. There are eleven loose teeth: 2I, 2C, 4P, 3M - with gross attrition but no caries.

INHUMATION 74 (a) Female, 35-40; (b) ?Male, adult.

Much fragmented remains of at least two persons - probably more.

Some female jaw fragments show:

										C				
? ? ? 0 4 3 2 1	1	2	3	4	.	.	? ?							
8 7 6 5 4 3 2 1	1	2	3	4	5	6	7	8						
C								C C						

Attrition is heavy. Caries is interstitial medially on $\underline{4}$ and $\overline{6}$. It is buccal on $\overline{7}$, whilst the $\overline{6}$ has had its crown eroded so that only two loose roots remain in the jaw. There is extensive tartar on the labial surface of the maxillary and mandibular incisors and canines, and on the lingual surface of all mandibular teeth. Osteoarthritis is present on both mandibular condyles.

Pathology

OPC	0/5	OAC	0/5
" T	0/12	" T	0/12
" L	1/5	" L	0/5

The R. clavicle (female) is abnormal (Plate LXXXVI) and also the L. tibia and fibula (Plate LXXXVII). The clavicle, which measures 131.4 mm in length, shows an area of destruction of the bone in its lateral half, surrounded by mild periostitis. The superior surface shows a multilocular cavity with a feeble proliferation of bone around it in a few places. This cavitation measures about 12.5 x 24.2 mm and extends to within 25.5 mm of the lateral extremity of the bone. It is in its anterior half. At its deepest it penetrates the whole thickness of the clavicle and has eroded the inferior surface to leave a hole about 3.0 x 5.5 mm in it. The tibia has an area of periosteitic and osteitic thickening of its tuberosity and of the bone adjacent to it on both the medial and lateral sides. The head of the bone has been removed by post-inhumation damage, but the pathology extends about a quarter of the length of the tibia. Immediately medial to the tuberosity there is a shallow excavation of the bone, roughly semicircular and about 15 mm in diameter, 2.5 mm deep. It appears to communicate with the underlying cancellous bone through a pin-sized aperture. The surrounding area of osteitis shows well marked bony proliferation.

The L. fibula has a fusiform swelling in its proximal third. There is an area of periosteitic reaction all round the shaft, through about 70.0 mm. Towards the middle of this, an oval aperture 8 x 16 mm, penetrates the bone. The margins are smooth and reveal a slightly undercut cavity with rough walls.

For discussion of these bones see the Summary.

A fragment of R. pubis from this skeleton suggests that this woman had had three-five pregnancies.

INHUMATION 75 Female, 20-21.

A badly broken skull. Apart from the jaws, reconstruction is not feasible. Many post-cranial elements in poor condition.

Teeth:

- 7 6 5 4 3 2 0	1	2	0	4	5	6	7	0
0 7 6 5 4 3 2 1	1	2	3	4	5	6	7	8

Attrition light. No caries.

List of Burials

Pathology

OPC	0/5	OAC	-
" T	0/6	" T	0/3
" L	0/5	" L	0/5

There is a Schmorl's node on the inferior surface of the ?T6 vertebra.

Both tibiae show extensive graining, with slight thickening of the cortex, throughout most of their shafts - especially on the medial and lateral surfaces. This appears to be the result of some well developed periostitis and osteitis of uncertain cause.

INHUMATION 76A Child, 2½-3 years.

A mandible and a few post-cranial remains, mostly damaged. Teeth: the L. canine and all four molars are present. They show heavy attrition but no caries.

INHUMATION 76B (a) Child, 6-12 months; (b) Child, 2-3 years.

These remains include a few damaged long bones and other post-cranial fragments.

INHUMATION 77 Female, 33-40.

A much broken skull, including a damaged mandible.

Teeth:

8 7 6 5 4 3 2 0	|	0 0 . 0 5 6 0 8
<hr/>		
. . . 5 4 3 2 0	|	0 0 0 4 0 . . .

Attrition heavy. No caries. Tartar on all surviving teeth. Enamel hypoplasia on C, P2 and M2 teeth.

Pathology

Osteoarthritis is present on both mandibular condyles.

INHUMATION 78 Female, 28-43.

A very much fragmented and deficient skeleton of a lightly-built woman. Maxillary fragments, and mandible almost intact.

Teeth:

0 7 6 0 4 0 0 0	|	0 2 3 4 5 6 7 8
<hr/>		
8 7 6 5 4 3 0 .	|	. 0 3 4 5 6 7 -

Attrition heavy. No caries. Extensive tartar on most teeth. Slight alveolar periostitis is present around the sockets of 765 and 67. There is no evidence of alveolar disease around the missing mandibular incisors and it is probable that they were lost as a result of trauma.

A second fragment of mandible shows:

<hr/>	
. . . 0 0 0 2 0	|
C	

Attrition is very heavy on the surviving tooth. The caries is cervical, labially. There are three loose mandibular teeth: 1I, 1C, 1P with distal interstitial caries on the pre-molar.

List of Burials

Moderately heavy attrition. No caries. A small abscess cavity at the site of the lost $\overline{16}$. Enamel hypoplasia present on the 1st and 2nd molars.

Pathology

OPL 3/3 OAL 3/5

Mild periostitis of the shafts of both tibiae is present and a low exostosis, in the form of interosseous ossification, is present at the distal end of the lateral surface of the L. tibia.

The R. calcaneus has a strongly marked and rough double exostosis distally. This is almost certainly due to tearing of both the calcaneo-cuboid and calcaneonavicular parts of the bifurcated ligament.

There is osteoarthritis of the heads of the R. 1st and R. 5th metatarsals.

INHUMATION 83 Male, 25+.

A few much damaged long bones and other post-cranial fragments.

Pathology

Extensive periosteitic and osteitic reaction is present in the shafts of the L. and R. tibiae and R. fibula. (The L. fibula is missing).

INHUMATION 84 Female, 25-35.

A well preserved skull, lacking mandible; a very few, damaged post-cranial elements.

The skull is lightly built. It is ovoid in norma verticalis; the frontal bone rises moderately steeply from negligible brow ridges; there is no tuber occipitale; muscle markings are weak; the orbits are high and rectangular with sharp superior margins; the dental arcade is parabolic.

Teeth:

0 7 6 0 0 0 0 0	0 0 0 0 0 6 0 0

Attrition is heavy; no caries.

Anomalies and Pathology

A L. epipteric bone is present.

OPT 0/2 OAT 0/2

INHUMATION 85 Female, 25-35.

A few much broken scraps of vault, damaged jaws and post-cranial fragments.

Teeth:

? 7 0 0 4 0 0 0	0 0 3 4 5 6 7 8
8 7 6 5 4 0 0 0	0 0 0 0 5 6 0 8

Attrition is severe. The two carious teeth are reduced to a single root each. There is enamel hypoplasia on the $\overline{7}$.

List of Burials

INHUMATION 88 Female, 35-45.

A cranium in good condition, (the mandible in three fragments). Many post-cranial elements, but mostly broken and soil eroded.

The skull is ovoid in norma verticalis. The metopic frontal bone rises from low brow ridges; there is a small tuber occipitale; mastoid processes are short and blunt; the orbits are rectangular.

Teeth:

? ?
0 7 . . 4 3 0 0	0 0 0 0 . . . 0

Anomalies and Pathology

OPC	5/5	OAC	5/5
" T	12/12	" T	4/6
" L	3/3	" L	2/2

This osteophytosis and osteoarthritis is extensive, with eburnation in the cervical segment. C4 and C5 are synostosed.

Osteoarthritis is also extensive on the vertebral articular surfaces for heads and tubercles of ribs. Osteophytosis and osteoarthritis are extensive on the 1st sacral segment and at the sacroiliac joints. Osteoarthritis is present on the heads or articular tubercles of eleven/eleven ribs. It is well marked on the margin of the R. scapular glenoid fossa; at the distal extremity of the R. humerus; and at the proximal and distal ends of both radii; the olecranon fossa of the L. ulna; and on the R. patella. Slight osteoarthritis occurs on the intertarsal joints of both feet and is gross on the heads of both 1st metatarsals. Severe osteoarthritis with eburnation is present on a (?R. 1st) metacarpal; and on the head of a 1st phalange of a L. hallux.

Three wormian bones occur in the R. lambdoid suture.

INHUMATION 89 Female, 35-45.

A badly fragmented skull (no reconstruction feasible); a very defective and fragmented post-cranial skeleton. These bones are small with poorly developed muscle markings.

Teeth:

	0 2 3 0 0 ? ? ?
? ? ? ? ? 3 2 1	0 0 0 ? ? ? ? ?

Heavy attrition. No caries.

Pathology

OPC	0/2	OAC	0/4
" T	9/12	" T	1/11
" L	2/2	" L	0/5

Two ribs appear to have a well healed fracture, but post-inhumation damage leaves a margin of uncertainty here. Osteoarthritis is present on the head of the R. humerus; on the distal articular surfaces of both humeri (worse on R.); on both ulnar semilunar notches (especially R.); on the head of the R. radius (severe); slight on the distal surface of the R. radius; and proximally and distally on the L. radius.

INHUMATION 90 Child, 6 years.

A severely fragmented skull; a fairly well preserved post-cranial skeleton.

Teeth:

M ₁ e d c 2 1					1 2 0 d e M ₁					
M ₂										M ₂

Attrition is moderately heavy. No caries.

INHUMATION 91 Male, 18.

Fragments of cranial vault, face and jaws; a fairly well preserved post-cranial skeleton.

Teeth:

8 7 6 5 4 3 2 1	1 2 3 0 0 6 7 8
8 7 6 5 4 3 2 0	0 0 0 4 5 6 7 8

Attrition is moderately light. No caries. Enamel hypoplasia occurs on the 2nd incisors, canines and 1st premolars.

The fairly well developed brow ridges, large frontal sinus, sturdy mastoids, largish articular surfaces and well marked pelvic features leave no doubt that this is a male. It is excluded from the metric series because long bone epiphyseal union is still incomplete.

INHUMATION 92 Child, 5-6 years.

A few fragments of skull, including jaws; a few long bones and other post-cranial fragments.

Teeth:

M ₂										M ₂
M ₁					e d c 0 1				0 0 0 d e	M ₁
					e d c 0 0			0 b c d e		
M ₁				C				C		M ₁

Attrition is moderately heavy; the caries is interstitial distally on both teeth.

INHUMATION 93 Female, 16-17.

A damaged skull and mandible; severely broken post-cranial fragments.

Teeth:

8										8
					7 6 5 4 3 2 0			1 2 3 4 5 6 7		
					7 6 5 4 3 2 1			1 2 3 4 5 6 7		
8										0

Attrition is heavy; the mandibular 1st molars are already deeply concave and have formed secondary dentine; the 2nd molars have eroded their cusps and are slightly concave. No caries. Enamel hypoplasia is present on I2, C, P2 and M2 teeth.

INHUMATION 94 Female, 32-40.

A few small fragments of cranial vault and jaws; some very deficient and fragmented post-cranial remains.

List of Burials

Teeth:

8 7 6 5 4 3 2 1	|	
? ? 0 5 4 0 0 0	|	0 0 0 ? ? ? ? ?

Attrition is light. No caries. Enamel hypoplasia of I2, C and P1.

In three loose maxillary molars no caries is present.

Pathology

OPC	0/1	OAC	0/1
" T	0/7	" T	0/4
" L	0/5	" L	0/5

Signs of parity (2-4 births) are present in the pubis.

INHUMATION 95 Male, 35-50.

A damaged calva; a mandible; long bones and a few other post-cranial remains of a lightly-built man.

Teeth:

8 7 6 5 4 3 2 0	|	0 2 3 4 5 6 7 -
8 7 6 5 4 3 2 0	|	0 2 3 4 5 6 7 -

Attrition is heavy. No caries. Slight deposits of tartar. There is a well marked diastema between $\overline{3-4}$.

Pathology

OPC	5/5	OAC	1/2
" T	3/12	" T	0/12
" L	4/4	" L	0/4

Schmorl's nodes are present on the superior surface of L1 and L2, and on the inferior surface of L1 and L4.

Osteophytosis is extensive on the 1st sacral segment. Osteoarthritis is present on the head of the L. 1st metatarsal. The 2nd L. cuneiform has a small exostosis which suggests organization of a blood clot associated with a torn ligament.

A L. (?2nd) metatarsal shows a well healed fracture of its shaft.

INHUMATION 96 (a) Male, 23-27; (b) Female, 35-55.

A few fragments of calva; a damaged mandible; a few fragments of post-cranial remains.

(Although it is clear that two persons are represented in this inhumation, the poor condition of the bones does not permit all of them to be attributed with certainty to the male or the female).

Teeth:

8 7 . 5 4 3 2 1	|	1 2 0 4 5 6 7 8
8 7 . 5 4 3 2 1	|	1 2 0 4 5 6 7 8

Heavy attrition. No caries. Enamel hypoplasia occurs on the C and P2 teeth. Tartar is present lingually and buccally. There is slight inflammatory reaction (periostitis) of the alveolus on the buccal side of all surviving molars and on the lingual side of both 3rd molars.

Pathology

OPT 0/1 OAT 0/1
 " L 0/2 " L 0/2

A length of (apparently male) fibular shaft shows some nodular thickening and ridging, which appears to be the result of periostitis.

INHUMATION 97 Male, 24-26.

A badly damaged skull; many post-cranial remains but almost all long bones severely fragmented. This was a well-built man with strong muscle markings.

Teeth:

? 7 6 5 4 3 2 0	0 2 3 4 0 6 7 -
8 7 6 5 4 3 2 1	0 2 0 4 5 6 7 8
C	

Moderately heavy attrition. The caries is too advanced to reveal where it began. Slight hypoplastic changes on the C, P2 and M2 teeth.

Pathology

OPC 0/5 OAC 0/5
 " T 0/11 " T 0/9
 " L 0/4 " L 0/4

INHUMATION 98 Male, 23-25.

A fragmented calva; R. maxilla; a mandible; many post-cranial elements in fairly good condition.

The skull is powerfully built, the mastoid processes are large and craggy, the area for attachment of the nuchal muscles is strongly developed.

Teeth:

8 7 6 5 4 3 2 0	? ? ? ? ? ? 7 8
8 7 6 5 4 3 2 0	0 2 3 4 5 6 7 8

Attrition moderately heavy. No caries. Enamel hypoplasia occurs on the maxillary M2 and mandibular C teeth. There are two loose teeth, a maxillary L. I1 and I2, neither of which is carious.

Pathology and Anomalies

OPC 0/4 OAC 0/4
 " T 0/12 " T 0/12
 " L 0/5 " L 0/4

Schmorl's nodes are present on the superior surface of T7 and T8, and on the inferior surface of T7.

There is slight osteoarthritis at the base of the 1st phalange of the R. hallux.

The talus of each foot has an irregular, rough, slightly lipped projection from the lateral tubercle of the posterior process. It does not suggest an abortive attempt to isolate an os trigonum. It may, perhaps, be the result of strain and tearing some of the fibres of the posterior talofibular ligament, due to twisting the ankle joint or landing heavily when jumping from a height.

List of Burials

There are three wormian bones in the R., and four in the L., lambdoid suture.

INHUMATION 99 Male, 18-19.

A broken cranium; damaged long bones and a few other much broken post-cranial remains.

The skull is ovoid in norma verticalis. The frontal bone has well marked midline keeling in the supra-glabellary region. It rises from strongly developed brow ridges. There is a trace of post-coronal sulcus. No tuber occipitale. Mastoid processes are small. The orbits are rectangular and set somewhat obliquely. Sub-nasal guttering is present. The palate is broadish and parabolic.

Teeth:

?	0	6	5	4	0	0	0	1	0	3	4	5	6	7	0
8	7	6	5	4	3	2	0	0	2	3	4	5	6	7	8
C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C

Heavy attrition. The caries is interstitial distally on all four teeth. Enamel hypoplasia of the canines.

Pathology and Anomalies

There is some osteitic change in the body of the terminal phalange of the R. hallux, perhaps due to infection after trauma.

There is a L. epipteric bone; and a wormian bone in each half of the lambdoid suture.

INHUMATION 100 Female, 38-44.

A cranium; many much broken and eroded post-cranial fragments.

The skull is a long ovoid in norma verticalis. The glabellary region is strongly developed, with well marked brow ridges medially. There is very slight sagittal keeling; no tuber occipitale; the mastoid processes are blunt, shortish but sturdy; muscle markings are well developed; the orbits are rectangular. The palate and dental arcade are parabolic. The mandible has a rather prominent mental region and slight eversion of the L. gonial angle.

Teeth:

8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
-	7	6	5	4	3	2	0	0	2	3	4	5	6	7	8
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

Attrition is gross. There is much alveolar absorption around the roots of 6. The crowns of 66 and 6 have been completely eroded so that the roots of these teeth are isolated in the jaws, but no caries is present because secondary dentine has sealed the cavities and capped the exposed tissues.

Pathology

OPC	3/5	OAC	2/5
" T	8/8	" T	1/8
" L	4/4	" L	3/5

Cervical osteophytosis is severe. Osteoarthritis is present on the head or articular tubercles of four out of eleven ribs. It is severe on the head of the R. humerus and around the margin of the R. scapular glenoid fossa. There is slight osteoarthritis proximally of the L. ulna and both acetabula.

List of Burials

Gross osteoarthritic changes are present on the head of the L. 1st metatarsal (Plate LXXXII) and the base of its 1st phalange, with extensive eburnation of the opposing surfaces.

Hallux valgus is present here.

INHUMATION 104 Male, 35-60.

A skull with damaged base, maxillae and mandible; damaged long bones and a few other post-cranial scraps.

The skull is ovoid in norma verticalis. The frontal bone rises rather obliquely from a strongly developed glabellary region. There is a very shallow post-coronal sulcus; no tuber occipitale. The mastoid processes are of moderate size; the orbits are rectangular and set slightly obliquely; areas for attachment of nuchal muscles are strong. The mandible is heavily built with a broad, square mental region.

Teeth:

? ? ? 5 0 0 0 0	| 1 2 3 4 5 . . .
. 7 . 5 4 3 2 1	| 1 2 3 4 5 6 7 8

Gross attrition, including all anterior teeth which are worn almost to their roots. No caries.

Pathology

OPL 2/2 OAL 0/2

Evidence of chronic sinusitis is present on the floor of both maxillary antra.

INHUMATION 105 Female, adult.

A severely fragmented skull; many small pieces of post-cranial skeleton in poor condition.

Teeth:

? 7 6 0 4 3 2 1	|
- 7 6 5 4 3 2 0	| 0 0 3 4 5 6 ? ?

Attrition is heavy; no caries; light deposits of tartar. Enamel hypoplasia of the canines. Most of the buccal surface of the mandibular alveolus shows evidence of inflammatory reaction, presumably a paradontal infection.

INHUMATION 106 Female, 38-45.

A damaged calverium; about two dozen fragments of post-cranial skeleton.

The skull is ovoid in norma verticalis. The frontal bone rises steeply from the supraorbital region; there is slight fullness of the glabella, but brow ridges are negligible. No tuber occipitale; light muscle markings; small mastoid processes.

Teeth:

Five loose teeth are present: 1I, 3P, 1M (a maxillary R. 3rd). Attrition is fairly heavy. The molar has an occlusal caries cavity.

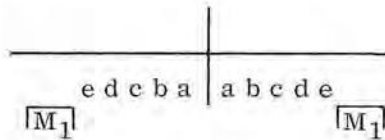
Anomalies

A wormian bone is present in the L. lambdoid suture.

INHUMATION 107 Child, 3-4 years.

A mandible; a fairly well preserved post-cranial skeleton.

Teeth:

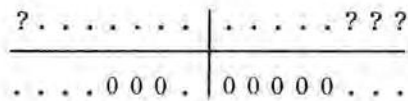


Light attrition; no caries.

INHUMATION 108 Female, 40-60.

A disintegrated skull; fragments of maxillae and mandible; a very incomplete post-cranial skeleton.

Teeth:



Pathology and Anomalies

OPC	4/4	OAC	3/4
" T	11/11	" T	0/11
" L	5/5	" L	0/0

A large Schmorl's node is present on the superior surface of T11.

There is a rough area of bone on the atlas, perhaps due to tearing of a ligament, just above the articular surface of the dens.

Mild osteophytosis occurs on the 1st sacral segment.

Early osteoarthritis is present on the heads of both humeri and around the glenoid margins of both scapulae; also on the distal articular surface of the L. cuboid. It occurs proximally and distally on the L. 1st metacarpal and (with eburnation) on the head of the R. 1st metatarsal.

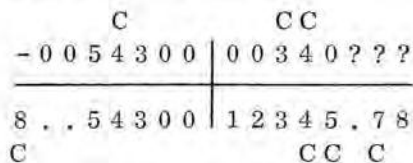
The sagittal and coronal sutures are completely fused; the lambdoid suture is wholly unfused. Three wormian bones occur in the L. lambdoid suture and one in the pars occipitalis of the sagittal.

Signs of parity (7-9 births) occur in the pubic bones.

INHUMATION 109 Female, 35-50.

Fragments of a much broken calva; damaged maxillae; a mandible; long bones in fair condition; a few other post-cranial fragments.

Teeth:



Attrition very heavy on all teeth except $\overline{18}$. Caries is occlusal on all and always due to complete erosion of crowns which has opened the pulp cavity. Enamel hypoplasia occurs on the C and P2 teeth. Light deposits of tartar are present.

List of Burials

Pathology

OPL 4/5 OAL 0/3

Osteophytosis occurs on the S1 segment.

Mild osteoarthritis is present on the mandibular R. condyle.

A well healed parry fracture is present in the distal third of the R. ulna.

Signs of parity (3-4 births) occur in the pubic bones.

INHUMATION 110 Child, 2-2½ years.

A few tiny fragments of cranial vault; a moderately well preserved post-cranial skeleton.

INHUMATION 111 Child, 6-7.

A fragmented calva; broken jaws; a few post-cranial scraps.

Teeth:

7		2		3	4	5	7
6	e	0	0	0	0	0	6
6	e	d	0	0	0	e	6
7							7

Attrition heavy; no caries.

Pathology

First degree cribra orbitalia is present in both orbits.

INHUMATION 112 Male, 35-55.

A few, much broken, scraps of a powerfully-built man.

Teeth:

	P	P					
?	0	0	5	.	0	0	0
0	0	0	.	5	.	.	.

Very heavy attrition. No caries. There is evidence of extensive alveolar inflammatory reaction.

Pathology and Anomalies

OPC	4/5	OAC	4/5
" T	5/6	" T	1/4
" L	2/2	" L	0/2

The cervical osteoarthritis is gross, with extensive lipping, eburnation and re-modelling of the bones.

Osteoarthritis is also present at the medial end of the R. clavicle; distally on the R. radius; distally, with eburnation, on both ulnae and the heads of the R. 1st and 3rd metacarpals. It is present, without eburnation, on the base of a 1st phalange (?3rd finger).

A perforated sternum is present.

INHUMATION 113 Child, 2-2½ years.

A few, much broken fragments of skull and post-cranial skeleton.

Teeth:

e d c b a	|	
e d c b a	|	a b c d e
6	|	

Light attrition; no caries.

INHUMATION 114 Female, 25-35.

A severely damaged skull; fragmented long bones and other post-cranial elements.

Teeth:

0 0 . . 4 0 0 0	|	0 0 0 0 0 . 0 0
- 7 6 5 4 3 0 0	|	0 0 0 0 0 . . -

Heavy attrition. No caries. Extensive tartar deposits on the mandible.

Pathology and Anomalies

OPT	1/6	OAT	0/7
" L	-	" L	0/4

There is extensive osteoarthritis and flattening of the mandibular L. condyle.

The skull is metopic.

INHUMATION 115 (a) Male, adult. (b) Female, 22-28.

(a) Damaged long bones and few other post-cranial fragments of a very powerfully-built man.

Pathology and Anomalies

OPC	0/1	OAC	0/1
" L	1/1	" L	0/1

Mild osteoarthritis occurs on the L. navicular, the heads of both 1st metatarsals and on the base of a hallucial 1st phalange.

There is a huge facet on the lateral surface of the L. 1st metatarsal for articulation with the 2nd metatarsal. A similar but smaller one occurs on the R. side.

(b) A much broken skull; a few post-cranial fragments.

Teeth:

P P C P	|	
. . . 5 4 3 2 1	|	1 2 3 4 5 6 7 8

Attrition heavy. The caries is occlusal. Enamel hypoplasia occurs on C, P2 and M2 teeth. Moderate deposits of tartar are present. Very extensive alveolar inflammatory disease occurs. The M3 is a small peg.

INHUMATION 116 Female, 25-35.

A well preserved cranium; post-cranial skeleton in excellent condition except for the pelvis.

List of Burials

The metopic skull is ovoid in norma verticalis. It is rather lightly built, with negligible brow ridges, a low tuber occipitale, small mastoid processes and sub-circular orbits. The face is asymmetrical, the distance between the inferior border of the orbit and the alveolar margin at M1 being 37.3 mm on the left, 33.2 on the right. The dental arcade is parabolic. The mandible is lightly built and compact.

Teeth:

																			C

Attrition is light. The caries is interstitial mesially. There is no trace of infective lesions of the alveolus and the missing incisor may have been lost from trauma.

Pathology

OPC	0/5	OAC	0/2
" T	0/12	" T	0/12
" L	0/5	" L	0/5

The asymmetrical face raises the question of whether this is simply a developmental oddity within the range of normal variation, whether it is a genetic or other developmental defect which can be seen as transgressing normal limits, or whether it is due to recognizable disease or injury. The occasional birth injury which produces an intra-cranial haemorrhage, may result in facial asymmetry, but in these cases considerable inequality of one or more limb bones is often found. In this skeleton the differences in length between the L. and R. humerus, radius, femur and tibia are, respectively, 4.6, 1.2, 2.5 and 0.1 mm. The average L. and R. differences of these four bones in all the females shown in Table 20 are 6.4, 2.3, 6.8 and 2.1 mm, which shows that Inhumation 116 is more symmetrical than the average. This may be taken to weigh against the likelihood of a traumatic birth lesion and the probability is that this lopsided face can be assessed as nothing more significant than an oddity of growth, of no identifiable cause.

INHUMATION 117 Child, 6 years.

A few small fragments of skull and long bones.

Teeth:

INHUMATION 118 Female, 28-35.

A broken calva and mandible; ten damaged post-cranial fragments.

The skull is metopic.

Teeth:

Attrition is heavy. No caries. The $\overline{4}$ seems to be unformed. Ten loose teeth are present: 2I, 1C, 4P, 3M.

INHUMATION 119 Male, 38-45.

Badly fragmented and deficient post-cranial remains of a powerfully-built man.

List of Burials

INHUMATION 123 (a) ?Female, 40-60; (b) Female, 18.

A few cranial fragments and many splinters of eroded post-cranial elements from at least two persons.

(a) Teeth:

? ? 6 5 4 3 0 0	|	

Gross attrition. No caries.

Pathology

OPC	4/4	OAC	0/4
" T	1/1	" T	-
" L	1/1	" L	1/1

Schmorl's nodes are present on both surfaces of L1.

The L. ischium survives in a damaged state. At about the junction of its inferior ramus with the inferior pubic ramus, it has been recently broken through at the site of a mass of what appears to be callus. This seems to be the result of a repaired fracture.

Two small rib fragments survive with well healed fractures, but it cannot be certain that they are part of this skeleton.

(b) Teeth:

[8] 7 6 5 4 3 2 0	|	

Light attrition. No caries.

INHUMATION 124 Male, 40-55.

A damaged skull with maxillae and mandible; a few badly eroded post-cranial fragments.

The skull is a long ovoid in norma verticalis. Its lateral walls are curiously 'pinched in' at the antero-inferior quarters of the parietals, giving a slightly hour-glass effect. Brow ridges are moderately developed; muscle markings are strong; there is a well marked tuber occipitale; the mastoid processes are sturdy and craggy. The vault is somewhat plagiocranial owing to a thickening and eversion of the postero-inferior angle of the R. parietal.

Teeth:

? ? ? 0 0 0 0 0	|	0 0 3 0 0 ? ? ?
? ? ? 0 0 0 0 0	|	0 0 3 4 5 6 7 -

Attrition is severe, with much secondary dentine. No caries. Tartar is present buccally on the [3], lingually on all the mandibular teeth.

INHUMATION 125 (a) Male, 40-60; (b) Male, 17-18; (c) ?Male, Adult.

(a) A damaged calva and mandible.

Teeth:

. . . . 4 0 . .	|	
	

Attrition heavy. No caries. There is the remains of a large abscess cavity in the body of the L. side of the mandible, close to the inferior border near the gonial angle. It measures about 15.0 x 11.5 mm.

Pathology

OPC	-	OAC	-
" T	6/6	" T	4/6
" L	2/2	" L	1/1

There is extensive osteoarthritis of the axis and on thoracic articulations for heads of ribs and on the transverse processes; it is mild on the margins of both scapular glenoid fossae.

(b) A damaged calva, maxillae and mandible.

Teeth:	$\overline{0}$ 7 6 0 0 0 0 0 | 0 0 3 0 0 6 7 <hr style="width: 100%;"/> 7 6 5 4 3 2 0 | 0 2 3 4 5 6 7 - $\overline{8}$	$\overline{8}$
--------	---	----------------

Attrition moderately heavy. No caries.

(c) A few cranial fragments of a third skeleton.

INHUMATION 126 Female, 35-50.

A damaged but reconstructible skull; many eroded post-cranial fragments.

The skull is ovoid in norma verticalis; the frontal bone is full and slightly bossed in the metopic region; there is a low tuber occipitale; the mastoid processes are small and blunt; the dental arcade is parabolic; the palate shallow. The mandible is gracile.

Teeth:	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; text-align: center;">P</td> <td style="width: 15%; text-align: center;">P</td> <td style="width: 15%; text-align: center;">P</td> </tr> <tr> <td style="text-align: center;">? . 0 5 4 3 . 0</td> <td style="text-align: center;"> </td> <td style="text-align: center;">0 . 3 4 5 6 . -</td> </tr> <tr> <td colspan="3" style="border-top: 1px solid black;"></td> </tr> <tr> <td style="text-align: center;">- . 0 0 4 3 2 1</td> <td style="text-align: center;"> </td> <td style="text-align: center;">. . 3 0 0 . . -</td> </tr> </table>	P	P	P	? . 0 5 4 3 . 0		0 . 3 4 5 6 . -				- . 0 0 4 3 2 1		. . 3 0 0 . . -	
P	P	P												
? . 0 5 4 3 . 0		0 . 3 4 5 6 . -												
- . 0 0 4 3 2 1		. . 3 0 0 . . -												

Attrition gross. No caries. Minimal tartar.

Pathology

Osteoarthritis is present on the heads of both humeri, with extensive lipping, especially on the R. It is also present at both ends of the R. radius.

INHUMATION 127 Female, 35-45.

A few disintegrated cranial and post-cranial remains of a lightly-built woman.

Teeth:	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">? ? 0 0 0 0 0 0</td> <td style="text-align: center;"> </td> <td></td> </tr> <tr> <td colspan="3" style="border-top: 1px solid black;"></td> </tr> <tr> <td style="text-align: center;">8 7 6 5 4 3 2 1</td> <td style="text-align: center;"> </td> <td style="text-align: center;">1 2 3 4 5 6 7 8</td> </tr> <tr> <td style="text-align: center;">C C</td> <td></td> <td style="text-align: center;">C</td> </tr> </table>	? ? 0 0 0 0 0 0						8 7 6 5 4 3 2 1		1 2 3 4 5 6 7 8	C C		C	
? ? 0 0 0 0 0 0														
8 7 6 5 4 3 2 1		1 2 3 4 5 6 7 8												
C C		C												

Seven loose teeth are present: 2I, 1C, 3P, 1M.

Attrition heavy. Caries is occlusal on $\overline{6}$, cervical buccally on $\overline{7}$ and $\overline{8}$. There is marked over-crowding of all premolar teeth. Enamel hypoplasia of I2. Tartar is extensive on all teeth, lingually and buccally. Slight infective changes of the alveolus are present in the mandible.

List of Burials

Pathology

OPC	0/1	OAC	0/0
" T	3/11	" T	0/9
" L	2/3	" L	2/5

Mild osteoarthritis occurs on both innominates at the sacro-iliac joint.

The L. pubis shows evidence of parity: ?3 or 4 births.

The R. ischium has well marked irregularity of the area of the bursa underlying the origin of the hamstring muscles. It resembles the periosteitic changes found in such forms of bursitis as 'weaver's bottom'.

INHUMATION 128 (a) Female, 30-45; (b) Adult, unsexable.

(a) A broken calva; a mandible; some very fragmented post-cranial scraps.

Teeth:

8	7	6	5	4	3	2	0	|	0	2	3	4	5	6	7	8

Attrition heavy; no caries. Light tartar deposits. Mild alveolar periostitis in molar region.

Pathology

OPC	1/1	OAC	0/1
" T	1/1	" T	0/4
" L	4/4	" L	3/5

There is mild osteoarthritis on both cuboids.

(b) This is identifiable only from a mandible.

Teeth:

.	.	6	5	4	0	0	0	|	0	2	3	4	5	0	7	8

Very heavy attrition. No caries.

INHUMATION 129 (a) Male, adult; (b) Female, adult.

A few grossly disintegrated remains of two persons.

INHUMATION 130 Male, adult.

A fragment of mandible and a few very disintegrated post-cranial scraps.

Teeth:

8	7	0	?	?	?	?	?	|								
CC																

Very heavy attrition. The two caries cavities are both cervical and on the buccal surface.

Pathology

OAT	0/2
" L	2/2

There is osteoarthritis on four out of seven ribs at the articular tubercles.

INHUMATION 131 Male, adult.

Nineteen damaged vertebrae and a few severely broken other post-cranial fragments.

Pathology

OPC	3/4	OAC	0/4
" T	3/6	" T	0/5
" L	2/2	" L	0/3

INHUMATION 132 Adult, uncertain sex.

A few damaged long bones and fragmented scraps of other post-cranial elements.

INHUMATION 133 Female, 25-35.

A broken skull; mandible intact; much damaged long bones; a few other fragments of post-cranial skeleton.

Teeth:

8 7 6 5 4 3 0 0	|	0 0 0 4 5 6 0 8
<hr/>		
8 7 6 5 4 3 2 1	|	1 2 3 4 5 6 7 8

Attrition moderately heavy. No caries. Tartar deposits slight. Overcrowding of anterior mandibular teeth. Osteoarthritis of both mandibular condyles.

Pathology

OPC	0/2	OAC	0/2
" T	0/6	" T	0/5
" L	0/4	" L	0/1

INHUMATION 134 Female, adult.

A few post-cranial remains of a lightly-built skeleton.

INHUMATION 135 Male, 30-35.

A damaged calva; fragments of maxillae; a mandible; and three post-cranial pieces.

The skull is a long ellipsoid in norma verticalis. There is a low tuber occipitale; the mastoid processes are sturdy.

Teeth:

? ? 0 5 0 0 0 0	|	0 0 3 4 0 ? ? ?
<hr/>		
8 7 6 5 4 3 0 0	|	1 2 3 4 5 6 7 8

Attrition severe. No caries. Enamel hypoplasia well marked on the C and M2 teeth. Two loose maxillary molars are present: no caries.

Pathology and Anomalies

OPC	2/2	OAC	0/1
-----	-----	-----	-----

The superior part of the occipital squama is separated from the rest to form a bipartite Inca bone.

INHUMATION 136 Child, 2-2½ years.

A few cranial scraps; jaws and post-cranial elements.

List of Burials

Teeth:

[6] e d c b a	0 b 0 d e
e d 0 b 0	0 b c d e

Attrition light. No caries.

INHUMATION 137 Child, 5 years.

A much damaged collection of cranial and post-cranial fragments.

Teeth:

e d c b a	a b c d e
-----------	-----------

Attrition moderate; no caries.

INHUMATION 138 Female, 25-30.

A skeleton in poor condition. A few cranial elements include a damaged but reconstructible mandible.

Teeth:

8 7 6 5 4 3 2 0	
8 7 6 5 4 3 2 0	0 2 3 4 5 6 7 8

Heavy attrition. No caries. Enamel hypoplasia on P1, P2, M2 and M3 teeth. Overcrowding of anterior mandibular teeth: the lateral incisors are lingual to the canines. Four loose teeth: 1C, 1P, 2M. No caries.

Pathology

OPC	0/2	OAC	0/2
" T	0/1	" T	0/2
" L	1/5	" L	0/5

INHUMATION 139 Male, adult.

A few small and eroded fragments of a strongly-built man.

Pathology

OPT	2/4
" L	1/1

Osteoarthritis with eburnation is present on the head of the R. femur.

INHUMATION 140 Female, 30-40.

Part of a calva; both maxillae and the mandible; many severely broken and eroded post-cranial fragments.

The skull is a long ovoid in norma verticalis. It is lightly built with weak muscle markings.

Teeth:

8 7 6 5 4 3 2 1	0 2 3 4 5 6 7 8
8 7 6 5 4 3 2 1	1 2 0 4 5 6 7 8
	C C

Attrition not very heavy. The $\overline{5}$ is reduced to a small root, the caries of $\overline{6}$ is interstitial mesially.

Pathology

OPT	4/9	OAT	0/4
" L	1/5	" L	-

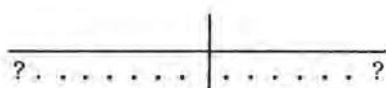
INHUMATION 141 Female, adult.

Nine fragments of lower limbs.

INHUMATION 144 ?Female, adult.

A few broken pieces of cranial vault, mandible and post-cranial fragments, all in poor condition.

Teeth:



Loose teeth: 2P, 1M.

Attrition heavy; no caries. Extensive deposits of tartar on all the loose teeth.

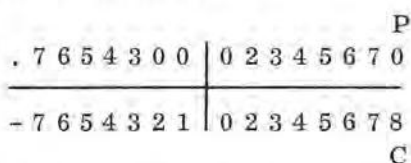
Pathology

Mild osteoarthritis is present on the L. cuboid.

INHUMATION 145 Male, 35-55.

A damaged facial skeleton; a few other cranial fragments; a damaged mandible. A few much eroded post-cranial elements.

Teeth:



Very heavy attrition. Occlusal caries. Extensive tartar.

INHUMATION 146 Female, adult.

A few damaged fragments of limb bones.

INHUMATION 147 Female, 30-50.

Fragments of vertebrae, pelvis, forearms and lower limbs.

Pathology

OPT	1/1	OAT	0/2
" L	1/1	" L	0/5

INHUMATION 148 Female, adult.

Very few badly fragmented and eroded post-cranial elements.

INHUMATION 149 Adult, doubtful sex.

A badly fragmented, defective and eroded skeleton. A much damaged mandible.

List of Burials

Teeth:

- 7 6 0 ? ? ? ?	|	
? ? ? ? ? 0 0 0		0 0 0 0 5 . . 8

Gross attrition. No caries.

Pathology

OPC	2/3	OAC	2/3
-----	-----	-----	-----

INHUMATION 150 Male, 23-25.

Abundant post-cranial remains, but long bones much broken. A fairly strongly-built man.

Pathology

OPC	-	OAC	0/1
" T	0/8	" T	0/9
" L	0/5	" L	0/5

Small Schmorl's nodes are present on the T11 and T12 vertebrae.

Extensive osteoarthritis is present bilaterally on T2 at the articulation for the heads of the ribs.

The lateral extremity of the inferior lip of the spine of the L. scapula and its upward extension towards the acromion is irregular, thickened and somewhat pitted. It suggests that some fibres of the deltoid muscle had been avulsed from the bone with subsequent organization of the area. It may, however, be the result of a penetrating wound which produced a localized area of infection of the bone. The R. scapula has been much more extensively injured - almost certainly by direct violence. An irregular fracture line extends from the neck towards the axillary border. The infra-glenoid area is craggy; the posterior rim of the glenoid fossa has early osteoarthritic lipping, and the glenoid fossa has undergone posterior rotation relative to the rest of the scapula. This would appear to be the result of a heavy and narrowly localized blow in this area, or perhaps penetration by a weapon with direct entry into the bone. As far as can be seen, from numerous rib fragments, the ribs escaped injury. It is possible that the damage to both scapulae resulted from a single traumatic episode - e.g. injury from a falling branch or tree, battering with a cudgel, etc. - and the osteoarthritis of the T2 vertebra may have been a secondary result of the trauma.

Traces of early osteoarthritis are present on both cuboid bones.

INHUMATION 151 Male, 35-50.

A few fragments of cranial vault, base and face; a broken mandible; a very defective and eroded post-cranial skeleton but most long bones can be reconstructed.

Teeth:

C	
0 7 . 5 4 3 2 0	| 1 0 3 4 5 ? ? ?
0 . 6 5 4 3 0 0	| 0 0 0 4 0 . . 8
C	
P	

Attrition heavy. The caries is interstitial distally on 7 ; it has eroded the whole crown of 6 . Enamel hypoplasia of the maxillary canines and P2.

Pathology

OPL 0/4 OAL 0/3

Slight osteoarthritic lipping is present at the R. sacroiliac joint.

INHUMATION 152 Male, 30-40.

A broken skull; many post-cranial fragments, mostly in poor condition.

Teeth:

8 7 6 5 4 3 2 1	1 2 3 4 5 6 7 8
8 7 6 5 4 0 0 1	1 2 0 4 5 6 7 8
C C	

Attrition moderately heavy. The caries cavities are both interstitial: distal on $\overline{6}$, mesial on $\overline{7}$.

Pathology

OPC 0/5 OAC 0/4
 " T 0/9 " T 0/7
 " L 1/5 " L 0/2

A L. fibular malleolus has a low exostosis, probably indicating tear of the crural interosseous membrane.

INHUMATION 153 Male, 35-50.

A damaged skull, with mandible. A rather deficient but well preserved post-cranial skeleton.

The skull is ovoid in norma verticalis; there is a full glabella and moderately well developed brow ridges. No tuber occipitale. The mastoid processes are stumpy but strong; moderate muscle markings; rectangular orbits. There is a trace of subnasal sulcus. The dental arcade is parabolic; the mandible is heavily built, with everted gonía.

Teeth:

C	C
8 7 6 5 4 3 0 0	1 2 3 4 5 6 7 8
8 7 6 5 4 3 2 1	1 2 3 4 5 6 7 8

Attrition very heavy. Caries is occlusal on both teeth. There is enamel hypoplasia on the C, P1 and M2 teeth. Tartar is extensive on the mandibular incisors and canines.

Pathology

OPC 0/3 OAC 0/3
 " T - " T 0/6
 " L 0/1 " L 0/2

There is a Schmorl's node on the inferior surface of a middle thoracic vertebra. The neural arch of L5 is anomalous. The two sides do not join to form a spinous process, the overlap (R. over L. in dorsal view) forms two separate small spinous processes about 1.0 mm apart. Its R. transverse process is also anomalous and articulates through a large, irregular facet (c. 30 x 24 mm) with the R. sacral ala. This anomalous joint is slightly arthritic. There is slight irregularity, probably due to disc injury, on the inferior surface of L5 and the superior surface of S1.

The L. tibia has extensive periostitis of its shaft, with a thickened irregular area

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about 90 mm long on the medial side of the middle third. It stands about 12 mm above the medial margin of the bone.

There is slightly exaggerated bowing of the L. and R. fifth metatarsals.

INHUMATION 154 Child, 12 years. Sex uncertain.

A fragmented skull and mandible; a well preserved post-cranial skeleton.

INHUMATION 155 Female, 19-21.

A few fragments of skull; maxillae and broken mandible; long bones (mostly broken) and other post-cranial remains.

Teeth:

0 7 6 5 4 3 0 0	0 0 3 4 5 6 7 0
7 6 5 4 3 2 1	1 2 c 4 0 6 7
[8]	[8]

Attrition moderate; no caries. Enamel hypoplasia of the incisors and 1st molars. The [c] is a retained deciduous tooth. Through the break in the jaw, the root of an unerupted permanent canine can be seen; its tip lies close to the lower border of the bone.

Pathology

OPT	0/12	OAT	0/12
" L	0/5	" L	0/5

INHUMATION 156 Female, 35-50.

A few broken fragments of skull; a much damaged mandible; many much damaged post-cranial fragments.

Teeth:

. . . . 0 ? ? ?	? ? ? ? ? 0 7 -
. . . . 0 ? ? ?	? ? ? 0 5 . . .

Attrition very heavy. No caries.

Pathology

OPC	1/5	OAC	1/5
" T	7/12	" T	0/12
" L	2/2	" L	0/5

The T6, 7, 8 and 9 vertebrae have osteoarthritic changes on their transverse process articulation.

Slight osteoarthritis or exostosis is present on the atlas around the facet for the dens axis.

INHUMATION 157 Male, 35-50.

A damaged skull, with mandible. Long bones well preserved; many other post-cranial elements in fair condition.

Teeth:

8 7 6 5 4 3 2 1	1 2 3 4 5 6 7 8
8 7 6 5 4 3 0 1	1 2 3 4 5 6 7 8

Attrition heavy; no caries. Slight tartar on the buccal surface of most mandibular teeth.

Enamel hypoplasia of the C, P2, M1 and M2 teeth. The 8j is anomalous: its crown is a long ellipse in shape and set obliquely in the alveolus. There is slight overcrowding of the anterior mandibular teeth.

Pathology

OPC	1/1	OAC	2/3
" T	1/3	" T	3/6
" L	4/4	" L	2/5

There is synostosis of C2 and C3. There is a small accessory rib fused to the L. side of L1. The L5 has a detached neural arch or total spina bifida. (The arch has not survived). It also has, on the L. side, an anomalous articulation with the L. ala of the sacrum.

A rib has extensive osteoarthritis of the head and articular tubercle. Osteoarthritis is also extensive on the R. talus, calcaneus and navicular.

There is a well healed oblique fracture across the middle third of the L. clavicle: two small exostoses have resulted from the injury.

INHUMATION 158 Sex uncertain, 18 years.

A much fragmented calvarium; a mandible; well preserved long bones; a few other disintegrated post-cranial remains.

Teeth:

8 7 6 5 4 0 0 0	|	0 2 3 4 5 6 7 8
<hr/>		
8 7 6 5 4 3 2 1	|	1 2 3 4 5 6 7 8
C		

Attrition light. The caries is occlusal.

INHUMATION 159 Male, 30-40.

Fragments of cranial vault; a mandible; many post-cranial fragments, mostly much broken and eroded. A powerfully-built man.

Teeth:

<hr/>		
8 7 6 5 4 3 2 0	|	0 2 3 4 5 6 7 8

Moderately heavy attrition. No caries. Enamel hypoplasia of the I2 and C teeth.

Pathology

OPC	4/4	OAC	0/5
" T	9/12	" T	0/11
" L	4/5	" L	0/5

Schmorl's nodes are present on the superior surfaces of T5, 6, 7, 8, 9, 10 and 12; and L1, 2 and 3 vertebra and on the inferior surfaces of T4, 5, 6, 7, 8, 9, 10, 11 and L1.

Osteoarthritis is present on the articular tubercles of five ribs. It is slight at the acromio-clavicular joint of the L. scapula and at the medial end of both clavicles.

There is complete synostosis of the R. sacroiliac joint (Plate LXXX).

The sternum is perforated (c. 10.0 x 6.5 mm).

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INHUMATION 160 Male, 30-40.

A mandible and many post-cranial elements, almost all in poor condition.

Teeth:

8	7	.	5	4	3	2	1	1	2	3	4	5	6	7	8
C	C	C	P									C			

Attrition heavy. The caries is interstitial distally on $\overline{7}$, mesially on $\overline{8}$. It was probably occlusal on $\overline{7}$, all the distal half of the crown is destroyed, leaving an isolated root in the jaw. There is recession of the alveolus around $\overline{876}$ and $\overline{7}$. Enamel hypoplasia of I1, I2, C and M1 teeth. Light tartar occurs on the lingual surface of the incisors and canines.

Pathology

OPT	1/9	OAT	0/9
" L	0/1	" L	0/1

Slight osteoarthritis is present on the R. scapula at the acromion.

There is a well healed fracture midshaft of a R. rib (?5th-7th); also a well healed fracture of a ?6th-8th R. rib.

INHUMATION 161 Male, 40-45.

A fragment of maxilla; a broken mandible; a few much damaged post-cranial elements.

Teeth:

											0	0	0	0	0	0	.	.
.	.	6	5	4	3	2	1	0	2	3	4	5	.	.	.			
C																		

Attrition heavy. The caries is interstitial distally. Enamel hypoplasia of I2, C and P1 teeth. Moderate deposits of tartar on all teeth. There is some alveolar inflammatory reaction in the mandibular L. molar region.

Pathology

OPL	5/5	OAL	0/0
-----	-----	-----	-----

Osteoarthritis is present on the lumbo-sacral articulations of the 1st sacral segment; and extensive at the distal extremity of the L. ulna.

It is also present on the base of the L. 2nd metacarpal; the head of the L. 1st metacarpal; on the R. patella and the L. talus.

INHUMATION 162 Male, 40-50.

Vertebral, pelvic and long bone fragments of a powerfully-built man.

Pathology

OPC	0/2	OAC	0/2
" T	0/1	" T	0/5
" L	0/5	" L	0/5

INHUMATION 162 (A) Male, 40-50.

A few fragments of cranial vault and jaws.

Teeth: C C

. 7 6 5 4 3 0 0	0 0 0 0 . . 7 8
. . 6 . 4 . 2 0	0 0 0 4 5 6 7 8

Very heavy attrition; the caries is interstitial, distally on $\overline{7}$, mesially on $\overline{8}$.

Pathology

OPT	8/8	OPT	2/8
" L	4/4	" L	1/4

There is extensive osteoarthritis, with eburnation, at the distal end of both humeri (Plate LXXXIV) and on the heads of both radii. Osteoarthritis is also present medially on the L. clavicle; and on the head of the R. 1st metacarpal.

The frontal bone is metopic.

INHUMATION 163 Male, adult.

A badly fragmented and eroded post-cranial skeleton - little apart from vertebrae, pelvis, ribs and long bones.

Pathology

OPT	2/12	OAT	0/11
" L	0/4	" L	0/4

There has been sacralization of L5 to give a six-piece sacrum; and the last lumbar vertebra (L4) has a detached neural arch.

INHUMATION 165 Male, 35-45.

A much broken cranial vault and base; maxillae and mandible in fair condition. Much damaged post-cranial remains.

The mastoid processes are short, but thick and craggy; smallish frontal sinus; strong nuchal muscle markings. The palate and dental arcade are parabolic. The mandible is sturdily built, with a rather thick body, little eversion of the gonion and a rounded chin.

Teeth:

8 7 6 5 4 3 2 0	1 2 3 4 5 6 7 8
8 7 6 5 4 3 2 0	1 2 3 4 5 6 7 8

C C P

Attrition is not very marked. Caries is interstitial mesially on $\overline{7}$, occlusal on $\overline{8}$. The $\overline{6}$, which is surrounded by a periodontal abscess cavity, is reduced to two isolated roots - the crown may have been fractured.

Pathology

OPT	0/12	OAT	0/12
-----	------	-----	------

Schmorl's nodes are present on the superior surfaces of T11, T12, L1, 2, 3 and 4, and on the inferior surfaces of T11, T12 and L2.

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INHUMATION 166 Male, 40-55.

Very few extremely small fragments of skull and post-cranial skeleton.

Pathology

Osteoarthritis is present on the lateral tubercle of a rib.

There is a well healed fracture, with slight deformity, in the proximal half of a carpal 1st phalange.

INHUMATION 167 Child, 12-13 years.

A few much damaged long bones and other post-cranial elements.

INHUMATION 168 Uncertain sex. Adult.

Eight foot bones, mostly damaged.

INHUMATION 169 Child, 4-5 years.

A much fragmented skull, post-cranial skeleton in fair condition.

INHUMATION 170 Male, 17 years.

Shafts of long bones and a few other post-cranial elements in poor condition. A very powerfully-built youth.

INHUMATION 171 Male, 40-50.

A calvarium and fragment of mandible; fairly well preserved vertebrae, pelvis and scapulae; long bones are present, but fragmented; a few other post-cranial elements. This was a powerfully-built man.

The skull is smoothly elliptical in norma verticalis. Brow ridges moderately developed; a bun-shaped tuber occipitale; the mastoid processes are stout and craggy; muscle markings strong.

Pathology

OPC	0/4	OAC	0/4
" T	4/7	" T	0/8
" L	-	" L	0/3

An epipteris bone (c. 17 mm diameter) is present bilaterally.

The R. innominate bone shows an irregularity of the anterior superior iliac spine (Plate LXXXIX). Unfortunately, there has been damage to the iliac crest immediately above this area and the precise assessment of the lesion is uncertain. There appears to have been a separation of the spine from the rest of the bone, with subsequent repair, and it now forms a mass projecting anteriorly, laterally and somewhat inferiorly - the affected area being c. 30 x 28 mm. There is no evidence of a sharply incised wound, as from a sword cut, etc., and the present attachment of the abnormal fragment is by smooth cortical osseous tissue to the body of the ilium. There is no mass of callus, but its anterior tip is slightly irregular and nodular. Displacement of the anterior superior spine, by a blow from a blunt instrument, might explain the result. Also it is possible to see it as a result of avulsion of a flake of bone or tearing of a tendon by muscular action, followed by a small haematoma at the site of injury, which later became organized. The area of bone involved is that which gives origin to the M. tensor fasciae latae and the M. sartorius. Whatever the lesion may have been, it seems to have occurred long before death. There is nothing to suggest an infective origin or that it is primarily an osteoma

or other neoplasm. It might just possibly be a developmental abnormality, but this seems extremely improbable.

There is a small, flattish button osteoma on the distal third of the antero-medial surface of the L. femur.

Slight periosteal 'graining' of both tibial shafts is present. The L. fibula shows severe periostitis and osteitic thickening throughout its length. This was probably the result of a Pott's fracture. It is well healed, with only slight deformity, but it might have been compound - hence the inflammatory reaction.

This skeleton is interesting on account of a number of wounds which are somewhat difficult to interpret.

The skull shows a clean cut, as from a sword or heavy dagger, extending from the anterior border of the R. temporal bone, across its squama, into the parietal bone about 15 mm above its inferior border (Plate XC). This wound is 80 mm long from front to back. It is uncertain whether the blow was struck by an adversary in front or behind the victim: probably in front. The weapon presumably cut through the upper part of the pinna of the ear and the blow was delivered from above downwards at an angle of about 35° from the vertical. Slight post-inhumation damage blurs a few of the finer details. The base of the R. zygomatic process, level with the glenoid fossa, has also been cut through by a blow which seems to have truncated the tip of the mastoid process. Unfortunately, the appearance of this last feature is ambiguous owing to soil erosion. The severed zygomatic process almost certainly implies that the follow-through of the blow would have injured the ramus of the mandible and probably the maxilla as well.

A third, and even more disastrous, blow was struck at this man. It was delivered from front to back and again fell on the temporal bone, this time on the L. side (Plate XCI). It cut through the squama and passed back for 92 mm to end in the occipital bone 25 mm lateral to the opisthion point. Compared with the wound of the R. temporal, this one cut more deeply towards the base of the skull. A thin slice was removed from the great wing of the sphenoid and it must surely have cut into the superior surface of the petrous bone - but this can only be inferred from the existing margins of the wound: the only surviving part of the temporal bone is about a third of the squama anteriorly. It was delivered rather more directly medially since it makes an angle of about 45° to the sagittal plane.

The only part of the facial skeleton to survive is a fragment of the inferior border of the anterior part of the body of the mandible. The edges have suffered some post-inhumation change and the condition at death is not wholly clear. But this and the wound of the L. temporal would, together, be compatible with two blows delivered on to the face of a man who had perhaps already fallen to the ground.

We cannot know what resistance he offered to his attacker, but one small crumb of evidence suggests that he made some attempt either to strike back or at least to ward off the blows. His R. humerus has a small incised wound, 14 mm long, on the lateral surface of the bone, 50 mm distal to the head. From its obliquity it is likely that his arm was raised, more or less horizontally, at the time. If so, this must have been a crippling blow because it inevitably cut through a substantial part of the deltoid muscle, a little proximal to its insertion.

There is no need to look for any cause of death other than the two (or more) violent head wounds, which would certainly have proved rapidly fatal. Even so, it is possible that as a coup de grace he died from a cut throat. The first three cervical vertebrae are missing but the fourth shows a cleanly cut wound which has removed the R. transverse process, most of its pedicle and the R. superior articular surface. This might have been

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the result of a sword blow to the neck, but it might also have been produced by a right-handed attacker standing behind his victim and violently drawing a dirk or scramasax obliquely across his throat. In either event, death must have followed swiftly from profuse bleeding as the great vessels - jugular, carotid, vertebral artery, etc. - were cut.

There is not quite enough here to reconstruct events as precisely as can be done for the medieval man murdered at Cox Lane, Ipswich (Wells 1963), but there is enough to give us the picture of a dark and bloody deed.

INHUMATION 172 Child, 3-4 years.

A much damaged skull and some long bones and other post-cranial fragments.

Teeth:

e	d	0	0	0	|	0	0	0	d	e
<hr/>										
e	d	0	0	0	|	0	0	0	d	e
[6]									[6]	
[7]									[7]	

Light attrition; no caries.

INHUMATION 174 Male, 22-24.

A much damaged calva; fragments of maxillae; a mandible; many pieces of a broken post-cranial skeleton.

Teeth:

0	7	6	5	4	3	0	0	|	0	0	3	4	5	0	0	8
<hr/>																
8	7	6	5	4	0	2	0	|	0	0	3	4	5	6	7	8

Very heavy attrition; no caries; extensive tartar on most teeth.

Pathology and Anomalies

OPC	0/4	OAC	0/4
" T	0/12	" T	0/7
" L	0/5	" L	0/5

There is a low palatal torus which measures about 34.5 x 21.0 mm.

INHUMATION 175 Male, 35-40.

A much disintegrated and eroded post-cranial skeleton of a strongly-built man with powerful muscle markings.

Pathology

OPC	4/4	OAC	2/4
" T	2/8	" T	1/9
" L	1/2	" L	1/2

Slight eburnation is present on one of the cervical vertebrae. Two vertebrae (probably T10 and T11) have Schmorl's nodes on the superior and inferior surfaces of the body.

Osteoarthritis is present on the articular tubercles of eight out of thirteen ribs - two are eburnated. It is also present on both bones, with eburnation, of the L. acromioclavicular joint.

Osteoarthritis occurs in varying degrees on: the R. scapular glenoid fossa; the

proximal end of the R. ulna; the heads of both radii and the distal extremity of the L. radius. There is slight osteophytotic lipping of the R. cuboid.

INHUMATION 176 Male, 30-40.

A broken cranial vault; damaged jaws; severely fragmented post-cranial remains.

Teeth:

0 7 6 5 4 3 0 0	|	
8 7 6 5 4 3 0 ?	|	? 0 3 0 5 6 7 8

Attrition light; no caries; enamel hypoplasia on the C, M1 and M2 teeth.

Pathology

OPL 2/3 OAL 0/4

Slight osteoarthritis is present on the L. sacro-iliac joint surfaces.

The L. radius is 207.5 in maximum length, the R. 246.2. There is nothing to confirm or refute that these two bones are from the same body. A proximal two-thirds of a L. ulna matches this radius. It is considerably lighter and more slender than the proximal half of a R. ulna. This might suggest the possibility of poliomyelitis or some other condition which produces bony changes of this kind. Slight discrepancies exist between the L. and R. femora and tibiae, but these are not enough to further the diagnosis.

INHUMATION 177 ?Female, adult.

A few fragments of cranial vault and base and some very disintegrated post-cranial remains.

Pathology

OPT 5/11 OAT 0/6
" L 1/2 " L 2/4

There is separation of the neural arches of L4, L5 and S1.

INHUMATION 178 Male, 21-23.

A few cranial fragments; some damaged long bones and other post-cranial remains.

Teeth:

	|	0 0 3 4 5 6 7 8

Attrition light; no caries; enamel hypoplasia on C, P1 and M1.

Pathology and Anomalies

OPL 0/0 OAL 0/3

The sacrum has six segments.

INHUMATION 179 Male, 40-60.

A fragmented vault; some broken long bones; a few other badly damaged post-cranial elements of a powerfully-built man.

Pathology

OPC 0/1 OAC -

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INHUMATION 180 Female, 35-50.

A fragmented skull; a few badly damaged post-cranial remains.

Teeth:

	? ? 0 4 5 6 . .
--	-----------------

Attrition heavy; no caries.

Pathology

OPC 1/1 OAC 0/1

INHUMATION 181 (a) Male, 22-25; (b) Female, 21-24.

(a) A broken mandible; many fragments of vertebrae and ribs; some other post-cranial remains.

(b) A mandible; vertebrae and other post-cranial remains.

Teeth:

- 7 6 5 4 3 0 0	0 0 0 4 5 6 7 -

Pathology

OPC	0/2	OAC	0/2
" T	0/7	" T	0/12
" L	0/5	" L	0/5

INHUMATION 182 Male, adult.

Two vertebrae and a few limb bones (all damaged).

Pathology

OPT 0/1 OAT -

INHUMATION 183 Female, 25-40.

A damaged skull; broken limb bones and a few other post-cranial fragments.

Teeth:

? ? ? . 0 0 0 0	0 0 0 0 . . ? ?
0 . . 5 4 3 2 0	0 2 3 4 5 0 7 8

Attrition heavy; no caries; tartar fairly heavy; slight enamel hypoplasia of the canines.

The skull is ovoid in norma verticalis; the frontal bone rises not very steeply from a full glabella; smoothly rounded occiput with no tuber; nuchal muscle markings are light; mastoid processes short and small; rectangular orbits. The palate and dental arcade are U-shaped, the mandible is light with no gonial eversion.

Pathology and Anomalies

OPC 2/3 OAC 0/1

Osteoarthritis is severe, with eburnation, on the base of the L. 1st metacarpal. There is slight osteoarthritis of the L. talus.

A palatal torus is present - about 26.5 x 12.0 mm.

INHUMATION 184 Male, adult.

Eight post-cranial fragments.

INHUMATION 185 Male, adult.

A fragment of vault; a dozen post-cranial pieces.

Pathology

There is osteoarthritis with eburnation of the head of the R. 1st metatarsal.

INHUMATION 186 Female, 30-40.

A fragmented vault; damaged mandible; a few poor post-cranial elements.

Teeth:

0 . . 0 0 0 0 0	0 0 0 0
P	

Pathology

OPC	0/5	OAC	0/5
" T	2/10	" T	0/4
" L	0/5	" L	0/1

INHUMATION 187 Male, 35-50.

A few scraps of vault; jaws and long bones.

Teeth:

? ? ? ? 0 0 0 0	0 0 0 0 5 . . .
-----------------	-----------------

Pathology

There is slight osteoarthritis of the mandibular R. condyle.

INHUMATION 188 Male, 35-55.

R. half of mandible; long bones in fair condition; the rest of the post-cranial skeleton very defective. A sturdily-built man.

Teeth:

8 7 6 5 4 0 2 0	
C	

Attrition heavy. Caries interstitial mesially.

Pathology

OPT	0/1	OAT	0/8
-----	-----	-----	-----

Early osteoarthritis occurs at the sigmoid notch of the R. ulna.

There is a small spur of bone on the volar surface of a 2nd phalange of a finger - perhaps from damage to the tendon insertion and periosteum.

An area of osteochondritis, about 6.5 mm in diameter, pits the proximal surface of the L. 1st metatarsal. There is also a trace of it on the R. 1st metatarsal.

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INHUMATION 189 Female, 35-45.

A damaged calva; maxillae and mandible; many post-cranial elements, mostly in poor condition.

The skull is ovoid in norma verticalis; slightly bossy frontal bone; negligible brow ridges; rounded occiput; light mastoid processes.

Teeth:

0 . . 5 4 3 0 0	|	0 0 0 0 0 . . 8
- 7 6 5 4 3 0 0	|	0 2 3 4 5 6 0 -
C C	|	C

Attrition heavy; the caries is buccal and cervical on $\overline{76}$, occlusal on $\overline{6}$. Slight alveolar erosion occurs around $\overline{6}$ and $\overline{6}$.

Pathology

OPC	4/4	OAC	1/3
" T	7/10	" T	1/9
" L	5/5	" L	3/5

Osteoarthritis is present on the transverse processes of T8 and T9; and on the articular tubercle of 6/10 ribs.

INHUMATION 190 Male, 40-50.

A skull, with mandible, in good condition. A moderately well preserved post-cranial skeleton of a powerfully-built man.

The skull is ovoid in norma verticalis; brow ridges moderately developed; the sagittal contour passes back in a low curve to a smoothly-rounded occiput. Mastoid processes are large and craggy; muscle markings are strong throughout; the orbits are rectangular and set slightly obliquely; shallow infra-nasal sulci are present; the dental arcade is parabolic. The sturdy mandible has everted gonion and a strongly projecting squarish chin.

P C	|	P C
. 7 0 5 4 3 2 0	|	0 2 3 4 5 6 0 -
8 0 6 5 4 3 2 1	|	1 2 3 4 5 6 7 8
C P	|	

Attrition heavy. The caries on $\overline{6}$ has eroded all the crown and only one root remains; on $\overline{7}$ it is occlusal; on $\overline{8}$ it is occlusal - the tooth is small and impacted. Light deposits of tartar are extensive. Enamel hypoplasia is present on the I2 and C teeth. There is slight overcrowding of the anterior mandibular teeth.

Pathology

OPC	3/4	OAC	0/5
" T	5/12	" T	2/12
" L	5/5	" L	2/4

Schmorl's nodes are present on the superior surfaces of T8, T9, T12, L2 and L3 and on the inferior surfaces of T7, 8, 9 and 11. There is osteophytosis of S1. Early osteoarthritis is present distally on the L. humerus and proximally on the L. ulna.

An exostosis, 31.0 x 12.5 mm, lies lateral to the L. anterior superior iliac spine, ?due to tear of muscle fibres. There is a small exostosis on the anterior margin of the distal articular surface of the L. fibula, probably due to organization of a blood clot from a torn ligament. There is a six-piece sacrum.

INHUMATION 191 Child, 2-3 years.

A few scraps of calva and some post-cranial fragments.

INHUMATION 191A Female, 23-35.

A much damaged skull, with maxillae and mandible; broken fragments of post-cranial remains of a lightly-built woman.

Teeth:

8 7 6 5 4 3 2 1	0 2 3 4 5 6 7 8
8 7 6 5 4 3 2 0	0 2 3 4 5 6 7 8

Attrition heavy; no caries; light deposits of tartar on most teeth.

Pathology

OPC	0/5	OAC	0/5
" T	0/2	" T	0/4
" L	2/3	" L	0/3

Mild osteoarthritis is present on both ilia at the sacroiliac joints.

Pubic changes suggest that this woman had had three to five children.

INHUMATION 192 Male, 25-40.

A few fragments of post-cranial skeleton.

Anomaly

A six-piece sacrum.

INHUMATION 193 Male, 35-43.

A broken and defective skull; pieces of maxillae and mandible; a fairly well preserved post-cranial skeleton.

Teeth:

	P		0 2 0 4 5 6 7 8
8 7 6 5 4 3 2 0			0 2 3 4 5 6 7 8

Attrition heavy; no caries; light deposits of tartar on most teeth. There is slight over-crowding of the anterior mandibular teeth.

Pathology

OPC	0/0	OAC	0/2
" T	0/1	" T	2/10
" L	0/0	" L	0/2

There is osteoarthritis on the lateral articular tubercles of four out of twelve ribs.

The shaft of the L. 5th metatarsal has a well healed fracture.

INHUMATION 194 Female, 35-50.

A few fragments of vault and jaws; some badly broken and eroded post-cranial remains.

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Teeth:

P	P
0 7 0 0 0 0 0 0	0 0 3 4 5 6 7 8
. 7 6 5 0 0 0 0	0 0 0 0 5 6 . 8
	C

Attrition severe; the caries is cervical. Very light deposits of tartar are present on the mandibular teeth, but it is heavy on 7 and 7. Large abscess cavities are present around the 3 and the shed maxillary R. 1st molar.

Pathology

OPC	0/4	OAC	1/4
" T	0/5	" T	0/4

There are seventeen surviving fragments of rib, of which at least eight (?4 L. and 4 R.) show well healed fractures.

INHUMATION 195 Female, 35-50.

A damaged calva; fragments of maxillae and mandible; a few broken post-cranial elements.

Teeth:

- 0 0 5 4 3 0 0	0 0 0 4 0 . . .
. . . . 4 3 2 .	. 0 3 4

There are two loose maxillary molars. Attrition very heavy; no caries.

Pathology

Mild 1st degree cribra orbitalia is present bilaterally.

There is osteoarthritis with eburnation of the R. patella.

INHUMATION 196 Child, 7-8 years.

Five pieces of vault; six fragments of post-cranial skeleton.

INHUMATION 197 Female, 30-35.

A broken vault, maxillae and mandible; a few fragments of post-cranial skeleton.

Teeth:

? 0 6 0 0 0 0 0	0 0 0 4 5 6 7 0
8 7 . 5 0 0 0 0	0 0 3 4 5 6 7 8
P	

Attrition heavy; no caries; light deposits of tartar. Enamel hypoplasia of P2 and M2 teeth. An abscess cavity discharged on to the buccal surface around the shed 6.

Pathology

The condition of the pubis suggests that this woman had had two or three children.

There is a small bony tumour, about the size of a hazel nut, on the medial surface of the L. fibula immediately proximal to the distal articular facet. It does not appear to be callus from a fracture. It might be an osteoma, early sarcoma or possibly a reaction to some infective process, but is far more likely to be simple organization (ossification) of a blood clot from a torn interosseous membrane. The L. femur has a much thickened

and roughened shaft throughout its distal half. This appears to be the result of a diffuse chronic osteomyelitis. The circumference 170 mm proximal to the knee joint is 111.5 mm, as compared with only 86.5 mm in the R. femur. There is no clear indication that this lesion is related to the other lesion of the L. fibula but a connexion is highly probable. Although the fibular shaft is much eroded, an area of periostitis can be recognised at the junction of the middle and distal thirds.

MISCELLANEOUS BONES

INHUMATION A Male, 20-21.

A few fragmented post-cranial remains of a powerfully-built young man.

INHUMATION B Infant, 6-7 months.

A fragmented skull; a few jaw fragments and teeth.

INHUMATION C Male, 30-45.

A skull lacking facial parts; six post-cranial fragments.

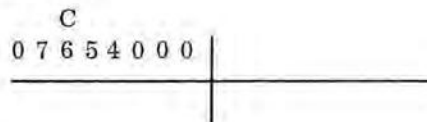
INHUMATION D Child, 3-4 years.

The proximal two-thirds of a R. tibia.

INHUMATION E Male, 22-24.

A few disintegrated fragments.

Teeth:



Light attrition; occlusal caries.

INHUMATION F Child, 5-6 years.

A few scanty remains.

INHUMATION G Child, 6-12 months.

A few scanty remains.

INHUMATION H Child, 2 years.

A few fragments of jaws and post-cranial remains.

INHUMATION 191A Female, 23-35.

A few damaged fragments of skull and long bones.

INHUMATION 162A Male, 40-50.

A few damaged fragments of skull and post-cranial remains.

14. THE ANIMAL BONES

I. A LIST OF THE BONE GROUPS SUBMITTED FOR IDENTIFICATION

NOTE

During the excavations about 30,000 animal bones were collected, washed and marked. These were originally recorded and bagged according to features, but after the excavations most of them were amalgamated into the following eighteen groups.

The arrangement of numbers listed here does not entirely correspond to the dating of the features in the features' gazetteer (Chapter 4). The reason for this is that the final pottery gazetteer was produced after the bones had been sorted. Nevertheless, the discrepancies are not sufficient to make any great difference to the conclusions about the bone material.

MIDDLE SAXON FEATURES: PERIOD I

The Middle Saxon ditches, which contained the majority of the Middle Saxon bones were divided up into the following ten groups.

Groups:

1. 358, 1222, 1861 (Ditch C)
2. 34, 607, 815 (North end of Ditch B)
3. 1789 (South end of Ditch B)
4. 44, 950, 1075 (North end of Ditch A)
5. 1785, 1786, 2022, 2612 (South end of Ditch A)
6. 1018 (Ditch D)
7. 1790 (Ditch E)
8. 1749 (Ditch Fi)
9. 120 (Ditches Fii and Fiii)
10. 3736 (Ditch G)
11. The two wells: I (3596); II (2957)
12. The Features in the Middle Saxon buildings with bones
252, 534, 902, 903, 964, 966, 971, 975, 976, 981, 987, 996, 999, 1001, 1003, 1024,
1035, 1054, 1055, 1287, 1288, 1298, 1304, 1305, 1306, 1308, 1314, 1315, 1454,
1520, 1536, 1555, 1561, 1562, 1563, 1570, 1583, 1586, 1587, 1610, 1611, 1619,
1628, 1632, 1636, 1752, 1754, 1762, 1928, 2921, 2922, 2955, 3594,
Other feature: 2903

ALL LATE NINTH AND TENTH-CENTURY FEATURES: PERIOD II

Group 13

Period II, Phase 1 pits: Features: 44a, 44b, 829 and 1036

besides these four pits there were a few post holes etc. with bones: Features: 50, 52, 219, 828, 829, 841, 893 and 955.

Group 14

Upper filling of Middle Saxon features, contemporary with Period II. Top 6" of ditches: 1749, 1785, 1786, 1789, 1790, 2022, 2612 and upper filling of Well II (2957).

Group 15

All Period II, Phase 2 features with bones. Features: 30, 95, 127, 258, 259, 269, 270, 290, 294, 315, 319, 321, 331, 362, 364, 470, 487, 499, 504, 508, 513, 515, 520, 523, 524, 528, 529, 535, 536, 537, 538, 545, 549, 552, 598, 599, 609, 611, 824, 836, 906, 928, 940, 988, 1012, 1013, 1014, 1070, 1106, 1121, 1125, 1448, 1452, 1455, 1616, 1685, 1691, 1698, 1714, 1721, 1723, 1739, 1784, 1889, 2119, 2130, 2133, 2146, 2190, 2258, 2360, 2523, 2733, 2750, 2763, 2899, 2963, 2982, 2987, 3509, 3728, 3737.

LATE SAXON AND EARLY MEDIEVAL FEATURES: PERIODS III AND IV

Group 16

Features: 46, 212, 257, 318, 322, 323, 335, 346, 350, 351, 356, 365, 373, 377, 433, 437, 440, 463, 493, 500, 525, 533, 550, 556, 557, 563, 564, 596, 638, 643, 645, 654, 655, 705, 720, 725, 826, 835, 840, 843, 845, 847, 850, 853, 854, 859, 860, 862, 865, 871, 875, 883, 889, 900, 905, 945, 949, 989, 1022, 1023, 1027, 1028, 1031, 1057, 1058, 1059, 1068, 1071, 1077, 1094, 1097, 1107, 1110, 1111, 1112, 1131, 1237, 1434, 1458, 1469, 1487, 1494, 1511, 1544, 1548, 1630, 1654, 1671, 1684, 1689, 1696, 1697, 1718, 1719, 1726, 1727, 1734, 1735, 1737, 1742, 1743, 1747, 1751, 1783, 1796, 1810, 1813, 1835, 1837, 1852, 1858, 1865, 1872, 1873, 1888, 1903, 1938, 1948, 2023, 2024, 2048, 2055, 2089, 2103, 2109, 2122, 2124, 2145, 2146, 2158, 2342, 2371, 2375, 2386, 2432, 2524, 2542, 2554, 2567, 2605, 2610, 2612, 2617, 2628, 2630, 2631, 2632, 2640, 2647, 2658, 2678, 2709, 2710, 2712, 2713, 2732, 2737, 2776, 2787, 2798, 2992, 2994, 3145, 3181, 3184, 3502, 3511, 3518, 3528, 3529, 3544, 3700, 3701, 3704, 3727, 3733, 3738.

MEDIEVAL PITS AND DITCHES

Group 17

Most of the medieval pits. The majority of these pits were clay quarries, which were backfilled with a mixture of topsoil and rubbish etc., some of which was derived from earlier deposits.

Features: 128, 134, 221, 293, 332, 352, 370, 384, 489, 490, 492, 494, 501, 502, 503, 505, 507, 526, 566, 861, 894, 945, 957, 1076, 1105, 1115, 1134, 1226, 1227, 1229, 1231, 1232, 1238, 1239, 1240, 1241, 1242, 1404, 1405, 1406, 1407, 1409, 1414, 1415, 1432, 1433, 1437, 1439, 1441, 1446, 1447, 1453, 1459, 1467, 1474, 1485, 1488, 1489, 1494, 1499, 1513, 1515, 1517, 1531, 1532, 1533, 1534, 1535, 1543, 1550, 1552, 1572, 1573, 1574, 1575, 1607, 1608, 1634, 1637, 1641, 1643, 1662, 1663, 1664, 1674, 1676, 1677, 1686, 1688, 1724, 1756, 1772, 1786, 1791, 1792, 1831, 1833, 1848, 1862, 1863, 1866, 1868, 1869, 1870, 1989, 2013, 2044, 2053, 2073, 2090, 2099, 2107, 2111, 2128, 2129, 2157, 2160, 2198, 2199, 2234, 2255, 2344, 2374, 2402, 2407, 2408, 2414, 2415, 2419, 2420, 2562, 2745, 2746, 2766, 2775, 2897, 2920, 2940, 2959, 2961, 2962, 2968, 2969, 2970, 2975, 2986, 2988, 2990, 3002, 3005, 3011, 3013, 3015, 3019, 3047, 3052, 3056, 3086, 3120, 3169, 3186, 3194, 3504, 3520, 3535, 3536, 3565, 3569, 3570, 3575, 3576, 3581, 3702, 3706, 3707, 3710, 3711, 3714, 3716, 3719, 3721, 3724, 3725, 3726, 3729, 3730, 3732, 3734, 3735, 3739.

POST MEDIEVAL FEATURES: PERIOD VI

Group 18

Post medieval features in the topsoil plus:

Features: 506, 653, 863, 864, 933, 936, 938, 946, 967, 1015, 1069, 1078, 1095, 1413,

List of the Bone Groups Submitted for Identification

1427, 1435, 1436, 1437, 1442, 1450, 1556, 1614, 1635, 1800, 1875, 1892, 1924, 1963, 2012, 2072, 2102, 2144, 2154, 2259, 2276, 2324, 2362, 2398, 2400, 2401, 2418, 2434, 2436, 2512, 2578, 2650, 2691, 2696, 2936, 2979, 2989, 3003, 3004, 3007, 3008, 3013, 3015, 3020, 3058, 3060, 3072, 3086, 3115, 3129, 3171, 3180, 3191, 3505, 3535, 3536, 3546, 3577.

II. IDENTIFICATION AND INTERPRETATION OF THE MAMMAL BONES

by Barbara Noddle

INTRODUCTION

About 20,000 bones and bone fragments from animals other than birds (which are reported on separately) were identified from North Elmham Park. This represents some 65% of the total recovered. About 75% of the fragments were identified from the earlier deposits, but this dropped to about 40% from later levels. The bones were in an excellent state of preservation, but were mostly broken into small pieces.

Following identification, the bones have been assessed in a number of ways; these are:

1. proportions of the different genera.
2. anatomical analysis.
3. minimum number of individuals.
4. the age and size of these individuals.

These concepts have been discussed by Uerpmann (1973), but none of them is entirely satisfactory. It cannot be determined how many identifiable fragments any bone might be broken into, and the concept of individuals is rather artificial when each possible individual is represented by only one or two bones rather than the hundred or more bones it possessed in life. (Owing to fragmentation and difficulty in precise identification, ribs have not been considered in this report). This concept has, therefore, been employed as a useful statistical entity rather than an exact 'head count' of the animals; there are always far more 'individuals' where there are a large number of archaeological layers than in large deposits and it has been assumed that each layer or feature contains the bones of separate individuals.

It must be borne in mind that the bones excavated are precisely that. Animals reared on the site and traded on the hoof will show no sign of their presence. It must be assumed that the few remaining bones are a true sample of what must have been present, although the practise of retail butchery may be an explanation for the scattered material of the later parts of the excavation. The findings may or may not give a true reflection of the livestock economy of the area; the possibilities of 'consumer choice' must be considered in the light of the other archaeological findings.

PROPORTIONS OF THE DIFFERENT GENERA

The proportions of the major domestic genera are set out in Table 58, where non-food animals, the less common genera, and the wild species apart from a few wild pig, are designated 'other'. These are classified in more detail in Table 59. The overall proportion of cattle bones is remarkably consistent through the entire period covered by the excavation, apart from the post-medieval period when it rises from 25-30% to 47%. Leaving out of the considerations those groups which are probably too small to be significant (Period I: groups 6-11) there is some variation between the different groups 3 and 5 being particularly high in cattle bones and 1, 2 and 4 being particularly low. The three groups in Period II show no such variation. The variation of the number of fragments per individual is probably accounted for by the number of separate deposits in the group, as mentioned above.

TABLE 58. DISTRIBUTION OF FRAGMENTS AMONG GENERA

Group	Total fragments	CATTLE			SHEEP			PIG			OTHER	
		Frg.	%	Frg.per ind.	Frg.	%	Frg.per ind.	Frg.	%	Frg.per ind.	Frg.	%
Period I												
1	578	109	19	12	280	48	10	124	22	12	65	11
2	965	188	20	7	359	37	8	337	35	10	81	8
3	993	461	46	18	138	14	7	259	26	8	135	14
4	3025	671	20	13	1280	42	7	892	30	9	270	8
5	1072	459	43	20	220	23	9	151	10	7	242	24
6	163	95	58	19	25	15	8	34	20	7	9	6
7	35	9	26	3	7	20	4	14	40	4	5	14
8	92	21	23	9	34	37	7	27	29	7	10	11
9	232	80	35	16	77	33	8	63	27	10	17	5
10	65	49	75	8	4	6	4	2	3	2	10	16
11	233	89	38	22	71	30	10	51	22	6	23	10
12	759	193	25	4	313	41	7	228	30	10	25	4
Total	8212	2424	29		2808	34		2182	26		896	11
Period II												
13	1715	472	27	23	752	44	6	388	23	11	103	6
14	709	168	24	7	303	43	9	190	27	12	48	6
15	1196	406	34	16	448	37	11	249	20	13	95	9
Total	3620	1046	29		1503	41		827	23		246	7
Periods III/IV												
16	1019	290	28	4	291	28	3	321	31	3	117	13
Period V												
17	3842	1025	26	4	1063	28	4	1225	32	4	529	14
Period VI												
18	2518	1169	47	5	623	25	4	419	16	3	307	12

Frg. = fragment
ind. = individual

TABLE 59. LESS COMMON GENERA

Group	Goat	Horse	Dog	Cat	Deer Red	Deer Fallow	Roe	Rabbit	Hare	Fish	Other
Period I											
1	13 (4)	32 (4)	12 (3)	3 (2)	1 (1)	-	4 (1)	-	-	-	-
2	25 (4)	25 (3)	23 (4)	4 (1)	-	-	4 (2)	-	-	-	-
3	13 (6)	120 (6)	2 (1)	-	-	-	-	-	-	-	-
4	122 (17)	99 (9)	18 (3)	1 (1)	2 (2)	-	28 (6)	-	-	-	-
5	6 (4)	43 (7)	167 (13)	17 (5)	-	-	2 (1)	-	2 (1)	-	Fox 6 (3) Other 1 (1)
6	-	9 (2)	-	-	-	-	-	-	-	-	-
7	-	3 (1)	1 (1)	-	-	-	-	-	1 (1)	-	-
8	-	8 (2)	1 (1)	1 (1)	-	-	-	-	-	-	-
9	4 (7)	7 (2)	7 (2)	1 (1)	-	-	-	-	-	-	-
10	-	3 (1)	3 (1)	-	-	-	-	-	-	-	-
11	-	11 (3)	6 (1)	6 (1)	-	-	-	-	-	-	-
12	2 (1)	8 (1)	5 (2)	4 (1)	-	-	5 (2)	-	-	-	-
Period II											
13	27 (6)	62 (7)	2 (1)	1 (1)	-	-	11 (2)	-	-	-	-
14	8 (3)	27 (5)	5 (4)	7 (2)	-	-	1 (1)	-	-	-	-
15	4 (4)	33 (5)	42 (3)	7 (2)	1 (1)	-	5 (2)	1 (1)	-	(1) -	Frog 2 (1)
Periods III/IV											
16	15 (8)	42 (22)	14 (7)	6 (4)	13 (8)	13 (4)	5 (4)	6 (4)	1 (1)	1 (1)	Fox 1 (1)
Period V											
17	15 (9)	181 (48)	132 (35)	86 (41)	71 (33)	22 (15)	6 (3)	3 (3)	3 (3)	6 (3)	Fox 2 (2) Frog 2 (1)
Period VI											
18	17 (8)	91 (36)	98 (20)	13 (9)	42 (22)	40 (16)	3 (3)	8 (5)	1 (1)	4 (1)	-

The figures in brackets indicate the minimum number of individuals.

Sheep bones are about one third of the total in Period I and they rise to 41% in Period II. There is a decline to about 25% of the total in the subsequent periods. Again the individual groups in Period II are fairly consistent but there is considerable fluctuation in Period I, groups 1, 2, 4 and 12 containing more than the others, and groups 3, 6 and 10 containing less.

Pig bones vary more in quantity during the periods covered by the excavation. Forming about a quarter of the total during Periods I and II, they rise to nearly one third during Periods III/IV and the Middle Ages (V) and drop considerably in the post-medieval period (VI). A possible explanation for this is that during the medieval period pigs maintained on pannage were supplemented by sty pigs and that during the post-medieval period, the practice of pannage declined.

The proportions of other animal bones must be considered in conjunction with the relative numbers of the seven genera commonly found, which are set out in Table 59. The number of individuals is probably a nearer approximation to reality here, particularly in the non-edible genera such as dogs. The goat is always a problem to the zoo-archaeologist as so few of its bones are readily distinguishable from those of sheep. Rather than use the 'capra/ovis' group which occurs so often in bone reports, the two have been separated, and those bones undoubtedly from goat are consequently an under-estimate of the true total, many goat bones having been classed as sheep. Owing to the preponderance of sheep bones, this will make little difference to the sheep total. However, insofar as it can be determined, it seems that few goats were consumed, and that the proportion of sheep to goat is constant throughout, except in Periods III and IV, when it rises.

Since the horse has never been a popular item of diet in Christian Britain, the number of horse bones found may not reflect the number of horses kept. Again, the numbers are fairly constant during the Saxon periods, but they show a considerable rise in the later periods, and this may well be due to an increasing use of horses for agricultural traction.

The number of dog bones is variable, but again there is an increase in the later periods. There is also a local concentration in Period I, group 5. The number of cat bones parallel those of dogs, including a large number in group 5. The very high rise in numbers during the medieval period (group 17) may be due to a rise in rodent numbers or it may be due to the use of cat skins by furriers.

Very little hunting seems to have been carried out during the Saxon period and those few deer bones that occur are those of roe deer, apart from three red deer bones. There is no increase in roe deer in the later periods, but there is a very marked increase in bones of red deer. Fallow deer appear for the first time in equal quantity.

Hare is very infrequent, but increases slightly in Periods III/IV onwards. Small numbers of rabbit occur from Periods III/IV onwards. No bones of rat or mouse were found¹.

There were a few specimens of fox and frog. One group of fish bones were found in Period II, which were probably eel. There were a few bones of the cod type in the later periods.

The scant importance of hunting during Saxon periods has some bearing upon the interpretation of the pig bones. It seems that the Saxon pigs were domestic, unless there is an element of consumer choice. Also the decline of pig in the later periods is not attributable to the destruction of the woodland pannage habitat, since there are plenty of deer, but the pigs may have been excluded from it.

Bird bones were plentiful at all times, but they comprise mainly domestic fowl and goose, with fowl predominating.

ANATOMICAL ANALYSIS

Anatomical analysis has been carried out in order to investigate what happened to the animals after their death, and to some extent the fate of the discarded bones after consumption. The small groups 7-11 of Period I were not analysed, as it was thought the numbers were too low to be significant.

The dead animal comprises the edible 'joints' of the upper limb and trunk, and the head and lower limb, conventionally regarded as waste, though there is a proportion of meat on the head, highest in the pig. The phalanges are sometimes removed with the hide and the metapodial bones are preferred raw material for bone working.

Not all bones are of equal durability. The femur has a thinner shaft than the other long bones and large cancellous epiphyses on both ends, so it is less likely to survive. The vertebrae are almost entirely cancellous apart from the spines and are easily destroyed. On the other hand the distal humerus and tibia and proximal radius with their accompanying shafts are durable. Metapodials, phalanges and mandibles are also durable, but the rest of the skull is very liable to mechanical injury and is frequently reduced to loose teeth.

The anatomical analysis is set out in Tables 60, 61 and 62 and comprises cattle, sheep and pig respectively. The bones tabulated are much the same except that the small bones of carpus and tarsus are included in the sheep in order to determine whether these bones were buried where they were first deposited or whether they were cleared from time to time, in which case these small bones are liable to be lost. The ulna is included in the pig bones only, as it is only weight bearing and of considerable durability in this genus.

Amongst cattle, all bones analysed occur in almost all groups in roughly constant proportions. Phalanges, however, are scarcer in Period I and mandibles rather more frequent. Loose teeth are particularly numerous in group 4 which is also high in mandibles and metapodials, so that this probably contains more slaughter waste than other groups. Metapodial bones are high in Periods III/IV, which may imply a decline in bone working. In all cases both fore and hind limbs are equally represented and it may be assumed that the animals were slaughtered on the site and consumed entirely, as might well be expected considering the difficulty of transporting these large animals other than on their own feet. It appears that the phalanges were largely removed with the hide, but the site of the tannery was not found in the excavation.

There is considerably more disparity amongst the bones of the sheep. Phalanges and metapodials are conspicuous by their relative absence in Periods I and II and both might well have been removed with the hide. Carpals and tarsals are almost entirely absent and though the carpal bones might have been removed with the metacarpal, it is not possible to remove the fresh tarsus from the distal tibia which is very much in evidence. It must, therefore, be assumed that nearly all the bones ended up in what might be termed a secondary midden. If the cause of its preponderance is not its intrinsic durability, the large number of tibiae, as opposed to forelimb bones, indicates a greater consumption of hind limbs rather than forelimbs except in group 5. This discrepancy is not quite so great in the later periods. The very large proportion of mandibles suggest that the heads might have been abandoned near the point of slaughter.

As with the sheep, there is a high proportion of mandibles among the pig bones, but in the pig this is a heavy and most durable bone. There is also a high proportion of loose teeth, largely incisors, more durable than those of the ruminants. The proportion is particularly high in groups 3 and 4 of Period I compared with the later periods, suggesting that these bones received rougher treatment in the midden.

TABLE 60. CATTLE - ANATOMICAL DISTRIBUTION OF RECOGNISED FRAGMENTS
EXPRESSED AS % TOTAL

Group	Total	Mandible	Vertebrae	Scapula	Humerus	Radius	Pelvis	Femur	Tibia	Metapodial	Phalanges	Teeth Total	Teeth %	
Period I														<p>The bone % are calculated from the number of bones without loose teeth.</p> <p>The teeth % calculated from bones + teeth.</p>
1	104	6	13	11	10	7	7	4	12	5	5	5	5	
2	181	4	4	21	9	10	8	6	8	7	3	7	4	
3	397	24	5	9	14	4	3	13	8	13	0	64	16	
4	493	24	18	3	9	8	12	10	9	13	1	124	20	
5	459	18	9	9	3	6	4	3	5	11	11	42	11	
6	93	19	5	3	11	6	5	8	0	0	0	2	2	
7	7				Not analysed							2	28	
8	17				Not analysed							2	12	
9	76				Not analysed							4	5	
10	36				Not analysed							13	35	
11	78				Not analysed							11	14	
12	168	10	13	10	11	3	11	5	5	10	7	25	13	
Period II														
13	466	4	15	11	9	7	8	6	7	13	2	6	1.3	
14	159	4	14	3	7	5	7	6	8	7	6	9	6	
15	406	6	11	3	11	8	5	12	11	10	6	50	11	
Periods III/IV														
16	255	6	6	6	13	7	8	8	8	18	8	35	12	
Period V														
17	1196	6	8	4	4	2	4	4	5	10	3.0	192	14	
Period VI														
18	1022	9	10	4	8	6	7	6	7	15	5	147	14	

TABLE 61. ANATOMICAL ANALYSIS - SHEEP BONES

Group	Total	Mandible	Vertebrae	Scapula	Humerus	Radius	Pelvis	Femur	Tibia	Metapodial	Phalanges	Carpals etc.	Teeth Total	Teeth %	
Period I															
1	252	22	6	10	9	9	7	5	14	2	0	0.5	28	10	All bones % of total bone. Tooth % total of bones + teeth.
2	359	15	3	11	7	15	11	6	26	4	0	0.3	33	8	
3	127	28	0	11	2	5	4	7	6	0.8	0	0	11	8	
4	1116	37	3	7	4	9	6	6	18	2	0	0	174	16	
5	185	19	8	7	11	24	4	5	16	4	0	0	24	11	
6	22					Not analysed							3	14	
7	7					Not analysed							0	0	
8	26					Not analysed							8	30	
9	65					Not analysed							12	18	
10	4					Not analysed							0	0	
11	59					Not analysed							12	20	
12	210	35	9	7	6	11	7	6	16	6	0.5	1.5	103	31	
Period II															
13	693	40	2	10	4	12	4	3	23	2	0	0.1	59	8	
14	264	27	3	8	5	11	6	5	18	4	0	0	39	15	
15	386	9	10	6	10	12	7	3	16	10	2	1.0	62	14	
Periods III/IV															
16	240	18	4	4	10	11	5	7	23	14	0.8	0.4	51	17	
Period V															
17	872	12	6	5	9	12	5	4	22	9	3	0	191	18	
Period VI															
18	534	13	3	6	13	13	7	5	20	10	0.3	2	91	15	

TABLE 62. ANATOMICAL ANALYSIS - PIG

Group	Total	Mandible	Vertebrae	Scapula	Humerus	Radius	Ulna	Pelvis	Femur	Tibia	Metapodial	Phalanges	Teeth Total	Teeth %	
Period I															
1	116	20	4	8	7	6	7	8	5	3	10	3	8	7	Bone % from bone total only. Teeth % bone + teeth.
2	286	22	2	10	6	4	3	8	3	6	4	0.3	51	18	
3	161	47	2	1	2	-	-	3	1	3	2	0	98	37	
4	661	14	3	12	7	3	3	7	5	5	5	1	161	18	
5	151	17	9	7	12	6	3	7	3	6	4	0	14	9	
6	29				Not analysed								5	16	
7	12				Not analysed								2	16	
8	18				Not analysed								9	50	
9	45				Not analysed								18	40	
10	5				Not analysed								1	0	
11	45				Not analysed								6	13	
12	140	32	4	16	4	2	0	4	4	5	6	0	88	39	
Period II															
13	349	24	3	12	5	2	4	14	6	7	11	0.3	39	11	
14	160	13	7	8	13	3	4	6	4	7	4	0.6	30	19	
15	226	18	8	7	15	3	4	7	4	6	8	4	74	25	
Periods III/IV															
16	230	16	5	7	14	5	4	5	4	12	8	2	91	28	
Period V															
17	968	12	18	5	12	5	5	5	6	7	7	2	257	20	
Period VI															
18	316	14	5	8	13	6	5	5	6	12	6	2	103	25	

Identification and Interpretation of the Mammal Bones

In summary, the bulk of the meat eaten at North Elmham was beef; one beef carcase contains about as much meat as those of six sheep. Pig comes just about third, depending on the relative weights of pork and mutton carcasses. Clutton-Brock suggests that in the Saxon period more pigs were consumed than appear in the middens. She explains this by postulating the boning out of pigs in special areas when cured for bacon; and there is literary evidence for the Saxon taste for bacon (Clutton-Brock 1976, 373-92). This theory may account for the low numbers of immature pigs found at North Elmham.

THE CATTLE

There are three categories of information which can be gathered about the type of animals in an archaeological deposit. Their age range can be deduced from the dentition and from the presence of closed or unclosed epiphyses of the long bones. Their size and probably weight can be deduced from measurements of both whole and fragmentary bones. It is possible that the type can be deduced, particularly in horned stock, but the subject is controversial and it is not possible to name breeds at this early stage.

The age range of all the common domestic genera is set out in Table 63. It would be misleading to give exact ages to these animals of so long ago, since although there is some data on dentition dating from the seventeenth century (Silver 1969, 283), there is none on epiphyseal closure and this has been shown to vary with the state of nutrition. Therefore, the ages have been divided into three stages:

- a) juvenile, under one year old in modern terms
- b) immature, between one and four years in modern terms
- c) mature, above that age.

Today's prime beef often comes from juvenile animals, but it is not likely to have done so before the present century. The proportion of such animals is low in both Periods I and II, being under 20% except in groups 1, 2, 9, 11 and 15, Period II. It is over 20% in the medieval and post-medieval eras and this is due to an increase in very young animals which might either have been casualties or might perhaps have been slaughtered for vellum production. The immature animal makes up about one third of the individuals throughout; these may be animals deliberately reared for meat or hides, but it is quite possible that they may include animals that have bred. The mature animal has probably fulfilled some other economic function than meat production, such as traction or prolonged breeding and perhaps dairy production in the later periods. Dairy production probably came mainly from sheep prior to the medieval era (Trow-Smith 1957). Over half the cattle at all periods were mature, except in Period II.

The adult size of an animal depends not only upon its genetic potential but whether it has received sufficient nutrition in its youth to fulfill that potential. The cattle at North Elmham are on the large side for animals of the past, being larger than those commonly found in the later prehistoric period, whilst the medieval animals are considerably larger than their counterparts found at such urban centres as King's Lynn and Bristol. However, there are larger animals on the continent of Europe, in both Holland and Germany (Schatz 1963; Kuhnhold 1971; Hanschke 1970; Anschutz 1966; Clason 1968). At Rijnsburg in the Netherlands in the tenth century there were animals of comparable size to the North Elmham ones. And also at a number of German medieval sites, especially Wulfingen, large animals have been found. An estimate of body weights, derived from measurements on the astragalus (Noddle 1971, 377) is presented in Fig. 197. Here it can be seen that the size of the animals does tend to decrease with time, but this might be attributed to the lowering of nutritional standards with the increase of arable over pasture. There are some large medieval animals, however. Histograms of other bone dimensions are presented in Figs. 198-208 and a table of whole bone dimensions, principally metapodials, is presented in Table 64. This data is not sufficient to give unequivocal information about changes in size. Thus, in most cases, the dimensions of Period I

TABLE 63. AGE DATA
AGE RANGE OF INDIVIDUALS

Group	CATTLE					SHEEP					PIG				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Period I															
1	13	12	40	30	30	28	27	15	7	78	15	14	35	15	50
2	13	10	20	20	60	27	25	12	23	55	31	31	23	23	54
3	26	26	12	31	57	17	17	12	24	64	34	34	0	15	85
4	47	45	18	31	51	173	157	10	22	68	106	103	11	33	56
5	23	23	13	26	61	25	24	25	29	46	24	22	23	27	50
6	5	5	0	40	60	7	4	25	56	25	5	3	0	66	33
7	3	2	0	50	50	2	2	50	0	50	3	3	0	66	33
8	2	2	0	0	100	5	5	0	40	60	3	3	33	33	33
9	5	4	25	25	50	9	9	17	33	50	6	6	16	16	66
10	6	6	0	33	66	2	2	100	0	0	2	1	0	100	0
11	4	4	25	25	50	7	7	14	28	56	8	8	50	25	25
12	45	8	17	33	50	51	44	7	11	82	22	16	6	31	63
Period II															
13	23	23	17	22	61	128	128	9	23	68	38	36	17	40	43
14	23	14	13	37	50	35	33	15	15	70	16	16	25	25	50
15	25	22	36	27	40	45	27	28	18	54	19	18	22	28	50
Periods III/IV															
16	74	41	12	36	52	90	45	18	20	62	110	66	18	50	33
Period V															
17	285	162	23	34	63	245	128	8	19	73	271	141	26	37	37
Period VI															
18	239	158	21	36	43	165	106	12	23	65	132	77	23	50	20

1. Minimum number of individuals.
2. Minimum number of individuals which were ageable.
3. % Juvenile.
4. % Immature.
5. % Mature.

TABLE 64. CATTLE - MEASUREMENTS OF WHOLE BONES
(measurements in mm)

Bone	Length	Proximal Width	Distal Width	Midshaft Width
<u>Period I</u> (Groups 1-12)				
Humerus	250	68	-	-
Radius	267	74	82	-
	252	70	65	39
Tibia	372	97	61.5	-
Metacarpal	173	50	-	28.5
	175	47	47.5	27.5
	177	52	52	30
	177	-	-	-
	185	-	45	26
	185	53	55	34.5
	185	51.5	49	28.5
	187	56	56	36.5
	190	-	-	-
	192	59	55	34
	193	-	56.5	35
	193	59	-	37
	193	53	-	32
	195	58.5	55	34
	198	63.5	-	36.5
	198	60.5	58	37
	199	59.5	59.5	34.5
	200	60.5	59.5	35
	200	63	63	38.5
	208	64.5	59	36
	210	-	-	-
Metatarsal	199	41	44	-
	210	-	-	-
	212	42	47	26.5
	212	42	50	29
	213	43	48.5	24
	213	44.5	46	25
	214	48	50	27
	214	-	-	27
	215	47	60	26
	215	45	57	26
	217	43	46	27
	220	50.5	51.5	28
	220	52	-	28
	224	48	51.5	28.5
	225	49	-	30
	225	51	-	30
	226	-	56.5	31
	227	47	57	31.5
	227	55	58	32.5
	230	46	-	32
	230	52	52	31
	230	50	57	28
	232	33.5	58	30

Bone	Length	Proximal Width	Distal Width	Midshaft Width	
Metatarsal (cont.)	233	49.5	45.5	29	
	234	49	54.5	30	
	237	44	52.5	29	
	237	49	56	29	
	240	54	56.5	32	
<u>Period II</u> (Groups 13-15)					
Radius	252	70	62	37.5	
	260	70.5	61	-	
Metacarpal	167	49	47.5	29	
	172	-	52.5	33	
	183	49	49	29	
	183	59	55	33.7	
	187	50.5	50.5	32	
	187	50	44.5	33.5	
	190	50	48	29.5	
	192	51	49	28.5	
	203	64	-	-	
	207	42.5	-	24	
Metatarsal	195	36	42	23	
	202	-	-	-	
	212	43	48	26.5	
	214	50	48	27.5	
	221	48.5	-	28.5	
	245	54	-	32.5	
	<u>Periods III/IV</u> (Group 16)				
	Metacarpal	170	52	50	33
173		52.5	51.5	32.5	
Metatarsal	200	43	46.5	26	
	204	43.5	46.5	26	
<u>Medieval</u> (Group 17)					
Metacarpal	160	45	41	-	
	177	-	-	-	
Metatarsal	163	40	40	-	
	225	48	53	-	
<u>Post-Medieval</u> (Group 18)					
Metacarpal	173	48	49	30	
	175	55	58	32	
	180	50	48	27.5	
	185	54	50	34	
Metatarsal	195	40	43	24	
	201	48	45	28	
	220	43	-	25	
	223	45	49	26.5	
	235	50	55	29	

On bones other than metapodials the midshaft width was measured at the nutrient foramen.

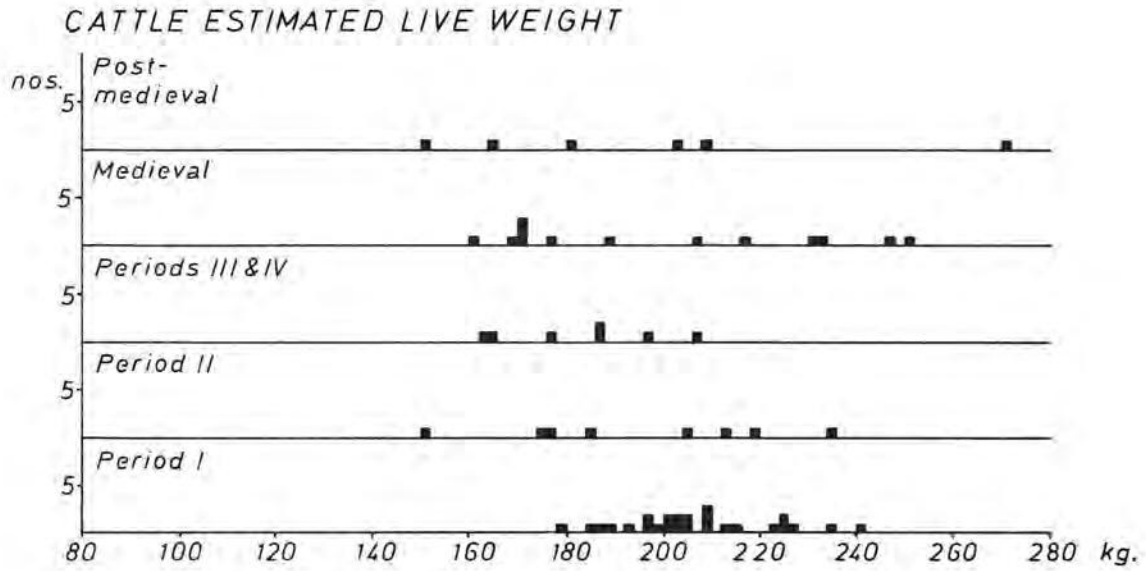


Fig. 197. Estimated body weight of cattle. Frequency plotted against body weight of cattle estimated from dimensions of astragalus.

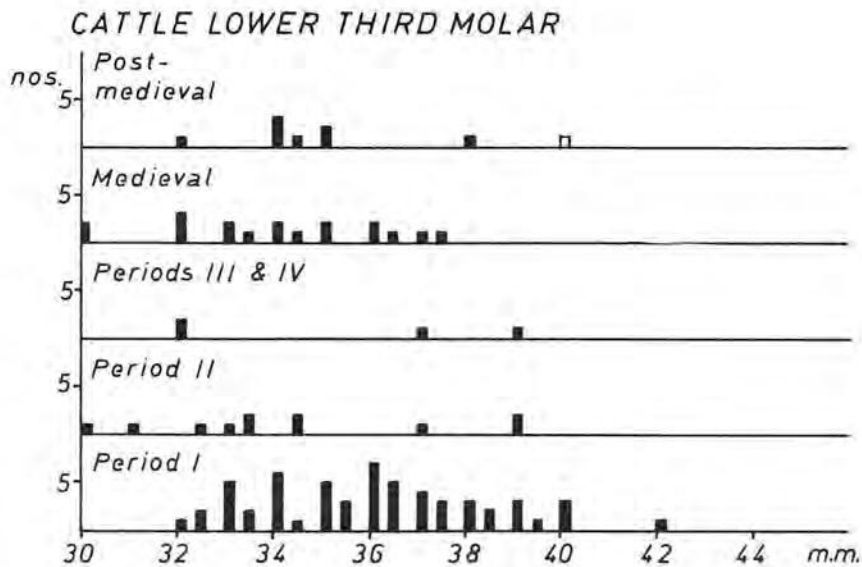


Fig. 198. Dimensions of lower third molar of cattle. Frequency plotted against anterior-posterior measurement of lower third molar at about gum level.

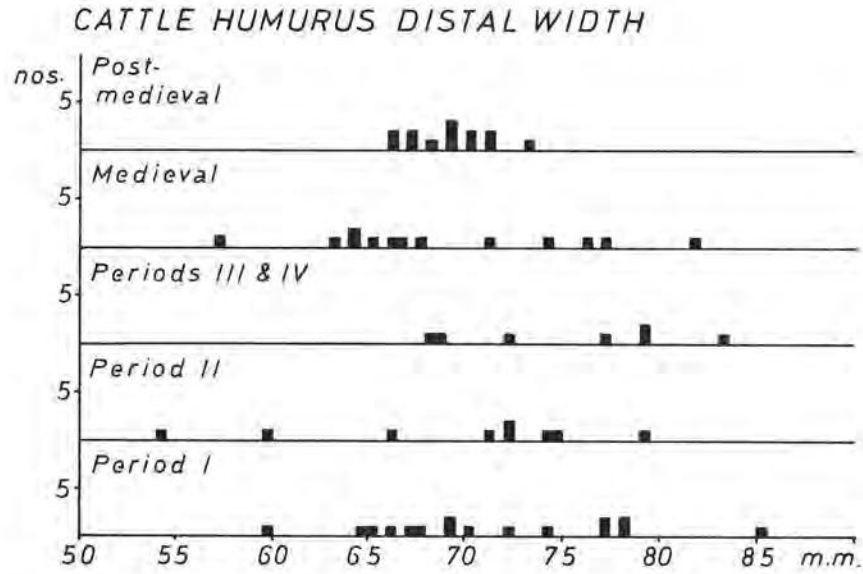


Fig.199. Dimensions of distal humerus of cattle. Frequency plotted against maximum width of distal condyles of bovine humerus.

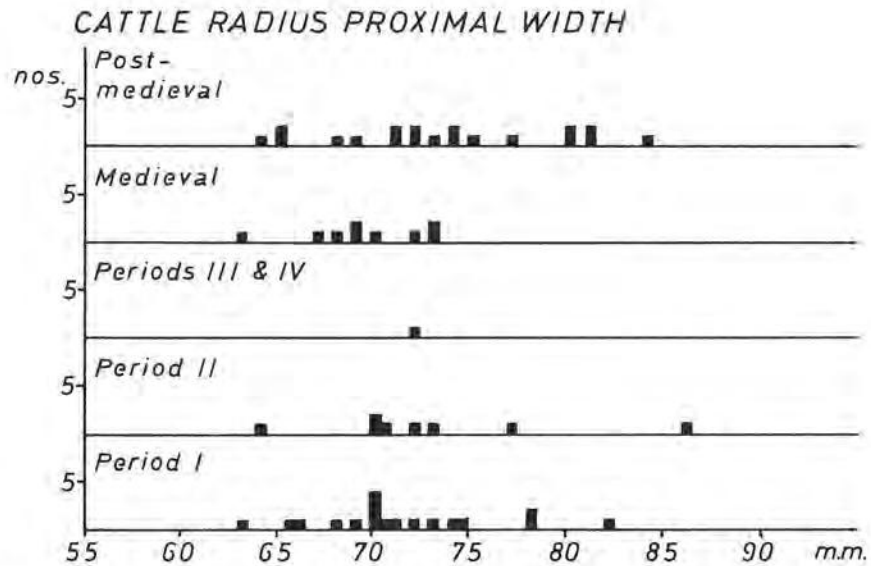


Fig.200. Proximal radius of cattle. Frequency plotted against maximum proximal width of bovine radius.

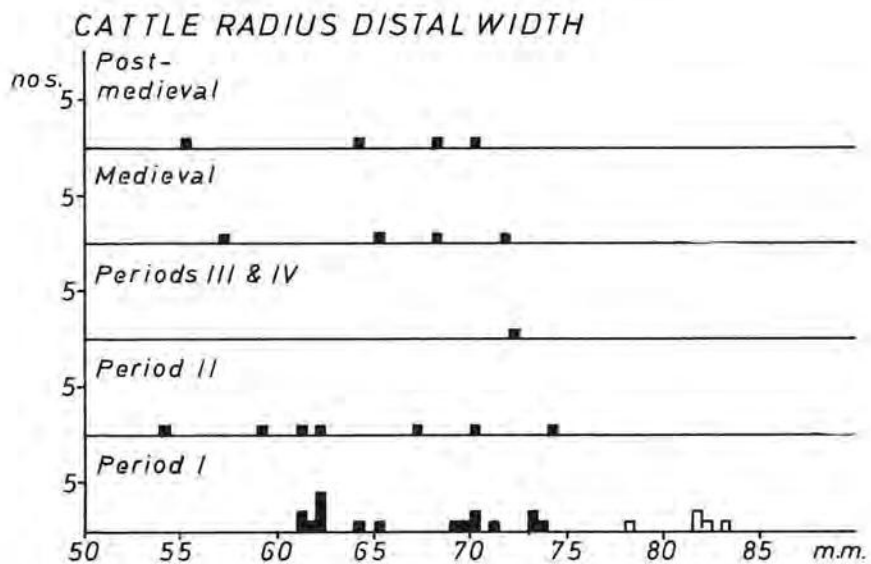


Fig 201. Dimensions of distal radius of cattle. Frequency plotted against maximum width of bovine distal radius.

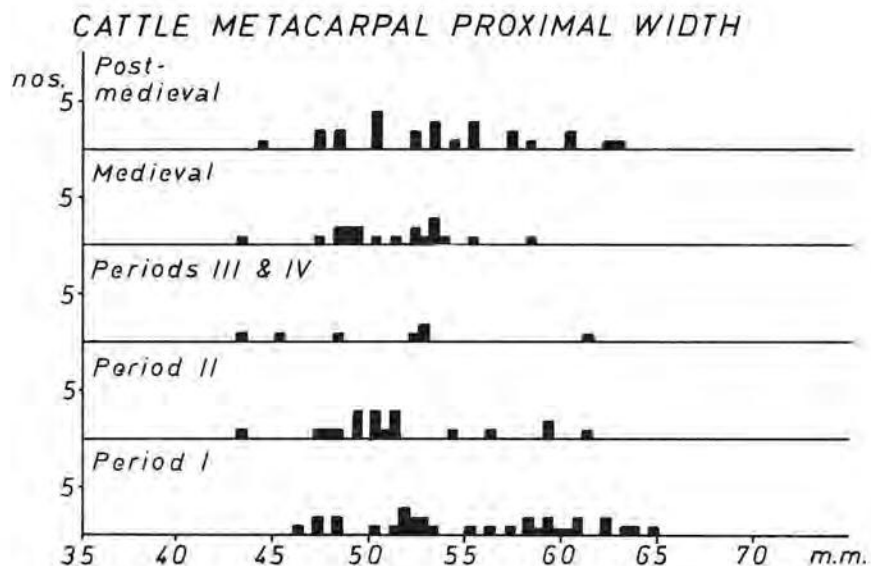


Fig.202. Proximal metacarpal of cattle. Frequency plotted against maximum proximal width of bovine metacarpal.

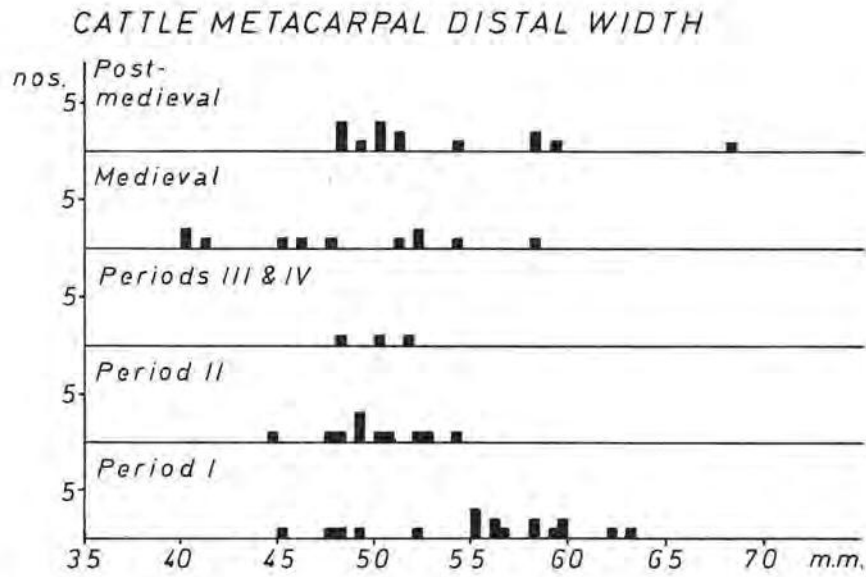


Fig. 203. Dimensions of distal metacarpal of cattle. Frequency plotted against maximum width of bovine metacarpal at epiphyseal junction.

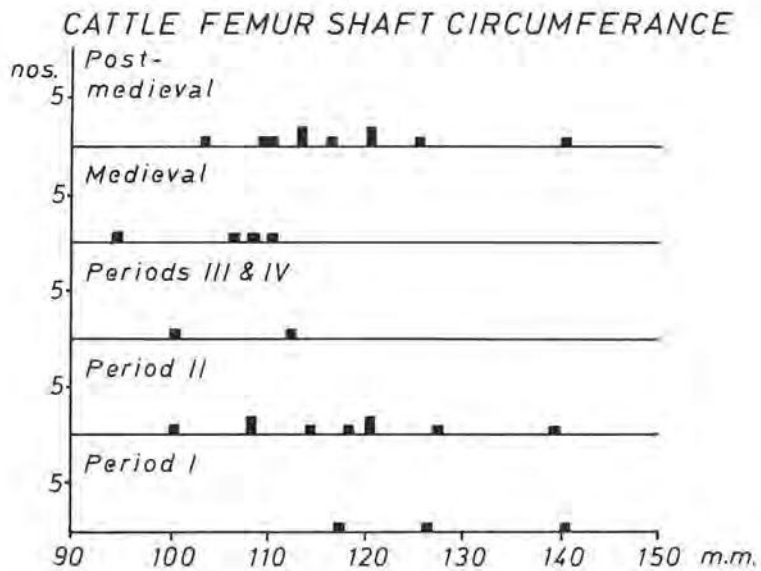


Fig. 204. Dimensions of bovine femur shaft. Frequency plotted against circumference of femur shaft at the level of the nutrient foramen.

CATTLE TIBIA DISTAL WIDTH

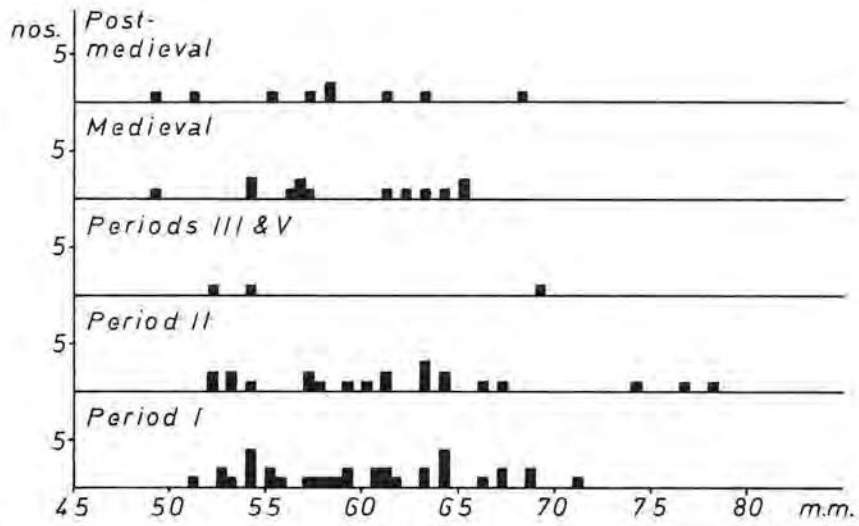


Fig.205. Dimensions of distal tibia of cattle. Frequency plotted against maximum distal width of bovine tibia.

CATTLE METATARSAL PROXIMAL WIDTH

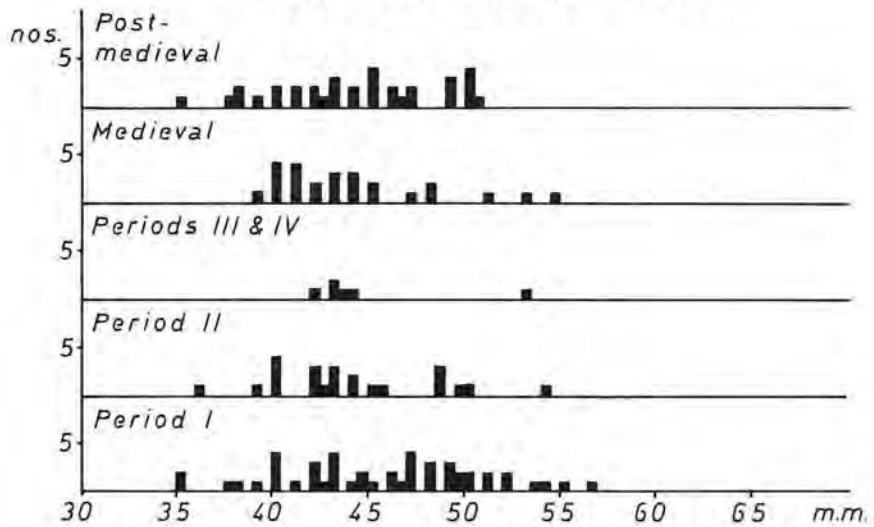


Fig.206. Cattle proximal metatarsal width.

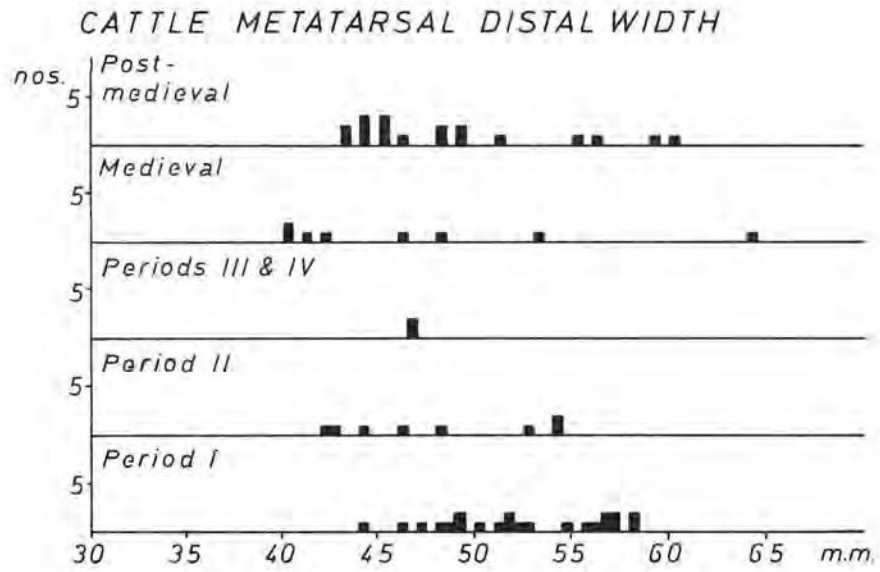


Fig.207. Cattle distal metatarsal width.

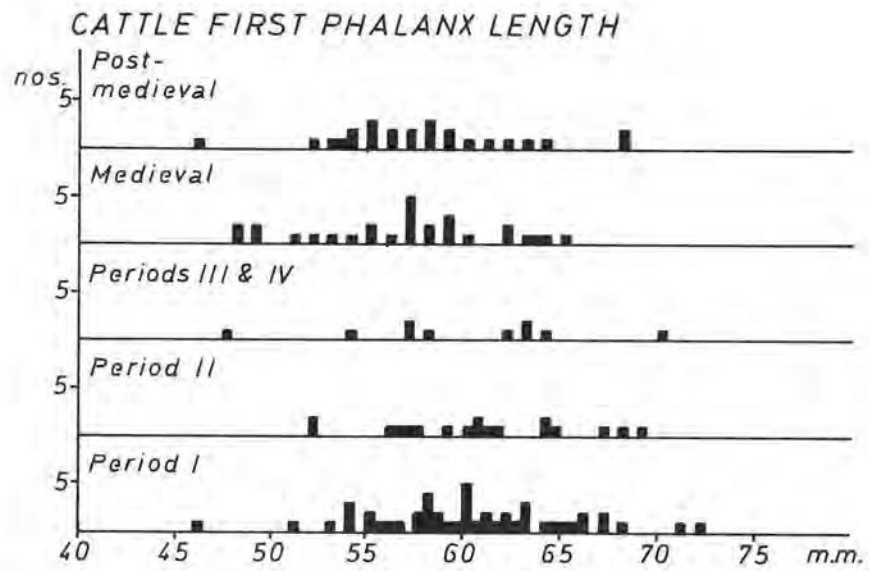


Fig.208. Length of first phalanx of cattle. Frequency plotted against length.

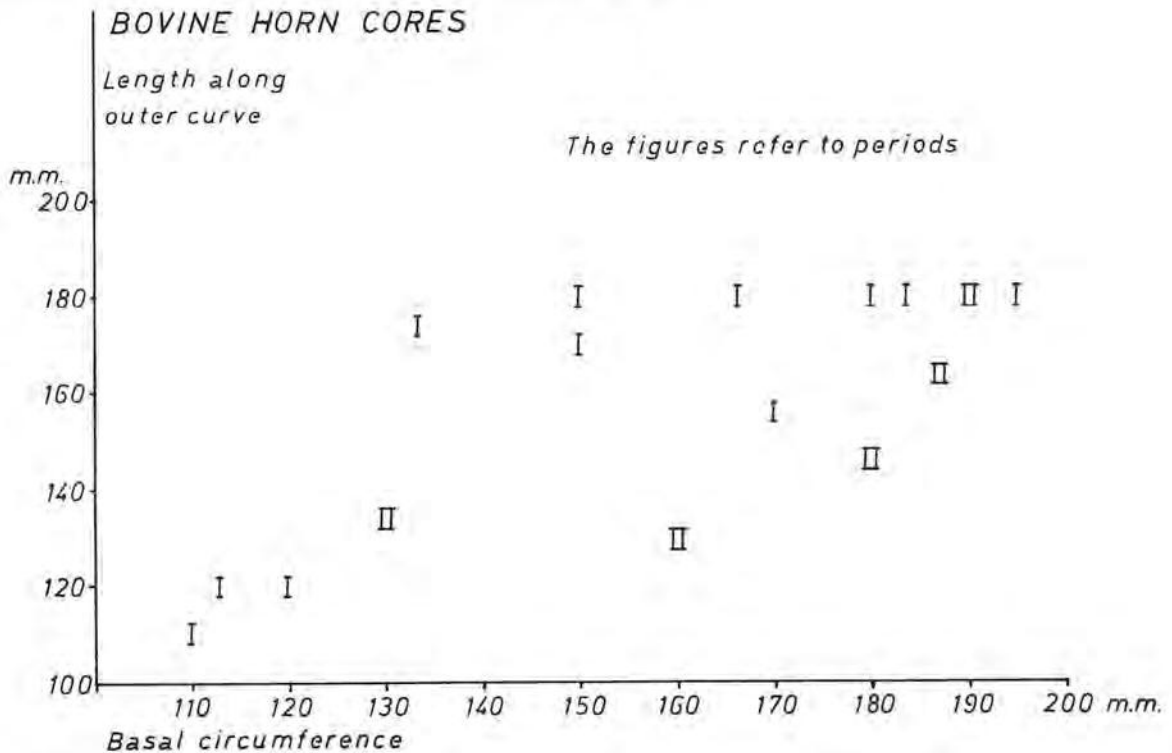


Fig. 209. Dimensions of bovine horn cores. Circumference at base of horn cores plotted against length along outer curvature. The numerals refer to periods.

bones are greater than Period II (length first phalanx, length lower third molar, proximal metacarpal, distal metatarsal, circumference of femur, distal radius) but in the other bones it is approximately equal. Where sufficient data exists for Periods III/IV the dimensions are the same as Period II. Medieval animals are smaller than the earlier ones in the cases of first phalanx, distal tibia, distal metacarpal. Post-medieval animals are larger than medieval ones in the cases of first phalanx, proximal and distal metacarpal, distal metatarsal and femur circumference, but are roughly equal in the cases of the other bones. Thus, these slight changes in proportion might be due to changes in genetic type. This evidence is substantiated in the case of the horn cores.

In Period I all the complete horn cores were long and curved (Plate XCIII). In Period II they become rather shorter and thicker (Plates XCIV-XCV, Fig. 209). Horns were also fairly massive in the medieval period (Plate XCVI). Horn cores are very variable within breeds and now that the day of the old steer and horned cow is passed it may never be possible to make a proper study of them, but the difference here is marked. The longer variety of horn core is similar to that of the modern Devon breed. The red breeds of cattle are traditionally supposed to be Saxon imports (Wilson 1909) and the extinct Norfolk horn was one of these, contributing its colour to the modern Red Poll. It has been suggested that the Saxons increased the size of their stock by cross breeding with the aurox, (Seebolm 1932) but the evidence, based on the increase of legal disputes following injury by cattle, is rather scanty. It is generally supposed that the aurox was extinct in Southern Britain by this period, but Low suggested it survived to the Norman invasion (Low 1845).

Also there are possibly differences in the femur. The nutrient foramen of the bovine femur is almost always in one or two places, either within the tendon insertion of the supra condylar fossa or alongside it. In most modern breeds the distribution is about 50:50, but in the limited number of specimens here there is some variation. In Period I the distribution was about equal; in Period II five out of seven foramina were located within the fossa, in Periods III/IV three out of seven and in the medieval and post-medieval periods it is back to 50% of twenty and twenty three specimens respectively.

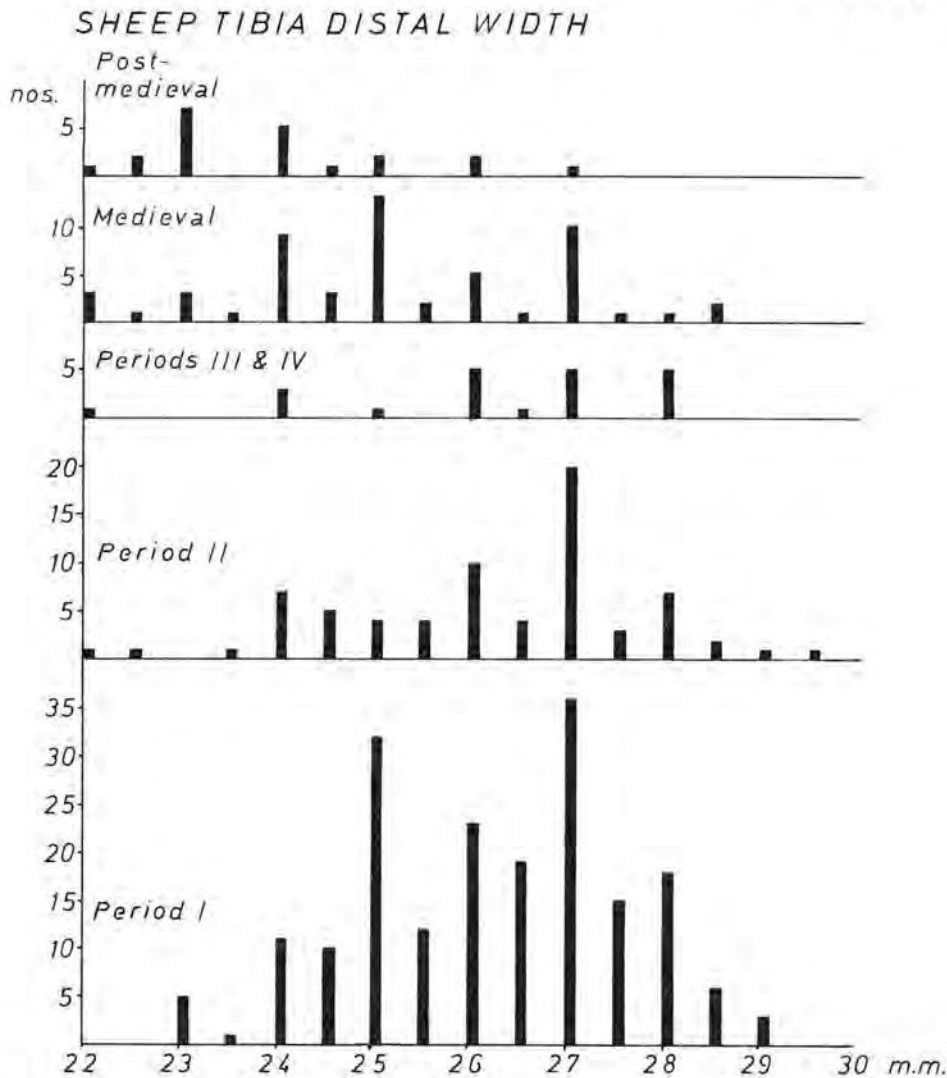


Fig. 210. Dimensions of distal tibia of sheep. Frequency plotted against maximum distal width of ovine tibia.

In summary, the tradition that the Saxons imported the red breeds is substantiated to some extent, but this possible 'red type' seems to be crossed with others in the later stages. The age range of the animals indicates that some 50%, being mature animals, performed some other economic function than carcass production before slaughter. Clutton-Brock has compared some of this data mainly from Period I with other Saxon bones, including another East Anglian site, Thetford, and finds them slightly larger than the others (Clutton-Brock 1976, 373-92).

SHEEP

The sheep bones from North Elmham are a very interesting collection, from which a considerable amount of information can be derived, although some of it must remain conjectural until more data is compiled from other sites. The high proportion of mature animals, at least 60% of all periods and rising to 73% in the medieval period, indicates that most of the animals had been kept for wool production. This is in marked contrast to the sheep found at the deserted medieval village of Wharram Percy, studied by Ryder; of these only 15% were mature (Ryder 1961).

The dimensions of the distal tibia in sheep of a single breed are triphasic. In a collection of forty adult Clun sheep the writer found that the width of the wether's tibia was, on average, 104% that of the ewe, and the ram 112%. If the histogram of distal tibia (Fig. 210) is examined in the light of this data, it appears that there were about equal numbers of ewes and wethers, but in Period II wethers predominated (peaks at 25 and 27 mm). This assumes that the 'breed' of sheep remained the same. In the medieval period the animals were small with possible female peak at 23 mm and wether at 25 mm. Ewes seem to predominate in the post-medieval period.



Plate XCIII. Bovine horn core from Period I: longer type.



Plate XCIV. Bovine horn cores from Period II: shorter thicker type.



Plate XCV. Bovine skull fragment from Period II with short and thick horn cores.



Plate XCVI. Bovine horn core from Period V: from a fairly young animal.



Plate XCVII. Sheep and goat horn cores from Period I. The two specimens on the right are from goat.

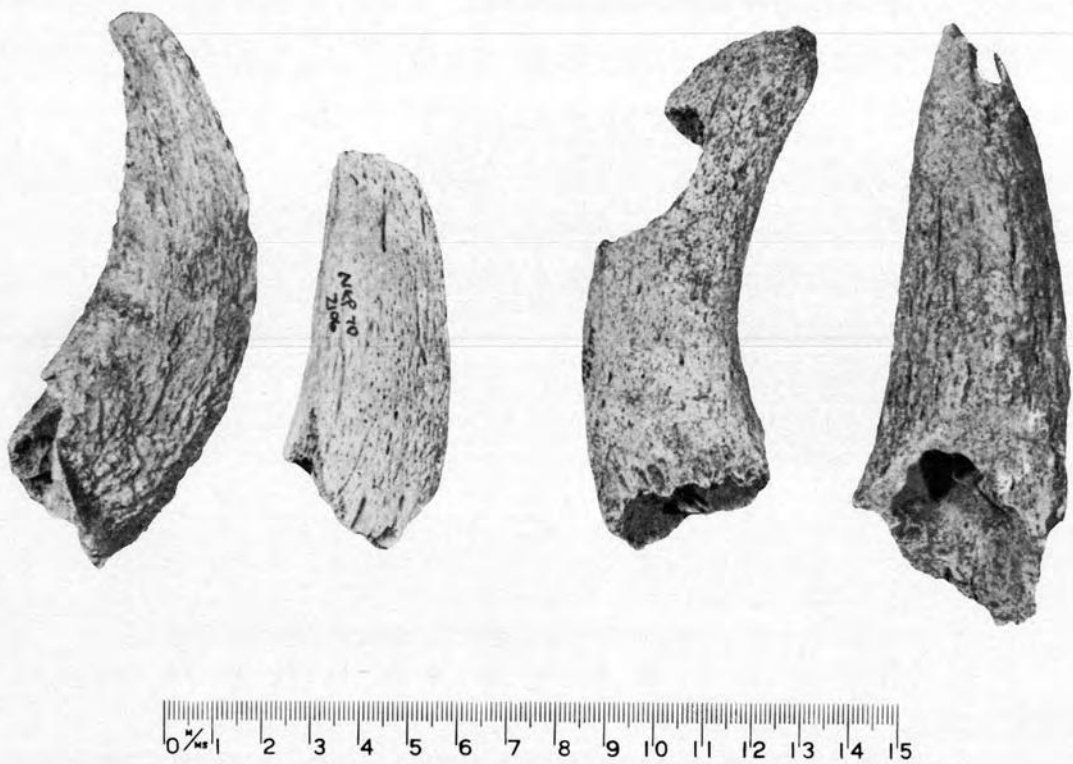


Plate XCVIII. Sheep horn cores from Periods III/IV. The specimen on the left shows lateral twisting.

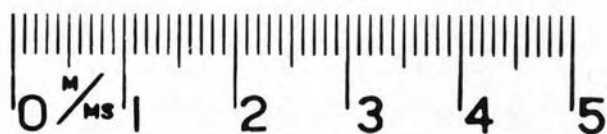
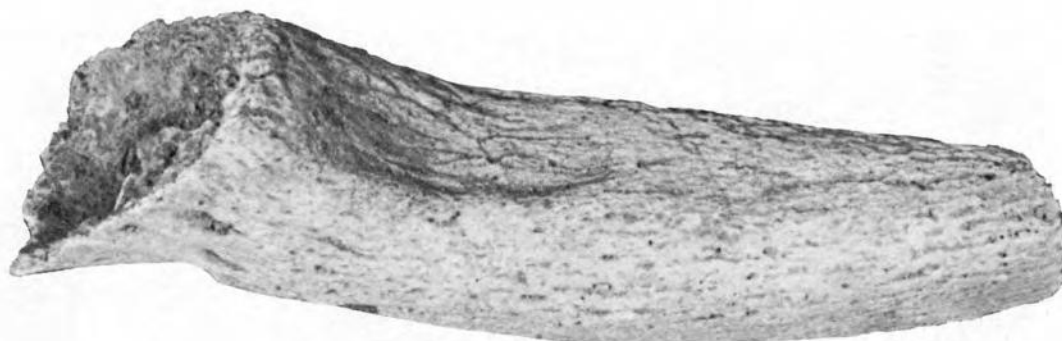


Plate XCIX. Horn core from a ewe of Period I showing a posterior notch found also in some modern black-faced breeds.



Plate C. Sheep horn core from a Period II ram: very massive.



Plate CI. Male sheep horn cores from Periods III/IV.

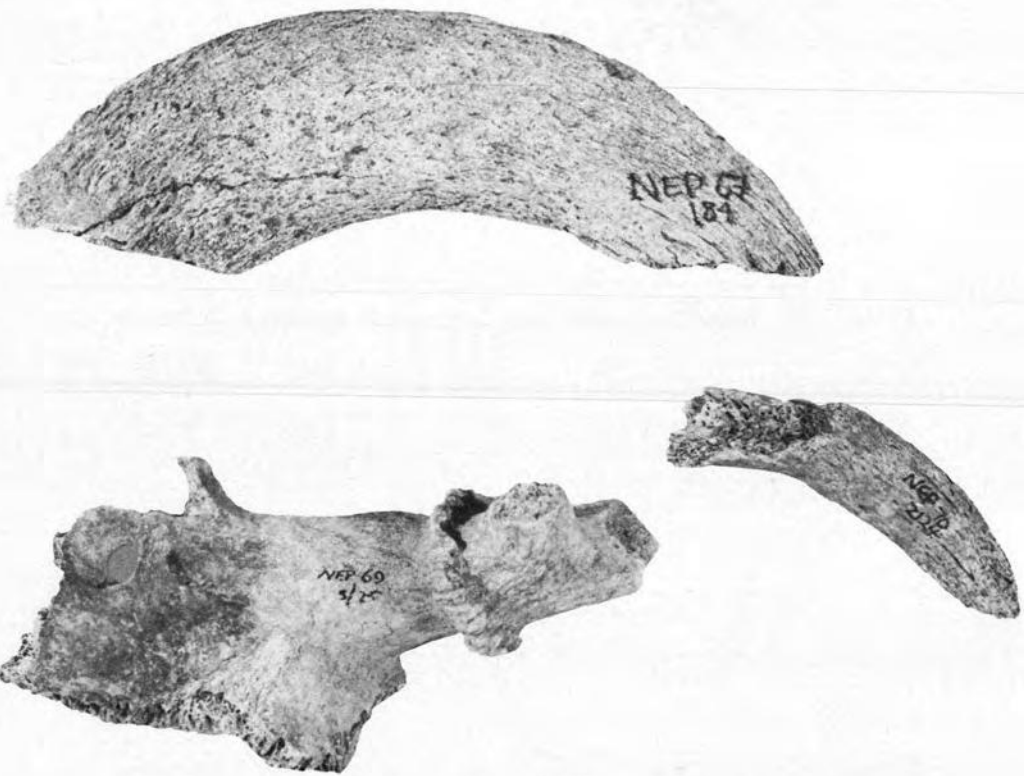


Plate CII. Horn cores from male and female sheep from Period V. The specimen at the bottom of the plate is a skull and antler fragment from a roe deer.

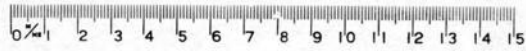


Plate CIII. Massive horn cores from male sheep from Period VI.

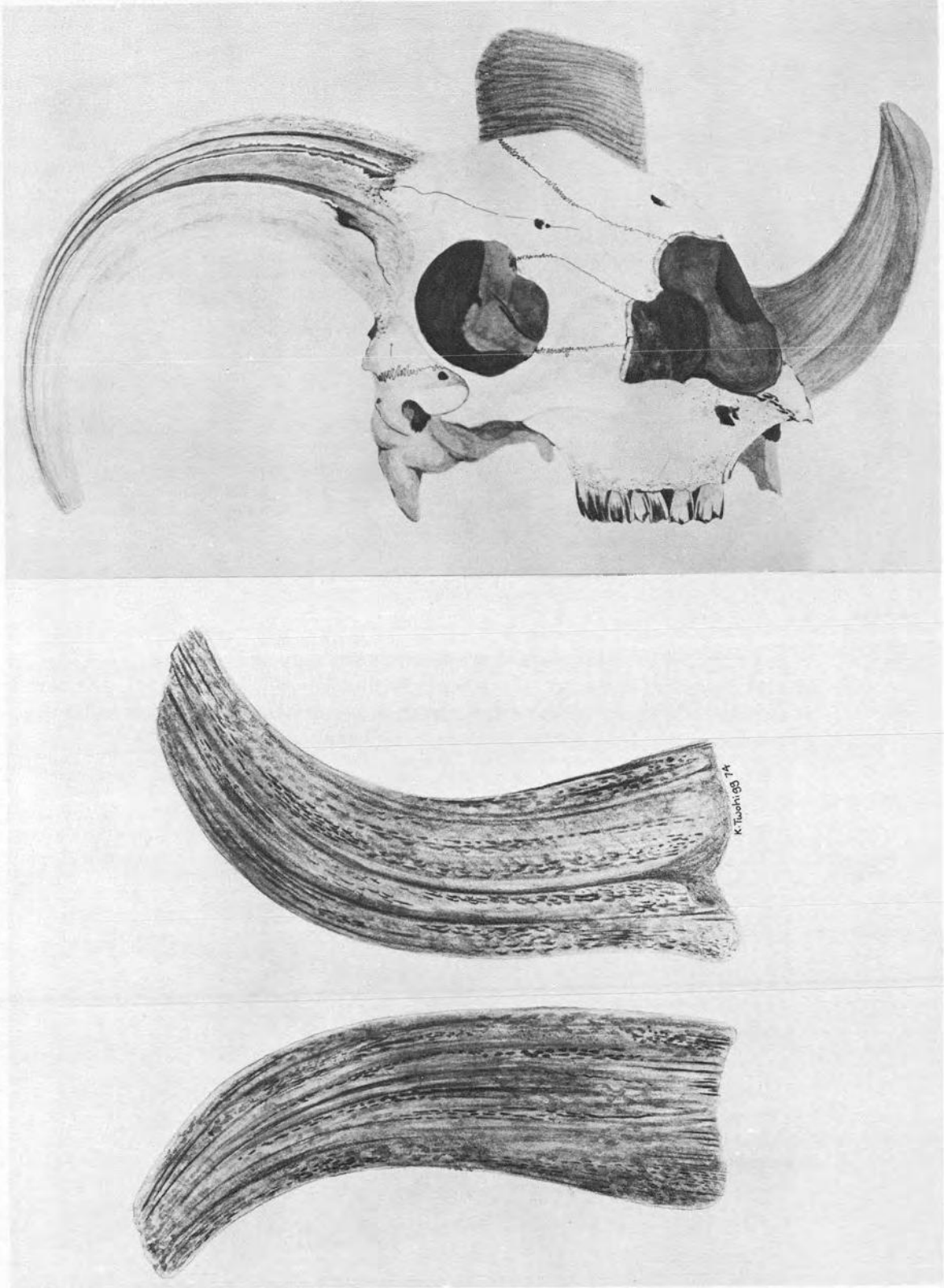


Plate CIV. Above: Skull of three year old Norfolk Horn ram showing linear grooves on outer horn core surface. Below: Similar grooves are shown in these two horn cores from male sheep of Period II.

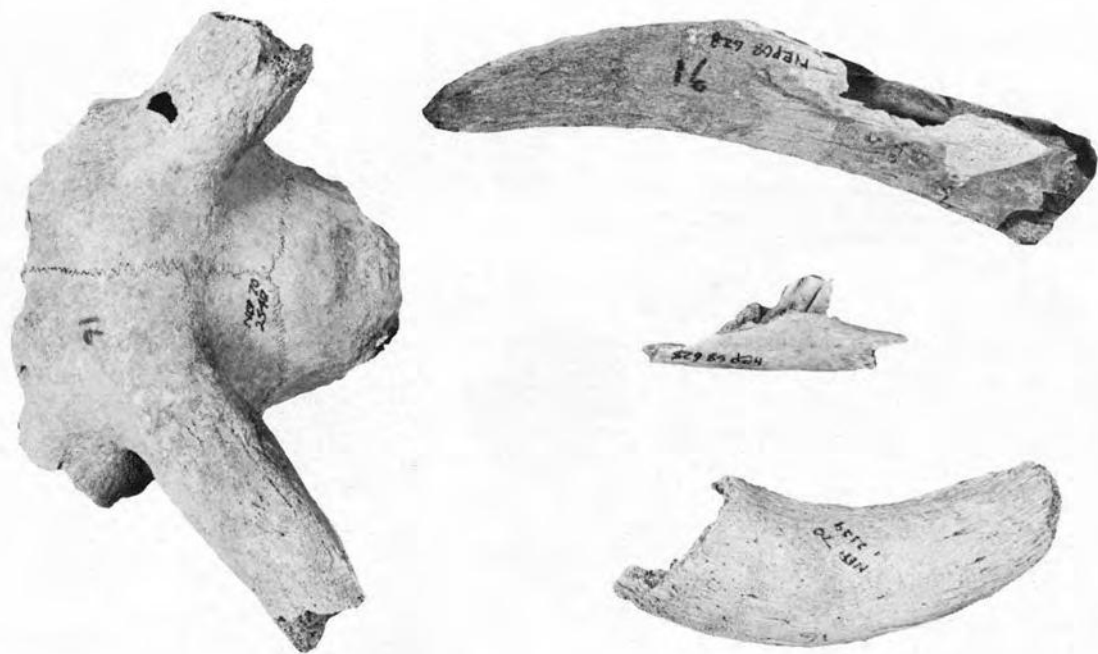


Plate CV. Skull fragment of sheep with round horn cores, probably of ewe, showing lateral direction of horns, from Periods III/IV. Also on the plate are part of a male horn core, a goat horn core and a fragment of sheep mandible with a molar tooth exhibiting pathological wear.

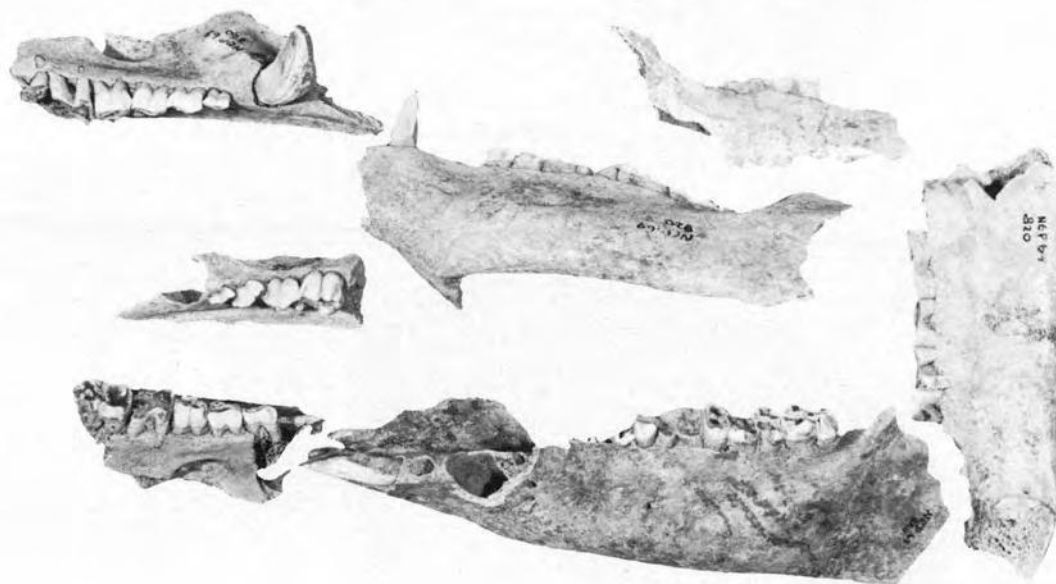


Plate CVI. Pig mandible fragments from Period II showing extreme wear of the molar teeth. On the left of the plate there are maxilla fragments, the middle one of which shows premolar teeth crowded into a diagonal position, probably due to youthful malnutrition.



Plate CVII. Pig mandible fragments showing molar teeth worn down to the roots in some cases.

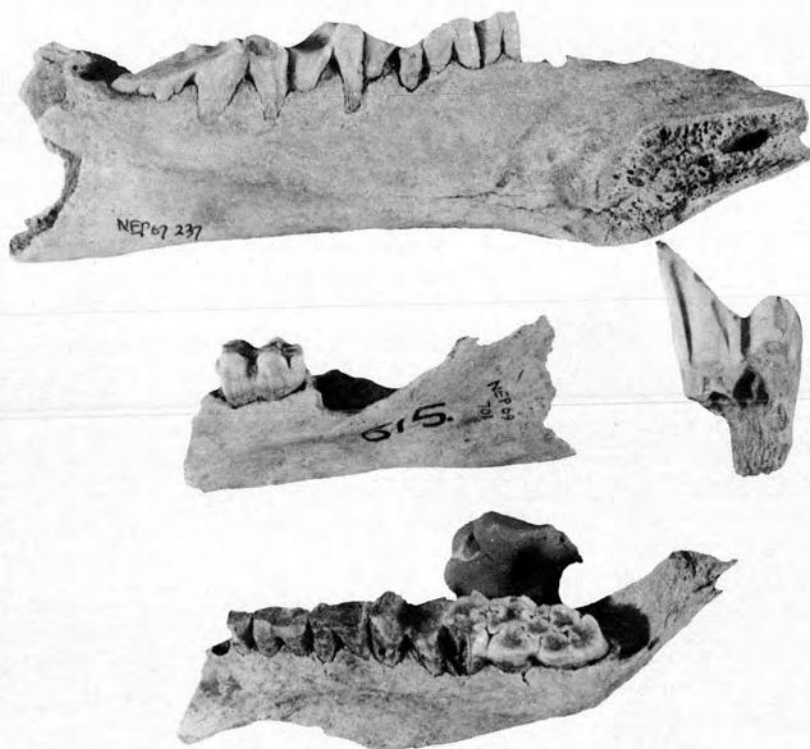


Plate CVIII. Pig mandible fragments showing irregular wear of molar teeth. In the middle is a specimen where a tooth has been lost following infection, leaving an abscess cavity.

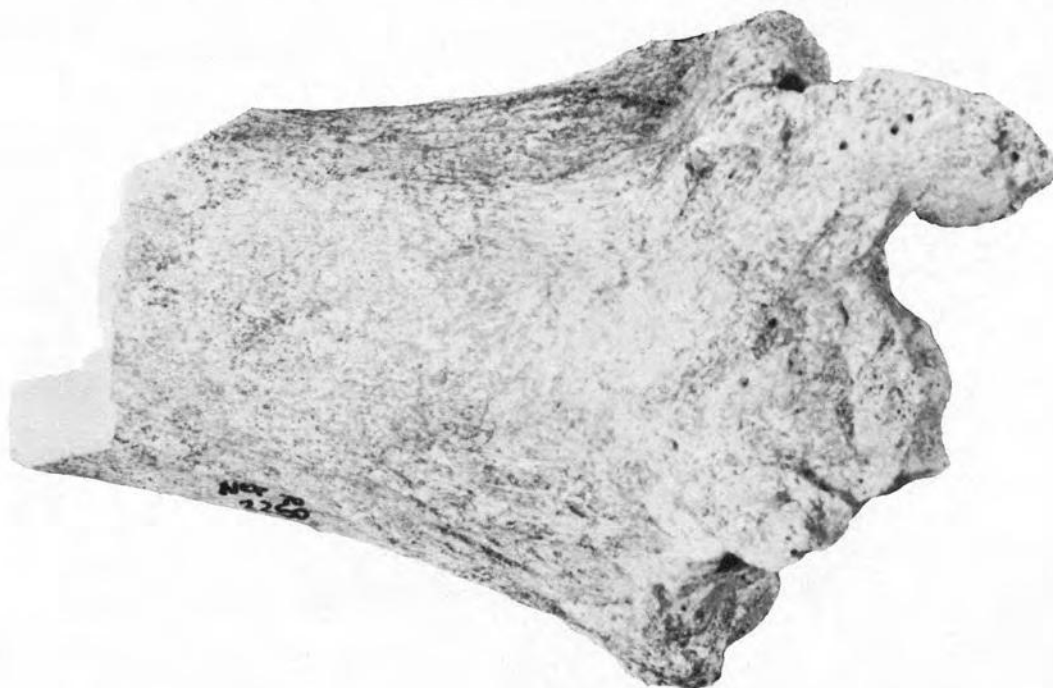


Plate CIX. Fragment of bovine tibia showing exostoses probably resulting from infection, Bovine vertebra (left) showing unusual foramen at its base.

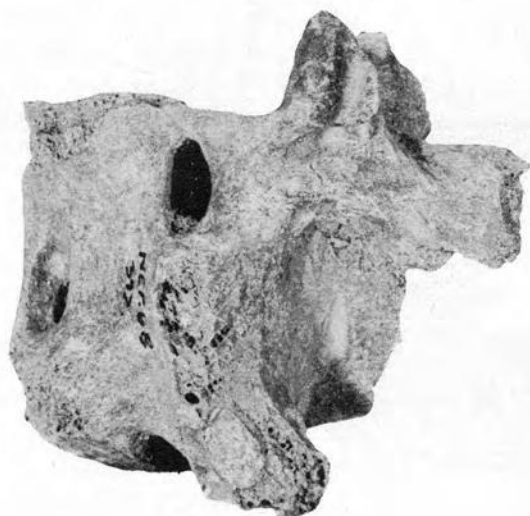


Plate CX. Right proximal end of bovine metatarsus showing arthritic joint surface.

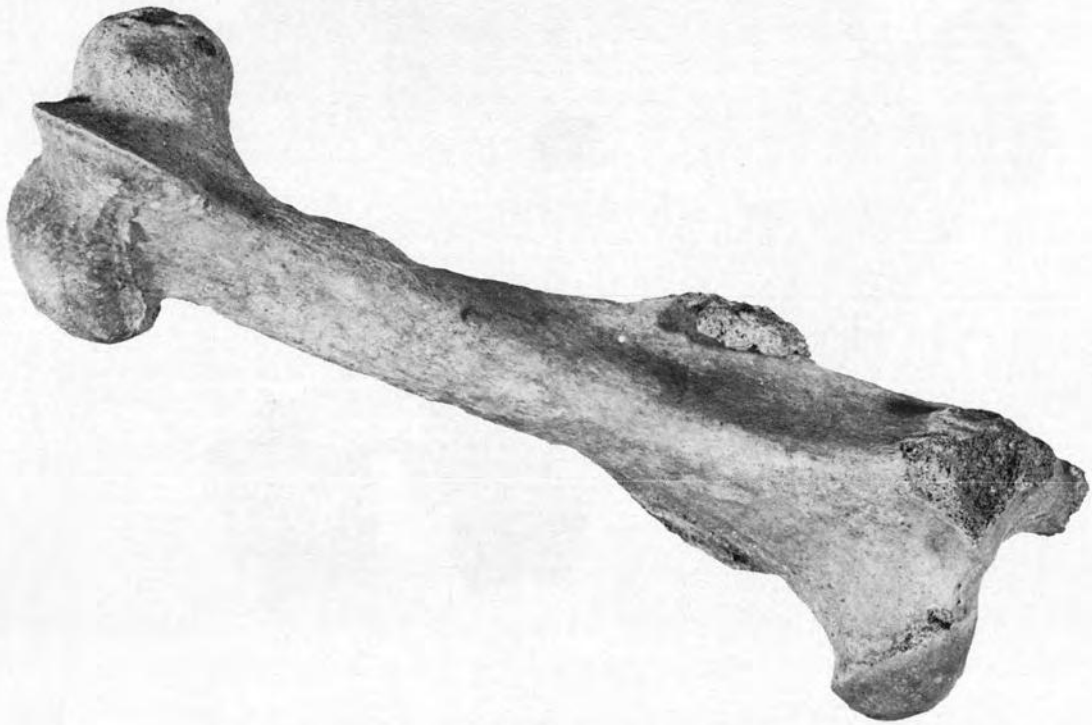


Plate CXI. Horse femur from Period V. There is a massive exostosis on the third trochanter (right hand upper side as shown).

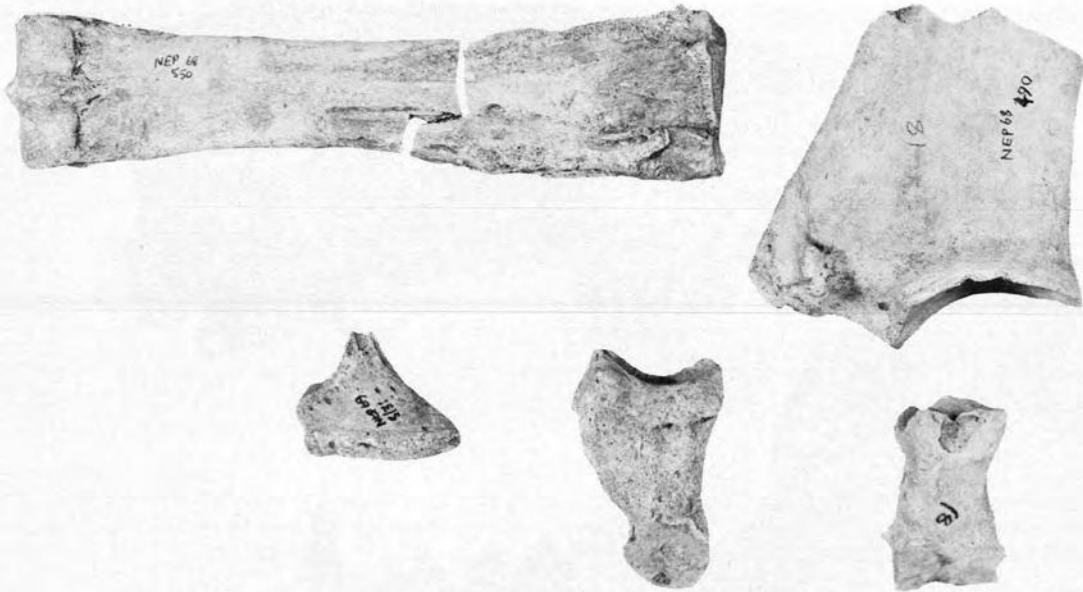


Plate CXII. Upper left horse metacarpal showing osteomyelitis. On the right hand side is a horse scapula bearing an exostosis. The lower row comprises a terminal bovine phalanx very high and short in shape, as is seen in some cases of chronic laminitis. The other first phalanges bear exostoses.

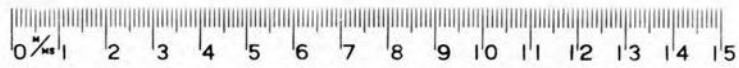


Plate CXIII. Part of a bovine skull from Period I viewed from above. The cause of the central hole is unknown.



Plate CXIV. Skull of dog from Period V; the animal appears to have been struck with an implement such as an axe.

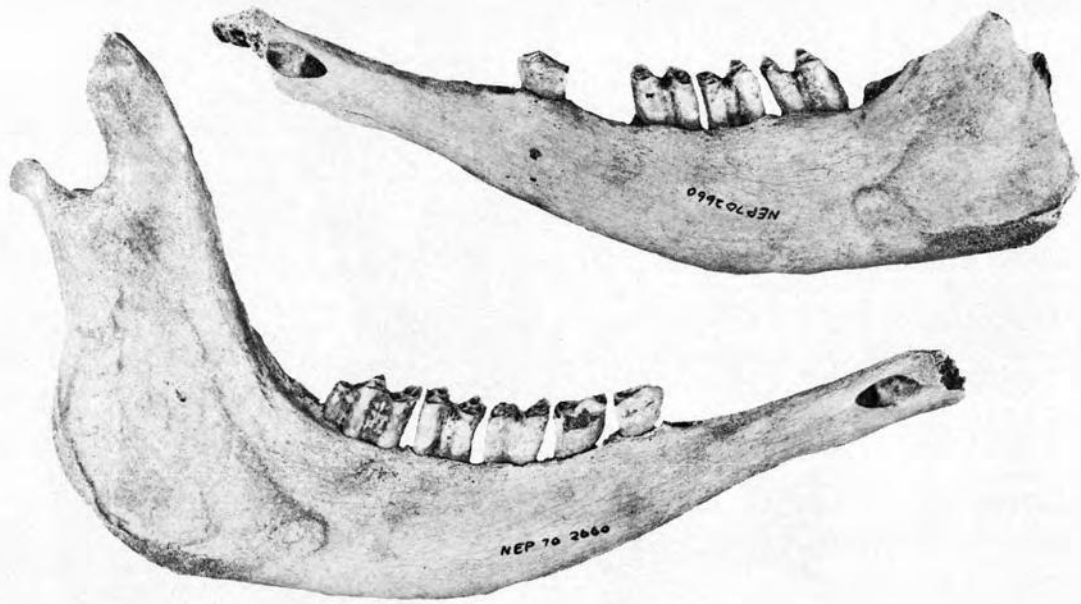


Plate CXV. A pair of bovine mandibles from the same animal. The upper one shows a third molar with only two cusps instead of the usual three shown in the other.

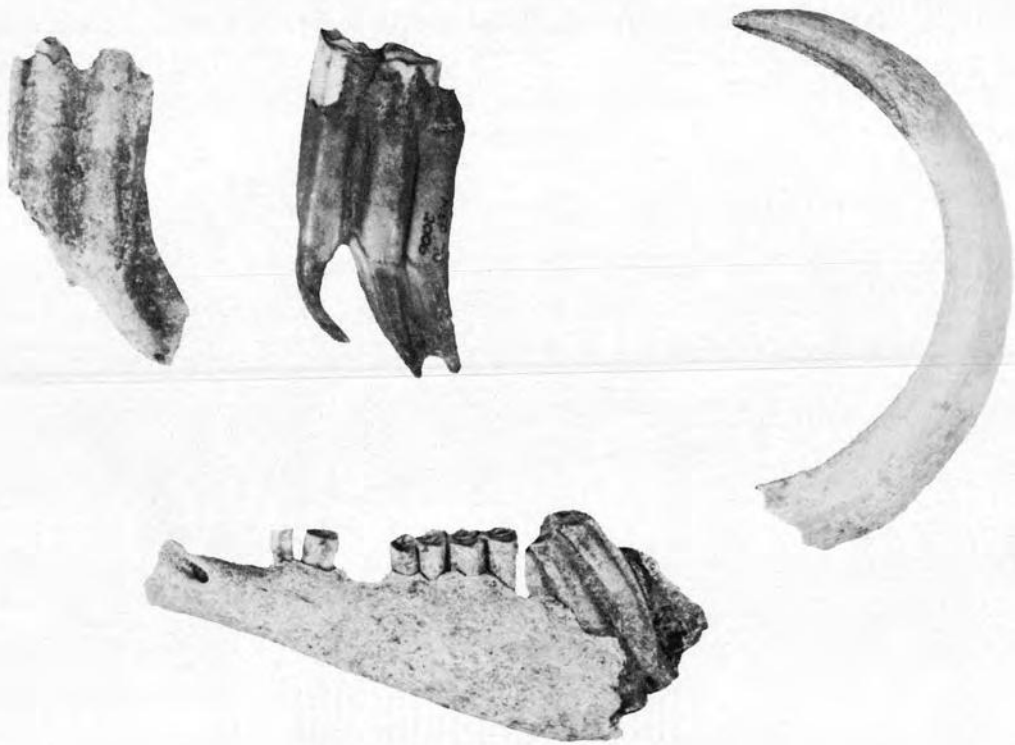


Plate CXVI. Upper left: two lower third bovine molars showing the two-and-three-cusped condition. Below: mandible from a sheep with the third lower molar reversed. On the right a tusk of a boar. All Period V.

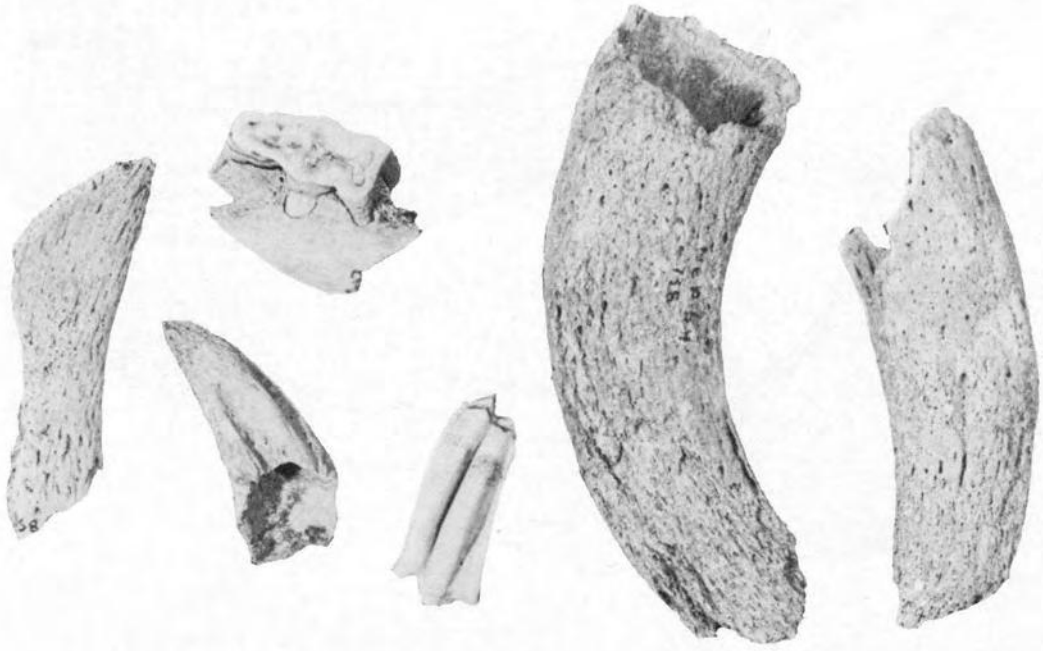


Plate CXVII. Central: lower third molar of sheep showing bilobed condition. Also sheep horn cores including a female horn with posterior notch. Upper: pig lower third molar, very worn. Period I.



Plate CXVIII. Sheep horn core, double. Periods III/IV.

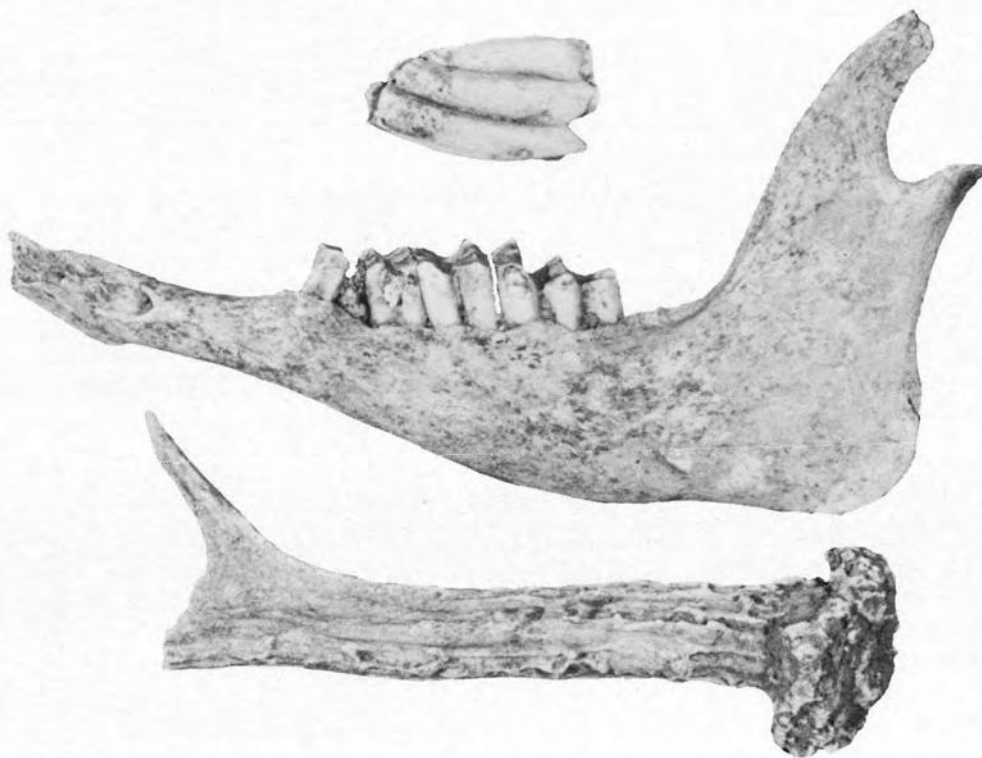


Plate CXIX. Sheep mandible showing early stages of paradontal disease. The plate also shows a roe deer antler and above a sheep lower third molar, the third cusp of which is notched, possibly the result of malnutrition and reduced mandible growth. Period I.



Plate CXX. Sheep mandible, showing advanced case of paradontal disease with abscess cavity. Period II.

Measurements on the distal condyles of the humerus (Fig. 211) also indicate a reduction in size. If one takes 28 mm as a dividing line, in Period I twenty nine measurements fall below this figure and twenty three above. In Period II there are thirteen below and four above. In Periods III/IV there are seven below and three above. In the medieval period twenty four below and thirteen above. And in the post-medieval period twenty below and ten above. The dimensions of the proximal radius in Fig. 212 show nothing clearly, but it is thought that this part of the bone may get wider with age. The radius shaft (Fig. 213) gets progressively narrower, with the peak at 18 mm in Period I, 17 mm in Period II, possibly 16 mm in Period III and a double peak at 16 and 18 mm in the medieval period which persists at 15.5 and 17 mm in Period VI. This might be due to nutrition or to the introduction of a second type of sheep. In the later middle ages, according to Kerridge, two types of sheep were kept: a wool sheep and an active heath sheep which was pastured on the waste and brought back at night to deposit its valuable dung on the arable land (Kerridge 1967). There is also a wide scatter in the length of the third lower molar in the medieval period (Fig. 214). Otherwise it tends to be slightly larger in Period II than Period I, and there seems to be a fairly sharp reduction in size in the post-medieval period.

At all periods the sheep were horned in both sexes. No polled frontal fragments were found and there are plenty of small horns which can be attributed to ewes. Feature 1075 contained thirteen such horn cores and seventeen attributable to male animals. These female horns included two very short specimens which appeared adult; such horns appear fairly frequently in the short-tailed Soay and Orkney breeds. There was also a large collection of horns in group 6. Such horn core collections are frequently indicative of horn workshops, but at North Elmham the horns were mostly from sheep and goat without the preponderance of cattle horn that has been found on later medieval sites. A collection of complete horn cores deriving from Period I is shown in Plate XCVII and another group from Period III is shown in Plate XCVIII. This includes a specimen with a strong lateral twist. Plate XCIX again shows a female horn core with a posterior notch. This twist is observed in the present day Norfolk Horn, a breed known to be of considerable antiquity and traditionally of Saxon origin. This notch is due to malnutrition in the first winter.

The horn cores of the male sheep were massive and their owners almost certainly carried horns of several spirals. In section these cores are D-shaped, another character of spiral horned sheep. Two of the horns from Period II are grooved along the inner surface, a character which again has been observed in the Norfolk, and to a lesser extent, unilaterally, in a Scottish Blackface. Horn cores of this form have also been observed in a specimen of the German Hiedesnuche and one out of two specimens of the Drenthe Heideschafe at the Biologische-Archaeologische Institut, Gronigen. It does not occur in the heavily-horned white-faced breeds, Dorset Horn and Merino. These massive horns are illustrated in Plates C-CIII, coming from Period II, Periods III/IV, medieval and post-medieval respectively. The grooved specimens are illustrated in Plate CIV.

All these horns seem to be of similar dimension. One wonders, therefore, whether the horns of the castrate male resemble those of the ram or the ewe. In many modern breeds the latter seems to be the case, but the paucity of adult wethers nowadays means that the subject has not been well studied. However, the writer has observed two Jacob Manx wethers with massive horns. If all the large horn cores are from intact rams, either females or wethers are under-represented. Possibly ram's horns were brought to the workshop without their former owners. Plate CV includes the major part of a skull from Periods III/IV showing a lateral direction of the horns. On the other hand, a skull and a number of bones from the same animal were found in feature 502 which appeared to be of the pure short-tail Soay type, but it might be argued that since the remains of this animal were not scattered and it appeared to have been buried without being used for meat, that this animal was regarded as a curiosity.

SHEEP HUMERUS DISTAL WIDTH

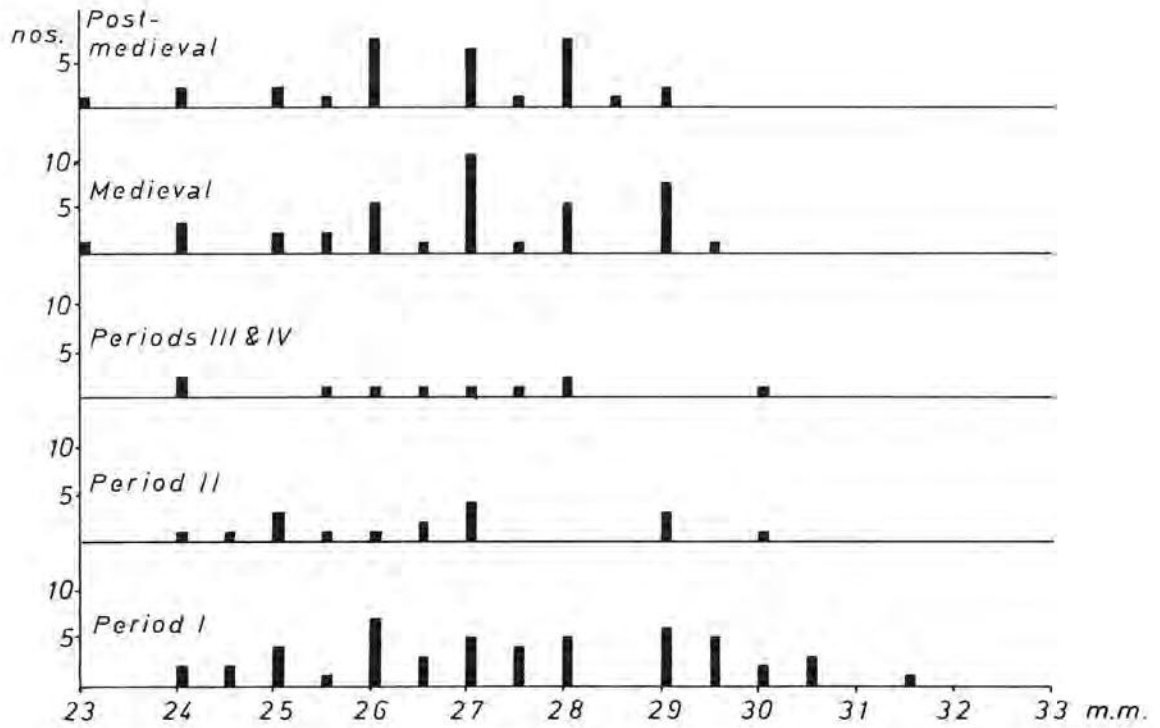


Fig.211. Dimensions of distal humerus of sheep. Frequency plotted against maximum width of distal condyles of ovine humerus.

SHEEP RADIUS PROXIMAL WIDTH

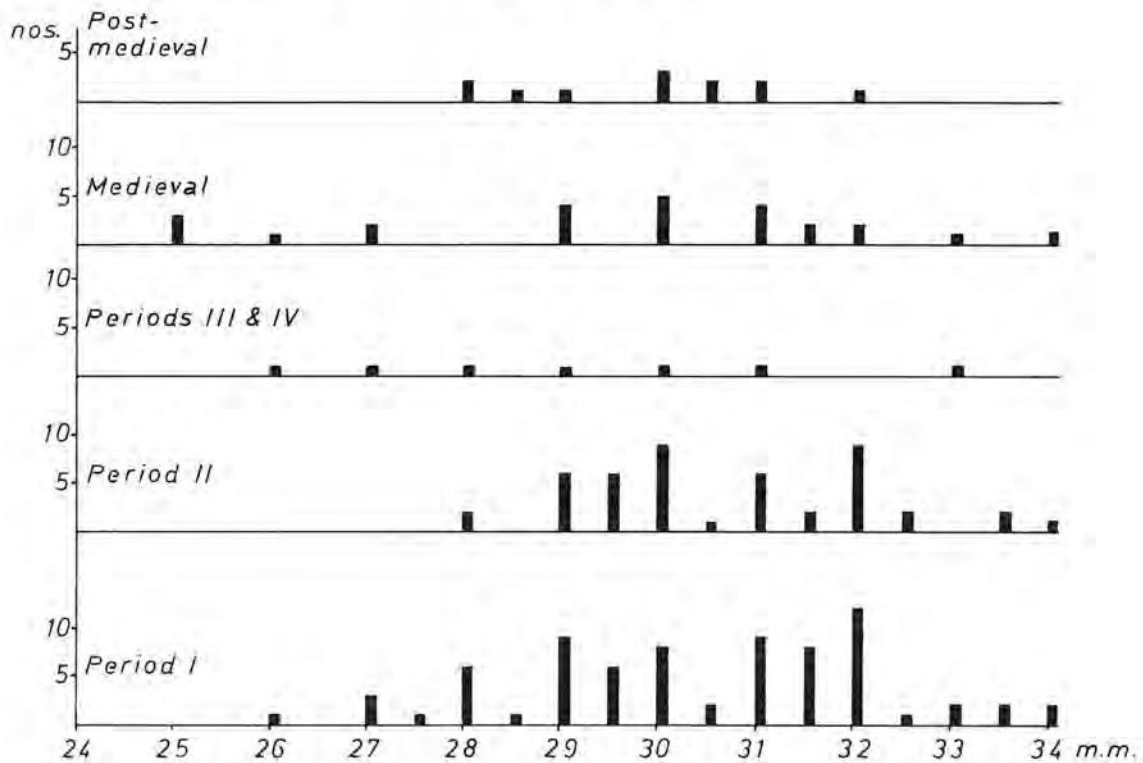


Fig.212. Dimensions of proximal radius of sheep. Frequency plotted against maximum proximal width of ovine radius.

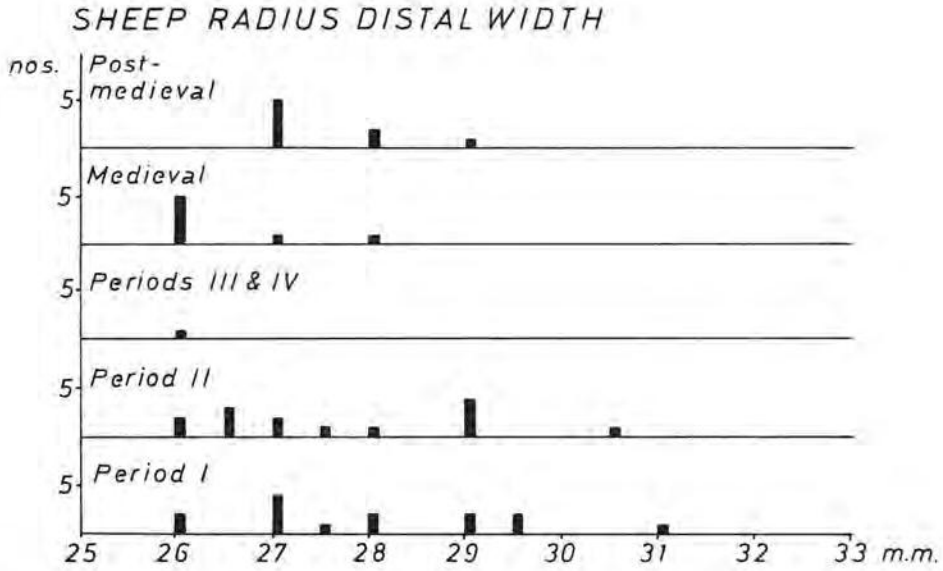


Fig. 213. Dimensions of shaft of radius of sheep. Frequency plotted against maximum width of radius shaft at level of nutrient foramen.

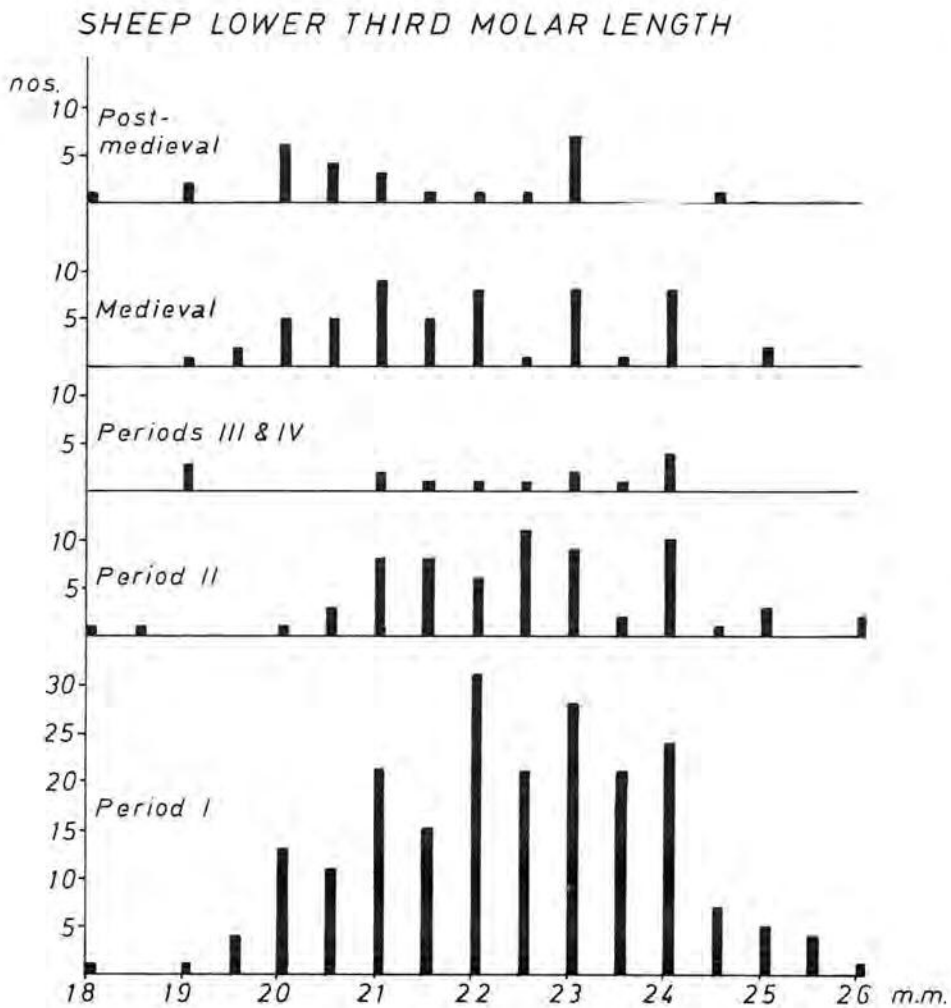


Fig. 214. Dimensions of lower third molar of sheep. Frequency plotted against anterior-posterior measurement of lower third molar at about gum level.

The scapula of sheep is of considerable use when determining the type of the animal, as the proportions of the neck of this bone vary. Amongst the present day breeds, the primitive Soay and Orkney have long thin scapula necks and the ratio of the length between the glenoid surface and the base of the spine to the minimum anterior-posterior dimension of the shaft is unity or greater. The more modern meat breeds have a short, thick neck, the ratio being about 0.85. An intermediate breed from this point of view is the Welsh Mountain, which is long-tailed but carries horns with a single backward curve as do the short-tailed breeds. From an examination of its fleece Ryder has concluded that this animal is a hybrid between long and short-tailed types (Ryder 1964, 1 and 65). The form of the scapula in the North Elmham sheep is similar to the Welsh mountain variety except for a few short specimens at every period and it might be argued that the derivation of the animals is the same, with the few short specimens being 'pure Saxon' and the longer ones 'Saxon British cross bred'. By the post-medieval period there are fewer of the longest type of scapula neck, which suggest that by this time the short-tailed 'blood' had been reduced further (Fig.215).

To sum up, therefore, it would seem that the mutton eaten by the community was derived from flocks kept primarily for wool production. During Period II such flocks may have consisted largely of wether sheep or an element of consumer choice has been exercised. The type of sheep kept was horned in both sexes and has some affinities with the Norfolk Horn, traditionally a Saxon import. This animal probably had a long tail, but, nevertheless, had a proportion of short-tailed 'blood' in most cases. This short-tailed element is reduced with the passage of time. The animals were rather heavier than the present day Soay, if the dimensions of the distal tibia reflects body weight, and there is some evidence for this in cattle (Noddle unpublished). On the other hand they are less than the modern Welsh Speckleface, which has an average live weight of 40 kg (ewe). The Soay weighs about 20 kg so perhaps a weight of about 30 kg may be suggested. The dimensions of whole bones, principally radius, are presented in Table 65. In addition to the large cattle bones, large sheep bones were also found at Wulfingen in Germany.

PIGS

In contrast to the sheep, there is not much that can be said about the pigs. The dimensions of frequently occurring bones are set out in Figs.216-221 and included in each figure are the measurements obtained from a pair of wild boars reared in the London Zoo, whose live weights were 180 kg (male) and 102 kg (female). The lengths of the metapodials are set out in Table 66. In all periods, therefore, there are possible animals of the wild type, having dimensions as much or greater than that. There is little evidence available, other than size, as to whether pigs are domestic; the modern type of pig, which is skeletally distinct from the wild, is a Far Eastern domesticate, and was only imported in the eighteenth century. The most valuable criterion is the length of the lower third molar (Fig.216). This distinction is perhaps somewhat academic however.

The age range of the pigs is of some interest. During the Middle Saxon period, where the groups are of sufficient size to be valid, the percentage of mature animals range from 50-85%; it is a little lower in Period II. In Periods III/IV and later it drops to about 35% and by the post-medieval period it is down to 20%. Furthermore, in the Saxon periods, some of the animals seem to have been very old indeed, their teeth being almost worn to the roots, although a particularly abrasive diet may have contributed to this (Plates CVI-CVIII). As the pig has no other economic function other than the production of meat and hide, it is usually killed at a younger age than the other animals as the evidence from the later periods suggests. It might be conjectured that during the Saxon periods the pigs were almost wild and were difficult to catch when young. Later pigs may well have been kept in stys.

For the sake of completeness, a list of lengths of whole bones of horse, cat and deer are also appended (Tables 68-70).

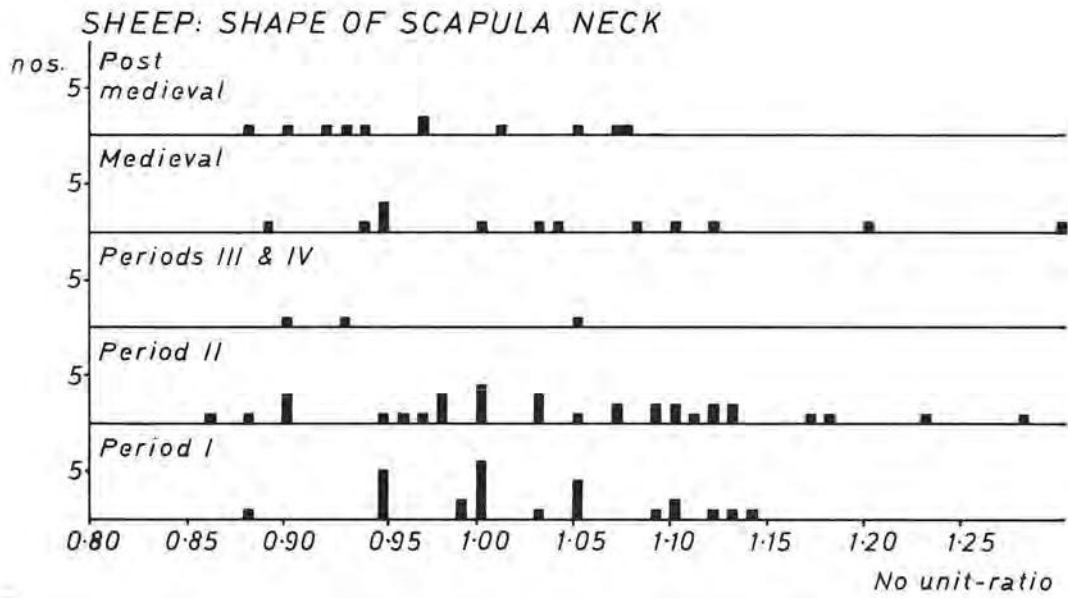


Fig.215. Proportions of scapula shaft of sheep. Frequency plotted against value of length of scapula neck minimum distance between base of spine and glenoid cavity divided by minimum width of shaft neck.

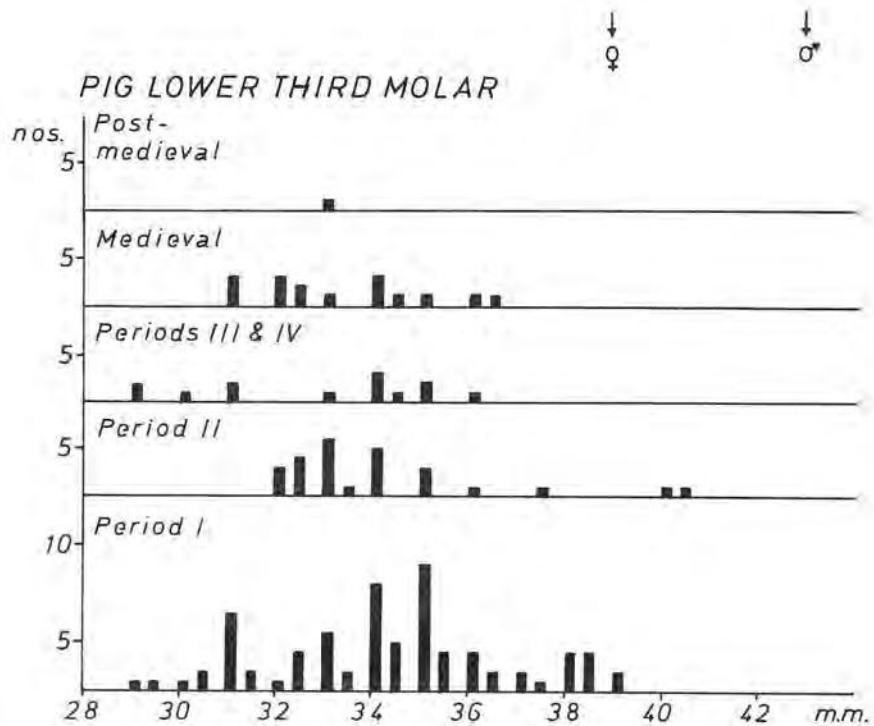


Fig.216. Dimensions of lower third molar of pig. Frequency plotted against anterior-posterior measurement of lower third molar at about gum level.

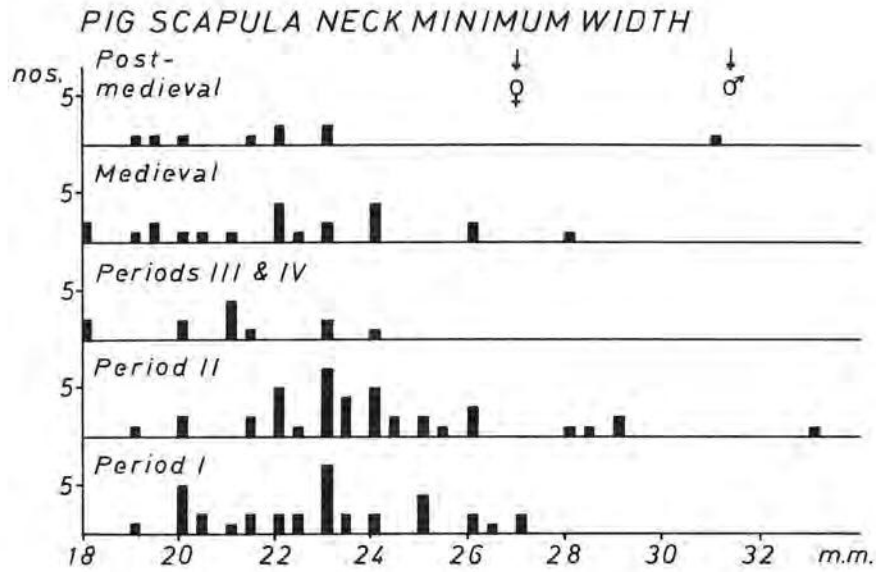


Fig. 217. Dimensions of scapula neck of pig. Frequency plotted against minimum width (anterior-posterior direction) of scapula neck.

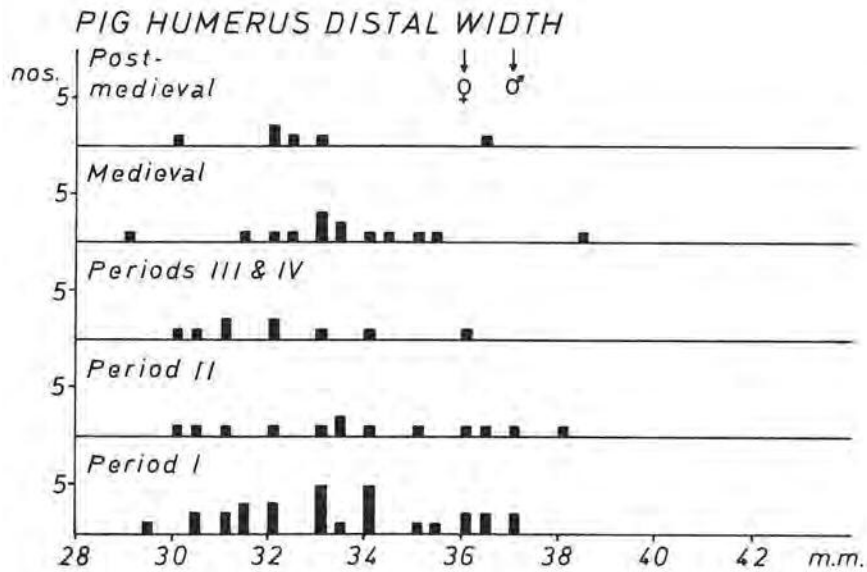


Fig. 218. Dimensions of distal humerus of pig. Frequency plotted against maximum width of distal condyles of porcine humerus.

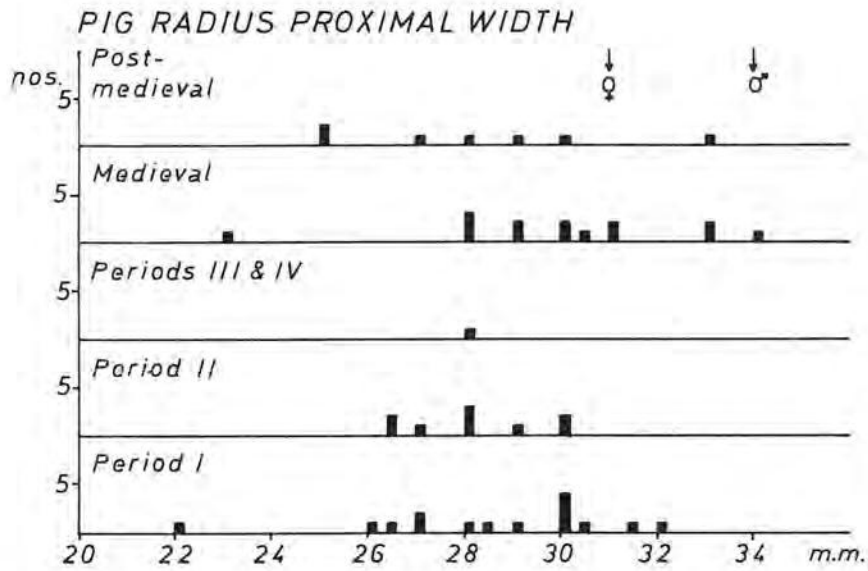


Fig. 219. Dimensions of proximal radius of pig. Frequency plotted against maximum proximal width of porcine radius.

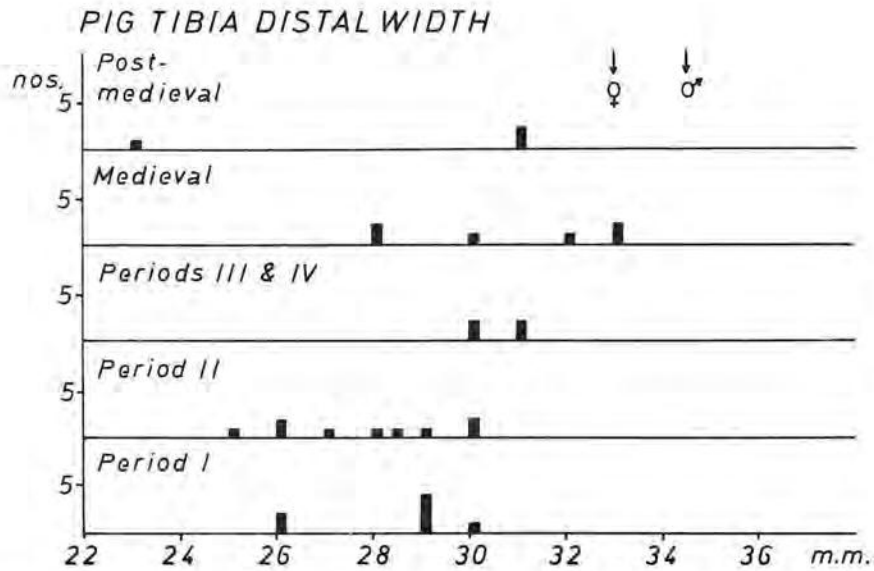


Fig. 220. Dimensions of distal tibia of pig. Frequency plotted against maximum distal width of porcine tibia.

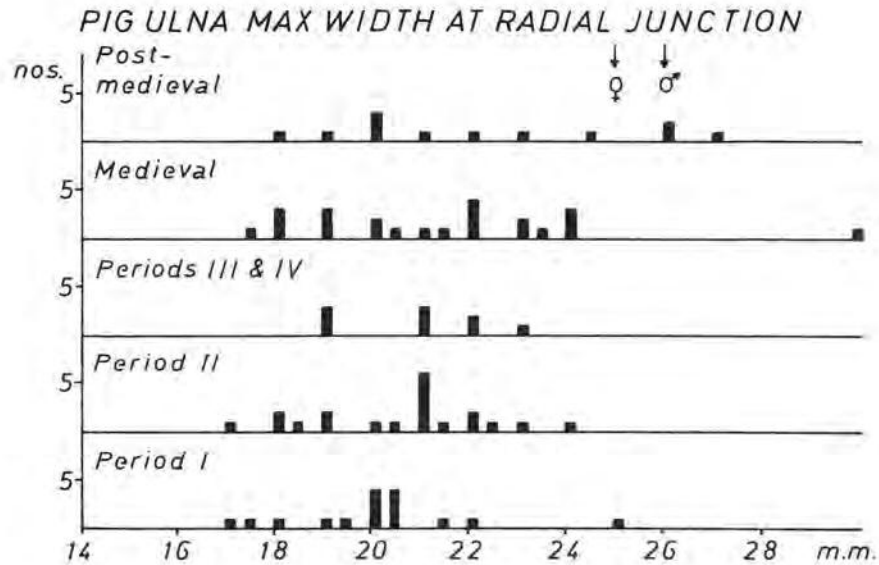


Fig. 221. Dimensions of ulna of pig. Frequency plotted against maximum width of ulna at proximal radius ulna junction.

ABNORMALITIES AND PATHOLOGY

When compared with a collection of their modern counterparts, the bones of earlier animals are usually conspicuous for their evidence of good health. The most frequent pathological specimens are caused by trauma; exostoses around joints are either the result of small multiple injuries or infection following penetrating wounds in all probability. Plates CIX and CX show a bovine hock and metatarsal and a very pathological vertebra; the cause of the latter has not been deduced. Plate CXI shows an exostosis on the lateral side of a horse femur, presumably due to trauma. Plate CXII shows an equine scapula with an exostosis, a metacarpal with osteitis at the proximal end and some bovine phalanges; the third phalanx is abnormally short and the sole seems to be placed more laterally than ventrally which might have been caused by laminitis.

Plate CXIII shows a bovine skull fragment from above with a hole in the middle. This is quite often seen, but in a more lateral position, the cause is unknown. The dog's skull in Plate CXIV appears to have been cleft with an axe or similar implement.

Dental abnormalities are frequently observed in archaeological material. One of the commonest is the absence of a posterior lobe on the lower third bovine molar. This has been reported previously by Bersu at Little Woodbury (Bersu 1940, 52), and occurs in present day material at a rate of about 0.5%². The specimen in Plate CXV is of interest, however, because the right mandible of a pair is perfectly normal while the left is affected. The roots of such specimens are shown in Plate CXVI in which is also shown an extraordinary sheep mandible with the lower third molar reversed. The bilobed third molar also occurs in sheep, which has not been reported previously; an example is shown in Plate CXVII with a second example of the notched ewe's horn core. There is also a dental abnormality in the pig in addition to the excessive molar wear already commented upon. Plate CVII left central, shows a maxilla with diagonally placed second and third premolars which is due to failure of the bone to grow with inadequate nutrition after the tooth bud has been formed (Tonge and McCance 1973, 1).

Plate CXVIII shows an interesting abnormality of a sheep's horn core which is bifurcate. This is due to a mutation which crops up sporadically throughout the domesticated history of the sheep (Epstein 1971). In its fullest expression it results in two separate horns or sometimes even three. It occurred in ancient Egypt and still appears in Libyan sheep; it is also known in the Navajo derived from the Spanish Merino and most commonly

Identification and Interpretation of the Mammal Bones

in sheep of the Hebridean area, in particular the modern Manx and perhaps universally in medieval Scottish sheep (Ritchie 1914, 100). A situation similar to that shown has been observed in the modern skull of a crossbred Jacob; the Jacob sheep is of unknown origin. There is a four-horned sheep illustrated in the Lutterel psalter.

The most interesting condition observed, however, occurs in about 10% of the sheep mandibles of the Saxon periods. This is periodontal disease, which has been described by Curtess and Linwig (1963). Bokonyi (1969) has attributed it to actinomycosis following injury by barley awns. The current view (in 1972) as to the aetiology of this condition is that it is due to a calcium deficiency, probably aggravated by lactation. This weakens the mandible and there is thinning of bone around the point of greatest stress under the fourth premolar and first molar resulting in the loss of one of these teeth. The resulting food trap becomes infected and this infection may spread to a large part of the mandible. Plate CXIX shows an early case; the fourth premolar is lost and the alveolar bone is infected. This animal has also lost the second premolar without leaving any trace of a socket, which may be either congenital loss or the result of old age. Plate CXX shows a very advanced case where an abscess has formed within the mandible and has eventually broken through to the surface. The condition is common in modern sheep of many breeds and has been observed in a Soay ram. Its presence in the Saxon sheep would seem to indicate an absolute or relative insufficiency of calcium when coupled with the demands of lactation perhaps aggravated by harsh forage. Some New Zealand workers attribute the condition to an insufficiency of selenium.

SUMMARY

All the common domestic animals were found at North Elmham; their proportions varied in the different periods, but at all times sheep were the most numerous as individuals, although if the bones are considered primarily as food waste, the highest proportion of meat eaten was beef. Pig is at all times third in importance, but it was more plentiful during the medieval period than at other times. The highest proportion of sheep occurs in Period II (42% of identifiable fragments). There are more dog and cat bones during the medieval period than at other times, but there is a local concentration of dog in group 5, Period I. Horse increased during the post-medieval period, suggesting that there was then an increase in its use in agricultural traction. Goat occurs at all periods, but the numbers are low. There are very few deer bones during the Saxon periods, but both red and fallow deer seem to have been hunted during the medieval period and later. (Bird bones were also plentiful at all times, but they comprise mainly domestic fowl and goose, with fowl predominating.) Anatomical analysis indicates that the animals were slaughtered in much the same area as they were found, but the food bones at least were in a secondary position, since small bones did not occur and there were many signs of wear.

Some 50% of the cattle bones came from mature animals, and their live weight is estimated to have ranged from 160-240 kg (400-600 lb) in most cases. This is similar to the size of Roman cattle on good land and is considerably greater than medieval animals found on other town sites; there is some evidence for a change in genetic type during the Saxon and medieval periods.

About 60% of the sheep were mature, indicating the importance of wool production throughout. The sheep were of a heavily-horned type, and may have been black faced; it is thought that they had some proportion of short-tailed primitive 'blood' which decreased with time. There was some reduction in size after the Saxon period, when the animals are estimated to have weighed around 25-30 kg live weight (75 lb).

Pigs were of the wild boar type with a considerable size range, over-lapping wild boar dimensions at all periods; it is possible that they were maintained in semi-wild condition until at least the medieval period. There was a high proportion of elderly animals in the Saxon period.

A number of pathological and abnormal specimens are discussed. The most important abnormality was periodontal disease in the sheep, which may have resulted from mineral deficiencies.

TABLE 65. SHEEP - MEASUREMENTS OF WHOLE BONES
(measurements in mm)

Bone	Length	Proximal Width	Distal Width	Midshaft Width
<u>Period I</u> (Groups 1-12)				
Humerus	115	-	-	26
Radius	125	28	26	-
	136	32	27	18
	139	29	27	-
	139	30	27	-
	142	31.5	28.5	18
	142	30	27	-
	143	32	28.5	17.5
	147	31	29	18
	149	31.5	28.5	18.5
	149	32	29	18
	150	31	27.5	-
	150	29	28	18
	150	30	-	-
	151	28	28	-
	155	33	27	-
Femur	174	46	-	-
Tibia	190	-	25	-
	190	37	27	-
	192	41	27	17
Metacarpal	107.5	21	-	-
	112	22	25	15
	117	22.5	23	13
	126	23.5	25	15.5
	131	24.5	-	-
Metatarsal	115	20	23	12
	115.5	20	23	13
	126	20	22	12
	135	20	22	13
<u>Period II</u> (Groups 13-15)				
Radius	126	29	26	17
	126	30	28.5	16.5
	128	-	28	17.5
	132	29	26.5	-
	133	28	27	15
	134	-	26.5	-
	136	30	27.5	17
	139	30	27	-
	143	31	29	-
	143	32	29	-
	147	33.5	30.5	-
	151	31.5	27	16
Tibia	187	41	28	-
	207	43	28	-
Metacarpal	112	22	25	14
	112	21	22.5	13

Bone	Length	Proximal Width	Distal Width	Midshaft Width
Metacarpal (cont.)	124	20.5	24	12
	125	-	-	-
	131	24.5	-	-
Metatarsal	115	22	27	14
	127	21	24	14
<u>Periods III/IV</u> (Group 16)				
Radius	138	29	26	17
Tibia	175	-	20	18
Metacarpal	124	22	25	13.5
<u>Medieval</u> (Group 17)				
Radius	145	29	26	17
	150	31	27	18
Metacarpal	123	23	25	14
Metatarsal	115	19	21	12
	118	19	21	11
	135	19	22	11
<u>Post-Medieval</u> (Group 18)				
Radius	155	32	27	17.5
Metacarpal	105	20	20.5	11
Metatarsal	106.5	17	19	10
	117	17.5	21	11

TABLE 66. LENGTH OF PIG METAPODIALS

a. <u>Period I</u> (Groups 1-12)	dimensions are maximum lengths
Metacarpal	68, 68, 69, 69, 71, 71, 74, 85 mm
<u>Period II</u> (Groups 13-15)	
Metacarpal	63, 73, 77, 80, 85
<u>Periods III/IV</u> (Group 16)	
Metacarpal	66, 67
<u>Medieval</u> (Group 17)	
	68, 73, 73, 73, 79, 81, 82, 86
<u>Post-Medieval</u> (Group 18)	
	-
Wild Pig:	Male 83, 85; Female 78, 80
b. <u>Period I</u> (Groups 1-12)	
Metatarsal	73, 75, 77, 78, 79, 80, 83
<u>Period II</u> (Groups 13-15)	
Metatarsal	77, 79, 94

<u>Periods III/IV</u> (Group 16)	dimensions are maximum lengths -
<u>Medieval</u> (Group 17) Metatarsal	78, 78, 92, 92
<u>Post-Medieval</u> (Group 18) Metatarsal	85
Wild Pig:	Male 91, 95; Female 87, 89

TABLE 67. LENGTH OF OTHER PIG BONES

<u>Period I</u> (Groups 1-12) Tibia	dimensions are maximum lengths 183, 196 mm
<u>Period II</u> (Groups 13-15) Tibia	176
<u>Medieval</u> (Group 17) Tibia	195
Femur	188
Humerus	109, 205, 210

TABLE 68. BONES OF HORSE

<u>Period I</u> (Groups 1-12) Tibia	dimensions are maximum lengths 345 mm
Metatarsal	272
<u>Period II</u> (Groups 13-15) Radius	323
Metacarpal	207
<u>Periods III/IV</u> (Group 16) Femur	375
Metatarsal	200
First Phalanx	82
<u>Medieval</u> (Group 17) Tibia	260
Humerus	270
Metacarpal	212
Radius	325
First Phalanx	68
<u>Post-Medieval</u> (Group 18) Radius	301
Metatarsal	205, 215, 225
First Phalanx	79, 87, 91

TABLE 69. BONE MEASUREMENTS OF CATS

<u>Period I</u> (Groups 1-12)	dimensions are maximum lengths
Femur	103 mm
<u>Period II</u> (Groups 13-15)	
Humerus	86
Femur	96
<u>Medieval</u> (Group 17)	
Humerus	79, 83, 85, 88, 89
Radius	78, 79, 87
Ulna	88, 102
Femur	84, 90, 96
Tibia	102
<u>Post-Medieval</u> (Group 18)	
Ulna	110

TABLE 70. BONE MEASUREMENTS OF DEER

a. <u>Red Deer</u>	dimensions are maximum lengths
<u>Medieval</u> (Group 17)	
Metatarsal	195 mm
Metacarpal	200
<u>Post-Medieval</u> (Group 18)	
Metatarsal	215, 215
b. <u>Fallow Deer</u>	
Metatarsal	160, 178, 180

III. IDENTIFICATION AND INTERPRETATION OF BIRD BONES

by Don Bramwell

Information on the birds affecting Saxon life and times is meagre when compared with the quite extensive lists from Roman or medieval sites. The present site gives an opportunity to see if there are any features which distinguish Saxon domestic and hunted species from other historic periods. The conclusion is that in the case of North Elmham there is less variety and that this appears to be due to less preoccupation with the hunting of wild species. There is an absence here of the larger birds such as peregrine falcon and goshawk, which appear so regularly in Norman and medieval times. Although the same birds are absent from the Roman sites there was then a wide variety of wild birds taken for food, evidently by snaring, liming or other means. There is at North Elmham a single sparrow hawk which may well have been trained to take small birds, but it would require some very much stronger falcon or hawk to take heron or crane. We are led to conclude, therefore, that these larger game were obtained by arrows or by snaring.

Poultry were important at this Saxon settlement and consisted of fowl, goose and a lesser number of ducks. The numbers of fowl were about twice those of geese, but it must be remembered that, owing to its superior size, a goose would provide more than

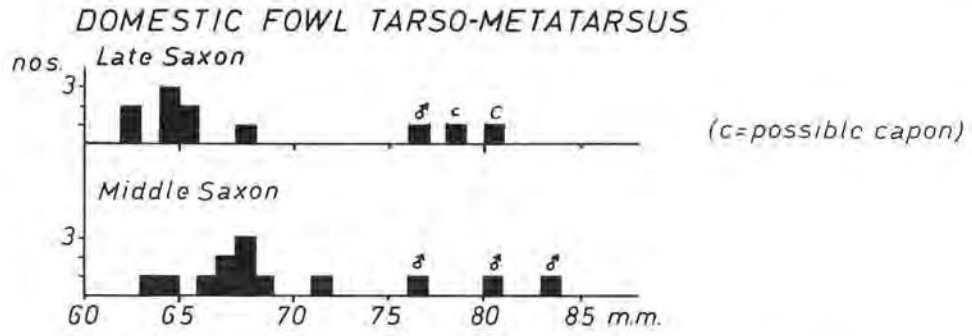


Fig.222. Domestic fowl: tarso-metatarsus length.

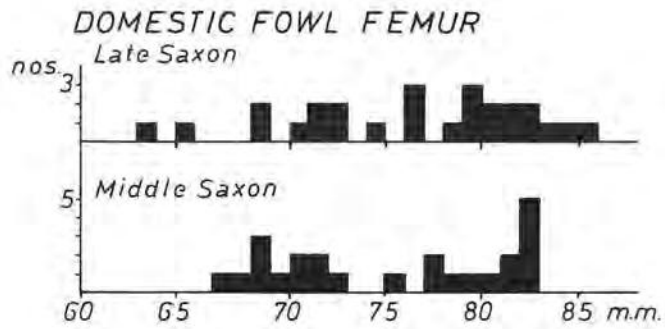


Fig.223. Domestic fowl: femur length.

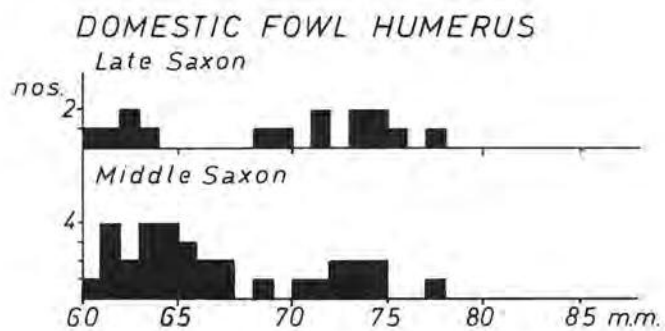


Fig.224. Domestic fowl: humerus length.

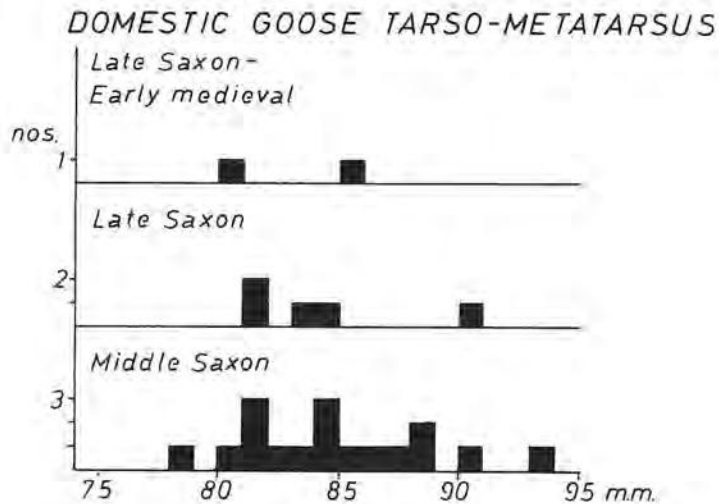


Fig.225. Domestic goose: tarso-metatarsus length.

twice the weight of meat; geese, then, provided the bulk of bird meat. The measurements of the Saxon geese bones reveal no particular features to distinguish them from geese of Roman or medieval date. One feature worth mentioning is that in Roman times geese appear only sparingly in the food refuse so it may be that the Saxons were responsible for the stepping up of geese rearing.

The bones of domestic fowl show a little variation, with some small bantam-like specimens and more of a slightly larger variety, still about the same weight as the average Roman bird. There are, however, a few larger bones which may be from capons, but the writer can find very little guidance on the characteristic features of capon bones. The most important fowl bones are the tarsal bones (tarso-metatarsi), because the sex is indicated in the spur in the male. Unfortunately about one third of the North Elmham tarsals have been butchered, usually about half way down, in preparation for cooking. A histogram of the remainder (Fig.222) is presented, but to obtain a better idea of fowl numbers the femur and humerus are also given (Figs.223-4). In the case of goose only the tarsal bone was present in sufficient numbers to use in a histogram (Fig.225). These were evidently more carefully severed at the joint with the tibio-tarsus, in preparation for cooking.

The wild birds include one or two predators and scavengers which probably bred in a nearby forest. They include red kite, common buzzard and raven, all of which may have been a threat to the poultry chicks and so were killed. Other wild birds are indicative of some local areas of marsh and freshwater. These birds are crane, heron, curlew and ducks. The crane's last known breeding place in Britain was in the East Anglian fenlands, so its presence in the North Elmham Saxon levels is not surprising. Besides the above-mentioned woodland species there were bones of jay, jackdaw, rook or crow, wood pigeon and stock dove, though jackdaw and stock dove are equally liable to nest in holes in buildings. The starling also often finds a nesting site in masonry. The dove remains are always difficult to resolve in view of the possibility of domestic forms being present which can easily be confused with both stock and rock dove. Barn owl is again equally at home in a building or a hole in an old tree. The wild geese and shelduck are largely shore feeders so may have been taken at some place on the coast; wild geese do, however, come inland and feed on agricultural land.

TABLE 71. ANALYSIS OF BIRD SPECIES IN SYSTEMATIC ORDER,
ARRANGED UNDER PERIODS

		Period I	Period II	Period III	Period V	Period VI
<u>Ardea cinerea</u>	Heron			1		
<u>Anser anser</u> variety	Domestic goose	18	16	9	4	5
<u>Anser cf.</u> <u>albifrons</u>	White-front goose	1				
<u>Anser cf.</u> <u>fabalis</u>	Pink-footed goose	1				
<u>Branta leucopsis</u>	Barnacle goose	1				
<u>Branta bernicla</u>	Brent goose	1				
<u>Tadorna tadorna</u>	Shelduck	1	?1		?1	
<u>Anas brachy-</u> <u>rhynchos</u>	Mallard	5	?1	1	?1	1
<u>Anas brachy-</u> <u>rhynchos</u> variety	Domestic duck	5	2	2	?1	1
<u>Anas crecca</u>	Teal	1	1	1	1	
<u>Anas penelope</u>	Wigeon	1		1		
<u>Milvus milvus</u>	Red kite	1		1		1
<u>Accipiter nisus</u>	Sparrow hawk	1	1	1		
<u>Buteo buteo</u>	Buzzard	1	1			
<u>Gallus variety</u>	Domestic fowl	37	44	14	10	9
<u>Grus grus</u>	Crane	2	1			
<u>Pluvialis</u> <u>apricaria</u>	Golden plover	1			1	
<u>Numenius arquata</u>	Curlew	1				
<u>Columba</u> <u>palumbus</u>	Wood pigeon	1	1			
<u>Columba oenas</u>	Stock dove				1	
<u>Columba species</u>	Dove sp.			1		
<u>Columba species</u>	Domestic dove?					1
<u>Tyto alba</u>	Barn owl		1			
<u>Sturnus vulgaris</u>	Starling				1	
<u>Garrulus</u> <u>glandarius</u>	Jay		1			
<u>Corvus monedula</u>	Jackdaw					1
<u>Corvus species</u>	Rook or Crow		1	1	1	
<u>Corvus corax</u>	Raven			1		

The numbers indicate the minimum number of individuals represented. It is possible in some cases that a skeleton has become dispersed into more than one layer. This is likely to have happened to the cranes and the sparrow hawk for example.

REFERENCES

1. This may be due to the methods of recovery for the smallest bones used during the excavation. P,W-M.
2. Pers.Comm. from A.Andrews.

ADDENDUM

The animal bones from North Elmham have been compared with a number of other British and continental sites of the same dates (Noddle 1975).

15. THE POTTERY

by Keith Wade

I. INTRODUCTION

Every stratified sherd of pottery from the excavation has been identified and listed in order of context in a gazetteer (Table 86). The most important ceramic groups are examined period by period and ware by ware. For each ware, information is presented about vessel types, decoration, base types, rim forms, fabrics and dating, with the most significant groups illustrated. Some new information about the pottery industry is forthcoming and there is discussion about the problems of interpretation raised by specific groups and the wider methodological problems encountered during the study as a whole.

As with most ceramic studies conducted on the material from a specific settlement excavation, two main questions governed the framework of analysis:

- 1) How much can the pottery assist in dating the excavated structures?
- 2) How much information can the sealed groups yield about the pottery *per se*.
 - a) in that it might reveal data on the medieval pottery industry as a whole;
 - b) in that a fuller knowledge of the typology of the various wares and the dating of the various types may eventually lead to a closer dating of any structures found associated with them both on the site in question and on other sites where such pottery may be found?

The broad dating of post Roman ceramics in East Anglia has been possible for over fifteen years, but has progressed little since then, with identified wares having a life-span varying from 150-300 years. Thus, once the wares had been identified (see Gazetteer), the excavator was able to relate his stratigraphic division of cultural features (Periods I-VI) to the broad ceramic phases of known date-range (see below).

ACKNOWLEDGEMENTS

The writer would like to thank, in particular, John Hurst for his identification of the imported medieval glazed wares, Richard Hodges for his report on the Carolingian imports, Kathy Kilmurry for notes on the Stamford ware, Alan Carter for his assistance with the post-medieval pottery and Miss Marie Dewhurst for drawing the pottery for publication.

II. THE CERAMIC SEQUENCE

- | | |
|---------------------|--|
| (1) HAND-MADE WARES | (A) <u>Sand-tempered</u> |
| | (B) <u>Grass-marked</u> |
| | (C) <u>Grit-tempered</u> |
| (2) ROMAN | |
| (3) MIDDLE SAXON | (A) <u>Local Slow-wheel ware</u> |
| | (B) <u>Ipswich-type ware</u> (c. 650 - c. 850) |
| | (C) <u>Imported Merovingian/Early Carolingian pottery</u>
(c. 650 - c. 850) |

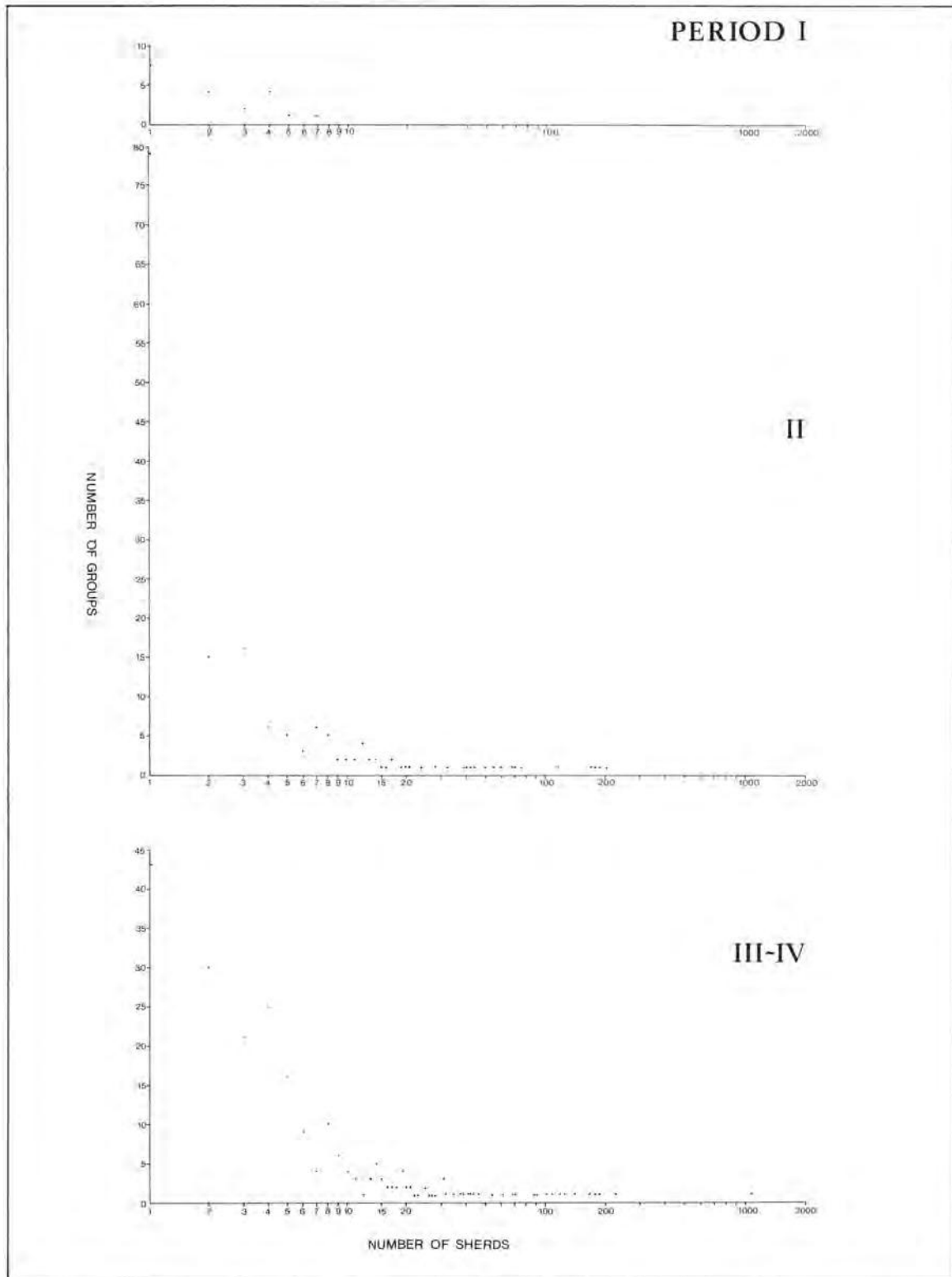


Fig. 226. The size distribution of ceramic assemblages associated with Periods I-IV.

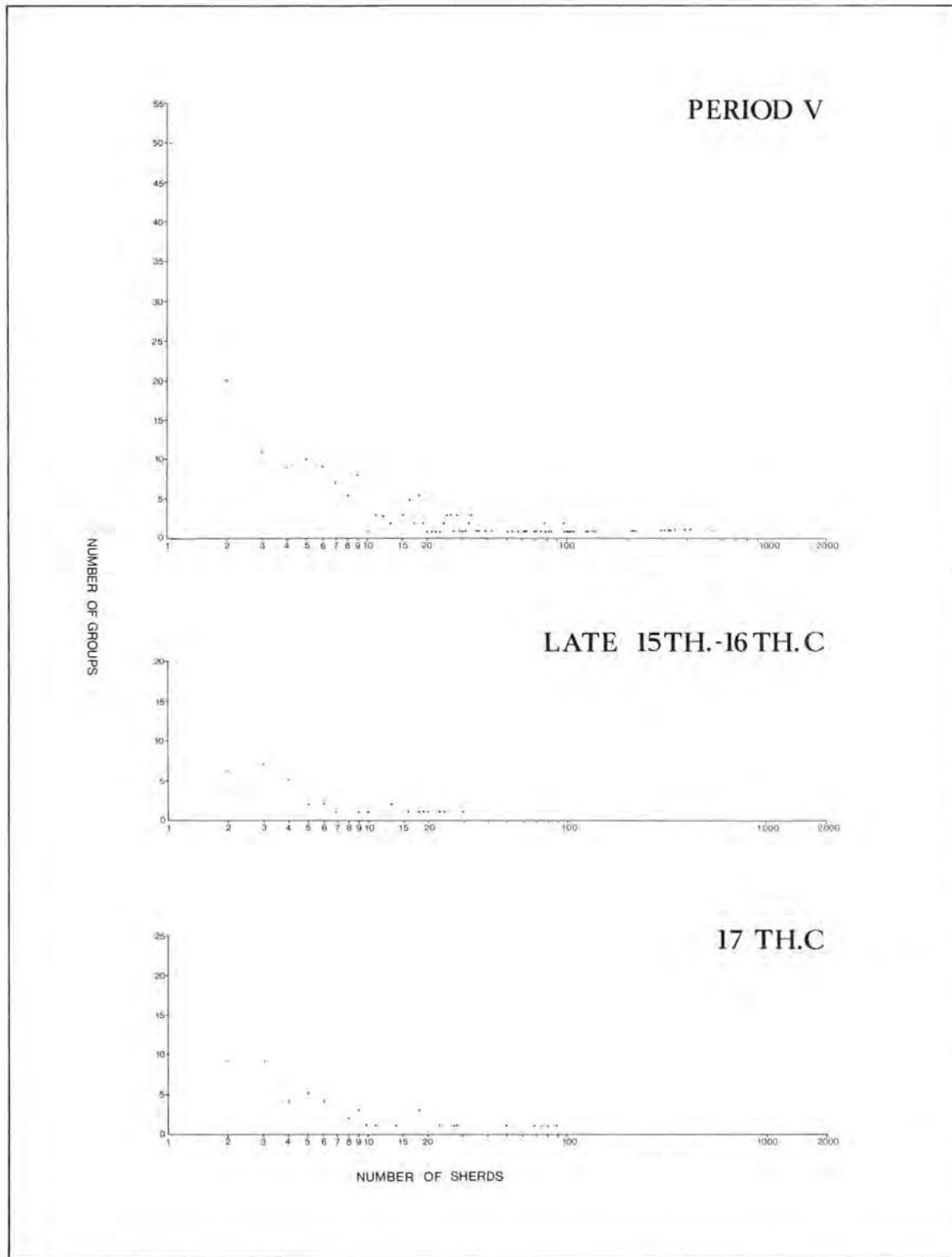


Fig.227. The size distribution of ceramic assemblages associated with Periods V-VI.

- | | |
|---|--|
| (4) SAXO-NORMAN | (A) <u>Thetford-type ware</u> (c. 850-c. 1150) |
| | (B) <u>Early Medieval ware</u> (c. 1000-c. 1150) |
| | (C) <u>Imported wares:</u> 1) English from outside East Anglia
2) Continental |
| (5) MEDIEVAL | (A) <u>Local coarse ware</u> (c. 1150-c. 1450) |
| | (B) <u>Local glazed ware</u> (c. 1200-c. 1450) |
| | (C) <u>Imported wares:</u> English from outside East Anglia |
| (6) LATE MEDIEVAL/
EARLY POST
MEDIEVAL | (A) <u>Local late medieval wares</u> (c. 1450-c. 1550) |
| | (B) <u>Local early post medieval wares</u> (c. 1450-c. 1600) |
| | (C) <u>Early post medieval imported wares</u> (c. 1450-c. 1600) |
| (7) POST MEDIEVAL
(SEVENTEENTH
CENTURY) | (A) <u>Local wares</u> |
| | (B) <u>Imported wares</u> |
| (8) POST MEDIEVAL
(EIGHTEENTH-
NINETEENTH
CENTURY) | |

The date-ranges quoted are the most recent suggested in the literature (Hurst 1957, 30; West 1963, 286; Hurst 1963, 150, 155-161; Rye and Hurst 1968, 279-292; Hurst and Golson 1955, 60-62, 74-85).

(1) **HAND-MADE WARES**

In all sixty seven hand-made sherds, of uncertain date, were identified and their distribution throughout the periods of activity on the site is shown in Table 71. They fall into three groups characterised by their tempering material:

(A) Sand-tempered

In all twelve sherds only, including one base sherd, were isolated. The majority display a dark grey-brown core and inner surface and red-brown outer surface (Fig. 228, No.2).

(B) Grass-marked

One base sherd with a grey core and orange surfaces showed grass impressions on its surfaces (Fig. 228, No.3).

(C) Grit-tempered

Fifty out of fifty four sherds in this category came from one feature (F.286). The fabric was a uniform dark grey-brown core and inner surface and orange-brown outer surface with a sandy texture with many white flint grits up to 4 mm in diameter.

The sherds represent an almost vertical-sided, hand-made pot or pots. The top of the rim is ornamented with finger-tip impressions and pierced holes occur at close intervals below the rim (Fig. 228, No.1).

Apart from this group only four other sherds in the same fabric occurred on the site, one in a shallow feature next to feature 286, and the others in either Middle or Late Saxon contexts.

Discussion The fabric and general style of the grit-tempered vessel is common to Late Bronze Age-Early Iron Age pottery in East Anglia, although the pierced bowl form is difficult to parallel¹. The closest parallel would seem to be a Middle Bronze Age urn from Southampton (Platt and Coleman-Smith 1975, 141, fig.38).

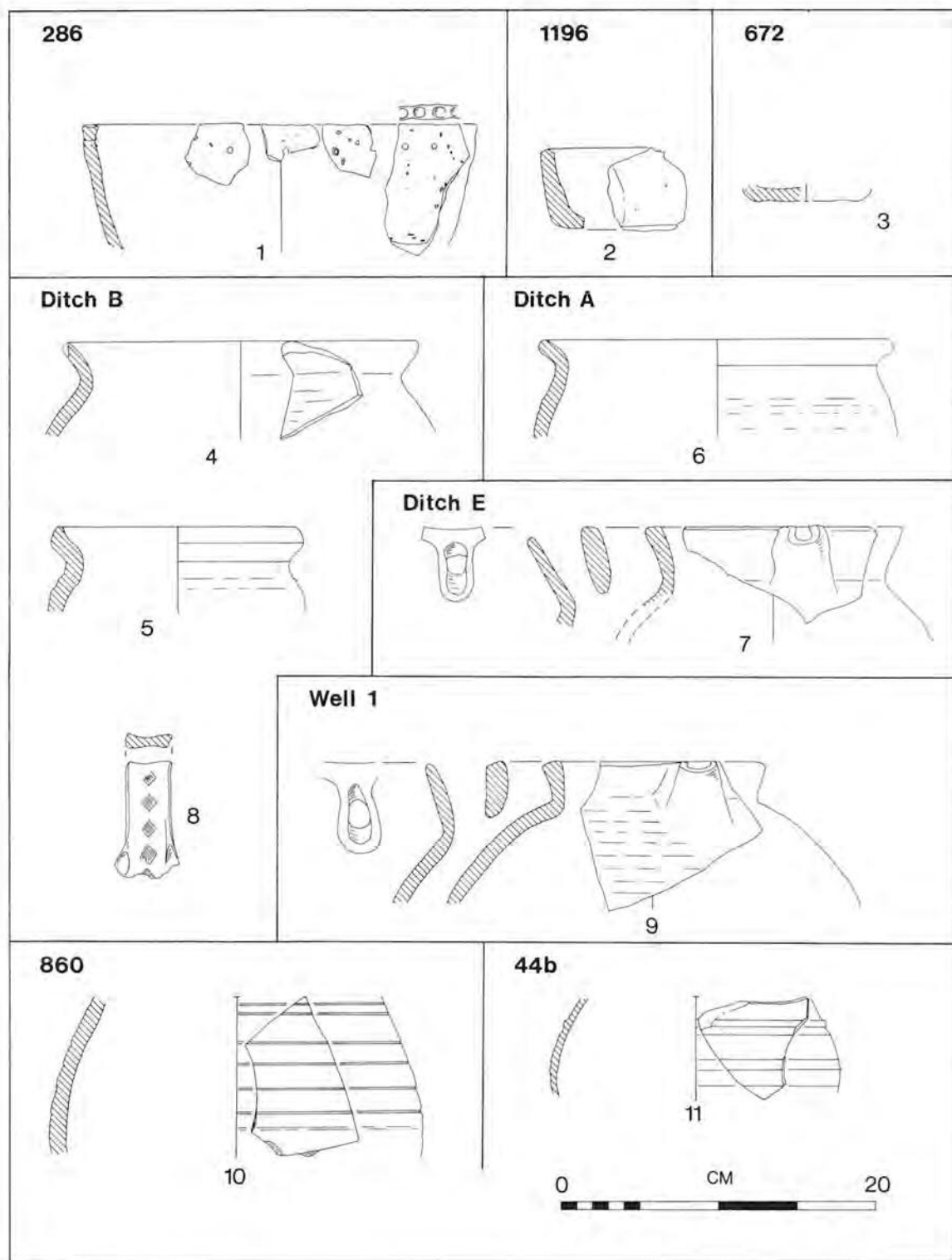


Fig. 228. Hand-made wares, Nos.1-3; Ipswich-type ware from Period I contexts, Nos.4-7 and 9, and imported Carolingian wares: Black wares: Nos.10 and 11; Tating ware, No.8. Scale 1:4.

The grass-marked (and/or tempered) base could well be Pagan Anglo-Saxon and parallels exist at this date in the West Stow village ceramic assemblage². No examples of grass-tempering are known from East Anglia in later contexts.

The lack of any distinguishing features renders the sand-tempered wares undateable, although they are presumably Pagan Anglo-Saxon or Prehistoric.

(2) ROMAN

In all forty two Romano-British sherds occurred on the site (Table 72).

Discussion by Christopher Green

Hardly any Saxon or medieval site fails to produce Roman material and North Elmham Park is no exception. The pottery includes Samian ware, grey coarse ware and two sherds of Late Roman colour-coated ware, a fairly normal assemblage for this region. The Samian consists of two abraded sherds of second century Central Gaulish ware and one fresh sherd of later second century East Gaulish ware. The nine grey-ware sherds include four rims which are not closely dateable but could be contemporary with the Samian. An abraded sherd of Nene Valley colour-coat and one of Oxfordshire imitation Samian complete the group, the former also an imitation of Samian form 36, but in a white fabric with dark grey slip. The two sherds extend the date range into the late fourth century.

Four possible reasons can be put forward for the presence of Roman material on this site. The abraded and fragmentary state of the pottery would militate against even the most casual occupation, especially since none was stratified in a certainly pre-Saxon context. An explanation that they were souvenirs from a nearby site must also be discarded; the pieces are so unexceptional as not to warrant their retention by even the most avid Saxon antiquarian. Large groups of Roman building materials, described elsewhere (p. 479), were recovered from the Middle Saxon wells, but these deposits yielded no Roman pottery and the possibility of their import with this rubble can be ruled out.

By far the best explanation is that the site was under cultivation and that the pottery was introduced in the manure spread on the land. Although the Roman period topsoil has since been reworked and dispersed, the sherds probably survived incorporated in the fills of later features. The pottery would then suggest cultivation in the later second century continuing into the fourth century. Several settlements exist nearby, but over a mile from the site, beyond the probable limits of their field systems. A further settlement should, therefore, be postulated in the general area of the later Saxon village.

TABLE 72. THE DISTRIBUTION OF MIDDLE SAXON AND EARLIER WARES THROUGHOUT THE STRATIGRAPHIC PERIODS AND PHASES

Period	Roman	Hand-made			Slow-wheel local	Ipswich-type ware	Possible Carolingian imports
		Sandy	Gritty	Grass-marked			
Pre I?	2	1	51	-	-	-	-
?I	1	1	-	-	1	16	1
I	8	4	2	-	1	29	2
II(1)	2	3	-	-	6	30	12
II(2)-(3)	6	2	1	1	-	30	1
III/IV	6	1	-	-	-	16	5
V	15	-	-	-	-	33	5
VI	2	-	-	-	-	6	-
Total	42	12	54	1	8	160	26

(3) THE MIDDLE SAXON POTTERY

Table 72 indicates the quantitative distribution of Middle Saxon pottery both in association with Period I and from later contexts. Fig.226 indicates the size distribution of assemblages believed to be Period I in that it includes assemblages with Middle Saxon pottery only and no stratigraphic evidence of date. Owing to the paucity of Middle Saxon pottery on the site, the whole assemblage has been treated as one group for the purpose of analysis.

(A) Local Slow-wheel Ware

Only two sherds of this possible local Middle Saxon slow-wheel ware were found in Period I associations, and another six came from the cess pit of the Period II, Phase 1, Building X (Fig.229, Nos.8-11). Cooking pots are the only vessel type represented. The fabric was in all cases sandy, but variations in coloration were present as follows:-

Fabric Colorations of the ?Local Slow-Wheel Ware

- (i) grey-brown with reddish patches;
- (ii) grey-brown core, dark grey-black sfs;
- (iii) brown core, grey sfs;
- (iv) grey core/insf, dark grey-black osf (wiped with flat implement causing vertical grit draglines);
- (v) dark grey-brown core/insf, dark grey-black osf;
- (vi) dark grey-black.

Discussion The ware is certainly not Ipswich-type ware but is more similar to Early Medieval ware with its thin walls, simple everted rims and sagging bases. However, the flattened profiles, small diameters and unusual surface treatment of Fig.229, No.9 suggest that the ware is Middle Saxon ³ and possibly a local attempt at pottery manufacture, although patently on a small scale from the number of extant examples.

(B) Ipswich-type Ware**a) Vessel types**

Cooking pots and pitchers only are represented. (Fig.228, Nos.4-7 and 9, Fig.229, Nos.1-7).

b) Decoration

No decorated sherds were identified.

c) Base Types

All were sagging except two possible flat base fragments.

d) Rim Form

Of the cooking pot rim forms, two-thirds belonged to West's Group I and one-third to West's Group II (Group III being unrepresented) (West 1963, 248, fig.41).

e) Fabrics

Sandy Ipswich-type ware was the most common fabric (nearly three-quarters of the total sherds) with gritty ('pimply') ware making up the remainder. Some sherds of both fabrics had external burnishing - a technique apparently restricted to the pitchers. The colour variations displayed by these fabrics are detailed in the fabric coloration lists (p.467).

f) Dating

The only absolute date, that for the construction of Well II (832 \pm 30 years), only confirms that Period I falls within the currently accepted dating of Ipswich-type ware

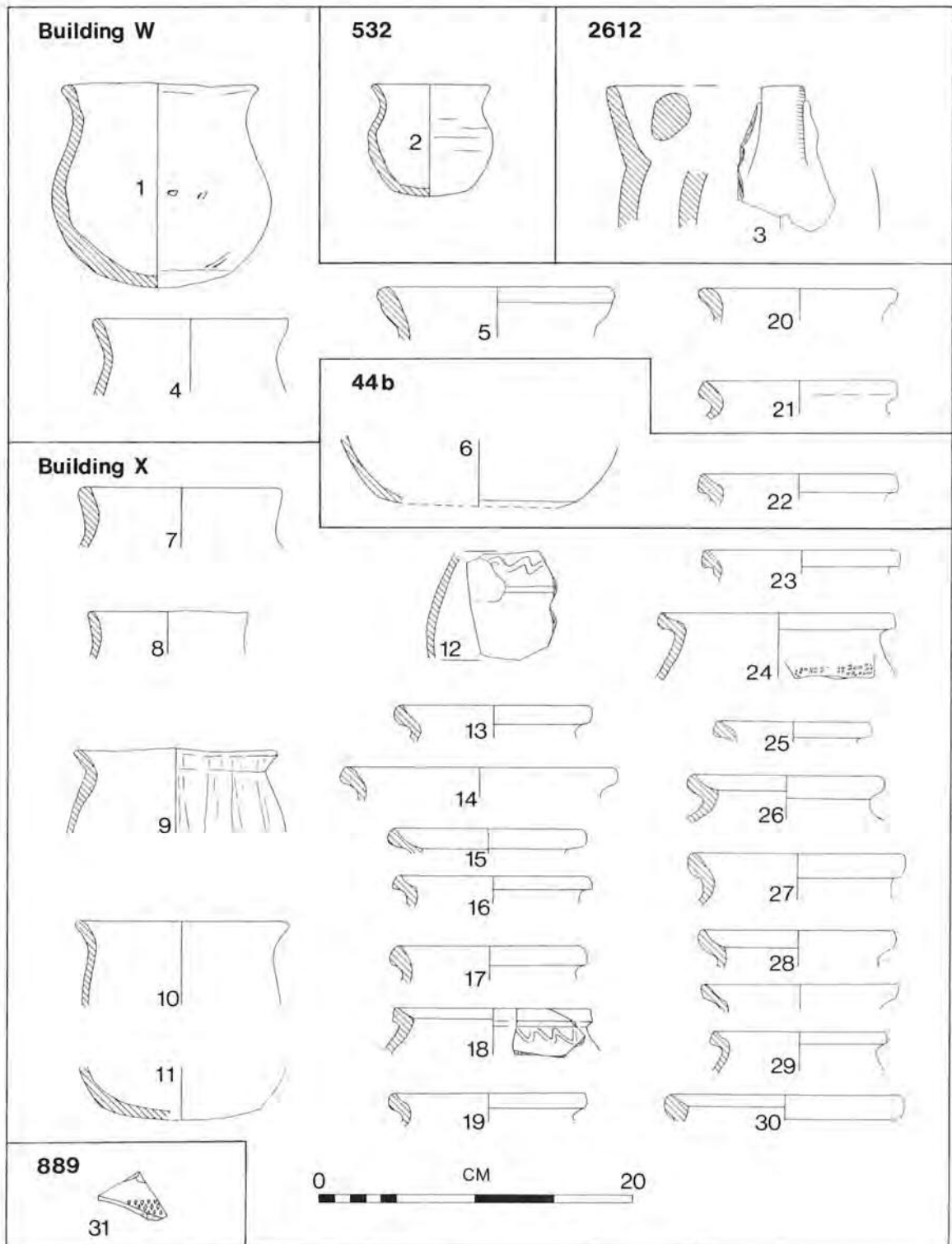


Fig. 229. Ipswich-type ware, Nos. 1-7; ?local slow-wheel ware, Nos. 8-11; ?imported Carolingian ware, No. 31; and Thetford-type ware from the Period II, Phase 1, Cess Pits, Nos. 12-30. Scale 1:4.

The Ceramic Sequence

(c. A.D. 650 - c. 850). The well pit of Well II does cut the foundation trench of Building AM, which contains Ipswich-type ware, and the primary artificial filling of Well II does contain an Ipswich-type ware spouted pitcher. The interpretation of the latter, however, must remain equivocal as it could represent the redeposition of old rubbish from the surrounding area or be contemporary with the filling. Either way, this pitcher cannot be used as further evidence of a terminal date for Ipswich-type ware, as the time of filling of Well II is impossible to calculate with useful accuracy. Similarly, the Ipswich-type ware in the foundation trench of Building AM is no evidence for a starting date of the ware on the site.

g) Source

In terms of forms and fabrics there is no visual difference between the Ipswich-type ware from Elmham and that from the only known source at Ipswich. Preliminary research, at present being carried out at Southampton University, aimed at characterising the wares from the source and comparing these with Ipswich-type ware found at some distance from Ipswich suggests, on the basis of a small sample, that Ipswich did supply the whole of East Anglia with its ware and, therefore, probably North Elmham.

The Ipswich-type Ware Content of the Earliest Period II Features and its Frequency of Use in Period I

The excavator's phasing of cultural features places four cess pits as the earliest features in Period II. All four of these contain an unusual quantity of Middle Saxon pottery (Ipswich-type ware, ?local slow-wheel ware, and imported Carolingian wares).

TABLE 73. FREQUENCY OF MIDDLE SAXON POTTERY IN PERIOD II, PHASE 1 FEATURES

Structure	MS Sherds	% of Total Sherds	Thetford-type ware
Building X (F.44a)	21+9 ?	15-21%	142
Building W (F.828/9)	5*	10%	45
F.50/1036	2	66%	1
F.44b	11	86%	2

* includes half an Ipswich-type ware cooking pot

Two problems requiring explanation arise from the above statistics:

- (1) Why does the Middle Saxon pottery form such a large percentage of the contents of these Period II, Phase 1 groups?
- (2) Why is there nearly as much Middle Saxon pottery associated with Period II, Phase 1, as there is stratified for the whole of Period I?

In order to answer the first question, it must be established whether the Middle Saxon sherds in Period II, Phase 1 are residual from Period I or whether the vessels in question are in use with the earliest Thetford-type ware. The lack of rubbish pits in Period I does imply that one should expect a certain amount of occupation refuse, including pottery, to have been deposited around the buildings and this is revealed by the distribution of such pottery as found in features belonging to Period II onwards (Fig.230). This pattern, presumably reflecting the distribution of Middle Saxon pottery on the ground surface at the beginning of Period II, reveals:

- (i) scatters in association with each Period I building;
- (ii) scatters near the buildings alongside the sections of Period I boundary ditches and in their upper fillings with later wares.

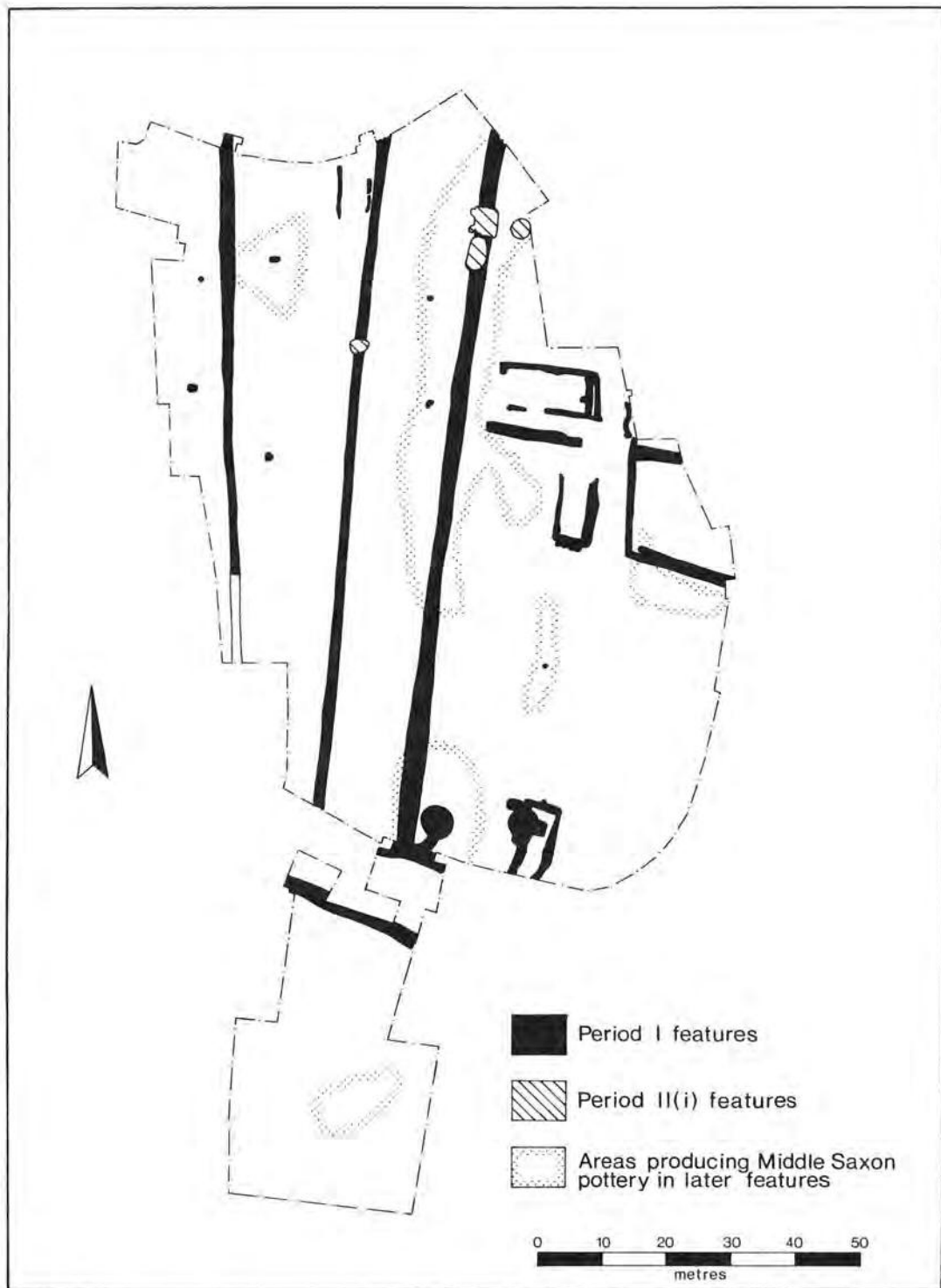


Fig.230. The distribution of residual Ipswich-type ware in Period II-VI contexts in relation to Period I features.

Furthermore, some idea can be gained of the probable density of this pottery on the surface at that time from the quantity still uninterred as late as Period V (these medieval pits contain up to six Ipswich-type ware sherds). Thus, it is clear that there was a substantial amount of Middle Saxon pottery lying around on the site at the beginning of Period II and that, as the four cess pits lie within its distribution, then the Middle Saxon sherds within them could be residual.

The likelihood of the alternative explanation, namely, that the groups represent the period of overlap in the use of Ipswich-type ware and the Thetford-type wares which replaced it, hinges on the dating of the groups, in that this changeover is thought to have taken place in the mid ninth century⁴. However, the absolute dating of this phase is vague: it is not certain whether it pre- or post-dates the suggested late ninth century break in occupation on the site, and the small finds from the four cess pits were not closely dateable.

Thus, in answer to our first question, we must conclude that the Middle Saxon pottery in the Period II, Phase 1 features could be residual from Period I or contemporary with the associated Thetford-type wares and that, therefore, neither the date nor the significance of the groups can be established. Why then is there nearly three times as much Middle Saxon pottery in the Period II-VI features than there is stratified in the certain and probable Period I features? Two hypotheses seem possible:

- (1) that the majority of rubbish (and, therefore, pottery) was discarded on the ground surface rather than in features during Period I.
- (2) that the quantity of Middle Saxon pottery in use during Period I varied and that at the time when the Period I features were filled it may well have been scarce.

In support of the latter, it is clear that at the time when the Period I ditches were filled, pottery was certainly scarce. The ditches produced vast quantities of animal bone, but a total of only nineteen sherds of pottery (Ditch D was aceramic). The Tating ware handle from the lower filling of Ditch B suggests that this final filling was taking place in the late eighth or more probably the early ninth century (see Section 3C, Group 6).

Whether pottery was scarce throughout Period I at Elmham, or just at this time, is impossible to say. The pottery which lay alongside the ditches surely resulted from ditch cleanings from earlier in Period I. If that was so, then it is possible that this pottery represents an earlier, more prolific, period; but owing to our lack of knowledge about the length of time over which it had been deposited, this cannot be demonstrated satisfactorily.

Period II, Phase 2 Ipswich-type Ware Pottery ?

The cess pits of Building O present an odd ceramic assemblage. Two are aceramic (F.601 and F.528), one contains a single Ipswich-type ware sherd (F.536), two contain single Thetford-type ware sherds (F.529 and F.522) and the remaining pit (F.532) contained an almost complete vessel in the Ipswich-type ware style (Fig.229, No.2). Its style and technology are that of Ipswich-type ware, but its small size is unusual, though not unique, as similar vessels have been found in Ipswich, though not, apparently, elsewhere (Hurst 1957, fig.2, nos.7 and 10). Another sherd of a similar pot was the single ceramic find from another pit on the site (F.534), to the north of Building O.

Assuming that the excavator is correct in associating these cess pits with Building O, in Period II, Phase 2, then a tenth-century date is to be postulated for the groups and some explanation for the small quantity and unusual nature of the ceramic content of these pits is called for.

The absence of pottery seems best interpreted as a reflection of the specialised function of the features (as cess pits in a latrine building) in that their filling was a process which did not involve the intentional deposition of household refuse, (apart from F.535 which was filled with refuse including a small proportion of Early Medieval ware pottery indicating that it was probably the last pit to be used in the building before its abandonment at the end of Period II, Phase 2. It is suggested that the vessel from cess-pit (F.532), because of its association with a specialised building, may also have a specialised function connected with the latrine building (a vessel for containing sweet-smelling substances?). Whether this is the case or not, it is evident that at least one specialised vessel manufactured in the Ipswich-type ware style was in use (although not necessarily in production) in the tenth century.

(C) Late Merovingian/Early Carolingian Pottery

Thirty five sherds were submitted to Richard Hodges as being possible imports of seventh- to twelfth-century date. Twenty of these remain unidentified; two, he suggests, are of eleventh/twelfth century date (see Section 4(C)), and the remaining thirteen he has placed into six groups belonging to Period I. Only two, however, were in Period I contexts, the rest being residual in later contexts. Of the sherds in Groups 1, 2 and 4 and the sherd in Group 3 from F.44b, Hodges writes 'an assignation of a Roman date cannot be ruled out', owing to the paucity of parallel material.

Characterisation and Discussion of Identified Imported Sherds

by Richard Hodges

Group 1. A light red (2.5YR 6/8) ⁵ diamond, roll-stamped sherd (from F.889, Period III/IV, Fig.229, No.31).

A fine, sand-grained fabric with a few inclusions of mica; very hard and smooth.

Oxidised vessels with fine roll-stamping are rare in the late Merovingian and Carolingian periods and unknown from the eighth and ninth-century site of Hamwih (Saxon Southampton ⁶). It is possible that this vessel is of an unrecognised French type or a rare ware from the middle Rhenish production centres. A Rhenish or Belgian source seems more probable than a French source; if it is a seventh- or eighth-century vessel.

Group 2. A pinkish-grey (7.5YR 7/2) handle with three ridges (unstratified). A large sand-grained fabric; very hard, with a coarse texture. There is a parallel for this form from Hamwih ⁷ in the class 12 fabric which probably originated from the Trier region (Hodges 1980). There are Merovingian parallels for this form from the cemeteries of Junkersdorf (La Baume 1967, G.555, no.1, tafel 54) and Krefeld-Gellup (Pirling 1966, G.23, no.11, tafel 9). However, the most common example of this type of handle is on the relief-band amphorae. This form, therefore, can only be dated c.600 - c.1100.

Group 3. a) Seven sherds with dark grey (2.5YR N4 to N3) rilled surfaces with a red (2.5YR 4/6) core, representing at least two vessels:

(i) one sherd from F.44b (Period II, Phase 1, Fig.228, No.11);

(ii) six sherds (three unstratified, one from Ditch C, Period I, one from F.860, Period III/IV (Fig.228, No.10) and one from F.945, Period V).

b) One sherd with a black corrugated outer surface, with a wavy line pattern and a dark greyish-brown inner surface (10YR 4/2); from S/114.

In this section the sherd from F.44b is quite different from that in F.945. The surface of the sherd from F.945 has been abraded in patches, a characteristic paralleled on black-ware sherds from the Treasury, London and Hamwih ⁸. In this section these sherds are similar; they have a brown, optically anisotropic clay matrix with abundant quartz-sand c. 0.03 mm across and some mica, as well as sub-angular quartz-sand c. 0.3 mm across and occasional grains of

plagioclase feldspars probably added as tempering⁹. The sherd from F.44b in thin section, has an optically anisotropic, clean brown clay matrix with sub-angular quartz-sand inclusions c. 0.3 mm across added as tempering¹⁰.

The sherd from S/114 is probably from a beak-spouted pitcher; the fabric is hard and smooth with common sand inclusions that are ill-sorted and range up to c. 1.00 mm across.

The Origin of the Black Wares The origins of the black wares are unknown. The range of wares represented in the Hamwih collection is evidence of the continuity of the great range of Merovingian black wares found in the cemeteries all across northern France as far as Alsace, and in Belgium (Hodges 1977). Some black ware sherds were found in the late seventh century kiln at Huy on the Meuse (Willems 1973, 148). However, there are no black wares of eighth or ninth-century date from Dorestad or the Zeeland sites, so a Carolingian period production centre in this valley seems unlikely. Some of the centres in this period must have been south of the Ardennes from where it was possible to export these wares by way of Quentovic. There is a great range of wares in this tradition from Hamwih, and single vessels have been identified at Portchester, Sandton, Canterbury, London, Wicken Bonhunt, Ipswich, Whitby and Jarrow.

- Group 4. A grey (2.5Y N6/ to N5) rilled body sherd (unstratified). The fabric has large sand grains with no other prominent inclusions; it is very hard, and coarse to touch.

There are several hundred grey-ware vessels from Hamwih, grouped into class 15 (Hodges 1977). Most of the Hamwih grey wares were probably made in the Pas de Calais, although reduced wares have been found in several Carolingian kilns in France and Germany. Grey wares were less frequently exported after the ninth century, although some eleventh and twelfth-century examples have recently been recognised in southern England (Hodges 1976).

- Group 5. A reddish-brown (2.5YR 5/4), hard-fired body sherd (F.44b, Period II, Phase 1). The fabric has large sand-grain inclusions which makes it coarse to touch.

It must be borne in mind that this fabric is very similar to several wares commonly found on Roman and later medieval sites. However, the class 24 fabric from Hamwih is a close parallel. This is not a common fabric in the Hamwih assemblage, but it includes one sherd with burnishing on the exterior surface and a wire-cut flat base¹¹ suggesting a French rather than a middle Rhenish source (Hodges 1977).

- Group 6. Tating Ware handle (from Ditch B, Period I).

It has a grey to black surface (2.5YR N4/0) with a light grey core (10YR 7/1). The surfaces are smooth and the handle is very hard. The tin-foil comprises diamonds set at intervals down the centre of the handle. There may have been a bordering of tin-foil along the raised edges of the handle (Fig.228, No.8).

In thin section it has a clean brown, optically anisotropic clay matrix with a few angular quartz-sand and iron inclusions c. 0.03 mm across, as well as a few sub-angular quartz-sand grains c. 0.03 mm across and some rounded clay pellets. The thin section gives no indication of the source of the vessel, although, as will be explained below, it is similar to other thin sections of Tating ware which probably were not made in the Rhineland.

The North Elmham Tating ware handle is a strap-handle of the kind commonly used on the contemporary black wares which were probably made in northern France (see above: Group 3). It is quite different from the rod-handle which is a characteristic feature of Tating ware ¹². The Tating ware vessel from the excavations at Old Windsor also differs from the characteristic form: it has a flattened rim, a beaked spout and a globular body very similar to the form of the black ware pitchers (Dunning 1959, 55, fig.24). Recent analyses indicate that there are several petrologically different types of Tating ware, one of which was made with clay derived from the Eifel mountains (Hodges 1980). There is, therefore, a suggestion that the tin-foil technique was adopted by several potteries, perhaps for special pieces. The black ware potters were the most skilled in northern Europe and there is no reason why they could not have made the North Elmham and Old Windsor vessels ¹³. However, the alternative suggestion made by Dunning that the Old Windsor vessel is an early example of Tating ware, derived from Frankish forms, cannot be ruled out (Dunning 1959, 52). An extended production period for Tating ware has not been considered and this could account for the typological and petrological variations.

Discussion The imports which have been identified include a late Merovingian roll-stamped ware sherd, dating to the seventh or early eighth centuries; a handle of a Tating ware vessel probably of the late eighth or early ninth centuries and at least three black ware vessels which probably date to the eighth or ninth centuries. The assemblage may well include other eighth, ninth or tenth-century wares which cannot be identified.

The number of recognizable imported wares is surprisingly small in view of the ecclesiastical importance of North Elmham and the extensive excavations which have been undertaken. It is also surprising that typical Badorf wares have not been found, since several vessels have been found in recent excavations at Norwich ¹⁴ and a pitcher rim was found during field walking at Sedgeford (Hodges forthcoming). This small assemblage suggests that the eighth and ninth-century settlement was in contact with Frankish merchants as well as with Frisian merchants who handled the Rhenish trade. There is a similar assemblage of imported wares from the excavations of a rural site by Keith Wade at Wicken Bonhunt in Essex: further evidence that Frankish merchants were active in eastern England ¹⁵. The Tating ware vessel may well have been a gift from a continental monastery or a souvenir from a continental visit ¹⁶.

(4) **THE SAXO-NORMAN POTTERY (c.850-c.1200)**

This assemblage of pottery was associated with Periods II, III and IV. It consisted almost entirely of two main ware types, Thetford-type ware and Early Medieval ware. No typological evolution of rim form has been established for either ware and there is no reason *per se* to expect one, but the benefits which would ensue in terms of closer dating, if such an evolution could be established, makes the analysis of suitable ceramic assemblages worthwhile.

Whilst the date range of Thetford-type ware has been established as c. 850-1150 (Hurst 1957, 42-45; Hurst 1963, 150). Early Medieval ware is thought to have started c. 1000, and to have ended at about the same time as the Thetford-type wares (Hurst 1963, 155-156; Dunning 1959, 44 and 48). Thus, the occurrence of Early Medieval ware is a reliable indicator of eleventh or early twelfth-century date, whereas groups consisting of Thetford-type wares only may be assumed to be ninth or tenth century, provided that they are large enough to rule out the possibility of the chance exclusion of Early Medieval ware.

The Ceramic Sequence

The excavator's sequence of structures for Elmham at this period involves two types of ceramic context: building foundations and boundary features, and they have been divided chronologically into seven phases spanning 275 years. Such a sequence of forty-year periods with associated ceramic assemblages provides, in theory, an invaluable opportunity to search for typological change in the two main ceramic types. Unfortunately, the assemblages of each phase proved too small for conclusions to be drawn. The pit groups (which unlike those from the building foundations and boundary features were of sufficient size to be of use in such a study) were, almost without exception, not stratigraphically linked to the phased sequence and consequently can only be considered as being before or after the introduction of Early Medieval ware. They can, thus, contribute only limited data about the range and variability of the two main wares.

Another problem is that there is probably not a full sequence of Late Saxon occupation (and hence Thetford-type ware groups) at Elmham resulting from its likely abandonment during Danish activity in the second half of the ninth century.

The pottery from this ceramic period was accordingly analysed with two main aims in mind. First, to isolate the assemblages from each structural period and phase and to note certain basic characteristics of the wares - particularly whether they changed with time. Second, to illustrate the best groups (considered to be those with the most sherds - especially rims), from the two main ceramic phases, i.e. pre- and post-1000, in order to show both the variability of the basic characteristics and the presence of such characteristics as were not present in the phased groups.

4(A) Thetford-type Ware

The ceramic assemblages associated with Period II structures were dominated by Thetford-type wares. Fig. 226 indicates the number of ceramic groups containing Thetford-type ware only (and, therefore, possibly Period II) and their size distribution. The initial problem is the reliability of the groups *per se*. A group of Thetford-type ware could still belong to the Early Medieval ware period; and the smaller the number of sherds in the group, the more likely this is. For this reason, only groups containing seven sherds or more were analysed - in all fifty one groups representing 90% (2028 sherds) of the pottery in this category. For Periods III and IV, where Early Medieval ware is present, all the Thetford-type ware could be analysed. Fig. 226 summarises the size distribution of the 231 assemblages containing 2088 sherds of Thetford-type ware (in association with 2186 sherds of Early Medieval ware, and/or 160 medieval sherds, twelve Late Saxon imported sherds, forty six earlier residual sherds, and six intrusive post medieval sherds).

a) Vessel Types

TABLE 74. PROPORTION OF THETFORD-TYPE WARE VESSEL TYPES DURING PERIODS II-IV

	No. of identifiable sherds (%)	
	Period II	Periods III & IV
Cooking Pots	175 (90.4%)	142 (83%)
Bowls	9 (4.6%)	13 (7.0%)
Pitchers	7 (3.5%)	12 (7.0%)
Storage Jars	2 (1.0%)	4 (2.5%)
Lamps	1 (0.5%)	1 (0.5%)

Cooking pots, bowls and storage jars were identified solely on the number of characteristic rims present, and the lamp by its base. The number of pitchers, based on the spouts and handles present, is undoubtedly an underestimate caused by their rim form being identical to that of cooking pots. Consequently, some of the rims identified as cooking pots really belong to pitchers. As can be seen from Table 74 the proportions of one vessel form to another remained fairly constant throughout Periods II, III and IV despite the competition in Periods III and IV of Early Medieval ware bowls and cooking pots (see below for further discussion).

b) Decoration

Only 2% of the sherds analysed in each period displayed decoration.

TABLE 75. DECORATIVE MOTIFS ON THETFORD-TYPE WARE DURING PERIODS II-IV

Decoration	II	III & IV
Impressed thumbprint	3 (7%)	3 (6%)
Impressed thumbprint on applied strip	11 (25%)	11 (23%)
Plain applied strip	- -	6 (13%)
Diamond rouletting	24 (53%)	13 (26%)
Square rouletting	3 (7%)	4 (8%)
'W' rouletting	1 (2%)	- -
Incised wavy-line	1 (2%)	10 (21%)

Firstly, it is obvious that only a minority of pottery was decorated - probably, in the main, special vessels such as pitchers or storage jars. Secondly, although the sample is small it does suggest that rouletting was more popular in Period II than later and that wavy-line decoration was the reverse. Unfortunately, however, the phased groups from Periods III and IV contained only three examples of decoration and it is, therefore, impossible to suggest a more limited life for any of the decorative motifs; they could all have existed throughout the life of the Thetford-type ware industry (or at least from the early tenth century when the Elmham sequence starts).

c) Base Types

TABLE 76. THETFORD-TYPE WARE BASE TYPES DURING PERIODS II-IV

	II	III & IV
Flat	84 (65%)	75 (78%)
Sagging	43 (35%)	19 (22%)

d) Rim-form

Period II Thetford-type Ware

Seventeen groups of Thetford-type ware are illustrated all of which are probably associated with Period II and, therefore, probably date to the tenth century. The earliest three groups come from the Phase 1 cess pits: Building W (Fig.229, Nos.20 and 21), Building X (Fig.229, Nos.12-19 and 23-30), and Feature 44b (Fig.229, No.22). The middle of Period II is possibly represented by the pottery from two Period II boundaries: F.499 (Fig.233, Nos.7-10) and F.1448/1784 (Fig.235, Nos.1-19). The end of Period II (Phase 3) may be represented by the two pits: F.331 (Fig.232, Nos.1-7, and 9-19) and F.252 (Fig.233, Nos.11-17). It is argued that another three groups contain pottery also

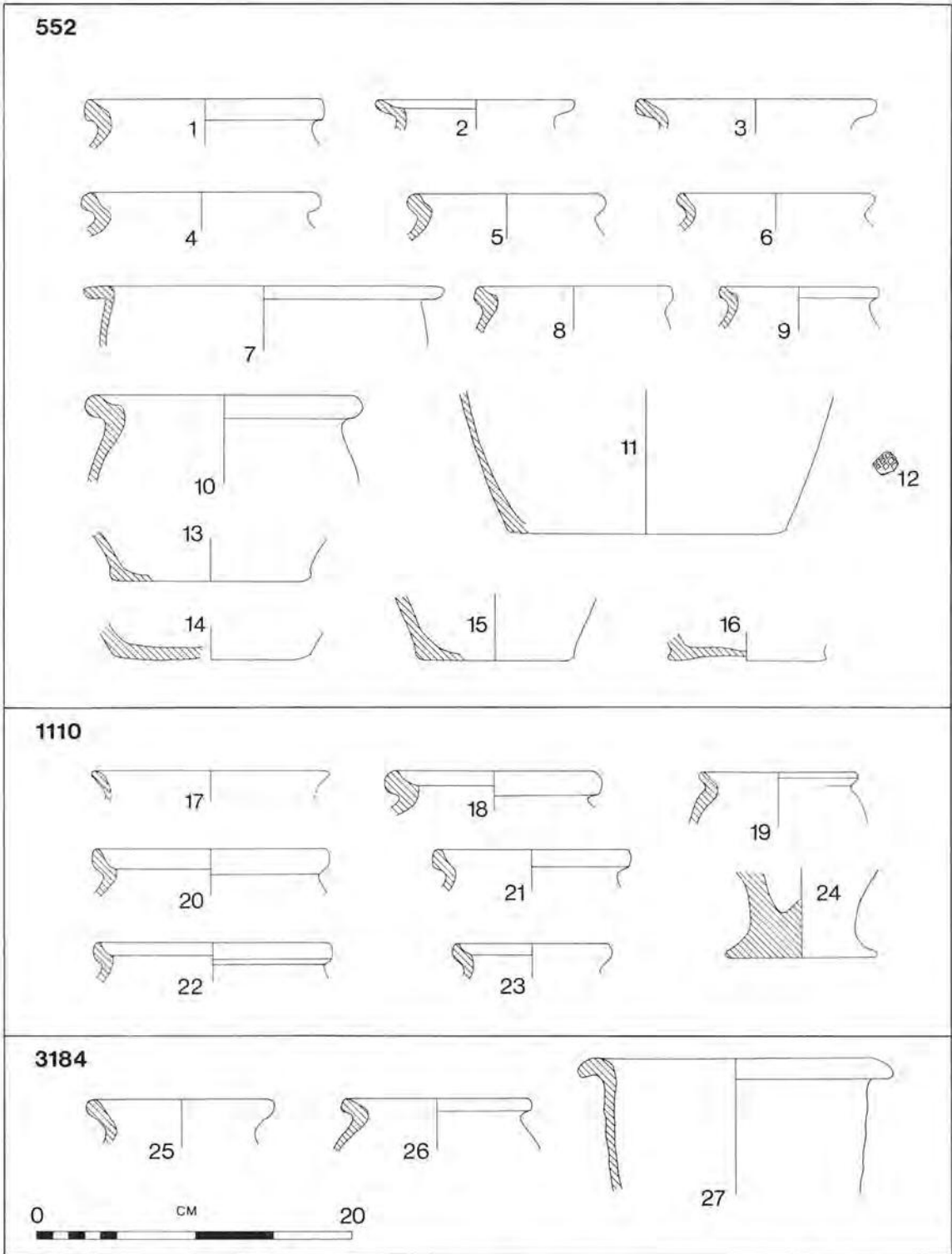


Fig.231. Period II pottery groups: Thetford-type ware, Nos.1-16, 18-27; Early Medieval ware, No.17. Scale 1:4.

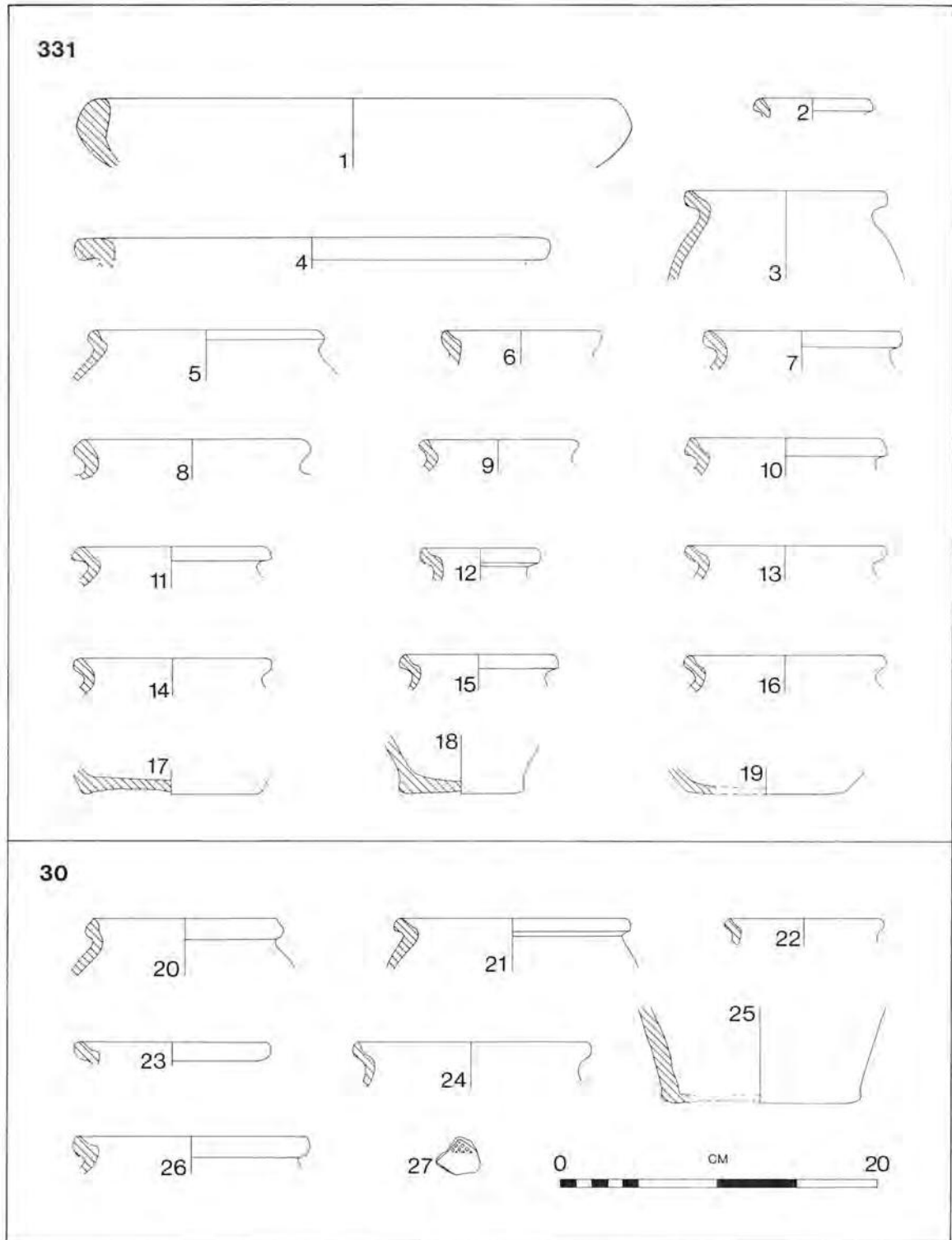


Fig. 232. Period II pottery groups: Thetford-type ware, Nos. 1-7, 9-27; St. Neot's-type ware, No. 8. Scale 1:4.

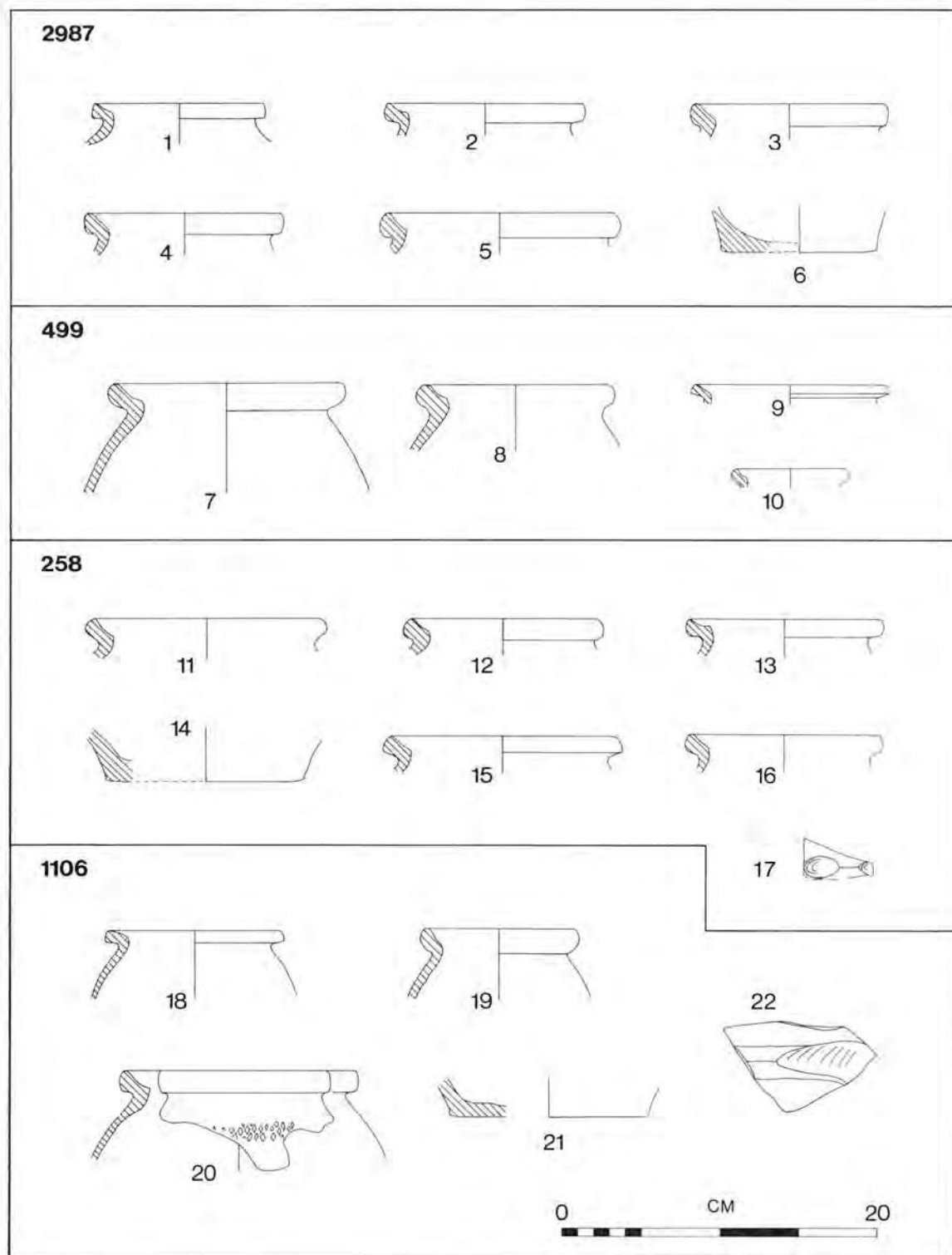


Fig. 233. Period II pottery groups: Thetford-type ware. Scale 1:4.

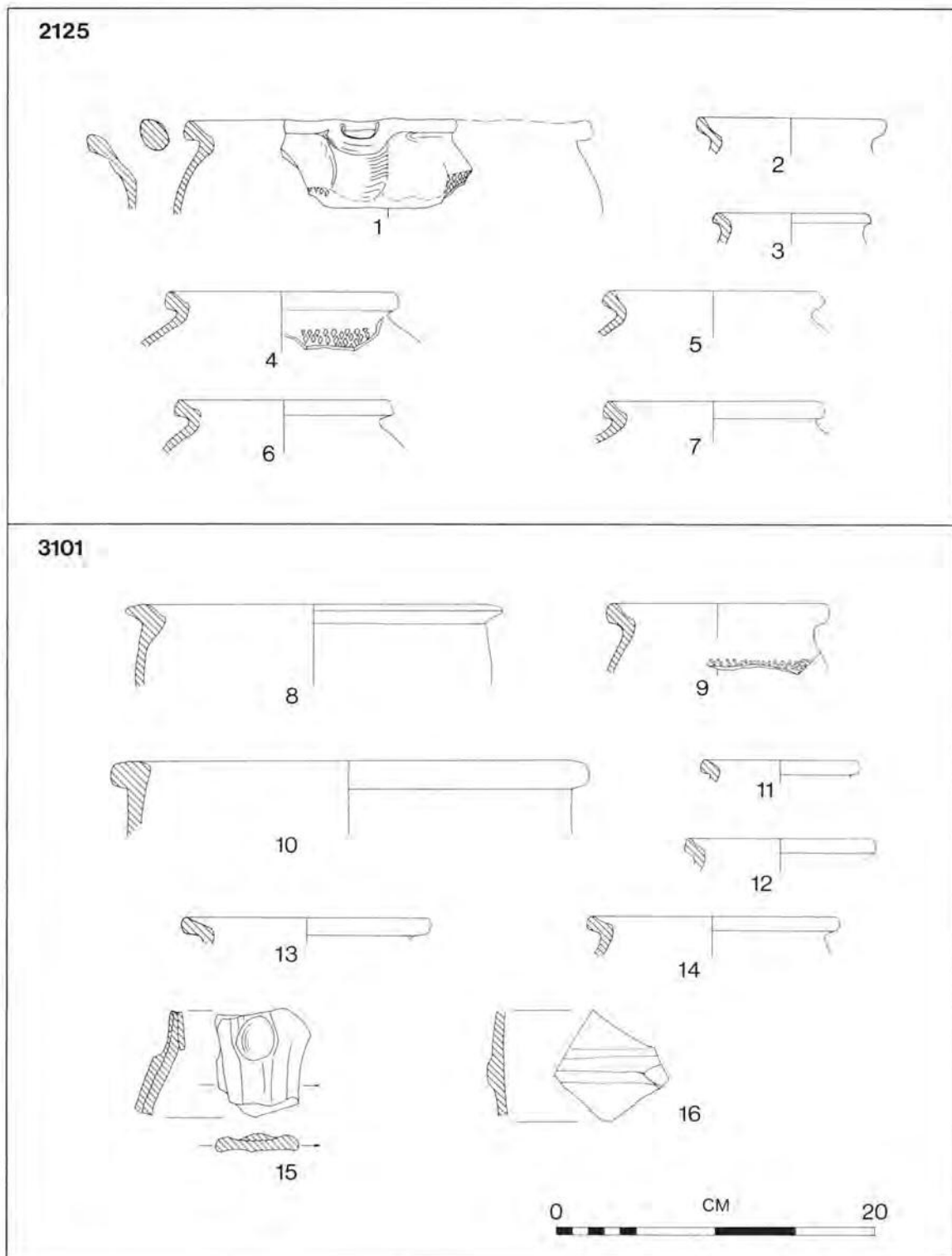
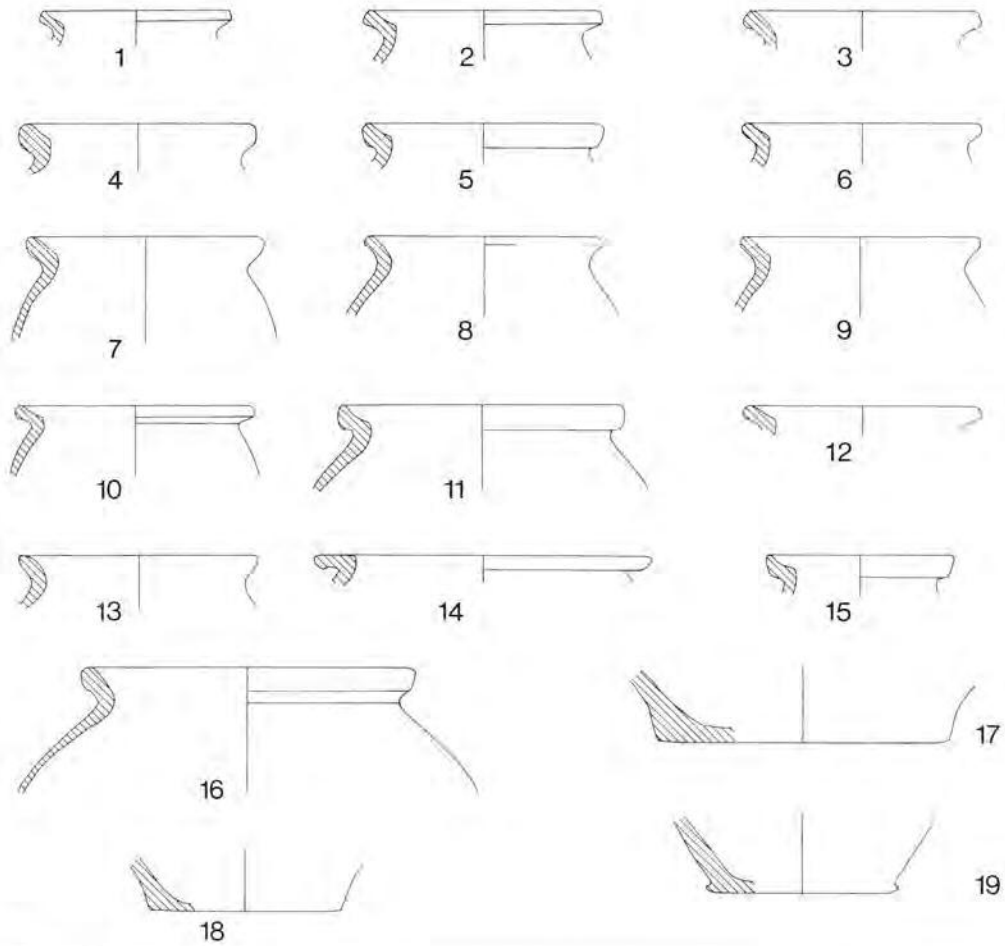
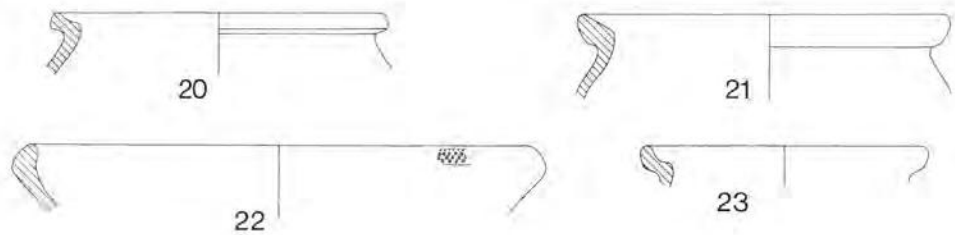


Fig. 234. Period II pottery groups: Thetford-type ware. Scale 1:4.

1784/1448



2119



0 CM 20

Fig.235. Period II pottery groups: Thetford-type ware. Scale 1:4.

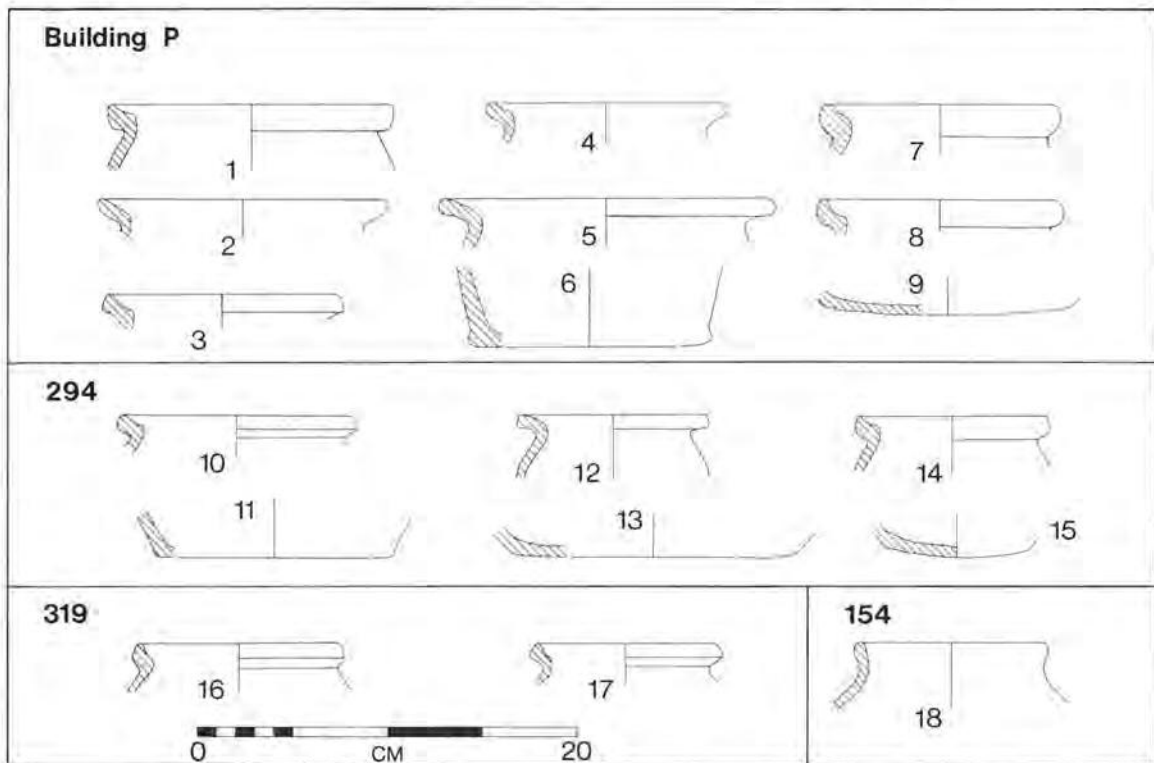


Fig.236. Period II pottery groups: Thetford-type ware, Nos.1-4, 6-17; St.Neot's-type ware, No.5; imported Limburg or Middle Rhenish ware, No.18. Scale 1:4.

representing the end of Period II: Building P and its cess pits (Fig.236, Nos.1-4 and 6-17), F.552, a pit cutting Building O (Fig.231, Nos.1-17) and the Period III boundary, F.1110 (Fig.231, Nos.18-24). There remain seven pit groups for which a Period II date is postulated on their ceramic content (i.e. Thetford-type ware only): F.3184 (Fig.231, Nos.25-27), F.30 (Fig.232, Nos.20-27), F.2987 (Fig.233, Nos.1-6), F.1106 (Fig.233, Nos.18-22), F.2125 (Fig.234, Nos.1-7), Fig.3101 (Fig.234, Nos.8-16) and F.2119 (Fig.235, Nos.20-23).

Period III/IV Thetford-type Ware

Unfortunately, the stratified contexts of Period III and IV were poor in rim sherds and it is only possible to illustrate Thetford-type ware rims in association with the best Early Medieval ware groups. Only four of these appear to date from the eleventh or early twelfth century: F.1111 (Fig.240, No.2), F.348 (Fig.240, Nos.4-6 and 10), F.493 (Fig.240, Nos.13 and 15) and F.596 (Fig.237, Nos.15-18 and 20-25). However, Thetford-type ware is also associated with the late Period IV/early Period V groups (Fig.237, Nos.1, 3, 4, 6-13, Fig.239, Nos.1-3, 5-7, 9-10 and 18 and Fig.241, Nos.7, 17 and 20).

Owing to the paucity of material it is difficult to show any development of Thetford-type ware since Period II other than to point to what may be two late characteristics (i.e. end of Period IV, c. 1150). Finger-tipping occurs on the edge of two cooking pot rims (Fig.240, No.2 and Fig.237, No.17) and a curious bowl rim form appears (Fig.240, No.10) which in one case also has finger-tip decoration (Fig.240, No.13).

e) Fabrics

In common with the majority of East Anglian post-Roman ceramics, all the Thetford-type wares of this period were sandy in texture. Some variation in the size distribution of the sand inclusions in the clays is obvious, however, even to the naked eye, with some sherds containing grits up to 3 mm in diameter.

The Ceramic Sequence

Also, in common with all the other Thetford-type ware groups examined by the present author from country sites in Norfolk, the Elmham assemblage displays a markedly variable fabric coloration. Such a variation is caused by differential firing conditions and characterises the two rural Thetford-type ware production centres examined to date - Langhale in the parish of Kirstead, south east of Norwich (Wade 1976, 101-127) and Grimston (Clarke 1970, 79-95) a few miles east of King's Lynn. This is in contrast with the Thetford-type wares being produced in the urban industries at Norwich and Thetford and the assemblages excavated in domestic contexts in those towns. The wares here are dominantly the standard grey ware - the characteristic of 'Thetford ware' as first defined (Hurst 1957, 43). The fabric coloration of every Thetford-type ware sherd from the Elmham excavation was noted and a total of 121 different combinations was present. The actual number, of course, depends partly on the degree of objectivity employed in their examination, but as can be seen from the fabric list (p.467), just about every conceivable combination was present. In spite of this great variation in coloration, however, in terms of quantity the finer quality 'grey-wares' formed about 65% of the total Thetford-type ware present throughout its useage on the North Elmham site (wares 4A(ii), 4A (Lxi), and 4A (Lvii), see Table 77).

At this stage in our knowledge it is impossible to assign, with certainty, any of the fabrics to a particular kiln source. The 'grey-wares' might well come from Norwich and the fabrics displaying buff surfaces from the Grimston kilns, which, unlike the other known production centres, produced a majority of such oxidised fabrics. Many of the other fabrics displaying colour variations could have been produced at other rural industries, as yet unknown, but within an economically viable radius of North Elmham. Many of the fabrics in this category are identical to those found in Early Medieval ware which not only made the positive identification of side sherds difficult in some cases, but also implies similarities of production technique. Finally, it is also clear from this analysis that the rural industries, which are suggested as the production centres for the 'inferior quality' wares, were in production before the introduction of Early Medieval ware.

TABLE 77. FREQUENCIES OF THE FIVE MOST COMMON THETFORD-TYPE WARE FABRIC COLORATIONS

Fabric Coloration (Notation)	Sherd Nos.	% Total TW	% II TW	% III & IV TW
Grey (4Aii)	1386	37	37	37
Grey core, dark grey/black surfaces (4Alxi)	853	23	21	24
Grey core, buff surfaces (4Axliv)	170	4.5	1.4	6.9
Grey core/inner surfaces, dark grey-black outer surface (4Alvii)	131	3.4	4.0	3.0
Grey inner core, red-brown outer core, black surfaces (4Acvii)	120	3.2	1.4	4.5

TW = Thetford-type ware

The Relationship Between Early Medieval Ware and Thetford-type Ware at Elmham

With the arrival of Early Medieval ware the Thetford-type ware industry had an established competitor. In terms of their share of the Thetford-type wares in use the 'grey-wares' remained constant, but in terms of the total ceramic assemblage in use at Elmham, Early Medieval ware gradually increased its share of the market (see Table 78).

TABLE 78. PERCENTAGE OF THETFORD-TYPE WARE AND EARLY MEDIEVAL WARE, DURING PERIODS III AND IV, BASED ON PHASED CONTEXTS ONLY

Period	Phase	Thetford-type ware	Early Medieval ware	Medieval coarse ware
III	-	83%	17%	-
IV	(i)	57%	43%	-
IV	(ii)	61.5%	34%	3.5%
IV	(iii)	31%	57%	11.5%

No production centre has yet been located for Early Medieval ware and it has been suggested that it was produced in clamps. This being the case, there seems no reason why it should not have been produced wherever there was a need for pottery and particularly in those areas a considerable distance from a Thetford-type ware production centre. In fact, in areas close to the latter, there seems no evidence that Early Medieval ware achieved the domination of the local ceramic assemblage as it did at Elmham. An analysis of the pottery from excavations on the rural settlement at Sedgeford (nine miles north of Grimston) demonstrated that Grimston Thetford-type ware formed 95% of the eleventh and early twelfth-century ceramic assemblage with Early Medieval ware accounting for the remainder (Wade forthcoming). The latter is also infrequent in the Thetford-type ware production centres of Norwich and Thetford.

At this stage, however, it is important to establish the precise relationship between the two pottery traditions. Both cooking pots and bowls were produced in Thetford-type ware and Early Medieval ware. Thetford-type ware bowls form only a small percentage of vessels in use at Elmham throughout the Saxo-Norman period (see Table 74) in contrast to the high proportion in Early Medieval ware. The statistics indicate a marked increase in the use of pottery bowls at Elmham during the eleventh and early twelfth century in relation to the earlier period. It is also clear that the Thetford-type ware industry did not supply the increased demand for bowls and the Norwich Thetford-type ware industry does not seem to have produced many at any time¹⁷. The exception to this, as it is in many other aspects, is the Grimston Thetford-type ware industry. Here, an analysis of the surface pottery scatter above the kilns shows that over 20% of the vessels produced were bowls. This fact alone might in part explain the predominance of this ware over Early Medieval ware in this part of Norfolk (Wade 1973, 25). A further fact, the comparative sizes of cooking pots and bowls in the two ceramic traditions, also has a bearing on the discussion (see Table 79).

TABLE 79. COMPARISON OF THETFORD-TYPE WARE AND EARLY MEDIEVAL WARE BOWL AND COOKING POT DIAMETERS DURING PERIODS II-IV

Diameter at rim in cm	Thetford-type ware		Early Medieval ware
	II	III & IV	III & IV
Cooking pots	3.5-7.5	5-9	6-14.5
Bowls	15-18	15-18	9-20

There is a marked increase in the diameter of Thetford-type ware cooking pots during Periods III and IV at Elmham and the Early Medieval ware cooking pots are still bigger. It is also clear that the Early Medieval ware bowls, as well as being present in much larger quantities than those in Thetford-type ware, also tend to reach a greater diameter than the latter. Thus, during Periods III and IV, there is not only a marked increase in the use of bowls, but also an increase in size of bowls and, more particularly, cooking pots.

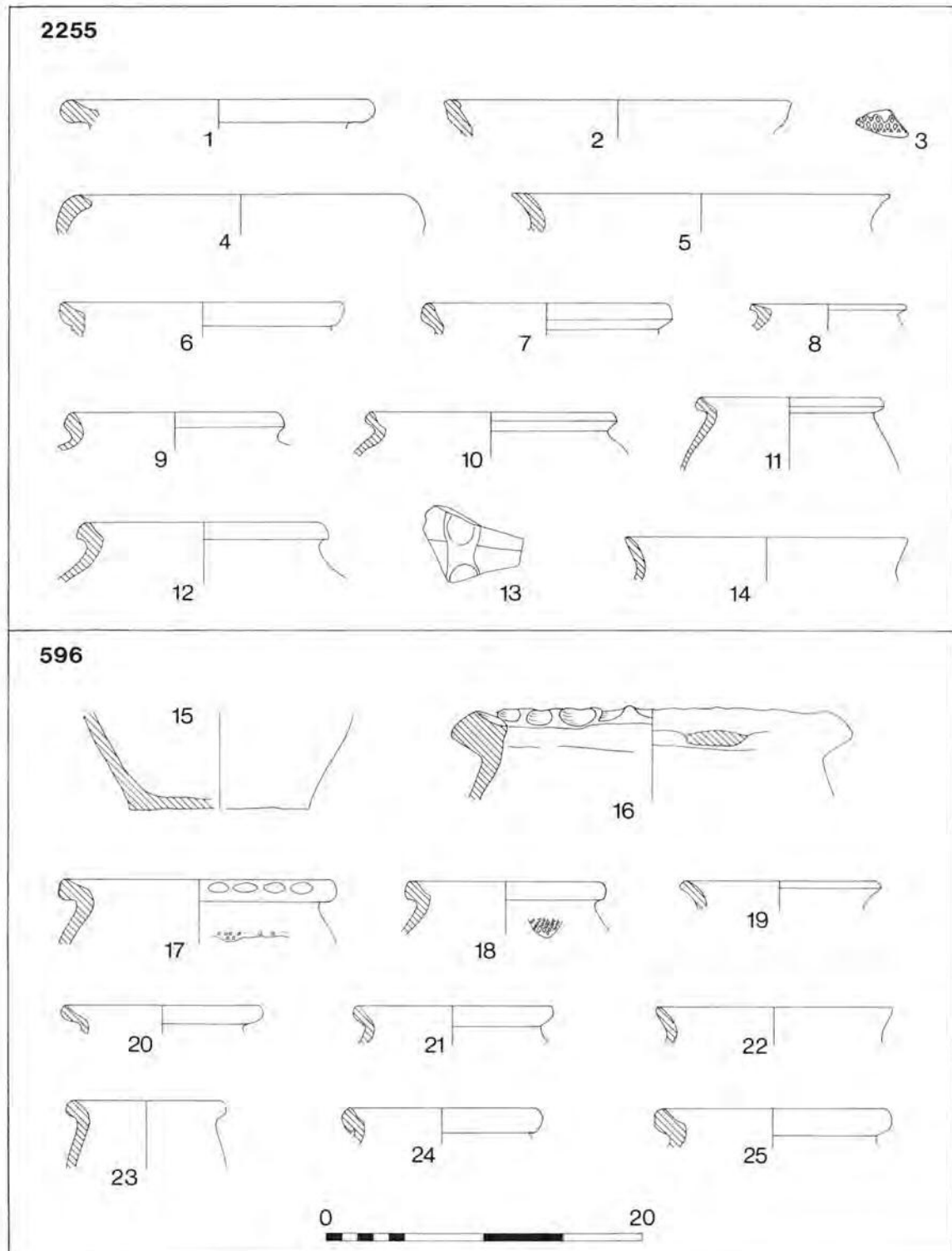


Fig.237. Pottery groups from Periods III/IV (F.596) and late Period IV/early Period V (F.2255): Thetford-type ware, Nos.1, 3, 4, 6-13, 15-18, 20-25; Early Medieval ware, Nos.2, 5, 14 and 19. Scale 1:4.

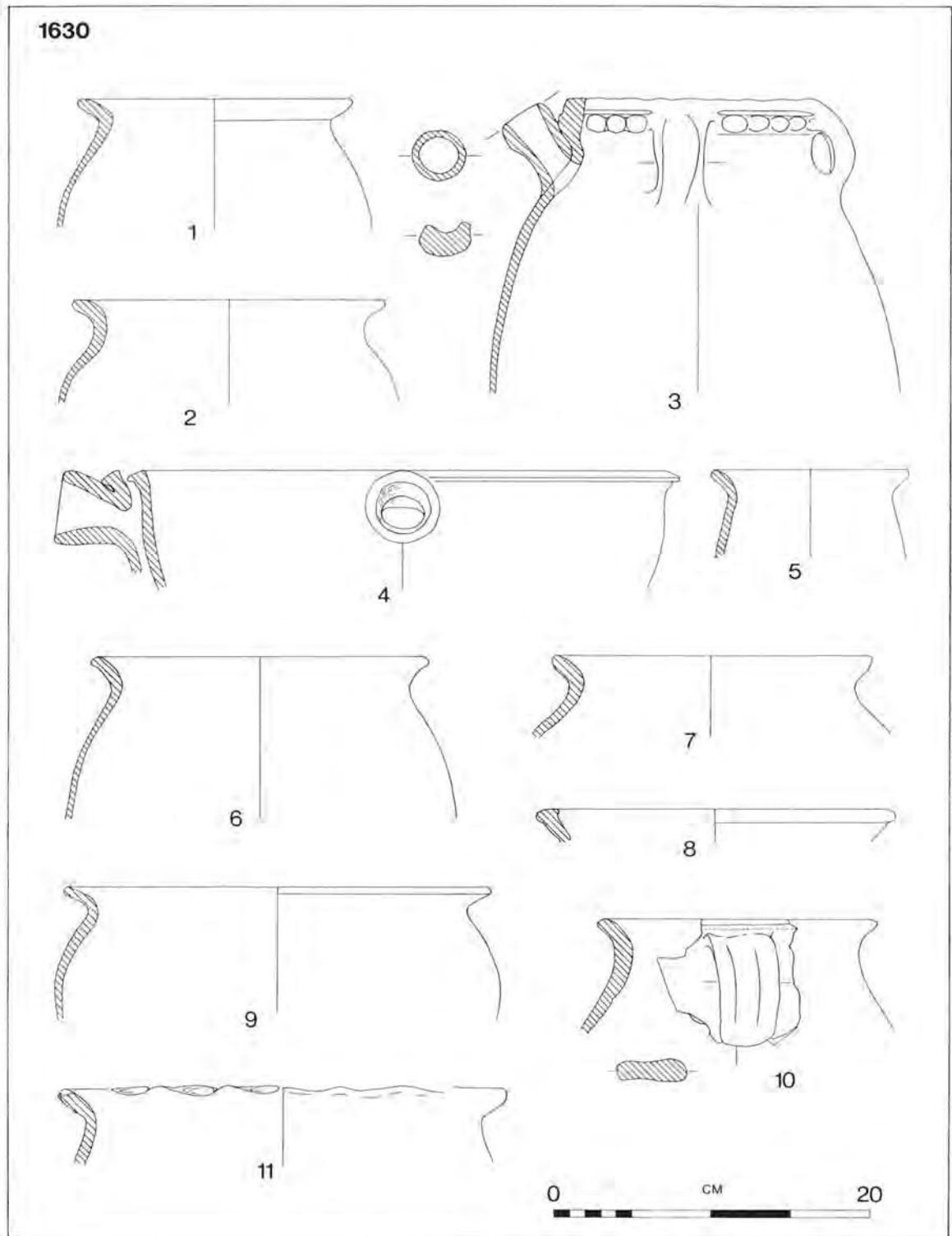


Fig.238. Pottery from a late Period IV/early Period V group: Early Medieval ware, Nos.1-7, 9-11; local medieval coarse ware, No.8. Scale 1:4.

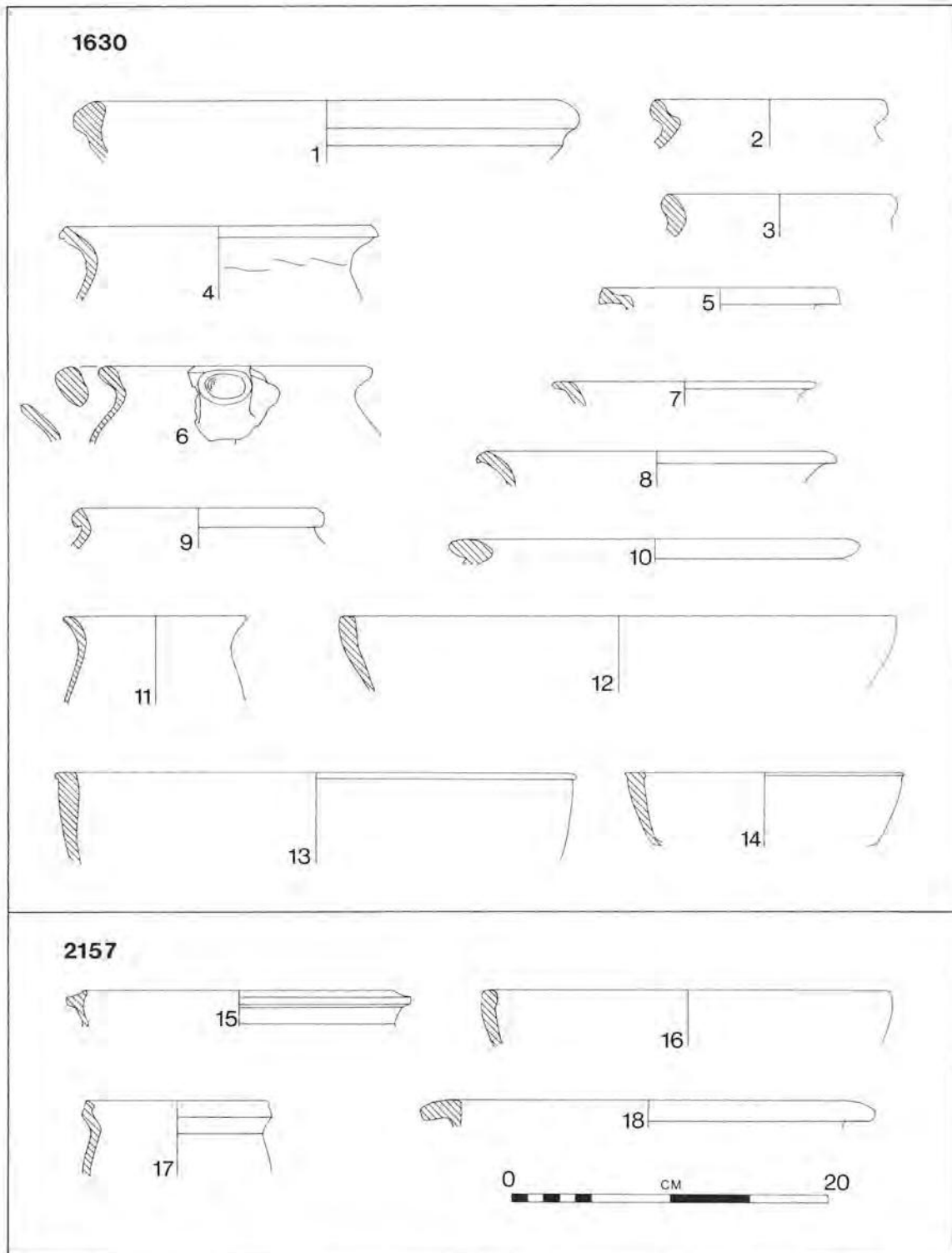


Fig.239. Pottery groups from the late Period IV/early Period V: Thetford-type ware, Nos.1-3, 5-7, 9-10, 18; Early Medieval ware, Nos.4, 8, 11-14, 16; local medieval coarse wares, Nos.15 and 17. Scale 1:4 .

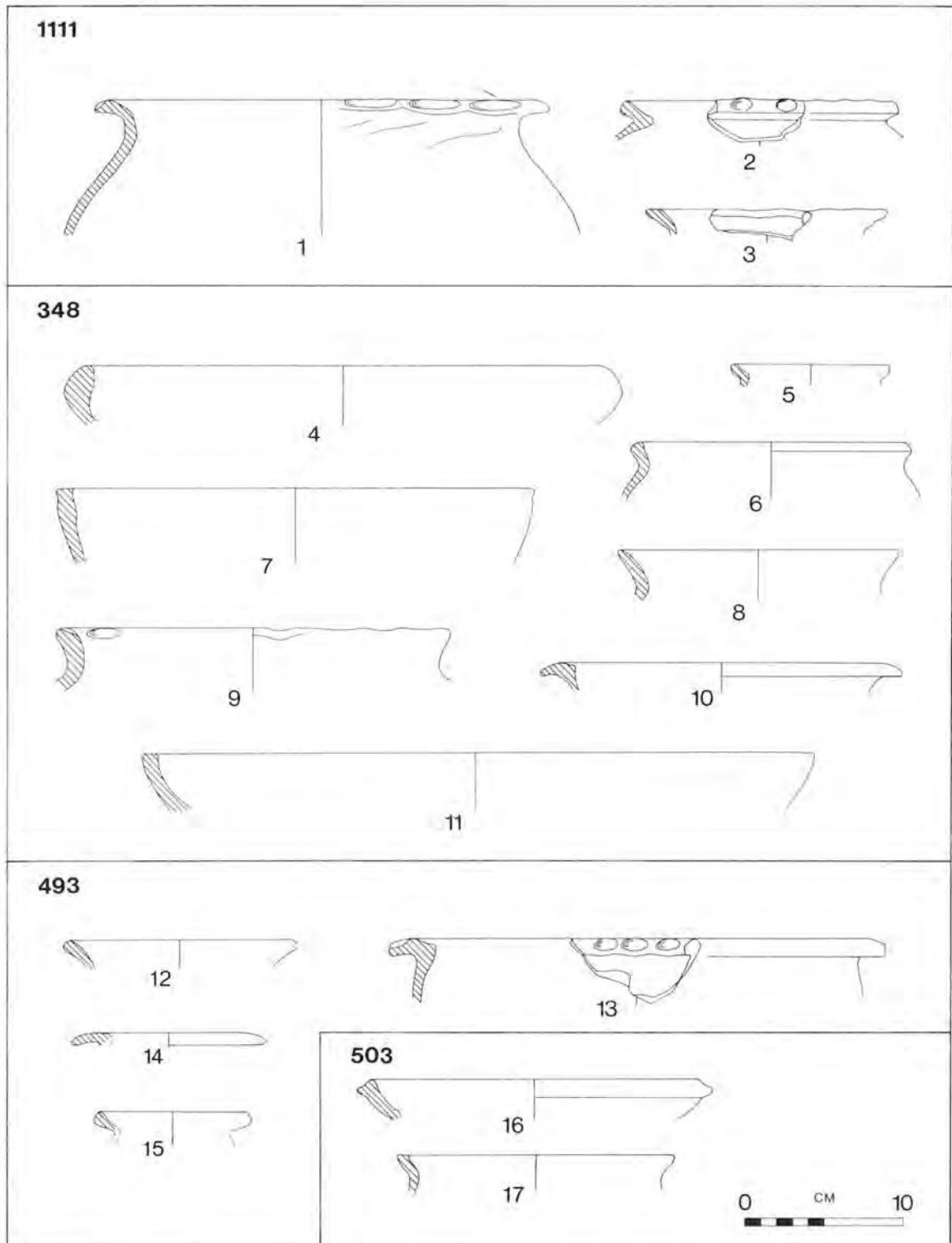


Fig.240. Pottery groups from late Period IV/early Period V (F.1111, F.348, F.493), Period V (F.503): Early Medieval ware, Nos.1, 3, 7-9, 11, 12, 14; Thetford-type ware, Nos. 2, 4-6, 10, 13, 15; and local medieval coarse ware, Nos.16 and 17. Scale 1:4.

The Ceramic Sequence

Inadequate Knowledge of Ceramic Interment in Period II

The excavator's sequence places Buildings U, O and P, as roughly contemporary in Period II, Phase 2. If one makes the assumption that the pottery contained in the foundations of a building is that which is lying around on the site at the time of construction and is 'accidentally' included in its filling, then one would expect the ceramic assemblages contained in the foundations of these buildings to be similar and indicative of wares in use prior to their construction. In fact, all three are completely different. The foundations of Building U contained no pottery, those of O contained Thetford-type ware and some residual Ipswich-type ware, and those of P had Thetford-type ware and 10% Early Medieval ware. This evidence reveals the complexity surrounding the interment of pottery in foundations and two deductions seem likely:

- a) that the amount and nature of pottery which is 'accidentally' interred must surely depend on the amounts and geographical distribution of such pottery on the site which is obviously variable and a reflection of previous activity on the site. Thus, one would suspect that in the area of Building U there was very little or no such pottery, whereas in the area of Building O there was both Ipswich-type ware and Thetford-type ware presumably from Phase 1 of Period II when the four large cess pits were in use.
- b) that further pottery may well get interred in such contexts both during any replacement of posts in the course of the building's life and during the final removal of any posts at the end of the building's life. The latter must surely be the explanation of the 10% Early Medieval ware in Building P's foundations. The same amount was also found in Building P's cess pits and one of those in Building O presumably filled at the end of the building's life and at the changeover to Period III.

The Introduction of Early Medieval Ware to Elmham

The cultural features placed by the excavator in Period III are associated with Early Medieval ware throughout, but there are indications from six groups of pottery that the ware had made an appearance by the end of Period II (Table 80).

TABLE 80. FEATURES DATING TO THE INTRODUCTION OF EARLY MEDIEVAL WARE

Feature	Total Sherds	EMW Sherds (%)
535 (cess pit, Building O)	32	+5(16%)
552 (pit cutting Building O)	172	+17(10%)
Building P foundations	110	10 (9%)
Building P cess pits	55	3 (6%)
Cemetery boundary ditch (Period III)	132	20(15%)
331 (pit cutting Building P)	208	+29(14%)
+ no rims of standard EMW type or fabric		

EMW = Early Medieval ware

Pit 535 is the only cess pit in Building O to contain Early Medieval ware and, consequently, must be seen as the last to be used; its filling presumably dates to the abandonment of the building prior to the reorganisation of the site in Period III (and similarly the cess pits of Building P). It is this interim period, between the end of Period II and beginning of Period III, to which all the above features must belong. On stratigraphic grounds, pits 552 and 331 are later than the Period II, Phase 3 buildings which they cut. The cemetery boundary, from its nature, represents a fence slot and, consequently, although in use during Period III, one would expect the pottery in its filling to date from its construction, in this interim rebuilding period. This also applies to the foundations of

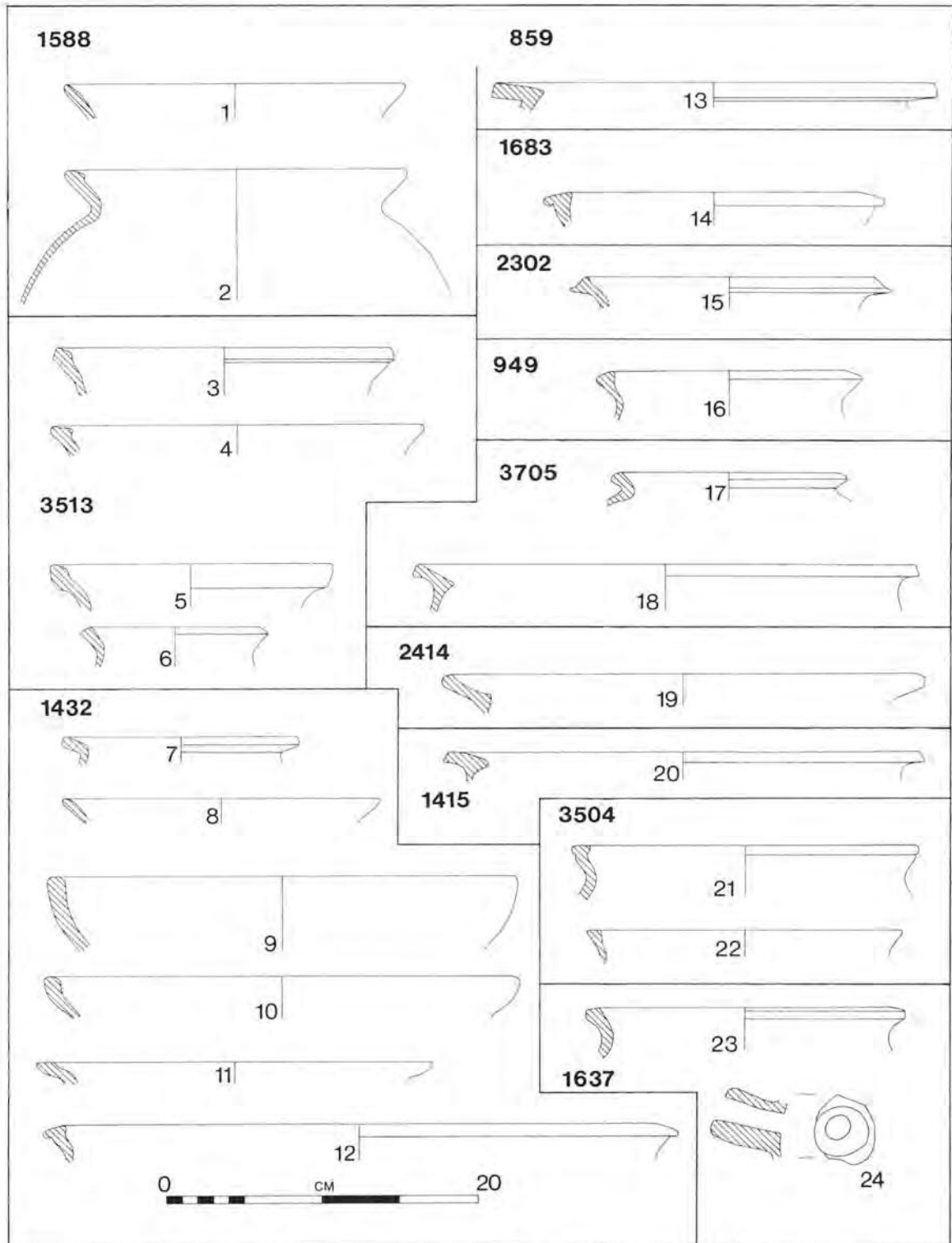


Fig.241. The earliest medieval pottery groups from the end of Period IV/ early Period V: Early Medieval ware, Nos.1, 8-10, 18, 24; Thetford-type ware, Nos.7, 17, 20; local medieval coarse wares, Nos.2-6, 11-16, 19, 21-23. Scale 1:4.

The Ceramic Sequence

Building P if one accepts the argument that the Early Medieval ware in its filling was interred at the end of the building's life (see previous section).

4(B) Early Medieval Ware

An analysis of the 2200 or so Early Medieval ware sherds associated with Periods III and IV of occupation on the site enabled the following characteristics of vessel type, rim form, decoration and fabric to be identified.

a) Vessel Types

With rare exceptions only cooking pots and bowls are known. On the basis of rim sherds only, 70% of vessels were cooking pots and 30% were bowls. There was one example of a spouted bowl (Fig.238, No.4) and one of a pitcher (Fig.238, No.10).

b) Decoration

Decoration is restricted to finger-tip and pie-crust forms on the cooking pot rims only.

c) Base Types

The cooking pot bases were all sagging and the bowl bases flat.

d) Rim Forms

The Early Medieval ware in features phased within Period III by the excavator contained no rim sherds and those in Period IV had few. This is unfortunate as it makes a search for any possible rim form development impossible.

The best groups containing Early Medieval ware dated mainly to the latter part of the ware's life. Four groups, however, may be considered to date from the eleventh or twelfth century: F.1111 (Fig.240, Nos.1 and 3), F.348 (Fig.240, Nos.7-9 and 11), F.493 (Fig.240, Nos.12 and 14) and F.596 (Fig.237, No.19). Three groups date to the end of Early Medieval ware production and, therefore, the end of Period IV: F.1630 (Fig.238, Nos.1-7 and 9-11, and Fig.239, Nos.4, 8 and 11-14), F.2255 (Fig.237, Nos.2 and 5) and F.2157 (Fig.239, No.16). Early Medieval ware rims also occur in another two groups at the very beginning of Period V: F.1588 (Fig.241, No.1) and F.1432 (Fig.241, Nos.8-10).

Not much variation from the standard, simple everted, cooking pot rim or upright, wedge-shaped bowl rim occurs, but three cooking pot rims display development towards medieval forms but still in Early Medieval ware fabrics (Fig.237, Nos.2 and 5, Fig.239, No.4). Variations do occur in the abruptness of the angle with which the rim leaves the body and the finger-tip and pie-crust decoration which occurs on some cooking pot rims could be a late feature (Fig.238, No.11 and Fig.240, Nos.1 and 9).

e) Fabrics

Considerable variation was present in fabric coloration, as with the Thetford-type and Medieval coarse wares. However, two thirds of the total sherds were represented by eleven fabrics, all of which were sandy and varied only in their coloration (Table 81).

Analysis of the Period III and IV contexts appeared to indicate that these main fabrics were present throughout the life of the wares and in roughly the same proportions, but this could not be demonstrated statistically owing to the paucity of sherds from some occupation phases.

TABLE 81. THE COMMONEST EARLY MEDIEVAL WARE
FABRIC COLORATIONS

Fabric Coloration (notation)	% EMW
Grey core, black sfs (4B xxxix)	25%
Grey core, orange-brown sfs (4B xvi)	8%
Grey core, orange-brown insf, d.grey-black osf (4B xviii)	7%
Grey core, d.brown insf, black osf (4B xviv)	7%
Grey core/insf, d.grey-black osf (4B xxxviii)	5%
Grey core, d.grey-black insf, d.red-brown osf (4B xl)	5%
Grey core, d.grey-black insf, orange-brown osf (4B xliii)	4%
Grey core/insf, orange-brown osf (4B xxxv)	4%
Grey core, d.grey-black insf, d.brown osf (4B xlii)	3.5%
Grey core, d.brown sfs (4B xxiii)	3.5%
Grey i/c, red-brown o/c, black sfs (4B lxiii)	3.3%

sfs = surfaces; insf = inner surface; osf = outer surface;
d = dark; i/c = inner core; o/c = outer core.

4(C) Imported Pottery

1) English (outside East Anglia)

TABLE 82a. FREQUENCY OF ST.NEOT'S AND STAMFORD-TYPE
WARES, PERIODS II-VI

	II (% Total Pottery)	III/IV (%)	V	VI
(A) St. Neot's-type ware	18 (1%)	6 (.2%)	11	-
(B) Stamford-type ware	-	7	6	4

TABLE 82b. FREQUENCY OF MEDIEVAL POTTERY IN
PERIOD IV FEATURES¹⁸

Feature	Period (Phase)	TTW	EMW	Medieval		% Med
				Cs	Glz	
Building AR fnds	III (Phase 1)	4	7	5	4	45%
Building T fnds	IV	14	6	1		5%
Building AF fnds	IV	9	3	1	1	14%
Building AL fnds	IV	67	16	4	2	7%
Building AK fnds	IV	42	124	12	2	8%
Ditch J	IV (Phase 3)	16	18	7	1	19%
Boundary (F.1435; 1683; 1935; 1938; 1948; 2105)	IV (Phase 3)	35	21	8	3	16%
Boundary (F.1028; 859)	IV (Phase 1)	3	4	1		12%

TTW = Thetford-type ware; EMW = Early Medieval ware; Cs = coarse ware;
Glz = glazed; Med = Medieval; fnds = foundations.

Although it is obvious that imported pottery from English sources outside East Anglia was rare at any period, it does seem to have been more common in the tenth century compared with the eleventh and early twelfth century (actually thirteen out of the eighteen St. Neot's-type ware sherds in Period II contexts came from two pits placed at the end of Period II: F.331 (Fig. 232, No. 8), and F.552.

All the Stamford-type ware was of fabric B with either green, copper glaze 3, or yellow glaze. All were typical of the twelfth century: the fourteen copper-glazed sherds probably date to after c. A.D. 1140, whereas the remaining three yellow-glazed sherds could be earlier. The seventeen sherds represent ten different vessels, eight of which are jug/pitcher forms, one is a small globular vessel and one a possible bottle ¹⁹.

2) Continental Imports

Two sherds were submitted to Richard Hodges as being of possible continental origin (one upright rim sherd from Grave 154 and one body sherd from Grave 182 (Period III/IV). He made the following identification: both sherds are very hard fired with a grey (7.5 YR N/5) outer surface and a light grey (7.5 YR N/7) core and interior. The surfaces are very smooth.

In thin section, the rim sherd from Grave 154 (Fig. 236, No. 18) has a dark brown anisotropic clay matrix with abundant angular inclusions of quartz-sand c. 0.03 mm across, and with quartzite, sub-angular quartz-sand ranging from 0.2 mm-0.6 mm across and rounded iron inclusions c. 0.15 mm across probably added as tempering.

Discussion The upright rim from Grave 154 suggests either a Middle Rhenish (Janssen 1970) or Limburg (Bruijn 1962-3, 370-390) origin (Fig. 236, No. 18). These are fragments of a fist-size cooking pot such as were made by the Pingsdorf-type and 'Blue-grey' production centres. There were also many vessels produced in this form in the Limburg kilns. The middle Rhenish wares span the period c. 950-c. 1200; the Limburg examples date to c. 1075-1225.

The Earliest Medieval Pottery at Elmham, c. A.D. 1150-1250

Period V at North Elmham is associated with Medieval coarse and glazed wares throughout, but they first make an appearance in Period IV, as shown in Table 82b.

It is clear that these eight groups represent the overlap period when Early Medieval ware and Thetford-type ware were still in use but the medieval coarse and glazed wares were available. If the excavator is correct in dating this period from c. A.D. 1050-1175, then we have evidence for the local medieval pottery industry starting in the late twelfth century. Although this is acceptable for the coarse wares, it is only recently that claims for such an early start for English glazed medieval wares have been made.

In terms of fabrics and glazes, all those present in these contexts occur in Period V, but as a group, the early glazed wares display two characteristics which separate them from later assemblages:

- i) half of the glazes are non-olive (yellow and orange being common);
- ii) one third of the glazed sherds are not fully glazed (one is sparse-glazed and two partially glazed).

This high proportion of glaze colour variation and the lack of fully competent glazing is characteristic of the earliest glazed pottery from the Grimston (Pott Row) kilns in west Norfolk (in all likelihood twelfth century)²⁰. Unfortunately, at Elmham there were no glazed rim sherds and only three coarse ware rim sherds in association (Fig. 241, Nos. 13-15).

None of the other assemblages containing medieval pottery is related to the stratigraphic sequence, but thirty two groups can be considered to date from this early period. One of these groups is associated with finds more closely dateable than the local pottery: F. 1630 contained five sherds of 'Developed' Stamford-type ware (c. A.D. 1140-1250) with

two coarse medieval vessels (Fig. 238, Nos. 3 and 8) in association with 1060 Saxo-Norman sherds, the latter surely placing the group at the end of Period IV. The pitcher (Fig. 238, No. 3) is of some interest in that the vessel form is in the Saxo-Norman tradition, but the rim form is unparalleled in the local ceramic assemblages at this time.

Another group (F. 2255) is likely to be very early Period V as it contains only five medieval sherds, including two rims in Early Medieval ware fabric, with 163 Saxo-Norman sherds (Fig. 237, Nos. 2 and 5). The remaining thirty groups are considered to date from this period on the following grounds:

- i) they contain medieval coarse ware only in association with Thetford-type ware and/or Early Medieval ware (twenty five groups), or
- ii) the medieval glazed sherds present are undecorated with a high proportion of non-olive glazes and/or they are sparse or partially glazed (five groups).

Out of these thirty groups, ten contained medieval coarse ware rims (Fig. 241, Nos. 2-6, 11, 12, 16, 19 and 21-23, and Fig. 239, Nos. 15 and 17) but none contained glazed sherds of an illustratable nature.

(5) THE MEDIEVAL POTTERY

Having isolated the earliest medieval pottery and the late medieval local wares, a large group of local medieval coarse and glazed wares remains presumably filling the gap between the two (i.e. c. A.D. 1250-1450). This group of pottery, associated with Period V of occupation on the site, is derived in the main from the complex of pits for the extraction of clay. The majority of these pits were only sampled and both the stratigraphy of their filling and their ceramic content suggest that a large proportion of residual pottery was present. This fact alone necessitates a cautious examination. Because of the lack of stratigraphic relationships the 218 ceramic groups have been divided into broad categories based on the nature of the pottery contained within them. The criteria used for this subdivision was the presence/absence of glazed wares and the nature of glazed wares when present. Medieval ceramic research suggests that the late thirteenth and early fourteenth centuries were characterised by the production of highly decorated glazed pottery, including face-masks (Rye and Hurst 1968, 279-292). Having isolated such groups from our total of 218, the remaining groups were divided into a further two categories, giving three in all:

- 1) Groups containing medieval coarse ware only (twenty);
- 2) Groups containing local 'decorated' glazed wares with local coarse wares (ninety six);
- 3) Groups containing local 'plain' glazed wares with local coarse wares (102).

The size distribution of the 218 groups within the above subdivisions is shown in Fig. 227.

1) Medieval Coarse Ware Only

There were twenty groups containing only coarse ware. Of these, seventeen contained single sherds only and the remaining three had respectively only two, three and six sherds. Consequently, no more precise dating for the features in which they were found other than 'medieval' would be safe and as groups they are of no use as data for the pottery *per se*.

2) The 'Decorated-Glazed' Groups

Ninety six groups fall into this category characterised by local glazed wares with distinctive decorative motifs (see below: The Local Glazed Pottery: Decoration). Owing to the lack of stratified relationships these groups could not be placed into an ordered sequence.

3) The 'Plain-Glazed' Groups

Although there are 102 groups in this category their dating is difficult. If the 'decorated' phase only spans the period from c. 1250-1350 then it is possible that the majority of these groups belong to the period 1350-1450. However, in the 'decorated' phase assemblages, on average only 15% of the glazed sherds present were decorated. Thus, any group belonging to the 'decorated' phase with seven or less glazed sherds need not necessarily contain a decorated sherd. Consequently, the dating of any group with seven plain, glazed sherds or less, without reference to the coarse rims present, must be conjectural and on these grounds alone, let alone the smallness of the groups *per se*, their analysis is an obvious waste of time. Five groups, however, containing more than ten sherds appeared to belong to the 'earliest medieval pottery' phase and have been dealt with under that section. Another group (F.503) contained only seven plain, glazed sherds, but can be placed in the 'decorated' phase on the basis that a halfpenny of Edward I was probably associated with it (Fig.240, Nos.16 and 17) ²¹.

Of the remaining ninety six groups only twelve contained eight or more glazed sherds in association with local coarse wares. Some of these contained glazed sherds and handles of late medieval character, but the groups were small and coarse ware rims were invariably absent or in ones and twos. This, combined with the problem of residual coarse ware intrusion, rendered the analysis of the groups in a meaningful way, impossible.

The conclusion must be that for the remaining ninety six groups out of the original 102, no date other than medieval (or possibly late medieval in some cases) can be offered and that their analysis would not be useful in any way.

(A) Local Medieval Coarse Ware

(a) Vessel Types

Cooking pots and bowls only are represented.

TABLE 83. PERIOD V COARSE WARE VESSEL TYPES:
THEIR FREQUENCY AND RIM DIAMETERS

	%	Rim diameter in cms
Cooking pots	76%	12-35 cm
Bowls	24%	20-52 cm

In terms of rim diameter both bowls and cooking pots were much larger during the medieval period than they had been in the eleventh and twelfth centuries (the latter being larger than the ninth/tenth-century vessels). Similarly, the trend towards an increase in pottery bowls in relation to cooking pots continued, although the latter was the dominant vessel type throughout.

(b) Decoration

Decoration was extremely rare, but a few examples occur of the following types:

incised 'wavy-line' on inner edge or top of bowl rims (Fig.249, No.11, Fig.243, No.3).

finger-tip impressions on inner and/or outer edge of bowl rims (Fig.245, No.1) with one example on a cooking pot rim (Fig.247, No.2).

incised lattice patterns on bowl rim top (Fig.244, No.7).

(c) Base Types

All the bases were sagging.

(d) Rim Forms

The considerable variation of coarse ware rim forms in association with the 'decorated' groups is illustrated by fourteen groups of sufficient size (Figs. 243-249).

(e) Fabrics

All the fabrics are sand-tempered, differing only in the size distribution of their sand inclusions. Most of the fabrics contain occasional grits up to 3 mm in diameter.

The 2992 sherds examined displayed 156 different colour variations. However, 60% of these sherds were represented by fourteen main colorations.

TABLE 84a. THE COMMONEST MEDIEVAL COARSE WARE FABRIC COLORATIONS

Fabric Coloration (notation)	% Whole
Grey core, black sfs (li)	20%
Dark grey-brown core/insf, black osf (cxxxviii)	6%
Grey core, dark grey-brown insf, black osf (lxxix)	5%
Grey core, grey-brown insf, black osf (lxxx)	4%
Grey core, orange-brown sfs (xl)	3%
Light grey-buff (vii)	3%
Grey core, grey-brown sfs (xlvii)	3%
Grey (ii)	3%
Grey core/insf, black osf (lix)	2.5%
Light grey-buff core/insf, black osf (cxlviii)	2.5%
Grey core, grey-buff sfs (xlv)	2%
Grey-buff (viii)	2%
Light grey (i)	2%
Grey core/insf, grey-buff osf (iv)	2%

sfs = surfaces; insf = inner surface; osf = outer surface.

TABLE 84b. THE COMMONEST MEDIEVAL GLAZED WARE FABRIC COLORATIONS

Fabric Coloration (notation)	% Whole
Grey core/insf, olive glazed osf (viii)	52%
Grey core, buff insf, olive glazed osf (xviii)	9%
Grey core/insf, olive-brown glazed osf (xi)	5%
Grey core, purply-grey insf, olive glazed osf (li)	4%
Grey core, orange-buff insf, olive glazed osf (xxviii)	3.5%
Grey core, grey-buff insf, olive glazed osf (xlii)	3.5%
Light grey core/insf, olive glazed osf (iv)	2%
Grey core, buff insf, yellow-olive glazed osf (xix)	2%
Grey core, orange insf, olive glazed osf (xxv)	2%

sfs = surfaces; insf = inner surface; osf = outer surface.

The Ceramic Sequence

(B) The Local Medieval Glazed Wares

(a) Vessel Types

All the vessels represented were jugs, apart from two examples of fish dishes (from F.2980 and F.1414), one pipkin (from F.1409/1550) and a glazed cooking pot (from F.3169).

(b) Decoration

Ninety six groups contained glazed jug sherds bearing decoration. Although the decorated sherds are the most distinctive of the glazed sherds, on average they formed only 15% of the total glazed sherds in these groups, the rest being 'plain-glazed'.

Jug/Decorative Motifs:

- Applied: vertical or curvilinear bands, of triangular section, glazed brown, red-brown, or yellow (some with moulded scales or incised cuts); (Fig.242, Nos.2, 5, 6 and 9, Fig.243, No.13);
- bands with a rectangular section and decorated with thumb/finger-tip impressions (Fig.243, No.9);
- faces, either moulded completely and attached to the rim, or with incised eyes and applied noses and arms (Fig.242, Nos.2, 8 and 10);
- rosettes (Fig.242, No.11);
- scales (Fig.242, No.12);
- Incised: horizontal lines (Fig.243, No.8);
- dot and circle (Fig.243, No.10);
- Stamped: rectangular-shaped rouletting (Fig.242, No.13);
- Different colour glazes: Linear (brown) (Fig.242, No.1);
- flowers/petals (yellow-brown-black) (Fig.243, No.14).

A selection only of the glazed sherds best displaying the decorative motifs is illustrated.

(c) Jug/Base Types

Forty one bases were present of two basic types:

- 'Obtuse': slightly sagging base with an obtuse angle to the body (70%).
These either have no thumbmarks at the angle, double thumbmarks every 72° (Fig.243, No.6), a single thumbmark at intervals (Fig.243, No.4) or continuous thumbmarks around the angle.
- 'Acute': slightly sagging base with an acute angle to the body (30%).
All these had continuous thumbmarks around the angle (Fig.243, Nos.5 and 7).

(d) Jug/Handle Types

Sixty four handles were present, 90% of which were of one of three types:

- 'Strap' handles (54%): (Fig.242, Nos.7 and 9);
- 'Rod' handles (22%);
- 'Hollow-back' handles (14%): (Fig.242, No.1).

The other 10% consisted of strap handles with multi-ridge decoration (Fig.243, No.13), oval-sectioned handles, and those made of multiples of rods stuck together, both straight (Fig.243, No.11) and twisted (Fig.243, No.12).

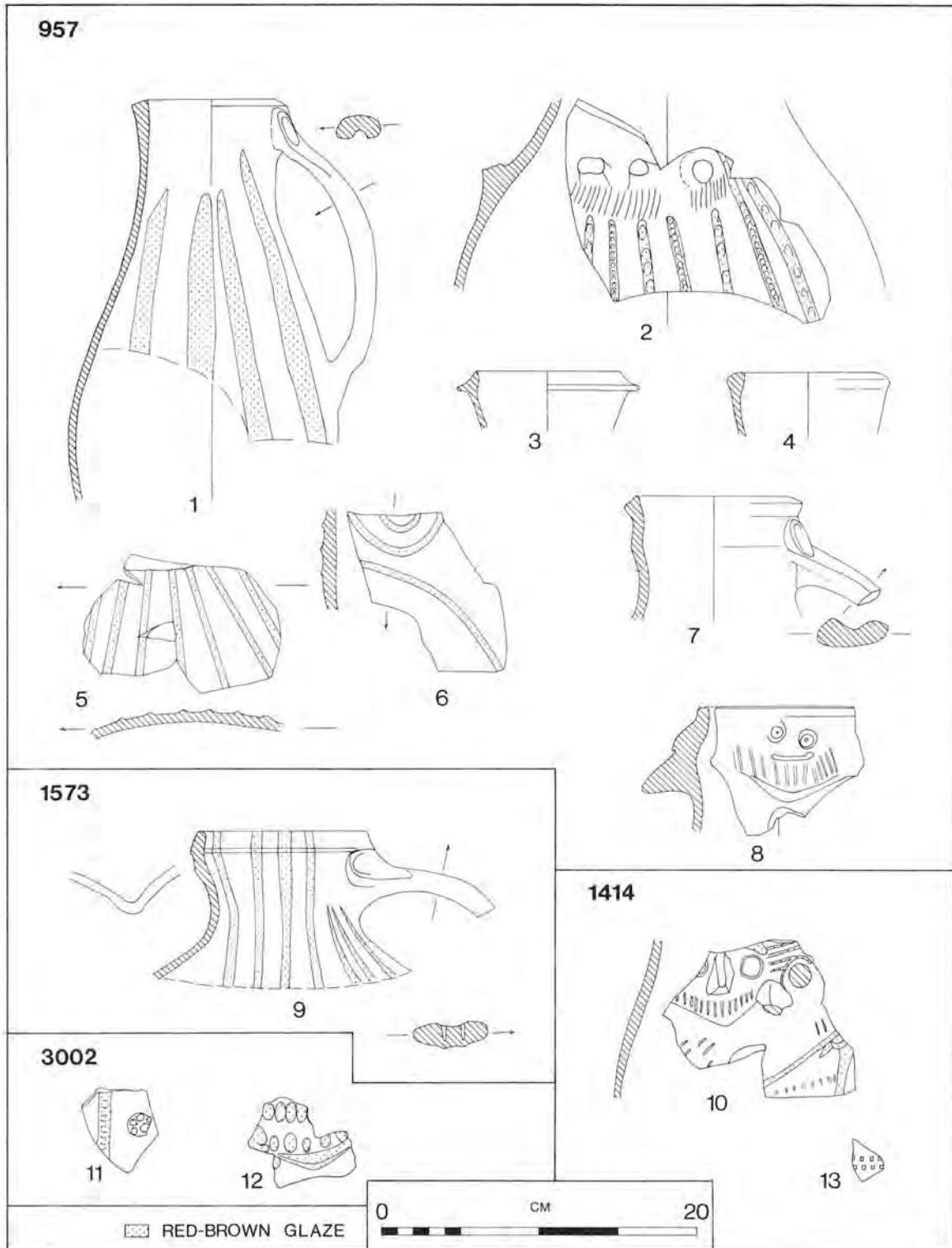


Fig. 242. Local medieval glazed wares. Scale 1:4.

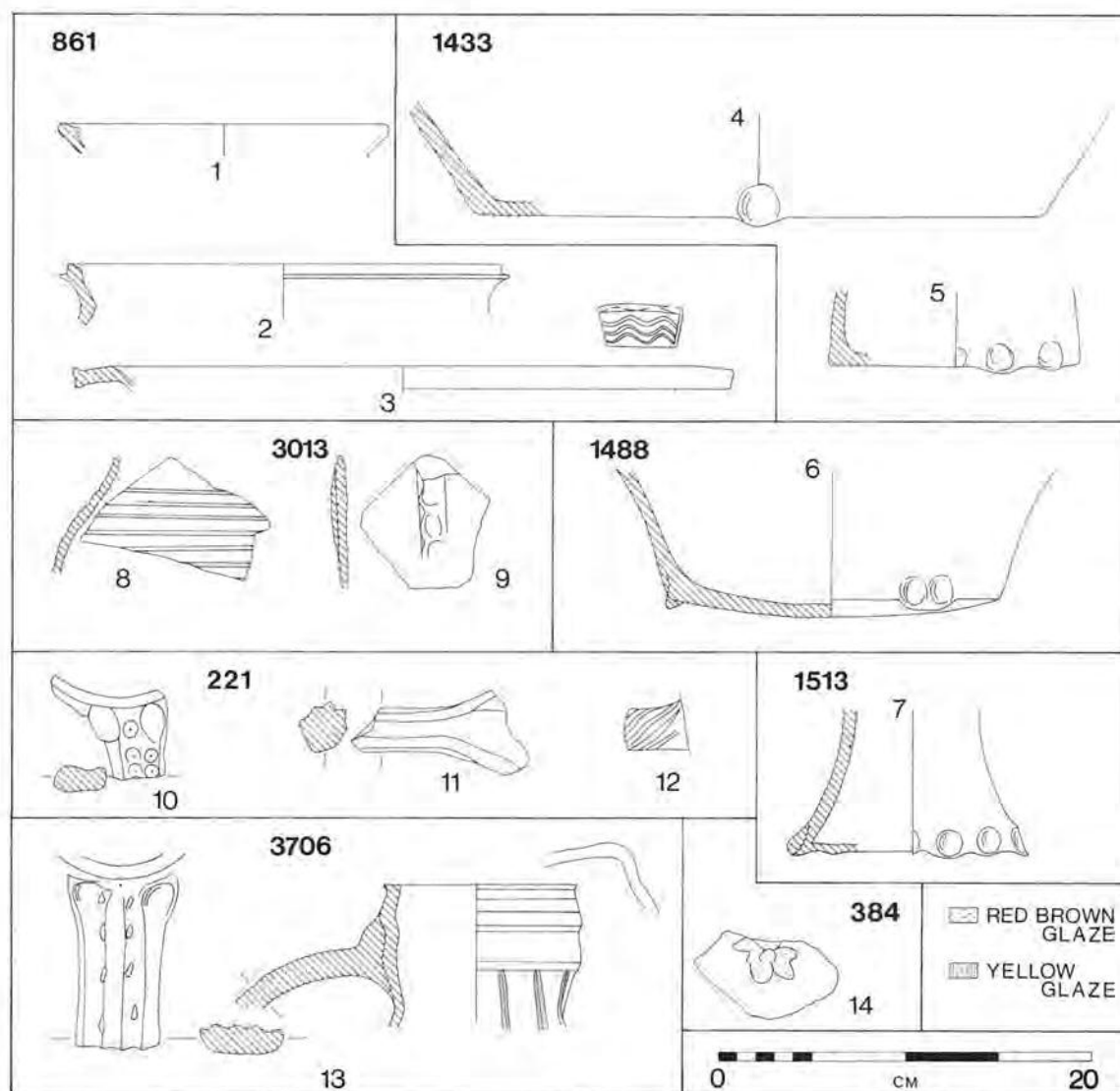


Fig.243. Local medieval coarse, Nos.1-3, and glazed wares, Nos.4-14. Scale 1:4.

(e) Fabrics

All the fabrics were sand-tempered. On the basis of fabric and glaze coloration, sixty seven different variations were identified in the 2183 glazed sherds examined. However, 83% of these sherds were represented by nine colorations (Table 84b).

Dispenser Ware and the Dating of the 'Decorated' Glazed Groups

This distinctive ware was first recognised by S.E.Rigold as a result of his excavations on the Cathedral at Elmham in 1954, where it was associated with Henry le Despenser's manor house dating to the last quarter of the fourteenth century (Rigold 1962-3, 101). Only one sherd of this ware was found in the Park excavations. The ceramic group in which it was found (F.128, Fig.246) is otherwise a 'decorated' glazed ware group, but the presence of this yellow-glazed sherd (with a red core) indicates a date at the end of the fourteenth century, conflicting with the traditional mid-fourteenth century date for the end of such decoration on medieval glazed wares. On the Cathedral site, this Dispenser ware was, in fact, associated with the highly decorated, local, green-glazed wares.

The conclusion, surely, is that it is quite possible that the 'decorated' phase continues to the end of the fourteenth century or even later. This extension of the 'decorated' phase diminishes, or possibly removes, the mid fourteenth to mid fifteenth century gap for which there are no ceramic groups at Elmham. It also creates a longer time period during which the considerable variation of associated coarse ware rim forms (Figs.243-249) is likely to have developed.

(C) Imported Medieval Glazed (English: from outside East Anglia) ²²

TABLE 85. THE FREQUENCY OF NON-EAST ANGLIAN ENGLISH MEDIEVAL GLAZED POTTERY

	Period V	Period VI
(a) Yorkshire (probably Scarborough) ware	2	-
(b) Hedingham ware	3	-
(c) Midlands ?	-	2

As can be seen from the above table, imported pottery was rare (five sherds only compared with the vast quantity of local medieval glazed sherds).

(6) **LATE MEDIEVAL/EARLY MEDIEVAL POTTERY**

Forty eight groups fell into this category, characterised by the presence of early post-medieval imported stonewares in association with local late medieval and early post-medieval wares.

(A) Late Medieval Local Glazed Ware

Vessel types are virtually restricted to jugs (Fig.250, Nos.5 and 10), bowls (Fig. 250, No.4) and handled jars (Fig.250, No. 1). The latter two categories are glazed on their inner surfaces whilst the jugs retain their basically medieval forms with glaze restricted to the outer surface. Decoration differs markedly from the earlier medieval forms and includes horizontal grooves, usually on the shoulders of jugs (Fig.250, Nos.2 and 3) and applied thumbed strips, usually on their necks (Fig.250, No.5).

As can be seen from the fabric coloration lists, glazes vary from dark green, orange, and yellow to mottled yellow-and-green and the application of glaze to the inner surface only and to both inner and outer surfaces, is a characteristic of these later medieval local wares.

The fabric and form of the jug (Fig.250, No.9) are early post-medieval, but it could well be a very late product of the local late medieval pottery industry. Jug handle types at this period are either the 'double central ridge' type (Fig.250, No.5) or the 'triple central ridge type'. Jug bases appear to be commonly of large diameter and obtuse-angled, often with single thumbprints at the angle (five at 72° intervals around the base, Fig.250, No.10).

All the characteristics defined above are common to the late products of the Grimston medieval pottery industry and it is hoped that a fuller list of characteristics will be possible in the excavation report on that site ²³. Since the excavations at Grimston, however, another production centre for local late medieval pottery has been examined at Fulmodeston in Norfolk - a site much nearer to North Elmham ²⁴. It is, therefore, impossible at this stage to be precise about the origin of the Elmham pottery in this class.

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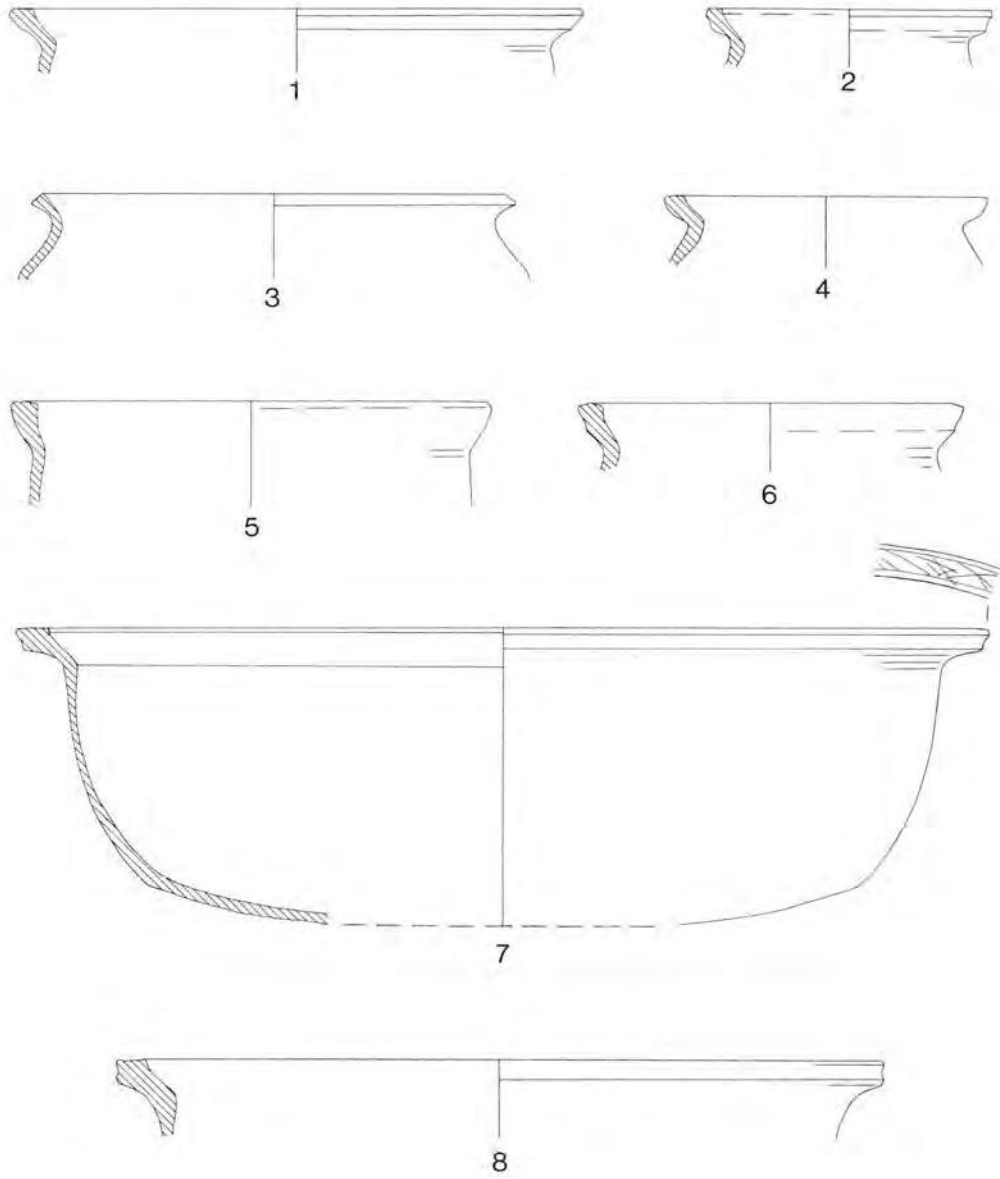


Fig. 244. Local medieval coarse wares. Scale 1:4.

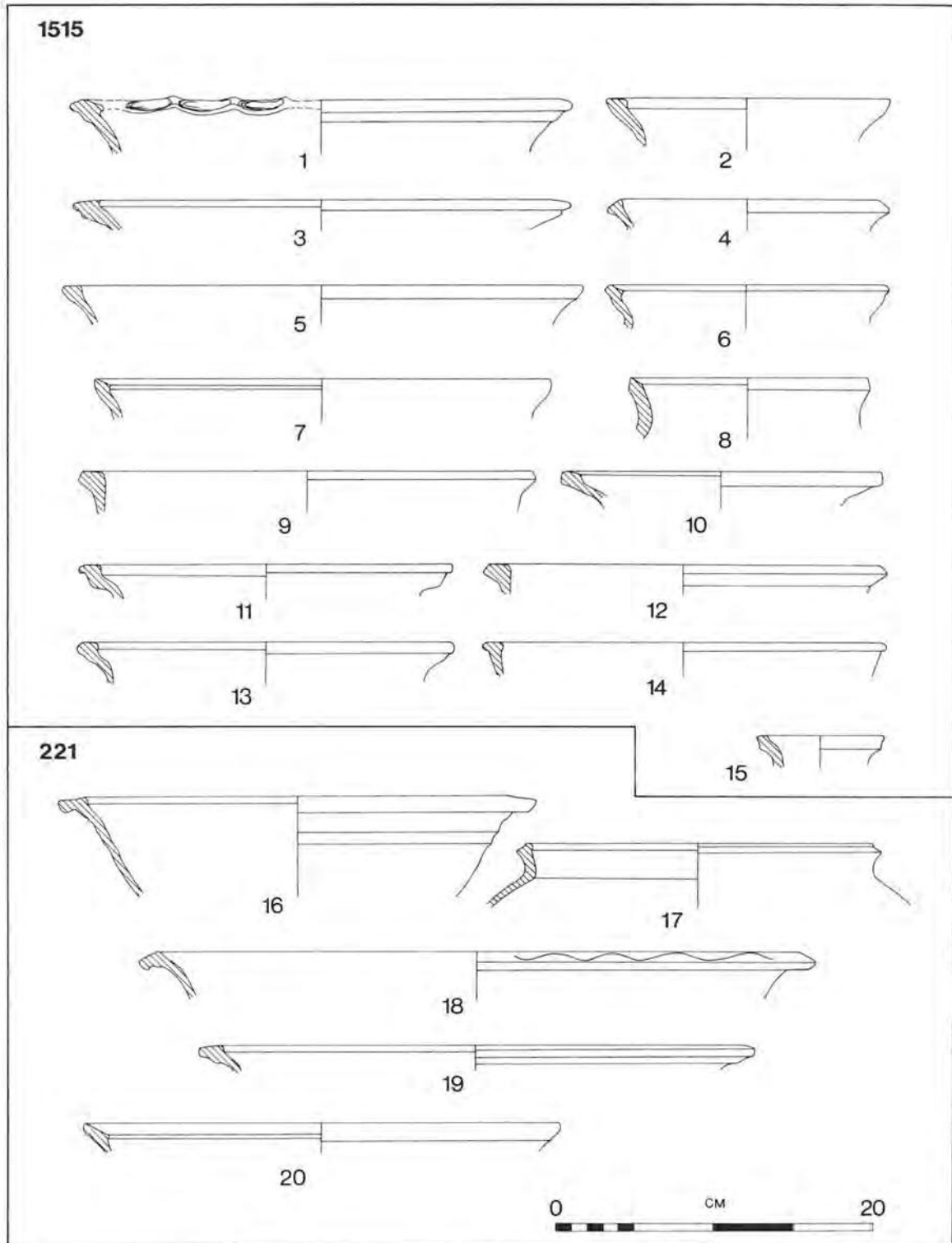


Fig. 245. Local medieval coarse wares. Scale 1:4.

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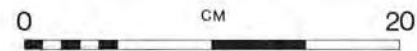
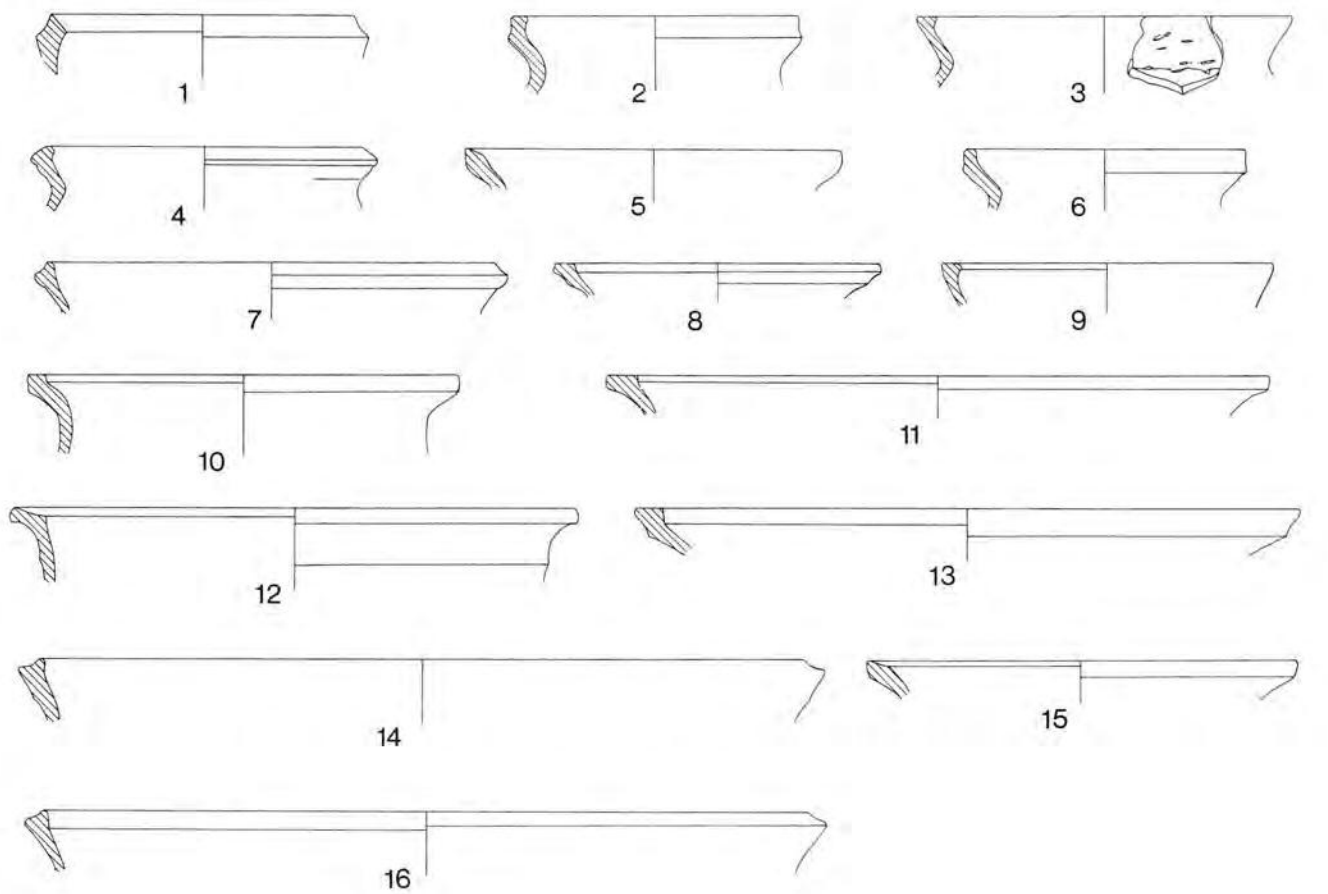


Fig.246. Local medieval coarse wares. Scale 1:4.

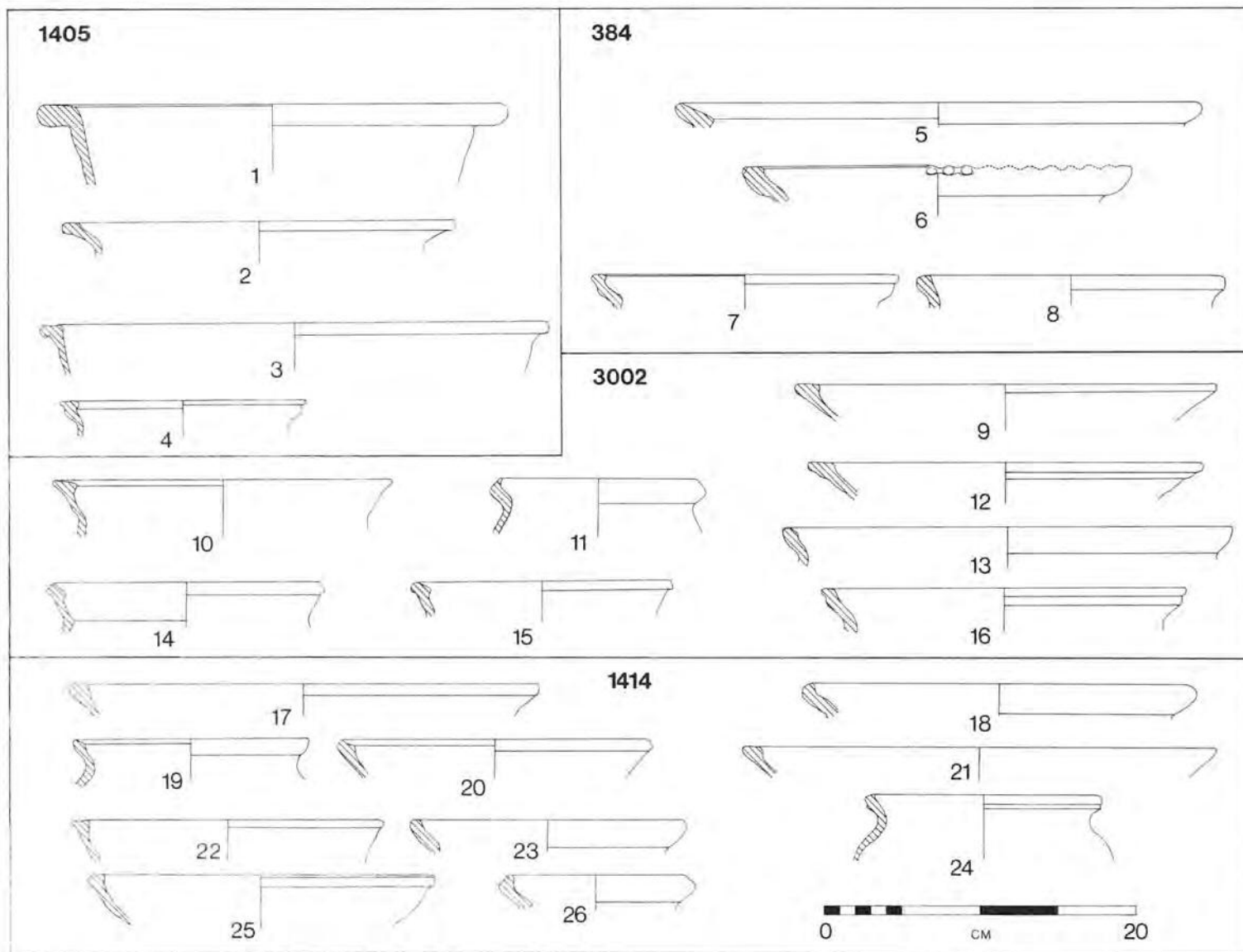


Fig. 247. Local medieval coarse wares. Scale 1:4.

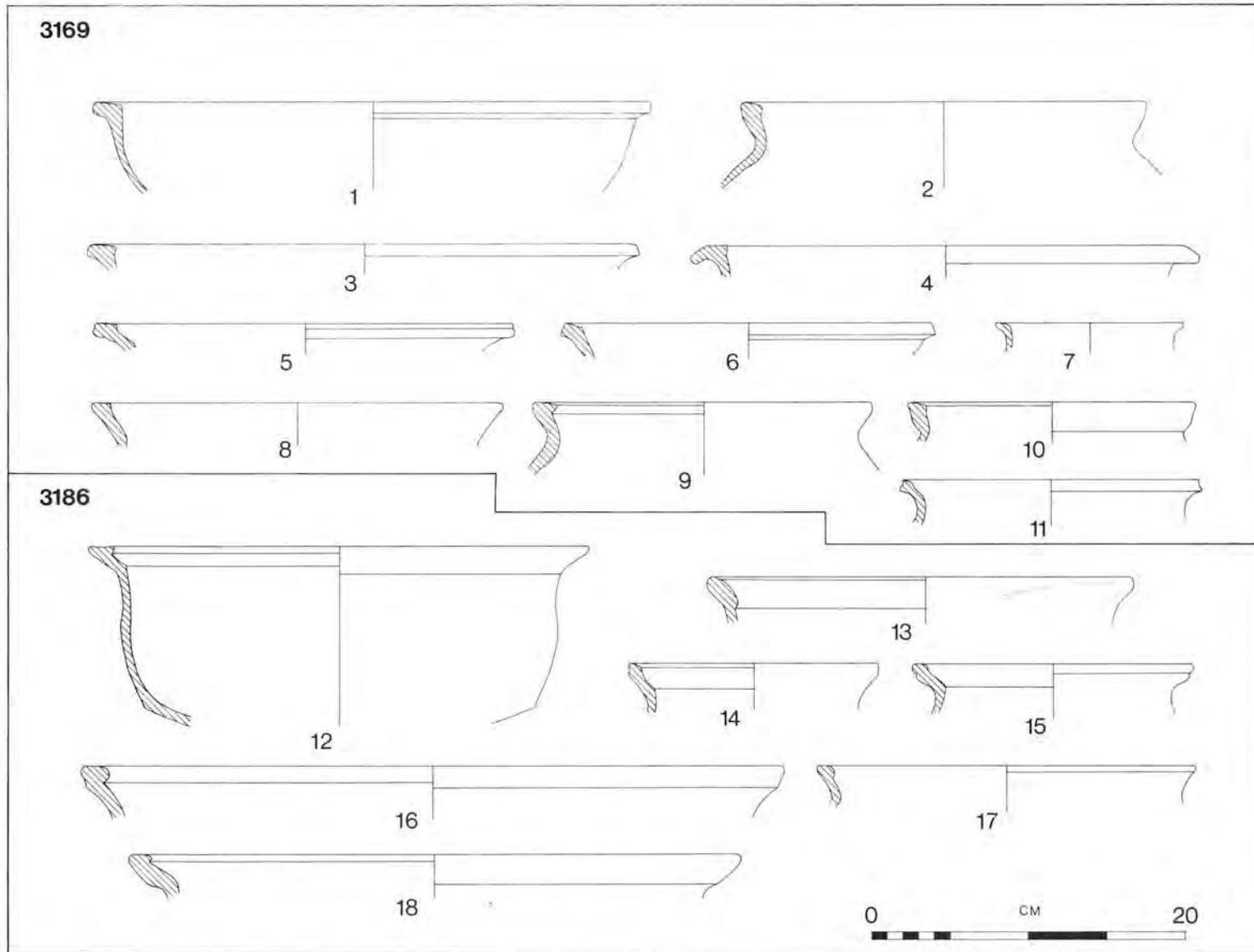


Fig.248. Local medieval coarse wares. Scale 1:4.

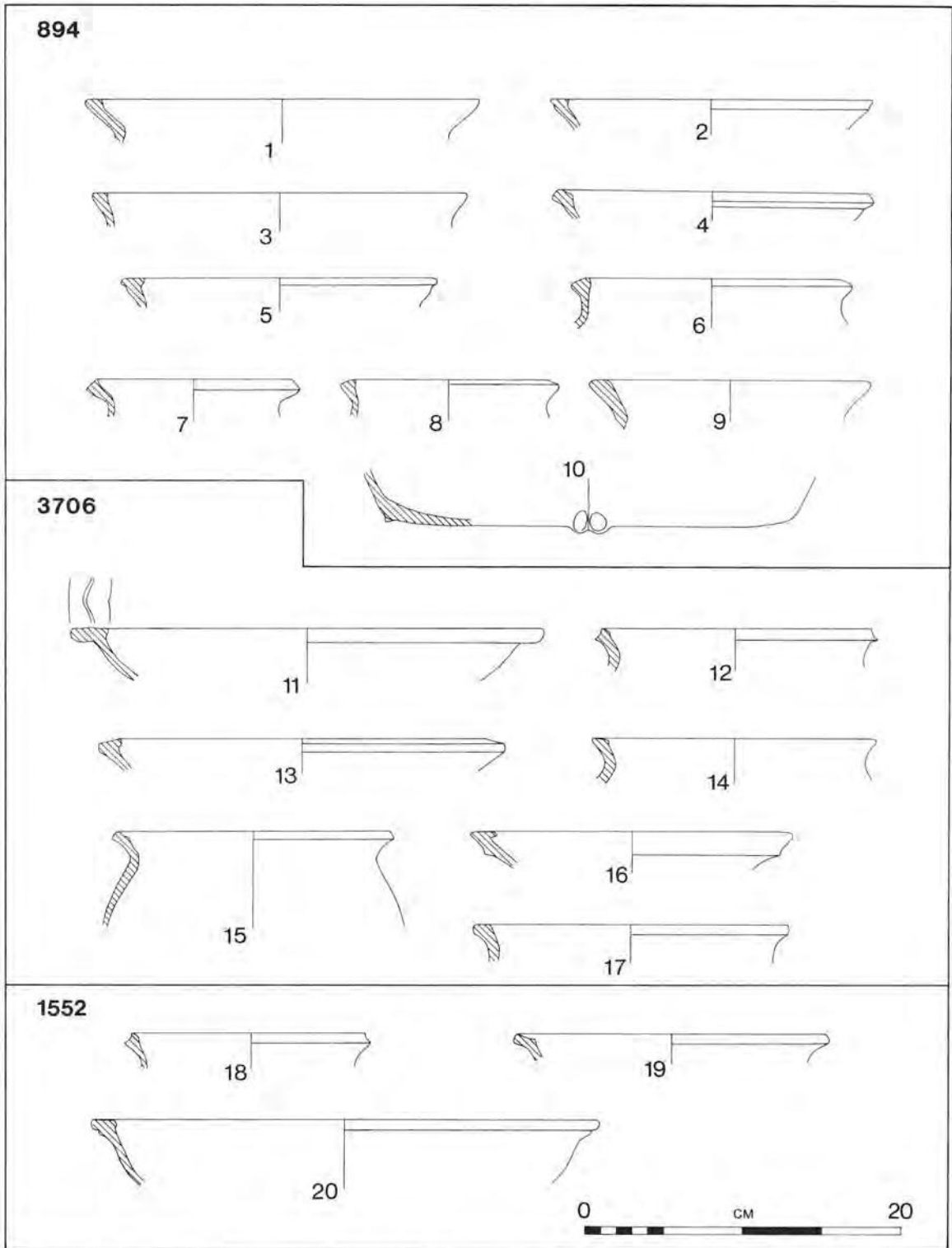


Fig. 249. Local medieval coarse wares. Scale 1:4.

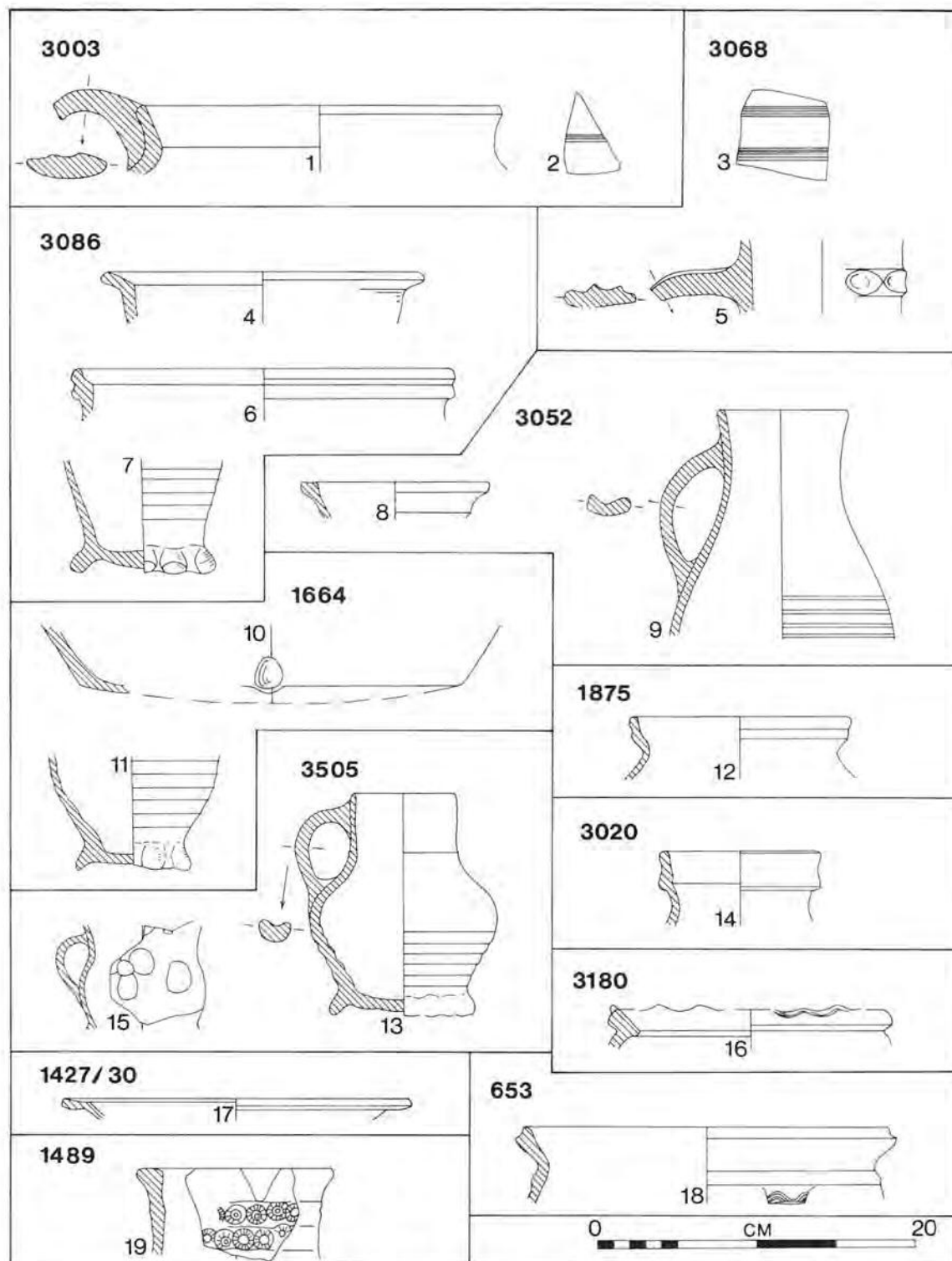


Fig.250. Late medieval local glazed wares, Nos.1-5, 9, 10, 14; early post-medieval local glazed wares, Nos.6, 8, 12, 16-19; and early post-medieval imported wares, Nos.7, 11, 13 and 15. Scale 1:4.

(B) Early Post-Medieval Local Glazed Wares

Practically all the fabrics listed in this category are found in greater quantity in the seventeenth-century groups. How early they start is impossible to say from the Elmham contexts, but there is an overlap in use (if not in production) with the local late-medieval glazed wares.

The use of a green glaze and a grey fabric (although the latter is much harder than the medieval fabrics) is dominant in this early period, whereas by the seventeenth century red fabrics and orange glaze increase to become the standard type. The use of 'black' glaze in this early period is restricted to the cooking pot or wide-mouthed jug (Fig.250, No.12).

(C) Early Post-Medieval Imported Wares**(a) Rhenish Stonewares**

- (i) Siegburg
- (ii) Raeren (Fig.250, Nos.13 and 7)
- (iii) Langeweh (Fig.250, No.11)
- (iv) Cologne

(b) English (outside East Anglia)

- (i) Cistercian ware (cup) ²⁵ (Fig.250, No.15)

Discussion The Elmham contexts add nothing to our knowledge of the imported stonewares of this early period; their accepted dates have, therefore, been used as a chronological guide for separating the earlier local wares from the later.

Siegburg, Raeren, and Langerwehe stonewares (with their characteristically early frilled bases) and Cologne stoneware were found in sufficient quantities to isolate the local wares described above. These stonewares appear in the imported section of the late medieval/early post-medieval column of the gazetteer and there were no pieces at variance with those already published from the Barn Road Excavations, Norwich (Hurst and Golson 1955, 74-76).

(7) POST-MEDIEVAL (SEVENTEENTH CENTURY)

Seventy four groups were isolated in this category and their size distribution is shown in Fig.227.

(A) Local Wares

Little can be said about this group of material which has not already been said by J.G.Hurst and J.Golson in connection with the pottery from the Barn Road Excavations, Norwich, 1951 and 1953 (Hurst and Golson 1955, 76-85). It is stated there that the wares are thought to start 'towards the end of the first quarter of the sixteenth century' and the Elmham contexts contain nothing which would conflict with that statement.

The vessel types are evident from the drawings and do not merit further comment. Neither the black-glazed tygs nor the slipware, however, start until the seventeenth century. Hurst in 1953 suggested that the latter were local in origin (Hurst and Golson 1955, 68).

(B) Imported Wares**(a) Rhenish Stonewares**

- (i) Frechen stoneware (Fig.251, Nos.12, 13 and 15; Fig.252, No.13; Fig.253, Nos.7 and 8);

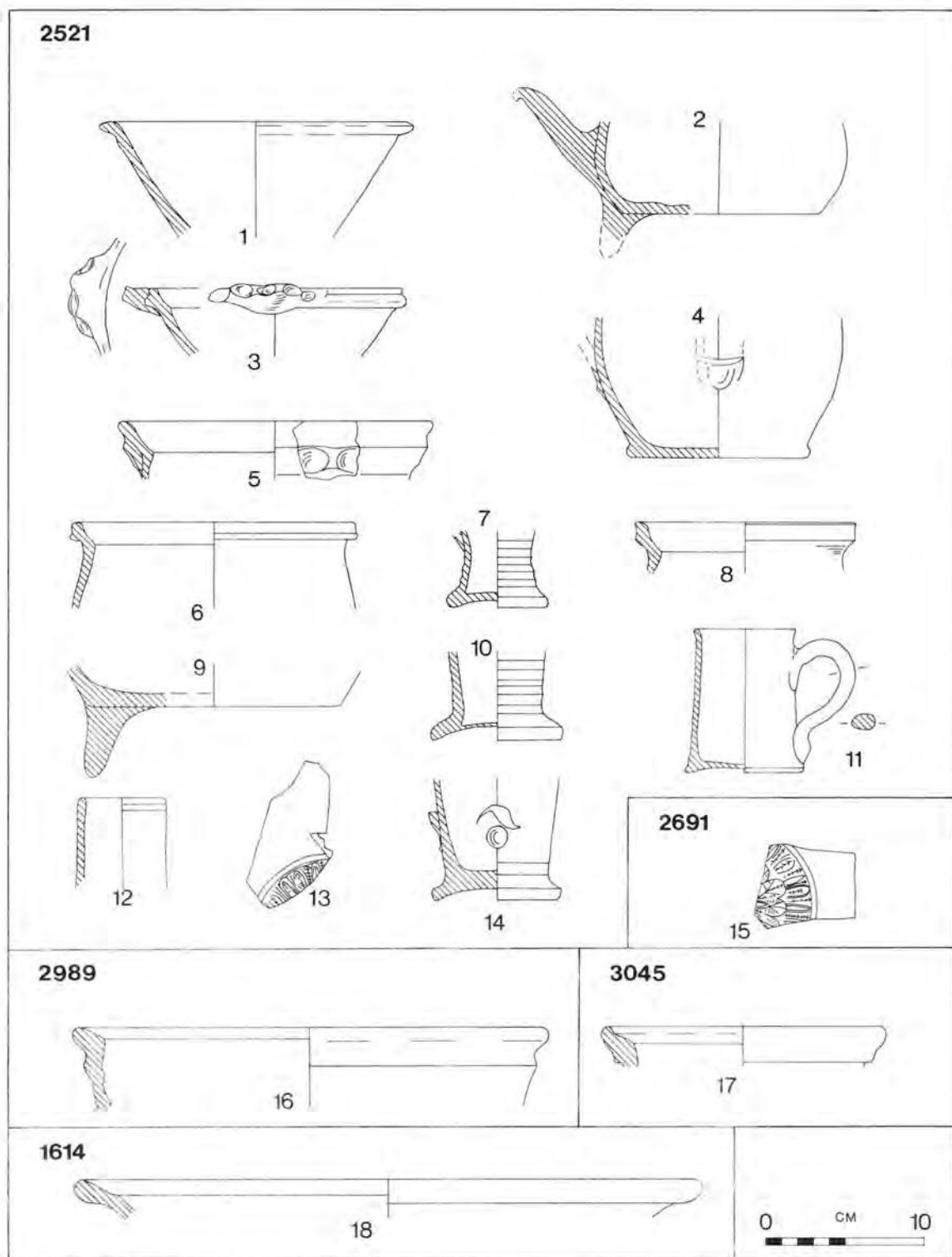


Fig. 251. Seventeenth-century pottery groups: local, Nos. 1-10, 14, 16-18; imported, Nos. 11-13, 15. Scale 1:4.

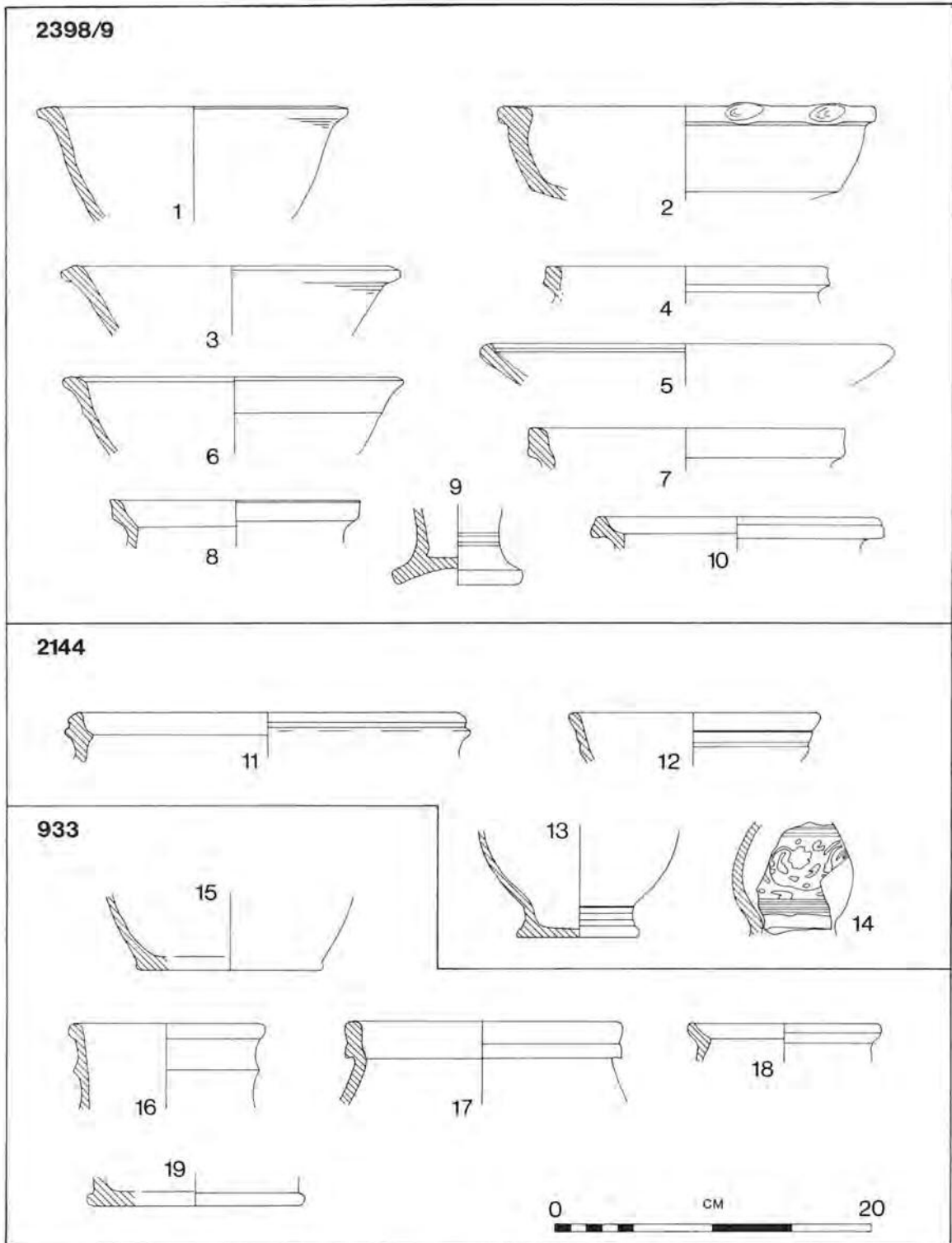


Fig.252. Seventeenth-century pottery groups: local, Nos.1-12, 15-19; imported, Nos.13-14. Scale 1:4.

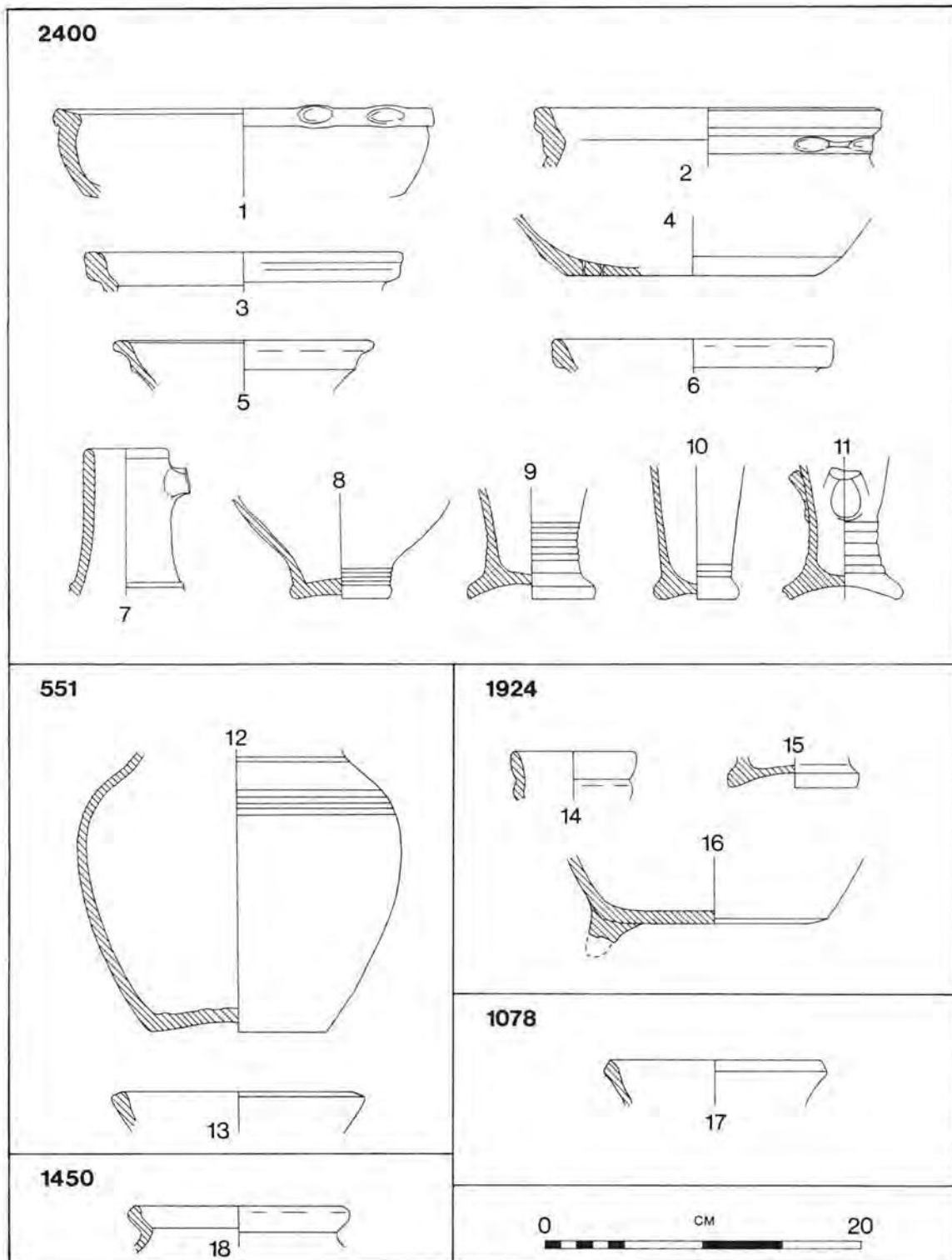


Fig. 253. Seventeenth-century pottery groups: local, Nos. 1-6, 9-18; imported, Nos. 7-8. Scale 1:4.

(b) Dutch Delft

- (i) Manganese speckled (Fig. 251, No. 11);
- (ii) Foliage cup (Fig. 252, No. 14) 26.

(8) **POST-MEDIEVAL (EIGHTEENTH AND NINETEENTH CENTURY)**

Only about a dozen groups belonged to this category, none of which merited comment or illustration.

III. CONCLUSIONS

In this chapter, some conclusions have been made in relation to the pottery industry of East Anglia, though little new information has been forthcoming about the typology of the known wares or their dating. The analysis has not, therefore, led to any finer dating of the structures than could be deduced from their stratigraphy.

The Middle Saxon assemblage is interesting largely because of the scarcity of such excavated groups at the present time. It is typical of the known East Anglian groups in that it is dominated by Ipswich-type ware and includes a small proportion of imported wares; but it differs from these other groups in the small quantity of pottery present in relation to the large area of occupation exposed, implying a phase of ceramic scarcity at least during the latter part of the period. The analysis of the Thetford-type ware groups is of some interest both in demonstrating the variability of fabrics encountered in a rural situation and the relationship between Thetford ware and Early Medieval ware during the eleventh and twelfth centuries. Of the medieval pottery, few conclusions can be drawn: a clear demonstration that our knowledge of the ceramics of this period is still surprisingly limited.

COMMENTARY

The analysis of the pottery from the North Elmham excavations was a laborious and lengthy process and it is worthwhile to consider its value in relation to its initial aims.

The Inadequacy of the Archaeological Evidence

In common with many rural, horizontally-stratified, multi-period sites, the number of stratigraphic relationships observed during the excavation was small – partly because of the similarity of the filling of features. It is possible to establish the basic sequence of periods and phases of structures (buildings and boundaries, etc.), but pits are often isolated from these features and are relatable to the broad stratigraphic sequence only by reference to the pottery they contain.

These factors led to two main problems in the analysis of the pottery:

- 1) The quantity of pottery associated with the phased contexts is too small in terms of diagnostic sherds to allow any conclusions to be drawn as to the detailed typological development of the wares present. The size distribution of the groups of each period is shown on Figs. 226 and 227.

The largest and most useful groups of pottery from the pits were seldom related to the smaller stratigraphic divisions or phases and, therefore, their dating can be no finer than the range established for the wares which they contain; this contributes little to our knowledge of the pottery *per se*.

- 2) This smallness of groups also made broad dating difficult in some cases:
 - (a) In theory the presence of Early Medieval ware with Thetford-type ware indicates the dating of a feature to post 1000 A.D., rather than earlier. However, the smaller the group, the less reliable this deduction becomes as by chance a group may be post 1000 A.D. and contain no Early Medieval ware.

Conclusions

- (b) The smaller the group, the more likely it is that dating will be biased by residual earlier material.

The Methods of Analysis

In terms of methodological approach, this report is not as 'quantitative' as some would advocate. However, it seems obvious (though it is seldom discussed) that the quality of evidence for ceramic research is variable from site to site and surely, therefore, the approach must also vary. It should also be stressed that the excavation of production centres must proceed in parallel with the study of pottery from settlement sites in order that wares might be characterised at their source. This study of the pottery from Elmham Park has certainly revealed the limitations of a very detailed survey of the material. Sites which are now most likely to advance pottery studies are those with a short sequence of occupation, datable independently from the pottery (such as major castles and ecclesiastical establishments), or a long sequence of occupation layers where the levels have not been disturbed, such as Great Yarmouth, where the occupation layers are separated by wind-blown sand (Rogerson 1976, 131-245).

IV. FABRIC COLORATION NOTATIONS FOR THE ILLUSTRATED POTTERY

Fig. No. Notation	Fig. No. Notation	Fig. No. Notation	Fig. No. Notation
228 1 1C(ii)	229 23 4A(xc)	231 25 4A(i)	233 4 4A(lxi)
2 1A(iv)	24 4A(ii)	26 4A(c)	5 4A(lxi)
3 1B(i)	25 4A(ii)	27 4A(xviii)	6 4A(ii)
4 3Ba(iv)	26 4A(ii)	232 1 4A(lxi)	7 4A(li)
5 3Ba(xii)	27 4A(ii)	2 4A(ii)	8 4A(iv)
6 3Bb(iii)	28 4A(ii)	3 4A(ii)	9 4A(ix)
7 3Bb(ii)	29 4A(ii)	4 4A(ii)	10 4A(iv)
8 3C6	30 4A(ii)	5 4A(ii)	11 4A(xviii)
9 3Bb(v)	31 3C1	6 4A(ii)	12 4A(ii)
10 3C3	231 1 4A(ii)	7 4A(ii)	13 4A(lxi)
11 3C3	2 4A(ii)	8 4C1A(ii)	14 4A(ii)
229 1 3Ba(i)	3 4A(lxi)	9 4A(iii)	15 4A(ii)
2 3Ba(i)	4 4A(lxi)	10 4A(lxi)	16 4A(ix)
3 3Ba(xvii)	5 4A(xviii)	11 4A(ii)	17 4A(lv)
4 3Ba(i)	6 4A(ii)	12 4A(iii)	18 4A(lxi)
5 3Ba(xv)	7 4A(vi)	13 4A(iii)	19 4A(ii)
6 3Bb(vi)	8 4A(xvi)	14 4A(li)	20 4A(ii)
7 3Bb(vii)	9 4A(lxi)	15 4A(ii)	21 4A(lxi)
8 3A(ii)	10 4A(ii)	16 4A(iii)	22 4A(lxi)
9 3A(iv)	11 4A(ii)	17 4A(lxi)	234 1 4A(ii)
10 3A(vi)	12 4A(lxi)	18 4A(ii)	2 4A(lxi)
11 3A(i)	13 4A(ii)	19 4A(ii)	3 4A(lxi)
12 4A(lxxxiv)	14 4A(xvi)	20 4A(ii)	4 4A(ii)
13 4A(xlviii)	15 4A(xvi)	21 4A(ii)	5 4A(lxi)
14 4A(ii)	16 4A(xlvi)	22 4A(ii)	6 4A(ii)
15 4A(ii)	17 4B(l)	23 4A(iii)	7 4A(cxi)
16 4A(xci)	18 4A(ii)	24 4A(ii)	8 4A(lxi)
17 4A(xviii)	19 4A(iv)	25 4A(xlviii)	9 4A(lxi)
18 4A(xii)	20 4A(ii)	26 4A(ii)	10 4A(cvii)
19 4A(ii)	21 4A(ii)	27 4A(iv)	11 4A(lxi)
20 4A(lxi)	22 4A(ii)	233 1 4A(ii)	12 4A(lxi)
21 4A(ii)	23 4A(cvii)	2 4A(ii)	13 4A(ii)
22 4A(ii)	24 4A(cvii)	3 4A(i)	14 4A(ii)

Fig. No.	Notation	Fig. No.	Notation	Fig. No.	Notation	Fig. No.	Notation
234	15 4A(xvi)	237	11 4A(lvii)	240	10 4A(cxxi)	243	9 5B(xviii)
	16 4A(lvii)		12 4A(lii)		11 4B(xiv)		10 5B(xi)
235	1 4A(ii)		13 4A(xvi)		12 4B(xxxiv)		11 5B(x)
	2 4A(ii)		14 4B(xxvii)		13 4A(xlviii)		12 5B(viii)
	3 4A(ii)		15 4A(lvi)		14 4B(xviii)		13 5B(xlii)
	4 4A(xviii)		16 4A(ii)		15 4A(ii)		14 5B(viii)
	5 4A(cvii)		17 4A(lxxii)		16 5A(vii)	244	1 5A(xlvii)
	6 4A(lxi)		18 4A(ii)		17 5A(xxiii)		2 5A(cxxxvii)
	7 4A(xcix)		19 4B(lii)	241	1 4B(xxxv)		3 5A(cviii)
	8 4A(vi)		20 4A(ii)		2 4B(lix)		4 5A(lxxx)
	9 4A(ii)		21 4A(xviii)		3 5A(c)		5 5A(cxl)
	10 4A(vi)		22 4A(ii)		4 5A(xviii)		6 5A(xlvii)
	11 4A(vi)		23 4A(ii)		5 5A(xxxii)		7 5A(vi)
	12 4A(lxi)		24 4A(xcii)		6 5A(lxxviii)		8 5A(cxxxii)
	13 4A(c)		25 4A(xlviii)		7 4A(lxi)	245	1 5A(lxxvi)
	14 4A(li)	238	1 4B(ii)		8 4B(xxxix)		2 5A(civ)
	15 4A(ii)		2 4B(xxxiv)		9 4B(xiv)		3 5A(xi)
	16 4A(iii)		3 4B(xvi)		10 4B(xviii)		4 5A(vii)
	17 4A(lxi)		4 4B(xv)		11 5A(lxxxv)		5 5A(xi)
	18 4A(ii)		5 4B(xiv)		12 5A(li)		6 5A(vii)
	19 4A(ii)		6 4B(xli)		13 5A(cii)		7 5A(xxvi)
	20 4A(cxvi)		7 4B(xxx)		14 5A(xliii)		8 5A(xxvii)
	21 4A(ii)		8 5A(cii)		15 5A(i)		9 5A(cxl)
	22 4A(i)		9 4B(xiv)		16 5A(lv)		10 5A(vii)
	23 4A(lxi)		10 4B(lvii)		17 4A(lxi)		11 5A(vii)
236	1 4A(ii)		11 4B(xxxiv)		18 4B(xxxix)		12 5A(viii)
	2 4A(ii)	239	1 4A(cxvii)		19 5A(xxvii)		13 5A(viii)
	3 4A(ii)		2 4A(cxi)		20 4A(iv)		14 5A(ctvii)
	4 4A(lxi)		3 4A(xlvii)		21 5A(cl)		15 5A(cxv)
	5 4C1A(viii)		4 4B(xxvii)		22 5A(xlvii)		16 5A(lix)
	6 4A(cxxi)		5 4A(i)		23 5A(ii)		17 5A(xlvii)
	7 4A(ii)		6 4A(lv)		24 4B(xxxiv)		18 5A(cxlviii)
	8 4A(ii)		7 4A(ii)	242	1 5B(xviii)		19 5A(li)
	9 4A(lxi)		8 4B(xvii)		2 5B(xi)		20 5A(li)
	10 4A(ii)		9 4A(lxi)		3 5B(xxviii)	246	1 5A(i)
	11 4A(ii)		10 4A(lxx)		4 5B(xli)		2 5A(xxxviii)
	12 4A(ii)		11 4B(lxxvi)		5 5B(viii)		3 5A(i)
	13 4A(lxi)		12 4B(lxiv)		6 5B(viii)		4 5A(vii)
	14 4A(ii)		13 4B(vii)		7 5B(xlii)		5 5A(cxl)
	15 4A(ii)		14 4B(xvii)		8 5B(xii)		6 5A(xxxviii)
	16 4A(xi)		15 5A(ii)		9 5B(viii)		7 5A(vii)
	17 4A(ii)		16 4B(lxiii)		10 5B(viii)		8 5A(i)
	18 4C2(i)		17 5A(lxii)		11 5B(xxviii)		9 5A(i)
237	1 4A(ii)		18 4A(lxi)		12 5B(viii)		10 5A(xxxviii)
	2 4B(xxxiii)	240	1 4B(xxvii)		13 5B(viii)		11 5A(cxl)
	3 4A(ii)		2 4A(lxi)	243	1 5A(vii)		12 5A(lxxxii)
	4 4A(cxvi)		3 4B(lii)		2 5A(li)		13 5A(i)
	5 4B(xxxix)		4 4A(ii)		3 5A(cxlvi)		14 5A(li)
	6 4A(i)		5 4A(cxvi)		4 5B(viii)		15 5A(xxxviii)
	7 4A(lxi)		6 4A(xliv)		5 5B(xviii)		16 5A(i)
	8 4A(ii)		7 4B(xiv)		6 5B(xlii)	247	1 5A(li)
	9 4A(lvii)		8 4B(xiv)		7 5B(xxxiv)		2 5A(lxxxii)
	10 4A(lxi)		9 4B(xxxi)		8 5B(viii)		3 5A(lxxxv)

Fabric Coloration Notations for the Illustrated Pottery

Fig. No. Notation	Fig. No. Notation	Fig. No. Notation	Fig. No. Notation
247 4 5A(cxl)	248 12 5A(xlv)	250 9 6A(xdii)	252 6 7Ah(ii)
5 5A(cldi)	13 5A(lxxxl)	10 6A(xiv)	7 7Ah(i)
6 5A(xlv)	14 5A(xlvi)	11 6Ca(iii)	8 7Ah(ii)
7 5A(cxxii)	15 5A(cxiv)	12 6Bf(i)	9 7Ap(i)
8 5A(xlvii)	16 5A(xlv)	13 6Ca(ii)	10 7Ak(i)
9 5A(xlviii)	17 5A(lxxxl)	14 6A(viii)	11 7Am(i)
10 5A(lxxxl)	18 5A(xlvii)	15 6Cb(i)	12 7Aq(i)
11 5A(lxxii)	249 1 5A(cxl)	16 6Bb(i)	13 7Ba(i)
12 5A(lxxxv)	2 5A(xliii)	17 6Bc(iv)	14 7Bb(ii)
13 5A(xl)	3 5A(i)	18 6Bb(ii)	15 7Af(ii)
14 5A(xlviii)	4 5A(cxiv)	19 6Bc(i)	16 7Am(iii)
15 5A(lxxxviii)	5 5A(vi)	251 1 7Ah(i)	17 7Ad
16 5A(xlvii)	6 5A(vii)	2 7Am(i)	18 7Ac(i)
17 5A(xlvii)	7 5A(xxxix)	3 7Ag(i)	19 7Aj(i)
18 5A(vii)	8 5A(ix)	4 7Ah(i)	253 1 7Af(i)
19 5A(x)	9 5A(i)	5 7Aa(ii)	2 7Aq(i)
20 5A(vii)	10 5B(viii)	6 7An(i)	3 7Am(i)
21 5A(lxxxl)	11 5A(cldi)	7 7Ap(i)	4 7Aa(i)
22 5A(xx)	12 5A(cxiv)	8 7Am(iii)	5 7Aa(i)
23 5A(xxxix)	13 5A(cxlviii)	9 7Aj(i)	6 7Ah(i)
24 5A(x)	14 5A(ii)	10 7Ap(i)	7 7Ba(i)
25 5A(cxlv)	15 5A(cxii)	11 7Bb(i)	8 7Ba(i)
26 5A(lxxii)	16 5A(lxxxv)	12 7Ba(i)	9 7Ap(i)
248 1 5A(li)	17 5A(xxxix)	13 7Ba(i)	10 7Ap(i)
2 5A(xlii)	18 5A(lxxx)	14 7Ap(i)	11 7Ap(i)
3 5A(lxxxl)	19 5A(cxvi)	15 7Ba(i)	12 7Ac(i)
4 5A(xlvi)	250 1 6A(v)	16 7Ah(i)	13 7Ab(ii)
5 5A(lxx)	2 6A(vii)	17 7Af(ii)	14 7Ab(i)
6 5A(xlii)	3 6A	18 7Ak(i)	15 7Ap(i)
7 5A(liii)	4 6A(iii)	252 1 7Aa(i)	16 7Ag(i)
8 5A(xxi)	5 6A(i)	2 7Af(i)	17 7Am(ii)
9 5A(xlv)	6 6Be(ii)	3 7Ak(i)	18 7Ac(ii)
10 5A(li)	7 6Ca(ii)	4 7Aq(i)	
11 5A(li)	8 6Bg(i)	5 7Am(i)	

V. FABRIC COLORATION LISTS

Abbreviations

- sf(s) : surface(s)
- insf : inner surface
- osf : outer surface
- i/c : inner core
- o/c : outer core
- glz : glaze(d)

(1) HANDMADE WARES

(A) Sand-tempered

- (i) brown
- (ii) black (burnt)
- (iii) dark grey-brown core/insf, red-brown osf
- (iv) dark grey-black core/insf, red-brown osf
- (v) brown-black core/insf, brown osf

(B) Grass-marked

- (i) grey core, orange sfs

(C) Grit-tempered

- (i) dark grey
- (ii) dark grey-brown core/insf, orange-brown osf

(3) MIDDLE SAXON POTTERY

(A) Local Slow-Wheel Ware

- (i) grey-brown with reddish patches
- (ii) grey-brown core, dark grey-black sfs
- (iii) brown core, grey sfs
- (iv) grey core/insf, dark grey-black osf
- (v) dark grey-brown core/insf, dark grey-black osf
- (vi) dark grey-black

3(B) Ipswich-type Ware(a) Sand-tempered Ware

- (i) grey
- (ii) dark grey
- (iii) buff-grey
- (iv) light grey core, grey sfs
- (v) grey core/osf, buff insf
- (vi) grey core, brown-black sfs
- (vii) grey core/osf, brown insf
- (viii) dark grey core/insf, brown-grey osf
- (ix) black core, grey-brown sfs
- (x) red-brown core, grey sfs
- (xi) grey i/c, red-brown o/c, grey sfs
- (xii) grey i/c, red-brown o/c, grey-brown sfs
- (xiii) grey i/c, pink-brown o/c, grey sfs
- (xiv) orange-brown i/c, grey-brown o/c and sfs
- (xv) grey-brown core, black sfs
- (xvi) grey core/insf, black osf
- (xvii) dark grey i/c, pink-brown o/c, dark grey-black sfs

(b) Grit-tempered ("Pimply") Ware

- (i) light grey core/insf, light grey-dark grey osf

- (ii) light grey core, grey insf, black osf
- (iii) light grey i/c, pink-brown o/c, grey sfs
- (iv) grey
- (v) dark grey core/insf, black osf
- (vi) red-brown core, light grey insf, dark grey-black osf

3(C) Imported: Late Merovingian/Early Carolingian Pottery

- (1) light red
- (2) pinkish-grey
- (3) red core, dark grey sfs
- (4) grey
- (5) reddish-brown
- (6) light grey core, grey-black sfs

(4) THE SAXO-NORMAN POTTERY

(A) Thetford-type Ware

- (i) light grey
- (ii) grey
- (iii) dark grey
- (iv) black
- (v) dark brown
- (vi) buff
- (vii) orange-buff
- (viii) brown-buff
- (ix) light grey-buff
- (x) light grey-brown
- (xi) grey-buff
- (xii) grey-brown
- (xiii) dark grey-black
- (xiv) light grey core, buff sfs
- (xv) light grey core, grey-buff insf, grey osf
- (xvi) light grey core, grey sfs
- (xvii) light grey core, grey insf, black osf
- (xviii) light grey core, dark grey-black sfs
- (xix) light grey core, orange-brown insf, grey osf
- (xx) light grey core/insf, buff osf
- (xxi) light grey core/insf, grey-brown osf
- (xxii) light grey core/insf, dark grey osf
- (xxiii) light grey core/insf, black osf
- (xxiv) light grey core, dark grey insf, grey osf
- (xxv) grey core, red-brown sfs
- (xxvi) grey core, red-brown insf, dark grey osf
- (xxvii) grey core, orange-brown insf, buff-brown osf
- (xxviii) grey core, orange-brown insf, black osf
- (xxix) grey core, orange-brown sfs
- (xxx) grey core, purpley-brown sfs
- (xxxi) grey core, dark brown insf, orange osf
- (xxxii) grey core, brown insf, black osf

Fabric Coloration Lists

- (xxxiii) grey core, dark brown insf, buff osf
- (xxxiv) grey core, orange-buff sfs
- (xxxv) grey core, buff-brown insf, buff osf
- (xxxvi) grey core, cream-orange sfs
- (xxxvii) grey core, cream insf, orange-cream osf
- (xxxviii) grey core, buff-brown sfs
- (xxxix) grey core, cream-buff sfs
- (xl) grey core, cream-buff insf, grey osf
- (xli) grey core, pinky-buff insf, dark grey-black osf
- (xlii) grey core, light buff sfs
- (xliii) grey core, light buff insf, grey osf
- (xliv) grey core, buff sfs
- (xlv) grey core, buff insf, light orange-brown osf
- (xlvi) grey core, buff insf, black osf
- (xlvii) grey core, light grey-buff sfs
- (xlviii) grey core, grey-buff sfs
- (xlix) grey core, grey-buff insf, grey-brown osf
- (l) grey core, grey-buff insf, grey osf
- (li) grey core, grey-brown sfs
- (lii) grey core, grey-brown insf, black osf
- (liii) grey core, grey insf, dark red-brown osf
- (liv) grey core/insf, grey-brown osf
- (lv) grey core/insf, buff osf
- (lvi) grey core/insf, grey-buff osf
- (lvii) grey core/insf, dark grey-black osf
- (lviii) grey core, dark grey insf, buff-brown osf
- (lix) grey core, dark grey insf, buff osf
- (lx) grey core, dark grey insf, grey osf
- (lxi) grey core, dark grey-black sfs
- (lxii) grey core, black insf, buff-orange osf
- (lxiii) grey core, black insf, cream-buff osf
- (lxiv) grey core, black insf, buff osf
- (lxv) grey core, black insf, buff-brown osf
- (lxvi) grey core, black insf, grey-brown osf
- (lxvii) grey core, black insf, grey-buff osf
- (lxviii) dark grey core, buff-brown sfs
- (lxix) dark grey core, buff sfs
- (lxx) dark grey core, grey-buff sfs
- (lxxi) dark grey core, grey-buff insf, dark grey osf
- (lxxii) dark grey core, grey-brown sfs
- (lxxiii) dark grey core, light grey sfs
- (lxxiv) dark grey core/insf, red-brown osf
- (lxxv) dark grey core/insf, buff osf
- (lxxvi) dark grey core/insf, grey-brown osf
- (lxxvii) dark grey core/insf, grey-buff osf
- (lxxviii) dark grey core/insf, grey osf
- (lxxix) light buff core/insf, buff osf
- (lxxx) light buff core/insf, grey osf
- (lxxx1) buff core/insf, orange osf
- (lxxxii) buff core, grey-brown sfs
- (lxxxiii) buff core/insf, dark grey osf
- (lxxxiv) grey-buff core/insf, grey-brown osf
- (lxxxv) grey-buff core/insf, black osf
- (lxxxvi) grey-buff core, grey insf, grey-buff osf
- (lxxxvii) grey-buff core, black insf, grey-buff osf
- (lxxxviii) buff-brown core, black insf, buff-brown osf
- (lxxxix) grey-brown core, dark grey insf, dark grey-buff osf
- (xc) grey-brown core/insf, dark grey osf
- (xci) grey-brown core, dark grey-black sfs
- (xcii) grey-brown core, black sfs
- (xciii) grey-brown core, light grey-brown insf, grey osf
- (xciv) light grey-brown core, grey sfs
- (xcv) red-brown core, buff-brown insf, grey osf
- (xcvi) red-brown core, grey sfs
- (xcvii) red-brown core, grey insf, black osf
- (xcviii) red-brown core, black insf, dark grey-buff osf
- (xcix) red-brown core, dark grey-brown sfs
- (c) red-brown core, black sfs
- (ci) cream core/insf, grey osf
- (cii) light grey i/c, red-brown o/c, dark grey-black sfs
- (ciii) grey i/c, red-brown o/c, buff sfs
- (civ) grey i/c, red-brown o/c, dark brown insf, dark red-brown osf
- (cv) grey i/c, red-brown o/c, grey sfs
- (cvi) grey i/c, red-brown o/c, grey insf, black osf
- (cvii) grey i/c, red-brown o/c, black sfs
- (cviii) grey i/c, buff-brown o/c, black insf, buff-brown osf
- (cix) grey i/c, buff-brown o/c and insf, grey osf
- (cx) grey i/c, buff o/c, dark grey-black sfs
- (cxi) grey i/c, light grey-buff o/c, grey sfs
- (cxii) grey i/c, light grey o/c, black insf, buff osf
- (cxiii) grey i/c, light grey o/c, grey insf, grey-brown osf
- (cxiv) grey i/c, light grey o/c, grey sfs
- (cxv) grey i/c, light grey o/c, grey insf, dark grey osf
- (cxvi) grey i/c, light grey o/c, black sfs
- (cxvii) grey i/c, grey-buff o/c, dark grey-black sfs
- (cxviii) dark grey i/c, red-brown o/c, black sfs

- (cxix) dark grey i/c, light grey-buff o/c, grey-buff sfs
- (cxx) dark grey i/c, light grey-buff o/c, black sfs
- (cxxi) dark grey i/c, light grey o/c, grey-dark grey sfs

4(B) Early Medieval Ware

- (i) light grey
- (ii) dark grey
- (iii) black
- (iv) light buff
- (v) light grey-white
- (vi) orange-brown
- (vii) grey-brown
- (viii) light grey core, black sfs
- (ix) light grey core/insf, light grey-buff osf
- (x) light grey core, grey insf, light buff osf
- (xi) light grey core, grey insf, grey-brown osf
- (xii) light grey core, dark brown insf, orange osf
- (xiii) light grey core, black insf, light grey osf
- (xiv) grey core, red-brown sfs
- (xv) grey core, red-brown insf, brown osf
- (xvi) grey core, orange-brown sfs
- (xvii) grey core, orange-brown insf, grey-brown osf
- (xviii) grey core, orange-brown insf, dark grey-black osf
- (xix) grey core, orange sfs
- (xx) grey core, orange insf, grey-brown osf
- (xxi) grey core, orange insf, dark brown osf
- (xxii) grey core, orange insf, black osf
- (xxiii) grey core, dark brown sfs
- (xxiv) grey core, dark brown insf, black osf
- (xxv) grey core, brown sfs
- (xxvi) grey core, grey-brown sfs
- (xxvii) grey core, grey-brown insf, dark brown osf
- (xxviii) grey core, grey-brown insf, grey osf
- (xxix) grey core, buff-brown sfs
- (xxx) grey core, buff sfs
- (xxxi) grey core, buff insf, brown osf
- (xxxii) grey core, buff insf, dark grey osf
- (xxxiii) grey core, grey-buff insf, orange-brown osf
- (xxxiv) grey core/insf, red-brown osf
- (xxxv) grey core/insf, orange-brown osf
- (xxxvi) grey core/insf, buff-brown osf
- (xxxvii) grey core/insf, grey-brown osf
- (xxxviii) grey core/insf, dark grey-black osf
- (xxxix) grey core, black sfs

- (xl) grey core, dark grey-black insf, dark red-brown osf
- (xli) grey core, dark grey-black insf, red-brown osf
- (xlii) grey core, dark grey-black insf, dark brown osf
- (xliii) grey core, dark grey-black insf, orange-brown osf
- (xliv) grey core, dark grey-black insf, grey-buff osf
- (xlv) grey core, cream-buff insf, grey-brown osf
- (xlvi) dark grey core, red-brown sfs
- (xlvii) dark grey core, red-brown insf, black osf
- (xlviii) dark grey core, orange-brown sfs
- (xlix) dark grey core/insf, dark brown to red-brown osf
- (l) black core/insf, black-brown osf
- (li) red-brown core, grey sfs
- (lii) brown core, black sfs
- (liii) black-brown core, black insf, black-brown osf
- (liv) orange-brown core, black sfs
- (lv) orange-brown core/insf, buff-brown osf
- (lvi) dark grey-brown core, light grey insf, dark grey osf
- (lvii) grey-brown core/insf, orange-brown osf
- (lviii) grey-brown core/insf, black osf
- (lix) light grey-buff core/insf, red-brown osf
- (lx) light grey-buff core/insf, dark grey-black osf
- (lxi) cream-yellow core/insf, grey-cream osf
- (lxii) white core/insf, grey osf
- (lxiii) grey i/c, red-brown o/c, black sfs
- (lxiv) grey i/c, red-brown o/c, grey-brown sfs
- (lxv) grey i/c, red-brown o/c, black insf, buff-brown osf
- (lxvi) grey i/c, light grey-buff o/c, dark grey-brown/black sfs
- (lxvii) dark grey i/c, red-brown o/c, black-brown sfs

4(C) Imported Pottery

- (1) English (Outside East Anglia)
 - (A) St. Neot's-type Ware
 - (i) grey core, buff-brown sfs
 - (ii) grey core, purply-brown sfs
 - (iii) grey core, grey-brown sfs
 - (iv) grey core, brown insf, black osf
 - (v) grey-brown core, orange-brown insf, grey-brown osf
 - (vi) grey-brown core, buff-brown insf, grey-brown osf

Fabric Coloration Lists

- (vii) dark grey core, buff-brown sfs
- (viii) black core/insf, brown osf
- (ix) grey-brown
- (B) Stamford-type Ware
- (i) creamy-white core/insf, yellow glz osf
- (ii) pinkish-white core/insf, pale greenish-yellow glz osf
- (iii) white core, pink insf, yellow glz osf
- (2) Continental (?Limburg/Middle Rhenish)
- (i) light grey core/insf, grey osf
- (5) MEDIEVAL POTTERY
- (A) Local Coarse Ware
- (i) light grey
- (ii) grey
- (iii) black
- (iv) light orange
- (v) buff
- (vi) orange
- (vii) light grey-white
- (viii) grey-buff
- (ix) orange-buff
- (x) light grey-brown
- (xi) grey-brown
- (xii) white core/insf, dark grey osf
- (xiii) white core, grey insf, black osf
- (xiv) light grey-white core, black sfs
- (xv) light grey-white core/insf, dark red-brown osf
- (xvi) light grey-white core/insf, light grey-buff osf
- (xvii) light grey-white core/insf, grey-brown osf
- (xviii) light grey-white core/insf, dark grey osf
- (xix) light grey-white core/insf, black osf
- (xx) light grey-white core, grey insf, light grey-white osf
- (xxi) light grey-white core, dark grey insf, light grey-white osf
- (xxii) grey-white core, light grey-brown sfs
- (xxiii) light grey core, black sfs
- (xxiv) light grey core, dark grey sfs
- (xxv) light grey core, dark brown sfs
- (xxvi) light grey core, buff sfs
- (xxvii) light grey core, light grey-buff sfs
- (xxviii) light grey core/insf, dark brown osf
- (xxix) light grey core, cream-buff insf, light grey-buff osf
- (xxx) light grey core, grey-buff insf, light grey-brown osf

- (xxxci) light grey core/insf, buff osf
- (xxxcii) light grey core/insf, red-brown osf
- (xxxiii) light grey core/insf, light grey-buff osf
- (xxxiv) light grey core/insf, black osf
- (xxxv) light grey core, buff insf, light grey osf
- (xxxvi) light grey core, grey insf, buff osf
- (xxxvii) light grey core, grey insf, black osf
- (xxxviii) grey core, red-brown sfs
- (xxxix) grey core, orange sfs
- (xl) grey core, orange-brown sfs
- (xli) grey core, brown sfs
- (xlii) grey core, buff-brown sfs
- (xliii) grey core, orange-buff sfs
- (xliv) grey core, buff sfs
- (xlv) grey core, grey-buff sfs
- (xlvi) grey core, light grey-buff sfs
- (xlvii) grey core, grey-brown sfs
- (xlviii) grey core, light grey sfs
- (xlix) grey core, patchy grey insf, grey-black-buff osf
- (l) grey core, white sfs
- (li) grey core, dark grey-black sfs
- (lii) grey core/insf, orange osf
- (liii) grey core/insf, buff-brown osf
- (liv) grey core/insf, buff osf
- (lv) grey core/insf, grey-buff osf
- (lvi) grey core/insf, dark grey (with red patches) osf
- (lvii) grey core/insf, grey (with buff-brown patches) osf
- (lviii) grey core/insf, grey-brown osf
- (lix) grey core/insf, black osf
- (lx) grey core, red-brown insf, dark grey-brown osf
- (lxi) grey core, **purply-buff insf, dark grey-black osf**
- (lxii) grey core, **red-brown insf, black osf**
- (lxiii) grey core, orange insf, brown osf
- (lxiv) grey core, orange insf, buff osf
- (lxv) grey core, orange insf, grey osf
- (lxvi) grey core, orange insf, light grey-buff osf
- (lxvii) grey core, orange insf, black osf
- (lxviii) grey core, orange-buff insf, black osf
- (lxix) grey core, buff insf, red-brown osf
- (lxx) grey core, buff insf, grey-brown osf
- (lxxi) grey core, buff insf, dark grey-buff osf

- (lxxii) Grey core, buff insf, grey-buff osf
 (lxxiii) grey core, buff insf, dark grey osf
 (lxxiv) grey core, buff insf, black osf
 (lxxv) grey core, light orange-buff insf, light buff osf
 (lxxvi) grey core, dark brown insf, black osf
 (lxxvii) grey core, dark brown insf, grey-brown osf
 (lxxviii) grey core, dark grey-brown insf, orange-brown osf
 (lxxix) grey core, dark grey-brown insf, black osf
 (lxxx) grey core, grey-brown insf, dark brown osf
 (lxxx1) grey core, grey-brown insf, black osf
 (lxxx2) grey core, light grey-brown insf, black osf
 (lxxx3) grey core, buff-brown insf, black osf
 (lxxx4) grey core, grey-buff insf, orange-brown osf
 (lxxx5) grey core, grey-buff insf, dark grey-black osf
 (lxxx6) grey core, light grey-buff insf, black osf
 (lxxx7) grey core, light buff insf, orange-brown osf
 (lxxx8) grey core, cream insf, grey-brown osf
 (lxxx9) grey core, white-buff insf, dark grey osf
 (xc) grey core, light grey-white insf, black osf
 (xci) grey core, light grey insf, buff osf
 (xcii) grey core, light grey insf, black osf
 (xciii) grey core, dark grey insf, dark red-brown osf
 (xciv) grey core, dark grey insf, grey-buff osf
 (xcv) grey core, dark grey insf, orange-buff osf
 (xcvi) grey core, black insf, dark red-brown osf
 (xcvii) grey core, black insf, brown osf
 (xcviii) grey core, black insf, dark buff-brown osf
 (xcix) grey core, black insf, grey-brown osf
 (c) grey core, black insf, orange-brown osf
 (ci) grey core, black insf, orange osf
 (cii) grey core, black insf, grey-brown osf
 (ciii) grey core, black insf, buff osf
 (civ) grey core, black insf, grey-buff osf
 (cv) dark grey core, orange-buff sfs
 (cvi) dark grey core/insf, buff osf
 (cvii) dark grey core/insf, grey-buff osf
 (cviii) dark grey core/insf, orange-brown osf
 (cix) dark grey core/insf, grey (with brown patches) osf
 (cx) dark grey core, grey-buff insf, black osf
 (cxi) dark grey core, buff insf, grey-buff osf
 (cxii) red-brown core, buff-brown sfs
 (cxiii) red-brown core, buff sfs
 (cxiv) red-brown core, grey-buff sfs
 (cxv) red-brown core, black sfs
 (cxvi) red-brown core/insf, black-brown osf
 (cxvii) red-brown core, dark brown insf, black osf
 (cxviii) red-brown core, buff-brown insf, grey osf
 (cxix) red-brown core, grey-brown insf, dark brown osf
 (cxx) red-brown core, grey-brown insf, black osf
 (cxx1) red-brown core, dark grey-buff insf, brown-buff osf
 (cxx2) red-brown core, light grey insf, brown osf
 (cxx3) red-brown core, black insf, dark brown osf
 (cxx9) dark brown core, dark grey-black sfs
 (cxxx) orange-brown core, dark brown sfs
 (cxxx1) orange-brown core, dark grey-brown insf, black osf
 (cxxx2) orange-brown core, black sfs
 (cxxx3) orange-brown core, dark brown insf, orange-brown osf
 (cxxx4) orange-brown core/insf, buff-brown osf
 (cxxx5) orange-brown core, dark brown insf, buff-brown osf
 (cxxx6) orange core, orange-brown insf, black (with orange patches) osf
 (cxxx7) orange core, grey-brown sfs
 (cxxx8) dark grey-brown core/insf, black osf
 (cxxx9) dark grey-brown core/insf, red-brown osf
 (cx1) grey-brown core/insf, dark grey-black osf
 (cx11) grey-brown core/insf, orange-brown osf
 (cx12) light grey-brown core/insf, black osf
 (cx13) grey-buff core, black sfs
 (cx14) grey-buff core, dark grey insf, grey-buff osf

Fabric Coloration Lists

- (cxlv) grey-buff core/insf, grey osf
- (cxlvi) grey-buff core/insf, black osf
- (cxlvii) light grey-buff core, black sfs
- (cxlviii) light grey-buff core/insf, black osf
- (cxlix) light grey-buff core/insf, grey osf
- (cl) light grey-buff core/insf, grey-brown osf
- (cli) light grey-buff core, black insf, light grey-buff osf
- (clii) grey i/c, red-brown o/c, dark grey-black sfs
- (cliii) grey i/c, red-brown o/c, black insf, buff-brown osf
- (cliv) grey i/c, red-buff o/c, dark grey-black sfs
- (clv) grey i/c, buff o/c, black sfs
- (clvi) dark grey i/c, light grey o/c, grey insf, grey-brown osf
- (clvii) grey i/c, red-brown o/c, buff sfs

5(B) Local Glazed Wares

- (i) light grey core, white-grey insf, matt yellow glz osf
- (ii) light grey core/insf, olive-brown glz osf
- (iii) light grey core/insf, dark olive glz osf
- (iv) light grey core/insf, olive glz osf
- (v) light grey core/insf, olive-yellow glz osf
- (vi) light grey core/insf, mottled yellow glz osf
- (vii) grey core, light grey-white insf, olive glz osf
- (viii) grey core/insf, olive glz osf
- (ix) grey core/insf, yellow glz osf
- (x) grey core/insf, yellow-olive glz osf
- (xi) grey core/insf, brown-olive glz osf
- (xii) grey core/insf, dark olive glz osf
- (xiii) grey core/insf, olive glz osf with orange patches
- (xiv) grey core/insf, mottled olive glz osf
- (xv) grey core/insf, sparse olive glz osf
- (xvi) grey core, buff insf, dark olive glz osf
- (xvii) grey core, buff insf, partial orange glz osf
- (xviii) grey core, buff insf, olive glz osf
- (xix) grey core, buff insf, yellow-olive glz osf
- (xx) grey core, buff insf, brown-olive glz osf
- (xxi) grey core, buff insf, orange-brown glz osf

- (xxii) grey core, buff insf, orange glz osf with yellow-olive splashes
- (xxiii) grey core, buff insf, orange glz osf
- (xxiv) grey core, buff insf, sparse olive glz osf
- (xxv) grey core, orange insf, olive glz osf
- (xxvi) grey core, orange insf, orange-brown glz osf
- (xxvii) grey core, orange insf, brown glz osf
- (xxviii) grey core, orange-buff insf, olive glz osf
- (xxix) grey core, orange-buff insf, olive glz osf
- (xxx) grey core, orange-buff insf, olive-brown glz osf
- (xxxi) grey core, orange-buff insf, orange glz osf with green patches
- (xxxii) grey core, pink-buff insf, partial olive glz osf
- (xxxiii) grey core, light buff insf, olive glz osf
- (xxxiv) grey core, cream-buff insf, olive glz osf
- (xxxv) grey core, cream-buff insf, olive-brown glz osf
- (xxxvi) grey core, cream-buff insf, orange glz osf
- (xxxvii) grey core, cream insf, olive-brown glz osf
- (xxxviii) grey core, cream insf, dark olive glz osf
- (xxxix) grey core, cream insf, matt olive-yellow glz osf
- (xl) grey core, light grey-buff insf, olive glz osf
- (xli) grey core, grey-buff insf, olive-brown glz osf
- (xlii) grey core, grey-buff insf, olive glz osf
- (xliiii) grey core, grey-buff insf, yellow glz osf
- (xliv) grey core, grey-buff insf, orange/grey-buff osf with olive glz splashes
- (xlv) grey core, buff-brown insf, olive-brown glz osf
- (xlvi) grey core, buff-brown insf, yellow glz osf
- (xlvii) grey core, buff-brown insf, olive glz osf
- (xlviii) grey core, grey-brown insf, olive glz osf
- (xlix) grey core, grey-brown insf, olive-brown glz osf
- (l) grey core, purpley-buff insf, olive-brown glz osf
- (li) grey core, purpley-grey insf, olive glz osf
- (lii) grey core, purpley-grey insf, olive-brown glz osf

- (liii) grey core, black insf, olive and yellow glz osf
- (liv) grey core, olive glz insf, grey osf
- (lv) grey core, olive glz insf and osf
- (lvi) grey core, olive glz insf, yellow glz osf
- (lvii) grey core, dark olive-brown glz insf and osf
- (lviii) grey core, thick olive-brown glz insf, grey-buff osf with olive glz patches
- (lix) dark grey core/insf, olive-brown glz osf
- (lx) dark grey core/insf, olive glz osf
- (lxi) orange core/insf, pink-cream osf with traces olive glz
- (lxii) orange core, yellow glz insf and osf
- (lxiii) orange core/insf, yellow-olive glz osf
- (lxiv) orange-pink core/insf, orange-brown glz osf
- (lxv) grey-buff core, dark olive-brown glz insf, dark green and yellow glz osf
- (lxvi) grey-buff core/insf, orange osf with splashes of yellow glz
- (lxvii) light grey-buff core/insf, sparse olive glz osf

5(C) Imported (English Glazed from outside East Anglia)

- (a) Yorkshire (probably Scarborough) Ware
 - (i) cream core/insf, yellow-orange glz osf with applied decoration glz red and black
 - (ii) white core/insf, light and dark green glz osf
- (b) Hedingham Ware
 - (i) pinkish-orange core/insf, very dark green glz osf
- (c) Midlands
 - (i) white core/insf, dark green glz (patchy) osf

(6) LATE MEDIEVAL/EARLY POST-MEDIEVAL FABRICS

(A) Late Medieval Local Glazed Wares

- (i) grey fabric, dark green glz osf
- (ii) grey fabric, dark olive glz insf and osf
- (iii) grey fabric, thick green glz insf
- (iv) grey fabric, bright green glz osf
- (v) grey fabric, mottled green and yellow glazed insf and osf
- (vi) grey core, buff insf, mottled yellow and green glz osf

- (vii) grey core, buff insf, olive glz osf
- (viii) grey fabric, olive green glz osf
- (ix) grey fabric, insf with spots green glz
- (x) grey fabric, mottled green and orange glz osf
- (xi) orange core, buff insf, poor orange glz osf
- (xii) grey fabric, olive green-brown glz insf and osf
- (xiii) hard grey fabric, buff insf, osf patchy olive glz (pitted)
- (xiv) light grey fabric, mottled yellow glz osf

(B) Early Post-Medieval Local Glazed Wares

(a) Green glazed

- (i) red fabric, green glz osf
- (ii) red fabric, dark green glz insf
- (iii) grey fabric, very dark green glz osf
- (iv) grey fabric, splashes green glz osf
- (v) grey core, red osf, with partial green glz, grey-brown insf
- (vi) grey core, red sfs, spots green glz osf

(b) Green and Yellow Glazed

- (i) grey fabric, green glz osf, yellow-green glz insf (Fig.250, No.16)
- (ii) grey fabric, green and yellow patchy glz insf and osf (Fig.250, No.18)

(c) Green and Orange Glazed

- (i) grey core, orange insf, dark green glz mottled orange osf (Fig.250, No.19)
- (ii) red fabric, speckled green, yellow and orange glz insf
- (iii) red fabric, insf orange glz with green speckles
- (iv) red fabric, osf orange glz mottled green (Fig.250, No.17)
- (v) red fabric, orange-brown glz osf with large blobs green glz

(d) Orange Glazed

- (i) red fabric, orange-brown glz osf
- (ii) red fabric, orange-brown glz insf
- (iii) red fabric, orange-brown glz insf and osf

(e) Purple Glazed

- (i) grey fabric, spots purple glz osf
- (ii) grey fabric purple glz insf (Fig.250, No.6)

(f) Black Glazed

- (i) grey fabric, black glz osf (Fig.250, No.12)

Fabric Coloration Lists

- (g) Red-Brown Glazed
 (i) red fabric, red-brown glz insf and osf (Fig. 250, No. 8)
- (h) Yellow-Brown Glazed
 (i) red fabric, yellow-brown glz insf
- (C) Early Post-Medieval Imported Wares
- (h) English (Outside East Anglia)
 (i) Cistercian Ware: red-brown fabric, dark brown slightly green glz insf, and osf; osf with yellow glz petal decoration (Fig. 250, No. 15)
- (7) POST-MEDIEVAL (SEVENTEENTH CENTURY)
- (A) Local Wares
- (a) Dark Green Glazed
 (i) red fabric, dark green glz insf (Fig. 252, No. 1; Fig. 253, Nos. 4 and 5)
 (ii) red fabric, dark green glz insf and osf (Fig. 251, No. 5)
 (iii) red fabric, dark green glz osf
- (b) Bright Green Glazed
 (i) white fabric, bright green glz insf and osf (Fig. 253, No. 14)
 (ii) red fabric, bright green glz insf (Fig. 253, No. 13)
- (c) Partial Green Glazed
 (i) grey core, reddish sfs, partial green glz osf (Fig. 253, No. 12; Fig. 252, No. 18)
 (ii) grey core, red osf, insf partial green glz (Fig. 253, No. 18)
 (iii) grey fabric, speckled light and dark green glz osf
- (d) Hard Grey Coarse (Fig. 252, No. 17)
- (e) Purple Glazed
 (i) grey core, red osf, insf with purple glz
- (f) Green-Brown Glazed
 (i) red fabric, green-brown glz insf (Fig. 252, No. 2; Fig. 253, No. 1)
 (ii) red fabric, green-brown glz insf and osf (Fig. 251, No. 17; Fig. 252, No. 15)
- (g) Yellow-Green Glazed
 (i) red fabric, yellow-green glz insf (Fig. 253, No. 16; Fig. 251, No. 3)
 (ii) red fabric, yellow-green glz insf and osf
- (h) Yellow-Brown Glazed
 (i) red fabric, yellow-brown glz insf (Fig. 251, Nos. 1, 4 and 16; Fig. 252, No. 7; Fig. 253, No. 6)
 (ii) red fabric, yellow-brown glz insf and osf (Fig. 252, Nos. 6 and 8)
- (j) Green/Yellow/Orange Patchy Glaze
 (i) red fabric, green/yellow/orange patchy glz insf and osf (Fig. 251, No. 9; Fig. 252, No. 19)
- (k) Orange-Brown Glazed Speckled Green
 (i) red fabric, osf orange-brown glz speckled green (Fig. 251, No. 18; Fig. 252, Nos. 3 and 10)
- (l) Orange-Brown Glazed with large blobs Green Glaze
 (i) red fabric, osf glz orange-brown with large blobs green glz
 (ii) red fabric, orange-brown glz insf with large blobs green glz
 (iii) red fabric, insf and osf orange-brown glz with large blobs green glz
- (m) Orange-Brown Glazed
 (i) red fabric, orange-brown glz insf (Fig. 251, No. 2; Fig. 252, Nos. 5 and 11; Fig. 253, No. 3)
 (ii) red fabric, orange-brown glz osf (Fig. 253, No. 17)
 (iii) red fabric, orange-brown glz insf and osf (Fig. 251, No. 8; Fig. 252, No. 16)
- (n) Red-Brown Glazed
 (i) red fabric, red-brown glz osf (Fig. 251, No. 6)
- (p) Black-Glazed (Tygs)
 (i) red fabric, black glz osf (Fig. 251, Nos. 7, 10 and 14; Fig. 252, No. 9; Fig. 253, Nos. 9-11 and 15)
- (q) Black-Glazed (Other Vessels)
 (i) red fabric, black glz osf (Fig. 252, Nos. 4 and 12; Fig. 253, No. 2)

VI. THE POTTERY GAZETTEER

(Table 86)

INTRODUCTION

The pottery gazetteer attempts an identification of every stratified sherd from the excavations. Only the first sheet of the gazetteer is printed, and the full gazetteer is reproduced on microfiche in a separate wallet with this report.

The hand-made category (Hm) includes all hand-made (and ?local slow-wheel) wares irrespective of date.

In the Middle Saxon column, a division is made between the imported pottery (Im), including all possible imports of that date, and Ipswich-type ware (Ip). The Saxo-Norman pottery is divided between Thetford-type ware (Thet), Early Medieval ware (Em), and all possible imports (Im), both continental and English (from outside East Anglia). The medieval pottery consists of local coarse (Cs), local glazed (Gl) and English glazed wares from outside East Anglia (Im). The late medieval/early post-medieval column and the post-medieval column distinguish only between local wares and those of continental origin (Im).

Symbols: * : very small sherds
? : no certain identification could be reached

TABLE 86. POTTERY GAZETTEER

	Feature No.	Roman	Hm	Middle Saxon		Saxo-Norman			Medieval			Late Med. & E. Post-Med.		Post-Med.		
				Im	Ip	Thet	Em	Im	Cs	Gl	Im	Local	Im	Local	Im	
	22					1										
	26					25										
	30					172										
	33					1										
Upper	34		1		2	2										
Lower	34			1												
	38				2	2										
Upper	44				2	4	1		1							
Lower	44		1		1											
Upper	44(a)	1	5	2	7	141										
Lower	44(a)		4	6	8	1*										
	44(b)			2	9	2*										
	46		1			11	10									
	47														11	
	50	1		2?		1										
	1036															
	51														1	
	64			1												
	103						4									

REFERENCES

1. Information from Mr.S.E.West.
2. Information from Mr.S.E.West.
3. This suggestion was first made by Mr.J.G.Hurst.
4. At present the only evidence for this mid ninth century overlap comes from the Cox Lane, Ipswich excavations (West 1963, 286). This evidence is far from conclusive.
5. Munsell Colour Charts (Baltimore 1954).
6. See the notes on Class 18 oxidised wares in Hodges 1980.
7. Sherd reference: SARC IV 72, F.2-18, p.82.
8. Sherd reference: SARC VIII, p.110.
9. A full comparative statement will be made on these thin-sections in the final report on the Hamwih pottery.
10. See note 9.
11. Sherd reference: SARC I, F.33, p.216.
12. The vessel from Grave 551 at Birka, for example (Arbman 1937, tafel 16, 2).
13. See note 9.
14. Richard Hodges is indebted to Alan Carter and William Milligan for showing him the imported wares from the excavations of the Norwich Survey.
15. Richard Hodges is indebted to Keith Wade for allowing him to study the Wicken Bonhunt material. There is a preliminary report included in Hodges 1980; there is also a possible Beauvais vessel of ninth or tenth century date from Ipswich (Dunning 1959, 58, fig.29, no.5).
16. For a discussion of gift exchange and the mechanisms involved see Grierson 1959, 137-9.
17. Analysis (by Keith Wade) of a sample of Thetford-type ware retrieved from the Cornhall site, Norwich in the proximity of the kiln, showed that 95% of the vessels were cooking pots and only 1% were bowls.
18. Those features which are suggested by the excavator to be possibly contaminated are omitted and building AR is included as it might be Period IV.
19. This information was provided by Miss Kathy Kilmurry, from whom a detailed description of each sherd can be obtained.
20. Excavations by Keith Wade 1970-71.
21. The coin was actually found in F.493, but this feature contained one sherd of medieval date (the rest being Saxo-Norman): a conflict of evidence which seems best explained by an error of excavation and best corrected by the transference of the two medieval finds to F.503 which cut F.493.
22. Keith Wade is indebted to Mr.J.G.Hurst for their identification.
23. Excavations by Keith Wade 1970-71.
24. Excavations by Dr.P.Wade-Martins, Norfolk Archaeological Unit 1974.
25. Brear's type 2 or 4 (Brears 1971).
26. Mr.J.G.Hurst informs me that the red fabric of this cup is not a Dutch characteristic. It is possible, therefore, that it might be of local manufacture (possibly from the Norwich Delft kilns as some sherds from these, in the Norwich Castle Museum, have a pinkish-red fabric).

16. ROMAN TILES AND BURNT DAUB

I. ROMAN TILES

Roman tiles were widely scattered over the excavation, both in the excavated features and in the topsoil. Usually they represented residual scatters or rather small deposits which are difficult to interpret.

However, two major concentrations of Roman tile were discovered in the upper fillings of the two Middle Saxon wells (features 3596 and 2957: p. 78, 86 and 94). Both deposits were thrown into the upper levels of the pits at a time when the wells had collapsed and the shafts had filled up above the level where the woodwork was preserved. Both groups of Roman tile were stratified in a similar way in the two wells, and charcoal and large quantities of burnt daub displaying wattle impressions were mixed with both groups. Sometimes the burnt wattles were found still adhering to the daub fragments. The association of the daub and tile in the one structure was indicated by the way burnt and unburnt daub was adhering closely on the tile surfaces. Furthermore, traces of white and yellow sandy mortar on the tiles would suggest prior use in some masonry building. Only Ipswich ware was stratified with this material and a date in the ninth century is proposed for this deposit (p.95). One or more buildings had been burnt down, perhaps as a result of Danish or Mercian raids in the ninth century, and subsequently the rubble was thrown into these wells.

The re-use of Roman tile in Anglo-Saxon churches is well known; it was used particularly in quoins, in the openings for doors and windows and in arches and arcading. How Roman tiles were used in contemporary timber-framed buildings is unknown and, indeed, it is a subject for which there has been little evidence up to now. Nowhere in the excavation were Roman tiles found in situ in a building.

Information about the use of Roman tile in Anglo-Saxon timber-framed buildings on the site can, therefore, only be obtained from these two rubble deposits. The most plausible way in which this material might have been re-used in such structures is in constructing door jambs or window openings or simply as infilling between the main wall timbers mixed in with the daub. The latter seems more likely in view of the highly fragmented nature of this material. Tiled arches would hardly be appropriate in a timber-framed structure. The tiles were certainly incorporated in the walls, because if they had been used in floors or pathways they would not have been gathered up in such large quantities when building rubble was being cleared away. The conclusion is that probably all the tiles, regardless of type, were used as infilling in the smaller spaces of the timber-framed walls, which were thickly covered by clay daub. In the wider spaces in the timber frame, wattles were used and these were also protected with a clay covering.

The largest deposit was from well II, feature 2957. This group of tiles was composed as follows:

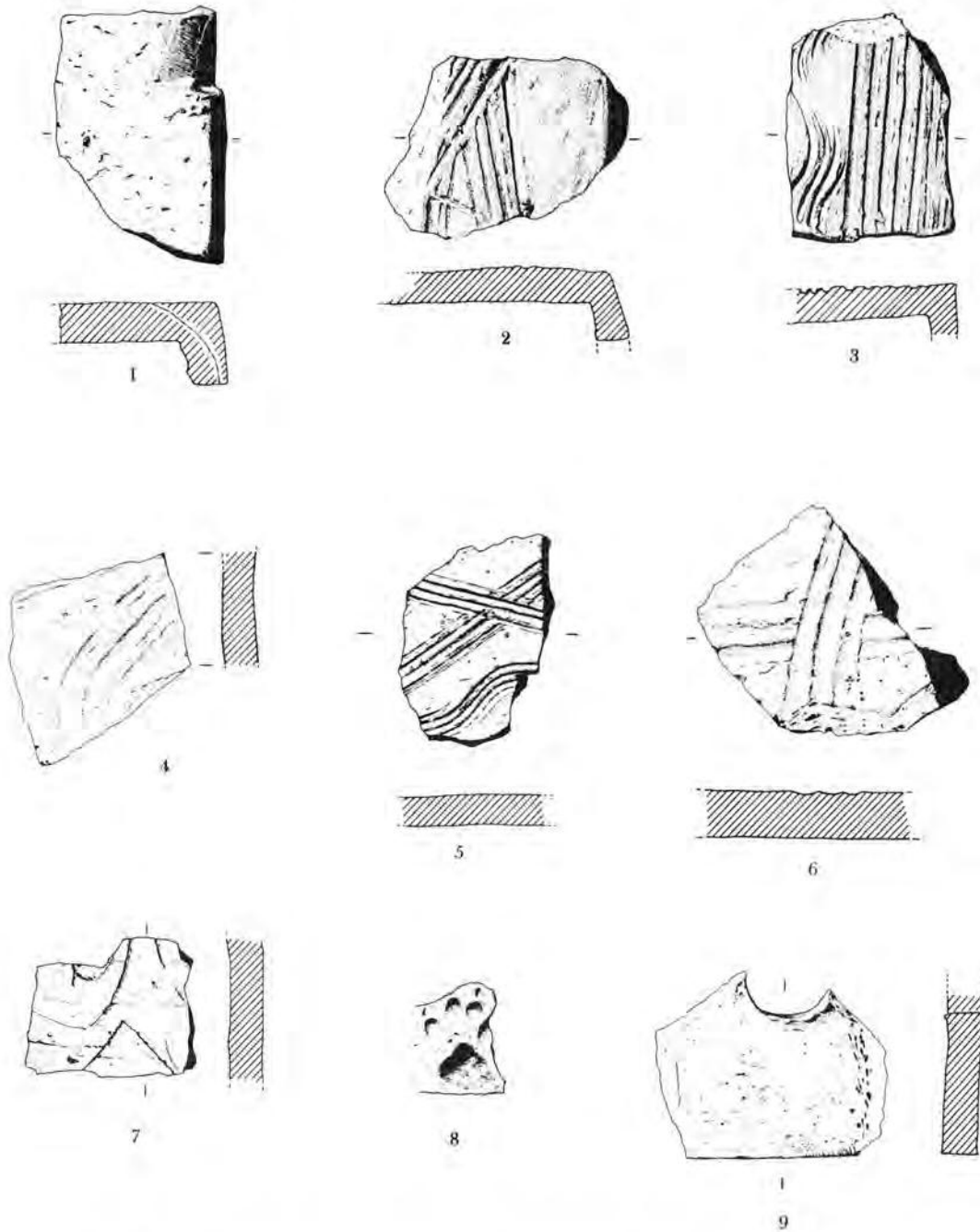


Fig. 254. Examples of Roman tile fragments from Well II. Scale 1:4.

Key to Fig. 254

1. Corner of tegula with rebate.
2. Fragment of box flue tile with combed keying pattern on one side.
3. Corner of box flue tile with combed keying pattern.
4. Fragment of tegula with finger marking.
5. Fragment of box flue tile with combed keying pattern.
6. Fragment of brick with finger keying pattern.
7. Fragment of box flue tile or floor tile with scored keying pattern and traces of blackening on the inside or underside.
8. Fragment of floor tile with dog's footprint (illustrated) and also traces of scored key pattern (not illustrated).
9. Undecorated flue tile with rounded access hole and traces of blackening on both sides and surface of aperture.

Roman Tiles

PLAIN ROMAN TILE FROM FEATURE 2957 - TIMBER CISTERN.

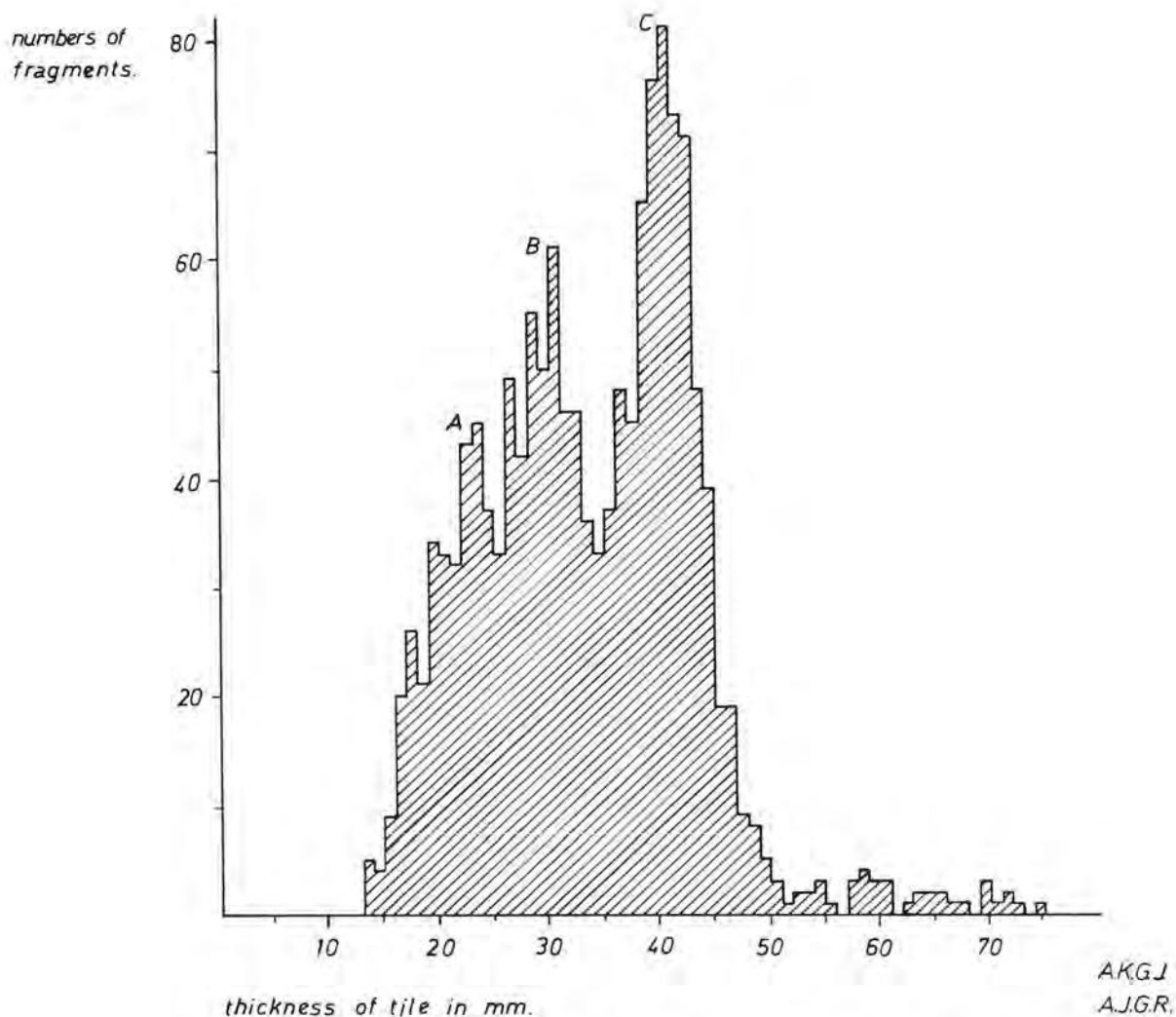


Fig.255. Numbers of plain fragments of Roman tile from Well II.

Recognisable <i>tegulae</i>	190	9.85%
Recognisable <i>imbrices</i>	82	4.25%
Recognisable flue tiles	80	4.14%
Plain tile: Peak A	342	17.75%
(Fig. 255) B	508	26.35%
C	726	37.66%
	<u>1928</u>	

All the usual types of Romano-British tile and brick are present in a fragmentary state; no piece retained more than one original corner. This might suggest that the material had either been detached from its original structure only with difficulty, had been fragmented through re-use on several occasions or had been deliberately broken up to a convenient size for incorporation in Saxon structures. It is unlikely that the material had been re-used in its complete form, and then afterwards shattered during a collapse or burning of the Saxon structure or on deposition in the two wells.

FLUE-TILES AND TEGULAE FROM FEATURE 2957- TIMBER CISTERN.

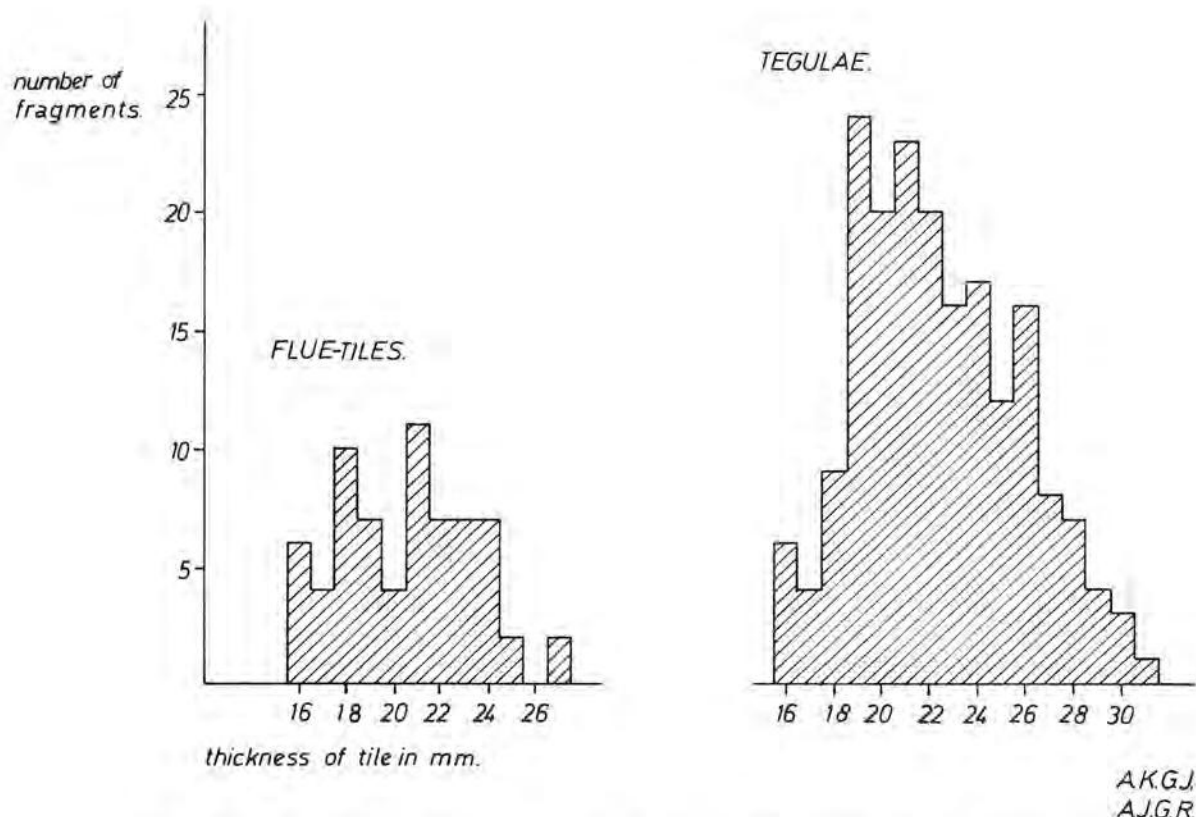


Fig.256. Numbers of fragments of flue tiles and tegulae from Well II.

The majority of the tiles were flat undecorated examples; the thicknesses of these were measured to the nearest millimetre and are analysed in Fig.255. The results should be compared with the histograms of recognisable flue tile and tegulae fragments in Fig.256. These suggest that the first peak (A) represents tegulae and plain flue tile fragments and peaks B and C thicker bricks and tile. Peak B consists of the large flat tiles used in hypocaust piers and suspended floors, while peak C represent the large bricks used in flue arches and walling. The exact proportions of one type of tile to the next cannot be assessed, but the large numbers of thicker bricks and roof tiles would be in order with their normal usage. The number of imbrices seems a little low, but many fragments could be included in the plain tile peak A, since it is often difficult to recognise the distinctive curvature on small fragments.

This debris would accord with its primary use in a normal Romano-British heated building. The surfaces of the brick and tile are fairly unabraded and would suggest an origin in a standing building demolished only shortly before re-use, the complete tiles and brick being broken up for their incorporation in the new work. The normal types of mortar to be found in a heated building were present, but only in small quantities, so it is possible that the debris was derived from a structure above ground in which frost and water action had degraded most of the bonding, thus facilitating demolition. Such ruins must have been characteristic of the Saxon landscape and they no doubt proved excellent quarries for building material ¹.

II. BURNT DAUB

Several thousand fragments of burnt daub were found in the upper fillings of the two well pits from contexts similar to those which produced the Roman tile fragments. Nineteen pieces are illustrated in Figs.257-8. These are some of the best preserved pieces, which represent all the characteristics identified on the daub fragments. Most illustrated fragments exhibit an area of daub surface, but whether these were internal or external to the building is not always clear. Nos.1 and 2 have external angles and Nos.3 and 4 exhibit internal angles. Nos.5 and 6 have particularly good 'trowel' marks, and there are deep finger marks on No.3.

Impressions from the interiors of the walls indicate large squared timbers with flat surfaces, such as in Nos.7 and 16-19. The shapes of interwoven hazel wattles were represented on most of the fragments. On some pieces, as Nos.9, 10 and 16, it can be seen that the wattles were woven around others set at various angles to them.

This evidence is quite consistent with the suggestion that all these fragments came from the walls of a timber-framed building with the spaces between the wall posts filled with interwoven wattles. Both the wall posts and the timbers were covered with clay daub. The fragments of flint and chalk in the daub show that the daub was made from unweathered chalky boulder clay.

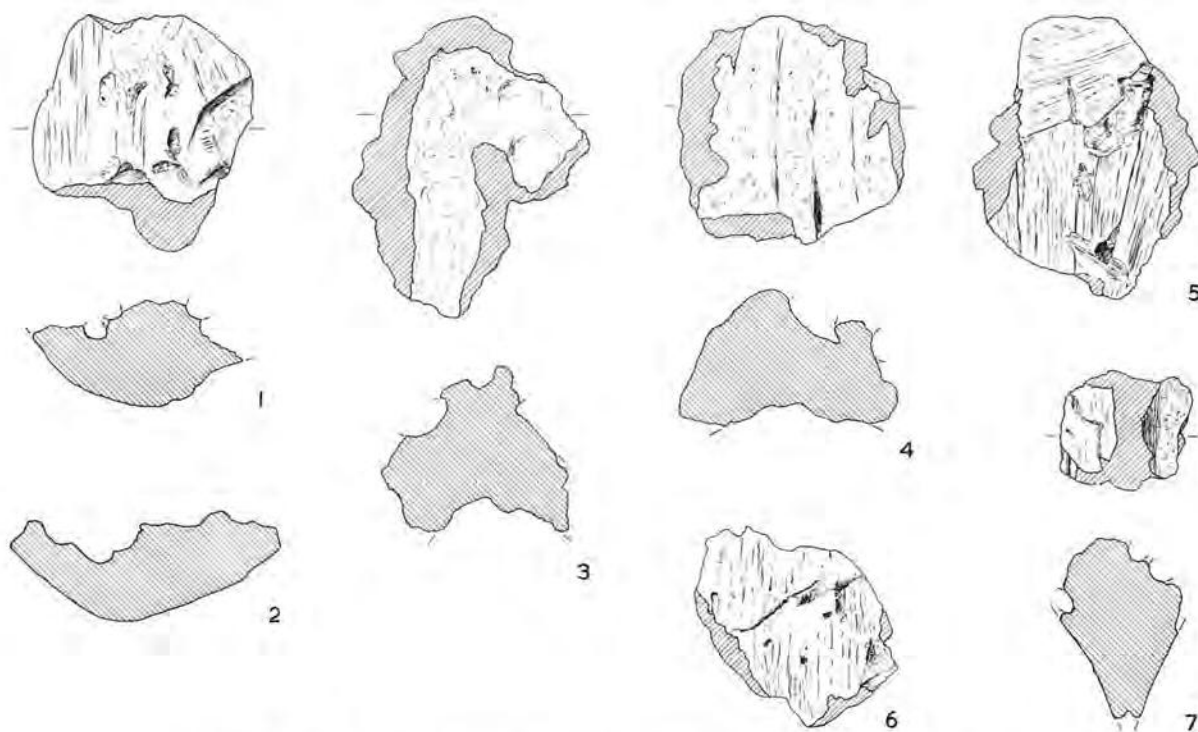


Fig.257. Examples of burnt daub from Well I. Scale 1:4.

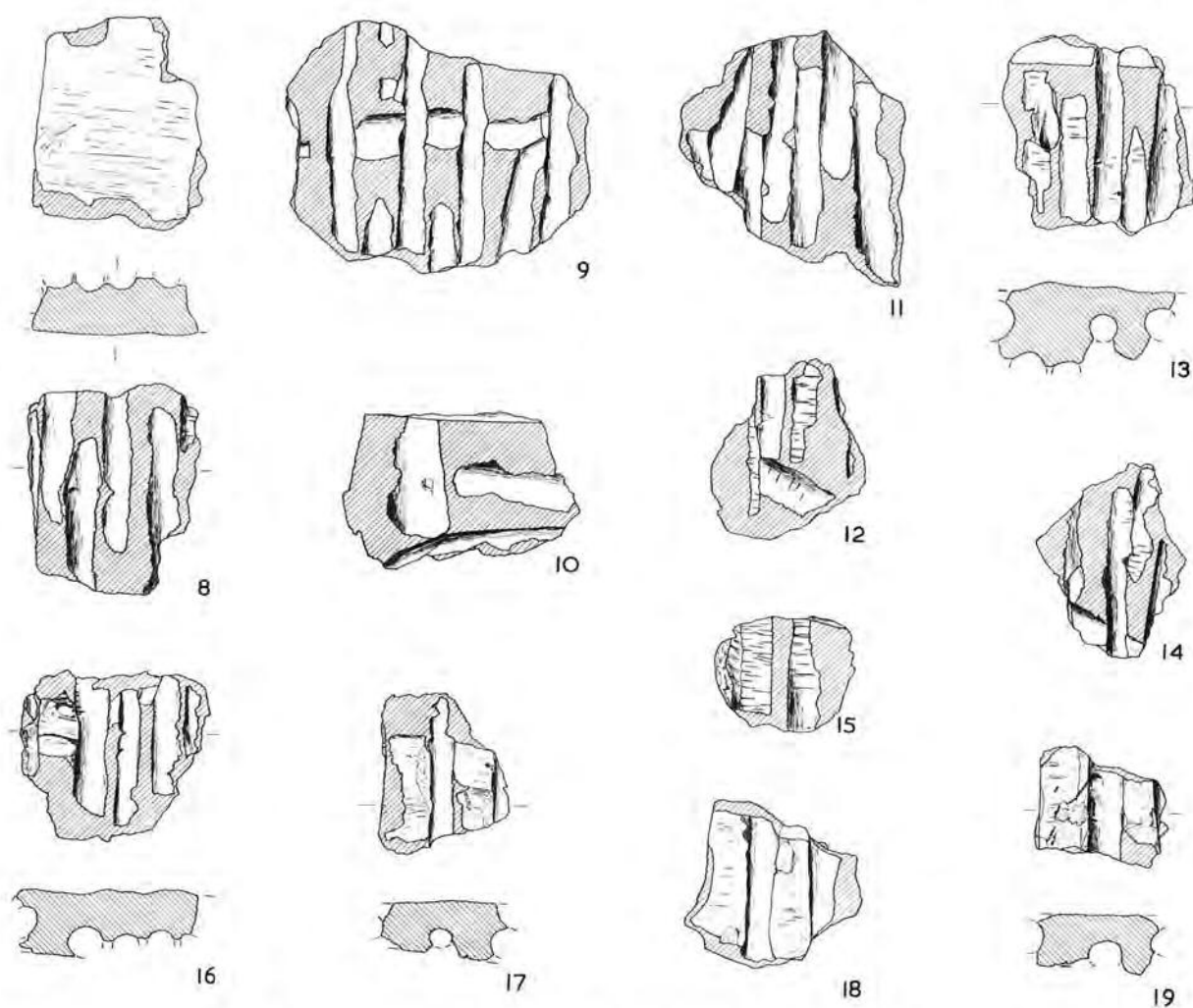


Fig. 258. Examples of burnt daub from Well I. Scale 1:4.

REFERENCE

1. The author is indebted to Christopher Green for his comments on the first part of this chapter.

17. OBJECTS OF BONE, AMBER, GLASS AND STONE

I. OBJECTS OF BONE

(Figs. 259-60)

1. Comb with a solid straight handle approximately square in section (Plate CXXI). The teeth plates are fixed by iron rivets into the handle which is decorated on one side only with groups of parallel grooves and two pairs of crossing lines. The handle is apparently of antler. ?Period II pit: feature 270, which also contained two other bone objects: Nos. 15 and 22.

On combs 1-4 the teeth were made by cutting them out after the plates had been riveted into the handle; overcutting by the saw in each case has left marks on the underside of the handle; it is interesting that these saw marks are all on the more decorated side of the comb (compare with Waterman 1959, 89; Smedley and Owles 1961, 273; Wheeler 1935, 152-3; Roes 1963, 22-3; Radford and Peers 1943, 70-1, fig. 20, no. 1).

2. Comb similar to No. 1, but with a handle of almost circular section with a curving profile; the decoration consists of groups of zig-zag lines which are framed by parallel grooves (Plate CXXI). Probably Period II, in upper filling of ditch: feature 120.
3. Fragment similar to No. 2 but with a hollow handle; the handles of the other five examples are solid. Topsoil: probably Period II.
4. Handle of a smaller comb with less elaborate decoration. Period II, Phase 1 cess pit: feature 829.
5. This comb is typologically different from the previous four samples, for the handle of this one is made in two parts which are separated by plates of bone. There are two rivet holes through the handle, although the rivets are missing. The handle is octagonal in section with a neat pattern of zig-zag lines on one side in two groups along the top and bottom and these are joined by pairs of parallel grooves. Period I, Well II: feature 2957, level containing layers O, P, Q, V and W.
6. Plate from one side of a comb case covered with dot and circle ornament (Plate CXXI). The complete end has a pair of rivet holes and on the reverse side of the plate are clear signs that it pivoted on the rivet in the hole nearest the end (compare Wheeler 1935, 152). ?Period II pit: feature 534.
7. Small single-sided comb cut out of one piece of bone with two rows of short decorative grooves along the top edge. Period VI boundary trench: feature 1614.
8. Terminal teeth plate from a comb. Period I, lower filling of ditch: feature 1789.
9. Teeth plate, probably from a handled comb similar to No. 1. Period II pit: feature 258.

10. Fragment of a double-sided comb with large and small teeth. Topsoil: probably Period VI.
11. Larger fragment of a comb similar to No.10. Period VI pit: feature 933.
12. Flute carved from the distal end of a sheep's tibia, a common raw material for such instruments. The surviving piece is 9.5 cm long though originally it could have measured up to twice this length; the only completely surviving end has been carefully trimmed off. The external diameter is about 11 mm and the internal diameter is 6 mm at the top and 8 mm where it is broken. The wider part of the flute was, therefore, towards the missing voicing lip. Five holes can be seen along the anterior surface; there is no trace of holes on the reverse surface. Four of the holes are large and evenly spaced along the pipe. The fifth is much smaller. The large holes are on average 6 mm and 4 mm wide. The small hole is about 2 mm wide. As a considerable part of the bone pipe is missing, it is not possible to reconstruct its original form with any certainty nor to test its musical potential as has been attempted for other British bone pipes of much the same period from White Castle, Monmouthshire, Canterbury and Southampton (Megaw 1968; 1969; 1975). Indeed, it may be suggested that the rough knife-cut surface of the bone of the North Elmham pipe indicates that it may have been unfinished or broken in manufacture. The smallest perforation - second from the intact end - can hardly have been intended as an additional finger-hole due to its close proximity to that immediately above. Since otherwise the holes are more or less equidistant with centres c. 1.5 cm apart, it is possible that the small hole may have been incorrectly laid out either for the natural fall of the fingers or to obtain the desired tonal range. If so, it could, of course, have subsequently been blocked with clay, beeswax or other material which has not survived.

Although the uppermost and incomplete hole has a more elongated and shallow cut surface than any of those further down the pipe, from its position it is unlikely to have been the voicing lip, but rather a fourth intentional finger-hole. Bone flutes with four finger-holes, though less common than those with three finger-holes, are by no means unique in early historical contexts ¹. Period II, Phase 2 cess pit: feature 294 of Building P.

13. Bone object from a pig metacarpel, broken off at one end; possibly a toggle. Period II pit: feature 331.
14. A roughly carved bone with a hole cut through an expanded flat flange. Period II, Phase 3 foundation trench: feature 515 of Building O.
15. Square bone plate with a large central hole; three sides have been carved to form a concave profile, while the fourth has been left roughly straight. ?Period II pit: feature 270.
16. Undecorated knife handle, probably made from a sheep's tibia. Period VI boundary trench: feature 1924.
17. Pin beater with a point at one end and a flattish blade at the other; it narrows to a waist about a third of the way from the pointed end where there is a row of parallel marks along one side (Addyman and Hill 1969, 72-3; Dunning 1952, 50; Leeds 1923, 183 and plate XXIX; Leeds 1927, 70; Biddle 1961/2, 183; Bantelmann 1955, plate 36). Period III/IV pit: feature 3727.
18. Part of a long pin beater. Period I ditch: feature 2022.
19. Part of a pin beater. Period II pit: feature 1106.

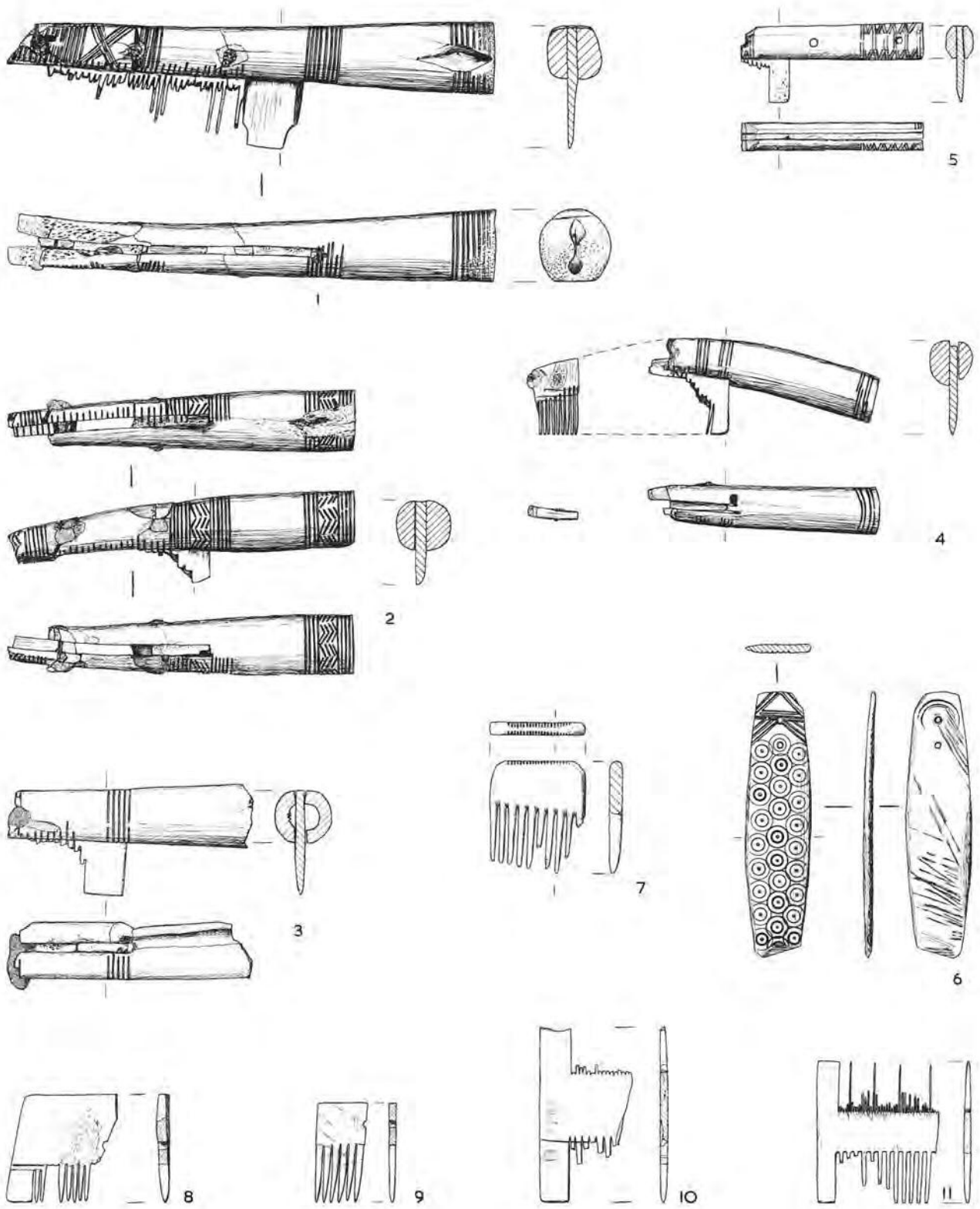


Fig.259. Objects of bone. Scale 1:4.

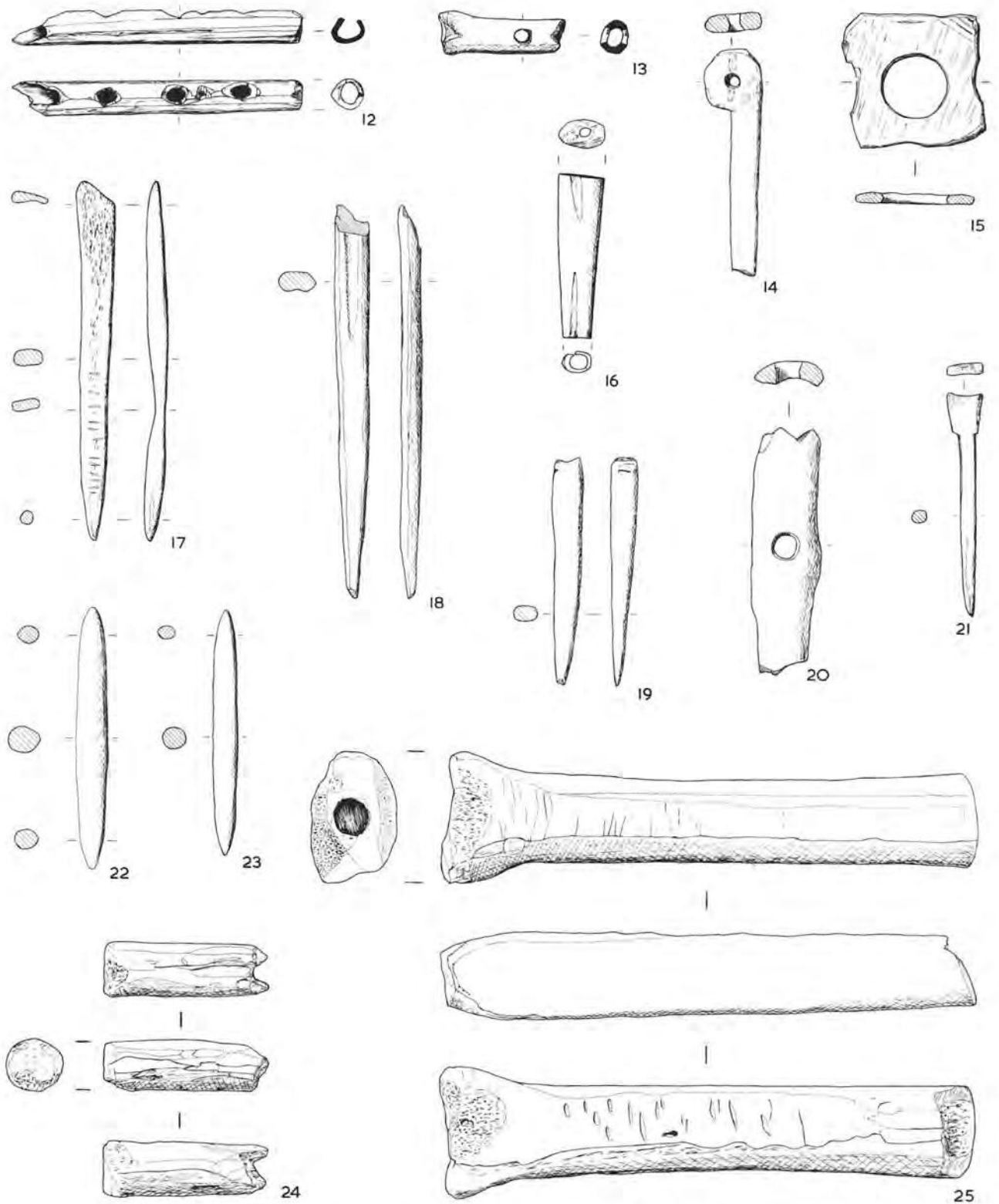


Fig.260. Objects of bone. Scale 1:4.

Objects of Bone

20. Fragment of bone unworked except for a central hole; possibly a toggle. Period V clay pit: feature 525.
21. Pin with a flat undecorated head. ?Period II pit: feature 3563.
22. Pin beater. ?Period II pit: feature 270.
23. Pin beater. Period II pit: feature 1714.
24. Unfinished tapering object broken off at the narrow end. Period III, phase 2 post-hole: feature 2578 of Building AD.
25. A roughly worked horse metacarpal flattened on two sides with a hole drilled into the wider end. This object is specially interesting because it does show the manufacture of a skate in progress. The rough surface on the top could help the boot grip the skate while the flatter lower surface was intended for sliding on the ice. The axial hole in the heel end is very typical for skates; they are found in examples of Late-Saxon and early-medieval dates, but it is at present uncertain whether this feature survived beyond the twelfth century (Smedley and Owles 1963, 312; MacGregor 1976). Topsoil.

II. OBJECTS OF STONE

(Fig.261)

HONES by David Moore

1. A blue-grey, well-fashioned smooth schist hone. The specimen is tapered with wear and measures 5.8 x 2.4 x 0.8 cms. It belongs to Ellis type IA₍₁₎ and is of Eidsborg type and of Norwegian provenance (Ellis 1969). Period V clay pit: feature 861.
2. A blue-grey cleaved fragment of a once-fashioned honestone. It is worn and broken and measures 7.4 x 1.5 x 1.7 cms. A schist hone of type IA₍₁₎ and of Norwegian provenance. Period V clay pit: feature 3513.
3. A rough and unfashioned fragment of a schist mullion. Blue-grey on fresh surface and pearly-grey on weathered surface, 5.1 x 1.8 x 1.6 cms. Type IA₍₁₎ and of Norwegian provenance. Period V clay pit: feature 1488.
4. A buff-brown, well-fashioned rectangular sandstone honestone. Broken at one end and measures 5.5 x 1.2 x 1.1 cms. Microscopically the rock is composed of more or less well-sorted angular quartz grains in a ferruginous cement with some occasional small strips of muscovite, and belongs to Ellis group IIIc.

It is not unlike a slide (BM 1959, 212(3)) cut from a hone in the Maidstone Museum, Kent, and similar in mineralogy to a hone from the Spong Hill Saxon cemetery, small find 194. Period II, Layer J in the upper filling of Well I: feature 3596.

5. A well-fashioned and bored schist honestone. Dusty-grey in colour and measures 7.8 x 1.8 x 1.1 cms. Microscopically the rock consists of quartz, muscovite, chlorite and abundant ore with lesser amounts of plagioclase. It is type IA₍₁₎ and of Norwegian provenance. Period V clay pit: feature 1515.
6. A powder-grey, well-fashioned, but now broken, bored schist hone. The hone is tapered with wear and measures 4.3 x 1.7 x 0.7 cms. The hone belongs to type IA₍₁₎ and is of Norwegian provenance. Period V clay pit: feature 501.

7. A blue-grey to powder-grey fashioned and bored schist hone. Worn thin and broken with wear. The hone measures now 3.3 x 1.7 x 0.7 cms. A schist hone of Ellis type IA₍₁₎ of Norwegian provenance. Period V clay pit: feature 3513.
8. A very fine grain, purple, very well-fashioned honestone fragment. Probably the purple phyllite coinciding with Ellis type IB₍₁₎ and possibly of Norwegian origin. Period V clay pit: feature 1095.
9. A pale grey and broken schist hone fragment from a well-fashioned hone. The specimen belongs to type IA₍₁₎ and is of Norwegian provenance. Period III/IV pit: feature 905.
10. A fragment only of a flattened schist hone, pearly-grey and measures 2.4 x 1.4 x 0.6 cms. The dimensions are here not very meaningful because the specimen is so badly broken. The specimen probably belongs to type IA₍₁₎ and is of Norwegian provenance? Period II cess pit: feature 44b.
11. A long, well-fashioned limestone honestone, bearing traces of original bedding. The specimen is more or less rectangular in cross section and measures 16.2 x 2.4 x 2.6 cms and is tapered with wear slightly. Microscopically the rock is composed of angular quartz grains set in a calcareous matrix with numerous ostracod tests. Layers of the ostracod tests are in part responsible for layers or bedding in the rock. The specimen belongs to Ellis group IVA and is probably Purbeck limestone from the Isle of Purbeck, Dorset. Period II phase 2 cess pit: feature 44b.
12. A grey, micaceous, smooth and fine-grained sandstone hone. The specimen is more or less fashioned and bears point scratches. It is 10.0 x 6.3 x 4.2 cms. Microscopically the rock is composed of close interlocking quartz grains of well-sorted size. There are strips of thin muscovite and large blocks of biotite, and pore filling material, where present, is of ferruginous type with some development of sericite. Provenance is unknown; the specimen has some affinities with the greywacke/sandstone group of hones from Winchester, notably in the development of muscovite, ferruginous pore-filling material and sericite. The specimen is without doubt a sandstone and could be placed in Ellis group IIIA. Period V ditch: feature 1786.
13. A rough-unfashioned mullion of quartz-mica schist. It is much worn with honing and measures 12.6 x 3.0 x 2.6 cms. The specimen belongs to group IA₍₁₎ and is of Norwegian provenance. Period V clay pit: feature 221.

SPINDLE WORL

14. Sandstone spindle worl. Period II, phase 2 cess pit: feature 44b.

FLINTS

15-20. Miscellaneous fragments of worked flints and flint flakes.

15. Period II well II: feature 2957.
16. Undated post hole: feature 2585.
17. Period III post hole: feature 2536.
18. Period III post hole: feature 2574.
19. Period V clay pit: feature 1676.

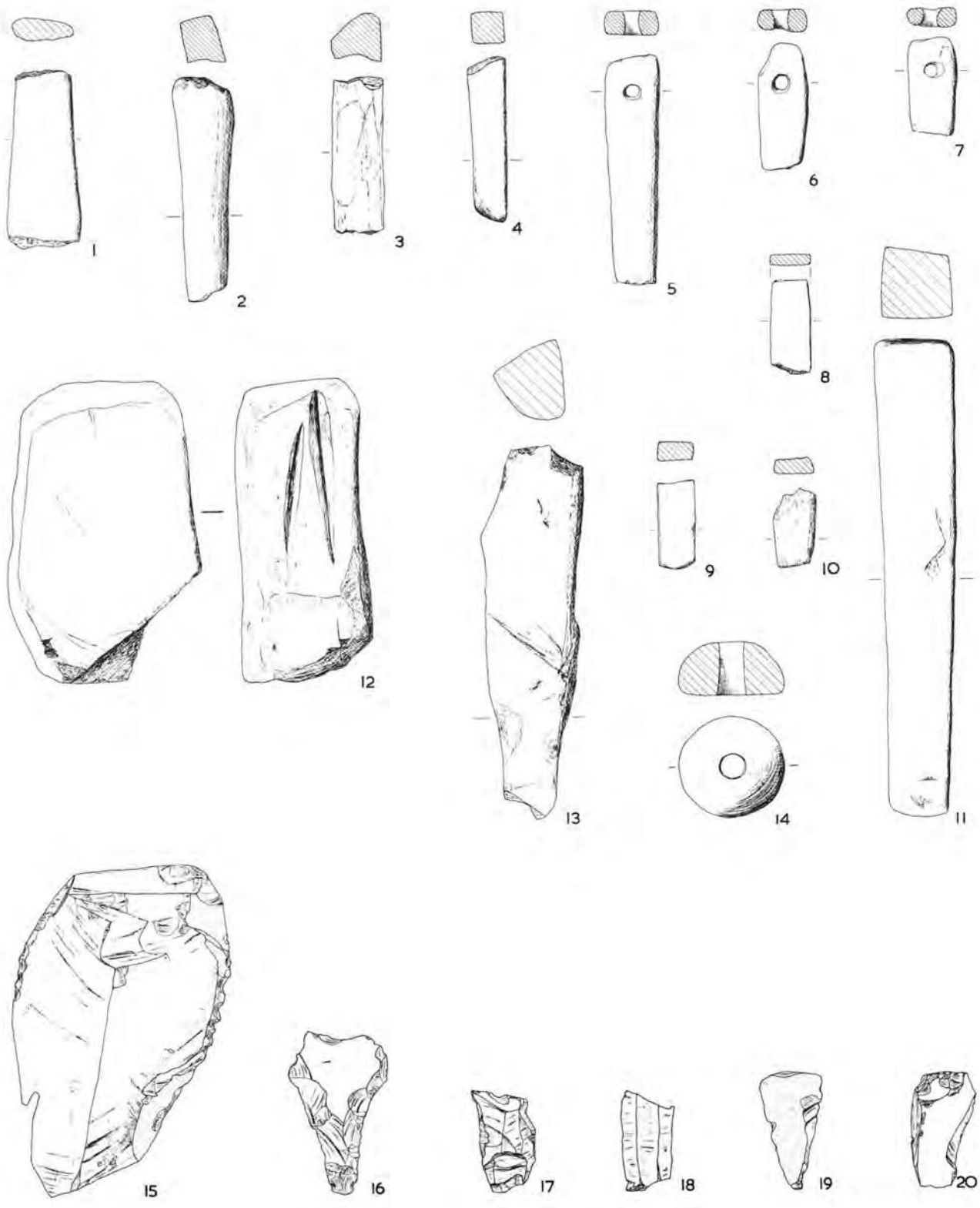


Fig.261. Objects of stone. Scale 1:4.

20. Period V clay pit: feature 1406.

Despite these contexts there is probably little doubt that these flints are residual.

LAVA QUERNSTONES

Pieces of lava quernstones were found in all of the features listed below. None is illustrated as they are too fragmentary. While they were found in deposits of all periods from Middle Saxon to post-medieval, the largest quantity came from medieval features.

Distribution of fragments of lava quernstones

<u>Period I</u>	Features	709		
		950		
		1075		
		1840		
		2921		
		3736		
<u>Period II</u>	Features	44b	1036	
		270	1107	
		294	1784	
		321	2733	
		331	3184	
		487	3563	
		829		
<u>Period III & IV</u>	Features	346	1023	
		348	1683	
		403	2145	
		493	2777	
		835	3500	
<u>Period V</u>	Features	293	1447	2255
		315	1488	2775
		332	1489	2962
		503	1515	2969
		1105	1552	3169
		1226	1573	3194
		1405	1663	3513
		1407	1688	3581
		1409	1831	3706
		1414	1863	3727
		1433		3732
<u>Period VI</u>	Features	583	1436	
		936	2144	
		1078	3140	
			3505	
<u>Undated</u>	Features	290	2954	
		1144	3526	
			3538	

With this number of stones it is perhaps surprising that the manorial accounts of the Middle Ages have no mention of the purchase of quernstones.

III. OBJECTS OF AMBER AND GLASS

(Fig. 262)

AMBER

9. Dice with the value of each side indicated by simple dots. Period II: upper filling of ditch: feature 34.
10. Dice with dots and circles. ?Period II pit: feature 270.

Neither dice is an exact cube and so they are bound to fall unevenly. The following is their throwing record based on fifty tests for each one:

<u>No.9</u>		<u>No.10</u>	
1:	4%	1:	6%
2:	0%	2:	16%
3:	24%	3:	4%
4:	18%	4:	26%
5:	28%	5:	42%
6:	26%	6:	6%

Whether they were deliberately loaded is of course difficult to say, but it is noticeable how the 5 was the most frequent score with both dice.

GLASS

11. Glass wine bottle seal marked 'P I 1772'. Topsoil.

REFERENCES

1. This note on the flute was prepared by the writer and Vincent Megaw and was first published in The Galpin Society Journal XXVI (1973), 142-3.

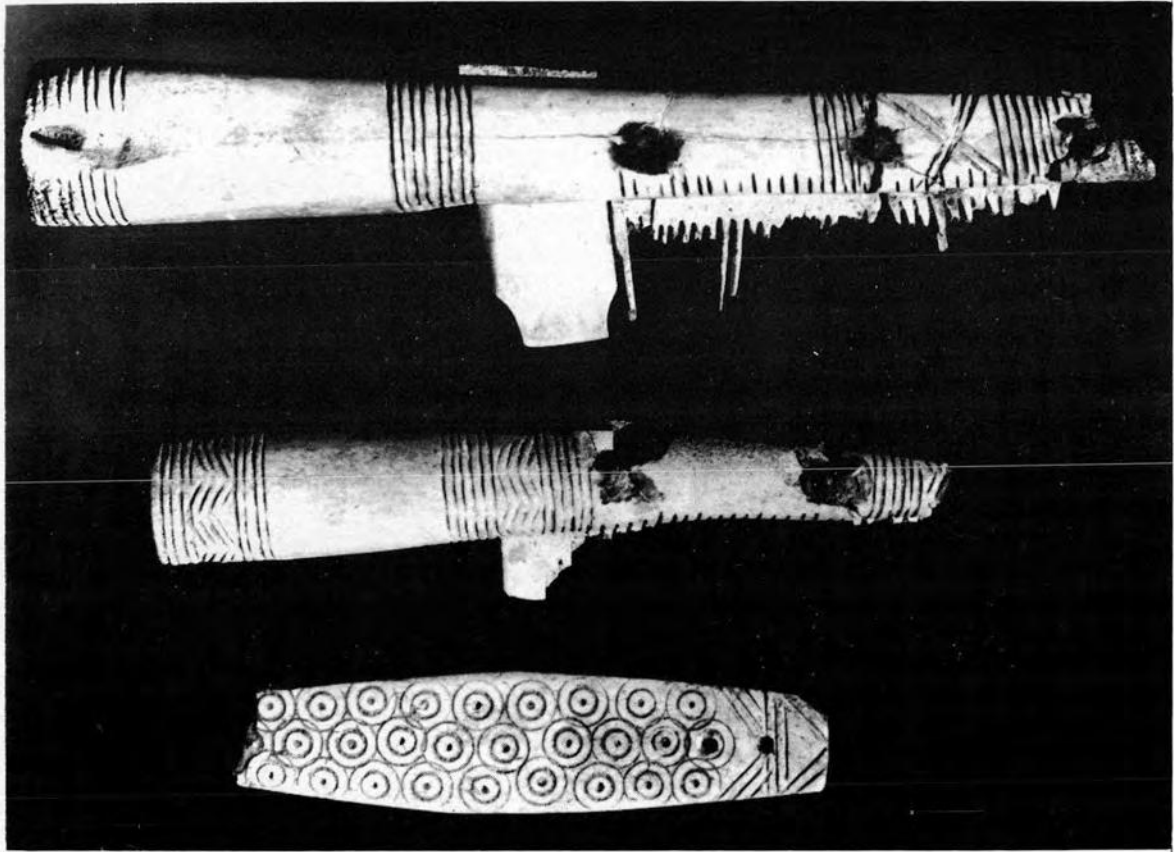


Plate CXXI. Combs and comb case plate. (See Fig.259, Nos.1, 2 and 6)

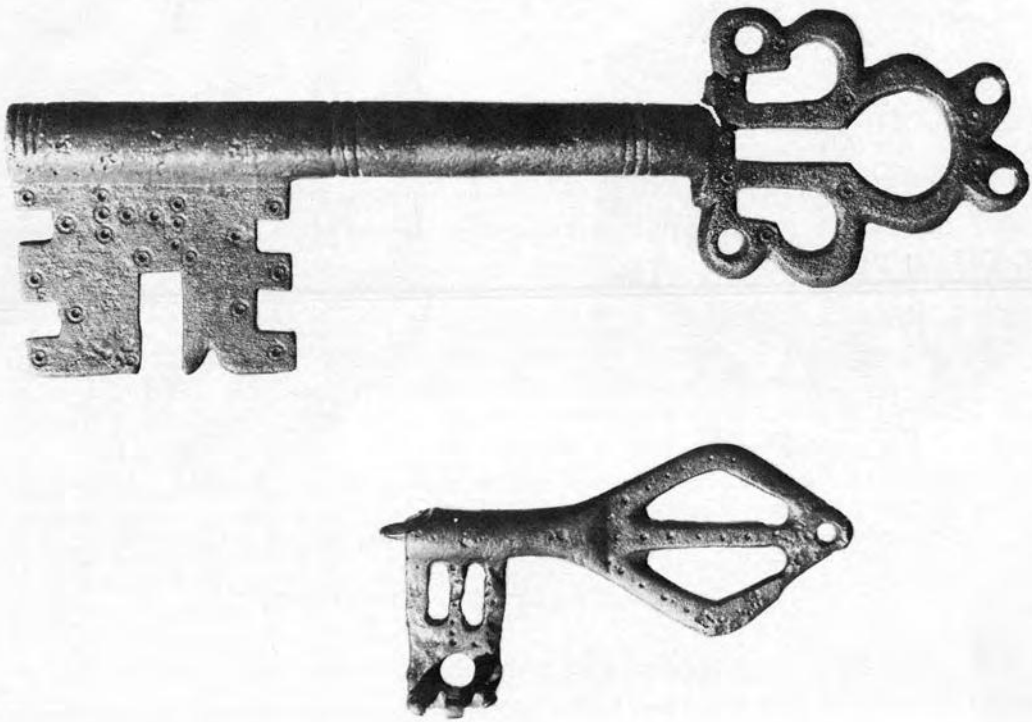


Plate CXXII. Copper alloy keys. (See Fig.263, Nos.1 and 2)



Plate CXXIII. Sceatta: Coin No. 27.



Plate CXXIV. Sceatta: Coin No. 28.

18. THE COINS AND OBJECTS OF NON-FERROUS METALS

I. THE COINS

MEDIEVAL AND LATER COINS AND JETTONS

by Marion Archibald

1. Edward III; probably Pre-Treaty Coinage, 1351-60; penny; York mint. This coin is in very worn and clipped condition and resembles pieces from hoards buried c. 1420. Always allowing for abnormal survivals, this coin was probably last in circulation in the early fifteenth century. Topsoil.
2. George II; halfpenny; Old Head type, 1740-54; date illegible. Topsoil.
3. Jetton; French; later fourteenth century. Obverse: Moor's head to right +AVE MARIA GRACIA PLEN; reverse: cross fleurdéliée with fleur de lys in the centre lozenge with one rosette in each angle A/V (upside-down) E/M/AR(?) (Barnard 1916, 103, no.12). Diameter 20 mm. Topsoil.
4. Illegible; very battered 'modern' coin; nineteenth-century penny. Topsoil.
5. Charles II; farthing 1675. Topsoil.
6. Jetton; Nuremberg; sixteenth century. Obverse: Reichsapfel, meaningless inscription in 'Lombardic' letters; reverse: three crowns and three fleur de lys alternately around a rose within an inner circle, meaningless inscription in 'Lombardic' letters. The lettering on this piece suggests a date earlier rather than later in the sixteenth century. Diameter 22.5 x 24 mm. Topsoil.
7. Jetton; English c. 1300. Obverse and reverse: short cross recercellée with a pellet in each angle within a border of pellets in place of a legend. (Barnard 1916 as reverse of p.97, no.2 for both sides). Diameter 19 x 18.5 mm. Topsoil.
8. 'Medley halfpenny'; contemporary forgery of 1st issue halfpenny of George III dated 1772. Topsoil.
9. Venetian Republic; Doge Michele Steno, 1400-1413; Soldino. In the absence of an adequate supply of English low-denomination coins, these Venetian soldini - known as 'Galyhalpens' because they arrived with the Venetian galleys - were used as small change despite government proclamations against them. Michele Steno is by far the commonest of the doges represented among the soldini found in England. The various measures taken against them were in the end successful and importation ceased by 1420. Since there were, no doubt, still numbers of specimens in circulation at that date, it is better to add a further ten years for the end of the currency of these pieces. (Spufford 1963, 132-9). Topsoil.
10. Jetton; English; early fourteenth century. Obverse: lion rampant within granulated inner circle, legend replaced by pellets within outer granulated circle; reverse: short recercellée ? with two pellets in each angle within beaded inner circle, legend replaced by pellets within outer beaded circle. Diameter 19 mm.

Pierced, as is normal for English jettons of this period. (Barnard 1916, Obverse as p.100, no.27; reverse as p.97, no.2, except two pellets in the angles). Topsoil.

11. Elizabeth I; threepence 1566; initial mark, lion. Topsoil.
 12. Charles I; 'Richmond' farthing; initial mark illegible. Topsoil.
 13. Jetton; Nuremberg; Hans Krauwinkel; late sixteenth to early seventeenth century; Types as No.6 above. Diameter 21 mm minimum. Topsoil.
 14. William III; halfpenny 1694. Topsoil.
 15. Elizabeth I; threepence 1581; initial mark, long cross. Topsoil.
 16. Edward I; farthing, London mint. Obverse: EDWARDVS REX; reverse: LONDONIENSIS. (Harris Purvey and Woodhead 1964, no.011; Fox 1910-14, class Ia). Topsoil.
 17. 'Medley halfpenny'; forgery of halfpenny of George II, Old Head type, but produced most probably in the last quarter of the eighteenth century. Topsoil.
 18. Edward III; halfpenny; first period 1327-44; London mint. Coin in poor condition to classify according to H., P. and W. Difficult also because of condition to discuss duration of circulation, but like the pennies of the sterling type, the halfpennies could remain in circulation for very long periods. Topsoil.
 19. Jetton; French; late fifteenth century. Obverse: shield of arms of France Modern with annulet between two upper lis; pellet above, annulet between two pellets to left, three pellets to right of shield. Initial mark cross with pellet in each angle. Nonsense legends in debased 'Lombardic' letters based on the AVE MARIA type. Reverse: cross fleurdelysée within quatrefoil M/A/E/A in angles. This variety is not in Barnard. Diameter 28.5 x 29.5 mm.
- I think this piece worth describing in detail for its extraordinary proliferation of pseudo-'privy marks'. The dating of these derivative types is particularly difficult for archaic types and styles of lettering could be perpetuated on jettons long after they might have disappeared on contemporary coins. On surface of cobbled flint yard on south side of Building AU.
20. Victoria; halfpenny 1897. In topsoil on flint cobbles on north side of Building AU.
 21. Illegible; this is made of a brass alloy so halfpennies may be ruled out. Under flint cobbles on north side of Building AU.
 22. Elizabeth I; groat; initial mark illegible. The condition of this coin suggests that it may have been in circulation as late as the middle of the seventeenth century when worn coins of Elizabeth regularly appear in Civil War hoards. In top of well - feature 1335 - depth 45 cm: Period VI.
 23. Edward I; halfpenny; London mint. (Harris, Purvey and Woodhead 1964, no.0304; Fox 1910-14, class IIg). Probably feature 503 - clay pit: Period V.
 24. Jetton; Nuremberg; types as No.6 above; legends uncertain; late sixteenth to early seventeenth century. Diameter 22 mm minimum. Feature 506 - ditch: Period VI.

The Coins

25. Jetton; Nuremberg; Hans Krauwinkel; types as No.6 above; late sixteenth to early seventeenth century. Diameter c. 25 mm. Feature 1662 - clay pit: Period V.
26. Charles I; 'Richmond' farthing; initial mark, dagger. Feature 2521 - pit: Period VI.

THE SCEATTAS by Stuart Rigold

27. 'Sceat' or small-flan penny; Obverse: contorted, diademed profile bust to right with cross before face, the drapery represented by three arcs to left and right and horizontal lines between; all within double dotted border. Reverse: bird to right with cross (unclear) before it, the tail represented by three knobbed strokes; above it an arc running off flan, which, in view of the diameter of the die, is more probably an annulet than the breast of a second bird; all within double dotted border (Plate CXXIII). Weight: 0.99 g, Specific gravity: 8.7.

Surface analysis (from University of Bradford):	Ag	29%)
	Sn	1.5%)
	Cu	68%	) ± 20%
	Au	0.5%)
	Pb	1.0%)
	+ trace of Fe		

This coin may be safely assigned to Rigold (1978) Series J, which has a widespread distribution, including the Midlands as well as south eastern and eastern coastal sites and is typologically derived from the Kentish Primary Series B. The rather crude, linear execution, as well as the double dotted border and the treatment of the bird's tail, are characteristic of Series J. Among the B.M. 'types' included in this series are late instances of 27 (those previously classed as 'B III'), 36 and 37: this coin would be close to 36 if it had two birds, but if it had one and an annulet it would show a re-arrangement of the reverse elements of 27. In any case, the drapery is uncharacteristic and perhaps borrowed from the also widely distributed Series K ('Wolf sceattas).

Date: J and K are Secondary Series; they are absent from the great Aston Rowant hoard, assigned to c. 715, which contained both Primary and Intermediate, but present in the last of the old-type grave-hoards (Garton-on-the-Wold) and in the Cimiez hoard (737 or probably rather later). This coin, pending statistical and chemical analysis in progress, appears to be of good average weight for the series (around 1.0 g or 16 gr), but below the best in metal. A date in the 730s, or possibly 740s, agrees with other pointers. Feature 27 - post holes: undated.

28. 'Sceat' or small-flan penny; Obverse: profile bust to right, of rectangular outline, with no distinct neck and traces of horizontal line derived from band of radiate crown. Unclear letters or quasi-letters, not legible as runic, before face. Reverse: 'Standard' type, with votive inscription rendered as [] II around a central O, cross over, quasi-letters at side, radial lines from corners (Plate CXXIV). Weight: 0.22 g (coin incomplete). Specific gravity: 5.7.

Surface analysis (from University of Bradford):	Ag	60%)
	Sn	11%)
	Cu	25%	) ± 20%
	Au	1%)
	Pb	2%)
	+ traces of Fe and Zn		

This coin can unhesitatingly be assigned to Rigold (1978) Series R (Secondary Runic), although, as quite commonly in this series, no runes are recognizable upon it. This series has a strongly East Anglian distribution, but is typologically derived from the Kentish Primary Series A, via the Primary Runic Series C. The treatment of the

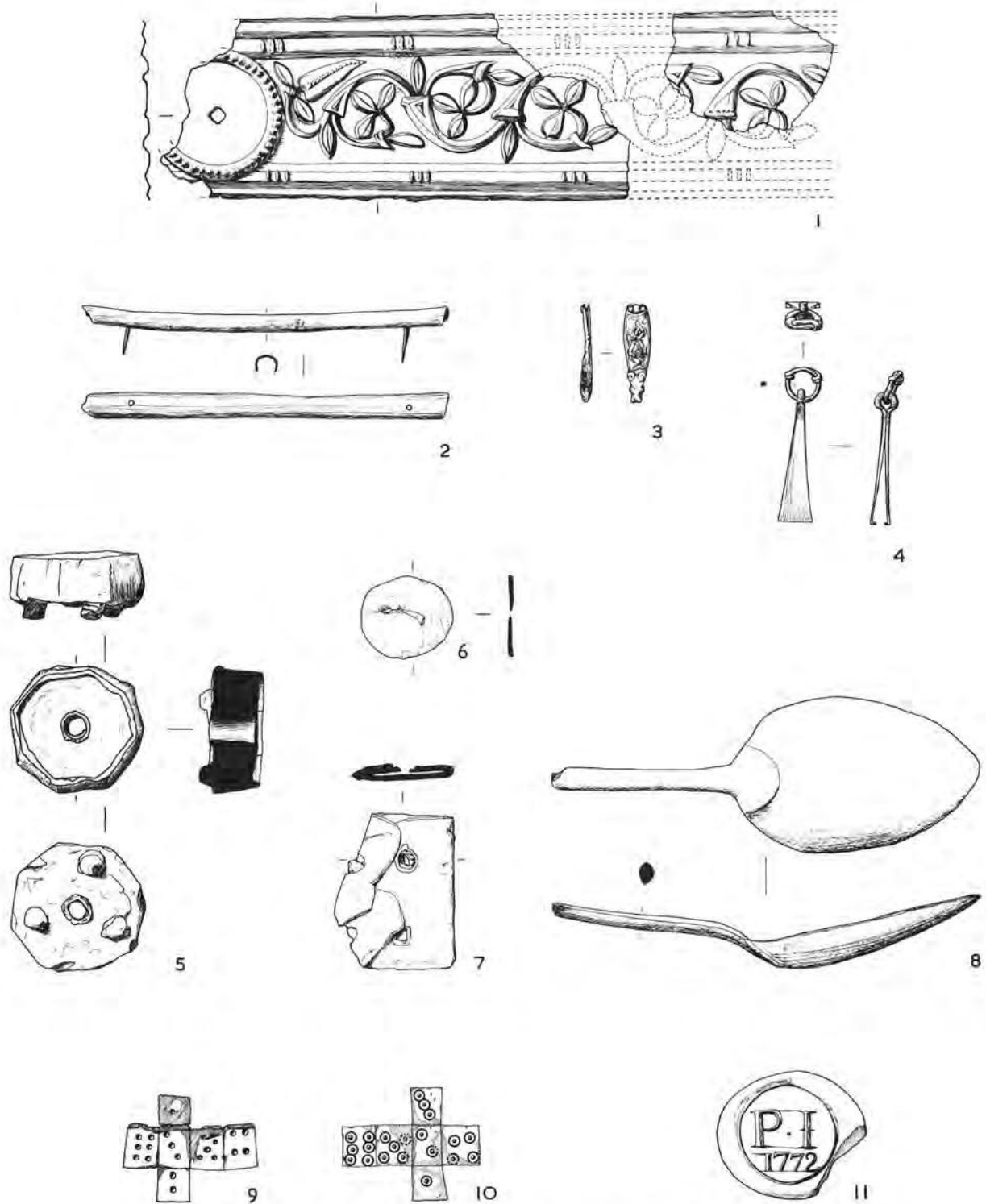


Fig.262. Objects of silver, lead, pewter, amber and glass. Scale 1:2, except No.1, 1:1.

head and rude, linear execution are characteristic of Series R, even though there may be some reversion to the archetype in the lettering: such coins are classed in the B.M. Catalogue as 'type 2b' (2a being Series A), but their weight, metal and execution show clearly where they belong. The better examples of Series R often weigh around 1.0 g (or 16 gr), but many are noticeably less, as this one clearly was, despite its ruinous condition and the possibility that it is full of corrosion-products and that much of it has leached away in the form of copper salts. This could account for the surprisingly high silver residue, despite its base and coppery appearance: it is still well below the silver content of a Primary sceat. Zinc content is also a late feature.

Date: Even the better Series R coins are seldom found with other types, save those that may have inspired Eadbert's sceattas after 738. These may be of the late 720s or 730s, the worse ones (as this) probably even later, but before their successors without bust that lead up to Beonna's coinage (? c. 760). Grave 187: Periods III-IV.

II. OBJECTS OF COPPER ALLOY

(Figs. 263-4)

by Ian H. Goodall, with contributions by
Blanche Ellis, D. F. Mackreth and D. M. Wilson

In contrast to the iron (Chapter 19), some of the most significant copper alloy objects came from Middle Saxon to Early Medieval contexts (Periods I-IV), and they are predominantly personal objects. Apart from two intrusive Roman brooches, characteristic early objects are the tweezers (4-6), tags (10-12), pins (40-1), keys (1-2) and folding balance beam (61). The gate from a mould (67) indicates bronze casting. Notable medieval finds are the strap ends and chapes (13-14, 18-19, 22) and the purse frame (62).

1. D. M. Wilson writes: Key with pierced bow, tubular stem and a bit with five rectangular and one triangular (possibly secondary) cuts. The bow and bit are decorated with ring-and-dot ornament. Spaced equally along the stem are three groups of three incised lines. The bow is in openwork around a central key-hole-shaped opening. One of the two pierced holes at the top of the bow is much worn, as though it was the loop for suspension.

This type of key belongs to the group isolated by Almgren (1955, tabell IA) as 'keys with key-hole-pierced bows'. They are normally considered a Continental, even a Rhenish, type. Although keys with similar bows occur in England (Almgren 1955, tabell IIA), the bit has a different form and the stem is by no means as substantial. The unpierced form of bit on this key is more closely related to the Rhenish type (Almgren 1955, pl. 3, nos. c, f and g), as is the ring-and-dot ornament which embellishes it. Keys are notoriously difficult to date: the only datable example of a key of this type comes from a late Merovingian grave at Onnen, Groningen, Holland (Almgren 1955, 14f). The Onnen key is, however, much smaller and on general grounds the size of the North Elmham Park key might suggest that it is of later date. It seems unlikely that a key would be imported from the Rhineland and we might presume that this object is of Anglo-Saxon manufacture. In which case the popularity of cast openwork bronze in ninth- and tenth-century England (Wilson 1964, pls. xvii, no. 18 and xxvii, no. 56) might suggest a late Anglo-Saxon date for the key; but such a date can only be postulated most tentatively and the date must ultimately depend on the associated finds in the pit (Plate CXXII).

Period II, Phase 1 cess pit 44a Also found in this pit were the copper alloy pin (Fig. 264, No. 40), the gilt copper alloy edge binding (Fig. 264, No. 50), the gilt silver strip and the silver mount (Fig. 262, Nos. 1 and 2). These five objects form the richest group of objects from the site.

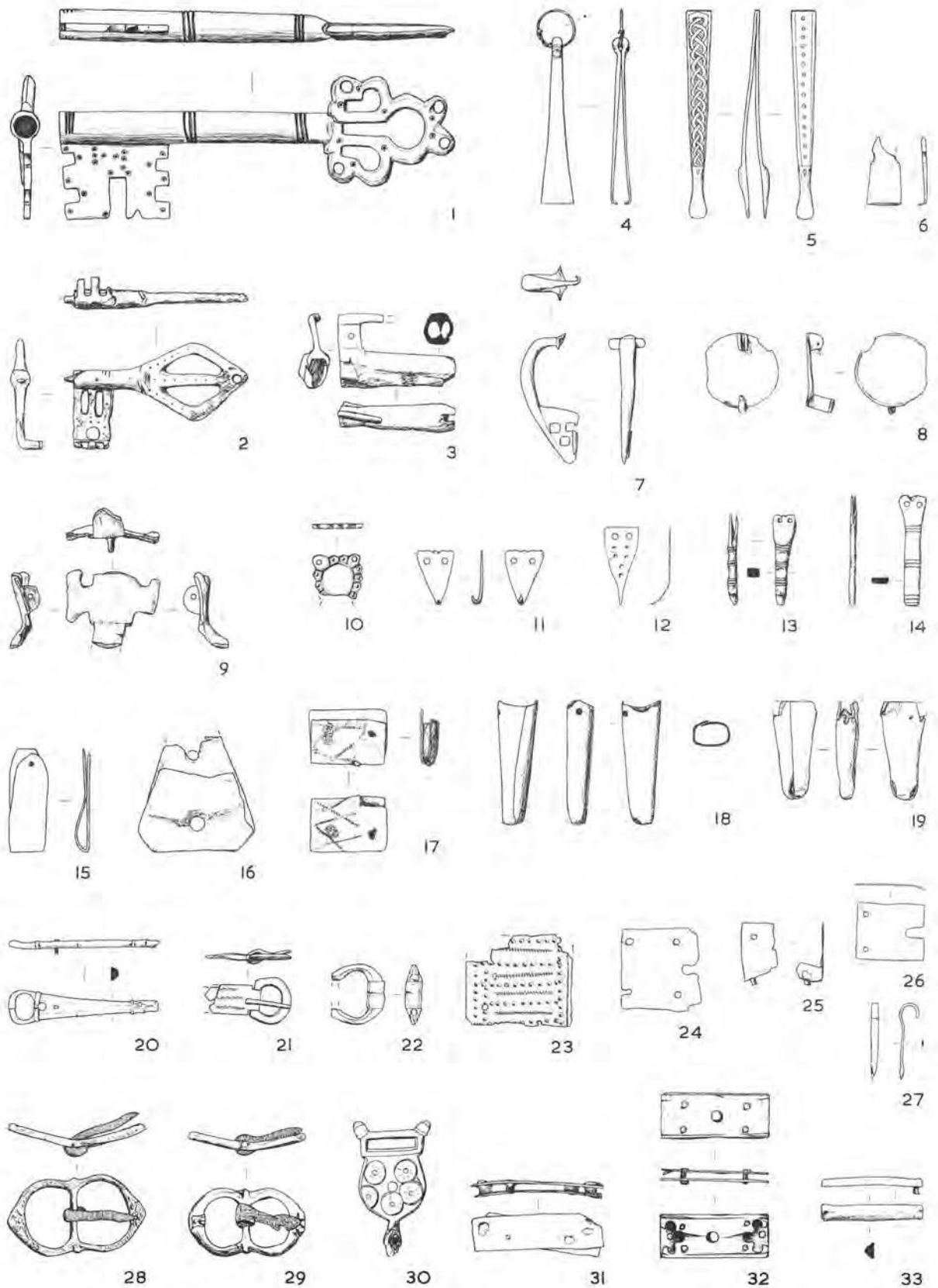


Fig.263. Objects of copper alloy. Scale 1:2.

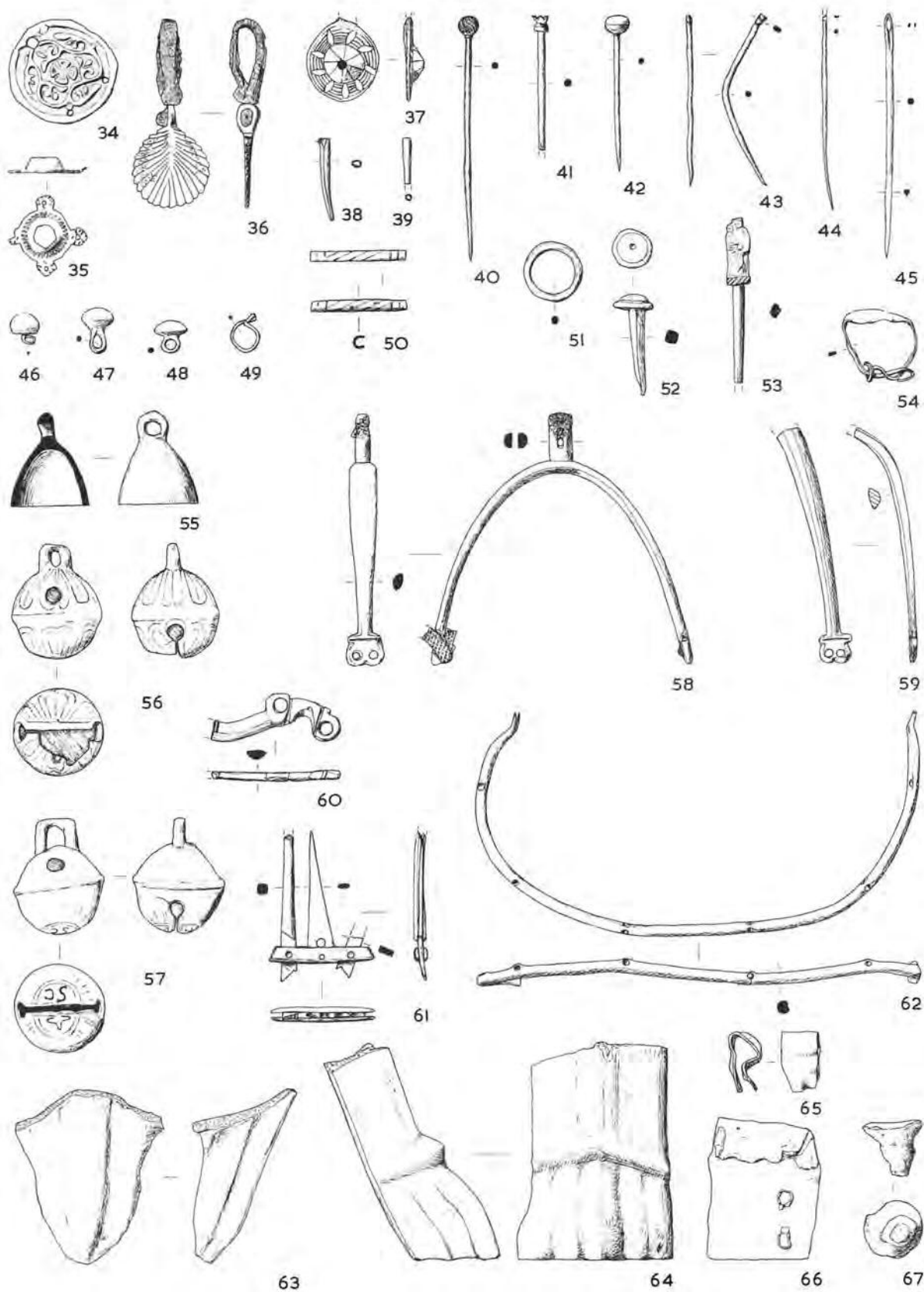


Fig.264. Objects of copper alloy. Scale 1:2.

2. Key with lozenge-shaped bow, solid stem with projecting tip and pierced bit with angled base. The stem has a band of three grooves and the bow and bit are decorated with a series of dots (Plate CXXII). Period ?II, in upper filling of Period I ditch: feature 120.
3. Small, incomplete barrel padlock case. Examples of medieval date come from Goltho and South Witham, Lincs. (Goodall 1975a, fig.44, no.21; South Witham excavated by P.Mayes). Topsoil.
4. Tweezers with wire suspension loop, decorated bow and incurved arm tips, similar to a pair in silver (Fig.262, No.4). Other examples of this type with gently expanding arms include those from the pagan Saxon cemetery at Lackford, Suffolk and from Whitby Monastery, Yorks. (Lethbridge 1951, 19-20, fig.12, no.50, 119A; Peers and Raleigh Radford 1943, 62, fig.13, no.6). Period I ditch: feature 2022.
5. Tweezers with simply moulded, spatulate terminals, one arm decorated with inter-lace, the other with punched circles between lines. The tweezers appear to be complete, but they are presumably brazed together at the head. A pair of tweezers from a pre-930 context at Cheddar, Somerset (excavated by P.R.Rahtz), though looped and with extended lozenge-shaped arms, has similar spatulate terminals. Period ?II, uppermost filling of the pit of Well II: feature 2957.
6. Shaped and incurved tweezer arm tip, similar to that of a pair from Holywell Row, Suffolk, an earlier example (Lethbridge 1931, 4, fig.1, no.C1). Period II, Phase 1 cess pit: feature 829.
7. D.F.Mackreth writes: Colchester brooch, spring and hook missing, wings short and plain, oval sectioned bow tapers to the usual pointed foot. The catch-plate is hammered out on one side of the bow and has three rectangular piercings.

The Colchester, the main pre-Roman Conquest bow brooch to be found in Lowland Britain, survived the Conquest, but was soon replaced by its derivatives. It is not clear if any of its successors had started to develop before the Conquest, but the Colchester persisted almost certainly until 50-60 A.D. Late specimens betray some of the decorative quirks which belong to the growing family. In the present case, the rounded profile and stumpy appearance of the brooch suggest that its date of manufacture is after the Conquest, but at a time before there was any attempt to copy the variant two-piece brooches which replaced it. Topsoil from near feature 128.

8. D.F.Mackreth writes: Plain disc brooch with a slight raised border. The pin was once hinged. The rough surface on the front suggests that there may well have been a repoussé sheet-bronze mount soldered on.

The brooch is essentially simple and without any ornament to help supply a date and it can only be suggested that it lies in the period from the middle of the first century A.D. to near the middle of the second. Period V clay pit: feature 128.

9. Part of an early Saxon square-headed small-long brooch. Period II, layer J in the upper filling of the pit of Well I, associated with sherds of Ipswich ware. The material from this deposit was the debris of Period I building and this brooch was, therefore, derived from a Period I deposit located elsewhere on the site.
- 10-12. Tags, small hooked plates with two or more attachment holes, are known from contexts of pagan to late Saxon date. Their shapes vary, but sub-circular examples like No.10 include that from Southampton (Addyman and Hill 1969, 70, fig.27, no.6), triangular ones like Nos.11-12 those from Shudy Camps, Cambs., Whitby Monastery,

Objects of Copper Alloy

- Yorks. and the Tetney, Lincs. hoard of pre-970 (Lethbridge 1931, 21, fig.1, no.E2; Peers and Radford 1943, 60, fig.12, no.10; Wilson 1964, 7, 64, 178, pl.xxxii, nos.86-7). No.10: Period II, Phase 2 foundation trench: feature 329; No.11: Periods III/IV pit: feature 1023; No.12: Topsoil.
- 13-14. Strap ends decorated with bands of grooves, No.13 additionally shaped. In form these relate to a plain strap end from Southampton of thirteenth century, and probably pre-1250, date, and a grooved and hooked example from a probable early twelfth-century context at Rottingdean, Sussex (Harvey 1975, 254, fig.240, no.1712; Norris and Hockings 1953, 61, fig.5). No.13: Period VI boundary trench: feature 1069; No.14: Topsoil.
15. Plain, sheet-metal strap end. Period I, Phase 2 ditch: feature 1075.
16. Plain, sheet-metal strap end perhaps used in conjunction with a buckle frame. Period VI boundary trench: feature 1614.
17. Strap end decorated with a criss-cross of zig-zag lines; pair of holes, one with corrosion from iron rivet. Topsoil.
- 18-19. Plain, sheet-metal chapes. No.18: Period V clay pit: feature 1688; No.19: Period VI pit: feature 1800.
20. Strap-end buckle, pin missing, frame and double-riveted plate cast in one. Compare with another early medieval example from Southoe Manor, Cambs. (Hunts.) (Lethbridge and Tebbutt 1939, 163, pl.Ib). Periods III/IV pit: feature 2146.
21. Strap-end buckle, plate decorated. Topsoil.
22. Incomplete frame from strap-end buckle. Period V clay pit: feature 3706.
- 23-6. Incomplete plates from strap-end buckles. Nos.23-5: Period V clay pits: features 1513, 3726, 957; No.26: Topsoil.
27. Sheet-metal buckle pin. Period V clay pit: feature 3003.
- 28-9. Spectacle buckles with shaped and moulded frames, angled in side view, with iron pins. Compare with those of probable early seventeenth-century date from Basing House, Hants. (Moorhouse 1971, 60, fig.25, nos.169-70). Topsoil.
30. Moulded and decorated strap slide, pierced terminal. Period V clay pit: feature 2419.
- 31-2. Strap plates or strap unions, No.31 plain, No.32 shaped with central hole. No.31: Period V clay pit: feature 1453; No.32: Topsoil.
33. Riveted strip. Period V clay pit: feature 957.
34. Decorated gilt roundel with three rivet holes. Gilding stippled on drawing. Compare with one from Goltho, Lincs. (Goodall 1975a, 93, fig.44. no.23). Period IV pit: feature 1630.
35. Decorated, domed boss with projecting, perforated terminals. Topsoil.
- 36-7. Harness pendants, No.36 a gilt shell pivoting on an iron loop (gilding stippled), No.37 a gilt oval plate with perforated dome, suspension loop broken off. Period V clay pits: features 370, 3002.

- 38-9. Lace ends. Period V clay pits: features 1485, 1513.
40. Pin with swollen shank, the writhen, spherical head similar to that of a pin from the Saxon site at Bonhunt, Essex (Bradley and Hooper 1974, 50, fig.8, no.4). Period II, Phase 1 cess pit: feature 44a.
41. Pin, shank incomplete, moulded and crowned head. Period III, Phase 2 post holes: features 2723-24.
- 42-3. Pin, No.42, with large domed head made from two sheets brazed together, the type of head which No.43, where only brazing fluid now remains, is likely to have had. No.42: Period V pit: feature 2190; No.43: Period VI boundary trench: feature 1069.
44. Needle broken across base of eye. Period VI pit: feature 2521.
45. Needle, shank of circular section becoming triangular, as on needles from Whitby Monastery, Yorks. and from a fifteenth to sixteenth-century context at Southampton (Peers and Radford 1943, 68, fig.13, no.8; Harvey 1975, 260, fig.242, no.1781). Topsoil.
- 46-8. Buttons, No.46 globular with attachment loop set in flat back, Nos.47-8 flattened spheres cast in one with the loops. No.46: Undated post holes: feature 3526; Nos.47-8: Topsoil.
49. Twist loop. Undated post hole: feature 2961.
50. Decorated gilt edge-binding with single rivet hole. Period II, Phase 1 cess pit: feature 44a.
51. Ring. Period V clay pit: feature 1095.
52. Stud with shaped head. Period VI pit: feature 2521.
53. Spoon terminal of copper alloy in form of Madonna and Child, hexagonal section silver stem. Topsoil.
54. Expanded wire loop, ends twisted together. Topsoil.
55. Bell. Without provision for a clapper or pea, the bell must have rung by clashing with others. Period II pit: feature 259.
- 56-7. Rumbler bells. Topsoil.
58. Blanche Ellis writes: Rowel spur of slender proportions with tapering sides, fragments of iron attachments for the leathers in one terminal and traces of rust in the other. Very short, straight neck with scant remains of small iron rowel in rowel box. Second half of the seventeenth century. Overall length 89 mm, span (slightly distorted) 86 mm, neck 17 mm long, rowel box 12 mm long. Topsoil.
59. Blanche Ellis writes: Almost complete side of spur of same type and size as No.58, but without traces of attachments. Second half of the seventeenth century. Overall length 80 mm. Topsoil.

Spurs Nos.58-9 are not a pair, but are so similar that they must have been made at the same place. Another is known from Earsham, Norfolk.

Objects of Copper Alloy

60. Blanche Ellis writes: End of slender spur side with elongated two-ring terminal. Broken behind terminal where upper edge had decorative V ridge and groove. Elongated terminals occur on some spurs between c. 1450 and c. 1800. Overall length 45 mm. Period ?VI: under cobbled yard in the southern area of the excavation.
61. Folding balance beam, incomplete, of a type known from late Saxon and early medieval contexts (Goodall 1975a, 95, fig.44, no.37). Topsoil.
62. Purse frame with six perforations through a circular-sectioned bar with inner grooves; suspension loops broken. This frame is one of two which hung from the purse bar (London Museum 1967, 162-71). Period V clay pit: feature 3003.
- 63-4. Skillet leg and cauldron foot. No.63: Undated post hole: feature 3065; No.64: Topsoil.
65. Clip. Period VI pit: feature 2521.
66. Sheet-metal patch. Period V clay pit: feature 2344.
67. Head from a casting which had formed in the gate of a mould. Period ?II, uppermost filling of the pit of Well II: feature 2957. Other evidence of casting included slag from a Period V clay pit, feature 1634, and various fragments of scrap from Period V and VI features.

COMMENT

The distribution of the copper alloy finds by period and contexts

Features:	Period I:	2
	Period II:	10
	Period III/IV:	6
	Period V:	24
	Period VI:	9
Undated features:		3
Topsoil:		22

The relative scarcity of metal finds of quality was one of the most surprising aspects of the excavation. Very few notable Anglo-Saxon small finds came from contexts other than those of Period II. The best of the bone objects also came from Period II contexts, as did three of the four silver objects described below, emphasising the possible significance of the excavation site during the tenth century (P.W-M).

III. OBJECTS OF SILVER

(Fig. 262)

1. D.M.Wilson writes: Fragmentary silver-gilt impressed sheet in fifteen fragments, all (save one) conjoined. Between a border composed of a lightly impressed double contour (the internal one bearing transverse groups of three beads at approximately 2 cm intervals) is a vine-scroll. At one end of the surviving sheet a now broken roundel cuts the inner border: the roundel has a beaded edge and is largely free from gilding; it has a central rivet-hole. The main portion of the field bears an impressed scroll with trefoil terminals; the scroll is made up of pairs of tendrils springing from horn-shaped axils. Near the roundel is a series of leaves now unclear. The back is plain. Width of strip: 3 cm.

This object is clearly part of the mount of a book or box (possibly a shrine) of a type familiar on the Continent but rare in England. The roundel presumably formed the base of a separate setting which, probably, originally contained a semi-precious stone or piece of glass. The edge of the strip would presumably have been clasped by a plain or beaded band which would itself be nailed to the base; it could perhaps also have been clasped by plates of metal or ivory which would form the main area of decoration of a large flat surface.

Such Pressblech foliate or scroll ornament occurs occasionally on the Continent; for example, on the pentagonal reliquary at Conques or the Charlemagne letter A (Taralon 1966, pls 210 and 212). There is also a vine scroll on the Arnulf ciborium which is dated c. 870 (Schramm and Mutherich 1962, pl.270). An inhabited vine-scroll also appears on the heavily insular-influenced Rupertus Cross at Salzburg (Fillitz 1963, 184ff).

There seems no reason, however, why these fragments should not be of English origin. The foliate scroll was a popular form in Anglo-Saxon art, appearing in one form or another on many pieces of stone sculpture. An exact parallel to this particular example is, however, hard to find and more work must be done before a clear parallel can be produced. The technique also is well documented in English metalwork (Wilson 1961, 211f); indeed, an elaborate inhabited vine-scroll, bearing little relation to this example, is found in the same technique on the Ormside bowl (Kendrick 1938, pl.lx). In general terms the discipline and clarity of the motif would suggest an eighth- or ninth-century date for the fragments. Period II, Phase 1 cess pit: feature 44a.

2. D.M.Wilson writes: Silver strip of sheet metal formed into a semi-circular mount. It is pierced, near top and bottom, by two silver brads which have now been removed from the object. One end of the strip is cut at a slight angle. The other end is torn at one side and cut at a 45° angle at the other. Length: 11.9 cm. Length of brads: 1.3 and 1.5 cm.

Such silver strips are commonly used for binding caskets, book-covers and shrines. It is possible that this object bound the edge of a wooden box or shrine (as on the Maaseik reliquary where similar strips occur (Elbern 1962, pl.280a), covered with silver plates or otherwise ornamented with metal. Such strips can be seen as borders to impressed silver sheets on a seventh-century Anglo-Saxon book-binding from Fulda (Wilson 1961, pl.xxxvii). That such caskets were produced in England is shown by the two tenth-century Anglo-Saxon plates of unknown provenance in the British Museum (Wilson 1964, pl.xliv, 154 and 155). It is just conceivable that this binding strip came from the object embellished by No.1. Period II, Phase 1 cess pit: feature 44a.

3. D.M.Wilson writes: Silver strap-end. At the terminal is an animal's head seen from above in relief; it has prominent eyes, oval ears with lunate incisions and moulded nostrils. At the split end are two slightly dome-headed rivets. In the central field is a nielloed pattern (now much damaged and obscured) which apparently forms an interlace pattern - whether of zoomorphic or ribbon character is unclear. The back is plain. Length 3.2 cm.

Strap-ends of this form and with decoration executed in this medium are commonly found in ninth-century contexts (Wilson 1964, 62f). Topsoil.

4. Ian Goodall writes: Tweezers with wire suspension loop and gently expanding arms incurved at the end in the manner of a copper alloy pair. The surviving area of gilding on bow is stippled on the drawing. Period ?II, Phase 1, upper filling of a Period I ditch: feature 44.

IV. OBJECTS OF LEAD AND PEWTER

(Fig.262)

LEAD

5. Base of pricket candlestick; eight-sided with three legs and a sunken top surrounded by a slightly bevelled rim. There is a square hole through the centre, probably for a lost iron spike. Period V clay pit: feature 332.
6. Oval-shaped plate partly torn through in the centre. ?Period II pit: feature 270.
7. Piece of sheet lead wrapped over twice with a pair of nail holes. Period V clay pit: feature 2344.

PEWTER

8. Spoon with a broken handle. ?Period VI: feature 363 sunken street.

19. THE IRON OBJECTS

by Ian H. Goodall

(Figs. 265-267)

The iron objects, as diverse in their uses as in their dating, range from a loose-ringed pin to a pair of smoker's tongs. A disproportionately small number come from Middle Saxon to early medieval contexts (Periods I-IV), but notable among them are the loose-ringed pin (118), slotted and tanged object (48), chain hook (89) and girdle hanger (91). Tools comprise an awl, two possible heckle teeth, an axe and a billhook (45-50), but the few knives (18-21) are too small to be other than domestic. Other objects include candleholders (92-3), a key (1), hasp (12), hinge pivot (66) and a handle (90). The most representative series of finds are from medieval contexts (Period V) and include knives (23-9), tools (51-8), keys and locks (3-10, 15-17), hinges and pivots (62-3, 67-70), structural fittings (74-6, 81, 83-4), horse furniture (105-7, 116), a number of buckles (122-8) and a chape (129). The post-medieval finds are similarly diverse, if a little less numerous.

KEYS, LOCKS, ETC. (Fig. 265)

1. Padlock key, elaborately cut bit, incomplete stem. Period II pit: feature 2125.
2. Padlock key with incomplete bit and non-ferrous plating, similar to one from Totnes Castle, Devon (Rigold 1954, 254, fig.8, no.8C). Topsoil.
- 3-8. Keys, all with solid stems, Nos.2 and 3 with non-ferrous plating. No.8, despite its context, was found with a heel-iron and is probably post medieval. Nos.3-7: Period V clay pits: features 1664, 3052, 2075, 1095 and 2090; No.8: Period V depression: feature 1078.
9. Barrel padlock case with longitudinal straps closely resembling one from Boston, Lincs. (Goodall 1972, 40-1, fig.7, no.1, pl.1). Period V clay pit: feature 3504.
10. Embossed padlock, the mechanism in a rectangular case with a back plate with fixing holes around its edge. A U-shaped shackle pivots in the case, its broader, angled arm having a nicked triangular rest which penetrates the case. Within the case, the bolt, pivoted at one end and sitting in the rest at the other, is held closed by an L-shaped spring. To open the padlock a key engaged the pin, formed by an S-shaped piece of iron within the case, and was turned to pass the arcuate collar, lift the bolt out of the rest and so free the shackle.

A padlock with an almost identical mechanism comes from a context of c. 1425 to 1521 at Writtle, Essex, one with a sliding bolt from a croft deserted in the late fourteenth century at Goltho, Lincs., and other padlocks of the same general type are known from contexts of the sixteenth to eighteenth centuries (Rahtz 1969, 85, fig.47, no.48; Goodall 1975a, 84, fig.39, no.65; Clarke 1952, 42; Goodall 1975b, 141, fig.28, no.340; Dunton 1972, 166, fig.77, nos.12-13). Period V clay pit: feature 3052.

11. Chest lock, the sheet iron plate with corner attachment holes, shaped keyhole and rectangular hasp slot. Two L-shaped mounts fixed to the back of the plate hold the

combined spring and toothed bolt in place and also held the lost ward. An indent in the underside of the bolt shows where it rested on the left-hand mount when in locked position. Period VI clay pit: feature 3056.

- 12-13. Staped hasps. No.12: Period ?II pit: feature 270; No.13: Period V clay pit: feature 3052.
14. Ward. A ward, sometimes with collars, was a barrier in a lock which the key bit had to pass before lifting any tumbler and throwing the bolt. Period VI clay pit: feature 936.
15. Tumbler with pivoting loop and projecting nib which engaged in a notch in the upper surface of the bolt. A bolt with an appropriate indent comes from Kettleby Thorpe, Lincs. (Goodall 1974, 34, fig.19, no.29). Period V clay pit: feature 2255.
16. Incomplete bolt with step on upper surface against which the horizontal nib of a tumbler rested. The bit of the key turned against the lower projections, so opening and closing the bolt and the lock. A suitable, if later, tumbler comes from Williamsburg, Virginia (Hume 1969, 243-5, fig.77b, no.3). Period V clay pit: feature 3003.
17. Broken figure-eight hasp. Period V clay pit: feature 2102.

KNIVES AND FORK (Fig.265)

Knives Nos.18-25, 30-2, 35-8 and 40 have whittle tangs for insertion in a handle, the remainder, scale tangs for riveted handles. Nos.27 and 28 have non-ferrous shoulder plates held by tubular rivets, No.39 shoulder plates brazed in position and Nos.33-4 merely the brazing fluid, stippled on the drawing, which formerly secured shoulder plates. No.29, and possibly No.34, have inlaid cutler's marks. The bolsters between blade and tang of Nos.35-9 represent a technique of manufacture introduced in the early or mid-sixteenth century. No.40 has a decorated bone handle, No.43 is the green-stained bone handle, with iron back rib, from a clasp knife, and No.44 is a table fork with whittle tang, bone handle, oval bolster and formerly three tines.

No.18: Period I ditch: feature 950; No.19: Period II pit: feature 30; No.20: Period II, Phase 1 cess pit: feature 829; No.21: Period ?II pit: feature 270; No.22: Undated pit: feature 670; No.23: Period V pit: feature 945; Nos.24-9: Period V clay pits: features 2420, 3735, 2562, 2988, 2102, 1641; Nos.30-4: Period VI clay pits: features 3748, 1635, 3535, 1635, 3748; Nos.35-8: Period VI pits: features 2400, 2400, 2521, 2521; No.39: Period VI: upper six inches of features 1240, 41, 27(S) and 1095; No.40: Topsoil; No.41: Period VI: Building AW; No.42: Period VI clay pit: feature 959; No.43: Period VI: under flint cobbles east end of Building AU; No.44: Period VI boundary trench: feature 937.

TOOLS (Fig.266)

45. Awl, wood graining on square-sectioned tang which becomes circular. Period I ditch: feature 950.
- 46-7. Tapering pins or heckle teeth, common finds on Middle and Late Saxon sites. They are comparable with the teeth of wool combs from Arhus, Denmark, datable to the period c. 900 to 1200 (Andersen, Crabb and Madsen 1971, 138-9; Addyman 1964, 60, fig.16, nos.15-17; Addyman 1973, 93, fig.19, nos.10, 13-17). No.46: Period II, Phase 1 cess pit: feature 829; No.47: Period II, Phase 2 cess pit: feature 294.

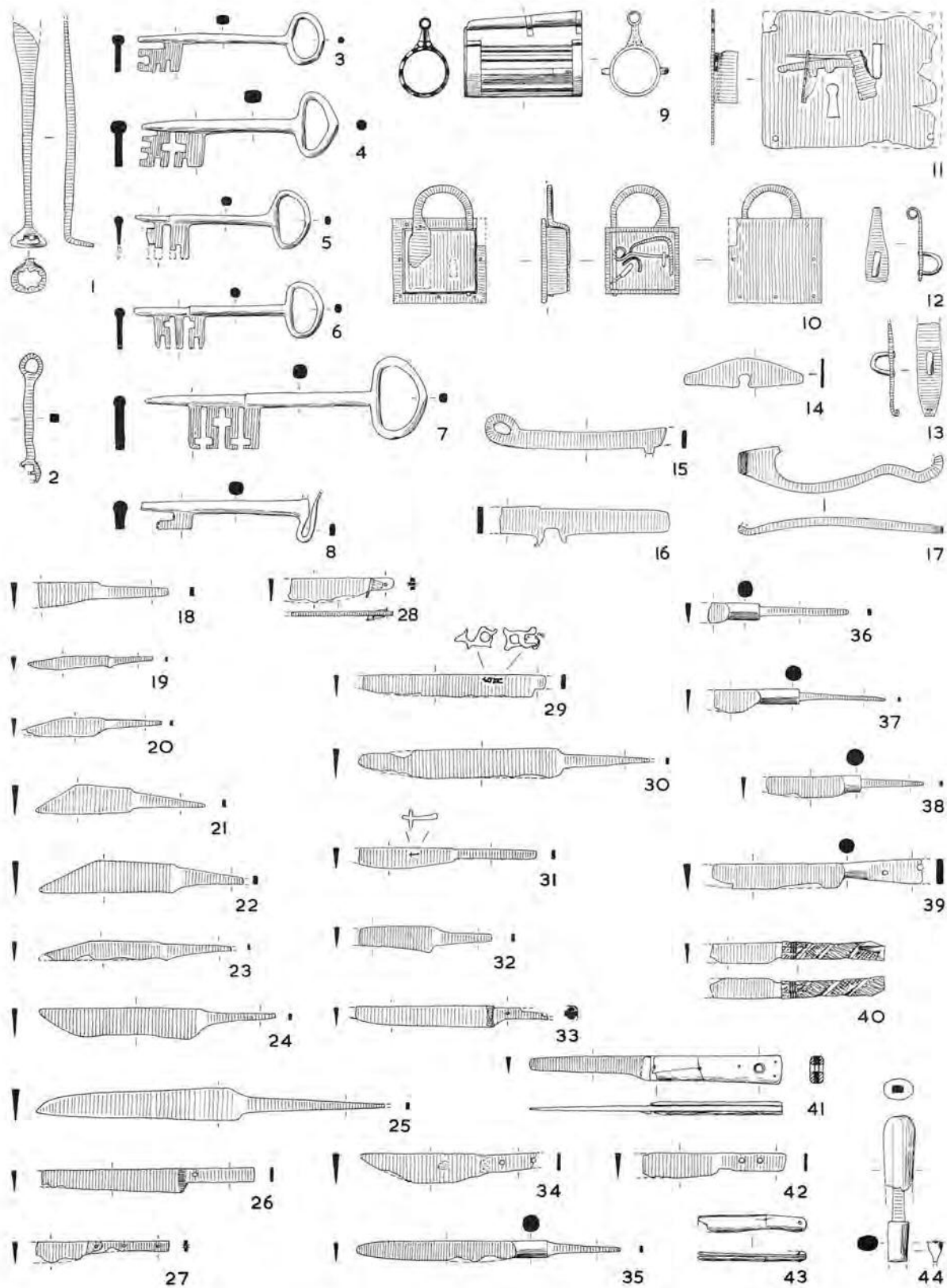


Fig.265. Objects of iron. Scale 1:4.

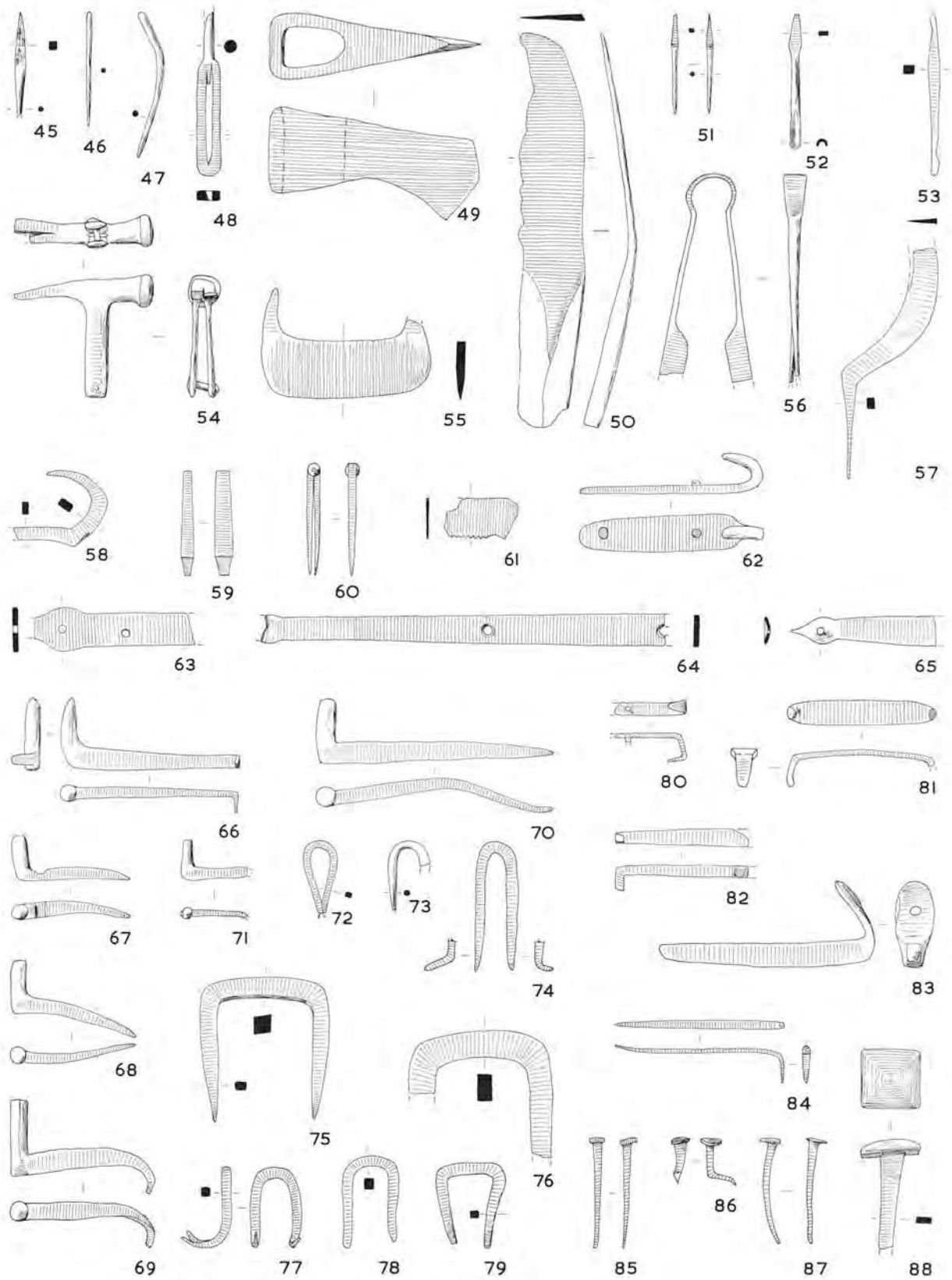


Fig.266. Objects of iron. Scale 1:4.

The Iron Objects

48. Rectangular slotted object with broken tang. Similar objects are known from a number of Early Christian Irish sites, namely Lagore, Cahercommaun, Uisneach, Dunbell and Carraig Aille II (detailed refs. in Alcock 1958-60, 223-4), but another from Lough Faughan (Collins 1955, 61, fig.11, no.70; keybows: Algreml 1955, fig.39, no.87) must be considered dubious since it more closely resembles a key bow. British examples come from Gwithian, Dunadd and Lesser Garth Cave (Laing 1975, 296; Alcock 1958-60, 221-7), in addition to the present one and another from Southampton (Harvey 1975, 279, fig.251, no.2007). The steady growth in the number of British examples might cause some reconsideration of the Irish origin claimed for the type (Alcock 1958-60, 224; Laing 1975, 296), just as the finding of one in a thirteenth-century context at Southampton must upset its hitherto neat, restricted chronology.

The use of these objects is uncertain, suggestions having included a use in making coarse fabric, as an auger or a strike-a-light. Their size varies considerably and their shape suggests that they may have been used as guides in some way. Period ?II, top fill of ditch: feature 834.

49. Axe. Period IV pit: feature 508.
50. Billhook with flattened socket. Period IV pit: feature 493.
51. Awl. Period V pit: feature 1076.
- 52-3. Auger bits. No.52: Period V clay pit: feature 2129; No.53: Period V post holes: feature 1615.
54. Claw hammer with nailed flanges down the shaft. Period V clay pit: feature 3014.
55. Drawknife or shave similar to one from Knaresborough Castle, Yorks. (Waterman 1953, 213, fig.1, no.22). Period V clay pit: feature 1641.
56. Shears, blades incomplete. Period V clay pit: feature 370.
57. Sickle. Period V clay pit: feature 3052.
58. Strike-a-light. Period V boundary trench: feature 3719.
- 59-61. Punch, pair of dividers and saw blade fragment. Period VI: Building AW.

STRUCTURAL IRONWORK (Fig.267)

- 62-5. Strap hinges. Nos.62-3: Period V clay pits: features 1414, 3052; No.64: Period VI pit: feature 1800; No.65: Period VI clay pit: feature 936.
- 66-71. Hinge pivots, the tip of No.66 clenched round, No.67 heavily worn. No.66: Period II, Phase 2 cess pit: feature 294; Nos.67-8, 70: Period V clay pits: features 1485, 3086, 3732; No.69: Period V pit: feature 3193; No.71: Period ?VI post hole: feature 3073.
- 72-9. U-shaped and squared staples. No.72: Period II pit: feature 269; No.73: Period ?III flint cobbles: feature 533; Nos.74-6: Period V clay pits: features 3735, 3578, 1664; Nos.77-8: Period VI pit: feature 1800; No.79: Period VI: Building AW.
- 80-1. Rove and timber dog. No.80: Period IV, Phase 3 post hole: feature 2522; No.81: Period V clay pit: feature 2198.

82. Cramp. Period VI: Building AW.
83. Wall anchor with perforated head. Period V clay pit: feature 2157.
84. Angular staple. Period V clay pit: feature 1868.
- 85-7. Three of six nails with flat, rectangular heads. Period I foundation trench of Building AM.
88. Stud. Period VI clay pit: feature 959.

FITTINGS (Fig.267)

89. Chain hook with central length of three strands of spirally-twisted iron, comparable with elements of the Sutton Hoo cauldron chain (Bruce-Mitford 1972, 39, figs.16-17). Period II pit: feature 552.
90. Bucket or cauldron handle: see a cauldron handle from Balladoole, Isle of Man (Bersu and Wilson 1966, 42, fig.28). Period II, Phase 1 cess pit: feature 44b.
91. Latch lifter? similar to one from the Anglo-Saxon cemetery at Shudy Camps, Cambs. (Lethbridge 1936, 23, fig.11, no.1). Period II, Phase 3 cess pit: feature 529.
- 92-4. Socketed candleholders. No.92: Period II cess pit: feature 2987; No.93: Periods III/IV pit: feature 493; No.94: Period VI post hole: feature 3098.
- 95-6. Binding strips, No.95 plated. No.95: Period I pit: feature 514; No.96: Period VI pit: feature 2441.
97. Arm with obliquely-set, perforated head. Period V clay pit: feature 3569.
98. Socketed arrowhead. Period V clay pit: feature 3565.
99. Two figure-eight chain links. Period V pit: feature 315.
100. Swivel ring and hook. Period VI clay pit: feature 3004.
101. Suspension lug with perforated terminals. Period VI boundary trench: feature 1102.
102. Ring. Period VI: Building AW.
103. Eyed closing hook. Period VI pit: feature 1800.
104. Small pair of pipe tongs, spring broken, tobacco stopper on one arm. The type, also found in brass, is often elaborately moulded (Lindsay 1964, 67-8, figs.363-6, no.8). Period VI pit: feature 352.

HORSE FURNITURE (Fig.267)

- 105-12. Horseshoes, No.105 with countersunk nailholes and slightly sinuous edge, the remainder with plain nailholes and edge. Nos.105-7: Period V clay pits: features 2198, 2073, 2988; No.108: Period VI clay pit: feature 936; No.109: Period VI depression: feature 1220; No.110: Period VI post hole: feature 1099; Nos.111-12: Period VI clay pit: feature 959.
113. Cheekpiece from snaffle bit. Topsoil.

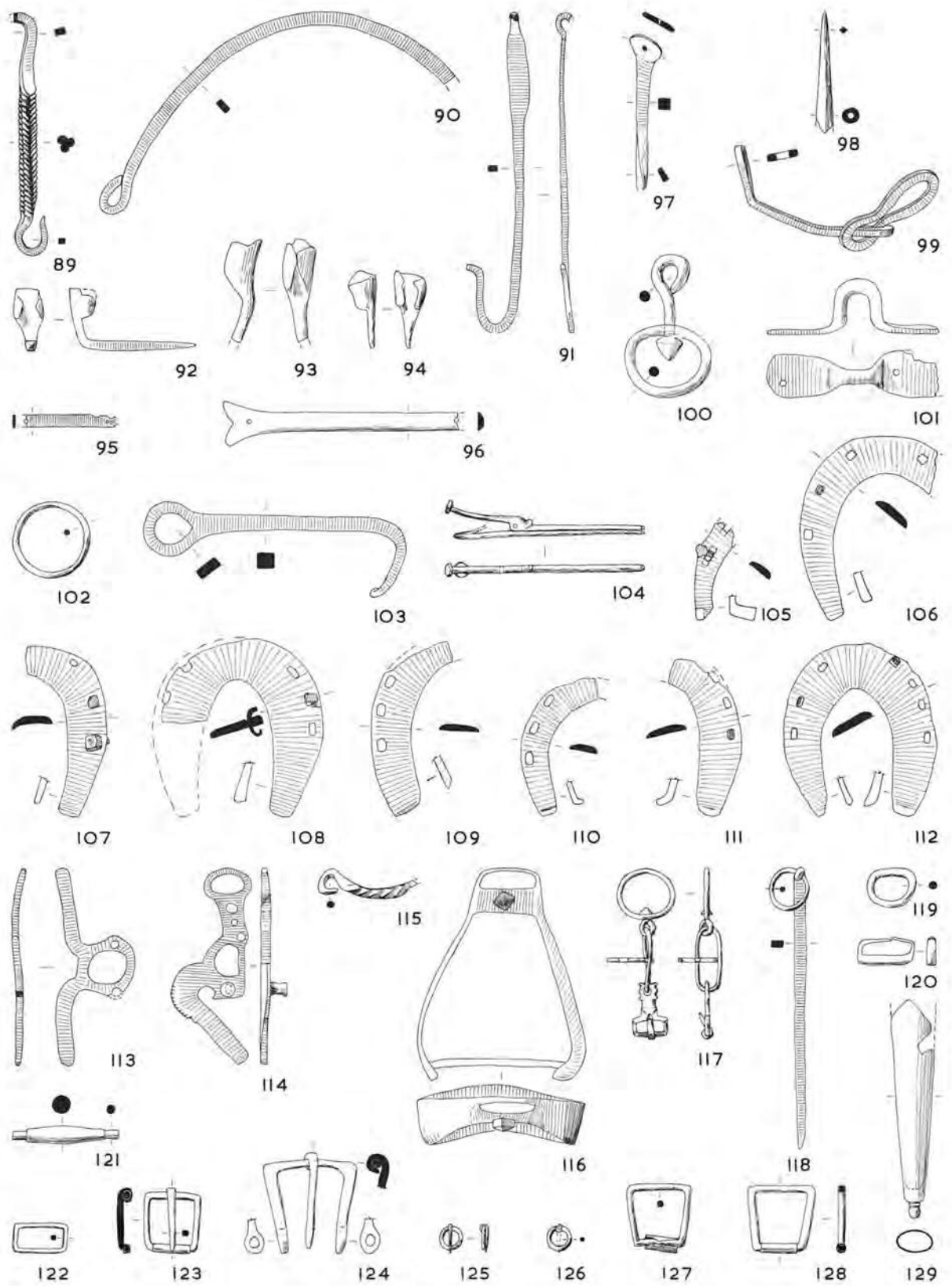


Fig.267. Objects of iron. Scale 1:4.

114. Cheekpiece from curb bit with non-ferrous plating and decorative grooves. The mouthpiece swivelled in the D-shaped opening and the mount below took a bridle boss. The remaining holes were for links and hooks which held the reins as well as chains between the cheekpieces. Compare with a similar seventeenth-century bit from Basing House, Hants. (Moorhouse 1971, 47-9, fig.21, no.89). Period VI clay pit: feature 3748.
115. Spirally-twisted mouthpiece from bridle bit. Period VI pit: feature 933.
116. Stirrup. Period V clay pit: feature 3052.
117. Chain, swivel ring and buckle from harness. Period VI pit: feature 2144.
- PIN, BUCKLES, CHAPE (Fig.267)
118. Loose ringed pin. Period I ditch: feature 1790.
119. D-shaped buckle frame, probably from a strap-end buckle. Period I foundation trench: feature 903.
120. Belt slide, to be compared with decorated examples from the Viking burial at Balladoole, Isle of Man and a plain one from a principally eleventh to early twelfth-century context at Gloucester (Bersu and Wilson 1966, 36-7, pl.viid, fig.26; Gloucester: excavated by Henry Hurst). Undated pit: feature 1178.
121. Swivelling baluster bar with non-ferrous plating from buckle similar to No.124. Period IV pit: feature 569.
122. Rectangular buckle frame, pin lost. Period V clay pit: feature 2988.
123. Rectangular buckle with pin resting against cylinder. Period V clay pit: feature 3576.
124. Buckle frame, baluster bar lost. Period V clay pit: feature 2979.
- 125-6. Buckles from breeches or shoes, similar to others in lead and iron. Period V clay pit: feature 3578.
- 127-8. Buckles, pins lost, sheet iron cylinders on shortest arms. No.127: Period VI: Building AW; No.128: Period VI pit: feature 2398.
129. Sheet iron chape with terminal knop. Period V pit: feature 2432.

20. INTRODUCTION

by David Yaxley

Soon after the excavation of the Anglo-Saxon site in the Park began, the investigation of the documentary history of North Elmham was commissioned. Even at the start there was very little hope that anything bearing on the history of the site in Saxon times would emerge, and that pessimism was quickly and fully justified. The earliest substantial document, the entry for Elmham in Domesday Book, was written more than a decade after the seat of the bishop of East Anglia had been removed from Elmham. As usual, the entry is not conspicuous for its clarity:

'Elmenham was held by Ailmar the bishop in the time of king Edward for a manor and for 8 ploughlands; now the bishop holds it in demesne. Then as now 41 villeins and 63 bordars. Then 6 serfs, now 4; 24 acres of meadow; then as now 4 ploughs on the demesne, and 16 ploughs belonging to the men. Then wood for 1,000 swine, now for 500. Then as now 4 mills and three rounceys (horses) and 32 swine, 300 sheep, 35 goats. And 24 sokemen with 1 ploughland. Stigand had their soke in the time of king Edward, and now it belongs to Mileham. Then as now 4 ploughs, 4 acres of meadow; wood for 30 swine, 1 mill. Here belongs now as then 1 outlying estate which is called Betellea (Beetley) of 1 ploughland, and 7 villeins, 10 acres of meadow; then as now 1 plough on the demesne, and there could be two; then as now 2 ploughs belonging to the men. And here belongs 1 sokeman with 26 acres, then as now 1 plough, and 1½ acres of meadow; and 1 church is on the manor with 60 acres and 1 plough, and it is worth 5 shillings and 4 pence. Then the whole was worth 10 pounds; afterwards and now 32 pounds. It is 1 league in length and a half in breadth, and pays 20 pence for geld. And the outlying estate is 8 furlongs in length and 4 in breadth.' (V.C.H., 1906, I, 114).

This tells us that Elmham was, in terms of 1086, a large village both in acreage and population, with much arable land, a fair, though diminishing, extent of woodland, a certain amount of pasture or heath for sheep, and five mills. This somewhat meagre information adds little or nothing to the information recovered from the excavations in the Park and on Spong Hill. There is little to help us with two of the major concerns of the archaeologists, the changing pattern of settlement and the development of building techniques; in fact, little documentary evidence of value on any subject survives for the two centuries following the Norman Conquest.

In 1255, however, the bailiff of the prior's manor rendered an account of the transactions of the past year to his masters in Norwich; this is the earliest survivor of a long series of manorial records for this manor, a series that includes accounts, rentals, and court rolls. The manor was a small one, a mere fraction of the size of the main manor which belonged to the bishop and for which comparatively little material survives; but the documents are full of interest. Moreover, in 1454-5 a general survey of all the manorial lands of the parish, excluding demesnes, was made, and this provides enough information to enable the physical framework of the village to be reconstructed. The boundaries, the open fields, the closes, the pastures, the meadows, the marshes, the woods, the deer park, the heaths, the greens, the roads, the settlements,

and the outlying hamlets can be described and laid out, at least diagrammatically, from this grand survey. The first section of this report is, therefore, the Topography of the Parish in the late Middle Ages. The 1454 survey and the manorial documents, particularly the accounts of the prior's manor, provide material for the second section, the Manors and the Agrarian Economy. Here the descent of the three manors is traced, the tenants and their holdings are analysed, deductions are made about the type of crops grown and their yields, and the tools that were used and the livestock that grazed the fields are described. The layout of the open fields is investigated, and some theories about the appearance of the landscape in the Middle Ages and the development of the settlement pattern are tentatively introduced. The theme of agriculture is carried into the post-medieval period with the help of the surviving probate inventories, and some speculations are made about the size of the village, in terms of houses and inhabitants, in the fifteenth and sixteenth centuries.

The third main part of the report is concerned with the buildings of the village. The archaeologists have evolved an attractive scheme to explain the development of houses in the pre-Conquest and early-medieval site in the Park. It is somewhat of a leap from the latest of the house-plans uncovered there to the first detailed documentary evidence for buildings, the bailiff's account of repairs to the prior's manor-house in the compotus of 1255; but the leap has to be made, and the evidence of the accounts is in a way complementary to that of the excavation, in that it deals with buildings of similar status to that of the Saxon and early-medieval halls and is concerned with the fabric above ground rather than the ground-plan, which is all, unfortunately, that is available for the archaeologist. The value of the documentary evidence appears, if in nothing else, in the fact that the survey of 1454 proves beyond reasonable doubt that there were then a number of buildings on the excavated site in the Park, whereas the excavation produced remarkably little evidence of occupation in the later Middle Ages. The bailiffs' accounts give some wonderful details about the prior's manor-house and its farm buildings, and two stray accounts of the bishop's manor are invaluable in that they provide a great deal of information about the predecessor of the manor-house that bishop Despenser created out of the hulk of the Saxon cathedral. Despenser's manor-house is discussed at length in this section. The third manor-house, Nowers, is not so fortunate in its documentation, but a sixteenth-century inventory of its fittings gives us at least a shadowy idea of its general shape. From the late sixteenth century onwards specimen houses of the village survive in the skeletal form of probate inventories; an examination of this type of evidence forms a major part of the third section of the report. In the eighteenth and nineteenth centuries most of the old houses were replaced by up-to-date cottages and farm-houses, and in this century council houses and private estates have been added to the village. The houses that exist only on the parchment and paper of the manorial records and the probate inventories are an invaluable link between the modern semi-detached house, the 'chalet', and the bungalow, and the post-hole patterns of the Saxon houses found on the excavation in the Park.

21. THE TOPOGRAPHY OF THE PARISH IN THE LATE MIDDLE AGES

by David Yaxley

THE SURVEY OF 1454-5

(Figs. 5, 6 and 9)

In the thirty-third year of the reign of Henry VI, the bishop of Norwich, Walter Lyhart, commissioned a survey or 'dragg' of his manor of North Elmham. Two main versions of the survey exist. The first, a substantial fragment of some eighteen folios, was among the papers of Francis Blomefield, the eighteenth-century Norfolk historian, and is now in the Norfolk Record Office ¹. The fragment comes towards the end of the survey and was preceded by approximately seventy five folios. The heading is missing and no significant date is incorporated, but there is no reason to doubt that it was made at the time of the survey. There are a few interpolations, probably made within fifty years of the survey. The second version covers the whole of the manor and was made in 1566 ². Detailed comparison of the two versions has revealed no serious discrepancy between them and it is safe to assume that, apart from a few insertions which are readily assignable to 1566, the text of the later version is an exact copy of that of the full 1454-5 survey. In the margin, however, another hand has added the name of the tenant of each plot of land; no date is given for these annotations, but comparison with the parish registers shows that they must have been made c. 1567. The holdings themselves were not amended. The version of 1566, therefore, can be considered a faithful copy of the original survey, and it will be used here as the basis for a reconstruction of the late-medieval landscape of the village ³.

COVERAGE OF THE SURVEY

The boundaries in the 1454 survey are those of the modern parish. On the north, east, south and most of the west side of the parish the boundary is running water and there is no evidence that any of the watercourses - the Wensum, the Blackwater, the Panford Beck and the unnamed tributary of the Wensum running between Elmham and Gateley - have changed course substantially in modern times. It is in the meadows and marshes flanking the watercourses, however, that the greatest discrepancies between the acreages of 1454 and the nineteenth century occur. This is because the survey gives no acreage for large tracts of these wet lands. For the greater part of the parish the acreages given by the survey fall little short of the totals for the same areas computed from the tithe map of 1839 and the ordnance survey 25-inch maps. In the area south of the Lynn road between Billingford Bridge and Panford Bridge, for instance, the 1454 acreage is about 96% of the modern total. It is impossible to attempt comparisons between 1454 and the modern values, however. The medieval acreages, given generally in multiples of a rood (a quarter acre), are obviously only approximate and although the smaller holdings, of two acres and under, may well have been accurately measured, it is evident that the larger holdings were only estimated. Moreover, for at least two areas of the parish the 21-foot perch was used instead of the more normal 16½-foot perch as the basis of the land measurement system. Fortunately, in the case of the Old Park both scales are used, and for Burgrave Wood (now Great Wood) the survey notes that the longer perch has been used, which enables us to convert the stated acreage of the wood to the more usual short-

perch acre. There is no evidence that the long perch was used in any other case and comparison with the modern surveys suggests that the arable fields, at least, used the short perch. A second reason for avoiding exact comparison with modern acreages is that the survey includes holdings which are not given any acreage, although their number is not large. Moreover, details like the width of roads and verges are not given. However, the medieval acreage compares well enough with the modern acreage to show that, apart from the land to the east and immediate north east of the village settlement, all areas of the parish were included in the survey. In the Fulfordhaugh, Dunham Hill and Brome Green areas the field acreage of 1454 falls to about 77% of that of the modern surveys. These areas were, however, bounded by heath, common and marsh, the extent of which was probably only roughly estimated; and in any case, the three areas form only 15% of the parish.

The medieval survey - part terrier, part rental, and using abuttals and rough cardinal compass-points to locate the various parts of the manorial landscape - falls far short of the accuracy of a good estate-map. Apart from two eighteenth-century maps of the Old Park ⁴ the earliest large-scale map of Elmham is the Road Diversion Order map of 1829 ⁵. The roads, tracks and names shown on this and the Enclosure map of 1831 ⁶ help to locate some of the medieval features and the Tithe map of 1839, with its schedule, also contains many clues about the medieval fields. Abuttals in manorial documents help and air photographs show some ploughed-out features. The survey of 1454, however, is the main source for the reconstruction of the medieval topography shown on Figs. 5 and 9.

THE LITTLE HEATH, SKOTLAND AND HIGH CROSS

The survey begins with 'le Gyrnmyll' (I) ⁷. This was probably on the site of Grint Mill, on the Wensum. Domesday has five mills in Elmham, but although the name Le Gyrn appears in the mid thirteenth century it is not until 1454 that there can be a positive identification of the site. A millstone was bought at Wiveton, perhaps for this mill, in 1401 ⁸. There were three other messuages, one of them unbuilt, in the area, all probably north of the present Billingford road and along the line that divided arable from meadow and marsh. One of them, a house with land in the place called Lez Inhams, was probably just south of the Grint Mill site. Billingford Bridge is not mentioned in the survey, but in 1526-7 it was out of repair (Carthew 1877-9, 563). Worthing Mill, which by the nineteenth century was partly in Elmham parish, is not mentioned in the survey. The windmill that appears on the Little Heath on the enclosure and tithe maps may have been built c. 1766 ⁹. On the 1829 map the Little Heath is crossed by a number of tracks, some of which were undoubtedly medieval in origin. The present main road from the railway crossing to near Billingford Bridge was made in the nineteenth century and cut across two heath tracks that led southwards to the bridge at Worthing Mill. A path from Spong Bridge that cut across fields and heath to join the more southerly of these two paths was known in 1454 as Millsty (XVII, XXI) and was probably a path used by tenants of the manor of Beetley, which had close connexions with that of Elmham, when taking corn to the Gyrn Mill. It also formed part of the Procession Way. In 1552 it was 'enclosed' with ditches and banks ¹⁰.

The western boundary of the Little Heath was well defined by the edge of the fields (XVIII-XXIIA) and by a path or track that began in Eastgate and came to the Blackwater at Woodford, where there was a small common (XVIII) and a decayed messuage and water-mill (LXX). The track was called Woodford Way in 1546 when it was repaired with gravel (Legge 1891, 36); on the tithe map the field to the north east is called Woodfords. The mill may have been on the site of one of the Domesday mills, but although a Simon de Wodeford occurs in 1326-7 ¹¹ no references to the actual mill prior to the survey have been discovered.

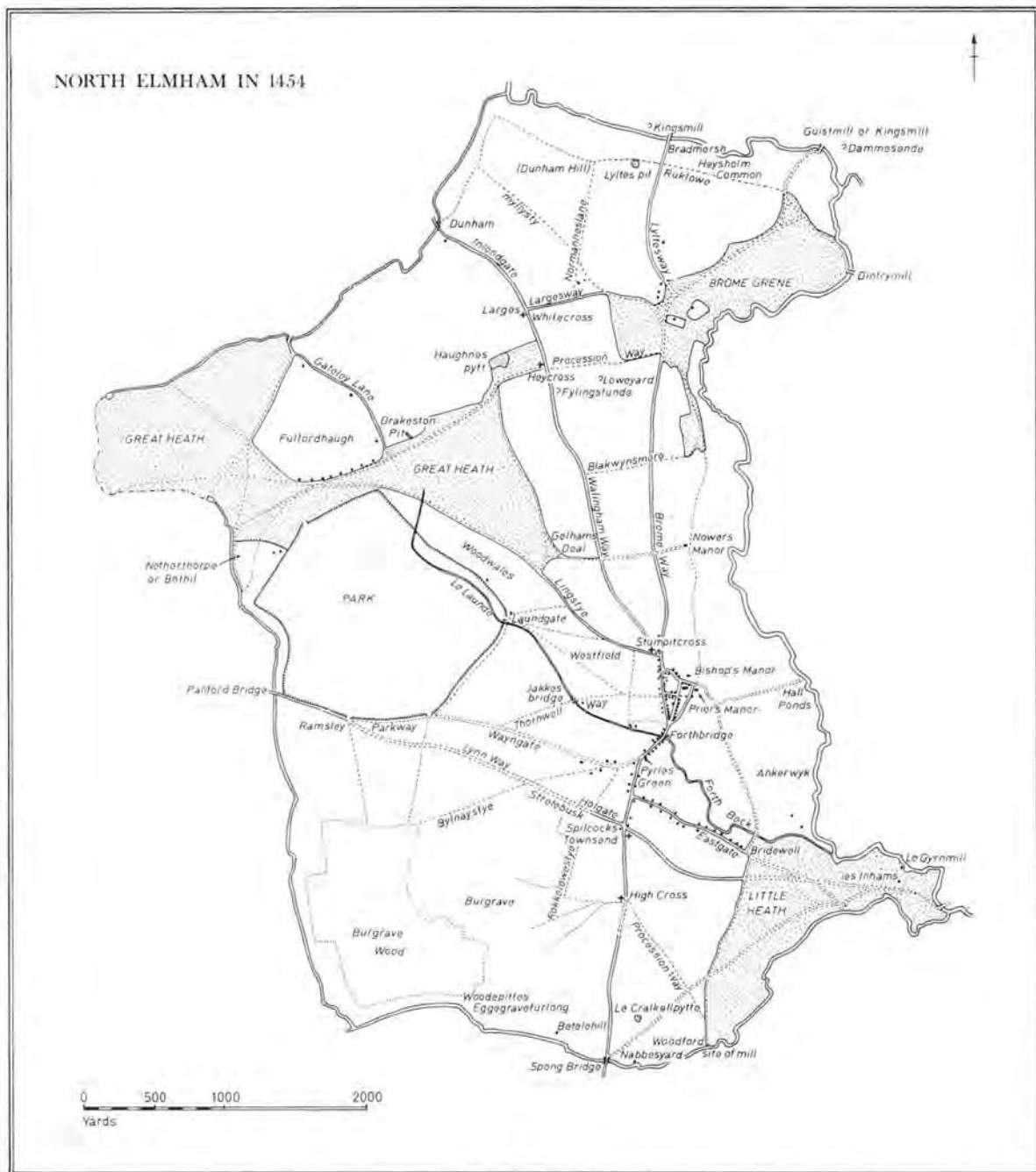


Fig.268. Topography of the parish in the fifteenth century.

The fields in this area were bounded by the Blackwater to the south, the Dereham Way to the west (XIX-XXIIA), Lynnway to the north (XIX), and the Little Heath to the east. In furlong XX five holdings ran across the Dereham road¹². The area was crossed by Millsty (XXI) and by the Procession Way (XIX), which diverged from Dereham Way at High Cross (XX) - that is Highcross Grove on Foxburrow Hill - to join Woodford Way just

north of the decayed mill. The High Cross was the first of the wayside crosses inside the parish that marked the pilgrimage route from Suffolk and south Norfolk to Walsingham. The Dereham Way crossed the Blackwater at Spong Bridge ¹³ and ascended Spong Hill, passing the pagan Anglo-Saxon cemetery on the west of the road. A Roger atte Spong occurs in the thirteenth century (Carthew 1877-9, 534). In 1454 there was a cottage near Spong Close and Nabbesyard or Nabbesclose (LXX, XXI), as well as 'le Cralkellpyte' or chalkpit, possibly the present pit (at TF 985 194), but evidence of the earlier settlement had entirely disappeared.

BURGRAVE

The large area known as Burgrave filled the south west corner of the parish. The earliest surviving occurrence of the name is in the thirteenth century (Carthew 1877-9, 533-4) and there is no variation from the normal spelling to help the place-name experts. The possibilities are based on Old English elements: burg or burh = fortified place, or beorg = hill or mound; and graf or graeft = grove, thicket, or graef = grave, pit or trench, or grafa = ditch (Ekwall 1960, sub.nom.). The area contained natural hills and woods, possibly Roman earthworks and a pagan Saxon cemetery. 'Eggegravefurlong' in the 1454 survey (XXXVI) is near the site of the cemetery. However, the area is also relatively hilly and the name Betelehill occurs (XXXVII) at the extreme south east corner near Spong Bridge; and undoubtedly the wood, now known as Great Wood, but at least as early as the thirteenth century known as Burgrave, covered a large part of the area in early medieval times. The woodland mentioned in Domesday ¹⁴ must have been mainly in this area.

In 1454 Burgrave Wood contained about 197 acres. If the Domesday entry is correct, large-scale assarting had been carried on between 1066 and 1086, for the number of swine that the Elmham woodland could support had apparently been reduced from 1000 to 500. It is possible, of course, that some of the clearance took place in other parts of the parish. By the mid thirteenth century, however, it is certain that Burgrave was being assarted. An inquisition stated that Stertesende and Mechelwode had been cleared and cultivated, causing a tithe dispute between the vicar and the prior of Norwich (Carthew 1877-9, 533-4) ¹⁵. In 1326-7 the ditch-and-bank ¹⁶ of Burgrave Wood was repaired, the gates or doors mended and bolts or locks and keys made for them ¹⁷. In 1328-9 a total of 648 perches of ditch around Burgrave was cleared ¹⁸. If this were the total circumference it would give a maximum area of 164 acres at the 5½ yard perch, or 265 acres at the 7 yard perch. The 1454 survey gives an area of 197 acres at the short perch and only 122 at the long. The Tithe map of 1839 has 167 acres for Great Wood, contained within a boundary of no less than 830 short perches. If the account of 1328-9 used the short perch it is evident that either the wood was quite small or the 648 perches were only part of the circumference. One would expect assarting to have produced a sinuous boundary, and even the long perch measurement might have enclosed an area much less than the maximum of 265 acres: the 167 acres of 1839 were contained in 652 long perches. There is no evidence, in fact, for any large-scale clearance between 1329 and 1454 - nor, indeed, would one expect to find it. The compotus of 1326-7 records the receipt of small sums for the sale of wood, underwood, thorns and stumps, and for the bark and branches of seven oaks, four brought down by the wind and three cut down to make a pigsty and barn. The compotus of 1328-9 shows similarly small receipts for roots and stumps, although the wood cleared from the banks and ditches made over £12 ¹⁹. The compotus of 1401 gives a small sum for wood from Burgrave, and records payments to the keeper of the wood and his boy ²⁰. In 1454, none of the furlong names suggest that they were newly-cleared land. It appears, therefore, that by the early fourteenth century the area and bounds of the wood may have been stabilised, with the possibility that between 1329 and 1454 the size of the wood may even have been increased by thirty acres or so.

A document of the late sixteenth century gives the area of 'Burgrave, in pasture in medowe and in woode' as 340 acres (Carthew 1877-9, 563). This obviously included land

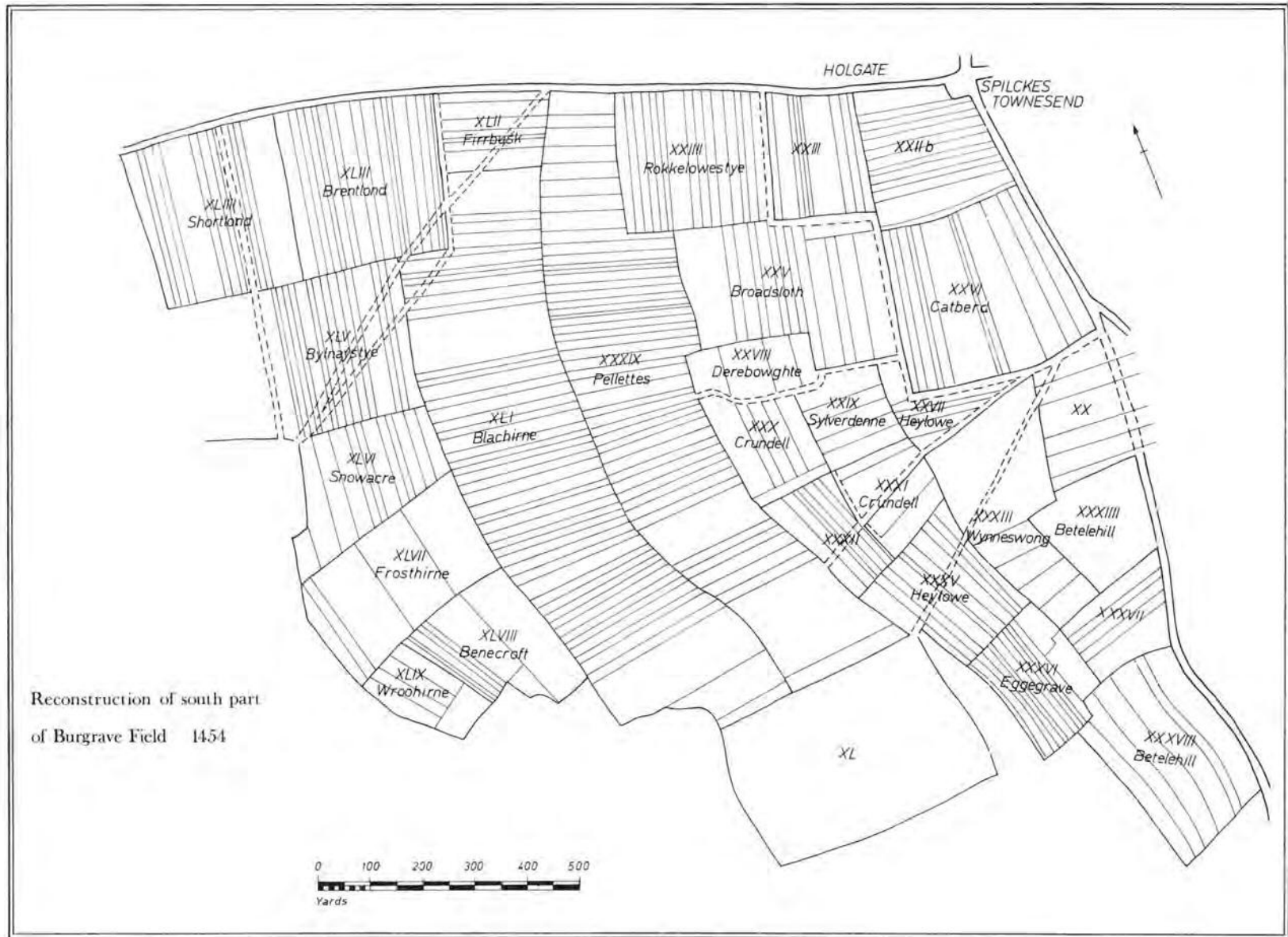


Fig.269. Reconstruction of Burgrave Field in the fifteenth century.

outside the wood boundary to the south and west. The compoti of 1326-7 and 1328-9 record payments for the herbage of Burgrave as well as the pannage (grazing for pigs), and 'Burgravepitts' provided rentable pasture, turf-cutting and fishing. By the sixteenth century the clear-cut bounds of the wood may have been deteriorating: an account of 1519 claims for 'repair of the hedges around the lord's wood called Burgrave in the places where they are most defective', and in 1528 they were still under repair²¹. Perhaps the 'opening' of the wood was responsible for the estimate of only forty acres for the wood in 1650, although in 1653 the annual revenue from the wood was put at £30 (Carthew 1877-9, 542, 563). Nothing has been discovered about the size or the management of the wood in the eighteenth century, but Faden's map of 1797 has a tongue of woodland leading from the south east corner of the main wood towards Spong Bridge. This woodland - if it ever existed - had disappeared by 1829. A further fifteen acres, on the west side of the wood, had been lost by 1887. Much of the central portion had been cleared, but not ploughed, by c. 1946; this area has now been replanted, mainly with conifers, but the whole of the northern end of the wood has been cleared and is now either pasture or arable. The former northern boundary of the wood is marked with a considerable, though flattened, bank and ditch; this is probably the earthwork referred to in the fourteenth-century accounts. The southern and western part of the wood is now largely hazel, ash and sycamore coppice. A bank, six feet high in places, marks its southern boundary.

In 1454 the arable field of Burgrave contained some 568 acres, disposed in thirty nine furlongs. These varied in size from $2\frac{1}{4}$ to $61\frac{3}{4}$ acres and in the number of holdings per furlong from two to fifty²². The Lynn Way cut across the northern part of the field, separating furlongs L to LX from the rest. The course of the road is not certainly that of the modern Lynn road; it may have been straightened when the New Park was created in the eighteenth century, but its general line must have been very much the same as today. There were several other roads and paths in this northern part of the field. Parkway ran along the south east side of the Old Park. At the south east angle of the Park, where there was a gate called Burgrave Gate in 1748²³, it seems to have split in two, one branch going almost due south to the north east gate of Burgrave Wood and the other turning west to run subtus parcum with room between it and the park pales for at least one strip (L, LII). From the same point another track, Wayngate (that is, the cart-road) headed eastwards towards the village (LVII). A track known as Thornwell Way branched off from Wayngate to cross the Town Beck by Jakkes Bridge, which was situated near the west end of the present lake, and continued east north east until it joined another path and met the village street at Gilberdstile (VII) (Fig. 9). The 'wayes Above Jacks brydge' were repaired with gravel in 1549 (Legge 1891, 49). In 1829 Clamp Lane and Clamp Lane Path cut across the south east corner of this part of Burgrave Field. Clamp Lane was more or less on the line of the present park wall, which was built c. 1840²⁴. Neither of these tracks seems to have been of importance in the fifteenth century. The 1454 survey begins at Spilcocks Townsend (XXIIB), the crossroads of the Dereham and Lynn Ways, where there was a cottage called Nobes. The Lynn Way seems to have been called Holgate (IV, XXIIB) as far west as the place known as Stretebusk (XXXIX)²⁵. A field road with the curious name of Rokkelowesty ran south into Burgrave Field near Stretebusk²⁶. Bynaysty (XLV) was a continuation of the path from the village street that crossed the Lynn Way and headed south west towards East Bilney, touching Burgrave Wood near the gate at the north east corner and either skirting the north and west sides of the wood or actually passing through it before crossing the Panford Beck.

To the south and west of Burgrave was a considerable extent of meadow and marsh (LXX). To the west of Spong Bridge there were nineteen and three quarter acres of meadow, marsh, pasture and land, split into twenty holdings. Somewhere in the middle of this stretch was a house called Bowkinghouse and at the west end was the 'great pasture' called Woodepittes, which may be the same as the Burgrave Pits mentioned above. There was more meadow, pasture and marsh alongside the Panford Beck. This section of the survey ended at Panford Bridge (LXXI), an important bridge which in the sixteenth century was mended with planks (Legge 1891, 54, 86).

RAMSLEY

To the north west of Burgrave Wood lay Ramsley, an area of 158 acres of mainly arable land disposed in nine furlongs. The ley element in both Ramsley and Culverlee-croft (one of the furlongs) suggests a formerly wooded area. The first surviving occurrence of the name is in 1228²⁷ and the area may have been part of the woodland that was apparently cleared after the Conquest. A Richard de Ramesle appears in 1309²⁸ and Roger Grys had a messuage there in 1454 (LXIV). A small green of three acres lay there in 1580²⁹ and in the sixteenth and seventeenth centuries the whole area was known variously as Ramesley Townesende, Ramsley Green and Rameslie Bottom³⁰. The Lynn Way, which enters Brisley Common at Panford Bridge, had a fallgate across it before 1831³¹. The house standing on the north side of the road at Ramsley appears to be of sixteenth or early seventeenth-century date; in 1748 it was The Hurdle public house³². Near Panford Bridge is the New Lodge, the house for the keeper of the Old Park built c. 1800.

WESTFIELD

In 1454 Westfield contained a mere ninety acres of arable land. Its south west boundary was the Town Beck, usually referred to in the survey as the common rivulet, but sometimes called Forth Beck (e.g. VI). By 1883 it had acquired the name of The Hyer, but this name, of unknown origin, was not adopted by the Ordnance Survey (White 1883). The Beck was bordered by marsh, pasture and meadow and was crossed by Forthbridge - in the village street, in more or less the same position as the present culvert - and by Jakkesbridge. There is no evidence of fishponds or pools here in the middle ages. A path called Spykkersmer or Watersty (LXXIV, LXXV, LXVIII) ran northwards from the Beck towards Lingstye³³. An important track, the principal approach to the Old Park from the cathedral manor-house, led from Gilbertstile on the village street to the east gate of the Old Park. In 1734 this track was a lane with hedges and wide verges³⁴. In 1454 the east gate of the Old Park was known as Lawndgate (LXXXI). The comptotus of 1326-7 records the sale of herbage from Launda, the pasturing of beasts and the repair of banks and ditches round Le Launde. In 1328-9 the ditches were cleared, the wood from the clearing and the croppings of the willows sold and the herbage and pasturing accounted for³⁵. The sums received for pasturing - over £4 in both accounts - show that Le Launde must have been of considerable size. It must have been inside the bounds of the Old Park and may well have been the less-wooded part of the park³⁶. Apart from Lawndgate it is not mentioned in the survey and had probably merged with the Old Park.

Westfield remained open field and pasture until the eighteenth century. In 1720 Richard Warner, a successful lawyer, bought the manors of North Elmham and Nowers. Soon after this he built Elmham Hall, which stood about 150 yards south east of the present Elmham House, and began to lay out his grounds. A complaint of 1734 alleges that the hedge of the track to Lawndgate, which had always been kept up by the owners of lands lying against it, 'has been lately thrown down by Mr. Warner who has laid his own ground now open to this Cart way (which has always been a Lane) at the entrance of it and has there hung a Gate on which there is a Padlock fixt and a key thereof sent to the Park-keeper'³⁷. By 1748 Warner had enclosed the whole of Westfield and all that part of Burgrave Field north of the Lynn Way. He had stopped up the two roads leading from Lawndgate (then known as Pound Gate or Eastgate) to the north and south of his house and also Wayngate, across which he had dug a marl or clay pit. After a dispute with the earl of Leicester he granted free passage over the roads immediately adjacent to the Old Park, but the rest of Westfield and the northern part of Burgrave Field were soon converted and landscaped into the New or Westfield Park³⁸. The final extension of the New Park came in 1831 when, at the enclosure, the Old Walsingham Way and the site of the Saxon village opposite the church were taken into the park.

THE OLD PARK

The Old Park (XCII), of a roughly heptagonal shape, contained 350 acres. Three gates were noticed in the 1454 survey: the gate near the old Hurdle public house to the north of Ramsley Green (XLI), the gate at the south east angle (LX) and Lawndgate (LXXXI). A map of 1708 shows four other gates - one near Panford Bridge, one on the west side of the park opening on to the long meadow there, one on the north west side and an opening at the most northerly corner. The pound is in the position of Lawndgate ³⁹.

Domesday does not mention a park at Elmham and the earliest surviving reference is in the first register of Norwich Cathedral where bishop John - either John of Oxford (1175-1200) or John de Grey (1200-1214) - alludes to his park in a confirmation of Herbert de Losinga's grant to Norwich priory (Saunders 1939, 107). The Elmham lands are considered by the leading authority on the diocese to have been part of the estate of the bishops of Elmham and Norwich from time immemorial (Dodwell 1963, 185), however, and there may well have been a park there before the Conquest. What evidence there is suggests that the bishops of Elmham had their main residence in the village, at least from the tenth century onwards. The origins of the Old Park may conceivably go back even further, for there are traces of a Roman settlement more or less in the centre of the park at TF 966 218. Does the medieval fence follow the line of a Roman estate boundary?

At all events, the park was well established by the time definite evidence for its state occurs. The compotus of 1326-7 has receipts of £5 6s. 1d. for the pasturing of beasts in the park and 15d. for the pasturing of geese in the winter. Bark, stumps and roots were sold for small sums. Six hundred pales were split for the fence in the same year and fifty perches - 275 or 350 yards, depending on the length of the perch - of fencing erected. In 1328-9, 540 pales were split and 64 perches - 352 or 448 yards - placed in position. This would give a spacing of one pale per 16½ or 21 inches for 1326-7 and one per 24 or 30 inches for 1328-9. As there is no mention of cross-pieces it is reasonable to assume that the pales themselves were of considerable width. A fence of pales twelve inches wide would be impenetrable at either of the 1326-7 figures; for 1328-9 a slightly greater width would be necessary. The pales were topped with 'berdings', points either cut on to the pales or made separately and fixed to them when in position ⁴⁰. The pales were probably made of oak (Withington 1889, 206) and the renewal of any large part of the fence must have taken a considerable acreage of young oak woodland. The circumference of the Old Park was over 5000 yards. The pales were almost certainly set on top of a bank with a ditch on the inner side. There is no record of any such ditch in the surviving documents apart from that round Le Launde, but the 1946 RAF vertical aerial photographs show slight traces of a ploughed-out earthwork along the west boundary of the park. The ditch and bank of the park at Old and New Buckenham, also Norman in origin, can still be seen in places.

Oddly enough, there is no mention in medieval documents of the deer that were the raison d'etre of the park, although tines were found in the early excavations at the Cathedral Manor-house site (Carthew 1877-9, 517). In the sixteenth century Harrison records that deer-parks brought 'no manner of gain or profit to the owner, sith they commonly give away their flesh' (Withington 1889, 207), and there may have been a similar lack of profit in the middle ages which would account for their exclusion from official documents. There were deer in the Old Park in 1538, for it was reported that a manorial assembly held in that year was 'before the destruction of the deer in Elmham Park' (Carthew 1877-9, 574). This 'destruction' was probably a total clearance, for the park is not mentioned in an Elizabethan list of 'the parkes keeping dere' in the county ⁴¹. However, the deer had returned by 1592 when they are mentioned in the will of Henry, Lord Cromwell (Carthew 1877-9, 524) and at about the same date it was stated that 'The park is newly impaled with pale which if it wer to doe would not be donne for a great somme of money' ⁴². In the eighteenth century it was still a deer park. The map of 1708 has it fenced all round, with

a 'Deer Penn' slightly to the north east of the centre; the fence was still of pales ⁴³. Blaikie, the Holkham agent, reported in 1816 that there were '8 brace of Buck to kill in the present season ... the land in the Park in the normal rough neglected state, a division of about 100 acres is stocked with nine miserably bad Neat Cattle, & nine as wretched Horses. The Devon cattle, one Galloway Heifer in the Deer Park are doing well - the Park fence in a very bad state' ⁴⁴. By 1829 the park was divided geometrically into nine major closes, but it was still pasture in 1839. About 1870 it was disparked, the trees were felled and the land ploughed and the deer were transported to Holkham ⁴⁵.

Blaikie's report also mentions the old and the new lodges. The earliest mention of a lodge is in 1326-7, and in 1328-9 it underwent considerable repairs, which will be discussed in the chapter on buildings. The map of 1708 shows a 'new lodge' standing within a pale fence and a rather larger building, presumably the old lodge, standing just to the south east. A rectangular 'pond' stands south of the new lodge. The pond reappears on the map of 1778, although both houses are missing ⁴⁶. An 'old lodge' is mentioned in Blaikie's report of 1816; there was still a building on the site in 1829 and 1831, but by 1839 it had disappeared ⁴⁷. A New Lodge was built by Panford Bridge around 1800.

Although the location of the warren is not certain, this seems to be an appropriate place to mention it. There was a grant of free warren to the bishop in the mid thirteenth century ⁴⁸ and in 1326-7 a lock or bolt was bought for the warren ⁴⁹. In 1404-5 the comptus of the prior's manor records rent received for land prope destructionem Coni-clarum Episcopi, but the meaning of this is not altogether clear. In 1482 the warren was farmed out ⁵⁰. It was alleged that Gregory Lord Cromwell intruded into the warren of conies and hares in 1540 while it was demised to William Collfore (Carthew 1877-9, 585). It was leased or farmed throughout the sixteenth century ⁵¹, but it is not mentioned thereafter.

THE GREAT HEATH

The 1454 survey gives the area of the Great Heath as 300 acres, a suspiciously round figure that was probably an underestimate. It lay in the north west corner of the parish, separated from Gateley Green on the north by a small stream and on the west and south by the boundary with Horningtoft and Harper's Green in Brisley. Even in 1454 the shape must have been irregular, with Fulfordhaugh (XCV-CIV) taking a large chunk out of the western half and arable fields encroaching on all sides of the eastern half. The heath was approached from the village by the road called Lingstye (LXXXIII), which divided the heath from the field of Woodwales (XC) and led to the settlement at Fulfordhaugh. A number of other tracks crossed the heath, but the only other important one was that later known as Sallow Lane. This came from Brisley Green and ran along the northern margin of the heath until it crossed the Walsingham Way near Heycross and became the Procession Way. The name Sallow Lane first appears in 1533 (Carthew 1877-9, 559). The triangular area through which Sallow Lane ran to Brisley Green was called Netherthorpp (CXIX) in 1454 and contained a messuage and a cottage (XCI). Just at the north end of this part of Sallow Lane was a small piece of pasture that was the subject of an inter-commoning agreement between Elmham and Brisley in 1533 (Carthew 1877-9, 559). This agreement refers to 'an old bound in the pasture called Foulden dich' which ran east to west and may have been part of the foldcourse arrangements in the Great Heath area. The heath was the main rough-grazing ground in the summer for the whole village and it also supplied brushwood and turves ⁵². Three messuages in the area had the right of 'free fold': Langgs (XCVI), Gelhams (CXXVI), and the messuage at Netherthorpp (CXIX). In the sixteenth century - and probably earlier - the heath was isolated from the surrounding fields and greens by falgates on Lingstye near Gelhams Deal (now Dale Farm), at Sallow Lane, near the Old Park, and in the 'northe part of the gret hethe', either on Grenes Lane or near Heycross (Legge 1891, 28, 45, 46, 51-2, 59). Such isolation argues either a good common-edge ditch or impenetrable hedges. There was a ditch on the east part of the heath and another 'at fulforth dale betwen Gatle & us' in the sixteenth century; the

latter may have been the same as the Foulden ditch referred to above (Legge 1891, 21, 45). There was at least one watering-pit for the cattle: in 1549 Henry Dyght was paid 4d. 'for ye Fyeng the pytt upon the grett heath one daye' (Legge 1891, 51).

At the enclosure in 1831 the Great Heath, apart from the large island encroachment on the east side, the date of which is not known, was substantially the same as it had been four hundred years earlier. The enclosure turned most of the heath to arable closes, but some of the shape of the boundaries, particularly on the north side of the heath, can still be traced on the ground. New, straight roads were driven across the heath and typical enclosure hedges planted, particularly in the Silverstones Farm area.

FULFORDHAUGH

The area known as Fulfordhaugh lay to the north of the west side of the Great Heath. It may have formed part of the Domesday woodland of Elmham, although the name (the earliest occurrence of which is in 1224)⁵³ suggests derivation from the Old English *haga*, an enclosure, near the dirty ford, that is the ford on the Gateley road⁵⁴. It was certainly a wooded area. Three trees were bought there for 2s. 6d. each in 1272-3, and stumps, roots, turves and hay from Fulfordhaugh were sold in 1326-7 and 1328-9⁵⁵. In the 1454 survey only three pieces of wood are recorded: 'Okeyard modoc voc Ditt Grove', an enclosed garden with wood upon a croft, and twenty one acres of the tenement Fulfordhaugh lying together with a grove of wood (XCV, C). Wood was felled in Fulfordhaugh during the course of the dispute between James Taverner and the Cromwells in the sixteenth century. A complaint by James Taverner in 1589-90 alleges that sixty oaks, twenty elms, twenty ashes and twenty loads of underwood were cut and carried away and that no less than 5000 little oaks, 100 ashes and 100 elms were rooted up (Carthew 1877-9, 570). It is possible that many of these were hedgerow trees, some, no doubt, planted by Taverner in his enclosing activities and it seems clear that even by 1454 most of the Fulfordhaugh area had been cleared of woodland.

It is not known when the settlement at Fulfordhaugh was begun. There is, in fact, little evidence relating to it before the fifteenth century, but it is apparent that it was in some decline by 1454. Three of the eight messuages and two of the three cottages were vacant and in the hand of the lord. One of the remaining messuages belonged to Henry Taverner, a large freeholder and great-grandfather of the James Taverner mentioned above. Two others - one of them free - belonged to Simon Fox, a considerable freeholder and copyhold tenant. Fox's chief messuage, the freehold Langgs, included buildings, an orchard, a dovehouse and a right of free fold. Another free messuage, that of Peter Berysfoot, a modest freeholder, had a yard. Just under a third of the recorded acreage of land in the Fulfordhaugh area was also in the lord's hand in 1454 and it is probable that the seeds of the later dispute between James Taverner and the Cromwells were already sown.

In 1454 Fulfordhaugh was composed mainly of crofts, meadows and closes - the surroundings of a well-established settlement - but there were three small furlongs, one of them called Heathfield. The eastern boundary was formed by Grenes Lane, otherwise Gateley Lane (XCVI), passing by a dolestone (boundary stone) which formerly divided the free land of Langgs messuage from the copyhold land of Simon Fox's other messuage. This track, which in 1829 was a bridle road called Tweed Spur Way, was stopped at the enclosure in 1831, but remained a footpath until this century.

WOODWALES

Between the Great Heath and the north east side of the Old Park lay a long narrow field. The surveyors of 1454 began near the cottage called Woodwales, which stood against Lawndgate (LXXXI, XC). The field consisted of thirty eight acres, divided into five large holdings of between five and eleven acres, and two small holdings of one acre

each. Two cottages formerly built stood near Lawndgate. One of them was called Woodwales and there is a reference to Henry Woodwales, a former tenant. Simon Woodwales was a tenant of the prior's manor in 1308⁵⁶. This area probably represents a fairly late encroachment on the Great Heath, with the two cottages marking an earlier edge-of-common settlement⁵⁷.

LINGSTY AND STUMPCROSS

The track leading to the Fulfordhaugh settlement, Lingsty (LXXXIII), branched off from the Walsingham Way at about the position of the present Hall Farm, separating Westfield from the fields to the north of the village. The road junction was marked by a wayside cross, Stumpcross or Stumpitcrosse (LXXXV). The Walsingham Way struck north west across what is now the northern part of the New Park and continued along the line of the Gateley road. On the east of the area was the Brome Way, the road leading from Elmham to Brome Green and thence to Thornage (an important manor of the bishops of Norwich), Hindringham, Hindolveston (both of which belonged to Norwich priory) and the North Norfolk coast. The northern part of the area was crossed by a track from Nowers manor house to the Great Heath.

This was an area of relatively small furlongs and small holdings. There were 116 acres divided into 100 holdings; 77% of the total acreage was in holdings of two acres or less and there were no holdings at all over three acres. This, together with its position next to the village settlement, could be used to argue that it was arable land of considerable antiquity.

Richard Warner seems to have tried to include this area in his park in the eighteenth century, for he attempted to stop up a lane leading from Lawndgate eastwards and to the north of his house in 1749⁵⁸. However, the final closure of both Lingsty and the Walsingham Way between the gates to Elmham House and the present junction of Great Heath Road and Gateley Road came only at the enclosure of 1831.

GELHAMS

Between the Walsingham Way and the east side of the Great Heath lay some ninety acres of land, divided into nine furlongs and subdivided into relatively large holdings averaging three acres apiece. The 1454 survey began at Heycross (CXXI), which probably stood at the junction of the Walsingham Way and the old road that traversed the north part of the Great Heath and continued, as the Procession Way, towards Brome Green. The area included an enclosure called Shepecoteyard (CXXIV) which had a thicket and a water-pit attached to it (CXXV) - possibly one of the pits north of Dale Farm - and there was also a former messuage called Gelhams with a sheepfold attached (CXXVI). The southern end of the area was 'Le Botome vocatum Gelhams Deale', from which, presumably, Dale Farm got its name. There was a falgate near Gelhams in 1548 (Legge 1891, 45).

WHITECROSS

The area of arable land here, for convenience, called Whitecross, lay between the Walsingham Way on the west and the valley of the Wensum on the east. It consisted of sixteen furlongs, varying in size from three to forty five acres, containing 136 holdings. In the southern part of the area - that is, nearest the village - the holdings were very small, averaging less than one acre apiece; at the northern end, near Brome Green, the average was three acres. The difference is even more striking when we look at the area included in the smaller holdings. In the southern end (CXXXII-V), thirty eight acres were divided into thirty nine holdings, with 78% of the land in holdings of two acres or less, and 56% in holdings of one acre or less. At the northern end (CXLIV-VI), eighty two acres were divided into twenty seven holdings; only 25% of the land was in holdings of two acres or less, and a mere 12% in holdings of an acre and under. The southern end was against

the Lingsty area, which was probably 'old' arable; the northern end was against the Dunham Hill area, which was probably broken to the plough relatively late.

The Brome Way ran northwards through much of the eastern side of the area. The Procession Way, beginning at the south east corner of the cathedral manor-house ditch, meandered through the fields more or less half-way between Brome Way and the Wensum before turning across Brome Way⁵⁹ and continuing westwards to join the north track of the Great Heath near Heycross (CXLV-VII). The name 'Procession Way' refers, of course, to the custom of progressing through the fields at Rogationtide to bless the crops. It is perhaps significant that here the Procession Way turns westwards a good deal to the south of the Dunham Hill area, suggesting that it may have been cleared and cultivated relatively late. The name Procession Way disappears after the Reformation; by 1649 a thicket called Holybush had changed the name to Hollybush Way⁶⁰. Another east to west track was Blackwynsmere (CXXXII, CL), which led from the small, marshy common at Blackwyns (CLVII) to the Walsingham Way. Henry and Walter Blacwyne were tenants of the prior in 1308⁶¹, but the location probably gave them its name from the Old English 'winn' or meadow (Carthew 1877-9, 293, 294, 296). The present Blackall's Farm suggests a continuation of the name. No house was recorded there in 1454.

The northern boundary of the area was a road called Largesway that ran from Brome Green to join the Walsingham Way at 'Larges'. At or near Larges was the White Cross (CXLIV) which marked the road junction and was not far from Heycross⁶². Just to the south of White Cross a field known in 1839 as Round Hill Breck⁶³ may have been the site called Lowehill in 1505 (Carthew 1877-9, 296). The 1454 survey has the names loweyerd, lowepece and lowepytt (CXLVII, CLII, CLIII), but it is difficult to make these coincide with Round Hill Breck where the exiguous remains of a Bronze Age barrow have been found.

INLONDGATE

The area here called Inlondgate for convenience lay between Grenes Way and Fulfordhaugh to the west, the parish boundary to the north, the Great Heath to the south and the Walsingham Way to the east. It was an area of moderately small holdings - 65% of its acreage was in parcels of two acres or less - divided among thirteen furlongs of greatly differing size. At the south west corner was a furlong called Drakeston, with a pit in it called Drakeston Pit (CXI). The pit may well be that marked on the Ordnance Survey maps at grid reference 970230; the east to west arms of this curious shape may be the remnants of an edge-of-common ditch. The name is possibly derived from the Old English *draca*, 'dragon', applied to a burial mound⁶⁴.

The boundary between the arable and the Great Heath was very irregular before the enclosure of 1831 and must have represented a series of encroachments on the heath. At the south east corner near Heycross, and to the south east of the present Heath Farm, lay Hamespit (CXVII) which, as Haughnes, was the name of a tenement. This was probably the pit from which gravel was being dug in the mid sixteenth century for road surfacing (Legge 1891, 23-8, 49). By 1831 the medieval name had been superseded by the prosaic Gravel Pit. It is still there. North of Hamespit was Larges and north of Larges the Walsingham Way was called Inlondgate (CXVI, CXVIII). Both Hamespit and Inlondgate occur in the middle of the fourteenth century (Carthew 1877-9, 293) while the earliest surviving occurrence of Walsingham Way dates only from 1417 (Carthew 1877-9, 294). It is possible that Inlondgate or Inlondwey was the original name for this particular road, surviving for this stretch after the rest of the road changed to Walsingham Way. The only house recorded in this area in 1454 was the messuage of Simon Evered, although the furlong heading mentions another messuage in the same place (CXVI). Most of the Inlondgate area was owned or tenanted by the men who held the messuages at Fulfordhaugh and it is probable that this area, with its small holdings, formed the arable land of the original Fulfordhaugh settlement. By the middle of the sixteenth century most of the land had come into the hands of James Taverner and, as Taverner's Great Close, figured largely in the dispute with the Cromwells.

DUNHAM HILL

This large area in the extreme north of the parish consisted of 201 acres in seventy six holdings, distributed among five furlongs of varying sizes. Only 28% of the land was in holdings of two acres or less and 55% of it was included in holdings of five acres or more. In other words, it was an area of unusually large holdings. By itself this would suggest that this was an area that was cleared and cultivated comparatively late - say in the expansion of the twelfth and thirteenth centuries. The comparatively late appearance of the 'manor' of Dunham - the first surviving reference is in 1368 (Carthew 1877-9, 281) - supports this. However, the name Dunham probably means 'ham on a dun or hill', and it is just possible that it marks the site of an early settlement that had disappeared before the Conquest⁶⁵. If this is so, the area had almost certainly reverted to waste before the twelfth century. The only houses recorded in 1454 were at Brome Green and just north of Largesway, although there was also a messuage in Inlonggate which, standing near the stream that divides Elmham and Gateley, looks to be nearer the site of a hypothetical settlement of Dunham. The 'manor' of Dunham carried with it free fold rights which suggests that not long before 1368 there may have been a large area of uncultivated or semi-cultivated heath at Dunham. Some of the field-names recorded at the tithe survey of 1839 - Hell Pit Breck, Thorofare Breck, Clay Pit Breck, Blanch Breck - seem to point to cultivation as brecks at some time in the immediate past. There is little evidence of such periodical cultivation in the survey of 1454; one piece of eight and a half acres is called 'le breche' (CXLII), but there is no other indication that the breck system was in use. It is possible, of course, that the organisation of the area into large holdings concealed the method of its cultivation.

The area was bounded to the north and north west by meadows and marshes, by Inlonggate and Largesway to the south west and south and by the track called Lyttesway to the east. Lyttesway (CXLI), which was probably on the course of Sennowe Lane, led past Lylytspyt to the Wensum⁶⁶. It would also have served as a drove road to the riverside pastures. There is no medieval evidence for a bridge over the Wensum at this point and the bridge that appears on nineteenth-century maps was probably connected with the Sennowe estate. Normanneslane (CXLIII) ran roughly parallel with Lyttesweye from Largesway to the Wensum. Myllysty (CXLIII), described as a path, led off from Largesway to the north west meadows. The reference of the name is obscure. Dunham Hill path, which in 1829 separated the arable from the meadow and marsh, is not mentioned in the survey. The meadows and marshes (CLVIII-CLXI) were important grazing and hay grounds. A large area of marsh and pasture called Dunham Close was newly enclosed in 1454 (CLX, CLXIX). The land is still used for grazing.

BROME GREEN

Brome Green was important enough to have given its name to Brome Field - the open fields in the north of the parish - and to the main road to the coast. The name was undoubtedly derived from the Old English brom, 'broom'; a large part of the Brome Green area was common pasture and the 1454 survey described it as 'the heath called Brome-heath' (CXXXVI). The name was well established by the reign of Edward I and the lay subsidy of 1329-30 includes a John de Brome⁶⁷. Flags were cut there in 1326-7 and 1328-9⁶⁸, and it was here that the poor were allotted fifty acres of land for turf-cutting for fuel at the enclosure of 1831.

In 1454 the settlement was around the western edge of the common. There were four cottages and a partly-built messuage, none of them free (CXXXIX, CLVII), with a free messuage and a cottage, formerly built, near the junction of Myllysty and Largesway (CXLIII). Two of the 'tenements' in the survey were named after Brome: Simon de Brome, twenty four acres of land and six acres of marsh, and Robert de Brome, a messuage, thirty acres of land and four acres of marsh. It seems likely that in medieval times the settlement was always smaller than that at Fulfordhaugh. By 1633, however, it was called a hamlet⁶⁹, and by the early nineteenth century it was larger than Fulfordhaugh.

North of Brome Green the road became a causeway liable to flooding ⁷⁰. It led to Guist Mill which was mentioned in 1434 and seems to have been situated about the position of the old bridge over the Wensum (Blomefield 1810, 214) ⁷¹. Both mill and causeway were much in evidence in the seventeenth century ⁷². Another mill in this area was King's Mill which was mentioned in the early sixteenth century and seems to have been somewhere near the place where Sennowe Lane came to the Wensum. It was on the Guist side of the river, but the waters of its pool sometimes flooded the meadows on the Elmham side (Carthew 1877-9, 562-3, 572) ⁷³. All trace of this mill had disappeared by the eighteenth century. One of these mills provided the dam that gave its name to Dammesend (CLIX) from which in turn a succession of fourteenth-century men took their name ⁷⁴. Bintry Mill, also reached by a causeway from Brome Green, is mentioned in 1636 ⁷⁵. This causeway is hardly apparent today, but the road from the former railway bridge to the bridges over the Wensum is very noticeably raised above the surrounding meadows.

THE EASTERN MEADOWS

Alongside the Wensum lay a series of meadows, marshes and pastures (CLVI, CLVII). These were often undefined in area and so are difficult to locate. Section CLVII lay, roughly, north of the grid line 22 and its approximate centre point can be fixed by the reference to Blakwynnes. Section CLVI ran north from about the Grint Mill; the two pieces of marsh and meadow called Ankyrwyk or Ankerwyk can be located from the tithe map, where the name Canker Weed Meadow occurs ⁷⁶. Hallepond was probably at the end of Hall Pond Lane and Sylvyrmedowe was the present school playing field ⁷⁷. Le Stewyerd was probably some sort of fishpond belonging to the manor. By the sixteenth century there was probably a bridge over the Wensum at the end of Hall Pond Lane, as a reference in 1598 to 'the markett way leadinge towards Cheyne Bridge' seems to belong to this area ⁷⁸. In 1454 there was one messuage and two decayed messuages in the meadows (I, CLVI).

THE EAST SIDE OF THE VILLAGE

This area forms the only sizable gap in the 1454 survey. About 230 acres of land lying here cannot be traced in the dragg. The blank area begins near the manor-house of Nowers which stood on the site of Grange Farm. In 1572 Thomas Franklin, yeoman, sold 'the scite of the mannor of Nowers in Northelmham otherwise called "the place" ' to Henry, Lord Cromwell, and in 1593 it was granted as a house 'lately called by the name of the mannor of Nowers and nowe com(mon)ly cauled the Graunge' ⁷⁹. The manor of Nowers dates at the latest from the mid thirteenth century (Carthew 1877-9, 279). The lands transferred by Franklin comprised some eighty three acres between Blakwynsmere on the north and the land immediately to the north of the cathedral site on the south. The present extent of this area is eighty two acres ⁸⁰. There can be little doubt that the demesne lands of Nowers manor, which in 1454 were in the hands of William Gedge, were omitted from the survey.

The demesne lands surrounding the bishop's manor-house and the prior's manor-house, together with the lands of the estate called Thornwell, were also omitted. The bishop's manor-house and yards are mentioned only incidentally in the survey; if the whole of the area north and east of the cathedral site was part of the manor-house complex, another fifty two of the missing acres would be accounted for ⁸¹. The bishop's total demesne may have been as much as 230-260 acres. There was not room for all of this around the manor-house and the remainder must have been in other parts of the parish. Section CLXIX of the survey has several entries referring to this area - Hallyard, Halleclose and Towerclose which lay on the north part of Tower Yards - and there is the enigmatic entry 'And of 30s. 6d. of the farm of sixty one acres of land lying in divers pieces' near Hall Pond. Several of the pieces in this section, however, can be identified with land already listed in the survey, so there is the possibility of duplicate entries. The prior's manor-house was also mentioned only incidentally; it stood due east of the church and its site may have extended to some three acres ⁸². The demesne of this manor amounted to

eighty two acres of arable and pasture. The tenement or estate known as Thornwell, which carried rights of free fold (Carthew 1877-9, 281) may also have stood in this area. Thornwell occurs as a place-name early in the fourteenth century⁸³ but its exact location is not known. The road running across Westfield over Jakkes Bridge and crossing the Walsingham Way at Gilbertstile was called Thornwell Way (LIX). In 1572 Thornwell was referred to as the site of the 'manor or toft inclosed' and Thornwell Green was mentioned (Carthew 1877-9, 558). Thornwell well occurs in 1455-6 (Carthew 1877-9, 295). In 1454, among the list of tenements carrying the office of reeve, the tenement 'Warin de Thornewell' was recorded as consisting of a messuage, seven acres of arable and two acres of pasture, but in the actual survey the lands of the free Thornwell tenement amount to ten and a quarter acres and no house or messuage is mentioned. Thornwell was near marshy land; it may have been down by the Town Beck, or, more likely, on the east side of the village. Another small area that may have been omitted from the survey was that covered by the Fairstead and Camping Close, each of seven acres in the nineteenth century. These may have been open or waste ground in 1454. There was probably a good deal of marsh along the fringes of the Town Beck which was included in the survey but which is not now identifiable. There can be little doubt, however, that the greater part of this area was taken up by the demesne of the bishop's, prior's, and Nowers manors.

In the early nineteenth century Old Hall Lane ran diagonally north and south across the area. This track probably took its name from the Old Hall on Eastgate. It was a logical connexion between the cathedral area and the Little Heath, but apart from its southern extremity on Eastgate it was not mentioned in the survey. It was referred to in 1598 as 'the common way from the Town to Little Heath'⁸⁴. It was closed in 1829. The Procession Way ran northwards through the northern part of the area, beginning at the south east corner of the cathedral manor-house ditch and passing close by Nowers manor-house. This, too, was closed in 1829, when it was known as Grange path⁸⁵.

THE VILLAGE (Fig.9)

In 1454 the shape of the village settlement was not very different from that of the nineteenth century. Two major alterations have occurred to the road-plan: the closure of the old Walsingham Way opposite the church and of the old Rectory road that went to the east of the church, both closed in 1831, and the diversion of the eastern end of Eastgate when the railway was built c. 1845. The several minor roads that have disappeared will be noted in their respective places.

The survey of 1454 began at the east end of Eastgate, on the south side of the road, where the common way entered the north west corner of the Little Heath. The tenement Bridewell must have been near the site of the present Old Hall. No references to an actual bridewell have been found. The land here was mainly in small crofts, with six cottages and a messuage lying between the beginning of Eastgate and its junction with the East Dereham-Holt road. At this corner, the surveyors turned south along the Dereham road, where they found another messuage and a cottage before they came to the crossing of Dereham Way and Lynn Way (II). Here was yet another wayside cross (III). They crossed the Dereham Way, noted a cottage called Nobes on the corner (possibly on the site of the present cottage, although another block of cottages, pulled down within living memory, stood to the east of the surviving building) and turned north, crossing Holgate (see p. 524) and proceeding on the west side of the main road in the direction of the Town Beck (III). In this stretch were six messuages and three cottages; about half-way along was a small green called Purles or Pylres Green, probably in the angle between Dereham Way and the track (later Clamp Lane) that led south west towards Lynn Way and Stretbusk. A John Pirles occurs in 1308⁸⁶. Adjoining the cottages and messuages were gardens, crofts and pightles. The cottage called Sewars stood against the Town Beck and paid one penny a year for obstructing the flow of the stream.

Having arrived at the Town Beck, the surveyors went back to the east end of Eastgate and beginning near the Bridgewell tenement proceeded in a westerly direction along the north side of Eastgate. This side of the road was rather more heavily settled than the south side, for by the time they had turned Post Office Corner and arrived back at the bridge over the Town Beck they had recorded eight messuages and buildings and eleven cottages. They began at the cottage standing in the angle of Eastgate and the road that led to the church, that is Old Hall Lane. Then came a messuage, and then the bishop's marsh and water called Halponds, not to be confused with the Hall ponds of section CLVI. The Town Beck ran close behind the settlement here and one or two names reflect the wetness of the area - for example, the orchard called Wateryard. There was also a ditch or pit called Estgatewell (V.85) next to the messuage called Wellhous. In the seventeenth century the cottages seem to have been crowded together here, for admissions to tenements included the provision of freedom of entry to a neighbour's property to place a ladder for thatching and repairing the building ⁸⁷.

This section of the survey concluded at Forthbridge. The Town Beck was also called the common stream or the Forthbek (VI), the 'forth' element probably deriving from the Old English ford. The main road probably crossed the Town Beck by a ford, with a foot-bridge by the side of the road. On the north bank the surveyors began by describing the tenements on the west side of the Walsingham Way. The remnant of this road, closed in 1831, can still be seen in the New Park ⁸⁸. In 1454 it was the main road through the village. It dates from at least the middle Saxon period and may even be much older. In 1454 the surveyors walked along it as far as Gilberdstile, which stood where Thornwell Way and the track to Lawndgate joined the Walsingham Way. A form of the name, Gilheysty, occurs in 1356-7 and one of the twelve-acre tenements was called 'Simon Gylberd' ⁸⁹. Here was also a spring or well (fontem) - probably a spring in a small pond, whose overflow ran down beside the road to the Town Beck. At Gilberdstile they turned east, walking along the road that led to the south west corner of the churchyard. This small stretch (about 200 feet road frontage) was occupied by three messuages and a cottage, one of the messuages being called a house (domo) and dignified with the name 'Constoryhous' (VII.125). At Kirkgate (that is, the church gate at the south west corner of the churchyard) they came to the road that lay along the line of the present main road. As can be seen from Fig.9, this branched off from the Walsingham Way just north of Forthbridge and headed straight for the cathedral. It has no particular name in the survey but for convenience it will be referred to as the King's Road, the surveyors' general term. They noted two cottages, one of them wasted, lying against the south side of the churchyard, before turning south towards Forthbridge. They must have gone down the King's Road, as they passed between the two cottages 135a and 135b. Between the churchyard and Forthbridge they noted nine cottages, all presumably fronting on to the King's Road. At Forthbridge they turned north again and described the holdings on the east side of the road that branched off from the main stem and headed for the rectory or prior's manor-house. The line of this road, which by the time of the enclosure was called Back Lane, can be traced on the Ordnance Survey maps and on the ground. Immediately north of the Town Beck was a piece of free land with a building on it, and two cottages, one of them divided into three parts. Between these cottages and the holding opposite the churchyard (VII.144) was a gap, probably connected with the blank area to the east of the village noted above (p. 532). The reference (VII.144) to the abuttal, on the south part, on the land of William Gedge, who at this time held the Thornwell estate, supports this suggestion. Opposite the south east gate of the churchyard was the messuage of Simon Codlyng, who may have officiated for the vicar (Legge 1891, 3). Passing between the churchyard and the prior's manor-house the surveyors reached the north east corner of the churchyard and turned west, noting a cottage on the north side of the churchyard.

Reaching the market place, they then described the tenements lying against the south west corner of the cathedral ditch-and-bank (fossatum). The reference to the 'king's road' and the north part of the market seems to indicate that the cottage, tenement and

garden described in section IX lay here and not along the south side of the cathedral manor-house ditch. It does, however, raise a doubt about the position of the gateway to the cathedral manor-house. If, as Rigold seems to imply (Rigold 1962-3, 76), the main entrance to the manor house was between the two semi-circular towers with a drawbridge spanning the ditch between the house-wall and the cut-away bank and an entry over the outer moat immediately to the south of this, there would be very little room for the cottage, the sixty three feet of land, and the garden of numbers 148-151 to lie west of the entry and yet be described as lying against the tower ditch. If the location of these properties suggested here is correct, it must mean that the entry to the cathedral manor house was to the east of the present entry, that is somewhere beyond the east end of the former George and Dragon public house. On the other hand, if 'the gateway' (introitum) of the manor was just beyond the south east corner of the outer ditch with the crossing of the ditch half-way along its eastern arm, the three tenements 148-151 would have been along the south side of the ditch. Blomefield, writing in the first half of the eighteenth century, stated that the entrance 'seems to have been on the east side' (Blomefield 1810, IX, 488). It seems likely that if the entry had been in its present position in the eighteenth century Blomefield, or his informant, would have noted this. Moreover, a piece of evidence from the sixteenth century suggests that at that time the entrance to the site was near the south east rather than the south west corner. In 1538 three officers of the Lord Privy Seal (Thomas Cromwell) went 'through the churchyard of Elmham to the Tower Hill' to a manorial assembly (Carthew 1877-9, 574). The cathedral manor-house had long been out of use as a dwelling-house and it is probable that Cromwell's manor-house stood opposite the south west corner of the churchyard just behind the present lodge ⁹⁰. If, as is likely, the officers came from Cromwell's house, they would not have needed to cross the churchyard to reach an entrance to the cathedral site in the present position, but would simply have walked up the road alongside the western boundary of the churchyard. On the other hand, an entrance by the south east corner of the ditch would have led them diagonally across the churchyard. Everything considered, it seems likely that in 1454, and probably earlier, the entrance to the cathedral manor-house was by a crossing of the outer ditch half-way along its eastern side, approached from the Procession Way which began at the south east corner of the ditch ⁹¹.

After noting two cottages and a parcel of land lying at the north east gate of the churchyard (X), the surveyors turned to the north part of the market place and described two cottages on the west of Towerdeke and another which was obviously an encroachment on the market place (XI). Then they went into the market place, where they noted Henry Taverner's messuage ⁹², a cottage and the five market stalls, all of which stood on the west side of the churchyard. The market rights belonged to the bishop's manor and brought him 29s. in rent in 1326-7 and 33s. 4d. in 1328-9 ⁹³. The rent of the market had declined almost to nothing by 1401 and by the early sixteenth century was apparently non-existent ⁹⁴. In 1565 there was mention of 'a plot of ground sometime called the Market place' and in 1572 there occurs a messuage 'abutting on the market place of Elmham, now called le Bell grene' (Carthew 1877-9, 556-558). A clerk of the market was paid twopence in 1566 (Legge 1891, 81). About 1592 the 'consideration of lands and leases offered to be sold by Henry Lord Cromwell' gave as an inducement the fact that 'The towne hath beene a markett towne which wer easily renewed which would much benefitt the purchasor' ⁹⁵. There is no evidence that the market was revived, but in the 1630s the area was still called 'the market' ⁹⁶. By 1678 much of the area was part of the vicarial glebe, but between 1770 and 1776 it was exchanged for land on the south side of the Great Heath and thus passed into the possession of the Milles family ⁹⁷. At the enclosure of 1831 it was included in the New Park and c. 1840 the park wall was built, finally cutting off this area, which had been a major part of the settlement from at least the seventh century, from the rest of the village.

The date of the grant of the market charter is not known. The fair dates at least from the episcopacy of bishop Everard (1121-45), who gave it to Norwich priory

(Saunders 1939, 61, 75). Oddly enough, the compoti of the prior's manor in the thirteenth and fourteenth centuries show no sign of any income from the fair, while those of the bishop's manor record small receipts in 1401, 1519 and 1528⁹⁸. It was alleged to be leased to Simon Dethick in 1540 for an annual rent of 10s. and in 1567-8 the tolls of the fair were estimated to be worth the same sum (Carthew 1877-9, 561, 585)⁹⁹. It is possible that this fair, which is not mentioned in the compoti of the bishop's manor for 1326-7 and 1328-9, was a later institution than that granted by bishop Everard; certainly it was not synonymous with the market, for both terms occur in the compotus of 1401. Moreover, the market place was not the venue for the fair. According to the tithe map, the Fairstead lay some distance to the south east of the churchyard, next to the Camping Ground, which is, traditionally, a piece of open ground where the old Norfolk game of camping was played¹⁰⁰. Edward Harvey, who probably lived in the rectory manor-house, had £20 worth of 'stall stuff for the fayre' in his possession when he died in 1685¹⁰¹. In the eighteenth or nineteenth century the fair was moved to the Green Field, on the site of the present playing field, and the date changed to 6 April¹⁰². In 1845 it was described as 'a large fair, for cattle, sheep and swine', but it ceased to be held c. 1880 (White: 1845; 1883; Legge 1891, 94).

After covering the east side of the market, the surveyors turned to the west. They began at the north west corner, where the present main road joins the old Walsingham Way. Here stood the messuage known as 'Le Bell' (XIII.162), a free tenement held by Richard Hedge. In 1516-7 it was said to have 200 acres of free land attached to it although the messuage itself was in ruins (Carthew 1877-9, 562)¹⁰³. The Elizabethan annotations to the survey give Edward Denny as the holder. The Dennys were an old Elmham family; Thomas Denny held eleven acres of land in 1454 and Denne was one of the pre-1454 'tenements'. The probate inventory of Edmund Denny (died 1592) mentions 'Bell halle' and 'the bell chamber'¹⁰⁴. Le Bell may well have been a medieval inn. It was well situated next to the church and the market place and it was certainly an inn between 1652 and 1663¹⁰⁵. An abuttal of 1681 refers to 'le Bell yard', leaving a slight doubt as to the existence of the Bell itself at that date¹⁰⁶. Extensive flint walls uncovered in the first phase of the Park excavations may well have belonged to the Bell and the curious lump of masonry incorporating medieval-type glazed tiles which was discovered at the same time may also have been connected with it.

Next to the Bell stood a plot of land, twenty eight by twenty feet, that was the subject of several transfers and disputes in the sixteenth and seventeenth centuries. It was mentioned in a court roll of 1491 as a simple plot with a well. By 1587 it contained a cottage and a draw-well, but by the time Edmund Denny died the cottage was in ruins¹⁰⁷. Three flint-lined wells were found during the park excavation (Fig. 12).

To the south of the Bell, on what must have been a narrow strip of land between the Walsingham Way and the market place, lay a messuage and eight cottages. None of them was described as 'built', but some almost certainly had buildings on them. They show that there must have been a fairly intensive settlement here after the archaeological evidence falters and before the 1454 survey. The most likely period for this settlement to be at its height was in the thirteenth and early fourteenth centuries when the population probably reached its highest point in medieval times and the market was flourishing.

Somewhere to the south and west of the market place lay the vicarage. The vicarage was ordained before the middle of the thirteenth century; a confirmation that may date from c. 1244 says that there was a vicarage-house with buildings on the west side of the church (Saunders 1939, 129). The house was mentioned only incidentally in the survey (VII.126), but the vicarage garden occurs in a court roll of 1491¹⁰⁸. By c. 1592 it seems to have come into the possession of the Cromwells, for the house and 'iij akers in the west feild' were listed among their lands and valued at 45s.¹⁰⁹. This may have been connected with Edmund Denny's occupation of the benefice. His successor, Thomas Smith, lived in a 'three-cell' house with a small wing¹¹⁰, but this was almost certainly

not the vicarage-house. Nathaniel Duckett, Smith's successor, also had no vicarage house; between 1653 and 1663 he lived in a house rented of the manor, which may, of course, have been the original vicarage returned temporarily to the use of the incumbent. Although he resigned the living in 1659, Duckett still had a house, either as tenant or owner, at his death in 1666 although he seems to have moved down to Huntingfield in Suffolk ¹¹¹. The earliest surviving glebe terrier, 1678, makes no mention of a vicarage house and it was not until c. 1835, when the present 'Old Vicarage' was built on a site to the north of the market place, that the incumbent had a house provided for him ¹¹². E.H. Townsend, who himself was vicar of Elmham, asserted that the former vicarage stood in the grounds of the 'Old Vicarage', slightly to the west of the present house, but there is no reason to suppose that a house in this position was the true vicarage, although it may well have been the dwelling of the Revd. Thomas Gregory, vicar 1741-77, whose house lay near the market place.

The earliest extant glebe terrier (1678) contains the following description:

Imprimis A faire churchyard, very well walled, and fenced in.
Item, A pittle (i.e. pigstye) neere adjoyninge therunto containing by estimation one Acre, & it lyeth betweene a comon way going betwixt it, and ye mannor house towards ye south, & ye lands of ye Lords of ye said mannor towards ye North, & abutteth uppon the kings high way leading from Deerham to Wells towards ye west, & a comon way betwixt it & the churchyard towards ye east.

The reference to the Dereham-Wells road - the Walsingham Way - places this pigstye to the west of the churchyard and it is thus obvious that the 'manner house' cannot be the priory or rectory manor which lay to the east of the churchyard. Similarly, it cannot be the cathedral manor-house, as this would place the pigstye to the north of the cathedral site and well away from the churchyard. The only reasonable explanation is that the 'manner house' stood somewhere slightly to the south of the present park drive, perhaps on the site of the farmhouse discovered in the park excavation and in the region of numbers 124-6 on the plan of the 1454 layout. The cathedral manor-house was almost certainly a ruin in the later seventeenth century and there is evidence that in the sixteenth century the Cromwells had a habitable manor-house in the village. A late sixteenth century 'Estimate' of Elmham includes both 'The scit of the Manor called Tower hille' and 'The howse' (Carthew 1877-9, 536). Two houses are mentioned in the 'Consideration' of c. 1592 and the first of these, 'the dwelling howse' may be the house mentioned in the will of Henry, Lord Cromwell, in 1592 ¹¹³. Thomas Cromwell, brother of Henry and son of Gregory, Lord Cromwell, lived at Elmham after his marriage in 1580 (Legge 1891, 78f). James Cromwell, Henry's 'cousin', had lived in the other house of the 'Consideration' and continued to live in Elmham until his death in 1613, but there is evidence that from about 1598 he may have occupied the prior's or rectory manor-house. Thomas Cromwell and his family probably moved from Elmham after the sale of the manor to Edward Coke. It is doubtful whether any of the Cokes lived at Elmham ¹¹⁴.

The manor was mortgaged by Edward Coke to Hugh Awdley in 1655 and on Awdley's death in 1662 it passed to his trustees, who included Robert Harvey (Carthew 1877-9, 541-5). It remained with the Harveys until they sold it to Richard Warner in 1720. In 1685 Edward Harvey died; his inventory shows that he lived in a house of considerable size, but it is more likely that this was the manor-house of the prior's manor than that of the bishop's manor ¹¹⁵. Richard Cooper, who died in 1640, was bailiff of the manor and may well have lived in the Cromwell's manor-house ¹¹⁶. There is no record of a manor-house in the suggested position in the eighteenth or nineteenth centuries; if it stood until after 1720 it would almost certainly have been pulled down by Richard Warner when he built his new house and began to create the New Park.

The surveyors of 1454, coming to the well near Gilberdstile, passed southwards towards Forthbridge, noting three cottages, a messuage and a barn with other buildings before they reached the fork in the roads (XIII). Then they turned north and went along the road towards Brome Green, noting the properties on the west side of the road: three messuages and a cottage (XIV), with a messuage at the junction of Walsingham Way and Brome Way (XV). After that they described the tenements on the west of the Walsingham Way, beginning at a well called Townwell, near the well at the back of the present Nelson House (XVI). In this stretch were three cottages, two messuages - one of them only a garden - and a plot with buildings on it. South of Gilberdstile and probably standing to the west of the long property already described (VI.123) were a building, a cottage and the site of a messuage (XVII). As can be seen from Fig. 9, this stretch on the west of the Walsingham Way between Townwell and Forthbridge was quite heavily settled in 1454 and it is logical to assume that it had long been part of the village settlement. There are few references to this area in the sixteenth and seventeenth centuries, however, and it is likely that settlement had begun to move away long before Richard Warner made Westfield into the New Park in the 1730s.

THE CHURCHYARD

In 1454 the churchyard probably covered about two thirds of the area of the present graveyard, not including the extension. The survey mentions Kirkgate (VII) at the south west corner of the churchyard, another gate at the south east corner (VIII.143), and a third at the north west corner (X). The churchyard was almost certainly fenced or walled in the middle ages, although there is no documentary evidence for this until the sixteenth century. In 1539 the south east gate was made of stone, iron and timber. It seems likely that the entry was over a kind of cattle-grid as the churchwardens' accounts refer to 'grats' with pits being dug for them (Legge 1891, 8-9) ¹¹⁷. In 1549-53 the north side of the churchyard was fenced with pales, a stile providing access; this replaced the old wall (Legge 1891, 52, 65, 68-9) ¹¹⁸. An 'Easte Style' is mentioned in 1553; this was probably opposite the prior's manor-house (Legge 1891, 70). The present churchyard wall seems to be of the same date as the other walls in the area, that is c. 1840.

SYNOPSIS OF THE SURVEY OF 1454-5

The page numbers of the right-hand column are from the MS survey in the N.R.O., Dean & Chapter MS.E.123. The roman numerals of the sections and the arabic numerals of the individual entries are the author's and are not to be found on the original. The survey is, of course, in Latin, apart from field names etc. which are in English. The section headings have been translated in full, but the individual entries, where they are of sufficient interest to be inserted, have been summarised, so that the tenant's name, the acreage, etc. are omitted.

(Compare with Figs.5, 9, 268 and 169)

<p>I Messuages, cottages and houses (<u>mansiones</u>) with crofts, land, meadow, pasture and marsh beginning at the south end of the town of North Elmham namely at the watermill called le Gyrnmyll</p> <p>1 watermill called Gyrnmyll with land</p> <p>2 house built (<u>domo edif'</u>) with land in place called lez Inhams</p> <p>3 Little Heath</p> <p>4 Clarkes close</p> <p>5 messuage with meadow</p> <p>8,9 meadow and marsh at Ankerwyk</p> <p>10 marsh - Mekeslake</p> <p>11 Ankerwyk</p> <p>12 close - le stewyerd</p> <p>13 messuage of tenement Brydewell now not built</p> <p>15 messuage</p> <p>And thus proceeding further on the south part of the place called Estgate</p> <p>II Estgate</p> <p>24 messuage - wellhouse</p> <p>25 Catscroft</p> <p>30 two cottages - Knightes and myllers - lying at the south end of croft against the common way called EstGatewaye</p> <p>32 cottage lately called Fowlers</p> <p>34 cottage</p> <p>36 cottage</p> <p>40 next in the corner of the roads a cottage</p> <p>42 messuage and Howletts close</p> <p>43 cottage in the corner of the roads the one called lynneway and the other leading from Elmham to Dereham</p> <p>III Now returning to the cross standing opposite the messuage</p>	<p>Page</p> <p>1</p> <p>3</p> <p>5</p>	<p>of the aforesaid Richard Spilcock (43) against the divisions of the roads there and proceeding by houses (<u>mansiones</u>) and crofts on the west part of the aforesaid road leading to Estderham until forthbrig is reached Beginning at the said cross against Lynneway</p> <p>45 in the corner on the south of the road leading to Bryslee</p> <p>46 cottage called Nobes</p> <p>IV On the north part of the road called Holgate</p> <p>53 messuage</p> <p>54 messuage built upon</p> <p>55 messuage</p> <p>57 messuage at Purles Grene</p> <p>58 close called Gires, messuage or cottage and croft called hulle</p> <p>the higher part of the road</p> <p>59 messuage built</p> <p>62 1 rood with a cottage at its south end and ditched in the west part</p> <p>63 messuage built and 1 acre in a croft extending in length up to the stream running to Forthbridge</p> <p>65 garden (<u>ortu'</u>) - Crowesyrd</p> <p>66 messuage and 12 acres in croft</p> <p>67 cottage called Sewars - pays <u>1d.</u> a year for obstructing the stream</p> <p>V Here forthbridge was reached by houses and Crofts on the south part of the road called Estgate and on the west part of the road leading to Derhm And now Beginning near Bridwell and proceeding on the north part of the said road called Estgate as far as Forthbrigge</p> <p>72 cottage called halfeparke in the angle of Estgate and the road leading to the church</p>
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	Page		Page
73		message	
74		the bishop's marsh and water called halponds	
75		Blextersmedow	
76		half cottage	
77		half cottage	
78		garden called Wateryard	
79		third cottage	
80		third cottage	
81		third cottage	
84		cottage - Hawkewodes	
85		piece of land against the pit (<u>fote'</u>) called Estgatewell	
86		Message - Wellhous	
87		Silvermedowe	
88		divers cottages	
89		garden with ash-tree	
90		cottage built	
91		cottage	
92		cottage	
93		half cottage	
95		half cottage	
97		cottage	
99		cottage	
100		message built	
104		close built - Bayesclose	
105		Waytes yarde	
106		message	
107		message	
108		half-acre Bulwers	
113		cottage	
114		message	
115		Forthmershe	
116		to the north of the stream running at Forthbridge west one piece of land called le lownde	
VI		Now further proceeding on the north part of the forthbrigg and on the west part of the king's road leading to Walsingham	11
117		cottage	
118		message built	
119		$\frac{1}{2}$ acre lying against road on east part. John Attemedowe formerly vicar of Elmham had enclosed it with ditches and banks to the north, east and west	
122		3 roods meadow newly enclosed, bordering on Forthbek	
123		enclosure lying in length against road as far as Gilberds stile with cottage built in north end	
VII		Thus Gilberdstile was reached and then proceeding by and against the road leading to the cemetery of the church namely on the south part of the same road beginning at the fount (<u>fontem</u>) of water there	12
		Gilberdstile	
124		cottage	
125		a place with a house (<u>domo</u>) built on it called Constoryhous	
126		message at Kirkgate namely opposite the vicarage and cemetery of the church of Elmham	
127		cottage	
128		land	
		here lies the king's road	
129		cottage against or opposite cemetery	
130		cottage wasted lying against said cottage here lies the king's road	
131		cottage	
132		cottage built called Cokys lying between two cottages not now built	
133		two cottages	
134		cottage	
135		two cottages, one lying on the west part of the road to the church, the other lying between the said road and another road leading to the rectory	
136		cottage - Hunts	
137		cottage built	

	Page		Page
VIII	13	Now returning to forthbrigg namely on the east part of the road leading to the Rectory	
		Forthbrigg	
		138 piece of land built 63 feet long 39 feet wide against the stream called Forthebeck	
		139 third cottage	
		140 third cottage	
		141 third cottage	
		142 third cottage	
		143 messuage at the gate of the church	
		144 $\frac{1}{2}$ acre between said messuage and garden of the same and the land of the bishop on the north part and land of William Gedge on south part and abutting on land of the bishop towards the east and on the common way towards the west	
		146 cottage lying between the cemetery on the south part and the common way on the north part	
		147 two cottages	
IX	14	Now proceeding on both parts of the market there beginning on the north part of the said market and proceeding east	
		Market	
		148 part of cottage called meperes against the ditch of the lord's manor namely on the north part of the market	
		149 the living part of the said cottage	
		150 piece of land 63 feet long and 48 feet wide at one end and 36 feet wide at the other lying between the king's road and the ditch-and-bank called Le Towerdeke and abutting on 148 towards west	
		151 enclosed garden at east end of 150 between the ditch called Castledeke on the north part and the king's road on the south part and abutting on the gateway (<u>introit</u>) of the manor to the east	
X	15	Here branching off south on the south part of the king's road	
		152 two cottages against cemetery on the south part	
		153 parcel of land 21 feet by 8 feet lying at west end of 152 against the gate of the cemetery	
XI	15	Now again on the north part of the said market and proceeding west	
		154 cottage	
		155 cottage	
		157 cottage in the market 55 feet by 26 feet	
XII	16	Now on the south part of the said market by the king's road lying on the west part of the cemetery and proceeding west	
		158 messuage against market	
		159 an encroachment on 158	
		160 five stalls in the market yielding 6d. a year which stalls are now wasted	
		161 cottage containing 50 feet in length and 14 feet in width	
XIII	16	Now turning to the west part of the said market	
		Le Bell	
		162 messuage said to be of the church	
		163 encroachment	
		164 piece of land	
		165 cottage	
		166 parcel of land sometime built called Ingglewelle	
		167 cottage	
		168 mediety of messuage	
		169 mediety of cottage	
		170 mediety of cottage 169	
		171 mediety of messuage 168	
		172 cottage with three tenants	
		173 cottage lying in two parts with piece of land between them	

	Page		Page
174		cottage	
175		part of cottage	
176		messuage towards the fount	
177		parcel of land with barn and other buildings	
178		parcel of land with ditch round it and 177	
179		part of cottage	
180		cottage built	
181		cottage	
182		cottage built	
XIV		Now returning on the west part of the road leading towards le Brom	
		broom	
183		3 roods with cottage built	
185		messuage and croft	
187		1½ acres with messuage built	
188		1 acre with messuage built	
XV		Here the return of the road called Walsingham Weye is reached	
		189 messuage at road junction	
XVI		Now beginning near the fount called Townewell and proceeding south against the king's road	
191		cottage	
192		cottage	
193		land between two otherwise unlisted messuages	
194		cottage	
195		land built on	
196		land newly enclosed	
198		messuage formerly built and now made a garden	
199		cottage	
200		½ acre with small messuage and ditch in south part	
201		2 acres with garden in east end	
		XVII Here Gilderdestyle was approached	21
		202 place formerly built called Shetenes	
		204 place built called Barrgate	
		205 cottage built	
		XVIII Lands and tenements in the fields and meadows pastures and marsh beginning against the croft of Robert Heyward (15-17)	23
		215 lying in length against the common heath (<u>cōe Bruar'</u>)	
		221 lying against the path called myllesty on the north part of the path	
		224 encroachment on heath	
		228 lying in length against the heath on the east part and extending to the common at Woodford	
		233 3¼ acres called le Gorlond	
		XIX Now beginning and proceeding north by the half-acre of land of Isabella Bulwer extending in length by the common heath to the east as far as the path called Procession Way to the west where two furlongs (<u>stadia</u>) begin ploughed eastwards and westwards	26
		235-7 mydlond	
		239 merle pytt	
		258 near lynnewell	
		And now proceeding after Thomas Cape's land northwards in the westerly furlong	
		260 houndhilacre abutting on lynne way to the north	
		261 le Gyrr	
		264 land at Springwell	
		266 land abutting on Dereham Weye towards the west	
		267 land at overspringewell	
		268 meadow abutting on Dereham Way towards the west	

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XX Now beginning at the cross called the high Cross standing in the fork of the road leading towards Derham and the said path called le Procession Way leading towards Woodford namely beginning on the south part of the said Cross	29	296 cottage called Nobes	
269-73 land cutting across the road to Derham		XXIII Now Beginning in another furlong against the said road called holgate in the south part of the same namely at the west end of the said furlong	33
XXI Now more in the furlong abutting on the said procession path towards le Northeast	30	316 $\frac{1}{2}$ acre on the east part of Rokkelowesty	
278 4 acres called Gyrne		XXIV Rokkelowesty	34
279 1 acre lying in length against the path called myllestye leading from Betelee to Gyrne mill on the west part of the path		317 1 acre on the west part of the said path	
280 2 acres against myllesty on the east part and Nabbesteles to the south		XXV And now returning east in another furlong called Brood-sloth namely at the south end of the aforesaid furlong	35
282 Spyrlingespece		343 2 acres against the path called Rokkelowstye	
286 1 acre against the Dereham road on the west part and near le Cralkellytt		and on the other part of the said path across the north end of 343	
288 meadow against Sponge close		344 1 acre called berysaker abutting on the path to the west	
289 meadow newly enclosed against le Sponge		XXVI Now in another furlong there called Catberd furlong abutting south and north beginning on the west part	36
290 Nabbesclose		345 1 acre against Rokkelowstye on the east part of the path	
291 5 acres in the bottom called le yardsell abutting on Dereham Weye towards the west		XXVII Now in another furlong called heylowe abutting east and west	38
XXIIA Now in another furlong there called Skotland abutting on the said 5 acres (291) towards the south beginning against the king's road	32	XXVIII Now in another furlong called Derebowghte abutting south and north	38
The land and tenements aforesaid lie between the common pasture coalled Ronehilleeslte (?) and the king's road leading out of Northelmham to Estderham except a parcel of lands of divers tenants which cross the said road as is noted above.		XXIX Now in another furlong called Sylverdenne abutting east and west	39
XXIIB And now Beginning at Spylckes: Townesend against the road called hollegate on the south part of the said road proceeding south	32	376 $\frac{1}{2}$ acre at Greenehille	

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XXX Now in another furlong called Crundell abutting south and north	39	Strehbusk in the furlong called Pellettesfurlong namely on the south part of the said road	
381 2 acres formerly divers pieces called harplond		482 1½ acres at Paynotlesdele	
XXXI Now in another furlong similarly called Crundell lying east and west	40	XL Now at Estsomerlond are 24 acres in one piece lying near hawkegate	47
XXXII Now in another furlong similarly called at Crundell abutting south and north	40	XLI Now more in the furlong called Blachirnefurlong lying east and west	47
389 1 acre in length against the path leading from Somerleswe at Brundelbuske		XLII Now returning by the said road southwards in another furlong called firrbuskfurlong abutting east and west	50
XXXIII Now in another furlong called Wynneswong abutting east and west	41	XLIII Now returning in another furlong called Brentlondfurlong abutting south and north beginning in the east part of the same furlong	50
XXXIV Betelehill	41	XLIV Now in another furlong abutting south and north called Shortlondfurlong or Shortlond	52
401 9 acres called Betelehill		XLV Now in another furlong called Bynaystyefurlong abutting south and north	52
XXXV Now in another furlong called heylowefurlong abutting south and north	42	581 1½ acres lying against the path leading towards Burgrave namely near the gate of Burgrave on the east part of the path	
XXXVI Now in another furlong called Eggegravefurlong abutting south and north	42	XLVI Now in another furlong called Snoweacrefurlong lying in length north and south beginning at le hedmere at Snowacre	54
XXXVII Now in another furlong at Beteleehyll abutting east and west Beginning on the south part of the same furlong and proceeding north	43	XLVII Now in another furlong called frosthyrne abutting upon the said furlong called Snoweacrefurlong towards the north beginning in the east part	54
XXXVIII Now in another furlong called Betelehill lying north and south	44	XLVIII Now in another furlong abutting east and west called Benecroft	55
428 6 acres lying on west part of Derhamway			
432 2 acres at Braydehevedes			
XXXIX Now beginning against the road called Lynneway at	44		

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XLIX Now in another furlong in Wroohynne lying south and north	55	700 messuage called Crommes in lord's hand	
622 1½ acres abutting on Burgrave		701 messuage formerly built and now vacant at Caper crofte	
L Now in another furlong lying between the road called Lynneway and the south part and the road called parkway under the park on the north part	55	708 1 acre lying against holgate	
Ramesley Grene			
LI Now in another furlong called Thralso lying in length east and west namely between the road called Lynneway and the road called parkway	56	LVIII Now in another furlong at the west end of the aforesaid furlong	61
LII Now in the furlong called Goodwynesdyke lying east and west beginning in the south part	57	712 1 acre called hedlondlond	
638 1 acre lying in length against the road called lynnway		LIX Now in a furlong called Jekkescroftes beginning against John Fuller's close on the west part	61
648 2 acres called Ketelsmere		716 cottage formerly called herbred	
649 1 acre lying in length against Parkway on the south part		718 land and pasture with close called spellers	
LIII And now Returnando to the said road in another furlong south	58	727 here came to the road called Thornwellway	
LIV And now returning north in another furlong	58	728 16 acres on the high part of the road	
LV Now returning east in another furlong	59	LX Now in another three-cornered (<u>Triangulato</u>) furlong beginning near le parkgate where it goes out towards Burgrave	63
LVI Now in another furlong called Waynegatefurlong lying south and north	59	746 close against the park and another close against the common stream on the north part	
696 cottage now not built		747 close against common stream on north part	
LVII Now in another furlong going east and west	60	748 close against common stream on north part	
699 ½ acre between the road called Wayngate on the north part and land on the south part		749 Redmersh	
		753 meadow and marsh called Palmers yard formerly built	
		Now beginning against the east side of the aforesaid Close (i.e. 746)	64
		760 Spadefoot	
		763 close called Gyllesyerd	
		765 great close called Thornwell Clos	
		LXI Now in the field at Ramsley beginning at the gate of the wood called Burgrave against the path leading from the	65

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park gate towards the aforesaid gate of Burgrave on the west part of the path		842 Brodemedowe	
LXII Now in another furlong called Westsomerlond and Elderbutfurlong abutting on the meadow and pasture lying between the headland of the said furlong and the stream running between Elmham and Bryslee towards the west	66	843 Brodemedowe	
LXIII Now in another furlong lying at the end in the north of Bowerwong	66	844 meadow at Throstholme	
LXIV Now in another furlong lying north and south	67	845 close called Woodford in which was formerly built a messuage and there was formerly a watermill	
800 messuage		846 cottage against Nabbsyerd	
LXV Culverleecroft	67	848 Sponge close	
LXVI Now in another furlong at Kerheed	67	849 portion of newly-enclosed meadow lying against the common way leading to Derham namely at the corner of Spongeclos	
804 extending to the king's highway towards the north		855 meadow against the common stream	
LXVII Now in another furlong called Culverleecroft		862 1 acre meadow and pasture on which was built a house called Bowkinghouse	
LXVIII Now in another furlong abutting on lynneway towards the north	69	865 pasture lying in length from Estsomerland to Bowkingehowse on the south part	
LXIX Now beginning at Ronehill	70	868 pasture against the common stream	
837 knyghtes ronehill		870-1 at Thackyngker	
LXX And now proceeding south and west by the boundary of Worthing Betelee and Brysley namely of meadows marshes and pasture	70	874 and further on the south part of the lord's wood called Burgrave is a certain great pasture called Woodepyttes	
839 lying against the common pasture of Elmham on the north and the stream running between the pasture of Henry Smyth towards the west (840)		LXXI And now further on the west part of the said wood called Burgrave beginning from the south and going north	72
840 pasture called Gellesinham		894 2 acres enclosed abutting on the road at Paynford Brygge	
		LXXII Rammesley	74
		LXXIII Land of the lights and gilds	
		WESTFELD	
		LXXIV View of the fields in the north part of the town of Northelmham &c beginning against the king's highway on the west part of the same road and proceeding by the stream running through the middle of the town aforesaid on the north part of the same stream	76

<p>1104 message</p> <p>Here Peter Berisfoote's message was reached</p> <p>Now in the field called Hethfeld beginning in a short furlong lying in length south and north namely against the heath</p> <p>XCVIII Hethfeld</p> <p>NOW IN BROWNECLOSE : 1106-12</p> <p>1108 at Jakkesgappe</p> <p>NOW IN DITES CROFT : 1113-5</p> <p>XCIX</p> <p style="text-align: center;">FULFORDHAUGHHYRNE</p> <p>Now going back beginning against the heath</p> <p>C Fulfordhaugh close</p> <p>1116 21 acres with a grove abutting on heath north and south</p> <p>NOW IN DIT CROFT : 1117</p> <p>CI NOW IN LITL HARDEMEDOWES & DITES CROFT 1117A-1120</p> <p>CII Now in another furlong there beginning against the said 21 acres towards the west</p> <p>NOW IN DITS CROFT : 1121-8</p> <p>CIII WATSONS CLOSE</p> <p>CIV Now going back in another furlong in a croft and against William Southwood's croft</p>	<p>Page</p> <p>93</p> <p>94</p> <p>94</p> <p>94</p> <p>95</p> <p>96</p> <p>96</p>	<p>NOW IN DITES CROFTS : 1131A-34</p> <p>On the higher part of the aforesaid lane formerly called Grenes lane and now called Gatelee lane</p> <p>Now from the east side of the aforesaid lane called Grenes lane and now called Gatelee lane beginning on the north part of the garden of Simon Fox (1101) against the east head of his croft</p> <p>CV NOW IN TAVERNERS GREAT CLOSE : 1135</p> <p>1135 one headland called Mawkyns acre abutting on the said garden towards the south</p> <p>Memorandum that it extends in a close called le xv acre close as far as le dolestone standing in the same close at the north end of the said garden and by the east side of the same.</p> <p>CVI Now more in Simon Fox's croft lying against harbaldes pightell</p> <p>NOW IN TAVERNERS GREAT CLOSE : 1136-49</p> <p>CVII GRATEHARDMEDOWE NOW IN TAVERNERS GREAT CLOSE : 1150-5</p> <p>Now further in Peter Berisfoote's croft now called le Brome Close</p> <p>CVIII Bromeclose NOW IN TAVERNERS GREATECLOSE : 1156-65</p> <p>CIX Now in another furlong called Dedlond or Dedwonge now called Le Bromeclose</p> <p>NOW IN TAVERNERS GREATE CLOSE : 1166-9</p> <p>1167 abutting on Mawkyns</p>	<p>Page</p> <p>96</p> <p>97</p> <p>99</p> <p>100</p>
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CX Now in another furlong beginning at Smalthornes NOW IN TAVERNERS GREATE CLOSE : 1170-92	100	CXVI Now beginning against the road called Inlondwey on the south part of the same road namely near the messuage of Thomas Barpo formerly Thomas Heede	107
CXI Now in the furlong called Drakeston beginning at le lane leading to Gatelee on the east side of the lane NOW IN TAVERNERS GREATE CLOSE : 1193-1205 1205 $\frac{1}{2}$ acre with a pit called Drakeston	102	1264 messuage and 7 acres NOW IN TAVERNERS GREATCLOSE : 1265	
CXII Now in the furlong called Gorges beginning in the west part of the furlong by the lane aforesaid called Gateley lane NOW IN TAVERNERS GREATE CLOSE : 1209-11 NOW IN LE LITL HETHFELD : 1212 -24 1221 against Appult'buske	103	CXVII But now proceeding in the higher furlong of the two NOW IN TAVERNERS GREAT CLOSE : 1266-73 NOW OUTSIDE TAVERNERS GREATCLOSE : 1274-8 1278 land near hamespit	108
CXIII Now in the furlong (<i>cultura</i>) called Appultrebusk lying east and west in length by the south head of the preceding furlong NOW IN LE LITL HETH FELDE : 1225-7 NOW IN TAVERNERS GREATCLOSE : 1228	104	CXVIII Now beginning at Wykencroft namely at the east end of the said croft in the furlong abutting on Inlondgate towards (blank) and proceeding south as far as Heycrosse NOW IN TAVERNERS GREATCLOSE : 1283 NOW OUTSIDE TAVERNERS GREATCLOSE : 1284-92	108
CXIV Dennemedowe	105	CXIX Now in the area called Netherthorpp now called Bethill 1293 3 acre close lying between the common pasture on the west part and a lane leading to the town of Gateley	110
CXV Now in the furlong called Stonehill beginning against the land of William Goodinowe namely against the croft of tenement Wykyn and proceeding south NOW IN TAVERNERS GREAT CLOSE : 1230-63 1249 at Cokkespytt 1263 $\frac{1}{2}$ acre against Peter Berisfoote's messuage enclosed by old ditches and hedges lying by the heath towards the south	105	CXX Now from the higher part of the heath towards Brislee near Sylvesters Closes Heycros	110
		CXXI And now further in the furlong abutting on Walsinghamwey towards the east beginning on the north part and going south NOW IN GELHAMS CLOSE : 1306-9	111
		CXXII Now beginning back again at Le heycrosse namely at the west end of the five acres of land of Henry Smyth (1302) in the furlong abutting towards the north	112

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NOW IN GELHAMS CLOSE : 1311-2		by estimation six acres of wood	
1312 2 acres lying against the common on the west part		GELHAMS PECE : 1326	
CXXIII Now next in another furlong at the south end of the said furlong abutting towards the north	112	1326 next south abutting on Gelhams and the path called lingsty on the south part and abutting on the king's road towards the east and upon the common pasture called le heth towards the west	
NOW IN GELHAMS CLOSE : 1313			
1313 lying in length against the heath		CXXVII Now in another furlong on the east part of the said close called Gelhams beginning against the close	114
CXXIV Now in another furlong there abutting east and west	112	NOW IN GELHAMS CLOSE : 1327-32	
NOW IN GELHAMS CLOSE : 1314-7		1332 lying in length against Walsingham Wey	
1317 land formerly enclosed by ditches called Shepecoteyrd		CXXVIII Now diverging in the fields northwards at the north end of the above furlong in Le Botome called Gelhams Deale	114
CXXV Now diverging on the east part of the said enclosure called Shepecoteyard beginning on the west part of the last furlong and going east as far as Walsingham Wey	113	NOW IN GELHAMS CLOSE : 1333-5	
SHEPECOTEYARD : NOW IN GELHAMS CLOSE 1318-22		1333 1 acre with one pit lying in le botome called Gelhams Deale	
1319 2 acres of land with a thicket and 1 water-pit		1334 $\frac{1}{2}$ acre against the pit with a thicket	
NOW OUTSIDE GELHAMS CLOSE : 1323		CXXIX Now going back to the common heath called Le Greate Heath near Gelhams	116
CXXVI Now of the pasture of Henry Smith lying between the said Henry's close called Gelhams on the south part and the land of Richard Hedge called Shepecoteyard on the north part	113	CXXX Now in the furlong on the east part of the road called Walsingham Wey abutting towards the north	116
NOW IN GELHAMS CLOSE : 1324		1351 1 acre lying against the road called Bromwey	
1325 next south Henry Smyth holds the said close formerly the messuage called Gelhams with one sheepfold (<u>Barcaria</u>) built within the close which messuage was formerly called de Ubeney and lies against the common pasture on the west part with the course of one free fold and now contains		CXXXI Now in another furlong at the south end of the said furlong beginning against the road called Walsingham Wey on the east part	117
		1352 2 acres lying in length against the said road	
		1364 $1\frac{1}{2}$ acres lying against Brome road on the east part	

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CXXXII Now in another furlong abutting on the path called Blakwynnesmer towards the north beginning against Bromeweve and going east	118	1425 Styntynggys	
CXXXIII Now returning in another furlong at the south end of the said furlong beginning on the east part 1380 $\frac{1}{2}$ acre lying against Bromeweve	119	CXXXIX Now in the furlong called Prestescroft beginning in the east part	125
CXXXIV Now in the short furlong abutting on Bromeweve towards the east opposite Henry Smith's croft beginning in the north part of this furlong	119	1434 prestescroft	
CXXXV Now in another furlong lying in length south and north at the west end of the said short furlong in the east part of the said furlong 1402 1 acre lying against Walsingham weve	120	1435 Tryllokes	
CXXXVI Bromefelde otherwise Bromeheth in Northelmham Beginning against the heath called Bromeheth near Nicholas Pepper's messuage 1404 called Mellond lying between the heath and Nicholas Pepper's croft on the west part 1405 between the heath and the land called heyspece 1406 heyes	123	1438 cottage Spylman	
CXXXVII Now beginning back at the said messuage of the said Nicholas 1408 Nicholas Pepper's messuage with croft 1413 at the north end namely at Ruklowe ploughed east and west	123	1439 cottage with incroachment	
CXXXVIII Now in another furlong at the south end of the aforesaid furlong lying crossways abutting on the road called lyltesweve towards the west	125	1440 $1\frac{1}{2}$ acres on which is built the greater part of a messuage and the other part is in a piece of land called moysyszerd	
		CXL Now beginning at the north end of Normanneslonde (or Normanslane)	127
		CXLI Now in another furlong abutting south and north at lyltyspyt 1460 against the west side of lyltesweve 1473 24 acres called Dunhamhyll or Dunhamdale 1474 4 acres called Whertlond 1475 2 acres called Pytlond	127
		CXLII Now beginning against Dunhamscloos 1484 8 acres lying under Dunhamhill 1489 abutting on the king's road towards the south 1492 $8\frac{1}{2}$ acres in one piece called le breche 1498 2 acres of land at larges on the south part of the road called Lyllysty 1500 1 acre lying in length against largesweve called bedetelowe	129
		CXLIII Now in the furlong there abutting south and north 1504 $1\frac{1}{4}$ acres called Ioneslonde 1505 1 acre called Shortacre	130

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1508 10 acres called Rydecroft		CL Now in another furlong beginning against the said road and going east at the south end of the said furlong	135
1510 4 acres lying in Rydecroft lying on the west part and with the road called Normanneslane on the east part and abutting on the path called myllystye towards the north		And here they come to Blakwynnesmere	
1512 1½ acres with one messuage built on it		CLI Now beginning against Bromeweie in the furlong abutting on the same road towards the east beginning on the east against Bromeweie and going west	136
1513 cottage formerly built called Tawfas against 1512			
CXLIV Now beginning at Le Whytecrosse against Walsyngham Weye above Larges	131	1558 2 acres called marelong	
1515 12 acres with messuage		1559 1 acre called Gor Akyr	
		1569 1 acre in le hevedes	
(CXLV) Memorandum that all the aforesaid lands in this furlong abut on the road leading from larges to Bromwelle towards the north	132	CLII Now again beginning against Bromeweie in another furlong on the east part and going west	136
1528 2 acres against the path now called procession Wey on the south part		1573 ½ acre called loweyerd	
CXLVI Now in another furlong abutting on the said procession weie towards the south by which they come to Walsyngham Weye beginning on the east part and going west	133	CLIII Now in another furlong called Loweyerde beginning against 24 acres of land 1541 on the north part and going south	137
CXLVII Now in the furlong abutting on the said procession Wey towards the north beginning at Walsyngham Wey towards the west at the close called Fylingston close	134	CLIV Now in another furlong beginning against Bromeweie on the east part and going west	137
1541 24 acres called le lowepece with a pit called lowepytte		and thus now they come to Walsyngham Weye	
CXLVIII Now in another furlong called Blakwynnes on the east part of the road called Bromeweie	134	CLV Now in another furlong at the south (or west) end of the land called lowepece under the 24 acres 1541 on the north part and going south and all abutting on Walsyngham Weye towards the west	138
CXLIX Now in another furlong beginning against Bromeweie and going east	135	CLVI Now of meadow pasture and marsh in the parish of Northelmham	140
1552 2 acres with one gravelpytte		1612 marsh enclosed lying in the place called lez Inhams	
		1613 Clerkyselos	
		1617 Ankerswyk	
		1618 Ankerswyk	

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1619		Makeslake	
1620		Ankyrwyk	
1621		close called le Stewyerd	
1622		messuage now not built	
1624		hallepond (meadow marsh and reeds)	
1625		Parkersmedowe	
1627		Wellehows - messuage and 6 acres	
1628		close Sylvermedowe	
1629		Furrmersh	
1637		Thorwelleclos	
1639		Gillesyerde	
1643		meadow and marsh called Palmersyerde	
1646		Reedmersh	
1650		1 acre lying in length against the stream running to Forthebrigge	
CLVII	143	Now of marsh and meadow beginning against the marsh of the lord Bishop of Norwich and going north	
1654		opposite the common pasture lying against the house formerly John Bernard's and now Henry Smyth's	
1656		marsh Spirlyngholm	
1657		marsh lyngwynholm	
1660		marsh at Blakwynnes	
1669		close of wood called Bromyerd	
1670		cottage called Stele	
1671		cottage	
CLVIII	144	And there is in the same place a great common namely marsh. And further on the north part of the said common	
1673		marsh Dot	
1674		marsh lynkys	
1675		marsh turbary and meadow near the mill called kynggys mylle	
1679		pasture lying in lez Inhams there	
		And further north is a great piece of marsh of the lord called Bradmerssh	
CLIX		And at Dammesende there	
1681		1 pit lying on the east part of the mill pool	
1683		against the said pool on the west part is a certain common marsh called Woderon'	
CLX		And immediately west is a certain common marsh called heysholm	
1687		marsh at Ruklowe	
1688		marsh at Esteroft	
1691		pightle called liltesyerd	
1693		pightle called howlyerd	
1694		marsh howndparcks	
1697		pightle called Ooldyerd	
1700		1 rood of marsh and 1 geynswath	
1703		a great close of marsh and pasture called Dunham crosse	
CLXI	146	Next returning by the stream running between Elmham and Gatele	
CLXII		Now further of meadows in the heth	
CLXIII	149	Now of the farm of the lord's lands, fee farm and foldcourse of the manor of Northelmham	
		Le Tower there	
1716		Hallyard	
1717		Hallclose	
1718		Towerclose lying on the north of le Tower yards	
1719		Hallpond	
1720		hemplands and other lands	
1721		61 acres in divers pieces there	
1722		1 aldergrove there called Faucon' kerr	
1723		Furmarsh	
1724		23½ acres in divers pieces there	
1725		8 acres in divers pieces there	

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1728 a wasted tenement with land	
1729 a wasted tenement called Drakes	
1733 a pasture called le pytts lying against Burgrave	
1734 a garden	
1746 a garden called Stewyerd	
1747 1 acre with a hempland under the wall of the Rectory	
1748 1 acre lying under le Doffehowselos	
1755 3 acres in Benecrofte on the east part of Burgrave	
1756 marsh called Brodefenne	
1762 Foldcourse worth 40s. rent	
1763 parcel of land against the Rectory of Elmham at the east end of Simon Codling's garden (see 144)	
1767 parcel of land against the gate of the cemetery of the church 8' x 21'	
1770 6 acres in divers pieces near Woodfords	
1771 marsh at Thornwelle	
1772 1 acre enclosed against le Castledyke	
1774 1 garden called huntesyerd	
1780 garden called Wattesyerd and garden called Crowesyerd	
1781 parcel with a house built on it	
1782 parcel between the king's road and the ditch called le Touerdyke and abutting on the cottage called meyrds	
1792 piece 55' x 26' between the market on the south part and the manor ditch on the north part	
1793 parcel of land with a piece of a house built on it	
1794 1 acre in the new-made close at Dunham	
1795 messuage and 12 acres	
CLXIV Now of commons and common pastures in Northelmham seen by the perambulators and estimated for quantity by the constables and churchwardens and also the inhabitants of Northelmham and certified to the chief constable of	157

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Launditch Hundred 22nd January 22 Elizabeth	
1805 the common pasture called le Great Heth containing in circuit by estimation one mile (actually about 5½ miles; see XCIV)	
1806 common pasture called heyesholme containing 9 acres (CLX)	
1807 common pasture called Brom grene containing 30 acres	
1808 common pasture called le Comon holme containing 25 acres (CLX)	
1809 common pasture called le letletheth containing 80 acres (I)	
1810 common pasture called Whytefoots and nebhamms (?) containing 9 acres (CLVII)	
1811 common pasture called Blackwins more containing 4 acres (CLVII)	
1812 common pasture called Ramsley grene containing 3 acres	
1813 common pasture lying under the park of Northelmham and against Brisley grene containing 8 acres	

REFERENCES

Abbreviations used in the notes

NRO	Norfolk Record Office
DC	Norfolk Record Office, Dean and Chapter muniments
Holkham	Holkham Hall muniments, North Elmham MSS.
NRS	Norfolk Record Society
PRO	Public Record Office

1. NRO, MS.10837.
2. NRO, Dean and Chapter muniments E.123 Elmham Survey.
3. Another copy of the survey is at Holkham: Holkham, Elmham MSS Bundle 3.
4. Holkham, MS. maps of Elmham Old Park.
5. NRO, Road Diversion Order Map, N.Elmham.
6. Norfolk County Council, County Hall: Enclosure Map N.Elmham 1831.
7. The Roman numerals throughout this account refer to the numbers in the summary of the survey (p.539). They do not occur in the original survey.
8. Holkham, compotus No.2, 1401.
9. NRO, BL22.
10. Holkham, Bundle 5 No.109.
11. DC 4737.
12. see below section on the open fields.
13. Spong: 'a long narrow strip of enclosed land...a little brook that can be stepped across, or the plank or gang-way over it' (Nall 1866, 659).
14. f.191.
15. Carthew 1877-9, 533-4. The date of the dispute is uncertain, but Hugo the vicar, one party to it, is mentioned in a document of 1244-5 (Saunders 1939, 129) cf. Carthew 1877-9, 531.
16. The word used for this kind of earthwork - fossat' - does not make it clear whether the operative part of the work was a ditch or a bank. It seems reasonable to assume, however, that in this case both ditch and bank would be useful.
17. DC 4737.
18. DC 4738.
19. DC 4737, 4738.
20. Holkham, compotus No.2, 1401.
21. Holkham, Bundle 5, Nos.107, 108.
22. In this account the word 'holding' means each holding as it occurs in the survey, irrespective of its size. A 'holding' could contain a number of 'lands' or 'strips'.
23. NRO, NRS 20775.
24. NRO, Road Order Box 15 No.1; Townsend 1927, 11. The name Clamp Lane suggests brickmaking and there was a brickyard to the south of the Lynn road in the nineteenth century.

25. Seventeenth-century abutments seem to imply that Holgate ran more north to south than east to west: NRO MS 504, pp.12, 90, 267. The 1454 Holgate, however, was definitely an east to west road. Perhaps the medieval road was capable of being used in both alignments or the name may have been transferred by the nineteenth century.
26. There was also a place called Ruklowe in the north of the parish near Sennowe Lane (CXXXVII, CLX). Could the derivation be OE hroc-leah, 'rook wood'? Sty is from OE stig, 'path'.
27. inf. Dr.O.K.Schramm.
28. DC 4667.
29. NRO, Dean and Chapter Muniments, E.123 fol.158.
30. Carthew 1877-9, 607; NRO, MS 504 pp.32, 217.
31. Townsend 1927, 7. Legge, who confuses Ramsley Green with the Bell Green, records a parish story that Richard Warner enclosed Ramsley Green: (Legge 1891, 190).
32. NRO, NRS 20775.
33. A mere is a green balk or road, sometimes a boundary.
34. Holkham, No.148.
35. DC 4737-8.
36. The Middle English launde comes from the Old French lande, 'glade, pasture', but there is also Old Norse lound, 'grove'. There was a Launde, a wood, in Tittleshall in the sixteenth century and there are numerous other occurrences in Norfolk, nearly all of them connected with either a deer-park or a wood. (cf. Beresford 1957, 220-7; Promptorium Parvulorum, i. 291).
37. Holkham, No.148.
38. NRO, NRS 20775.
39. Holkham, MS maps of Elmham Old Park.
40. DC 4737-8.
41. PRO SP 12/148.
42. Holkham, Bundle 4 No.72.
43. NRO, NRS 20775.
44. Holkham, Report on Holkham Estate by Francis Blaikie, Esq.1816.
45. NRO, Road Diversion Order map; Tithe Map 1839; Carthew 1877-9, III, 104.
46. Holkham, MS maps of Elmham Old Park.
47. Holkham, Report on Holkham Estate by Francis Blaikie, Esq.1816; Enclosure Maps 1831; Tithe Map 1839.
48. Cal.Chart.R. 1224-57, p.404; Blomefield 1810, IX, 487 gives 1250-1.
49. DC 4737.
50. DC 4721; NRO, EST/15/1/4.
51. Holkham, Bundle 5 Nos.107, 108; Carthew 1877-9, 524, 560, 561, 585.
52. DC 4738; Legge 1891, 66; Carthew 1877-9, 590.
53. inf. Dr.O.K.Schramm.
54. There was a wood called Rahaugh in Beetley, surrounded by a ditch: DC 4737.

55. DC 4693, 4737-8.
56. DC 4667.
57. The 'wale' part of the name may be from OE wald 'open upland ground, waste'.
58. NRO, NRS 20775.
59. Near the cottage at grid ref. TF 986 236.
60. NRO, MS.504, 249.
61. DC 4667.
62. There are two references in the fourteenth century to a 'Lowecross' (DC 4713, 4715), which has not been identified. It might be Stump Cross, Whitecross or another cross altogether. No remains have been discovered of any of the Elmham crosses although other Norfolk parishes have considerable portions of their medieval crosses left: (Cozens-Hardy 1934-5, 297-299).
63. Number 88 on the Tithe Map, number 460 on OS 25 inch 2nd edn.
64. The idea was that a dragon guarded the treasure in prehistoric barrows: (Cameron 1963, 124). The form 'Drake' occurs in Colkirk, only four miles from Elmham, and also at Thwaite St. Mary in south east Norfolk: Norfolk Research Committee Newsletter June 1971.
65. There is no obvious connexion between this area and the parishes of Great and Little Dunham over ten miles distant.
66. Lyltyspyt is possibly the gravel pit at grid ref. TF 985 249. Senowes occurs in 1520-1: (Carthew 1877-9, 563).
67. PRO, E179 149/7 f.38.
68. DC 4737-8.
69. NRO, MS 504 p.73.
70. as note 68.
71. NRO, 78 BCH.
72. NRO, MS 504 pp.31, 35, 57, 73, 146, 220; Carthew 1877-9, 563, 571.
73. It probably took its name from the manor of Geist-Regis: (Blomefield 1810, 214).
74. PRO, E 179 149/7 f.38.
75. NRO, MS 504 p.108.
76. No.424 on Tithe Map and schedule.
77. Nos.416, 428-9 on Tithe Map and schedule.
78. Holkham, Bundle 4, No.98.
79. Holkham, Bundle 3, No.38, Bundle 4, Nos.90, 91. Legge (1891), following Carthew, confuses Nower's manor-house with the bishop's manor-house: (Legge 1891, 123-5).
80. OS 25 inch map (2nd edn.), 401, 369, 384, 372, 305, 366, 367, 304.
81. OS 25 inch map (2nd edn.), 279, 276, 277, 281, 277a, 259, 266, 266a.
82. OS 25 inch map (2nd edn.), 261, 262.
83. DC 4667, 4714; PRO, E 179 149/7 f.38.
84. Holkham, Bundle 4, No.98.

85. NRO Road Order Box 15 No.1.
86. DC 4667.
87. NRO, MS 504, pp.86, 129.
88. The Revd. E.H.Townsend, writing in 1927, recorded that 'the late Mrs.Ransom' could remember seeing the mail coach pass along this road: (Townsend 1927, 8).
89. DC 4714; E.123, 166.
90. The whole question of this manor-house is discussed in Chapter 23.
91. The cathedral manor-house is discussed at length in Chapter 23.
92. Taverner had another messuage at Fulfordhaugh.
93. DC 4737-8.
94. Holkham, compotus, No.2, 1401.
95. Holkham, Bundle 3, No.2.
96. NRO, MS 504, pp.34, 42, 49, 155, 160.
97. NRO, glebe terriers bundle 33.
98. Holkham, compotus No.2, 1401; Holkham, Bundle 5, Nos.107, 108.
99. In the sixteenth century the fair was on 25th March: (Legge 1891, 94).
100. There were camping grounds at several villages in Norfolk, e.g. Colkirk, East Bilney and Swaffham, all near the church. For the game see Nall 1866, 525. It is likely that the camping ground was also used for archery. The Fairstead and camping ground were at Nos.413 on the Tithe Map and Nos.208-9 on the OS 25 inch map (2nd edn.). Legge (1891, 94), following the inference of the churchwardens' accounts of 1539, puts the Fairstead next to the churchyard, but this hardly seems possible.
101. NRO, Norwich Archdeaconry Inventories 1674-92, No.100.
102. Presumably because of the change to the Gregorian calendar.
103. It then belonged to Roger Martyn, gent., son of Richard Martyn of Long Melford. No other reference to these 200 acres has been found.
104. NRO, Consistory Court Prob. Inv. INV/9.56. Edward and Edmund Denny seem to be one and the same person. Denny, probably born before 1539, was in orders. Characterised by the puritan compilers of the list of scandalous ministers in 1584 as 'malitious, suspected of poperie', he was vicar until October 1584, when he resigned (Peel 1915, II, 150; NRO, Bishop's Register 14).
105. NRO, PD 209/440.
106. NRO, Norwich Chapter Estates 135471, p.26.
107. DC 4685.
108. DC 4681.
109. Holkham, Bundle 4, No.72.
110. NRO Cons. Court Prob.Inv. INV/37.219; and see Chapter 23.
111. NRO Cons. Court Prob.Inv. INV/52A.89; NRO, PD 209/440; and see Chapter 23.
112. NRO, Glebe Terriers Bundle 33, terrier 1760.
113. Holkham, Bundle 3, No.72; Carthew 1877-9, 524.
114. A Richard Cooke occurs between 1614 and his death in 1630; he seems to have

moved from Tuddenham c. 1612 and had four sons and two daughters born at Elmham: (Legge 1891).

115.NRO, Norwich Archdeaconry Invs. 1674-92, No.100; and see Chapter 23.

116.see Chapter 23.

117.It is possible that this is simply a misspelling of 'gates', the pits being for the posts; but an entry on page 66 in the accounts for 1552, 'to Henry Wells for feyyng of ye gratte' implies some sort of pit.

118.The pales were nailed, i.e. they formed a low fence of split oak or other hardwood with crosspieces, in contrast to the longer pales of the Old Park in the fourteenth century.

22. THE MANORS AND THE AGRARIAN ECONOMY

by David Yaxley

I. THE MANORS

There were three medieval manors in North Elmham.

THE CHIEF OR BISHOP'S MANOR

It has long been a tradition among historians that the bishop had an estate in North Elmham from the end of the seventh century (Dodwell 1963; Blomefield 1810, IX, 487; Howlett 1914; Rigold 1962-3). The tradition springs from the association of the bishopric of Elmham, created in the last quarter of the seventh century, with this village in the pre-Danish period. This is an association that has not gone unchallenged, the favourite rival claimant for the seat of the pre-Danish bishops being South Elmham in Suffolk (Scarfe 1972, 116-27). The present writer has no intention of entering the controversy about the seat of the earlier bishops, except to observe that there is no documentary evidence that points conclusively to either the Norfolk or the Suffolk site. As a matter of fact, there is no contemporary documentary evidence for this early period that will stand up to even a cursory historical examination. Both sides of the argument use back-projections from much later manuscripts and inferences from archaeological excavations. The case for the Suffolk site is based on the curious plan of the 'minster' at South Elmham, the unusual arrangement of the landscape around it and the association between the kings of East Anglia and the early bishops of Dommoec - the site of which is also unestablished. The case for the Norfolk site is based on the known association between the bishop and the village from the tenth century and the possibility that there was a pre-Danish planned settlement centring on a cathedral. The idea of a deliberately planted town, involving a movement from the pagan site at Spong Hill to a 'clean' site a mile and a half to the north, is attractive; but it must be pointed out that the pattern of the 'planned' town is simply a projection from a relatively small area exposed by excavation and that the earliest documentary evidence for the pattern beyond the excavated area is the road diversion order map of 1829. It is true that my reconstruction of this part of Elmham from the survey of 1454 shows that the general pattern of roads and paths was established by the middle of the fifteenth century, but even this is hardly enough to take us back without question to the pre-Danish period. Moreover, the archaeological evidence for the later Saxon period shows that the pre-Danish pattern of roads and ditches in the excavated area had been completely obliterated by the middle of the tenth century. As far as firm evidence goes, the grid-pattern to the north, east and south east of the cathedral, so essential to the theory of a planned town, could well have been a result of the development of the area in the twelfth century by the bishop and the prior.

Whether the tradition of the seventh-century origin of the bishop's estate is true or not, he certainly held the manor of Elmham in 1066 (V.C.H. 1906, 119). At the Conquest it was held for a manor and eight ploughlands; there were forty one villeins, sixty three bordars, six serfs and twenty four sokemen with one ploughland. There was woodland for 1000 swine - reduced by 1086 to 500 - four mills, 300 sheep and an outlying estate in Beetley. This was the chief manor of Elmham and it remained in the hands of the bishops of Norwich until 1536 when, along with the rest of the property of the bishopric, it was exchanged for the lands of St. Benet's at Hulm. Four months later it was granted by the king to Thomas Cromwell (Carthew 1877-9, 518-9). It remained with the Cromwells until 1598 when it was sold to Edward Coke. Coke's heirs got into financial diffi-

culty in the 1650s and the estate was mortgaged to Hugh Awdley, whose heir, Robert Harvey, finally obtained possession of everything except the Old Park in 1670 (Carthew 1877-9, 521, 541-3). Harvey's heirs sold the estate in 1720 to Richard Warner (Carthew 1877-9, 545-6), a lawyer who had built up considerable possessions in this part of the county. Warner built the Hall, enclosed Westfield and created the New or Westfield Park. On Warner's death in 1757 it passed to Christopher Milles of Nackington (Kent) who had married Warner's eldest daughter. Milles son, Richard, was succeeded in 1820 by the Hon. George John Milles, his grandson, who became fourth Baron Sondes in 1836. The estate remained with the Milles family until 1919 when it was broken up and sold.

NOWERS MANOR

William de Noers was the royal bailiff for Archbishop Stigand's East Anglian estates and a tenant of the bishop of Norwich in 1086 (Dodwell 1963, 188, 190). However, he surrendered all his lands before 1101 and the manor of Nowers probably takes its name from Sir Simon de Noers, who had land in Elmham c. 1130 (Blomefield 1810, IX, 489-90). It is uncertain if it originated in a grant from the bishop, but this seems at least possible. Its history during the Middle Ages is shadowy. John Pawle of Norwich was lord in 1404, and between 1408 and 1420-1 it was in the hands of trustees (Blomefield 1810, IX, 489-90; Carthew 1877-9, 279-83, 286-7). It was not included in the 1454 survey, but was probably in the hands of William Gedge of London, mercer, who also held thirty nine acres of land of the chief manor. In the 1470s it consisted formally of a messuage, fifty acres of land, a watermill, 34s. in money rents and a rent of five hens and fifteen days' harvest labour in Elmham and Beetley. The mill was apparently pulled down and the materials sold soon after 1476 - a date that would prevent identification with Woodford Mill, unless the latter had been rebuilt between 1454 and 1476 (Carthew 1877-9, 288-9). It is more likely that the mill was on the Wensum, close to the manor-house. In 1490 the manor was sold, still with a watermill, to the Martyns of Long Melford. The estate seems to have been broken up in 1565-7 (Carthew 1877-9, 284), but the manor-house, with some land, was bought by Thomas Frankling, yeoman, who in 1568 sold fifty acres near the manor-house to Thomas Lawrence of Brome in Suffolk. In 1572 Frankling sold the manor-house with its appurtenances and eighty three acres to Henry, Lord Cromwell, and thenceforward it passed with the chief manor ¹. The manor-house became known as the Grange ².

PRIOR'S, RECTORY, OR DEAN AND CHAPTER MANOR

Bishop Herbert de Losinga (1091-1119) endowed his new priory, attached to Norwich cathedral, with a manor and lands in Elmham, and Simon de Noers, knight, gave it two parts of the tithes of his lordship in Elmham (Saunders 1939, 53, 59). Bishop Everard (1121-45) confirmed the church and gave it the fair and the fishery, and bishop William (1146-74) also confirmed the grants (Saunders 1939, 61, 75). Cattle-grazing, swine-pasturing and turf-digging rights were confirmed by bishop John (either John of Oxford, 1175-1200 or John de Grey, 1200-14). The vicarage was ordained some time before c. 1244-5 (Saunders 1939, 107, 129). The lord of the manor was the prior of Norwich, and his successor, the Dean and Chapter, held it until the twentieth century. It was farmed out from the end of the fourteenth century and the manor-house was sold off in 1801 ³.

OTHER ESTATES

There are disconnected references to other small estates in the parish from medieval times. The messuages of Dunhamstede, Thornwell and Le Hil, with their folds or fold-courses, were granted by Dionisia de Ty to John Attedamesende, chaplain, and Thomas Attebrigge on 23 May 1369 (Carthew 1877-9, 281). In the 1454 survey there occur:

1. A free messuage called Langgs with buildings and the liberty of one fold. This was conveyed by charter temp. Edward II, confirmed by a charter of 19 May 1370.

2. A close and a decayed messuage with a free fold, granted by charter 10 May 1370. This was formerly called Netherthorpp and 'now called Bethill'. The 'now' may refer either to 1454 or 1567.
3. A close, formerly a free messuage, called Gelhams, with a sheep-fold and right of free fold. This was 'formerly' called 'de Ubeney', and its title was a deed of Katherine formerly the wife of Henry Barward dated 1429-30.

In 1454 numbers 1 and 2 were held by Simon Fox and number 3 by Henry Smyth. There is no evidence to identify these three messuages with Dunham, Thornwell and Le Hil; in fact, topographical evidence places them in entirely different locations, but the near-coincidence of date for the three granted by Dionisia de Ty and the charters for Langgs and Bethill is interesting.

Dunham, which first appears in surviving documents as a surname in 1308⁴, was dignified with the name of manor in 1429 and 1480, but it appears as a simple messuage or tenement at other times in the fifteenth century. In 1480 it was sold by Thomas Brampton of Brampton (Norf.) to William Spark, citizen and draper of London (Carthew 1877-9, 281, 289-91). The estate was probably located in the north west of the parish near Dunham Hills; no record of an independent holding of any size after the fifteenth century has been found and certainly by 1831 the whole of the area, with the exception of about eight acres opposite Winter's Farm, was in the hands of the Hon. George Milles.

The first appearance of Thornwell is also as a surname, *c.* 1308⁵. It may have been parted from Dunham after the grant of 1369. It gave its name to one of the 'tenements' of the 1454 survey, but it is by no means clear that the tenement was connected with the messuage with free fold granted in 1369. In 1572 the 'manor or toft inclosed' called Thornwell, with lands at Thornwell Green, was granted by William Franklin to John Denny (Carthew 1877-9, 558). No further record of a separate holding of this name has been found and it may be that it was amalgamated with the lands of Edmund Denny; indeed, a possible location for the messuage was somewhere near the present Nelson House at the north end of the disused portion of the Walsingham Way, adjacent to Le Bell, also Edmund Denny's property⁶.

Le Hil is equally elusive. After 1369 allusions to it are fragmentary and uncertain. There was a large tenement called Hill within the manor in 1454; this included both free and customary land and most of the strips belonging to it were in Burgrave and Westfield.

In 1332 a moiety of a messuage called le Parkhus, with lands and portions of two folds, was granted to Alice Oldman and her son John (Carthew 1877-9, 293). In 1454 the tenement Oldman comprised 22½ acres, but again the connexion is hard to establish. The strips of the tenement were spread over several fields, but the name 'Parkhus' suggests a location for the messuage somewhere near the Old Park, at the north east or north west corners.

II. THE TENANTS

It is not proposed to attempt a full-scale analysis of the manorial tenants as this is an exercise that belongs to legal and social rather than topographical history. The holdings of individual tenants, however, often have a great influence on the history of the landscape; for example, the amalgamation of strips in the open field was often the preamble to enclosure. Moreover, the survey of 1454, with its annotations of *c.* 1567, can tell us quite a lot about farming in Elmham during this crucial period in agricultural history.

The survey of 1454 gives the names of 180 'tenants' of the chief or bishop's manor. These include institutional occupiers - the bishop of Norwich, the prior of Norwich, the

vicar, the Light of the Virgin, the gilds of Corpus Christi and St. James, and the prior of Walsingham. The complete list is too long to reproduce, but Table 87 shows in detail those tenants holding over ten acres of arable and a summary of those holding less.

THE TENANTS IN 1454

TABLE 87. THE TENANTS IN 1454

	Arable					Messuages	Cottages	Other
	Holdings	Acreage	Pasture acres	Meadow acres	Marsh acres			
Lord's hand	191	386 $\frac{1}{2}$	5 $\frac{1}{2}$ +	1 $\frac{1}{2}$ +	4 $\frac{3}{4}$ +	2	2	park 300a waste 10a
Henry Smyth	51	111 $\frac{1}{2}$	4+	6	24+			
Richard Hedge	62	98 $\frac{1}{4}$		5		2	3	1 place
Prior of Norwich	31	98 $\frac{1}{4}$	3	some				
Simon Fox	45	88 $\frac{1}{2}$	5+	1+	1	3	1	
Roberty Pynnes	79	85 $\frac{3}{4}$		3 $\frac{1}{4}$ +	some	5	3 $\frac{1}{3}$	
Nicholas Pepper	21	78 $\frac{1}{4}$				2	1	
Henry Taverner	62	71	$\frac{1}{2}$ +	$\frac{3}{4}$		3	3 parts	
Robert Larwood	42	66	5 $\frac{1}{2}$	1	10 $\frac{3}{4}$	2	2	1 wood
Katherine Chamberlin	43	58	1			2		
John Barnard	26	50 $\frac{3}{4}$		1+	2			
Roger Gryfe	12	41	$\frac{1}{2}$			1		
William Gedge	19	39		3				
Henry Mayken	27	36 $\frac{1}{2}$			4		1	
Thomas Fuller	34	35 $\frac{3}{4}$	3			4		
Peter Berysfoot	25	34				2		
Thomas att Hegh jun.	12	32	$\frac{1}{4}$					
John Bathom'	22	30	1 $\frac{1}{2}$	$\frac{1}{2}$ +		3	1	
Constantine Mynde	10	28				2	1	
John Harpor	12	26 $\frac{1}{2}$			6			
John Geben	15	25 $\frac{3}{4}$	1			1		
Richard Spilcoks	26	25 $\frac{3}{4}$		2			2	
Thomas att Hegh	7	23 $\frac{3}{4}$	4					
Thomas Sylvester	6	22 $\frac{1}{2}$				1	1	
William Mydlham	17	22 $\frac{1}{4}$	2			1		
John Lopham	14	20 $\frac{3}{4}$						
John Grene	18	18 $\frac{1}{4}$	2	1	some			
William Dyte sen.	20	17 $\frac{1}{2}$		$\frac{1}{2}$		1	1	
Thomas Curson	10	17						1 mill
Robert Tytingeton	11	17				1	1	former mill
John Fuller	23	16 $\frac{3}{4}$		2		1		
Robert Heyward	9	16 $\frac{1}{4}$				1		
Thomas Broun	9	13 $\frac{1}{2}$				1	1	1 place
William Dyte jun.	12	13 $\frac{1}{2}$				1		
Andrew Woderow	11	13 $\frac{1}{4}$					2	
Adam Heyward	8	13		1		1		
John Cowper	15	11 $\frac{1}{4}$			$\frac{1}{4}$		1	
Thomas Demy	2	11		3 $\frac{1}{4}$				
Henry Stacye	10	10 $\frac{3}{4}$			1 $\frac{1}{2}$	1		
John Greene fyshman	7	10 $\frac{1}{2}$				1		
Nicholas Stacy	9	10 $\frac{1}{4}$				1		
Robert Holley	2	10						
Vicarage	3	10						

events had been altered by the Black Death and the other plagues of the fourteenth century, is not apparent. It may be significant that, of the seventy nine surnames that occur in the 'tenements', only nine appear in the actual tenants of 1454.

3. By 1454 the larger tenants already held the major part of the arable land of the manor. 1234 acres, or 59% of the arable, was in the hands of the top twelve of Table 87, although admittedly this includes the land in the hand of the lord and the prior of Norwich. If we take the forty three at the top of the table we find that 89% of the arable of the manor lay in their hands.

4. A large number of small tenants had very little arable. 109 individuals held less than three acres each and forty of them had no arable at all in this manor. It is true that they may have held arable belonging to the other two manors although some of this seems to have been included in the survey, but this was hardly enough to provide more than a few of them with viable holdings. One is forced back to the possibilities in 1 (a) and (b) above, namely that they had other means of support and that the smaller tenant arable land was of secondary importance. Moreover, of the sixty nine small tenants who held some arable, forty nine had it all, from a quarter of an acre to two and a half acres, in one holding in the fields. If a strict rotation of crops with a fallow year were practised, it would appear that 30% of all the tenants of the manor might have no land under crop in any one year. Twenty nine of these 109 small tenants held a cottage or messuage, but the gardens attached to these tenements can hardly have been large enough to supply the deficiency of corn. Elsewhere, tenants were allowed a quantity of demesne land in recompense for losing their crops during the fallow year (Allison 1957, 20); there is no evidence for or against this practice obtaining in Elmham, but it is certainly a possibility. Of the forty tenants holding no arable, one was the prior of Walsingham and at least eight others were 'foreigners' living in neighbouring villages where they may well have had land in the fields. Of the remaining thirty one, twenty had small amounts of pasture, meadow or marsh, varying from half an acre to eight and a half acres. On the other hand, only eleven of the sixty nine tenants with small amounts of arable had any grazing land. Was there already a certain amount of small-scale specialisation in animal husbandry among the forty tenants without arable? The amounts of grazing land involved were small, averaging - if we remove the two exceptional holdings of eight and a half and five acres - less than one and a half acres apiece. No doubt there was paid labour to be done for the lords and the larger tenants and there may well have been enough work in the cloth industry to make some of the small tenants virtually independent of arable cultivation. Certainly by the sixteenth and seventeenth centuries there was a reasonable linen and wool industry in the village.

5. Only twenty five of the tenants with under three acres of arable were also tenants of messuages or cottages. Leaving aside the four 'institutional' tenants and the sixteen who were stated to live in other villages, this gives a maximum figure of fifty five small tenants who

(a) lived in houses not mentioned in the survey because they either belonged to Nowers' or the prior's manors, or were outside the manorial structure, or were too insubstantial to mention

or (b) rented their dwellings from the larger manorial tenants.

Thirty out of the forty largest non-institutional tenants held messuages or cottages and several of them, as can be seen in Table 89, held more than one such tenement. Robert Pynnes, for instance, with eighty five acres of arable, held five messuages and three and a half cottages, while lower down the scale Simon Codling, chaplain, held seven and a half acres, one messuage and four and a half cottages. Whether all these messuages and cottages were in fact habitable dwellings is another matter and is discussed elsewhere¹⁰, but some of them, at least, must have been sub-let to the small tenants. Ten

The Tenants

of the forty largest tenants had no houses mentioned in the survey. Of these, John Barnard may have lived in the half-cottage tenanted by his wife Joan; William Gedge also held Nowers' manor with its manor-house and in any case was described as a mercer of the city of London; and John Grene or att Grene alias Lyster may be the same man, despite the implication of his alias (a lister was a dyer) as John Greene, fysheman, who held a cottage and ten and a half acres. Henry Smyth almost certainly had a house at Gelhams deale near the present Dale Farm.

6. The quantity of grazing land noted by the acre in the survey is not great and there is some evidence that the actual acreage was much larger. The unstated acres, however, were almost certainly in the hands of the lords of the manors. Of the individual tenants, only Henry Smyth is recorded as having more than a few acres of grazing land.

TABLE 88. PASTURE, MEADOW AND MARSH IN 1454

	Number of tenants	Number without stated grazing	%
Arable: Tenants of more than 10 acres	43	15	35%
Tenants of 3-9 acres	28	18	64%
Tenants of under 3 acres	69	58	84%
Tenants with no arable	40	11	28%

For all tenants, both large and small, there was also available the 400 acres of heath and common, the shack or grazing over the fields after harvest and the herbage of the fallow fields.

THE ELIZABETHAN TENANTS

The tenants of c. 1567 appear only as a rubric to the fifteenth-century survey; it is not possible, therefore, to determine the exact state, either legal or agricultural, of the holdings at that time.

TABLE 89. THE TENANTS OF c. 1567

	Arable					Messuages	Cottages	Other
	Holdings	Acreage	Pasture acres	Meadow acres	Marsh acres			
James Taverner	177	298 $\frac{1}{2}$	10	$\frac{1}{2}$	1	8	1	9 pieces
Richard Piers	102	186 $\frac{3}{4}$	7	5	18 $\frac{1}{2}$	1	4	6 pieces
Richard Franklyn	101	166 $\frac{1}{4}$	2		21	3	4	6 pieces
Thomas Heyward	114	126 $\frac{3}{4}$	$\frac{3}{4}$	7	some	2	5 $\frac{1}{3}$	1 piece
William Batche	84	119 $\frac{3}{4}$	5	3	6	6	4	2 pieces
Cursus falde	19	108 $\frac{1}{2}$						
Robert Piers	82	83		3 $\frac{1}{2}$		2	1	5 pieces
Rectory	22	64						
Simon Shittell sen.	32	53 $\frac{1}{2}$	6	1		4	2 $\frac{1}{2}$	2 pieces
Robert Lusher	33	48 $\frac{1}{4}$		3	some	2		2 pieces
Edward Handford	44	47 $\frac{1}{2}$				3	1	
Thomas Handford	34	42 $\frac{3}{4}$						
Stephen Purdy	22	38 $\frac{3}{4}$		2 $\frac{3}{4}$		2	2	1 piece
Robert Wakefield	16	36 $\frac{3}{4}$					1	
Richard Heyward	16	32 $\frac{1}{4}$	2			2	$\frac{1}{2}$	
Thomas Lusher	18	31 $\frac{1}{2}$	1		some	1	7 $\frac{1}{3}$	2 pieces

TABLE 89 (continued)

Arable									
	Holdings	Acreage	Pasture acres	Meadow acres	Marsh acres	Messages	Cottages	Other	
Ralph Blomfield	19	30 $\frac{3}{4}$				1	1	1 piece	
William Smyth	23	29 $\frac{1}{4}$			3		4		
Thomas Franklyn	15	28 $\frac{3}{4}$			1	1		1 piece	
John Browne	29	26					6	2 pieces	
Roger Martyn	3	25 $\frac{1}{2}$	some	1	13 $\frac{1}{2}$	1		1 piece	
Robert Rudd	28	25 $\frac{1}{2}$					$\frac{1}{3}$		
Simon Shittell jun.	22	25 $\frac{1}{2}$			8 $\frac{1}{2}$	2		1 piece	
William Tompson	17	25 $\frac{1}{2}$				1	1		
Simon Shittell	13	25							
John Fletcher	5	22 $\frac{1}{2}$			7		1 $\frac{1}{2}$	2 pieces	
Town of Elmham	21	21							
Hamon L'Estrange	13	20						1 mill	
Richard Purdy	17	20				2			
Thomas Soham	8	19 $\frac{1}{2}$	5 $\frac{3}{4}$	5 $\frac{1}{2}$					
John Browne of Brysley	1	18				1	1		
Thomas Dunham	6	17 $\frac{1}{2}$			3 $\frac{1}{4}$				
Christopher Dawbeney	2	15 $\frac{1}{2}$						1 piece	
Henry Heyward	10	12				1			
Cecilia Piers	5	12							
Vicarage	3	11							
John Pytcher	9	10 $\frac{1}{2}$					3		
Nicholas Fox	2	10						1 place	

Arable									
Holder of arable	Number in class	Holdings	Acreage	Pasture	Meadow	Marsh	Messages	Cottages	Other
5-9 $\frac{3}{4}$ acres	9	42	64 $\frac{1}{4}$		1:2a	3:10 $\frac{1}{2}$ a	2:2	3:3 $\frac{1}{3}$	
3-4 $\frac{3}{4}$ acres	6	13	22	3:6 $\frac{1}{4}$ a	1:2a			1:3	
2-2 $\frac{3}{4}$ acres	4	5	8 $\frac{3}{4}$					1:1	
1-1 $\frac{3}{4}$ acres	9	12	11				1:1		
Under 1 acre	5	5	2 $\frac{1}{3}$	1:2a				3:2 $\frac{1}{2}$	1 piece
No arable	19			1:2a	5:6 $\frac{1}{2}$ a	2:2 $\frac{1}{2}$ a	3:4	10:13 $\frac{1}{2}$ $\frac{1}{3}$ a	7:11 pieces

TABLE 90. COMPARISON OF THE TENANTS OF 1454 AND 1567

Arable holding	Number of tenants 1454	% of arable acreage held	Number of tenants 1567	% of arable acreage held
Over 40 acres	12	58.8%	12	65.8%
10-40 acres	31	30.0%	26	28.9%
Less than 10 acres	97	11.2%	33	5.3%
No arable	40	-	19	-
	180		90	

Almost three quarters of the land in the lord's hand in 1454 was now dispersed among the tenants. The 108 acres of the Cursus Falde, however, was all land that had been in the lord's hand in 1454 and was now presumably cultivated by the lord (Henry, Lord Cromwell) or let out to farm. In other parts of Norfolk at this time landlords 'farmed out their demesne land but retained their foldcourses' (Allison 1957, 22). It seems unlikely, however, that this Cursus Falde was a typical foldcourse as it seems to have consisted mainly of separate strips and holdings, albeit of several acres each, in the open field and not of a compact area. The three other 'foldcourses' also seem to have been outside the usual definition 11.

James Taverner, the largest tenant of 1567, was engaged for much of his life in a running fight with the Cromwells (Carthew 1877-9, 576f). The annotations to the survey show that by 1567 he had, in theory at least, got no less than 169½ acres of Inlonggate into 'Taverner's Great Close', presumably as part of his fight to free his lands from the burden of copyhold tenure. He also had forty eight acres in 'Gelhams Close', based on the old Gelhams deale of Henry Smyth. It is doubtful whether his 'Great Close' was a permanent enclosure 12, but there is little evidence on the state of this area between the sixteenth and the nineteenth centuries.

The tables show that there had been a significant movement towards larger holdings between 1454 and 1567 and there was also a slight upward movement in the percentage of arable land held by the larger tenants. Five men held over 100 acres each in 1567 compared with the one of 1454. There was a dramatic drop in the total number of small tenants and with these, too, there was a trend towards slightly larger holdings. In 1454 only 29% of tenants with less than ten acres of arable held between three and ten acres while in 1567 the figure was 45%.

An analysis of Burgrave Field illustrates this trend. In 1454 the 311 holdings south of the Lynn Way were divided among fifty seven tenants, including the land in the hand of the lord. In 1567 there were only thirty four tenants for this area. The reduction had been accomplished without a great deal of consolidation of adjacent holdings. In only twenty two places were holdings which had been separately tenanted in 1454 brought together under one tenant in 1567 and in eight cases a holding of 1454 had been split up. In Inlonggate, where James Taverner was operating, however, there is a very different picture. In 1454 the 160 holdings were shared by twenty three tenants. By 1567 the number of tenants had dropped to twelve, and Taverner held no less than 132 of the formerly separate holdings. It is true that eleven of the 1454 tenants had only one holding each but there were also six substantial tenants and Taverner or his father, Henry Taverner, must have amassed considerable wealth to have been able to take over to such an extent, for the Taverner holding of 1454 consisted of only sixteen acres. The Taverners were one of the few examples of continuity in family names; of the 128 surnames of tenants of the 1454 survey, only nineteen reappear in the tenants of 1567 - either a remarkable example of the mobility of the late medieval population or evidence of a substantial depopulation of the village, at least in the male lines, between 1454 and the middle of the sixteenth century. On the whole, however, consolidation of holdings in the parish seems to have been closer to the Burgrave than the Inlonggate example and the aspect of the open fields in 1567 must have been still almost entirely medieval.

III. THE MEDIEVAL MANORIAL ECONOMY

The main source for this short account of the medieval agricultural economy is the series of compoti and tithe accounts for the prior's or rectory manor. The manor itself was small with less than 100 acres of demesne and only a handful of tenants and there are big gaps in the series of accounts, with few surviving for consecutive years. Nevertheless, a useful general picture emerges.

THE CROPS

TABLE 91. SEED SOWN ON PRIOR'S DEMESNE

Year	Acres						Total	Barley % of total
	Wheat	Rye	Barley	Oats	Peas	Beans		
1255-6	-	2	12	2	-	-	16*	
1263-4	2	4	20	2½	2	-	30½	67%
1272-3	(5)	3	14	(7)	5	-	34	42%
1273-4	(2½)	(7)	(18)	(2½)	(2)	-	32	56%
1287-8	2	8	19½	(½)	(2½)	(1)	33½	57%
1288-9	2¼	(6½)	(14)	(½)	-	-	23¼	60%
1295-6	5	5	17	2½	3½	-	33	53%
1297-8	2	7	18	2½	2¼	-	31¾	58%
1305-6	2½	8	28	-	3½	-	42	67%
1309-10	3	9	27¼	-	2¼	-	41½	66%
1311-2	5	13	19	2¼	4½	-	43¾	44%
1312-3	(5)	(11)	20	6½	(4½)	-	47	42%
1319-20	5	8	25½	2	6½	-	47	53%
1320-1	7	7	24	3½	6½	-	48	50%
1322-3	5¾	7	24	½	2	-	39¼	61%
1324-5	6	3	22½	6¼	6	-	43¾	51%
1325-6	4¼	4¾	30½	3¾	3	-	46¼	65%
1327-8	2½	7½	23	1¾	4½	¾	39⅝	60%
1340-1	5	6½	22	2	4	½	40	55%
BISHOP'S DEMESNE								
1326-7	-	16⅜	70½	7	4	-	97½*	
1328-9	25½	20	89	12	24	-	170½	52%

* Indicates that the accounts are incomplete and that no computation of the barley percentage can be made.

Figures in brackets are computed from the amount of seed corn set aside and are, therefore, only approximate.

TABLE 92. YIELD OF THE PRIOR'S DEMESNE

Year	Bushels				
	Wheat	Rye	Barley	Oats	Peas
1255-6	96	24	160		
1287-8	138	45	502		
1297-8	63	100	325	59	10
1305-6	-	-	361	-	9
1309-10	162	131	422	-	20
1311-12	50	82	322	-	32
1312-13	97	104	180	-	54
1319-20	-	37	482	-	-
1320-1	80	120	563	-	26
1322-3	100	49	342	-	17
1324-5	-	-	431	-	24
1325-6	-	-	458	-	16
1327-8	-	-	479	-	2
1334-5	88	49	-	56	-
1340-1	91	73	381	52	28
1356-7	-	60	319	-	8
BISHOP'S MANOR					
1328-9	162	79	838	none	51

The many gaps in Table 92 and the absence of figures from the *compoti* of the later fourteenth and early fifteenth centuries are due to the facts that the tithe receipts and corn rents are often inextricably mingled with the demesne yield and to the spasmodic farming out of the demesne after the middle of the fourteenth century. The demesne arable sown seems to have remained fairly constant at 30-34 acres in the second half of the thirteenth century, with the exception of two accounts which may be defective. From the turn of the century the area sown goes up to thirty nine to forty eight acres, only to drop back in the second half of the fourteenth century as the demesne was farmed piecemeal and as a whole. In 1517 the demesne was eighty two acres¹³. Barley was the dominant crop, taking on average 56% of the land sown. The second largest crop, rye, varied between 7% and 30% of the total acreage, with an average sowing of seven acres (18%). Wheat averaged four acres (10%), with a minimum of 6% and a maximum of 15%. Oats averaged two and a half acres (7%) and peas three and a half acres (9%). The variations in all these crops seem to be of little general significance.

Table 92 shows the yield of the prior's demesne. The figures are less complete and more variable than those of Table 91, but they, too, show the predominance of barley as a demesne crop. They also demonstrate the variability of yield as a whole. In the period 1300-41 the acreage sown varied only between thirty nine and a quarter and forty eight acres, but the yield - admittedly not for the same years - varied between 381 and 763 bushels, a much greater degree of variation. In only two cases are *compoti* for successive years explicit enough for us to compare seed sown with its product in the following harvest in all grains. These are shown in Table 93.

TABLE 93. SEED AND HARVEST ON PRIOR'S DEMESNE

Year and grain	Acres sown	Seed bushels	Seed per acre bushels	Yield bushels	Yield per acre bushels	Yield per bushel of seed
<u>1311-2-3</u>						
wheat	5	12	2.4	97	19.4	8.1
rye	13	32	2.5	104	8.0	3.3
barley	19	91	4.8	180	9.4	2.0
oats	2 $\frac{1}{4}$	9	4.0	not known		
peas	4 $\frac{1}{2}$	12	2.7	54	12.0	4.5
<u>1319-20-21</u>						
wheat	5	15	3.0	80	16.0	5.3
rye	8	24	3.0	120	15.0	5.0
barley	25 $\frac{1}{2}$	128	5.0	563	22.1	4.4
oats	2	10 $\frac{1}{2}$	5.3	not known		
peas	6 $\frac{1}{2}$	17	2.6	26	4.0	1.5
<u>1324-5-6</u>						
barley	22 $\frac{1}{2}$	113	5.0	458	20.3	4.1

This table well illustrates the tremendous variations in yield with which the medieval farmer had to reckon. All yields except wheat were well below the 'standard' (Lamond 1890, 71) and the yield of barley in the 1312 harvest and peas in the 1320 harvest were particularly low. It is possible that the barley yield in particular was not typical, for both the demesne figures and the tithe accounts show that barley was by far the largest single crop throughout the late thirteenth and the fourteenth centuries, and it seems hardly likely that lords and tenants would have continued to put their trust in a crop that always gave lower yields than wheat or rye. However, it is possible that the low average yield of barley was counterbalanced by its use for brewing, a purpose for which, of course, wheat and rye are not suited. The land, too, may have been thought more suitable for barley than either of the other two grain crops; although it is dangerous to argue back from the

profit-farming circumstances of today to the mainly subsistence economy of the Middle Ages, it is a fact that the main crop in this part of Norfolk nowadays is barley. Table 94 shows that this was also so for the period 1255-1351.

TABLE 94. TITHE CORN RECEIVED BY THE PRIOR'S MANOR

Year	Bushels				% of Total Received		
	Wheat	Rye	Barley	Total	Wheat	Rye	Barley
1255-6	162	202	1336	1697	9.5	11.8	78.7
1287-8	228	250	1926	2404	9.5	10.3	80.2
1309-10	347	314	1532	2193	15.9	14.4	69.7
1311-12	352	313	1394	2059	17.1	15.2	67.7
1312-13	259	313	1541	2113	12.1	14.7	73.2
1319-20	242	196	1640	2078	11.7	9.4	78.9
1320-1	324	218	1574	2116	15.2	10.2	74.6
1322-3	253	176	1109	1538	16.5	11.5	72.0
1325-6	*	*	1269				
1334-5	217	176	1216	1609	13.5	10.9	75.6
1338-9	270	161	(640)	(1071)			
1340-1	265	178	(720)	(1163)			
1349-50	160	96	922	1178	13.6	8.1	78.3
1351-2	74	60	678	812	9.1	7.4	83.5

* indicates defective accounts. The figures in brackets are not certainly the whole yield of the tithe.

Comparison of the yield per acre in Table 94 with the tithe yield for the same years suggests that the demesne yield may have been abnormally low for rye and barley in 1312 and abnormally high for wheat in 1312 and barley in 1320. Using the yield-per-acre figures of Table 95 as divisors for the tithe yield, we arrive at a total of 2163 acres of arable under the grain crops in 1312 but only 1059 acres in 1320. The total yield of the tithes is almost the same in both years and it is, of course, possible that an abnormally good harvest in 1320 might have concealed a significant drop in the acreage under cultivation. The figures in Table 95 for the period 1322-41, though admittedly of spasmodic occurrence, show a distinct dropping-off from the figures of the period 1309-21.

TABLE 95. AVERAGE TITHE YIELD PER ACCOUNTED YEAR
IN BUSHELS

	Wheat	Rye	Barley
1309-21	305	271	1536
1322-41	251	172	1198

The barley figures for 1338-9 and 1340-1 given in Table 94 have not been used here, because although they are possibly correct they are also suspiciously low. Instead, the figure from the otherwise defective account of 1325 has been used.

These figures could point to a drop in the acreage under cultivation of something like 20-25% - a sizeable fall, though not so catastrophic as the crude comparison between the yield of demesne and tithe would suggest. On the other hand, it is possible that the harvests of 1309, 1311, 1312, 1319 and 1320 may simply have been abnormally good while those of 1322, 1325, 1334, 1338 and 1340 may have been worse than usual. It is to be regretted that no accounts survive for the famine years 1315 and 1316 (cf. Hudson 1920, 209-213).

The tithe figures provide some evidence that Elmham was severely, if temporarily, affected by the Black Death ¹⁴. The tithe corn received for the harvest of 1349 was only 72% of the average in 1322-41 and that received for the harvest of 1351 was only half the same average figure. The only two certain figures for the later fourteenth century - 1373 and 1393 - show that in those years the barley figure, at least, was restored to the 1322-41 level. The farming of the demesne and the tithes in the second half of the fourteenth century obscure any trends. From at least 1391 rent for demesne lands was being paid in barley.

The bulk of the prior's demesne barley was used for brewing; it was generally malted at the manor-house kiln and the malt sent to Norwich, but large quantities of the grain were sold in 1295, 1309, 1311, 1319, 1320, 1325, 1334, 1404, 1406 and 1407. A certain amount of grain was diverted to the lord's table in the manor-house at harvest-time. The barley straw was used for fodder, for thatching, for strewing the floor of the church and for litter for the beasts and the monks. Most of the demesne rye was sold, but small quantities were fed to the dogs and the stotts. The wheat was sent to the prior except in 1319-20 and 1320-1 when 60% of it was sold, and 1391-2 when 40% of it was sold. Wheat and rye straw was used for thatching and fodder. The small quantities of oats were generally fed to the animals, particularly the stotts, but from time to time some oats was sold, leaving a balance of fifty to sixty bushels for use at the manor-house. Oat-straw was used for the monks' litter in 1349-50. Of the minor crops, peas appear regularly in small quantities as a field crop; they provided food for the 'family' and the swine and a small portion was sometimes given to the poor. Beans appear to have been grown only rarely in the fields, but they may have been sown in the garden. Hemp, for rope and coarse cloth, was grown in the garden or court of the manor-house and some of the crop was usually sold ¹⁵. Certain unspecified vegetables were also sown in the court.

There are few hints in these documents about the management of the open fields. Some system of rotation of crops was undoubtedly practised, though whether it was based on the three main field areas - Burgrave, Westfield and Brome Field - or on smaller 'precincts' is not apparent (cf. Allison 1957, 20). As we have seen, the demesne acreage sown on the prior's manor in the early fourteenth century varied between thirty nine and forty eight acres, with an average of forty three. On a three-shift course, with every third course fallow, this would mean that the demesne arable of the time was about sixty four acres. In 1517 the total demesne was eighty two acres; the balance was in meadow and pasture. The comptus for 1373-4 contains this curious phrase: 'and of the farm of lands this year nothing, because they lie in fallow /warect'/ and ley /frist/ as he /i.e. the farmer/ says'. The comptus for 1356-7 has a similar phrase ¹⁶. It seems extraordinary that the whole of the prior's demesne arable was being fallowed at one time - if this is indeed what the account means. The bishop's manor had at least sixty seven and a half acres in fallow in 1326-7; there were only ninety seven and a half acres sown that year, but in 1328-9 the total sown was 170½ acres. This also seems to indicate that on the demesnes at least the practice was to fallow a larger proportion than a third ¹⁷.

There is no mention in these accounts, or in the inventories of 1288 and 1352 ¹⁸, either of a mill or of dues paid for grinding the corn. Perhaps the small quantities of flour used at the prior's manor-house were ground in a hand-quern or at one of the Elmham mills without dues having to be paid ¹⁹. The bishop's mill was farmed out in 1401 for £13 6s. 8d., but the bishop still had to pay for a stone (53s. 4d.), two quern-stones (2s. 2d.) and repairs to the water-wheel ²⁰.

The prior's manor had comparatively little grazing ground. The bishop's manor, however, had meadow, marsh and woodland in quantity. In 1326-7 six mowers, four binders, a collector, a reeve and a messor mowed Blaxtersmedow in a day; Forthmersh took eight mowers, four binders and the same officials two days, and Croftholmes was cleared in a day by fifteen mowers, nine binders, a collector, two reeves and two messors. The hay was brought out of Bradfen, a marsh, by boat. The hay crop was

presumably used for the manorial stock as none of it was sold. Herbage, however, was sold in Burgrave, Burgrave pits, the Old Park, Le Laund, Eastgate, Sandpittes, Forth-marshdam, Fishpoldam, the Warren, Ankerwyke, Crofthevedes, Le Girn and several other places, for a total of £6 7s. 8d., some 5% of the total receipts of the manor. In addition, herbage was sold on sixty seven and a half acres of fallow for £3 19s. 1½d. Non-demesne beasts were allowed to graze in the Old Park and Le Laund, bringing in another £9 14s. 1d., and a little hay was sold from Burgrave and Fulfordhaugh. Altogether almost 20% of the income of the manor was derived from these sources. Burgrave Wood also provided pannage. In 1326-7 the sale of wood, underwood and bark brought in only £2 14s. 6d., but in 1328-9 the clearing of the encircling ditches in Burgrave, Fulfordhaugh and Le Laund and the consequent sale of wood, bark, roots and stumps realised £13 4s. 8d. Fisheries at Croftholmes, Bradfen and Burgravepittes were sold for small sums and eels out of the pond (presumably the mill pond) accounted for 7s. in 1326-7 and 3s. 2d. in 1328-9. Burgravepittes, Crofthevedes, Bradfen and Brome supplied turves, netting £5 9s. 9½d. in 1326-7 and £7 17s. 0½d. in 1328-9 and flags were taken from Brome, Rouhil and the Heath.

FARM EQUIPMENT

Repairs to the demesne plough occur frequently in the accounts ²¹. It was of the two-wheeled type and was drawn by a pair of 'stotts' which suggests that it was of lighter construction than the usual heavy and cumbersome plough later known as the 'Hertfordshire' (cf. Fussell 1952, 35-7). The purchase of an 'akerstaf', a pole shod with iron to clear the plough when it choked, is recorded in 1305-6 ²². In 1288 the farm equipment of the demesne farm consisted of the bodies of three harvest-carts and two muck-carts, a plough, two scythes, a muck-fork, a winnowing-basket and three fans, ten sacks and various other receptacles ²³. In 1352 it consisted of a four-wheeled cart and two old cart bodies, a plough, two pitch-forks, three muck-forks, a 'mukhok' of iron, two sieves, a winnowing-basket, two fans and a seedlip. From various accounts we can add spades, rakes and - possibly - harrows. A few instances are recorded of muck being taken from the beast houses and the yard to be spread on the fields; we can assume that this was a regular practice, although the small amount of stock kept on the prior's demesne could have produced enough muck for only a few acres each year. The muck-cart was probably a two-wheeled tumbril while the harvest-carts had four wheels. The corn, in sheaves, was carted straight from the fields to the barns and remained there in stack until threshing which was carried on throughout the early part of the winter.

LIVESTOCK

The main draught-beasts were 'stotts'. Several accounts contain sums paid to the smith for shoeing the stotts, but this suggests only that they were used for road-work as well as the plough and does not necessarily mean that they were horses, as both horses and oxen were shod in the Middle Ages. The purchase of collars rather than yokes for the plough, however, points to the use of the horse as a plough-beast. The figures of stotts kept from 1255 to 1373, when they make their last appearance in the surviving *compti*, suggests a 'team' of four. In fifteen out of the twenty one accounts in which they appear there were four stotts on the demesne throughout the year, the number being kept up by buying and selling. In 1255 there were only two, both of which were sent away from the manor at some time during the year with the result that the ploughing had to be paid for. In 1287-8 and 1288-9 there were only three on the demesne throughout the year. In 1312-3 the year began with four stotts; one was sold, two died of the murrain and two more were bought. The receipts for the year include 15d. for the skin of one dead horse; as horses as such were not mentioned in the list of stock, this must surely mean that, in this case at least, the stotts were horses. The fact that the demesne could manage with only three stotts for a whole season without, apparently, having to hire a fourth, suggests that only two were harnessed together to draw the plough and as we know that the plough was the two-wheeled variety, this is another piece of evidence in the identification of

stotts with horses (Trow-Smith 1957, 92-3). The compotus of 1328-9 for the bishop's manor distinguishes in the stock-list between stotts and cart-horses, but this may only be a distinction of use. In 1404 on the prior's manor the cart-horses were shod in harvest-time²⁴. The clinching argument for the identification of stotts as horses rather than oxen is that the stotts are always separated from the bullocks, cows, heifers and calves in the compoti and their numbers are always replenished by purchase and not from the calves or bullocks produced on the manor. This is not to say, of course, that oxen were never used as draught animals in the thirteenth and fourteenth centuries. The manorial tenants may well have used them for both ploughing and carting and even on the demesne they may have supplemented the horses. There is virtually no information in the surviving documents about the plough-team of the peasant farmer. The prior's plough and carts were hired out from time to time. In 1397-8 and 1404-5 there were no ploughing and harrowing works performed for the prior because none of the customers had a whole plough-team²⁵.

Up to the middle of the fourteenth century a stock of about six cows was kept on the prior's demesne. There were six there in 1352, but none appears in the compoti after that date; this is probably attributable to the spasmodic farming-out of the demesne in the second half of the century. From 1309-10 there are intermittent records of the cows being at farm. They produced an average of just under one calf per cow a year, a very reasonable figure. In most years one or two calves were retained to keep up the herd and the rest were sold. A small amount of butter and a much larger quantity of cheese were made from the milk. In 1319-20, for instance, the six cows each produced a calf - all of which, unusually, were sent to the cellarer at Norwich - and their milk was processed into 104 cheeses weighing about two and a quarter pounds each. Sixty three of the cheeses were eaten at harvest and the remaining forty one were sold for 7s. 7d. The weight of the cheeses varied from time to time, for in 1295-6 a hundred cheeses weighed eleven stone or one and a half pounds each. The cheese was made between early May and the beginning of August. In 1319-20 each cow produced, on average, thirty nine pounds of cheese, that is about thirty nine gallons of milk during the period when the cheese was made²⁶. Allowing for milk lost during suckling or not recorded after cheese-making stopped in August, the annual yield can have been little more than sixty to seventy gallons, a very poor figure indeed. Over the five compoti between 1319 and 1325-6 the average yield per cow, calculated in terms of cheeses of two and a quarter pounds, was forty seven gallons of milk during the summer months, which would give a total milk yield for the year of about ninety gallons per cow with a top figure of ninety eight gallons for 1324-5. The figures in the earlier compoti are much more variable, but this may be the result of variations in the weight of individual cheeses as much as differences in the milk-yields. In 1295, when we are told that the cheeses averaged one and a half pounds each, four calves were born and a calculation based on this figure (the entry for cows is defective) gives a cheese-milk yield of forty three gallons per cow or eighty gallons a year. In 1272-3 six calves were born of eight cows, but only eighty eight cheeses were made, which for a one and a half pound cheese would give the extremely low cheese-milk yield of twenty two gallons. Five of the calves were sold for 11½d. each, a figure that suggests that they were sold not many weeks after birth; this could mean that the milk yield of the cows was exceptionally low, but it could also mean that more milk was available after suckling, although it was obviously not used for cheese-making unless the cheeses were unusually large. On the whole, the cheese figures suggest that either the stock was of poor milking quality or that the feed was meagre. On the other hand, the calving rate was quite good.

No cows were kept on the demesne in the period 1287-9 and the accounts give no explanation. The gaps in the record of bullocks are wider, suggesting that they were not an important item in the manorial economy. The largest number kept in any one year for which an account survives was four, in 1297-8. They may well have supplemented the stotts as working beasts, at least in the thirteenth century; the same pair of bullocks was

kept over the period 1272-4 and there are very few instances of bullocks being sold. On the bishop's manor, with its greater resources of grazing, the situation was different. In 1328-9, if the account is not defective, the twenty two cows remained throughout the year but produced only one calf and no cheese between them. There were also two bulls and twenty six bullocks in the same year; the bulls were retained, but the bullocks, all but one of which had been brought from the bishop's manor of Gaywood during the year, were disposed of - twelve to other manors belonging to the bishop and fourteen to his larder. As this large demesne had only six stotts, it looks as if much of the traction was supplied by the apparently sterile cows. The prior's relatively fertile cows, incidentally, may have been generally served by the bishop's bull, as a bull is recorded on the prior's manor in only four of the eighteen years when cows were present.

Pigs were kept on the prior's demesne throughout the thirteenth and fourteenth centuries. The largest total in any one account was a sow, ten pigs and twenty piglets (1391-2); the average number for all swine in each account was fourteen. In many years pigs were bought for fattening and then sold. The female piglets were often spayed. There is no evidence as to how the prior's swine were fed, apart from some small allocations of peas, barley and rye. The bishop's herd, which in 1328-9 consisted of a boar, two sows, fifty eight pigs and fifty six piglets, was, no doubt, pastured in Burgrave Wood. A pigsty was built there in 1326-7. The presence of a sty at the prior's manor-house suggests that his pigs were kept at home; there was no woodland belonging to his manor and he does not seem to have paid pannage.

Sheep appear in the prior's accounts only in 1272-4, 1287-8 and 1373-4 and then only in small numbers. In 1328-9, however, the bishop had a flock of 130 wethers, plus 100 'sheep' which had been bought and 226 'sheep' received from his neighbouring manor of Beetley. Two of the wethers were sold and the rest were sent to Norwich; forty of the 'sheep' also went to Norwich, leaving 286 at Elmham. Also from Beetley came 230 fells weighing twenty eight stone, and from Elmham a total of 570 fells weighing sixty three and a half stone. This gives an average of 1 lb 9½ oz of wool per fleece, a figure that is about average for the medieval sheep (Trow-Smith 1957, 120-3). No doubt sheep remained important for the rest of the Middle Ages, but they found little place in the economy of the small and medium farmers of the sixteenth and seventeenth centuries ²⁷.

Throughout the thirteenth and fourteenth centuries the prior's manor kept up a fair stock of poultry and it is only in the early years of the fifteenth century that the accounts show the total falling below twenty. This abundance was partly the result of certain rents being paid in fowls, the number thus received being stable at sixteen until after 1373 when it fell to fourteen. These fowls included cocks and hens, but as the sexes are not often made clear in the accounts it is impossible to relate the number of fowls to the large quantity of eggs that was produced. Most of the eggs were sold. Capons are mentioned only in the accounts of the later fourteenth century and were of either sex. In the period 1255-1305 a fair number of geese, varying between four and thirty three, were kept, but after that their appearance is sporadic. In 1287-8 some thirteen geese were kept during the year; one was sold and eight were eaten at the harvest and between them they produced forty eggs, all of which were sold. There was a brief experiment in duck-farming between 1263 and 1288; sixty two ducks were kept in 1272-3 and twenty nine in 1273-4. By 1288-9 the number had fallen to four; these produced eighty eggs, which were sold for 3d. Most of the poultry was fattened and sent to Norwich or consumed during the harvest. On the bishop's manor there were twenty two geese, 276 fowls, and thirty four capons in 1328-9. Five of the geese - 'of which three are old' - remained from the previous year, two were received as rent and fifteen were goslings produced on the demesne. During the year twelve were sold, one was eaten and two sent to Norwich, leaving seven 'of which four are old'. Thirteen of the capons were sold. Of the fowls, forty came from the manor of Beetley, 204 were received as rent, twenty were perquisites and twelve had survived from the previous year. One hundred and four were sold and 160 delivered to the larder in Norwich. The bishop also received 860 eggs as rent and 100 as perquisites.

IV. THE OPEN FIELDS AND THE LANDSCAPE

The arable land covered by the survey of 1454 comprised some 2099 acres divided into 2115 holdings. The size of the holdings and the furlongs and the distribution of the various sizes of holdings varied enormously. Table 96 gives a breakdown of the size of holdings for the main arable areas and a complete but necessarily generalised picture of the agricultural state of the parish in 1454 is in Figs. 268-9.

TABLE 96. PERCENTAGE OF LAND IN HOLDINGS OF DIFFERENT SIZES

	Size of Holding in Acres							
	0- $\frac{1}{2}$	$\frac{3}{4}$	1	0-1	1 $\frac{1}{4}$ -2	0-2	2 $\frac{1}{4}$ -4 $\frac{3}{4}$	5+
Lingsty	13.4	13.4	34.3	61.1	15.8	76.9	23.1	0
Westfield	17.5	5.0	34.4	56.9	27.7	84.6	9.4	6.0
Burgrave	8.7	4.8	35.0	48.5	24.3	72.8	9.1	18.1
Inlondgate	9.3	1.6	21.1	32.0	33.5	65.5	13.1	21.4
Ramsley	6.6	0.4	21.8	28.8	15.0	43.8	27.0	29.2
Skotland	5.5	0	22.2	27.7	19.8	47.5	40.4	12.1
Whitecross	2.6	3.5	20.9	27.0	19.0	46.0	20.5	33.5
Fulfordhaugh	8.4	3.1	12.8	24.3	2.1	26.4	18.3	55.3
Dunham	3.2	1.6	9.9	14.7	13.8	28.5	15.8	55.7
Brome	2.6	2.6	1.2	6.4	18.4	24.8	26.5	48.7
Woodwales	0	0	2.3	2.3	3.0	5.3	44.1	50.6

From this it will be seen that apart from the village area and the hamlet on Great Heath, which are not included in the table, the areas with the most land still in small holdings were Burgrave Field, Westfield and Lingsty. Dunham, Brome and Woodwales had the largest holdings on average. Dunham and Brome Fields were probably comparatively late additions to the open fields; although there may have been minor settlements at Dunham Hills, Brome Green and perhaps Fulfordhaugh in the Saxon period, the great area of arable may have been taken in from heath, pasture and woodland in late-Saxon or early-medieval times. Woodwales is an obvious encroachment on the Great Heath. Ramsley was probably an assart of Burgrave Wood. Skotland may have been, in part at least, an encroachment on the Little Heath. Fulfordhaugh was obviously part of the hamlet settlement on the north side of the Great Heath and Inlondgate may have been an extension of the arable land of this settlement and the hamlet at Dunham. This is, of course, assuming that the older arable areas would tend to retain the division into small units of one acre or less and that areas brought under the plough comparatively late would tend to be cultivated in larger units. Certainly the settlement of, say, the eleventh century, would appear to be very neatly arranged: the village in its present L-shape, but heavily weighted at its northern end around the cathedral; the arable fields at Burgrave Field, Westfield, Lingstye and the western part of Skotland; the meadows and pastures

to the east and south of the village, on the banks of the Wensum and the Blackwater, as well as a certain amount of pasture along the course of the Town Beck; common pasture at the two heaths; woodland at Burgrave Wood, beginning to be assarted at Ramsley; and the deer park in the Old Park. The northern third of the parish, on a line drawn east to west across the northern tip of the Old Park, would have been woodland, heath and marsh, with a certain amount of arable round Dunham and the Fulfordhaugh settlement.

How long a history lay behind this pattern is a moot point. The archaeological evidence would appear to place the establishment of the cathedral-area settlement in the eighth century at the latest; and some would push it back as far as the division of the see of East Anglia, that is to c. 680. The pros and cons of the site of the bishopric of Elmham are argued elsewhere; but to an historian not directly involved in the passions of archaeological dispute, it seems doubtful whether any evidence stronger than opinion will be found on this point without a total excavation of the whole of the cathedral area. However, a general pattern for the development of the parish may be suggested. It seems possible that the earliest Saxon settlement, probably in the neighbourhood of the pagan burial-ground at Spong Hill, was superseded by another site, presumably in the area of the present village, some time during the seventh or eighth century. The early site would probably have had Burgrave Field as its main arable, with meadow along the Blackwater, and pasture at Little Heath. The part of the parish north of the Beck may have been at this time a wide tract of heath and wood, relieved only by small settlements at the Beck, Dunham and Fulfordhaugh. The establishment of a strong settlement, for political, religious, or agricultural reasons, on the southern slope of the hill on which the cathedral stands, polarised the human geography of the village and determined the ultimate boundaries of the parish. Had the settlement remained near Spong Hill we might well have had a very different parish boundary with that part of the village south of the Town Beck combining with Beetley - an outlying estate of Elmham in the late eleventh century - to form one parish and the land north of the Beck developing into a small, rather poor parish, with its settlement either on the hill on which church and cathedral now stand, or on the edge of the marsh at Brome Green, or at Dunham, or scattered on the west side of the Great Heath. But this did not happen; some force was strong enough to obliterate the old settlement near Spong Hill and establish a new one in the present village area. Whether this force was Christianity, working through the early bishops, or the will of some great lay landowner, or a social impulse, or an overriding agrarian reason, may never be known.

One other element may have had some influence in the determination of the place of the final settlement: the Old Park. It may, of course, have been only a late-Saxon or early-Norman creation of the bishop and thus have post-dated by some centuries the establishment of the 'new' village. The park was not mentioned in Domesday, and the earliest surviving reference to it is in the late twelfth century (Saunders 1939, 107). If, however, Elmham was part of the bishop's estate as early as some authorities suggest (Dodwell 1963, 185), the Old Park may well have been established before the Danish invasion, and the location of a Roman building near its centre suggests that its bounds may possibly have been established some centuries before the settlement of the 'new' village. In other words, it could have acted as an additional magnet in the seventh or eighth century to draw the settlement northward. The opening-up of Westfield between the Old Park and the new settlement would have followed.

The above theories assume that there was a fair-sized settlement near the pagan burial-ground at Spong Hill. It is only fair to point out that this may not have been the case. Just as the later cathedral graveyard probably attracted corpses from many parts of the county, so the pagan cemetery, on a smaller scale, may have served several settlements, none of them necessarily very close to Spong Hill itself. However, the long archaeological history of the site, the enigmatic crop marks shown on aerial photographs and the pattern of the medieval fields make it appear more likely than not that there was

a settlement of some sort at or near Spong Hill in the early Saxon period before the seventh century. What is certain is that by 1454 there was little to mark the site of either cemetery or settlement except the names Eggegravefurlong and Burgrave (p.578). Burgrave Field was a completely developed strip field; using many of the field boundaries that appear on the enclosure map of 1831 and the tithe map of 1839, the reconstruction in Fig. 269 gives the approximate location of the furlongs. None of the furlong names of 1454 survived to be recorded on the tithe map and schedule, but the written information of the fifteenth-century survey fits remarkably well into the nineteenth-century maps, and the field-structure that emerges is very similar to that on other, genuine, field maps of the late sixteenth and early seventeenth centuries - West Raynham, Tittleshall, Colkirk, and Hillington, for example. The furlongs in the south east corner of the field (XXVII-XXXVIII) may represent, with others on the eastern side of the main road, the arable of the pagan settlement. They form a distinct block of comparatively small irregular furlongs, equally divided between north to south and east to west alignments. Furlong XXVIII may represent the furthest extension of the arable before the desertion of the settlement. This arable - about a hundred acres, with another fifty on the east side of the road - would have been bounded by woods to the north and west, with open heath to the east and the Blackwater river, with its meadows and marshes, to the south.

Once the 'new' settlement was founded, c. 700, the arable would be extended into the woodlands from the other direction - that is, the north. Furlongs XXII B-XXVI may represent the first phase of this assarting. Then came two great efforts to push back the woodland - furlongs XXIX and XLI - and finally piecemeal assarting on the extreme west of Burgrave Field, cutting into the woodland in furlongs XLIII-XLIX. All this probably took place before the Norman Conquest, although some of the last clearances may account for the apparent diminution of woodland between 1066 and 1086. The surviving documents for the later medieval period contain no hint at large-scale clearances and indeed such clearances were unlikely, for many reasons, to have taken place after the twelfth century. On the other hand, the twelfth and thirteenth centuries may well have seen a great deal of encroachment on the heathland of the parish.

It is impossible to decide what was the original unit of land division simply on the basis of a fifteenth-century survey. Innumerable divisions and amalgamations obscure the centuries between 1454 and the pre-Conquest pattern, which itself was probably not at all simple. Even in the fields with the greatest area under cultivation in small units - Lingsty, Burgrave and Westfield - it is not easy to distinguish any pattern. Table 97 gives a breakdown of holdings in these fields.

TABLE 97. NUMBER OF HOLDINGS

	0- $\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2	2 $\frac{1}{4}$ -5	5-10	10+ Acres
Burgrave	11	94	37	200	5	31	0	43	14	14	1
Westfield	6	29	6	31	0	5	0	9	3	1	0
Lingsty	4	16	12	23	1	4	2	5	6	0	0

In each field the processes of subdivision and amalgamation may have been going on contemporaneously throughout the medieval period. It seems likely that the one-quarter, three-quarter and one-and-a-quarter acre holdings were the products of subdivision. Either the half-acre or the whole-acre holdings may represent the 'original' units; if we plump for the half-acre, then the whole-acre holdings must be amalgamations, and if we decide on the whole-acre then it is obvious that the half-acre holdings were formed by sub-division. The evidence of the surviving documents gives us no reason for preferring one to the other. The matter is further complicated by the 'tenements'. At the end of the 1567 recension of the survey is a list of 'tenements' divided into four sections:-

TABLE 98. THE 'TENEMENTS'

Tenements	Number	Messuages	Total arable acres	Total other land acres	Notes
1. Carrying office of collector	23	19	544	42½ (17 tens.)	total acreage of each ten, varies between 13 and 43 acres
2. Carrying office of reeve	21	16	211½	17 (10 tens.)	acreage ranges from 7 to 17 acres arable
3. Tenements of twelve acres	15	15	180	12¾ (12 tens.)	all of 12 acres arable
4. Carrying office of messor	36	24	156½	3 (3 tens.)	2½-7 acres arable
Totals	95	74	1092	75¼	

TABLE 99. THE 'TENEMENTS'

Arable acres	Type 1 'collector'	Type 2 'reeve'	Type 3 '12 acres'	Type 4 'messor'	Total
2½	-	-	-	4	4
3	-	-	-	9	9
4	-	-	-	2	2
5	-	-	-	15	15
5½	-	-	-	1	1
6	-	-	-	4	4
7	-	1	-	1	2
7½	-	1	-	-	1
8	-	5	-	-	5
9	-	5	-	-	5
11	-	1	-	-	1
12	-	7	15	-	22
13	2	-	-	-	2
15	2	-	-	-	2
16	3	-	-	-	3
17	-	1	-	-	1
18	1	-	-	-	1
20	3	-	-	-	3
22	2	-	-	-	2
24	1	-	-	-	1
26	1	-	-	-	1
30	5	-	-	-	5
35	1	-	-	-	1
40	1	-	-	-	1
43	1	-	-	-	1

These tables do not include the comparatively small amounts of marsh, meadow, etc. It will be seen that of the ninety five tenements, thirty two are multiples or factors of ten and fifty two multiples or factors of twelve. This suggests original tenements of thirty or twenty four acres or possibly ten and twelve acres, similar to those found at Martham by Hudson (Hudson 1921, 273f.). As at Martham, the tenements have a family or descriptive surname. There is no evidence to put the names themselves further back than the thirteenth century, although of course the actual holdings may well be more ancient. Hudson

saw his twelve-acre holdings as Anglo-Saxon and the holders of the ten-acre tenements as 'Danish settlers on lands outside the old fields, or perhaps ... outside the village system when the three-field common ownership had been abandoned'. There is, unfortunately, no way of applying a test to the Elmham tenements to check Hudson's theory, for the tenements as recorded in the actual survey of 1454 differ wildly from the list at the end of the survey - which, incidentally, reinforces Hudson's conclusion that 'the list was rather an official record of a past condition for convenience of organising services than a definite assertion of its actual existence as a whole at some one time' (Hudson 1921, 298). Hudson found an apparent correspondence between the Martham tenements and the Domesday figures of villeins and sokemen. At Elmham, it is perhaps mere coincidence that the total of acres in the 'ten-acre' tenements is $412\frac{1}{2}$ while Domesday records the number of villeins as forty one; and if we take the number of twelve-acre tenements from the list - twenty two - and add to it the single twenty-four-acre tenement we get a figure of twenty four units of twelve acres, which is exactly the number of sokemen in the Domesday entry for Elmham. The remaining acres - 396 - when divided by six come to sixty six, only three more than the number of bordars recorded in Domesday.

This, however, may only be numerative juggling and its only certain use is to illustrate the sad truth that if an historian knows what he wants he can always find figures to help him. Even if the figures are valid their relevance is to the legal rather than the topographical history of the parish. Only large-scale amalgamation and enclosure could change the actual appearance of the landscape and this did not occur in the Middle Ages. Even the fields which have been assigned to the 'later' period of clearance and cultivation had a certain number of holdings of one acre and under, the only exception being Woodwales. We can assume that the furlongs were divided into the usual long, narrow strips, each composed of a small number of 'lands', the number depending on the length and width of the strip. One of the longer half-acre strips, for instance, measuring about 250 yards in length, would have a width of about nine yards and might well be cultivated in one 'land'. A whole-acre strip of 200 yards length would have a width of twenty four yards and would be divided into two or possibly three 'lands'. Whether the 'lands' were raised in the ridge-and-furrow fashion of the midlands is a debatable point. It is possible that the lighter soils of Norfolk, with a minimal need for drainage, were ploughed flat (Thirsk 1967, 165; Orwin 1967, 48-50), the natural tendency of the plough to create ridges being counteracted by regular 'splitting'. Indeed, the lack of any large-scale fossilised ridge-and-furrow in the county has led some historians to believe that Norfolk's fields were never ridged. However, fragments of ridge-and-furrow are discernible, at least to the eye of faith, in several parts of Norfolk - at Babingley and Oxburgh in West Norfolk, for example, and at Beeston-next-Mileham, Little Bittering and Foxley, all in the Elmham area. Aerial photographs, too, show traces of ridge-and-furrow at Caldecote, Godwick, and Great Palgrave (Allison 1955, pl. II, IV, V). It is difficult to believe that the heavier soils, at least, were not built up into ridges by the use of the two-wheeled plough. On the other hand, many of the sixteenth and seventeenth-century maps of central and west Norfolk show unfenced roads and tracks cutting diagonally across open fields in seeming disregard not only of property boundaries but also of the alignment of the strips. It seems scarcely credible that these roads were permanent in the sense of being an unploughed surface all the year round, for some of the strips at the sides of each furlong, as at furlongs XLIII and XLV on Fig. 269, are so cut that the small nipped-off portion would be scarcely cultivable by the plough (it could, of course, be dug). A practice of leaving diagonal roads unploughed would create two extra sets of headlands in each furlong so affected. On the other hand, if the strips were ploughed through the diagonal road each year it would hardly be practicable to drive a fresh road up and down the numerous slopes of a heavily-ridged furlong; it would surely be in the interests of both travellers and cultivators for the road to go by the existing headlands. In other words, the diagonal track - where it is more than a simple footpath - argues for a system of flat cultivation, at least in the affected fields.

In Elmham there were few such diagonal crossings, perhaps because the road-pattern was established very early and the arable fields were fitted in between major tracks. The road pattern is, in fact, very simple. The presence of sizeable watercourses on three sides of the parish limits the possible range of the exits. The Dereham Way is the only route to the south, and north of the present village it passes the settlement at Brome Green, crosses the Wensum at Guist and heads for Blakeney, Cley, Salthouse and Kelling, all places of some importance in the Middle Ages (Hoskins 1967, 150-9). At the present entrance to Elmham House the Walsingham Way branched off north north west from Brome Way and arrived at Great Ryburgh, evidently an important place in Saxon times (the round tower of the church is Saxon). Here the road crossed the Wensum and headed towards Walsingham and Wells. The only east to west road of major importance is the road from Billingford Bridge to Panford Bridge. It seems reasonable to suggest that this line, or one close to it, was in use in Roman times, branching off the known Roman road at Billingford and passing close to the Old Park settlement, where one branch headed towards Roug-ham and the other towards Beacon Hill, both Roman settlements. The main branch flourished, however, in a diverted form, as the Lynn Way, leading to Brisley, Mileham (Norman castle), Castle Acre (Norman castle and priory) and eventually to King's Lynn, a settlement originally founded at the end of the eleventh century by the Bishop of Norwich, the lord of the chief manor in Elmham.

All these roads were through routes and a good case could be made for them all to have been in use as such in Saxon times. The open fields fit more or less neatly into this framework. At only two points were these roads noted in 1454 as crossing the strips: at Stump Cross (LXXXV) and at High Cross (XX). The first case suggests some realignment of the road, perhaps when the pilgrimage trade of Walsingham expanded in the thirteenth century, and the Walsingham Way, as a through route, became more important than the Brome Way, a trade route. Before that it may well have skirted furlong LXXXV or branched off the Brome Way at a slightly different point. The northern end of the Walsingham Way, near the Gateley boundary, was known as Inlondgate or Indelondgate, a name that may well be older than the Walsingham Way. A much earlier realignment may account for the High Cross case. The Roman and pagan Saxon settlements may have used a slightly different crossing of the Blackwater; once the village had moved to its present site the earlier crossing may have become redundant. The cutting of the strips in furlong XX, therefore, could represent a rationalisation of the road as early as the eighth century and incidentally could be cited as further evidence for the antiquity of the field pattern in this area.

Of the minor roads, Bilneysty seems to have cut across three furlongs²⁸ but, as its name suggests, it was probably only a footpath or at most a bridle way and an annual disturbance by the plough as well as a certain amount of up-and-down work over ridges would not have been too great a disadvantage to the few travellers to East Bilney. The other minor roads of the parish provided access ways to the field, the heaths and the meadows and marshes.

V. AGRICULTURE IN THE LATER PERIODS

THE SIXTEENTH AND SEVENTEENTH CENTURIES

The probate inventories of the later sixteenth and the seventeenth centuries, with their listing of corn, grain, stock and implements, provide plenty of detail about the small and medium farmers of the time. The evidence is, of course, random in its survival, but several general points emerge. For instance, it is obvious that, as in most parts of Norfolk, agriculture was not confined to those who made it their livelihood. Thomas Rudd, plowwheelmaker²⁹ (1611), had four horses, two cows, a calf, eight swine, three fowls, corn growing on about six acres and cheese-making utensils. Oddly, no plough appears in his inventory. John Spratt, linen weaver (1634), had two mares, three colts

and a foal, a cow, a cart and a plough. John Allyerd, tanner (1639), had two heifers, a cow, a pig, five geese, a hen, about two acres of corn, a plough and a pair of harrows. These were, in fact, the seventeenth-century version of the cottager who from early times had eked out his small portion of arable with the help of a trade or occupation. The proportion of farming to trade obviously varied from individual to individual and from period to period. The type existed in large numbers until the nineteenth century and has still not entirely died out.

More representative of the farmers of the period, however, were four men with larger holdings. Thomas Heyward (1591) held 126 acres of arable and five acres of meadow in 1567³⁰. His inventory, made in March, includes sixteen acres of wheat, fourteen acres of rye, three acres of oats and three acres of vetches; obviously his barley had not yet gone in. He had a good store of grain: twenty coomb of wheat, twenty four coomb of barley, eight coomb of rye, three coomb of buckwheat, three coomb and a load of oats and two loads of hay. His stock consisted of four mares, two stallions, three geldings, a colt and two foals, twelve cows, two steers, seven bullocks, five calves, seventeen sheep, eight swine and eighteen fowls. He had two shod carts, a tumbril, two ploughs, a pair of harrows, a scythe, four fans, a riddle, a hand or horse mill, nine sacks and a wheelbarrow. He had cheese vessels, brewing vessels and a spinning wheel. Debts owing to him amounted to £150 and of the remaining £130 value of his estate the grain, corn and livestock accounted for some £94. The total impression is one of a mixed-economy farm, primarily arable but with enough stock to eat off the fallow, to provide meat for the household and to be sold if necessary.

William Kempe, yeoman (1626), was a farmer in a much smaller way than Heyward. His inventory was made in November. He had five or six acres of winter corn sown and only £12 worth of corn threshed and unthreshed in the barn - about thirty to thirty five coomb of all grains. He also had small quantities of peas, oats, fruit, wool and hemp. It seems unlikely that he had sold surplus produce at this time in the year. He had three horses, three cows, three calves, ten swine, some fowls, a cheese press, four vats and two churns. His implements were, typically, few and simple: two carts, a plough, harrows, forks, rakes, a sled³¹, a seedlip, a screen, three sieves and a grindstone. His total estate amounted to £86, of which grain, corn and stock accounted for £38. There was little difference between his house and furniture and that of Heyward, but the latter was obviously a farmer for profit while Kempe, although comfortable, was doing little more than hold his own.

Francis Guildingwater (1635) lived in a much smaller house than Heyward or Kempe, but his farm showed the same diversity. His inventory was made in May when all his crops were sown. He had half of five acres of winter corn, one acre of wheat, one acre of rye, three acres of barley, 'j acre to halfes iij acres of Oates', half an acre of peas, part of three acres of vetches and a small patch of hemp. His livestock consisted of a horse, a mare, three foals, three cows, two bullocks and three swine. He had a cart, a plough, a pair of harrows, querns for mustard and malt, and milkbowls. Stock and growing corn account for £26 out of a total estate of £36.

The inventory of Thomas Smith, vicar, who died in September 1631 just after harvest, shows practically the whole range of crops at this time. Unfortunately the actual amounts of grain are not given, but he had moderate quantities of wheat, barley, oats, peas, vetches, buckwheat, hay, hemp and hops. He also had two horses, three cows, five swine, nineteen geese, sixteen fowls, eight turkeys and six ducks; these relatively small numbers must mean that he had already disposed of the stock received as tithe or that the tithe was paid in money and not kind. The time of year precluded any corn being on the ground, but the glebe amounted only to eleven acres in 1678 and Smith's inventory includes neither plough nor harrows.

All the inventories of the period 1590-1640 display a mixed economy, but with the arable predominant. The fields were still largely unenclosed and still, as far as the evidence goes, cultivated in the strip state; the tools and implements used on even the larger farms were little different either in kind or in quantity from those of the medieval manor-houses. There is no doubt, however, that some piecemeal enclosure was being carried out. The most notable example was James Taverner's creation of 'Taverner's Great Close' in the Inlondgate area in the middle of the sixteenth century. In 1590 Taverner accused the Cromwells of breaking his close and houses, consuming his grass, measuring 200 acres of pasture with tow lines and rods, digging up 166 acres of pasture and fixing stakes in the same, erecting forty ditches to the length of 1000 perches across the 200 acres of pasture, and cutting down and carrying away a vast number of trees (Carthew 1877-9, 570-1). Taverner's allegation of trespass estimates his land at 305 acres, of which 232½ were pasture, thirty and a half meadow or marsh, three wood and only thirty nine arable. All the pasture was in closes, in the Fulfordhaugh, Inlondgate and Whitecross areas. An allegation concerning the impounding of twenty cattle was also made, but there must be little doubt that his closes of pasture were for the maintenance of a large flock of sheep.

The open fields were still used for grazing after harvest, as a paper, without a date but probably of the 1560s, makes clear:

'As touching the foldecourse, Wylyam Rudde ... seyth in his time he hath known the same /i.e. beasts, probably sheep/ goe in Burgrave field during the shack or open tyme, so lykewyse in broome field and west field, and so all the other fields of Northelmam, and that during the rest of the year they went upon the lord's course - and a shak in the snowe or haue /i.e. hoar/ wether he have known them goe in the greate heathe' (Carthew 1877-9, 590).

A rehearsal of the manorial customs in the court book of 1640 states that no-one shall keep cattle on the arable fields after harvest 'before the Shacke Bell hath been runge' 32. The Great Heath was evidently not normally used for grazing during the winter, but was reserved for summer feeding while the arable fields were under crop (Allison 1957, 17-18). It is very noticeable that out of the fourteen inventories of this period only one - Heyward's - included sheep and then only seventeen of them. The bulk of the livestock, both of the smallholders and the larger farmers, was horned cattle. No doubt much of this stock was kept for dairy farming and belonged to the same general type as the famous Suffolk dairy cattle (cf. Trow-Smith 1957, 196-8), but as early as 1535 a manorial by-law stated that no tenant was to place oxen, bullocks, or 'steeres de le Northenbreede' to graze in the fields during the shack 33.

The inventories of the later seventeenth and early eighteenth centuries contain evidence of the changes that were taking place in farming methods during the period. The most important is that of Edward Harvey (January 1686), who probably lived in the rectory manor-house and was the farmer of the great tithes. His farming stock was as follows:-

wheat	53 coomb	wheat sown worth £10 8s. (about six acres)	
rye	15 coomb		
barley	191 coomb		
oats	35 coomb		
meslin	93 coomb	meslin sown worth £2 12s. (about one and a half acres)	
peas	32 coomb		
hay	13 loads		
turnips	worth £4		
horses and mares	11	shod carts	3
colt	1	ploughs	2
foals	3	harrows	2
bulls	3	forks	
cows	13	rakes	

heifers	5	whisker	1
Scotch heifers	10	fans	2
Scotch steers	10	riddles and sieves	11
wethers	50	sacks	
swine	11	cheese press	1
poultry	15s. worth	cheese vats	6
		churns	2

It is impossible to say what proportion of the grain was tithe corn, but from his horses and livestock one gets the impression that Harvey must have farmed a substantial acreage³⁴. White and red wheat are mentioned (cf. Thirsk 1967, 168-9), but the only new crop was the turnips which at this time were becoming a common field crop for feeding cattle and sheep in Norfolk. Harvey's implements were still comparatively few and simple - very little different, in fact, from those listed in the manorial inventory of 1352. The farm buildings, moreover, were very similar to those of the medieval manor: granary, great barn, tithe barn, cross barn, lower barn, cart-house, stable. No cowshed is mentioned, but this is probably because there was nothing in it worth including in the inventory. The horses were worth £60, the cattle and sheep £111, the sown corn £13 and the grain £194, a total of £378 out of an estate of £567.

John Brooke, yeoman (August 1715), farmed on a smaller scale than Harvey, but the fact that he died just before harvest enables us to see how his arable, of about 56 acres under cultivation, was divided.

TABLE 100. INVENTORY OF JOHN BROOKE, 1715

	acres	% of total	stock	
wheat	4	7.1	horses	5
rye	9	16.1	colts	2
barley	21	37.4	cows	11
oats	2	3.6	heifers	10
peas	2	3.6	calves	5
turnips	18	32.2	swine	13
			poultry	some

To work his land he had two carts, two ploughs, a pair of harrows, eleven forks, six hand rakes, two swath rakes, a whisker, three spades, three shovels and three dressing riddles. He also had cheese-making and brewing utensils. In short, he was practising a mixed husbandry, with the addition of a considerable acreage of turnips to feed his stock. Barley was still the dominant grain crop as it had been in the thirteenth century. John Smyth the elder, yeoman (1701), had a parcel of parsnips, roots and turnips on the ground and John Collison (1707) had eleven acres of turnips³⁵. Several inventories of this period show tradesmen, craftsmen and labourers with an interest in the land. Andrew Everett, carpenter (1707), had a mare, three cows, two small bullocks, two calves, three pigs, a cart, a plough and a pair of harrows. Richard Youngs, labourer (1711), had two cows, two bullocks and a calf. John Browne, husbandman (1692), had only a mare, a foal and two cows, although his house contained brewing and cheese-making utensils, while Nicholas Browne and William Lancaster, labourers (both 1682), had only a couple of swine each. Lancaster's tools consisted of two scythes, a hook, a sickle, a mattock, a hatchet and a spade. There were eleven such 'small doers' in this period of inventories; only four of them had a cart and the same four and one other had a plough. Only one, a widow, had growing corn and that was a mere three acres of oats, meslin and peas. Seven had horses, seven had cows and three had bullocks. Eight kept pigs. All this evidence points to the continuance of a predominantly pastoral economy among the smallholders.

THE EIGHTEENTH AND NINETEENTH CENTURIES

One would expect the smallholders and the cottagers to be the individuals that had most to lose by the enclosure of the open fields, the grass-lined ways and the heaths and commons. A complaint of 1734 stated that Richard Warner had thrown down the hedges of the lane leading to Lawndgate; 'poor people residing near this Lane being used sometimes to feed this Lane with their cattle' ³⁶. Richard Warner bought the manors of North Elmham and Nowers in 1720 and almost immediately set about modernising the estate. He built himself a new house - Elmham Hall - and created the New Park or Westfield Park by enclosing Westfield; he also enclosed at least part of the open fields and the green at Ramsley and almost certainly initiated enclosure in other parts of the parish. His successors carried on with this policy and the parliamentary enclosure of 1829-31 was mainly a tidying-up of the commons and heaths. The Statement of Claims, made in connexion with the enclosure ³⁷, shows that the Honourable George John Milles (he became fourth baron Sondes in 1836) owned nearly 3,000 acres in the parish; 480 acres were in his own hand and the remainder was let out in twelve major farms, ranging from eighty four to 355 acres, plus a number of much smaller holdings. A policy of creating large farms and replacing copyhold tenure by leases had evidently been followed, for although four tenements, fourteen cottages and fifty one messuages remained in copyhold, only eleven acres of land were still held as copyhold of the manors of North Elmham and Nowers. The Dean and Chapter manor was more conservative, for there seventy six acres of copyhold remained, together with three cottages and eight messuages. The results of the final enclosure were that most of the Great Heath and much of Broom Green and the Little Heath passed into Milles' hands; allotments were made in Broom Green and the Little Heath to the other claimants, but usually in very small portions; the poor were compensated for the loss of grazing rights over the heaths and fields by being given fifty acres of Turf Fen in the north east corner of the parish near Broom Green, for the gathering of fuel; and new, straight roads were made across the two heaths and Broom Green.

The enclosure of the commons and heaths was the final step away from the subsistence economy of the Middle Ages. The tithe award schedule enables an accurate breakdown to be made of the landholders in 1839, eight years after the enclosure.

TABLE 101. LANDHOLDERS IN 1839

Acres:	arable	meadow	pasture	wood	other
Lord Sondes	359	12	320	88	26
James Hubbard	294	41	14		
Money Fisher	260	7	39		4
Thomas Bradfield	208	50	42	14	2
William Rix	180	50	39		1
James Bradfield	176	7	20	168	1
Robert Elmer	176	52			2
Robert Bradfield	111	9	13		1
John Winter	110	23			1
John Howell	95	31	5	1	2
William Riseborough	91	17	4		
Philip Allison	66	7	14		1
John Bliss	53	31	4		
John Wells	52	31			
Thomas Englebright	47		12		
William Whiter	39		13		
William Hawes	35		1		
Rudd Howling	35				
James Allsebrook	29	20	28		

Acres:	arable	meadow	pasture	wood	other
John Kirby Willimont	26	1			1
Joshua Mayston	19		3		
Charles Elgar	15	2			
Thomas Rudd Breame	13	9			
Samuel Henry Clarke	10	2			
William Bailey	10		2		1
Under 10 acres arable:					
27 landholders	91	93	8	2	
Lord Leicester			409	15	
16 landholders		55	26		

Note: of the twenty seven landholders with under ten acres of arable, eleven held meadow or pasture.

This table shows clearly the concentration of arable land in the hands of the larger farmers and landowners. Fifteen men held 2278 acres of arable, 87.6% of the total arable of the parish, compared with the 65.8% of a similar class of tenants (men holding over forty acres of arable) in 1567 and the 58.8% of 1454. At the same time, of course, the number of smaller tenants and the amount of arable that they held was much less than in previous centuries³⁸. The actual total acreage of arable was about the same as in 1454³⁹, but the stated acreage of meadow and pasture, of course, was vastly greater than that of the earlier survey, which was generally vague about quantities of grazing ground. Ignoring gardens and yards, which form a very small proportion of the total acreage, the land-use in 1839 was as follows:-

arable	2600 acres
meadow	550 acres
pasture	1026 acres
wood	288 acres

Although there is little direct evidence on the subject, there is little doubt that the large amount of grazing ground supported fatstock and dairy cattle rather than sheep.

As Table 101 shows, smallholders as a class had decreased in importance since the sixteenth century. As in previous centuries, there were a number of smallholders whose farming activities were subsidiary to their main occupations. George Nicholson, butcher, held six and three quarter acres of arable and eight acres of grazing land; Robert Norton, miller, of the Grint Mill, held eight acres of arable and nine of grazing; Robert Howell, tailor, held six acres of arable and another tailor, John Cooper, held one and a half acres of pasture; and John Monument, blacksmith, had an acre of arable, two and a half acres of meadow and three and a quarter acres of pasture. All traces of the cloth industry had vanished by the nineteenth century, however. In 1845 the village included two inns, two beerhouses, three bricklayers and builders, a pumpmaker, a watchmaker, a tinner and brazier, three blacksmiths, two millers (both watermills), three joiners, two saddlers, four shoemakers, five tailors, a cooper, four bakers, a tea dealer, a butcher, two grocer-drapers, two boarding schools and the National School (White 1845). The population of the village was growing rapidly at this time. In 1801 there were 836 inhabitants; by 1841 the number had risen to 1219, only to decline, as in most Norfolk villages, during the second half of the century. In 1901 there were 999 inhabitants and by 1921 only 837. The council housing estate and the newer (and architecturally regrettable) Manor Park Estate have helped to raise the population over the thousand mark again. Many of the houses in Eastgate and along the main road date from the early nineteenth century, reflecting the rising population then and, probably, the poor state of the pre-nineteenth century village houses⁴⁰.

VI. HOUSING AND POPULATION IN THE FIFTEENTH AND SIXTEENTH CENTURIES

Table 102 gives a break-down of all messuages, cottages, etc. in the survey of 1454.

TABLE 102. THE 1454 SURVEY

domus edificata	2
messuagium	41
messuagium edificatum	10
messuagium non edificatum	1
messuagium quondam edificatum	2
cotagium	$62 + \frac{1}{3} + \frac{1}{2}$
cotagium edificatum	10
cotagium non edificatum	2
cotagium quondam edificatum	3
placea	1
placea edificata	5
placea quondam edificata	5
molendinum	1
molendinum quondam edificatum	1
	<u>146</u> + $\frac{1}{3}$ + $\frac{1}{2}$

From this it will be seen that only twenty seven of the properties are described as being 'built'. There must have been more than twenty seven tenements with dwelling-houses on them. The greatest number of tenements described in the survey that could have contained a house is 134 - that is, the total of 146 and two pieces minus all those which are definitely said to be either 'not built' or 'formerly built'. This maximum would ignore the apparent distinction between, for instance, a 'cottage built' and a simple 'cottage' ⁴¹. 'Cottages' in the early-fourteenth-century court rolls vary in size between 50 x 42 feet and 80 x 10 feet. In 1523 a plot 28 x 20 feet had a cottage built on it as well as a well with an engine for raising water ⁴². There is no doubt that the cotagium was a small plot; what is in doubt is whether every cotagium except those described as 'not built' or 'formerly built' had on it a dwelling-house. This question is, of course, closely connected with the problem of population.

There is no sure means of estimating the medieval population of the village or even the number of families in it at any one moment. However, the 1454 survey includes 139 male and seventeen female individual tenants and freeholders, excluding those who are noted as dwelling in another village. This total of 156 must represent the maximum number of households covered by the survey, as only 109 surnames are recorded and there must have been a certain amount of sharing of houses between tenants of the same family. The four Brimstons, for example, held only two messuages and one cottage between them and of the five Heywards two held one messuage each, one had a third of a cottage and two had no cottage or messuage recorded. The two Barnards had only half a cottage between them. The four Stacys, on the other hand, held two and a half messuages and two cottages. Table 103 shows the distribution of cottages and messuages among the tenants.

TABLE 103. DISTRIBUTION OF MESSUAGES, COTTAGES, ETC.
(EXCLUDING THOSE 'NOT BUILT' OR 'FORMERLY BUILT')

Number of cottages etc. held	by stated 'foreigners'	Total including 'foreigners'
none	19	93
$\frac{1}{3}$	-	5
$\frac{1}{2}$	-	5
$\frac{1}{2} + \frac{1}{2}$	-	2
1	1	35
$1 + \frac{1}{2}$	-	1
$1 + \frac{1}{3} + \frac{1}{3}$	-	1
$1 + \frac{1}{2}$	-	3
2	1	16
3	1	6
$3 + \frac{1}{3} + \frac{1}{2} + \frac{1}{2}$	-	1
4	-	3
$5 + \frac{1}{2}$	-	1
$7 + \frac{1}{3}$	-	1

There are three major possibilities. First, many of those tenants with no messuages or cottages recorded in the survey were not resident in the village. Secondly, there was a great deal of sub-letting and splitting of houses which was not mentioned by the survey. Thirdly, there were many houses which were not recorded in the survey either because they belonged to a manor or estate which was not itself included, or because their ownership or tenancy was not known, or because they were not of sufficient manorial value to be noted. The three manor-houses, for instance, were not entered, neither was the vicarage, nor - probably - the houses belonging to the small estates of Dunham and Thornwell. Six of the larger tenants (holdings of over twenty acres apiece) had no houses mentioned. It is not clear if the survey included all the tenants of the manors of Nowers' and Prior's, but they were in any case few in number. If we allow twenty five as the maximum number of houses omitted we are probably erring on the side of generosity. Apart from these exceptions, we must conclude that every house was included in the survey, either explicitly or implicitly.

Population in the sixteenth and seventeenth centuries

In 1603 each minister in the diocese of Norwich sent in a return to the bishop stating the number of communicants in his parish or parishes (Jessop 1888, 38). The figure for Elmham was 400, making it the thirteenth most populous parish in the county. This position is strikingly different from that reached in the subsidy assessment of 1334, when Elmham, assessed at £7 10s., was only seventy seventh in the county; by 1449 the parish, at the reduced assessment of £6 16s. 8d., had moved up to fifty eighth place (Hudson 1895). The subsidy assessments, of course, are not an accurate guide to population, but there is some reason to think that in the latter part of the sixteenth century Elmham may have been outgrowing its economic strength. The parish registers show that in 1603 the village was in the middle of a prolonged period of population growth.

TABLE 104. BAPTISMS, MARRIAGES AND BURIALS
IN THE PARISH REGISTER

	Baptisms	Marriages	Burials	Excess of baptisms over burials	Excess of burials over baptisms
1540-9	155	32	92	63	
1550-9	152	47	179		27
1560-9	164	45	101	63	
1570-9	192	41	99	93	
1580-9	230	60	112	118	
1590-9	233	57	167	66	
1600-9	248	68	195	53	
1610-9	246	57	188	58	
1620-9	232	39	205	27	
	1852	446	1338	541	27

On the face of it, this seems to show that between 1540 and 1600 the population of Elmham increased by 376. If the communicant figure is correct, however, Elmham cannot have had a population much in excess of 670 in 1603⁴³, and it cannot seriously be held that the population more than doubled between 1540 and 1600. The 1603 figure is supported by a calculation based on the average number of births per annum in the period 1590-99, which yields a total population figure of 699⁴⁴. It is reasonable to assume, therefore, that the 1603 figure is at least not wildly inaccurate.

Unfortunately, the 1603 figure cannot be related directly to the manorial tenants and the tenements of c. 1567. These tenants appear only as marginal glosses in the survey book, with no indication of the contemporary state of their tenements. Their number - eighty three individuals - is a great reduction on the figure of 1454 and there had evidently been a good deal of land amalgamation and exchange in the intervening years. However, there can be no simple inference from this that the population of Elmham was smaller in 1567 than it was in 1454 or that the fabric of the village had decayed.

There is, however, another way of using the communicant figures to arrive at an approximation of the size of the village settlement. There are a number of detailed manuscript maps of parishes in central and north west Norfolk which were drawn in the late sixteenth and early seventeenth centuries and on which the dwelling-houses are readily distinguishable from barns and outbuildings⁴⁵. Table 105 correlates these houses with the communicants of 1603⁴⁶. If the number of communicants in Elmham is divided by the highest figure of communicants per house in the table below, the number of houses comes out as sixty five; if by the lowest, 222; and if by the average, 114.

Which figure is the nearest to the truth? 222 is obviously too high. Sixty five is probably too low. At the census of 1801 Elmham had 122 houses, inhabited by 836 people, a population increase over 1603 of something like 25%. If the number of houses had increased in the same proportion the figure in 1603 ought to have been ninety eight. This, of course, supposes that the population per house had remained constant, but there is little support for this in the figures of the other villages in this selection. While Tittleshall, for instance, had ten persons per house in 1603 and 9.5 in 1801, the density for Great Bircham had risen from 6.3 in 1603 to 9.0 per house in 1801 and for Colkirk from 3.3 in 1603 to 8.7 per house in 1801, whereas at Cawston the figure had actually fallen from 6.8 to 4.9. It seems impossible to derive any valid argument from a comparison of the 1603 and 1801 figures, but it seems on the whole likely that the figure of 114 houses in 1603 may not be very wide of the mark. What bearing has this on the figures for 1454?

TABLE 105. RATIO OF DWELLING HOUSES TO COMMUNICANTS c. 1600

Map	Number of houses	Communicants	Communicants per house
Tittleshall	36	220	6.1
Cawston	77	320	4.1
Snettisham	86	332	3.9
Great Bircham	50	190	3.8
West Raynham	22	80	3.6
Morley St. Botolph & Peter	39	138	3.5
North Creake	55	190	3.4
Heacham	68	200	2.9
Longham	29	80	2.7
West Lexham	22	60	2.7
Hillington	37	100	2.7
Colkirk	30	60	2.0
Flitcham	33	60	1.8
	584	2030	3.5

We know that the population of the village rose steadily between 1540 and 1600 and, in fact, continued to rise well into the seventeenth century. There are two main ways in which the rising population could have been accommodated. More people may have been crammed into the existing houses so that the population per house rose dramatically, as seems to have happened between 1600 and 1801 in Bircham, Colkirk, West Lexham, Longham, Heacham and doubtless many other Norfolk villages; or new houses could have been built, old ones refurbished, and unbuilt cottage and message plots rebuilt. At first glance the second alternative seems the more likely. An expanding population means more families and families need houses. The number of marriages in Elmham, though an uncertain guide to total population, gives some indication of the expansion and contraction of village society. Table 104 shows that from the 1580s the number of marriages increased by some 50% following, presumably, the excess of baptisms over burials in the 1540s and 1560s. There is no evidence that most of these new families moved out of the village and they must either have shared house with in-laws or moved into new, reconditioned or newly-subdivided tenements. All these, of course, must have occurred; but one is forced to conclude that there was a certain amount of new building going on in the forty years centring on 1600, although there is little evidence, either material or documentary, of the 'Great Rebuilding' that has been suggested in general for this period⁴⁷.

Even a relatively minor rebuilding, however, causes problems. Even if we do not accept as real the apparent population increase of 376 between 1540 and 1600 and argue instead that as much as 40% of this increase did not, for one reason or another, become part of the permanent population of the village, we are still left with the conclusion that there must have been many fewer standing, or at least habitable houses in 1540 than there were in 1600. If the number of inhabitants per house remained constant throughout this period and we use the average figure from Table 105 we get a total of only seventy six houses in 1540. The lowest figure, for Flitcham, would, of course, yield a figure of 146 houses for 1540, but the highest, Tittleshall, would leave us with only forty four. This is a wild variation even for an hypothesis; but whatever the actual figure of population per house, we must conclude that if the figure of 134 houses that has been suggested for 1454 is correct there must have been a serious decline in the population and economy of the village in the 100 years before 1540. A high density figure would give us few houses, while a low density figure would mean, inevitably, empty or under-used houses. Alternatively, the figure of 134 may be far too high. This would mean that the decline came before, and not necessarily after, 1454.

The evidence for or against decline in the later Middle Ages is as follows.

1. There were 118 customers owing precarial services to the bishop's manor in 1326⁴⁸. The number of tenants holding customary arable land in 1454 was eighty one; another twelve held small portions of customary non-arable land or cottages and fifteen held no customary land but some arable of unknown status. This gives a maximum of 108 tenants who may have owed precarial services in 1454 and doubtless some of them can be discounted. These figures, therefore, point (albeit with a somewhat shaky finger) to a diminution of tenants between 1326 and 1454.
2. The acreage under cultivation may have been declining in the early fourteenth century. This is fully discussed in the section on the medieval manorial economy.
3. In the 1454 survey the bishop is recorded as having some 386 acres of arable land in his hand. There is nothing to say how much of this was demesne. In 1328-9 some 170 acres were sown on the bishop's manor, a figure that implies a total arable demesne of 230-260 acres when land in fallow is taken into account. There was no room for a compact demesne of this size on the north and east of the cathedral manor-house; the most that can be allowed there is 130 acres⁴⁹. Even if the 386 acres included all the demesne, therefore, we are left with over 120 acres of non-demesne land in the lord's hand; and if 130 acres of demesne lay in the area near the manor-house not covered by the survey there could have been as much as 250 acres of tenant land in the hand of the bishop⁵⁰. Whatever the exact figure, there can be little doubt that much land formerly tenanted was in the hand of the lord at the time of the 1454 survey. There is no evidence to show whether or not this land was in a state of cultivation, but the probability is that some, at least, of it was not. One piece of ten acres in Inlondgate in the furlong called Stonehill was described as *in manu domini i pec' cum fyrres et broom super crescen'*; in 1567 it was part of the foldcourse. On the other hand, if this land was in the hand of the lord because of a retreat of cultivation, it is difficult to understand why it is spread so evenly throughout all the fields except Woodwales. In Skotland, Burgrave, Ramsley, Westfield, Lingsty, Whitecross and Brome, land in the hand of the lord averaged 15% of the total acreage, with Brome the lowest at 9% and Burgrave the highest at 16%. In Inlondgate the figure was 25%, in Dunham 30% and in Fulfordhaugh 35%. These last three areas probably contain the greatest proportion of poor soil in the parish. For that reason they may have been brought into cultivation comparatively late and we might expect them to suffer most from a contraction of the arable land of the parish. The settlement at Fulfordhaugh, on the edge of the Great Heath, certainly shows signs of being run-down in 1454. On the other hand, land in the hand of the lord was fairly evenly distributed throughout the furlongs and not, as we might expect from the 'marginal land' theory, concentrated on patches of low fertility. However, the soils of the parish are extremely mixed; in the Burgrave and Ramsley areas, for instance, bands of good soil alternate with strips of sand and gravel and an infertile clay forms the sub-soil⁵¹, circumstances that would surely give rise to extremely variable yields over a comparatively small area under medieval cultivation.

It is, however, difficult to understand why a large amount of arable remained in the unwilling hands of the lord when there was a large number of tenants with little or no arable. It has been suggested that a peasant family with a holding of less than eight acres could not expect to receive full subsistence from that holding alone (Postan 1971, 620-1). 73% of the individual tenants at Elmham had holdings of less than eight acres - most of them, in fact, considerably less. Why did they not take up the vacant holdings if they were available? Perhaps the land was too exhausted or basically too infertile to be worth cultivating. Perhaps there was a lack of equipment and tractive power among the smallholders and landless men. Perhaps it was more profitable, or easier, for them to scratch a living from keeping a few cattle, a few swine, a few fowls, than to slog away in the open fields with no certainty of a good crop. Perhaps

the freemen, who probably formed the bulk of this smallholder group, were unwilling to take on land burdened with customary dues that made it much less profitable than freehold land (Postan 1971, 603-4, 611-4). Perhaps it was better to sell their labour to the larger landholders. Perhaps there was some alternative source of income, such as the cloth industry. Families with little arable would have to find money from somewhere to buy their corn.

4. There is some evidence that the Black Death visited the village, but no tax allowances were made in the years immediately following the first onset, so we can assume that the visitation was not catastrophic (Saunders 1930, 189) ⁵².
5. The compotus of the bishop's manor of 1401 ⁵³ gives no sign of any distress among the tenants. The receipts from fixed rents, at £31 6s. 1d., were fractionally higher than those of 1328-9 while the arrears of rent received, at £2 3s. 4d., were well under half the amount of 1328-9.
6. About 1449 a reduction of some 9% was made in Elmham's assessment for the tax of tenths and fifteenths. This was well under the average for the hundred of Launditch and while these reductions can be used only in extreme cases to indicate the decline or prosperity of individual townships, this low figure is an argument against a sharp decline in the fortunes of Elmham (Hudson 1895, 277).
7. Apart from the land in the lord's hand, the 1454 survey has certain indications of decay in the village. There were three sites 'not built' and eleven 'formerly' built. The market was obviously in decline; in fact, it was declining by 1401 when the tolls of the market, the fair, and the fishery together came to only 9s. 1d. compared with the 33s. 4d. paid for the farm of the market alone in 1328-9 ⁵⁴.
8. Of the seventy nine surnames that occur in the list of 'tenements', which goes back, perhaps, to the thirteenth century, only nine occur in the tenants of 1454. Similarly, of the 128 surnames in the 1454 survey, only nineteen are repeated in the tenants of c. 1567. No doubt there were many blood-relationships hidden by descent in the female line or even by changes of surname in male tenants, but these two sets of figures surely point to a great amount of social change in the village during the later Middle Ages.
9. An account of 1482 includes arrears of fines exacted on two tenants for making a waste in their tenements ⁵⁵. It is not apparent whether these were genuine cases or just legal fictions concealing a fee for making enclosures.
10. Two compoti, for 1519 and 1528, record the receipt of large amounts of arrears for the bishop's manor. In 1519 the demesne income included arrears of £19 8s. 5d., and the arrears on the fixed rents were £27 8s. 3d. For 1528 the figures were £22 8s. 7d. and £20 14s. 7½d. respectively. The fixed rents were constant at £24 14s. 6d. ⁵⁶. In 1534-5, on the eve of the exchange of lands with the king, the arrears on the demesne were over £24 ⁵⁷. These arrears do not necessarily mean that farmers and tenants were hard put to it to find the rents; they could as easily point to an inefficient administration. The account of 1519 also includes the arrears of a fine on William Soper, clerk, for a waste on the houses of husbandry in his tenement at the Heath.
11. By c. 1567 the demand for land was again great, if we can accept the annotations to the survey at their face value. No land was left in the lord's hand apart from the hundred acres of the foldcourse and almost every piece of land has a tenant's name against it. It is true that some of the land had gone out of cultivation in the sense that it had been enclosed and converted to pasture, notably in the case of Taverner's

Great Close, but the bulk of the open fields remained in strip cultivation. At the same time a much smaller proportion of the village population had a direct stake in the land: there were only ninety tenants in 1567 compared with 180 in 1454.

The picture that emerges from all this is indistinct in its details, but some general shapes can be discerned. Following the general trend throughout the country, the village probably reached its medieval peak of population and prosperity in the late thirteenth century. By the 1340s there may already have been some retreat of cultivation following, or accompanying, a slight decline in population. The Black Death visited the village, but apparently without catastrophic results. At the beginning of the fifteenth century there was still no sign of serious decline; the rents of the main manor were kept up and the cathedral manor-house was one of the chief residences of the bishop. The prior, however, though modernising his manor-house⁵⁸, was letting out the manor and the demesne to farm. At some time before 1454 - how soon before we cannot say - a considerable acreage of arable came into the hands of the bishop, land for which he had been unable, or unwilling, to secure tenants at the time of the survey. It is not clear whether a sudden catastrophe, such as a visitation of the plague or a similar pestilence, or a cumulative economic and agrarian process, or a crisis in the legal and tenurial relationship of lord and tenant, was responsible for this accession of land. In the later fifteenth and early sixteenth centuries the decline continued, manifesting itself in the surviving documents in the 'wasting' of lands and cottages, arrears of rent, enclosure and a wholesale change in the old tenant families. By the middle of the sixteenth century, however, the decline had been halted and a major rise in population had begun; this was probably accompanied by a movement in the poorer class away from smallholding and small-doing and towards wage-earning and engagement in the textile industries.

REFERENCES

Abbreviations used in the notes

NRO	Norfolk Record Office
DC	Norfolk Record Office, Dean and Chapter muniments
Holkham	Holkham Hall muniments, North Elmham MSS.
NRS	Norfolk Record Society
PRO	Public Record Office

1. Holkham, Bundle 3, Nos.30, 38.
2. See Chapter 21.
3. See Chapter 23.
4. DC 4667.
5. DC 4667.
6. But see Chapter 23.
7. In Chapter 21.
8. For this estimate of demesne land, see next section on Manorial Economy.
9. See next section on Manorial Economy.
10. In the section on Housing and Population later in this chapter.
11. The 1567 glosses for these are Cursus libere falde (XCVI), Cursus falde (CXIX), to supplement the 1454 cursu' unius falde lib'; the third had no gloss, but was called Cursus unius libere falde in 1454.
12. But see below for evidence of enclosure.

13. DC 4723.
14. H.W.Saunders (1930, 189) states that the court rolls of 1349 show that sixteen tenants of the prior's manor died that year. I have been unable to trace this reference.
15. 'Hemplands', small, odd pieces of land, are very common in records of Norfolk villages, both in the Middle Ages and later.
16. DC 4714-5.
17. DC 4637-8.
18. DC 4697, 4246.
19. None of the eleven manor-house inventories in DC 4246 (1352) has mention of a quern or hand-mill.
20. Holkham, compotus No.2, 1410.
21. e.g. DC 4700, 4702, 4713.
22. DC 4700.
23. DC 4697.
24. DC 4738, 4721.
25. DC 4720, 4721.
26. These calculations are based on figures in Trow-Smith (1957), 120-3.
27. See section on Agriculture in the later period in this Chapter.
28. It is visible on the R.A.F. vertical air photographs.
29. The probate inventories referred to in this section are all in the NRO and are: Rudd INV/24.146; Spratt INV/40.157; Allyerd INV/44.143; Heyward INV/6.36; Kempe INV/33.234; Guildingwater INV/41.31; Thomas Smith INV/37.219; Harvey Norw. Archd. Inv. 1674-92.100; Brooke INV/71.232; John Smyth the elder Norw. Archd. Inv. 1700-1.235; Collison ibid. 1707.87; Everett ibid. 1707.30; Youngs ibid. 1711.26; John Browne ibid. 1674-92.43; Lancaster ibid. 1681-2.10.
30. NRO, Dean and Chapter muniments E.123.
31. There are very few instances of this archaic and hill-country implement in Norfolk inventories.
32. NRO, MS 504 p.169.
33. Holkham, Bundle 5, No.109.
34. Unless tithing customs had changed since 1373, when it was stated that the tithe of peas belonged to the vicar, the peas at least must have been grown on Harvey's land.
35. NRO, Norw. Archd. Inv. 1707.87.
36. Holkham, No.148.
37. NRO, MS 18623/42. The statement of claims refers only to the manor of Nowers, but this obviously includes both Nowers' and the chief manor.
38. See Tables 87 and 89.
39. In 1454, including an estimate for demesne land of the manors, the total arable was 2513 acres.
40. See section on houses in Chapter 23.
41. e.g. Chapter 21, p.540, VII nos.131-2, 136-7.

42. DC 4667, 4670, 4683.
43. The usual method for converting adult population figures to total population is to assume that children under communicable age, i.e. about 15 years old, amount to some 40% of the total population and, therefore, to multiply the communicant figure, which in theory was the total adult population, by $\frac{10}{6}$. This would give a total for Elmham of 666: Hoskins 1959, 145-7.
44. The average number of births per annum over a given period is multiplied by 30: Hoskins 1959, 143-4; Tate 1946, 80-2.
45. In the 'bird's-eye view' drawings of buildings, barns nearly always have their doors reaching from ground sill to eaves whereas the dwelling-houses have smaller doors and windows and chimneys.
46. The Bircham map is in the archives at Houghton Hall; the remainder are all in the NRO. The figures for communicants are taken from Jessop 1888 and the relevant volumes of Blomefield 1810.
47. Hoskins 1965, chap.7. Pressure on housing was probably responsible for the conversion of a stable and a hayhouse to domestic use c. 1632: NRO, MS 504, 60.
48. DC 4737.
49. See Chapter 21 on Medieval Topography.
50. M.M. Postan (1971, 590) implies that holdings in manu domini were vacant tenements and not demesne.
51. Ex inf. Lord Wise.
52. PRO, E 179/149/32-35; DC 4734.
53. Holkham, Compotus No.2.
54. Holkham, Compotus No.2; DC 4738.
55. NRO, EST/15.1/4.
56. Holkham, Bundle 5, Nos.107-8.
57. NRO, EST/15.1/6.
58. See Chapter 23.

23. BUILDINGS

by David Yaxley

I. THE BISHOP'S OR CATHEDRAL MANOR-HOUSE

The problems of this building as a 'cathedral' have been discussed at length elsewhere ¹ and it is not proposed to extend the discussion to this study, especially as there is virtually no documentary history for the building before the Conquest or, for that matter, for a good many years after it. The history of the building as a Saxon 'cathedral' is indistinct; after the transference of the bishop's seat to Thetford in 1071-2 it becomes even more obscure. The parish church was said to have been founded by Herbert de Losinga, first bishop of Norwich, in the 1090s (Blomefield 1810, IX, 492), and it has been assumed that the 'cathedral' remained in service as a domestic chapel until bishop Despenser adapted and fortified it as his manor-house in the latter part of the fourteenth century (Rigold 1962-3, 70). This would certainly explain why the Late-Saxon fabric of the building remained more or less intact for three hundred years after the removal of the bishopric. However, although many of the medieval finds in the most recent excavation were judged to belong to the late fourteenth century, a significant amount of pottery dating from the eleventh to the early fourteenth century was found (Rigold 1962-3, 100-101). It is reasonable to suppose that the immediate surroundings of the 'cathedral' formed the manor-house site of the early medieval bishops of Norwich long before the transformations wrought by Despenser.

It is, however, impossible to say whether or not the building had been converted to secular use before Despenser fortified the site c. 1387. The accounts of 1326-7 and 1328-9 mention a number of parts of the manor-house complex. In 1326-7 a hundred and three quarters of 'bord' was bought at a price - 23s. 7d. - that suggests it was boards bought by number rather than footage; 1500 nails and 100 lath-nails were also purchased and the boards were laid super aulam, that is, on the hall. They may have been floor-boards laid on the dais of the hall or they may have been used for some sort of staging or upper storey. There is a slight possibility that the hall was roofed with boards; or they may have been simple barge or eaves-boards ². The pales at the hall door were mentioned in 1328-9 ³. In 1326-7 work on the chamber or chambers of the lord and 'Pye' occupied a thatcher and his boy for ten-and-a-half days; a hedge was made against the bishop's chamber and the hedge against the bailiff's chamber was mended; entries that suggest that both were ground-floor rooms. In 1328-9 the clerks' chamber was thatched, the door to the steward's chamber repaired, the partition between the kitchen and the larder mended and a key bought for the store room of the bakehouse. In 1326-7 a conduit or sewer was connected to the 'pit' and in 1328-9 it was repaired and sluiced-out in the 'dung-pit'. Outbuildings mentioned in these two accounts are the great barn, the wheat barn, the south barley barn, all of which seem to have been timber-framed and thatched; the palfrey stable, the long stable, the bailiff's stable, which were also thatched; a granary; and a cowhouse and pinfold. The reeds from eight acres of marsh were brought for the thatching in 1328-9, but straw was also used. A hedge was made in the 'garden' and around the courtyard in 1328-9 and walls between the 'great door' and the barley barn and by the road against the church were thatched, crested and whitewashed. Clay was dug for these walls, so they could have been either timber-framed or of clay lump; the employment of a mason for four days to 'cement' them suggests the latter.

The bishop also had a lodge in the Old Park at this time. It, too, was a timber-framed building. In 1328-9 a quarter of a hundred of 'bord' was bought for it, the price - 4s. 1d. - again suggesting quantity rather than footage, together with 400 'keys' (probably oak pegs for pegging joints), a small quantity of 'great keys', 1100 lath-nails, some hooks and four 'vertivells' (door-bands or hinges) and a lock and key for a window. The lodge was 'carpentered', daub made and applied and the roof was thatched. The whole operation cost just over 31s., implying a repair or addition rather than a complete rebuild.

These accounts show that in the early fourteenth century the manor-house must have occupied a fairly large and complex site, situated somewhere near the church and surrounded at least by walls and hedges. Whether any of the moats had yet been dug is debatable, but the 1326-7 account contains the entry *fossat' levand' subt' maner' jd ob'* - a dyke raised under the manor - which, in spite of the smallness of the sum involved, is suggestive.

Bishop Henry Despenser's alterations to the cathedral have been fully described by Rigold in his report on the excavation (Rigold 1962-3, 76, 78). He suggests that the first phase of the conversion to a manor-house involved a ground-floor hall with a dog-leg stair in its south west corner, just to the right of the south door of the church, leading, presumably, to upper rooms in the west tower. This hall would have occupied most of the nave of the Saxon cathedral and would, one supposes, have been approached through a doorway in the position of the Saxon nave-transept arch. The transept itself may have had its walls cut down almost to ground level to provide a foundation for a timber-framed building, which had a door in the position of the Saxon apse-arch leading to a bridge over the inner ditch. Rigold assigns this conversion to a period before the licence to fortify of 1387; there is, of course, no evidence that it went back as far as 1326-7, but may well have dated from the beginning of, or even before, Despenser's episcopate⁴.

If we accept the theory of a ground-floor hall for the first stage, the semi-circular turret (D1 on Rigold's plan) and the line of flint pillar-bases, which Rigold also assigns to the first period before 1387, must have belonged to the second phase of this period when the nave of the cathedral was converted to a first-floor hall. The bases are smooth capped, as if prepared for timber posts, and must have supported the floor of an upper room. Rigold suggests that in the first-floor hall stage, the entrance to the hall must have been between the two semi-circular turrets and at first-floor level. The placing of the second - Despenser's - turret certainly suggests a main entrance here and it seems unlikely that the old south doorway was used, as part of it is masked by the turret and it is, in any case, blocked immediately inside the cathedral wall by the 'solid base'. It is logical, therefore, to suggest a door at first-floor level, but it should be pointed out that, as the wall between the two turrets is completely destroyed, there is no actual evidence for such an opening. The excavation report makes it clear that this 'solid base', which is there assumed to be 'the back of a drawbridge pit', is bonded with the first staircase, but it is not easy to see how the suggested bridge between the two turrets fits into the general plan at this stage. A drawbridge could only span the relatively narrow gap between the masonry wall and the inner bank, which itself, after 1387, was piled against the wall of the west tower just on the far side of the original stair-turret; and even if there were a drawbridge here, there would still be an awkward transition between the inner bank and the lower ground between it and the outer ditch. The later entry to the site by the side of the former George inn and the filling of the outer ditch to form the back-yard of the inn, have, unfortunately, obscured the original form of the outer ditch at this point. It is suggested above (p. 535) that the 1454 survey abuttals, together with later evidence, make it seem unlikely that the main entry to the site in the fifteenth century was in the position of the present gate and path. It is not clear, in fact, that the manor-house was still in use in 1454, but it is surely likely that Despenser's entrance to the site would still be in its original position. The 1454 survey implies that it was somewhere to the east of the modern gate and it may well have been half-way along the eastern arm of the outer ditch,

The Bishop's or Cathedral Manor-House

with a preliminary entrance at the south east corner of the ditch. The suggestion that there was a bridge from the former apse of the cathedral over the eastern arm of the inner ditch to connect house and yard surely supports this placing of the site entrance. This would not necessarily rule out a doorway between the turrets as a path could easily have been accommodated between the bank and the outer ditch; but a drawbridge - by definition a defensive feature - seems unnecessary and more-or-less useless in the suggested position.

The whole of the central portion of the building, in fact, is full of uncertainties. What was the deep pit between the 'solid base' and the old north doorway? If Rigold's interpretation is right, the pit must have been directly underneath the screens passage of the first-floor hall and apparently inaccessible after c. 1388, since both the old north doorway and another - presumably pre-1387 - doorway beside it were both blocked, while the second and larger staircase as well as the partition wall prevented any access from the undercroft. And why is the wall behind the 'solid base' so thick? The pullog holes that run right through it suggest that it may have been a structure of some height, but it seems to bear little relationship to the south wall of the cathedral. And what exactly was the function of the new turret? Was it primarily ornamental, to balance the old staircase tower, or did it, too, contain a stair in its upper portion? The lower part is butted on to the Saxon wall and has one oddly-placed aperture aimed at the corner of the south east tower and apparently custom-built for a left-handed archer.

There is no evidence on the use of the west tower during Despenser's time. Rigold suggests that, following the usual pattern, it was separated from the hall by the screens passage and used as a service room, probably with a store room in the base of the tower and accessible only by way of the Saxon stair. The bishop's chamber, he suggests, was over the former transept and this agrees well with the position of the garderobe in one corner of the south east tower and probably accessible from both hall and chamber.

The second main phase of Despenser's transformation, which Rigold dates from the time of the licence to crenellate (1387), involved the construction of a new, wider staircase at the north west corner of the undercroft, the blocking of two doors in the north wall and one each in the twin east towers and the partitioning-off of the west end of the undercroft. The fate of the 'drawbridge' doorway is unknown, but the position and scale of the new stair suggest that the main approach was now from the east via a passage through the former transept. The kitchen fireplace, on the north of the nave, also dates from this period and so does the small cess-pit in the south east tower. There is little trace of the walls of the kitchen and presumably it was a timber-framed building on sleepers. The archaeological evidence suggests that the inner ditch was dug at this time (Rigold 1962-3, 81). No dating is yet possible for the outer ditch, although one would suppose that it was at least no later than the inner ditch. The spoil from the outer ditch, spread over the courtyard, effectively hides any evidence of pre-Despenser buildings, although slight traces of a flint-and-mortar building were found on the north lip of the inner ditch. The mound in the north west corner of the enclosure is also undatable. There seems to be no evidence that either the inner or the outer ditch was ever 'wet' in the sense of being filled with water other than from surface drainage, although the guide to the site refers to the shapeless mass of rubble in the inner ditch as 'some sort of sluice' (Rigold 1960, 5). Blomefield noted the absence of water in his day. He also stated that the 'great and deep entrenchment' contained about five acres (Blomefield 1810, IX, 487) and that 'the inner keep was also encompassed with a deep ditch, containing within it two acres joining south, and in the south west part of which it stood, and had a deep well'. The area inside the outer ditch is no more than two-and-a-half acres; if this is Blomefield's 'two acres', the implication is that the five acres referred to the outer bailey, which must have extended as far east as the remaining fragment of its ditch, and as far north as the lane, now ploughed up, that ran from the south end of the council-house terrace towards the Wensum. Something that the eye of faith can see as the south east angle of this bailey is visible on

aerial photographs, but the continuation beyond the existing remnant has been ploughed out. Rigold suggests that the ditch was never finished. Dr. Wade-Martins thinks that the outer bailey ditch extended almost to the north west and south west angles of the outer ditch to cover the supposed entrances to the site (Fig. 193). Blomefield's evidence enlarges the outer bailey to the north of the site. There is, of course, a possibility that either Blomefield or his informant exaggerated the acreage of both enclosures; but even if we accept that he could mistake half-an-acre for two acres, his statement that the 'keep', that is the cathedral manor-house, stood in the south west part of the two-acre enclosure surely proves that this enclosure was the yard within the outer ditch. It is doubtful whether he meant the five-acre enclosure to include the two acres of the yard; but a further clue to the northern extent of the bailey is the slight but definite curve to the south that the lane took at the junction of OS fields 276 and 266a before it changed direction to head towards the Wensum ⁵. Moreover, the 'Estimate' of c. 1590 refers to 'The Scit of the manor called Tower hille, conteynyng by estimacon vij acres, (Carthew 1877-9, 563). Blomefield's phrase 'a great and deep entrenchment', referring apparently to the bailey ditch, also raises some doubt as to his accuracy; if the bailey ditch were indeed as big as the outer ditch it is surprising that all trace of it had disappeared by the nineteenth century, apart from the surviving remnant.

The remains of Rigold's third main phase of Despenser's occupation are, if possible, more puzzling than the first two phases. He suggests that the 'bench' along the outside of the north wall of the nave may have been the support for a timber kitchen, although this would surely have been an unusual way of building. A pit was apparently dug and walled in at the west end of the undercroft and the triumphal arch between nave and former transept was blocked with a masonry wall - which may, of course, have replaced a timber screen. If the main entrance to the first-floor hall were still from the east of the undercroft it must have been a route full of obstacles - a narrow door through the new wall, at least one pillar supporting the floor of the hall, and a new wall and doorway across the other side of the undercroft from the arch doorway. If, as Rigold suggests, there was an outside stair to provide access from the kitchen once the north doors were blocked, nothing remains to tell us where it was, unless the fragment of brickwork in the upper part of the wall is the remnant of a doorway. In this period the inner ditch was partly filled, but the outer ditch was deepened (Rigold 1962-3, 81-2).

In 1401 there was a 'keeper of the tower', William Cook. The house was evidently in good order for no money was spent on repairs that year ⁶. The towers were obviously the prominent feature of the house. The 1454 survey refers to 'le Towerdeke' and 'Castledeke'. The archaeological evidence points to the disuse of the house soon after Despenser's death in 1406. There is, unfortunately, no description of the house and its yards in the survey of 1454. The site was still used as a meeting-place for the manorial court in 1538 under the name of Tower Hill, but there is no evidence that the house was then in an habitable state (Carthew 1877-9, 573-4). The Cromwells probably built a new manor-house at some time in the middle of the sixteenth century (p. 579). By 1561 the cathedral was in use as a quarry for stone for repairs to the parish church; the churchwardens' accounts record payments for carrying six loads of stone from the tower and for digging the same (Legge 1891, 74-5). In 1568 the Toweryard was leased to Richard Franklin with the proviso that he should let it revert to pasture six years before the end of his lease ⁷. About 1590 it was referred to as 'The scit of the Manor called Tower hille' (Carthew 1877-9, 563). The ditches continued to dominate this part of the village throughout the seventeenth, eighteenth and nineteenth centuries, providing a reference-point for numerous abuttals. The site remained a possession of the manor until the nineteenth century when, at some date between 1839 and 1867, it became part of the vicarial glebe. A vicar, A.G. Legge, began his excavations on the site in the 1870s, believing it to be simply the ruins of the bishop's manor-house and it was not until 1903 that the Saxon elements were recognised and the building identified as a church (Rigold 1962-3, 71-2).

II. THE RECTORY, PRIOR'S, OR DEAN AND CHAPTER MANOR-HOUSE

This house lay to the east of the church, immediately beyond the old Back Lane that was closed in 1831⁸. A house existed on this site until recently. Two of Dr. St. Joseph's aerial photographs show, dramatically, the disappearance of the house; in one the house is there and in the other there is only a pile of rubble (Plates V and VI). Comparison of the aerial views with a photograph of c. 1900⁹, together with information from persons who knew the house, suggest that the house may well have been the remnant of the medieval manor-house. The photograph of 1900 shows a three-bay, two-and-a-half-storey farmhouse with a single massive axial stack at the east end. The house was of flint with brick dressings, apparently of c. 1800, but the pitch of the roof and the general appearance of the building leave no doubt in the writer's mind that the core was timber-framed. The flanking one-and-a-half-storey ranges were also brick and flint of the same date. The surviving farm buildings are nineteenth century.

Although the manor itself dates from the time of bishop Herbert de Losinga (1091-1119), the earliest surviving record of a manor-house is in the compotus of 1255-6. There are thirty one compoti surviving in the muniments of the Dean and Chapter, the latest of them dated 1410-11. On only six occasions are there compoti for consecutive years, but the only large gap in the series is in the later fourteenth century. The compoti are important in this section because the accountant recorded in detail the payments made for repairs to the manor-house and farm buildings during the year and while the gaps in the series mean that no complete picture of the development of the site can be attempted, there are enough details left to present a general picture of the buildings during the thirteenth and fourteenth centuries. Table 106 records the appearance of the component parts of the manor-house in these compoti¹⁰.

DOMESTIC BUILDINGS

Repairs are sometimes mentioned under the general term 'house'. In 1407, for example, six cartloads of reeds were bought for thatching the houses and walls of the rectory and it is impossible to tell whether the manor-house, the outbuildings or the barns are meant. Generally, however, the rooms are referred to by name.

THE HALL

As in most medieval houses, the hall was the major room and the one most frequently repaired. For the whole of the period covered by the accounts it was a thatched building and was regularly re-thatched. Sixty bundles of reeds were bought for repairing the hall in 1404 and 200 in 1406; four days were spent in repairing the thatch in 1407, and in 1410 Robert Reder and his man completely re-thatched it. It was almost certainly a timber-framed building; although there is nothing in the accounts relating to the hall that specifically refers to timber-framing, there is also no evidence that flint, the only possible competitor, was used in the hall or indeed in any other building on the site. Clay lump, which might be difficult to distinguish from daub in these accounts, has no certain history going back to the Middle Ages and in any case it would be an unlikely material for a building of such size and importance.

The dimensions of the hall are, unfortunately, not known, but they may have been in the region of 20 by 30 feet¹¹. The main block of the recently-demolished house was about 32 by 20 feet. The hall had to house fifteen to eighteen persons during harvest-time. In 1352 it contained three tables with two pairs of trestles, three forms, two basins, two lavers, three barrels, four tuns, two tubs, two keelers and two troughs¹². In 1263 a key was bought for the window of the hall, probably to lock the shutters¹³. The heating was probably by open hearth until 1410 when John Wright and John West were paid for five days' work in making 'les flewes' of the hall and the chamber joined to it, using in the process two pieces of oak worth 7d. Part, at least, of the fuel

TABLE 106. PRIOR'S MANOR-HOUSE: REPAIRS NOTED IN THE MANORIAL ACCOUNTS

Repairs to prior's manor-house, from the <u>compoti</u>		1255-6	1257	1263-4	1272-3	1273-4	1282-3	1287-8	1288-9	1295-6	1297-8	1305-6	1309-10	1311-12	1312-13	1317-18	1319-20	1320-1	1322-3	1324-5	1325-6	1334-5	1340-1	1356-7	1373-4	1391-2	1393-4	1396-7	1397-8	1404-5	1406-7	1407-8	1410-11			
Aula	hall	x																																		
Domos	house			x	x	x										x												x	x							
Camera	chamber						x			x	x			x				x	x														x	x		
Solar	solar						x								x																					
Celar	cellar								x																											
Coq'na	kitchen												x	x									x										x			
Camer' serv'	servants' chamber																	x					x		x											
Pistrina	bakehouse																							x												
Furnas'	see text																x						x													
Furin	see text	x			x				x				x	x			x																			
Camera mon'	monks chamber																						x													
Thorall'	kiln			x	x		x						x										x	x												
Curia	court	x	x				x			x																										
Gardin'	garden													x	x																					
Mur'	walls						x		x							x	x	x	x			x								x	x	x	x			
Granar'	granary			x	x	x	x							x									x													x
Porcar'	pigsty	x																																		
Grang'	barn	x	x	x		x		x			x		x	x	x	x	x	x	x	x	x	x							x	x	x					x
Parva grang'	small barn				x																															
Vet' grang	old barn																	x																		
Grang' ord'	barley barn							x	x	x						x											x			x			x	x	x	
Grang' silig'/fr'	rye barn/wheat									x					x								wheat				x					x	x			
Grang' dec'	tithe barn																																			
Stabl'	stable			x			x						x	x									x						x	x	x			x	x	
Vaccar'/bovarium	cowshed	x	x				x							x																						
Dom' carecar'	cartshed				x				x						x	x	x					x														
Dom' bras'	malthouse											x	x	x									x					x	x							
Le chaffhouse	chaffhouse													x																						
Daieria	dairy											x										x		x												
Pinfold	pinfold																					x														
Reference: NRO, Dean and Chapter muniments		DC4691	DC4692	DC4692	DC4693	DC4694	DC4695	DC4696	DC4697	DC4698	DC4699	DC4700	DC4701	DC4702	DC4703-4	DC4705	DC4706	DC4707	DC4708	DC4709	DC4710	DC4712	DC4713	DC4714	DC4715	DC4717	DC4718	DC4719	DC4720	DC4721	DC4722	DC4723	DC4724			

was turf or peat; a turf house was thatched in 1340 and a pit twenty feet square supplied the turves in the same year. In 1273 a wall was made between the hall and the servants' quarters (domu' famul').

CHAMBERS

The chamber next to the hall occurs only in the 1410 account, although a chamber 'behind' the hall is mentioned in 1320. A wooden partition in the chamber was mended in 1282. The lord's chamber had a new door in 1297 and fourteenpence-worth of 'candel-veycks' was bought for it in 1320. The servants' chamber, possibly a new building, also occurs in 1320, so in that year we have three chambers mentioned. In 1305 a small wall was made at the head of the steward's chamber, but this may have been an external wall and not part of the actual room. A key was bought for the door of the monks' chamber in 1334; an entry in the tithe account for 1349 says that nine bushels of oat straw were expended in litter for the monks. The apparent profusion of chambers in the early part of the fourteenth century makes it surprising that the inventory of 1352 mentions only the hall and the kitchen¹⁴. One can only assume that the chambers contained no furnishings or that they were in decay. In 1373 a wall near the servants' chamber was repaired and four locks and keys were bought for the doors of the servants' chamber, the pantry and the pantry chamber. In 1407 the thatch on the chamber was repaired and three years later the chamber joined to the hall was completely re-thatched after 'les flewes' had been made.

Whether any of these chambers was the same as the 'solar' which is mentioned in 1282 and thatched in 1312 is not apparent. The 1282 reference is to a key and lock for the door under the solar, suggesting a classic juxtaposition of solar and cellar, but the only direct reference to a cellar is in 1295 when another key is bought for the door. It is possible that in the later accounts these rooms became simple chambers.

SERVICE ROOMS

The kitchen had its thatch repaired in 1309 and 1311, but in 1319 tenpence was paid to the man who pulled down the old kitchen. By the next account a new kitchen had been built at a cost, with a new stable and servants' chamber, of £5 4s. 11d. This kitchen was thatched in 1340. In 1352 it contained a lead, three ewers, two bowls, a tripod, a grid-iron, a mortar and pestle, a pastry trough, a strainer for the kiln, a latch or lock, a hook, a bread barrel, a wine cask and a scoop or shovel¹⁵. The absence of any tables or seating gives the impression that it was little more than a store room and, perhaps, a cooking-room. It was timber-framed; in 1407 a carpenter was paid to repair and replace studs ('les stothes') and the walls were daubed. The pantry has a passing reference in 1373, together with the pantry chamber. The bakehouse appears as such only in 1356 when it took three days to thatch, but there can be little doubt that some of the entries for the furnace (furin' and furnas') refer to the bakehouse oven. Indeed, the accounts of 1295 and 1309 refer to two furnaces, for bread and lead, and in 1340 a new furnace was made for bread¹⁶. There seems to be some differentiation in the accounts between furin' and furnas' and it may be that the latter refers either to the lead-furnace or to the malt-kiln. Entries in 1257, 1273 and 1311 show that clay was 'thrown' at the furin', so it may well have been a very primitive form of clay dome-oven. The lead-furnace, occurring in 1295 and 1309, was probably used for melting lead for pipes, vessels and repairs to the chancel roof.

The malt-kiln was used to turn the large quantity of barley grown on the demesne or received as tithe into malt before it was sent to Norwich. It occurs regularly in the accounts from 1263 to 1340 and probably lasted far beyond the latter date, for malt continued to be sent to Norwich until the end of the fourteenth century. The kiln was a timber-framed, thatched building with a lock and key to the door and may have stood in its own enclosure, as the 'gate called Kilnehusgate' was repaired in 1327. Straw is occasionally mentioned as a fuel for the kiln and turf may also have been used. The malt-house was a separate building; it was thatched and timber-framed and its door also had a

lock and key. It must have been a fairly large building if it were used for the storage of malt; 151 quarters of malt were made and sent to Norwich in 1393, for example, although it need not all have been in the malthouse at the same time. The dairy was also thatched and had a lock on the door; a set of gunphis and vertivells - hook-and-eye hinges - were bought for its window in 1319. It was not mentioned by name in the inventory of 1352 although milk and butter vessels were included; the increasing disengagement with direct provisioning during the fourteenth century probably meant that the dairy fell into disuse.

BARNES

Many of the accounts simply record repairs to the barns without further identification. They all seem to have been timber-framed buildings thatched with reeds and straw. In 1273 a barn was 'carpentered' and fifteen 'spikings' (probably large nails), 100 lath-nails, three 'cheverunes' (rafters or braces) and a quantity of withies and reeds were bought; the building was thatched and daubed and a door made. Of the named barns, the barley barn appears most often in the accounts. It seems to have needed thatching almost continuously in the later fourteenth century. Posts and tie-beams of the rye barn were repaired in 1312, and in 1319 the partition in the barn was mended. It makes its last appearance in the surviving accounts in 1324, but the manor continued to produce rye in small quantities until the end of the century. A wheat barn was named in the accounts for the first time in 1393, although wheat had been produced on the demesne and in tithe long before this. A tithe barn occurs in 1320 when the door was mended and some thatching carried out and 1334 when a lock with a key was bought. In view of the quantity of barley produced by the parish and the fact that the barley barn is not mentioned in these two accounts we can say that 'tithe barn' was almost certainly an alias for 'barley barn'. Twenty quarters of barley straw for thatching the tithe barn occur in the tithe account of 1351-2¹⁷. A lord's barn is mentioned in 1334; this may be a way of distinguishing a demesne barn from the tithe barn.

The arrangement of the stacks recorded in the compoti between 1295 and 1327 tells us more about the barns. The barley barn was aligned east to west. The 1311 compotus refers to 'del pycks' towards the east and the west and they occur again in 1312 as West-pycks and Estpycks. These 'pycks' must be the gables (Salzman 1967, 533). It was a long building with a capacity of at least five stacks. In 1320 the tithe barley was stacked thus:-

The stack in the 'mydsty' producing 25 quarters
 The front stack towards the west producing 42 quarters
 The stack at the head of the barn towards the west producing 44 quarters
 The front stack towards the east producing 40 quarters
 The stack at the head of the barn towards the east producing 44 quarters

The 'mydsty' may have been a porch used for threshing, as in Essex (Hewett 1969, 14, 23, 40). A porch to the barley barn was thatched in 1288. As this 'mydsty' contained a stack, however, it seems more likely that it was an internal threshing-floor, as in many sixteenth-and-seventeenth-century Norfolk barns. In either case the 'myd' element of the word must mean that it was in the centre of the barn; the 'sty' element may be derived from the Old English sti, a hall. The entry for 1327 is muddled, but it refers to the north part of the midsti and the south head of the barn; this may indicate that a new barn had been built in 1326 or it may mean that another barn was in use for the time being. The rye barn was aligned north to south and at times held the wheat as well as the rye. In 1295 it contained a small stack of rye, a small and a medium stack of wheat and a large stack of barley; the barley barn itself had three very large stacks in it. The rye barn also had a 'mydsty'. In fact, it may well be that there were only two barns in the later thirteenth and early fourteenth centuries.

The granary, which was adjacent to the barns, the stable and the hall, was a thatched building with a lock on its door and a partition wall between it and the stable. There is no

indication in the accounts that it was raised from the ground to discourage vermin, but it may very well have been so. The chaffhouse also had a lockable door. The prior or his bailiffs certainly seem to have been security-minded.

STOCK HOUSES

At no time during the period covered by the accounts was there a great head of live-stock on the prior's manor and the stock houses must have been fairly small. The cowshed was cleaned out in 1255 and the muck spread on the fields. This cowshed may have been the same as the Bovarium which appears intermittently in the accounts. Cribs were made for it in 1282, a lock or bolt put on the door in 1311 and it was thatched in 1396. The entries for the pigsty are even more scattered; it was mended, at the cost of one penny, in 1255 and a carpenter spent three days in repairing it in 1396. Repairs to the stables, on the other hand, occur with great regularity. Broches and laths were bought in 1309 and the mangers and partitions were repaired. The old stable was thatched and a new stable built in 1320. The stable is not mentioned in the inventory of 1352, although the manor possessed four stotts then. Major re-thatching was undertaken in 1396 and 1397; in 1404 the daub and plasterwork was renewed, in 1406 mangers were made, in 1407 a new wall was erected with a threshold, studs and laths and in 1410 mud and clay were 'thrown' and another manger made.

A new carthouse was built in 1272. The woodwork cost 8s. 4d., the key 3d., laths 2d., daub 3s., reeds 1s. 7d., 'throwing' the clay 7d., walling and thatching 2s. 3³/₄d. and wattles and withies 1s. 3¹/₂d., a total of 16s. 6¹/₄d. The daub was mended in 1288 and the thatch repaired in 1312 and 1317. In 1319 laths to the value of 2s. 8d. together with lath nails and large nails costing 1s. 10d. were bought and the whole building, with its partitions and walls, was repaired by Thomas the carpenter and his two men at a total labour charge of 9s. 4¹/₂d. and a total bill for the job of 13s. 9¹/₂d.

The pinfold has a solitary mention in 1334 when two hingepins and twenty lath nails were bought to repair the gate. It is not apparent whether this was for manorial animals, in this case cattle, as there were no sheep on the manor at the time, or for animals straying on to the demesne.

THE YARDS

The manor was surrounded by walls. In 1263 earth was gathered and thirteen perches - seventy one and a half or ninety one yards, depending on the length of the perch - of wall were made. This was apparently a wattle-and-daub wall as wattles to the value of 1s. 6d. were bought. Clay was 'thrown' for cresting the wall, so it must have been more than a few inches thick. Sixteen perches of wall on the east side of the court were thatched and crested in 1287 and several other accounts testify to the practice of cresting with clay and thatching the walls. In 1334 two men made a wall on the south side of the manor, a little wall between that wall and the tithe barn, another little wall between the tithe barn and the cartshed and a wall running from the granary to the lord's barn, a total of sixty six or eighty four yards in eight days. These, too, were crested and thatched. In 1404 two daubers daubed and repaired the walls on the east side of the rectory (i.e. the priory manor-house) and Richard Thaxter and his servants thatched and crested the walls about the rectory. Four cartloads of hay were bought for thatching the house and the walls inside the rectory in 1406 and in the following year six cartloads of 'starr' - probably sedge - were bought for the same purpose. The walls round the manor on the north and west were thatched in 1410.

A 'great' gate or door is mentioned in the accounts. In 1312 a carpenter spent three days mending magnas portas et portas ad hostium aule. Hostium, generally translated as door, seems here to mean entrance or even porch, perhaps leading to a screens passage. These gates or doors were locked or bolted. In 1404 they were broken down by the

wind and a carpenter spent four days repairing them. A small gate is mentioned in 1320. In the thirteenth century the land enclosed within the walls was known as the court. In 1255 the hedges about the court - probably on that part of the boundary that was closed with a wall in 1263 - were repaired and the walls against the greater and inferior courts were mended and crested. In the same account a man was paid for four days' labour in cleaning the court which was then dug and planted with vegetables. Another part of the court was dug twice and planted with a bushel of hempseed. In 1257 the court was cleaned out and ploughed. This 'cleaning' may have been clearing it either of weeds or of cattle dung. A door to the 'curtilage' was made in 1272. This may have been the same doorway for which a door was made in 1311, but on that occasion it was described as a door to the garden and constructed of five willow boards, an unusual type of wood for a door. It had a bolt, which may have been simply a catch to prevent it swinging. Vegetables were mentioned in several accounts and in 1373 an entry in the receipts section 'and of the fruits of the garden this year nothing' suggests that the surplus was sometimes sold. Several of the thirteenth-and-early-fourteenth-century accounts record the receipt of a few pence for the sale of fruit (pomis). Stacks of rye and peas in the court were thatched in 1340.

The water-supply of the manor is mentioned only a few times in the accounts. In 1396 and 1404 a hoop and a cord were bought for the fons and in 1391 and 1393 the fons was cleaned out at a cost of 10d., implying perhaps two days' work by a pair of men. The fons in this case was almost certainly a well.

LATER HISTORY OF THE PRIOR'S MANOR-HOUSE

The compotus of 1383-4 shows that the manor was being farmed by John Hayward, but by 1393-4 it was back in the hands of the prior. It may have been leased soon after the date of the last surviving compotus (1410-11). As the demesne was not included in the survey of 1454 it is impossible to say whether it was being farmed at that time. The earliest surviving lease is dated 1496, to John Sohame late of Beetley, 'courteholder', and concerns the site of the rectory with all buildings, lands, rent, etc.¹⁸. In 1538 it was leased to Robert Thwaiyts or Thwayte and his assigns for fifty years, the lessor to repair all the houses, buildings and fences on the site¹⁹. A fresh twenty one year lease to Thomas Franklin was made in 1560, but the rectory house was separated from the manor by a lease of 1567, when Thomas Gooche took over the farm on a ninety nine year lease, presumably leaving the Franklins in the rectory house²⁰. In 1586, however, the lease of the site was granted by John Townsend of West Dereham to Henry, Lord Cromwell, who held it at his death in 1592²¹. The lease was reckoned to have sixty nine years to run in 1597 and to be worth £800²². The lease of the house was not conveyed to Edward Coke with the other Cromwell property but was granted to James Cromwell, 'cousin' of Henry Lord Cromwell, in August 1598. The property was described as 'the Parsonage howse of the said northelmham with the garden orchard and yard thereto adjoininge nowe inclosed & dytched in together with the same Lyinge neere unto the Lords closes called the Campinge Close and halcrofts'²³. The grant was for twenty one years.

James Cromwell died in 1613. His probate inventory shows that his house consisted of a parlour, buttery, maids' chamber, parlour chamber, buttery chamber, chamber at stair head, hall, kitchen and study²⁴. The inventory is transcribed at Appendix B and a possible reconstruction of the house from the inventory appears at Fig.270. The hall contained only firewood, a ladder, three beeskeps, a few garden tools, a cider-making trough and a four-footed stool. The parlour was the main living-room, with tables, stools, a bedstead - a usual furnishing for a Norfolk parlour of this date - and, unusually, a large fireplace; the two 'hookes of Iron in sted of hakes & a barr of Iron in the chimney' suggest that it was used for cooking. Next to it was the buttery, with stores, barrels, implements and tableware. The maids' chamber and the buttery chamber were probably small rooms over the buttery, and over the parlour was the parlour chamber, which shared the chimney-stack with the parlour and contained the only other bed noted in the house. The chamber at stair head has been placed in the attic of this range. No hall

chamber is mentioned, so it is probable that the hall was open to the roof. The kitchen, which held the pewter, cheese-making and brewing utensils, and the cooking pots has been placed at the end of the hall furthest from the parlour range, a common late-medieval and sixteenth-century position; but it could well have been a leanto on the back of the hall. Outside was a stable. No barns are mentioned, but then none was included in the grant of 1598.

Unfortunately we cannot be certain that this was, in fact, the rectory house. James Cromwell is rather a shadowy figure. He left a son, Henry, who does not appear in the Elmham registers and presumably lived away for much of his life. The next reference we have to the rectory house is in 1622 when the site of the rectory together with the glebe, tithes and rent was leased by the Dean and Chapter to John Skeet of Norwich, yeoman²⁵. The Parliamentary survey of c. 1650 lists a house and a homestall of one acre worth £2 10s. per annum and great tithes worth £40, all leased to Sir Edward Coke but now 'come to Mr Peapes'²⁶. John Spooner, gent., rented it at some time between 1653 and 1663, but otherwise its status during the Interregnum and the legal muddles that followed the mismanagement of John and Edward Coke is not known. In 1671 the site of the rectory 'with all the houses edifices & barns being scituate and builded within and upon the said scyte' plus the said scyte' plus the glebelands and tithes was leased for twenty one years to Sir Thomas Davies and Robert Harvey, Esq., both of the City of London, by the Dean and Chapter²⁷. Harvey and Davies were executors of the will of Hugh Awdley, the mortgagee of the Coke estate²⁸. Edward Harvey lived in Elmham from 1669 at the latest (Legge 1891, 186) and it is possible that he occupied the rectory. The house in which he died - reconstructed from his inventory in Fig.270²⁹ - is certainly nothing like James Cromwell's, but one of the four barns in it is called the 'Tyeth barn'. This was almost certainly the rectory tithe barn, but this does not, of course, necessarily mean that Harvey was living in the rectory house.

Harvey's house was a large one with fourteen rooms and outbuildings. In the main wing of the ground floor were the parlour, with the usual living-room furnishings, a bed, and fireirons; the kitchen, with typical kitchen furniture, cooking vessels and fireirons for a cooking fireplace; and three smaller rooms - a backhouse, which acted as store room for the surplus cooking pots, a pantry, which held pewter and, presumably, food, and a dairy with milk and cheese vessels. Attached to this wing was the cellar, perhaps in a semi-basement³⁰, with the cellar chamber over it. There were two chambers over the parlour, two more over the kitchen and one each over the dairy and backhouse. In the roof was the garret chamber. Outside were the granary, partly filled with twenty five coomb of wheat, mixtlin, oats and buckwheat; four barns; a carthouse; and a stable. The tithe barn held forty coomb of mixtlin, thirty of barley and twenty of oats, a low total for January if this were all the lithe corn of the parish. He may, of course, have already sold most of the tithe corn or perhaps compounded for a money settlement in lieu of the actual grain. Moreover, disposed among his other barns we find fifteen coomb of rye, thirty two coomb of peas (which were accounted small tithe here and so went to the vicar), fifty coomb of mixtlin, fifty coomb of wheat and 161 coomb of barley. He also had £4 worth of turnips and a fair amount of livestock. Among his goods was £20 worth of 'stall stuff for the fair'; the Fairstead was adjacent to the rectory site.

The absence of a hall in Harvey's house might be considered a strong argument against the idea that this was the rectory manor-house. This is not necessarily so. Harvey's kitchen was probably in a position typical of a late-medieval hall and its furniture would certainly not have been out of place in a hall of eighty years before. In other words, the name of the room may simply have changed. The whole house was definitely old-fashioned in its arrangement as well as in its furnishings. The only obvious 'modern' furniture was the ten leather chairs and the couch in the parlour - which also contained a bed, as a sixteenth-century parlour so often did - and eight cane chairs in the parlour chamber.

Documentary evidence, such as it is, seems to point to the identification of Harvey's house with the rectory. The fact that it was certainly a much larger building than the house that stood there until recently need not argue against this identification, for the latter could well have been a fragment of a large old house, modernised in the eighteenth or nineteenth century and clad in flint and brick. If it was the rectory, we are left with three possibilities for James Cromwell's house: either he was living in only part of the manor-house, or he had ceased to live in it some time before his death in 1613, or the old rectory had been replaced, or at least drastically modernised and added to, before Harvey's death in 1685. Cromwell almost certainly lived in a house other than the rectory before 1597 as the 'consideration' of that date seems to separate the parsonage from 'the howse wher Mr James Crumwell dwelt' ³¹. There is no other evidence for a positive identification. The other possibility, Nowers' manor-house, does not fit the description in Cromwell's inventory.

In 1683, two years before Harvey's death, the rectory site was leased by the Dean and Chapter to Sir Charles Cesar as three acres 'with a messuage Barn & Stable there-upon built comonly known by the name of the Parsonage house, with an orchard and garden to the sayd messuage adjoyninge' ³². If this single barn was the tithe barn, Edward Harvey's other barns must have been elsewhere, possibly on adjacent land - or, alternatively, Harvey's house and barns were elsewhere, with the tithe barn on the rectory site. In 1692 and 1700 it was leased to Cesar and Robert Harvey of Low Leyton, Essex, and subsequently to John Harvey of New Buckenham ³³. In 1723 Richard Warner took over the lease and it remained with him and his heir, Richard Milles, until 1801 when Milles purchased the site with glebe, tithes, lands and wood for £5,967, exclusive of £562, the value of the full-grown timber, which was to be used for the repair of the cathedral in Norwich ³⁴.

III. NOWERS MANOR-HOUSE

The manor of Nowers seems to have been created out of the chief manor some time in the middle of the thirteenth century (Carthew 1877-9, 279, 285). The confirmation of the grant by Simon de Walton to his valet, Reginald Daubenye, alludes to a messuage with lands. This messuage was probably on the site of Nowers manor-house. Nothing, however, is known about the house until the sixteenth century. Abuttals of 1568 fix its position as that of the modern Grange Farm ³⁵. In 1572 Thomas Franklin, yeoman, sold to Henry Lord Cromwell

all that mannor tenement of messuage nowe knowen or accompted for the scite of the mannor of Nowers in Northelmham aforesaid otherwise called the place with all the edifices orchards gardens yards dovehouses and other hereditaments and appurtenances to the same belonging ... together with all the glasse locks keys sealings doores gates benches covers and drawers of windowes in upon or abowte the said premisses ³⁶.

The 'covers and drawers of windowes' were shutters. It was leased in 1593 to William Hill of North Elmham and Wolleye, Hunts., as the house 'lately called by the name of the mannor of Nowers and nowe commonly called the Graunge' ³⁷. A note appended to this lease gives the fittings:-

Imprimis dores to all and ev'ie chamber hawle & office of the saide Graunge
 Item one lock & key to the chamber ov' the hall
 Item one lock & key to the owld hall dore
 Item one lock & key to the buttrey dore wth two beare seates and two shelves
 Item one lock & key to the myddle howses
 Item a lock & key to the kitchine dore
 Item a lock & key to the dary hows dore
 Item a lock & key to the Chamber dore ov' the kytchin

Item a lock & key for the chamber dore ov' the dayrie howse
 Item a locke & key for the mawlt howse dore
 Item a lock & key for the kelne hows
 Item one new hear cloth for the kilne
 Item in the chimney in the hall one bar of Iron and thre hookes of Irone
 hanginge theron.

In 1572 it also contained a 'backehouse', possibly a bakehouse³⁸. The mention of the chamber over the hall and the hall chimney shows that it was a modernised, if not a relatively new-built, house. Could this have been 'the dwelling howse ... the building wherof cost a great some of money' of the 'Consideration' of 1597?³⁹ James Cromwell lived in a house 'neere adioyning' to that dwelling house, but as his house was 'not valewed or rented' it is possible that it was in an advanced state of dilapidation. Another indenture at Holkham, however, complicates the story. In 1599 Coke demised and farmed to Edward Wyborowe of Longham, yeoman, 'The mansion howse, lying ... between the Capital messuage of the said Edward Coke of the southe, and the orchard of John Denny of the Northe with the yards & orchards thereunto belonging or appertaining together with the tythes of the Rectory & parsonage impropriat of Northelmham' together with a large barn⁴⁰. This can hardly have been the rectory house, which, as we have seen, had been leased to James Cromwell the year before under the description 'one messuage or Tenement ... being the Parsonage howse'; in any case, Cromwell's lease did not include the tithes. The abuttals in the 1599 lease, however, seem distinctly odd if applied to Nowers' manor-house, for although the 'Capital messuage' might be held to mean the Tower Hills site, Nowers' manor-house hardly abutted on to it and by 1599 Nowers' was called the Grange anyway. The capital messuage referred to must, therefore, be the relatively new house of the chief manor, which was still standing in 1678 (p. 537). John Denny of Huntingfield in Suffolk inherited Edmund Denny's property in Elmham in 1592; Edmund Denny had held Le Bell and a quantity of land in the old market-place to the west of the church and to the north of the suggested site of the sixteenth-century manor-house.

From 1598 Nowers' manor descended with the main manor in the Coke, Harvey, Warner and Milles families.

IV. THE OLD HALL

This is a puzzling building, with virtually no documentary history discovered so far. It is built of flint with brick dressings. The north gable, rebuilt this century, has a re-set panel giving $\frac{D}{IC}$ 1669, a date consistent with the brickwork of the rest of the house. The entry is by a door in an almost completely retracted porch at the south end of the main range with a blocked window above it. To the south of this is an added bay of brick with an inset panel-painting over the fireplace which probably dates from 1730-40. This bay is evidently a rebuilding of an earlier range, as the bridging joist running north to south is not in the centre of the panel as one would expect at that date and flint footings have been discovered beyond the present south gable. There are good beams in the other ground-floor rooms and a displaced cast-iron fireback with Aesop's fable of the fox and the stork and the date 1697. The main stack in the older range has three flattened hexagonal flues with plain caps and footings and there are kneelers on the gable-ends. The main barn is probably of the early eighteenth century and has a tie-beam roof with collars and scissor-bracing.

It is surprising that a house of such quality should not be better documented. It is possible that it belonged to one of the smaller freehold estates. By 1829 it had been incorporated into the Milles estate, but no documents have been found in the Sondes collection which appear to relate to the house. The name, 'Old Hall', would seem to make it the predecessor of Richard Warner's hall (built before 1734) in the New Park; Carthew,

in fact, says that Warner may have lived there before he built the new Hall and Warner certainly resided in Elmham from at least 1707 (Legge 1891, 188-9)⁴¹. It may be that the name Old Hall dates from Warner's time, but its earliest documentation is in 1829⁴².

V. THE NEW HALL

This was probably built by 1734, when Richard Warner threw down the hedge beside Lawndgate way, and was certainly standing by 1748⁴³. It was a handsome mansion of brick, some 60 feet long and of five bays with a central door; there was a basement, two main floors and an attic storey topped with a solid balustrade with recesses echoing the window-pattern. The quoins were rusticated and it looks nearer to 1720 than to 1748. Two flanking lodges of three bays and one-and-a-half storeys each were connected to the house by short passages (Blomefield 1810, IX, opp.489). Plans were prepared soon after 1820 for the addition of two wings to the house and the concealment of the neat early-Georgian front behind a portico of six giant Ionic pillars. The portico was not built, but the wings, of three bays each, replaced the lodges and either then or shortly afterwards the face of the house was modernised, the rustication between the two outer bays and the three inner being changed to shallow giant pilasters with plain capitals and the columned and pedimented doorway giving way to a rusticated frame enclosing a window. The strong course between the attic storey and the balustrade was also removed and the two ground-floor windows in the outside bays of the front had their sills dropped to match those in the new wings.

This house went into decay after the sale of the estate in 1919 and was demolished in the early 1920s. The present neo-Georgian house is set some 150 yards north west of the site of the old house. The park, which may have been laid out by the middle of the eighteenth century, was fully developed by about 1800 except for the small addition made in 1831 by taking in the site of the old market-place (Bell Green) and the blocking of the old Walsingham Way. The lake, of eight-and-a-half acres, was formed by damming the Town Beck. Traces of the lines of the old furlongs of Westfield can be seen on the early editions of the Ordnance Survey maps and the remains of a broad avenue of oaks and elms stretch across the south east corner of the park in a direct line from the former Hall. Nothing has been discovered about the designer of the park. James Grigor visited it shortly before 1841. The entrance to the hall opposite the church was then overshadowed by lofty specimens of limes, chestnuts and oaks, 'somewhat formally disposed, but exhibiting many of the honours of mature years'. These must have antedated the creation of the park and must, therefore, have belonged in part at least to the open field system. One of the oaks was seventeen feet in circumference. There was a group of Holm Oaks on the north side of the Hall, about forty feet high and eight to nine feet in circumference, acquired, no doubt, from the Holkham estate. A 'recently-formed' collection of conifers included the Deodar, Cedar of Lebanon, Big Cone Pine, Digger Pine, Monterey Pine, Corsican Pine, Mountain Pine, Stone Pine, Weymouth Pine, Mexican Pine, Douglas Fir and West Himalayan Spruce. The pleasure-grounds were delightful and there was a fine collection of fuchsias and many trained and exotic shrubs (Grigor 1841, 169f.). Hall Farm, an extensive range of farm buildings with decoration in the Tudor manner, was built at some time between 1831 and 1839⁴⁴.

VI. HOUSES FROM THE PROBATE INVENTORIES

(Figs. 270 and 271)

THE EARLY PERIOD 1590-1640

The probate inventories of the various ecclesiastical courts form an extensive quarry for the building historian. Norfolk had three such courts - the bishop's or consistory court and a court for each of the two archdeaconries. No inventories for the archdeaconry

Houses from the Probate Inventories

of Norwich, in which Elmham was placed, survive before the later seventeenth century, but there is a very good series from the consistory court from 1580 onwards. Unfortunately, Elmham is not so well represented in this series as some comparable villages - Shipdham, for instance, has thirty nine inventories surviving for the period 1584-1614 - but there are fourteen inventories left for this early period. All of them are in the form of room-by-room descriptions, enabling reconstruction of the houses to be attempted. They fall naturally into two groups: six small houses, consisting of one to three ground-floor rooms, and eight medium-sized houses of between four and seven ground-floor rooms.

The medium-sized houses are analysed in Appendix A. Four of them - Lusher's, Smith's, Hancock's and Cooper's - can be reconstructed as basic three-cell houses with additions. In the annotations made c. 1567 to the survey of the manor, Thomas Lusher held a messuage, formerly the tenement 'Trimme', with three acres of land standing alongside the track that ran from Lynn Way to Pirles Green, just to the north of the present vicarage. He also held seven cottages and two-thirds of a cottage and thirty-one-and-a-half acres of arable. One of the cottages, 'not built' in 1454, stood near the messuage but the others were all near the church and three of them were 'built' in 1454 (VII, VIII, LVI). It is, unfortunately, impossible to be certain about the state of the messuage and cottage c. 1567, but it seems likely either that Lusher lived in the messuage rather than any of the cottages or that he lived in a house which was outside the manorial structure and, therefore, not recorded in the survey. It is, of course, possible that his house was on a site not built upon in 1454. Wherever it was, it seems to have been a straight-forward three-cell house with hall, kitchen and buttery in line. The hall, with pewter utensils, a long table, a form, two chairs and three stools, was the eating room; it had a fireplace with fireirons but no cooking pots which were in the buttery next door. The buttery must have been a fairly large room, for it contained six barrels as well as all the kitchen implements and, presumably, the food. The appearance of spits and a latchpan (i.e. dripping pan) in the buttery may indicate that it contained a fireplace, although it is also possible that the cooking was done in the hall. The 'kitchen' contained a bedstead and some sparse furnishings, but no actual cooking utensils. Adjoining the buttery was a milkhouse with a store room/servant's bedroom over it. Upstairs, each of the three main rooms had a chamber over it. There was no furniture listed in the roof. The backhouse, with baking implements, together with the malthouse and 'the chamber next to the gate' may either have stood in a separate range, as in the reconstruction at Fig.270, or have been attached to the house at right-angles.

The house of Thomas Smith, vicar 1580-1631, reconstructed in Fig.270, was another basically three-cell building with a wing at right-angles. His inventory is in Appendix B. The house was unusual for the time in not having a 'hall'. On either side of the axial chimney-stack stood the kitchen and the parlour. The kitchen contained cooking pots and open-fire implements - spits, pothooks, hakes, dripping-pan - and the parlour was evidently the eating room. At the other end of the central room, here called a kitchen but in other inventories the hall, were a buttery and a dairy, with a brewhouse leading off the buttery, perhaps at right-angles. Smith's study, containing his books and six quarts of rosewater, was over the kitchen and next to the kitchen chamber, which must have been a small room for it contained only a table. The parlour chamber was the main bedroom and from this a small stair or ladder led to the vance roof, an East Anglian term of uncertain derivation for the attic or garret. Here it was simply a store room. Over the buttery end of the house was the corn chamber, at this time usually a room in the upper storeys, and there were two small chambers over the brewhouse. Outside were store-house, stable and barn, and a yard with a draw-well. There is no evidence that this house either was or was not the vicarage (p.536).

Thomas Hancocke's house was of an apparently simple three-cell plan. The hall contained all the cooking utensils and implements, together with two tables, two chairs and four stools. Next to the hall the prisers listed the contents of the boulting house:

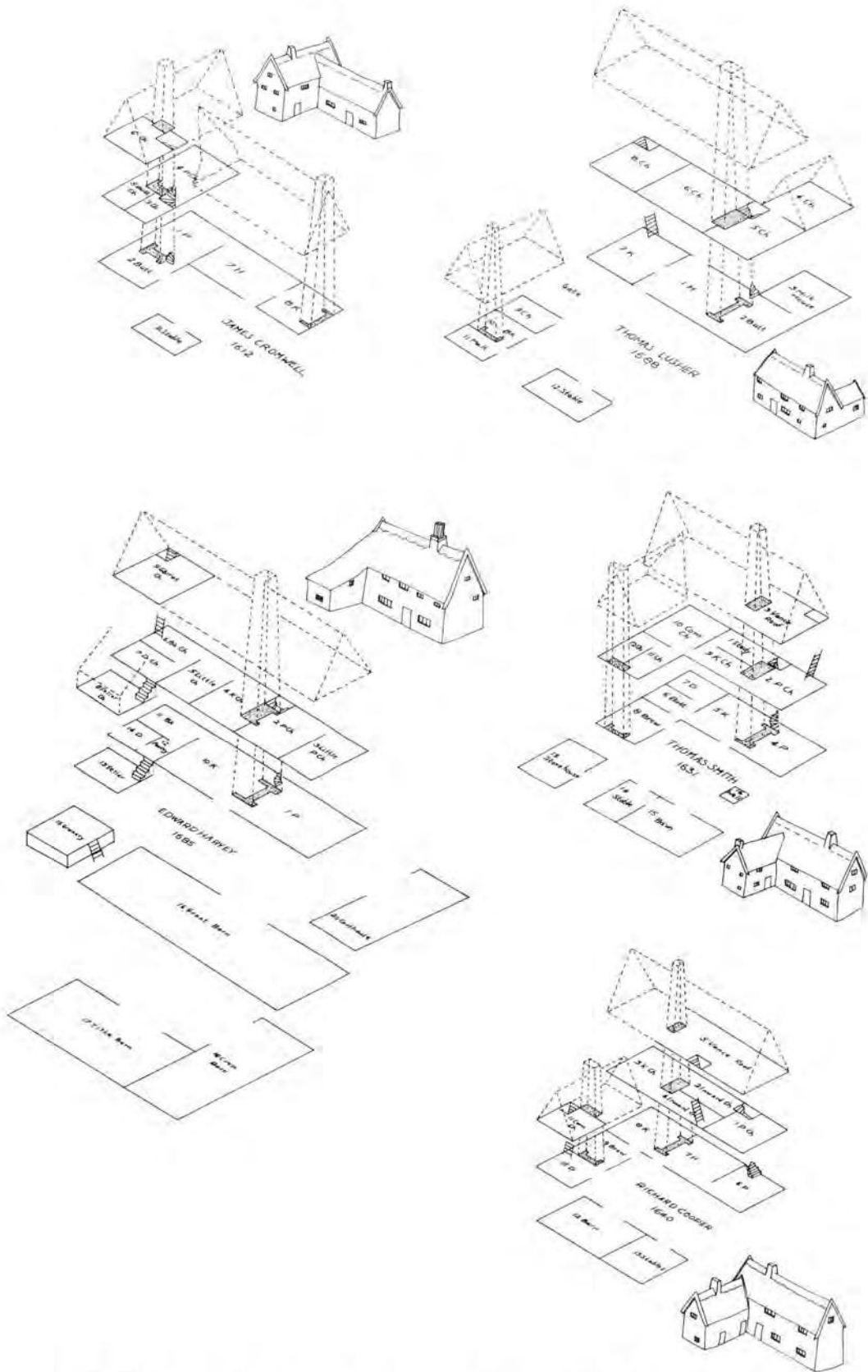


Fig. 270. Houses reconstructed from fifteenth-and-sixteenth-century probate inventories.

bowls, tubs, trenchers and a 'minging trowe' or trough for making dough. As a buttery chamber is mentioned later, we can assume that this boulting house was in fact the buttery. A parlour, sparsely furnished with a long table, a chest, a form and a pair of tables (probably a gaming board), completed the ground floor. All these rooms were chambered over; the hall chamber was the main bedroom and the parlour chamber contained only a few items of furniture, the household linen and the dead man's clothes. The buttery chamber had two bedsteads; Hancocke had at least three children. The furnishings suggest that the parlour bay of the house was comparatively small. Only the hall had any fireirons, which may indicate that the stack was attached to the side of the house rather than being axial. Hancocke's profession is not known; no corn was included and his only livestock were two young pigs.

Richard Cooper's house is rather more of a puzzle than Lusher's, Smith's or Hancocke's. The hall, as in James Cromwell's house, contained very little, with no mention of fireirons. The parlour, too, was apparently without a fireplace, although it was furnished as an eating room. The kitchen contained all the cooking implements and utensils and provided the one certain fireplace. The itinerary of the prisers began in the parlour chamber, undoubtedly the main bedroom, and continued through an inward chamber to the kitchen chamber and thence to another inward chamber. They ended in the vance roof where the cheese was stored. After that they went downstairs to the parlour, continued through the hall and came to the kitchen. The brewhouse, the dairy and the first-floor corn chamber were probably in a right-angle wing. In the reconstruction at Fig. 270 the house is depicted as a basic three-cell house, with the two inward chambers formed by the division of what would, in other houses of the type, be the hall chamber. This conforms with the general pattern for three-cell houses, in which the hall is the central room. In this case the absence of fireirons and the general sparseness of the hall furnishings cast some doubt over its position as the primary room. It is possible, of course, that the house was new-built and that the hall was a mere entrance room, but this would have been an extremely early example of this arrangement and in any case it does not seem to fit in well with the rest of the house. It is far more likely that the house was an old one and that the hall had recently been ceiled to provide the two inward chambers. Cooper had been in Elmham since at least 1626; he was bailiff of the chief manor in the 1630s⁴⁵ and it is possible that he lived in the manor-house built by the Cromwells and lying near the church. In that case it would be difficult to account for the apparent disuse of the hall. The description in his inventory does not fit that of the Nowers' manor-house⁴⁶.

Thomas Heyward's house is another that may well have been of some considerable age at the time of his death in 1590. The inventory is complicated by some ambiguous terminology: the pantry occurs only incidentally as a reference in 'the chamber over the pantry', and the 'chamber over the volt' is a similar indirect reference to the vault. Pantry is here probably another term for buttery. Cellars are not common in contemporary inventories of country houses⁴⁷ but it is not likely that 'the volt' is a chamber in the roof. The hall of Heyward's house contained only a couple of tables and forms and there is no mention of fireirons. The hall chamber - a term that generally indicates the chamber over the hall, not beside it - contained only his clothes, packed in two chests, an old featherbed and four stone of hemp; it is just possible that this was a small room built at first-floor level at one end of an open hall. The parlour seems to have been the main living-room, having a fireplace, tables, a chair and eleven stools. All the cooking gear was in the backhouse, while the kitchen contained only a cupboard, a counter and the pewter. Upstairs was 'over the kitchen chamber'. As no actual 'kitchen chamber' is mentioned, this must mean the room over the kitchen; perhaps the kitchen was simply a small store room. The room 'over the kitchen chamber' and the parlour chamber were the main bedrooms; the latter had a fireplace, probably in the same stack as the parlour beneath it. Outside were a barn, a hayhouse, and a stable.

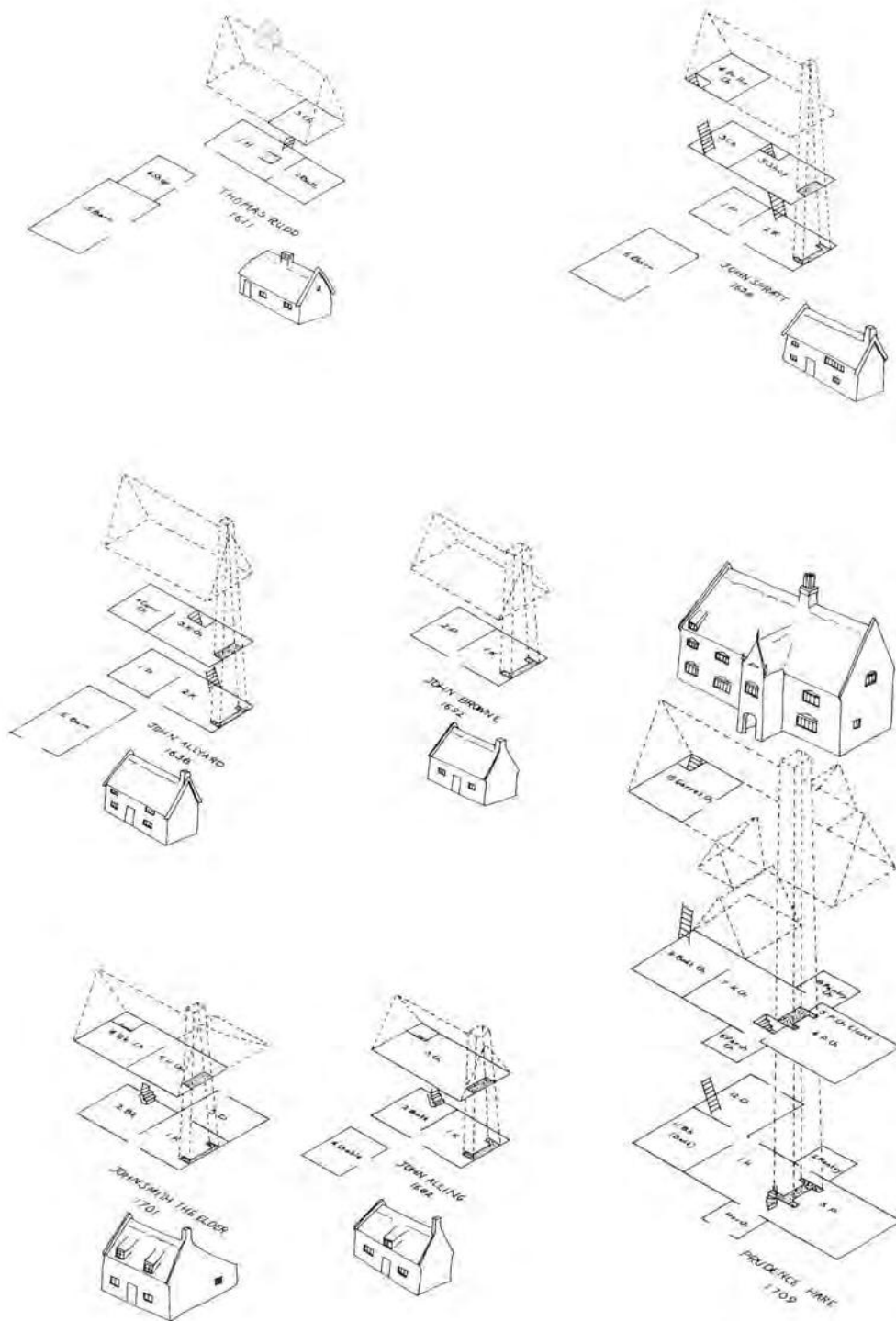


Fig.271. Houses reconstructed from seventeenth-and-eighteenth-century probate inventories.

Francis Guildingwater's house (1635) seems to have been fairly primitive and was probably of quite small dimensions if the amount of furniture it held is anything to go by. The inventory is printed at Appendix B. The parlour was evidently the eating room; the 'six peeces of pewter & ij saults' were probably augmented with earthenware and wooden utensils not valuable enough to mention. The 'Fyer house' held a ceiled bedstead, the cooking vessels and the rudimentary fireirons - hake (adjustable hook), fire pan, tongs and bellows. The dairy room completed the house. As no upstairs rooms are mentioned we can assume that the parlour and the fire house were open to the rafters. Guildingwater was a farmer in a small way, having about twelve acres of growing corn and a small quantity of livestock.

The house of Robert Tare or Taie appears at first glance to be the most primitive of this group. The parlour chamber contained a bed, a stool, two chairs, carpet and curtains and six cushions; the parlour, two chairs and pewter and brass vessels; and the sollar chamber a trunk, linen, grain, butter and cheese. Considering that he had three horses and seventeen acres of land sown with various grains, a house of this apparent size is decidedly small. There are no entries for him in the Elmham registers and it is possible that he may have been a bachelor or at least childless. The name sollar chamber, however, implying a room underneath which is not recorded, raises doubts as to whether this was complete house or only part of one. The word sollar itself was old-fashioned by 1634 - in fact, it occurs in no more than 3% of the Norfolk inventories arranged by rooms that survive from the period 1584-91 - but it cannot have meant a ground-floor room at any time in its history and here, as 'sollar chamber', it must surely have been upstairs. Can it have been an attic room over the parlour chamber? The progression of the prisers - parlour chamber to parlour to sollar chamber - argues against this and it would in any case have resulted in a curiously proportioned building. The most likely explanation is that these three rooms were part of a house, perhaps a divided message or cottage.

Rudd's and Allyard's houses were almost certainly of only one-and-a-half storeys, with upper rooms of a virtually triangular section under the steeply-sloping rafters and lit either by small ankle-high windows under the eaves or by twelve-inch-square openings in the gable or - perhaps more rarely - by dormers through the thatch. The manuscript maps of the period have countless examples of this type of house. The larger houses were of two or two-and-a-half storeys, with wood-mullioned or mullion-and-transom windows in the ground and first floor and gable or dormer windows for the attics. The larger mullioned windows were glazed, but the smaller square windows were probably only shuttered. The local style favoured the gable rather than the hip or half-hip, which was more common in the south of the county near the Suffolk border. What evidence there is suggests that most of the small and medium houses of the period were timber-framed with wattle-and-daub infill. Licence was given in 1630 in the manor court for five oaks on Great Heath to be cut down to repair houses and in 1633 an elm suffered the same fate⁴⁹. Tenants of the manor were occasionally accused of letting their houses decay in woodwork, carpentering, daubing and thatching⁵⁰. There is no mention of any roof covering other than thatch at this period, but it may be supposed that the smaller houses were thatched with straw rather than with the more durable but more expensive and less available reed. There was plenty of suitable clay for the daub, but the amount of timber necessary for even a small timber-framed house must have caused problems (Rackham 1974)⁵¹. There is no certain evidence about the management of Burgrave Wood and the Old Park, but in any case these were manorial woodlands and any timber needed by the smaller tenants must have been bought from the lords or obtained from the smaller trees of the heaths and hedgerows. The main reason why so few Tudor 'cottages' survive today is that they were built of inferior materials - boughs and branches or possibly clay lump - and so simply fell down in the course of time.

The abundance of clay and the comparative shortage of timber suggest the use of clay lump, but few Norfolk buildings in this material can be dated to a period before the eighteenth century, although it must be admitted that, by itself, clay lump is virtually undatable. J.G.Hurst suggests that clay lump was 'a common technique in East Anglia throughout medieval times' (Hurst 1961, 334). The present writer has found no incontrovertible proof in standing buildings that the clay dug in medieval times was used for clay lump rather than daub for timber-framed walls, although it is possible that the walls about the prior's manor-house, for instance, were a sort of clay lump or cob rather than wattle-and-daub⁵².

The medium-sized houses of the sixteenth and early seventeenth century were almost certainly timber-framed. 'Shettles', standing on the west side of the main road, has a south end with a timber-framed upper storey underbuilt in brick, giving the suggestion of

a jettied house. The studs are fairly widely spaced. The centre portion of the house, rising above the level of the timber-framed end, is brick and has a good brick stack with three flattened hexagonal flues at its north end. This and the timber-framed section are probably of the late sixteenth century. The north end of the house is much later. The house was badly damaged by fire in the early 1960s and has been largely rebuilt. It cannot be identified with any house arising from documentary evidence. Another timber-framed house is on the north side of Eastgate opposite the council estate. This is a one-and-a-half-storey three-cell house with thatched roof and a brick stack and from the outside appears to date from the earlier seventeenth century at the latest. The Old Hurdle, a former inn standing on the north side of Ramsley Green, is also partly timber-framed. It is a long, narrow house of one-and-a-half storeys standing east to west and facing the present road. At the western end of the main building stands another and slightly lower bay; the studs of this part can clearly be seen under the surface coating. The main range has two stacks - central, and at the eastern gable, which are of brick, and there is a third stack between the main range and the subsidiary bay. All stacks appear to be fairly recent in their brickwork above the roofline. The whole house is thatched. The earliest reference to the Hurdle that has been discovered is a mention in 1748/9⁵³; in 1829 it was referred to as 'a tenement (formerly the Hurdle)', but it was still a public house in 1839⁵⁴. By 1845, however, it seems to have become a private house, for the occupant is described in White's *Directory* for that year simply as 'carpenter' and there is no evidence that it was a public-house later in the century. The house now known as 'Cornerways', standing at right angles to the main road at the entrance to the deplorable Manor Park estate, bears the date 1640 in a curious position on its backside. The main range of the house is timber-framed. It was almost certainly built as a three-cell house, but the eastern cell has been removed and a single-storey kitchen built in its place. There is a large central room, with a massive bearer-joint running longitudinally from the hearth to an odd position over the doorway to the western cell. The common joists are 'on the flats', that is with their broader sides upwards and downwards. The room next the street, which consists of one bay only, was modernised in the eighteenth century. The roadside gable is brick and can only be dated to some time between 1600 and 1700; there is evidence in it of a blocked door and possibly a blocked window at ground floor level. The main posts of the frame, typically, are wider at their upper than at their lower ends and they and the outer walls incline slightly inwards. There is a fine collar and windbrace roof, typical of the earlier seventeenth century. There is scarcely one true right-angle in the whole house, which is broadly similar to the many examples of three-cell houses of the same period in central and south Norfolk.

Other timber-framed houses may lie behind the flint or brick facades in the main road and in Eastgate. There was a fire in the village in 1683, but the great period of rebuilding seems to have been in the early nineteenth century. By the seventeenth century, however, the incentive to use the fieldstones and flints of the fields and gravel pits must have been great. A very good 'fossilised' flint gable, now unfortunately rendered over, is in the cottage near the Old Vicarage on the north side of the former market-place; the cottage had been enlarged and the earlier gable fossilised in the nineteenth century, but the gable itself was certainly not later than the early seventeenth century. Opposite the present entrance to the grounds of Elmham House is a composite row of cottages, with a fossil gable of fieldstones with square tumbles to the edge and intermittent brick strings, which may be mid-to-late-seventeenth century in origin. There is little other evidence, however, of widespread sixteenth-or-seventeenth-century rebuilding of houses of this type in brick or flint.

The records of the manorial court provide a certain amount of information about houses. The medieval court rolls of the prior's manor are remarkably uninformative about the houses that were transferred in the court, but the sixteenth-and-seventeenth-century court books of the chief manor contain certain incidental information. Two conversions on surprisingly modern lines are noted: a stable and 'lez Hayhouse' were both turned into houses and both were in the occupation of weavers. A 'backhouse' is some-

times mentioned and one entry identifies this with a pistrina or bakehouse. Part of a message called 'Le Parlour cum Cubiculo superinde edificat' was surrendered in 1641; presumably the clerk meant a parlour with a little bedroom over it. A surrender in 1551 was on condition that Agnes Curson, the late tenant, should have sufficient access to 'le fyrehouse' and the garden, together with half the fruits of the garden. A similar surrender was made over two hundred years later, in 1773, when Mary Davy, widow, surrendered a message on condition that she and her three daughters should have 'their Dwelling in the West End or Parlour End of the Message ... with the Chamber over the said Parlour And also the use of the outhouse there to lay Firing in'. In the sixteenth and seventeenth centuries cottage gardens seem to have been fenced in with pales. Barns are sometimes mentioned in manorial transfers of land; a carthouse without walls occurs in 1633 and a neathouse twenty seven feet long and nine feet wide in 1628 ⁵⁵.

THE LATER PERIOD

Eighteen inventories with the rooms named survive for the period 1666-1728. Four of them, analysed in Appendix A, were of medium-sized houses. Edward Harvey's house has been described above in the discussion of the rectory manor-house and is reconstructed in Fig.270.

Nathaniel Duckett was vicar of Elmham from 1631, when he succeeded Thomas Smith, to 1659, when he resigned. He died at his house in Huntingfield, Suffolk, in 1666, but his probate inventory shows that he retained a house in Elmham. This house bears a superficial resemblance to Smith's, particularly in the positioning of the study upstairs, but the differences are enough to make it unlikely that they were one and the same. Moreover, it seems unlikely that either Smith's or Duckett's house was the 'vicarage', particularly as Duckett seems to have retained at least the tenancy of the house in Elmham for seven years after he gave up his living. His will mentions several messages and tenements in Elmham ⁵⁶. The inventoried house was still furnished, but it has an air of disuse about it. The parlour must have been a fairly large room, for it held two framed tables, four chairs, thirteen buffet stools and two livery cupboards. A pair of cobirons, a jack and two pairs of tongs indicate a hearth, possibly sharing the stack with the hall. 'Posts for a bedstead' suggest a room in a state of virtual abandonment. The hall contained cooking implements, a drawleaf table, a small table and four chairs with a 'cold' for the pewter. Next to the hall was the kitchen, probably an old-fashioned preparation-room rather than a cooking room, although it contained a fire fork, a 'cole rack' (probably a grate) and two peels. Also in the kitchen was a 'pumpe swaipe', which could have been either the long pole used as a lever to raise a bucket from a shallow well (the 'shaduf' type of 'engine', certainly in use in Norfolk at the time), or, more likely, the iron handle of a suction-pump. The fourth room on the ground floor was the dairy, here called the dairy chamber and containing cheese-making utensils, a dresser, a stool, two kettles and a few oddments. The 'ciller' may have been a semi-basement under this room which would account for the dairy being called the 'dayrie chamber'; it would have been raised three or four feet above the floor-level of the other ground-floor rooms. The parlour chamber was probably the main bedroom; the posted bedstead was complete with curtains and valance and there were two pairs of sheets in the room, so it is likely that the house had had some recent occupation even if Duckett himself had not used it. The study contained only a great chest and a little chayer; his books were at Huntingfield. The hall chamber probably shared the space over the hall with the study; the presence of a 'cole cradle' in the room does not necessarily mean that there was a fireplace there as it could have been a brazier for charcoal or, indeed, an item simply put there for storage (it is followed by 'one Hay crome & two old tubbs'). Both the kitchen chamber and the hall chamber contained posted bedsteads and there were two more bedsteads in the 'Vancruffe' or attic. It has not been possible to locate this house.

Prudence Hare's house (1709), reconstructed at Fig.271, was probably about the same size as Edmund Harvey's but had fewer internal divisions. In the kitchen were all

the cooking fireirons, although the cooking pots were kept in the pantry. Two tables, five stools and ten chairs show that some meals, at least, were taken in the kitchen. The parlour, true to tradition, contained a bed, together with a table, a 'case of drawers' and eight leather and four turkey-work chairs; andirons and a pair of bellows indicate a fireplace. The parlour chamber also had a fireplace with a closet beside it containing twenty old small books. The house also had a porch, a common feature of brick or flint houses of this size in the sixteenth and seventeenth centuries, providing not only an imposing entrance and a shelter about the front door but also, if it were of the usual two-or-three-storey type, a useful small chamber or chambers upstairs. Here the porch chamber may have been used as a dressing-room or powder-room for it contained the household's only looking-glass. The multi-storeyed porch on the front of the house is sometimes echoed by a similar building at the back⁵⁷ and in this reconstruction, the pantry and the pantry chamber have been placed in this position. The third cell of the house was the buttery or backhouse with a chamber over it having access to the attic (Garret chamber) by means of a ladder or rough stair. The dairy and the dairy chamber were probably in an added leanto building, the chamber occupying the roof space with access only from the dairy. The house cannot be identified. There are no existing houses in Elmham with such a porch, although the Old Hall has a porch retracted into the body of the building. There is some reason to believe that Richard Warner lived in the Old Hall, but as he was residing in Elmham from 1707 at the latest and Mrs. Hare did not die until 1709 there is little coincidence of dates to help with a speculative identification. Moreover, the evidence from the inventory would suggest that Mrs. Hare's house was built in the later sixteenth or early seventeenth century, whereas the Old Hall bears the date 1669.

The house of John Brooke, yeoman (1715), may have been a three-cell house similar in plan to others already discussed. On the ground floor the kitchen and parlour were the main rooms. The kitchen had the only apparent fireplace and also contained a bed in which, perhaps, Brooke passed his last days, for the inventory begins with his clothes, money and debts, and then passes to the bed in the kitchen⁵⁸. The parlour shared with the kitchen the function of living-room, but contained no bed; the 'Bed chamber', possibly also a ground-floor room as it is sandwiched between the parlour and the buttery, also had no bed in it. Upstairs, the parlour chamber held two beds; the kitchen chamber and another chamber malt, corn, wool and leather, and the corn chamber, probably over the buttery, more malt and forty stone of cheese. The buttery may have shared the third cell of the house with the Bed chamber, and the backhouse and dairy were probably out-shuts. Brooke was a fairly well-to-do yeoman, having nearly seventy acres sown with grain, peas and turnips.

The fourteen small houses that were inventoried between 1677 and 1728 are analysed in Appendix A. At first glance they appear to be remarkably alike. All except one have a kitchen and each kitchen has a cooking hearth. Every one of the eight parlours was used as a living-room and seven of them contained a bed. Closer examination, however, reveals many differences and permutations, both of name and use, in the rooms. They can be divided into seven groups,

1. Houses with no upper rooms: Colman, John Browne. (Fig. 271)

Colman's house (1691) consisted of one room, which he called the kitchen and in which he lived, cooked and slept, and a 'shop chamber'. This contained hoops, staves and the tools of his trade - cooper - and seems unlikely to have been upstairs as the shop of a weaver often was. It is not apparent whether this kitchen was a house on its own or was part of a larger, sub-divided, house; it was unlikely, at this date, to be part of a 'long row'. There are plenty of small inventories that give a jumble of living, cooking and sleeping chattels without naming a room. These inventories may well have been of one-roomed cottages, but it is impossible to be certain about that. Colman's inventory, as it actually names the room, at least tells us that he occupied only one room. John Browne's house, consisting of kitchen and parlour with no upper room, was of a type that

appears on many of the manuscript maps of Norfolk and may still occasionally be found in the county ⁵⁹. It is not known how much land Browne held, but he seems to have engaged in brewing, butter-making and cheese-making and the furnishings of his house are no different from those of many similar houses of a hundred years before. Both houses probably had chimney-stacks; Colman even has a coal-grate.

2. Two ground-floor rooms, one upper room: Alling, Lancaster, Overton, Youngs.

The nomenclature of Youngs' house (1711) is distinctly primitive. A 'Low Roome' contained a bed, two chairs and a table; the 'low' probably refers to the ceiling height of an upstairs chamber directly under the rafters rather than a downstairs room. The 'Fyre Roome' was the living room, with, of course, fireirons (hake, tongs, gridiron) and a 'Small Roome' contained barrels and his tools. Alling's house (1682), reconstructed in Fig. 271, had the kitchen as the living-room with two tables, two chairs and two stools, and the buttery as a storeroom with beer vessels and cheeses. There were two feather beds in the chamber, as well as linen and corn. A stable held four working horses and three colts. The main room in Lancaster's house (1682) is not named, but we can safely call it the kitchen. It was furnished very much as Alling's, but also contained a bed. The cooking utensils were stored in the buttery and the chamber held corn and his working tools. Overton's house (1692) was much the same, but the ground-floor rooms were called kitchen and parlour (see Appendix A). The kitchen had four chairs, a table and a bench, but the parlour was probably the main living-room. It held a cupboard, a livery table and another, probably larger, table, with seating on chairs, stools and a bench for six or seven people. The main bed was also in the parlour. Another bed was up in the chamber, among hemp, hops, salted meat and an assortment of tools. None of the chambers in this group of houses shows signs of being more than an attic reached, perhaps, by a simple ladder and lit by a small dormer or hole in the gable.

3. Two ground-floor and two upper-floor rooms: Wakefield.

The kitchen of Francis Wakefield, alias Shackle, wife of Henry Wakefield (1677), contained a large fireplace, tables and forms and a bed with tester. The dairy may have been the other half of the house with the bed chamber over it. The kitchen chamber contained only a trundle bedstead, a coal cradle (presumably not in use unless it was a charcoal brazier) and some corn. As a general rule it is not possible to be quite so certain about the reconstruction of a widow's house, as the practice of sharing a house with a married child was quite common.

4. Three ground-floor and one upper-floor room: Stolworthy.

As only one chamber is noted in this inventory (1724) it is possible that either the kitchen or the parlour may still have been an 'open hall' type of room. The kitchen, as the successor to the late-medieval hall, is the obvious choice; the fire, however, would almost certainly, by this date, have been enclosed in a hearth and stack. Three tables, five chairs and a bench show that the kitchen was also the common eating-room, although a table and ten chairs in the parlour suggest that this room may also have been used for eating. The parlour also contained the customary bed. The solitary chamber was also a bedroom while the buttery held brewing utensils.

5. Three ground-floor and two upper-floor rooms: John Smyth, Richard Smith.

Two houses that may well have been identical in plan, although the room names and use differ. John Smyth's house (1701) had a kitchen that combined all three functions of cooking, living and sleeping (see Appendix A). Smyth's own bed was here and it may have been brought down so that the dying man could be in the warmth of the kitchen. The backhouse, probably the other part of the main range, held spare cooking-pots and some garden tools. Upstairs, the kitchen chamber held beds and the backhouse chamber farm lumber; both, no doubt, were semi-attics under the rafters. The dairy, which contained

brewing utensils, was probably a leanto outshut. In Richard Smith's house (1708), the kitchen was probably used for eating as well as cooking, although the parlour contained a table and three chairs as well as a 'bedsettle'. Smith himself probably slept in the parlour bed. The buttery, containing the cooking pots, was probably in the same position as John Smyth's dairy. The parlour chamber and the kitchen chamber formed the upper storey. This type of house is quite common in the county, both in timber-framing and flint-and-brick. The stack tends to be in the gable rather than in the centre of the house.

6. Four ground-floor rooms with a varying number of upper-floor rooms: William Everett, Nicholas Browne, Andrew Everett, Jeffrey Browne.

William Everett, singleman, was a relatively wealthy man: £14 in ready money, £73 owing to him, and corn and stock worth £122. His house could well have been a three-cell house, with a central kitchen, parlour at one end and buttery at the other. Everett himself probably slept in the parlour, at least at the end of his life, for the inventory begins with his money and apparel and moves on to the parlour. The kitchen also had a bed in it as well as the only apparent hearth, but the absence of chairs or stools suggests that the parlour was the living-room. The dairy had a chamber over it used for storing cheese and as the prisers seem to have gone up to this chamber from the dairy and then down again to the buttery it may be that the buttery was a leanto adjacent to the kitchen. The parlour chamber contained little besides two beds and the kitchen chamber contained only corn. These two rooms were sandwiched between the parlour and the kitchen in the inventory, suggesting that the stairs may have been beside the chimneystack and that access to the dairy chamber was by a separate ladder. The house of Andrew Everett, carpenter (1707), could be forced into a similar plan, but no connexion between the two men other than their name has been discovered. Here, the main bedroom was the parlour chamber which also contained a 'coulegrate'. Of the two certain ground-floor rooms, only the kitchen has fireirons mentioned. If there were a fireplace in the parlour chamber to accommodate the grate it must have shared the kitchen stack. Some meals may have been taken in the kitchen, but the 'best' living-room was evidently the parlour which, besides linen and bedclothes, contained an oval table and nine chairs, one 'case of Drawers', a small case of drawers, a looking-glass, three cups and five silver spoons. There were two other rooms which may or may not have been on the ground floor (one of them contained a bed) and a chamber, holding corn and tools.

The houses of Nicholas Browne and Jeffrey Browne were very similar, in spite of some differences of nomenclature, and the totals of their estates were almost identical: Nicholas £12 3s. 9d., Jeffrey £12 6s. 7d. Nicholas Browne, labourer (1682) slept in a curtained bed in the parlour which was also a living-room with a hearth and well provided with furniture. Another parlour served as a secondary bedroom and storeroom and must have been adjacent to the kitchen, which was probably used only for cooking. A buttery, probably an outshut, held tubs. Upstairs, furniture was sparse in both the kitchen chamber and the parlour chamber, suggesting a degree of disuse of what was, no doubt, an attic. Jeffrey Browne (1728) also slept in his parlour which had a fireplace, tables and chairs and stools. His kitchen contained pots and the cooking hearth, and a table, four chairs and the pewter. A pantry and a scullery completed the ground floor; it is just possible that this was the same house as Nicholas Browne's and that these two rooms were simply the former second parlour and buttery. In a chamber upstairs were two old beds.

There is nothing much that can be distinguished as 'modern' about any of these fourteen cottages. Comparison with the four cottages described in the early seventeenth-century inventories, in fact, leaves the impression that all eighteen might well have been built in the same period, that is the second half of the sixteenth century, for investigation of all the surviving Norfolk inventories of the 1580s and 1590s shows that all the plans deduced for the houses described above were common then. This is, no doubt, a misleading impression, for the same few types of houses went on being constructed throughout the seventeenth century and for much of the eighteenth. The earlier versions, ex-

Houses from the Probate Inventories

emplified on the manuscript maps of 1580-1630, were almost certainly detached cottages, although there is some little evidence for the splitting of larger tenements. Paired cottages built as such were not common in Norfolk until the end of the eighteenth century.

REFERENCES

Abbreviations used in the notes

NRO	Norfolk Record Office
DC	Norfolk Record Office, Dean and Chapter muniments
Holkham	Holkham Hall muniments, North Wimham MSS.
NRS	Norfolk Record Society
PRO	Public Record Office

1. See references in Chapter 2.
2. DC 4737. For the price of boards, see Salzman (1967), 239f.
3. DC 4738.
4. Despenser was consecrated bishop on 20 April 1370 and died on 23 August 1406.
5. OS 25 inch map (2nd edn.) sheet XXXVII.9; NRO, Road Diversion Order map; Enclosure map, 1831. The enclosure map has the supposed remnant of the bailey ditch as a couple of rounded ponds.
6. Holkham, Compotus No.2
7. Holkham, Bundle 3, No.29.
8. OS 25 inch map (2nd edn.), 261 and 162. Evidence for the identification of the site will be found in Chapter 21.
9. Inf. Mr.P.Futter.
10. To avoid a multitude of footnotes the dates of the compoti are given in the text and the references can be found at Table 106.
11. The early-medieval houses on the excavated site (Buildings AJ and AK) had halls that may have been 40 by 20 feet. The main portions of the aisled halls excavated at Brome in Suffolk were 35 by 14 feet and 37 by 17 feet (West 1970b). In Cambridgeshire, aisled halls of the thirteenth and fourteenth centuries measure 20 by 21 feet (Barrington), 25 by 24 feet (Bourn), and 36 by 25 feet (Kingston) (R.C.H.M. 1968, 9-10, 24, 155).
12. DC 4246.
13. Harrod 1850, 258, where, in a report of 1263, the 'chains, bolts and oaken boards of the windows' of a Norwich house are mentioned.
14. DC 4246. The rooms of the other priory manor-houses given in this document are as follows:-
 - Eaton: (hall), chapel, pantry, bakehouse.
 - Hemsby: chamber, steward's chamber, chapel, hall, buttery, kitchen, dairy, bakehouse.
 - Hindolveston: chamber, hall, kitchen.
 - Hindringham: (hall), pantry, kitchen.
 - Newton near Trowse: prior's chamber, chapel, hall, monks' chamber, pantry, buttery, kitchen, bakehouse, dairy.
 - Plumstead: hall, pantry, buttery, bakehouse, kitchen, dairy.
 - Sedgeford: chamber, hall, pantry, kitchen.
 - Taverham: hall, chapel.
 - Gnatingdon: (hall).

Thornham: no furniture given.
See also Yaxley & Virgoe 1978, 14-22.

15. DC 4246.
16. The exact interpretation of these entries is not, perhaps, certain. The entry for 1309 reads 'in factura j furin' ad plumb & em'daccoe' furni' ad pane'.
17. DC 4734.
18. DC leases (Elmham).
19. Holkham, Bundle 3, No.22.
20. Holkham, Bundle 3, No.22; DC Ledger Books 3, f.12.
21. Holkham, Bundle 4, No.44; Carthew 1877-9, 524.
22. Holkham, Bundle 4, No.72. This would seem to date the document to 1597, the year before Coke bought the estate from Edward, Lord Cromwell; but the document is headed 'A Consideration of lands and leases offered to be sold by Henry Lord Cromwell', who died in 1592. As it was delivered by Thomas Cromwell, Henry's brother, to Coke before the purchase, the date 1597 is to be preferred and we may conclude that 'Henry' is a mistake for 'Edward'.
23. Holkham, Bundle 4, No.99.
24. NRO, INV/26.16.
25. DC Ledger Books 3, fo.379.
26. Lambeth Palace, Parliamentary Surveys vol.13, p.39.
27. DC Ledger Books 5, pp.65 sqq.
28. For the whole business of the Coke estate and Awdley see Carthew 1877-9, 540-6.
29. NRO, Norw.Archd.Inv. 1674-92.100.
30. As in several existing sixteenth-and seventeenth-century Norfolk houses, e.g. the timber-framed house near Mattishall Burgh church.
31. Holkham, Bundle 4, No.72.
32. DC Ledger Books 5, pp.326 sqq.
33. DC Ledger Books 6, pp.114 sqq; 7, pp.39 sqq, 247 sqq; 8, pp.1 sqq, 33 sqq.
34. DC Ledger Books 8-16; Kent CRO, Sondes MSS, T 346.
35. Holkham, Bundle 3, No.30. Neither the house nor its lands was included in the survey of 1454.
36. Holkham, No.38.
37. Holkham, Bundle 4, No.90.
38. Holkham, Bundle 3, No.38.
39. Holkham, Bundle 4, No.72.
40. Holkham, No.102.
41. Warner's son Richard was baptised in Elmham Church in 1707, followed by another three sons and three daughters before 1720.
42. NRO, MS.18623/42; Road Order Box 15 No.1.
43. Holkham, No.148; NRO, NRS 20775.
44. Enclosure and Tithe maps.

45. NRO, MS.504.
46. Cooper's will (NRO, Cons.Court Wills 72 Gibson) mentions his daughters but no sons; his property in Elmham passed to his daughter Elizabeth and her husband, George Williamson, gent.
47. Out of 378 inventories of the period 1584-91 which I have analysed, only eleven mention cellars or vaults.
48. NRO, Norwich Chapter Estates 135471, p.26; Legge 1891, 190.
49. NRO, MS.504, pp.42, 83.
50. NRO, MS.504, p.2; Holkham, Bundle 3, No.143; Bundle 5, No.109; DC, Extracts from court rolls 1585, 1600.
51. A timber-framed house at Shipdham, 54 by 18 feet, surveyed by the writer, contained about 650 cubic feet of timber and would have taken at least thirty mature Norfolk oaks to build.
52. Alterations to an eighteenth-century cottage at East Bilney revealed that it had walls of cob laid down between shuttering - an unusual technique for Norfolk.
53. NRO, NRS 20775.
54. NRO, MS.18623/42; Tithe Schedule.
55. NRO, MS.504, pp.60, 6, 86, 192, 79, 129, 83, 5; Holkham, Bundle 5, No.108, third roll; NRO, Norwich Chapter Estates, 135471, p.47.
56. NRO, Cons.Court Wills, 261 Stockdell.
57. E.g. Brisley Hall, c. 1590.
58. On the other hand, clothes, money and debts often come first in inventories, irrespective of the position of the corpse or the 'best' bed.
59. There is a good example, now disguised by an asbestos roof, at East Bilney.

24. CONCLUSIONS

As a result of the Park excavations and the documentary research, it is now possible to suggest the following sequence for the cathedral area from Middle Saxon times until the nineteenth century.

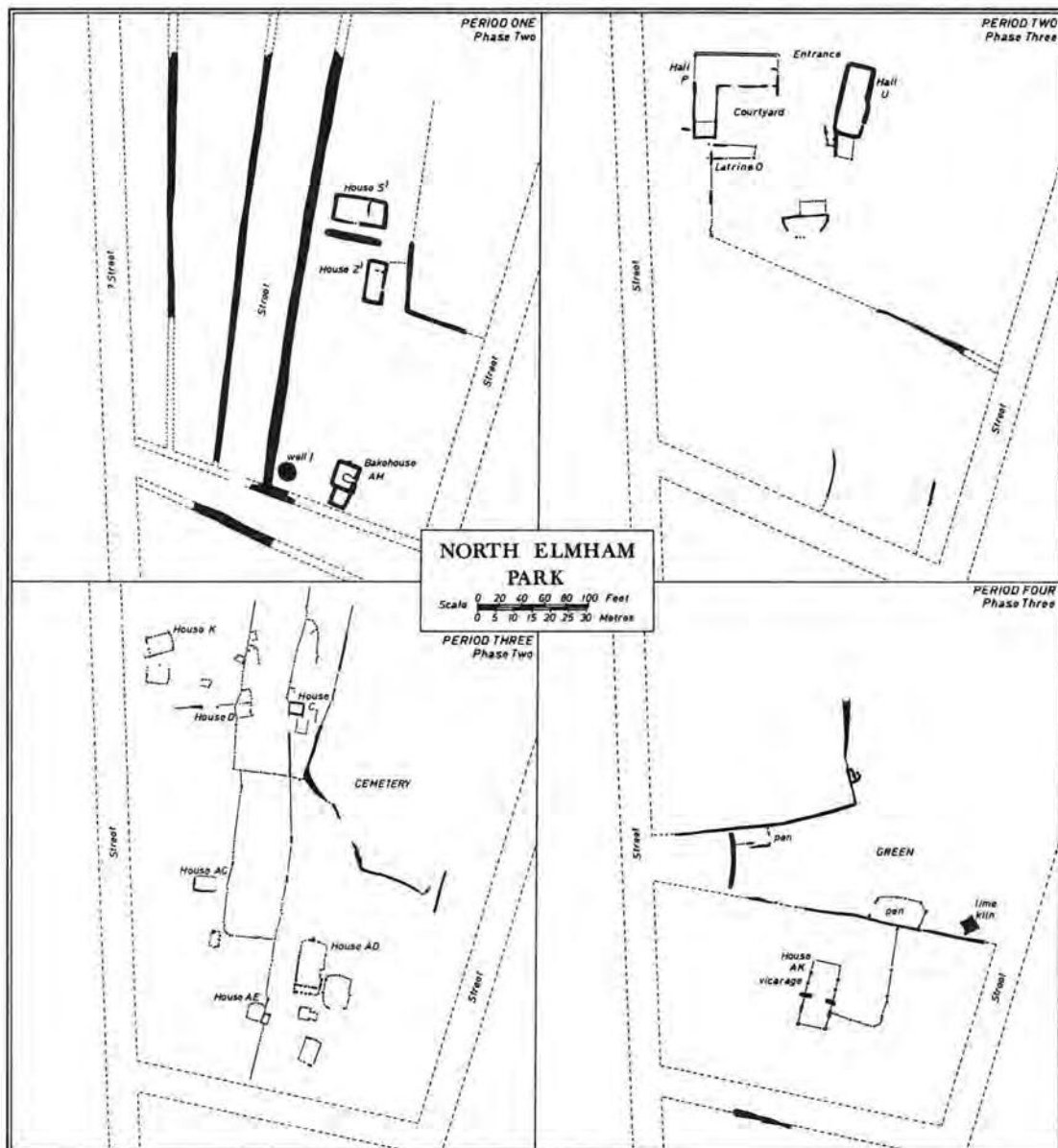


Fig.272. Composite plan showing Periods I-IV of the Park site.

PERIOD I

Although it would be unwise to pre-judge the issue until South Elmham has been re-excavated, there is now enough evidence from the Park excavations to suggest that the see for the northern diocese was located at North Elmham in the Middle Saxon period.

The existence of a major pre-Christian burial ground at Spong Hill, about 2.5 km to the south of the site, may have played some part in the choice of North Elmham as a Christian site perhaps in the seventh century. The earliest dateable finds from North Elmham are two coins dated to about the second quarter of the eighth century; these suggest that there was some occupation near the cathedral by at least the mid eighth century. As excavations progress on Spong Hill it may be possible to link the cessation of burials there with the earliest use of the Christian site. However, this link may well remain tenuous because of the difficulties of dating Early Saxon grave goods and Middle Saxon pottery with any precision. Nevertheless, a possible connection between the two sites will, in the future, have to be considered.

During the Middle Saxon period the settlement was apparently limited to the hilltop around the cathedral site. The excavations revealed three Middle Saxon phases of settlement. The evidence of the first is relatively slight; it consists of two small rectangular buildings and possibly a third. The next phase, with its apparently well-built houses, a regular arrangement of property boundaries and a deep timber-lined well, belonged to a more established community.

The main reasons for concluding that the see was at North Elmham in the Middle Saxon period are: (a) the proximity of the site to Spong Hill (b) its central position in a diocese covering the northern part of East Anglia (c) the apparent attempt to create a regular lay-out to the settlement plan and (d) the availability of the resources and leadership necessary for the construction of the two wells. Against this is the remarkable shortage of pottery and metalwork. Other Middle Saxon settlements in the area will have to be excavated before the significance of this aspect of the site can be fully appreciated.

The suggested Period I sequence is as follows:

PHASE ONE (possibly late seventh century)

Two small houses, H and AA, and a possible early bakehouse

Two small buildings, and possibly a third which may have been a bakehouse, were erected on the site. They were rather widely spaced, perhaps along a central street. Whether the regular pattern of Middle Saxon streets, apparent in Phases 2 and 3, was created at this time is uncertain. But the way these buildings were so widely spaced could suggest that the settlement was planned out with relatively large plots at an early stage.

The early church may have occupied the same site as the Late Saxon cathedral. In Fig. 5 one can see that this point is the highest part of a spur of land which drops away into the Wensum valley to the east and the Town Beck valley to the south. Around this central point the early settlement was apparently organised. No evidence for the original church came to light during the 1954 excavations, but since the natural surface was only exposed in relatively narrow trenches, the negative result this provided is not in itself conclusive. Neither should the absence of Middle Saxon pottery from the cathedral excavation be regarded as evidence that the cathedral stood elsewhere (Rigold 1962-3, 75, 87-106). Any trace of an original pre-Danish church can only be recognised by large-scale excavation.

PHASE TWO (eighth century)

Two larger houses, S¹ and Z¹; the bakehouse, AM; Well I, followed by the boundary ditches A, B, C, D, Fi, G and H

Conclusions

Sometime in the eighth century the two original houses were superseded by larger buildings. Building S shows Middle Saxon house carpentry at its most advanced form with an internal roof span of just over 6 m.

Further south were two structures which served a more communal function. One may have been a small bakehouse which had an annexe to one side. Nearby was Well I which was dug almost 12 m through the boulder clay into the water-bearing sands beneath. It is difficult to visualise how such an engineering enterprise would have been attempted in a village so far removed from the prosperity of trading centres such as Ipswich unless it was carried out under strong central control such as a cathedral or a royal establishment could provide.

At a time subsequent to the digging of Well I, the system of boundary ditches was dug, thus dividing the site into large rectangular plots. How early this took place is uncertain; the ditches could have been cleaned out annually for fifty years at least before the silt and rubbish was allowed to accumulate. The single sherd of Tating ware in the rubbish layer above the primary silt of Ditch B suggests that the fill of this ditch is unlikely to be earlier than the middle of the eighth century; it may even be early ninth century.

The ditches have been phased to the latter part of Phase 2, partly because of the date of the fill of Ditch B, and partly because it is unlikely that the tons of clay and sand could have been dug out of the pit for Well I with Ditch A so close. This ditch was almost certainly dug after the well had been finished, with the bank piled over the top of the infilled pit close to the well opening.

PHASE THREE (late eighth and early ninth centuries)

Houses S² and Z² were enlarged; the earlier ditches were filled with rubbish and Ditches E, Fii and Fiii were dug; Well I was refurbished at about the same time as Ditch I was dug and re-filled and Well II was constructed

Both houses S and Z were enlarged. This may have been in response to a growing prosperity as the bishopric became firmly established. Well I was rebuilt when the upper boards started to decay; also a shallower cistern (Well II) for rainwater was built close by.

The tree-ring-linked radio carbon date for the felling of the oak trees for Well II is 832 ± 30 years. How long Well II was used and regularly cleaned out is uncertain, but it seems that while the shaft was filling up the site lay abandoned. The cistern filled with branches and twigs from surrounding trees, and the seeds of stinging nettle, dock, fat hen and elder in the filling show how the well top had become overgrown. Both well shafts gradually fell in.

Probably at about the time the settlement was abandoned, a building which stood somewhere to the north of the excavated area was burnt down. It is unlikely that this was any of the excavated buildings as there was no evidence of a fire in the vicinity of Buildings S and Z. It is just possible that the burnt rubble in the upper filling of the two wells was from the pre-Danish cathedral or else some other substantial building. It may even be that this was the time when the bishop's throne, now in Norwich cathedral, was so damaged by fire (Raleigh Radford 1961, 115-120).

THE PLAN OF THE MIDDLE SAXON SETTLEMENT

The regular layout of the boundary ditches and the early buildings is a particularly interesting feature of Period I. Although we can see in the excavated area only a part of the total Middle Saxon settlement, there is some evidence of careful planning. It is a pity, however, that the limitations imposed by the present village have so far prevented

further excavation to the east and to the north of the site, for it was to the north east of the excavation that the nucleus of the original settlement apparently lay (Fig.109).

The best evidence we have that the High Street and the street to the west of the site were both used during this period is the Period I plan (Fig.71). This shows that the area of the plot was considerably restricted towards the south end of the excavation where the two streets were much closer together. All three streets seem to have been aligned originally to meet at the present crossing point over Town Beck at the bottom of the hill. If ever the bridge or ford over Town Beck near the village school is replaced, an excavation here might reveal a long sequence of bridges going back to the Middle Saxon period.

In Phase 2, subsequent to the original design, the street in the middle of the excavation was closed off by Ditch G. The east to west street between Ditches G and H then became the southern perimeter of this part of the settlement.

Fig.109 is an attempt to interpret this excavation plan in the light of other nineteenth-century boundaries at the north end of the village which appear to be of ancient origin. The way the alignments of the streets on the east and west sides of the site so clearly relate to the plan within the excavated area is in itself sufficient reason for looking at other boundaries on the Enclosure Award map of 1831 (Fig.8) for other signs of an overall plan for the Middle Saxon settlement. The medieval churchyard appears as a Middle Saxon 'insula' and so perhaps does the next plot to the east. They were separated by a north to south street. Further east interpretation gives way to speculation; but one further block can be suggested from the strange twists taken by Old Hall Road, which once linked the cathedral area to the bottom end of Eastgate Street (Fig.9). The short length of street at the north end of the excavation site is almost parallel to the street which runs along the north side of the churchyard.

The field pattern to the north of the cathedral is quite different; the hedges in this area appear to be of relatively recent origin. Excavation should reveal whether the original settlement extended to the north of the cathedral. The results of field walking in this area have so far been negative.

Within this framework of early streets and boundaries the cathedral stands in a central position. This is the main reason for saying that the original cathedral lies somewhere near to the site of the existing ruins. Although it might be interesting to investigate this hypothesis by a large scale excavation within and around the ruins, a more urgent task is to verify other parts of this plan. Wherever possible there ought to be large scale excavations of all the available areas to the east and south of the parish church if they are ever to be covered over by further village expansion. (When the two new houses were erected in 1972 on the south side of the cathedral in the garden of what had been the George and Dragon public house, an opportunity was lost to verify whether this was a Middle Saxon street frontage. Such an opportunity must not be lost again.)

This settlement plan was created at a time when new bishoprics were being founded frequently in old Roman sites, such as Canterbury, Rochester, Winchester, London, probably Dommoc, Dorchester (for a short while), Leicester, Worcester and York. In south east England only Elmham and probably Selsey were completely new settlements. The settlement pattern at Elmham might possibly have been an attempt by the early community to duplicate a pattern of streets resembling other cathedral towns in lowland England.

PERIOD II

It has been assumed that from about 917, when the area was re-conquered from the Danes, until the 950s East Anglia was administered as a part of the London diocese. The evidence for this comes from the will of Theodred, bishop of London (942-951), who left

Conclusions

possessions for his estates and for a minster at Hoxne in Suffolk. The existence of this subordinate Suffolk see is confirmed by the Domesday entry for Hoxne where it is stated that Hoxne had been the bishopric for Suffolk at the time of Edward the Confessor. So there was a subordinate see at Hoxne both while the diocese was being administered from London before the 950s and also later when it was controlled from Elmham.

But if North Elmham was chosen as the regional centre in the 950s, it is at least possible that it had already been a subordinate see in the early tenth century. In the first half of the tenth century the tradition of two separate East Anglian dioceses may have continued in this way while the area was being administered from London.

Unfortunately, there is no accurate archaeological date for the phases equated with this crucial period; however, the 14C date of 870 ± 90 for a Phase 1 pit fits in fairly well with the suggested sequence set out below.

For the second half of the ninth century, after the cessation of the see subsequent to the last attestation of Bishop Hunberht in 845, the site was abandoned. Desertion of the hilltop is the best explanation for the most remarkable absence of finds in the upper levels of the two Middle Saxon wells. If there had been Late Saxon occupation in the vicinity, Thetford ware sherds and other domestic refuse would certainly have been thrown into them. Instead they were filled only with clean layers of organic clay soil, branches and twigs and a few pieces of Roman tile.

PHASE ONE (late ninth century)

Latrines W and X and pits 44b and 1036

The re-occupation of the site is represented by three latrines (Buildings W and X and pit 44b) and one small well or water pit (feature 1036). At the time some Ipswich ware seems to have been still in use alongside Thetford ware, so this phase should be dated no later than the end of the ninth century. The cess pits were cut through the infilled Middle Saxon ditches which were, therefore, still partly visible, but no longer used as boundaries. The nature of this short-lived phase of settlement during the period of Danish rule is unclear. It is interesting that one of these cess pits contained the only rich group of metalwork found on the site; one of the items is a gilded silver strip possibly from a shrine (Fig.262, No.1).

PHASE TWO (early to mid-tenth century)

Hall U

Sometime after 917 the hilltop was cleared and levelled in preparation for a new minster and its ancillary buildings. The new church was probably on the site of the existing stone ruins. Nearby Building U, the first large hall, was erected. Subsequently this hall was extended by an addition at the south end. In this phase the door opened towards the cathedral. It is possible that this was a bishop's hall, but there is no way this can be confirmed. This hall is dated to the first half of the tenth century on negative evidence - the absence of Thetford ware in the foundation trenches - which contrasts noticeably with the amount of material from the other Period II buildings.

PHASE THREE (late tenth century)

Large Hall P, latrine O and outbuilding Y

In about 954 or 955 Athulf was consecrated bishop of all of East Anglia. The greater prestige this brought Elmham may have encouraged further building work. Sometime in the second half of the tenth century, the east end of the cathedral was replaced in stone, although it is not possible at present to relate this work with any precision to the excavated buildings in the Park. This is a slightly earlier chronology for the cathedral than the one advanced by Rigold (1962-3, 103), who suggests that the first stonework was erected by Aelfric the Black (p.8).

It may have been Athulf who erected the large L-shaped hall, Building P, which stood at the junction between the old main street and the route which led from this street up to the west entrance into the cathedral. The excavated area (bordered on the west by the main street, on the north by the route up to the cathedral and on the east by the road now followed by the present village street) was apparently set aside for the bishop's use, and no other Period II houses were erected in this area.

This possible palace complex was completed by a latrine block (O) on the south side of the courtyard and another building (Y) further to the south. In this phase a porch was added to the west side of Building U. Between the two halls was a wide space which provided an entrance into the courtyard from the minster.

The absence of any major rebuilding of Building P suggests that it was demolished by the early part of the eleventh century. A new palace was erected elsewhere, perhaps on the north side of the cathedral as Stuart Rigold has suggested.

The site was then given over to secular use, and during Period III the Late Saxon village spread over this area.

PERIOD III

The first half of the eleventh century was a relatively uneventful period for the see and for the village. But it was a time when the bishops and those who served the cathedral must have felt increasingly isolated from the expanding urban centres at Norwich and Thetford. The excavations have emphasised the rural nature of the site and there is a remarkable scarcity of rich finds. They have shown that it was very much a rural community of peasant houses which clustered around the cathedral precinct. The excavated area was covered with a patchwork of fenced enclosures containing houses, outbuildings and animal pens. This provides us with a good opportunity to study the layout of part of a Late Saxon village. Period III had two phases and most of the houses of the second phase were considerable improvements on those of the first.

The growth of the population during the eleventh century and possibly the pressure on space around the cathedral led to the expansion of the cathedral cemetery into the excavated area. The burials show that the people were healthy, relatively disease free and familiar with heavy farm work. Although there was a gap in the cemetery fence in the south west corner, it appears that the main entrance was on the south side under the present main road where the street, which runs up the hill from the bridge over Town Beck, entered the burial ground. This emphasis on a south entrance probably coincided with the blocking of the original west door of the cathedral and the making of new doors in the north and south walls of the nave, dated by Rigold to the latter part of the eleventh century. It is possible, therefore, to link the latter part of Period III in the Park sequence with this alteration to the cathedral building. But it is a very tentative link which needs to be supported by much more extensive excavation.

PHASE ONE (early eleventh century)

Houses L, E, B, AR and AS; outbuildings N and AI and ? cemetery

The period began with rather poorly-built dwellings, which were the first to be erected in the area vacated by Building P. In every case these dwellings were small, the roofs were hipped and their ground plans were irregular. Hipped roofing was the traditional style which had remained in use since Middle Saxon times.

PHASE TWO (mid eleventh century)

Houses K, D, C, AE and AD; outbuildings M, J, I, R, AC, AN, AT, AO and AH; pens G and F and cemetery

Conclusions

Gradually during Phase 2 these meagre structures were replaced by houses which in most cases reflected the growing prosperity of their owners. Most of the houses now had gabled roofs, except for C.

At the lower end of the social scale, house C differed very little from its predecessor. In comparison, house K was larger and well built, occupying an important corner site. And house AD was undoubtedly the best example, built by a man of substance. It had two rooms, one of which is best described as a 'hall' in the medieval sense. The house stood in an extensive plot bordered on the east and south sides by streets and on the north by the cathedral cemetery. This house was later replaced successively by house AJ and AK during Period IV, which documents suggest stood on the site of the thirteenth-century vicarage. Building AD was, therefore, the first in this sequence.

PERIOD IV

At the time of the Domesday survey North Elmham was the largest village in this part of Norfolk, but it failed to develop as a centre for trade alongside Norwich and Thetford and the market towns. It was still, in essence, a village with a rural economy based almost entirely on agriculture. The finds provide very little evidence of trade or industry.

Period IV covers the last years of the see at Elmham through to the early twelfth century. While this period represents a continuation of Period III, there was certainly a decline in importance of the hilltop site as an area of settlement at about the time the see had moved away. The number of houses during this period gradually dropped to one, and this house was probably the vicarage.

After the move in 1071 the cathedral probably remained intact for a while and may have served as a parish church until the new church was built on the south side of the cemetery in the early twelfth century.

At least part of the cathedral cemetery was regarded as a piece of common land and this was extended to create a village green where markets were held in the Middle Ages. It is particularly interesting to see archaeological evidence for the formation of a village green out of an area which had previously been part of the Late Saxon village.

PHASE ONE (mid eleventh century)

Houses AD and A and cemetery

House AD of Period III was the first to be erected on a north to south alignment which was typical of Period IV. It was soon followed by house A at the north end of the site.

PHASE TWO (late eleventh century)

Houses T and AJ/AL, outbuildings V, Q and AB and ? cemetery

Houses AD and A were replaced by larger, better constructed buildings. Houses T and AJ/AL both stood within their own large fenced areas in which traces of some of their outbuildings have also survived.

PHASE THREE (early twelfth century)

House AK, pens AF and AG and lime kiln

Finally in Phase Three, in the early twelfth century, house T decayed and was not replaced, but house AJ/AL was followed by a large hall house, possibly the first vicarage contemporary with the new parish church. This house is especially interesting because it was the first with opposing doorways and a cross passage, not unlike medieval

houses, with a two-bay hall to one side and a single bay parlour to the other. A lime kiln found in the excavations may well have been used during the building of the church.

PERIOD V

Clay pits and boundary ditches, and documentary evidence for occupied tofts and market place

It is probable that the cathedral site was retained as a chapel for the Bishop's Manor until it was desecrated by Despenser in the fourteenth century. It is possible that there was some continuity between a Late Saxon bishop's palace standing somewhere near the cathedral and the manor-house which apparently occupied the site before Despenser's arrival.

During the fourteenth century there was a market on the green, which by the sixteenth century was known as Bell Green. The twelfth-century decline of settlement on the hilltop was reversed, probably in the thirteenth century, so that by the mid-fifteenth century the streets around the old market place were again lined with houses; these included the vicarage to the south of the market and the Rectory Manor to the east of the church.

PERIOD VI

Buildings AU, AV, AW and earthworks

It is possible that the excavations to the south of the Park drive located the Cromwell family's sixteenth-century manor-house which replaced the Bishop's Manor.

By 1678 Bell Green was probably enclosed and the old vicarage house demolished. In the 1720s Richard Warner began to lay out his New Park by taking in an area of arable land to the west of the village. At this time the eastern boundary of the Park was Walsingham Way, but this was closed with a Road Diversion Order in 1829 and by 1831 the Park had been extended to include the excavated site.

TABLE 107. INTERPRETATIVE SUMMARY OF THE PARK SEQUENCE

	Possible Dates	Periods	Phases	Phase Dates	Structures	Bishops of Elmham and related dates
MIDDLE SAXON	c.680 - c.845	PERIOD I	Phase One Phase Two Phase Three	(late seventh century) (eighth century) (late eighth and early ninth centuries)	Houses H, AA and possible early bakehouse Houses S ¹ and Z ¹ , bakchouse ΔM and Well I, followed by boundary ditches A, B, C, D, Fi, G and H Houses S ² and Z ² , boundary ditches E, Fii and Fiii, Well I refurbished and Well II	Beaduwine (c.680)... ...Hunberht (845)
LATE SAXON	c.845 - ?c.880		Site deserted			
LATE SAXON	?c.880 - c.1000	PERIOD II	Phase One Phase Two Phase Three	(late ninth century) (early to mid-tenth century) (late tenth century)	Latrines W and X, and pits 44b and 1036 Large hall U Large hall P, latrine O and outbuilding Y	c.890/900 - c.917 c.918... Athulf (955)...
LATE SAXON	c.1000 - c.1075	PERIOD III	Phase One Phase Two	(early eleventh century) (mid-eleventh century)	Houses L, E, B, AR and AS, outbuildings N and AI, and ? cemetery Houses K, D, C, AE and AD, outbuildings M, J, I, R, AC, AN, AT, AO and AH, pens G and F and cemetery	
LATE SAXON/ EARLY MEDIEVAL	c.1050 - c.1150 (overlap with Period III)	PERIOD IV	Phase One Phase Two Phase Three	(mid-eleventh century) (late eleventh century) (early twelfth century)	Houses AD and A and cemetery Houses T and AJ/AL, outbuildings V, Q and AB and ? cemetery House AK (? vicarage), pens AF and AG and lime kiln	Herfast moves see to Thetford (1071)
MEDIEVAL	c.1150 - c.1550	PERIOD V			Clay pits and boundary ditches	
POST-MEDIEVAL	c.1550 - c.1831	PERIOD VI			Buildings AU, AV and AW and earthworks	

APPENDIX A

	living	sleeping	storing	cooking fire	heating fire	workroom		living	sleeping	storing	cooking fire	heating fire	workroom
Thomas Lusher, 1588 Inv/5.154	x				x		James Cromwell, gent. 1613 Inv/26.16	x	x				
hall							parlour						x
buttery				x			buttery			x			
milkhouse							maids' chamber						
chamber over milkhouse		x					parlour chamber		x				x
chamber over buttery		x					buttery chamber						
chamber over hall		x					chamber at stair head						
kitchen		x					hall						
kitchen chamber		x					kitchen				x		
chamber next gate		x					stable						
backhouse													
malthouse							William Kempe, yeoman 1626 Inv/33.234						
stable							parlour	x					x
							parlour chamber		x				x
Thomas Heyward, 1590 Inv/6.36							vansroof over ch.		x				
over the kitchen chamber		x					his lodging ch.		x				
kitchen							kitchen		x		x		
hall chamber		x	x				buttery			x			
chamber over pantry		x					buttery chamber			x			
brewing chamber				x			milkhouse						
malthouse				x			cellar						
malthouse chamber				x			malt house			x			
barn				x			stable						
hayhouse				x			barn			x			
chamber over stable				x									
stable							Thomas Smith, clerk 1631 Inv/37.219						
parlour chamber		x			x		study						
parlour		x			x		parlour chamber		x				
hall		x					vaunce roof			x			
brewen							parlour	x					
backhouse				x			kitchen				x		
carthouse							buttery						
buttery							dairy			x			
							brewhouse						
Edmund Denny, clerk, 1592 Inv/9.56							study above kitchen						
hall chamber	x	x					kitchen chamber						
parlour chamber		x					corn chamber						
kitchen chamber						x	chambers over brewh.	x					
kitchen				x			storehouse						x
parlour	x						stable			x			
Bell hall							house barn			x			
milk house							William Thompson's barn			x			
bell chamber							Robert Handford's barn			x			
							at Goodman Barneys						

	living	sleeping	storing	cooking fire	heating fire	workroom		living	sleeping	storing	cooking fire	heating fire	workroom
Thomas Hancocke, 1637 Inv/44.72							buttery stable barn outhouses						
hall	x			x									
boulting house													
buttery chamber		x											
hall chamber		x					Francis Wakefield, 1677 Inv/60B.19						
on the parlour ch.							kitchen	x	x		x		
parlour	x						bed chamber		x				
wood house							dairy						
Richard Cooper, gent. 1640 Inv/46.111							kitchen chamber		x				
parlour chamber		x					barn						
inward chamber		x					John Alling, 1682 Norw. Archd. invs.						
kitchen chamber							1681-2.90						
inward chamber		x					kitchen	x			x		
vance roof			x				buttery			x			
parlour	x						chamber		x	x			
hall	x						stable						
kitchen				x			Nicholas Browne, lab. 1682 Norw. Archd. invs.						
brewhouse							1681-2.11						
dairy							parlour	x	x		x		
corn chamber							other parlour		x				
barn			x				kitchen				x		
stables							buttery						
John Brooke, yeoman, 1715 Inv/71.232							kitchen chamber		x				
kitchen	x	x		x			parlour chamber						
parlour	x						William Lancaster, lab. 1682 Norw. Archd. invs.						
bedchamber		x					1681-2.10						
buttery				x			(kitchen)	x	x		x		
parlour chamber		x					buttery						
other chamber				x			chamber			x			
kitchen chamber				x			Thomas Colman, cooper, 1692 Norw. Archd. invs.						
cheese chamber				x			1674-92.44						
backhouse							kitchen	x	x		x		
dairy					x		shop chamber						x
carthouse							William Everett, singleman 1677 Inv/60B.142						
stable							parlour	x	x				
William Everett, singleman 1677 Inv/60B.142							parlour chamber			x			
parlour	x	x					kitchen chamber				x		
parlour chamber		x					kitchen		x			x	
kitchen chamber			x				dairy			x			
kitchen		x		x			dairy chamber			x			
dairy				x			Nicholas Overton, husb. 1692 Norw. Archd. invs.						
dairy chamber				x			1674-92.31						
							parlour	x	x				
							kitchen				x		
							chamber		x	x			

Appendix A

	living	sleeping	storing	cooking fire	heating fire	workroom		living	sleeping	storing	cooking fire	heating fire	workroom
John Browne, husb. 1692 Norw. Archd. invs. 1674-92.43 kitchen parlour	x	x		x			milkhouse chamber over hall shop				x		
John Smyth, yeoman. 1701 Norw. Archd. invs. 1700-01.235 kitchen backhouse dairy backhouse chamber kitchen chamber barn	x	x		x			John Spratt, linen weaver 1634 Inv/40.157 parlour kitchen little chamber on the chamber shop barn	x	x			x	
Andrew Everett, carp. 1707 Norw. Archd. invs. 1707.30 parlour chamber parlour kitchen another room another room chamber							Nathaniel Duckett, clk. 1666 Inv/52A.89 parlour hall kitchen parlour chamber study hall chamber kitchen chamber vancruffe ciller dairy chamber	x				x	
Richard Smith, 1708 Norw. Archd. invs. 1709.47 parlour parlour chamber kitchen chamber kitchen buttery barn	x	x					Prudence Hare, widow, 1709 Norw. Archd. invs. 1709.13 kitchen pantry parlour parlour chamber parlour chamber closet porch chamber kitchen chamber pantry chamber buttery chamber garret chamber backhouse dairy dairy chamber barn				x		
Thomas Rudd, plowe- wheelmaker, 1611 Inv/24.146 hall buttery little chamber shop barn	x			x			Robert Tare or Taie, 1634 Inv/40.67 parlour chamber parlour soller chamber						
Samuel Barber, weaver, 1619 Inv/30.40 hall backhouse	x	x		x							x		

	living	sleeping	storing	cooking fire	heating fire	workroom		living	sleeping	storing	cooking fire	heating fire	workroom
Francis Guildingwater, 1635 Inv/41.31 parlour Fyer house dairy room on the chamber	x			x			dairy granary great barn tithe barn cross barn lower barn carthouse chamber stable				x		
John Allyerd, tanner, 1639 Inv/44.143 parlour or bed chamber kitchen upon kitchen chamber corn chamber barn cart house stable	x	x					Richard Youngs, lab. 1711 Norw.Archd.invs. 1711.26 a low room Fyre Roome a small room						
Edward Harvey, 1686 Norw.Archd.invs. 1674-92 no.100 parlour parlour chamber little parlour chamber kitchen chamber little chamber backhouse chamber dairy chamber seller chamber garret chamber kitchen backhouse pantry seller	x	x			x		Richard Stolworthy, yeoman 1725 Inv/76.1 kitchen chamber parlour buttery barn cart house Jeffery Browne, 1728 Norw.Archd.invs. 1728.10 parlour kitchen pantry scullery chamber	x					

APPENDIX B

(NRO INV/41.31. Francis Guildingwater of North Elmham, husbandman, 18 May 1635)

Imprimis his Ready mony and apparell xxx^s iij^s iiij^d

In the Parlor

It' one short table & a Forme one ould Cubbd & a Spineing
 whele one Chayer a Table one old Chest & a Flaskett
 for Clothes xvijs

It' iij payer of Sheets & ij pillowbers xvs

It' Six peeces of pewter & ij saults viijs

In the Fyer house

It' one seeled bedsted with a Fether bed one boulster one pillo
 one Cev'lett one blankett as it nowe standeth xxxs

It' one Old Cheast ij Chayers one hake a fier pane j payer
 of tongs bellows a lanthorne a brasse Candlestick
 ij brass kitles one kowle & c'teine other things in the
 same Rome xxs

In the Dayrye rome

It' j payer of quarnes for mault j payer of mustard quarnes
 myke booles & other Implemts there xiijs iiijd

One Fane a bushell & other things on the chamb^r iijs iiijd

In the Yarden

It' one Meare j nage iij fooles iij kowes ij bullocks
 and iij Shotts xij^{li} xiijs iiijd

It' one Cart one plough one payer of harrowes Cart treyce &
 plough trayce and kollers helters & a Cart Roope there ij^{li} iijs

In the yarde and feilds

It' c'teine hempe j acre of wheat j acre of Rye and the halfe of
 v acres of winter corne ij acres & a halfe of baly & j acre
 to halves iij acres of Oates & part of iij acres of Fetches
 and halfe an acre of pease & halfe an acre of barly in
 worthing feild xij^{li} vs

Sm tot' 36^{li} - 10^s - 4^d

(INV/26.16. James Crumwell gent. 11 March 1612)

In the parlor

Inp' one little frame table with a carpet of old darnicke prised at iijs

It' one liu'ye cupbord with an old carpet prised at vjs viijd

It' one old little table with a cubard in it prised at vs

It' v Joined stooles cou'ed prised at ixs

It' viij other Joyned stooles prised at xs

It' 4 quisshens of needleworke prised at xs

It' 2 quishens of turkeye worke prised at vs

It' certain hangings of darnicke & a curtin of gren saye prised at xijs

It' one liv'ye bedstead with matt & corde one mattres j
 fetherbed with a bolster ij blankets j cou'let j longe carpet
 & 2 pillowes prised at iij^{li} xs

It' j pictuer of his father a scutcheon of his owne armes in
 a frame and certain phissick observacones printed & set in
 a frame prised at blank

It' certain other pictures and printed paper pinned uppo the
 hangings prised at blank

It' one pair of bellowes j paire of tons 1 fire pann j dogiron & ij hookes of Iro [~] in sted of hakes & a barr of Iron in the chimney prised at	vs
It' one blacke staffe with Iron piks in it one pitch forke and one salt boxe prised at	ijs
In the buttrye	
Inp' 4 halfe barels j alestoole one old keepe of bords standinge uppon ij tressels j narrow Table uppon 4 feet j fourfooted stoole prised at	viijs
It' one little basket prised at	viijd
It' one old wicker hamper prised at	iiijd
It' one meatsickle (?meatpickle) prised at	viijd
It' j pair of andirons with 3 feet prised at	ijs
It' j peale of wood & one () to wind yarne with & certain olde boards prised at	xijd
It' ij drinkinge potts & 3 drinkinge glasses for beare & one for wine prised at	blank
It' one Lether Jack & iij cans and twoe tilts & a funill prised at	xvjd
It' j dussen of trenchers prised at	iiijd
In the maids chamber	
Inp' j save of splytter wth lock & kei prised at	vjs viijd
It' one litle table with 4 feete & a shelve under the keep prised at	ijs
It' 3 little ould boxes prised at	xijd
It' j one hand basket prised at	vjd
It' one little fourfooted table & one boxe j pair of scoles & certain waits in the entry at the chamber dore prised at	iijs
In the plor chamber	
Inpr one liv'y bedstead wth matt & cord one mattres j fetherbed ij blankets j cou'let one bolster j pillow & an olde canopye prised at	iiij ^{li}
It' j Joined frame with three drawers prised at	xiijs iiijd
It' ij trunks prised at	vjs viijd
It' 3 chests prised at	xvjs
It' 2 boxes wherof one is cou'ed with black lether and one deske prised at	xs
It' j looking glasse prised at	ijs
It' j paire of belowes & one dogg Iron prised at	ijs
It' certaine pictures in paper hanging about the wales prised at	blank
It' a boxe for starth a batledore to smoth clothes a block to set rufes about & a peece of wood with Lead in it to sett uppo [~] the stocks of bands prised at	iijs iiijd
In the butry chamber	
Inpr one litle table with a frame one cheesrack prised at	iijs
It' one olde trunke & certain shelves prised at	iijs iiijd
It' ij earthen potts & one mealeseve prised at	xijd
In the chamber at stair head	
Inp' on table with 4 feet prised at	ijs
It' 2 old trunks prised at	iijs iiijd
It' j deske & a seed Leap with a frame of boards to sett uppon a cupboards head prised at	ijs


Appendix B

In linnens	
Inp' 6 paire of sheets prised at	52s
It' 3 table clothes prised at	vs
It' 2 diap cubbord towels	vs
It' 6 pillow beares	vjs
It' 18 table napkins prised at	vs
It' 4 small clothes for the little table prised at	ijs
It' 4 towells prised at	iijd
In the halle	
Inp' certaine billet & firinge prised at	xs
It' j lather prised at	xijd
It' 3 beeskepess & ij underlayers prised at	ijs
It' j garden rake & one haye Rake one forke & j trough to stamp crabes in and a stooles wth foure feet prised at	xvjd
In the Kitchen	
Inp' 15 pewter dishes ij handbasons 8 poringers 3 butterdishes 3 sauces 4 trencher plates j pie plate v candlesticks of pewter & ij sockets one pewter cann 2 little cupes one round pewter posnet wth a cou' one vinger one tunill 5 pewter spoones & one bell salte & 3 three chamber potts prised at	xxxxs 4d
It' 2 silv' spoones prised at	xijs
It' one short table with a frame 2 longe stooles & 2 3 footed stooles prised at	vjs
It' one Longe cole prised at	iijs
It' one bolting hutch prised at	vjd
It' one cheese presse prised at	ijs vjd
It' j beerstooles prised at	xijd
It' 3 tubbes prised at	ijs
It' j mashe fatt & one guilefat prised at	iijs
It' 4 keelers prised at	xvjd
It' 2 churnes prised at	xxd
It' 2 milk boles & ij panes	xxd
It' 2 cheesefats prised at	xijd
It' 1 washe boll prised at	xijd
It' 1 chenser 2 cupes j pint j wode platter & j pecke prised at	xijd
It' 2 pailles 1 ash tubb ij pott spoones j chopinge board one pair of mustard quernes prised at	iijs
It' one tems j pair of cheesetongs one stovell for the mash fatt one pair of bellows 2 pairs of tongs 2 brandlets one () iron prised at	vjs
It' 2 peales j fireforke j battledore & rollinge pinne j hake & j barr of Iron prised at	vs
It' 3 brasse potts ²⁴ j chafer ^{6.8} 2 brasse pann ³⁴ 3 kettles ¹⁰ 3 skellets ⁴ 2 scum's ² j chafing dishe ¹⁸ prised at	iij ^{li} vs iiijd
It' 2 morters & 2 pestills prised at	
It' j ffrying pann ij dripping pans ³ 2 spits ¹ 2 rostinge Irons prised at	vs
It' 2 grates ⁶ j cliver & one shredding ⁸ knife j basting spone ³ prised at	xviyd
It' 3 latten candle sticks prised at	iijs
It' one hatchet ⁶ j mattock ¹⁸ 2 sholves ⁸ & one windle ² prised at	ijs xd
It' 3 earthen potts prised at	xijd

In the Stable		
Inp' j sadle j bridle j panell prised at		vjs
It' j fork j rack 2 lathers prised at		iijs
It' 3 milche cowes prised at		viij ^{li}
his Apparell		
Inp' 2 dublets 2 pair of briches j cloke j Jerkine 2 hatts		
3 pair of stockings 3 paire of shues one pair of slippers		
& 2 sherts & four shertbonds & 2 handkerchers prised at		xxxxs
In books		
Inp' Chawcers woorks j cronicle j bible the miror of maistrats		
wth certain prayer books and other pamphlets prised at		blank
sma xxxix ^{li} xixs viijd		
(INV/37.219. Thomas Smith, late vicar of North Elmham. 15 Sep. 1631)		
In ye Studdy		
Inprimis his Library		vj ^{li} xiijs iiijd
In ye Parlor Chamber		
Item his apparell		iii ^j li xs
lynnen		ii ^j li xvijs vjd
a large Chest		vs
one posted bedstead 3 Curtaine rodde and 3 Curtains j matt & cord		xxs
one fetherbed j fether boulster and a fether pillowe		xxxijs iiijd
one Coverlett j greene blankett j white blankett		xxs
one trundle bedstead wth ye beddinge to it		vjs viijd
one small Counter and ye 10 Comaundmts in a frame		ijs
3 handkirchers		iijs iiijd
one pre of black silk stockens		iijs iiijd
one wooden box and a plate Candlesticke		iijs iiijd
a Closestoole covered with lether		ijs
In ye Vaunce Roofe		
Item Cheese		xls
woollen and lynnene yarne		xjs
a still and a lynnene wheele and a clocke reele		xiijs iiijd
3 pound of Cempt wooll & 2 stone of unceempt wooll 8 lb of nyles		xxiiijs
one potkett of hopps		iijs
tressell and boords & 2 tubbs		ijs vjd
In ye Parlor		
Item j long frame table wth a darnex Carpett		xxvs
one long forme 3 Joyne stoole and 4 wooden Chayers		ixs
3 Cushen stooles and 5 Cushens		viijs
one presse		vs
a lyverie Cupboord and a paire of tables		xs
ye La: Cromewells pickture and a looking glasse and other old		
pictures and ye names of ye Norff. Bpps in a frame		xs
a paire of dog irons		ijs
one round Table, one pairs of garden sheeres, and a frame to		
dry clothes on		vs

Appendix B

In ye Kitchen		
Item 1 planck table a one Cowell & j mashing stoole and one fourme one Bing and a glasse case		iijs iijs iiijd
4 brasse kettles 1 Copper kettle and one iron kettle		xxxiijs iiijd
one brasse pott and one iron pott and one skillett		xs
2 brasen Candlestickes and wyer Candlesticke and a brass Chafendish		iiijs
pewter		xviijs
4 spitts 1 paire of dog irons 3 paire of potthooks 3 hakes and one iron to hang them on short hooke & and iron drippin pan and 2 pre of tongs and fire shovell		xs
one little Chaire one hanging shelve and a forme planke a frame for pewter a gridiron a warmeing pan and a breadgrate		iiijs
one paire of scales & waights		xijd
In ye Buttery		
Item a boulding hutch one minging killer 2 meale poakes 1 flower tubb beare vessell and beare stoole and certaine shelves		xijs iijs iiijd
trenchers potts glasses and an lanthorne		
In ye Darye		
Item 1 Churne 5 milk bowles 3 cheese fatts 1 Cheese bread 1 salting trough 1 great Chist 2 formes 1 salting bowle 4 Cheese butter and butter potts		vs vijs xiijs iiijd
In ye Brewhouse		
Item brewing vessells 1 bucking tubb 1 Cowell and a forme		vjs viijd
In ye Studdy above ye kitchen		
It' 6 qrts of Rosewater and glasses		vs
In ye kitchen Chamber		
Item one frame table		iiijs
In ye Corne Chamber		
Item woolle		ijs
7 peeces of pewter 1 firepan 2 kettles j fire sholve and other old yron		xijs xijd
2 formes and a little killer		
In ye Chambers over the Brewhouse		
Item a tubb and some fethers one boorded bedstead charcole		iiijs
In ye Storehowse		
Item certaine worke tooles timber and a bell rope a wheelbarrow and a Grindstone		xs vs
In ye Stable		
Item 1 planke 2 saddles 2 bridles j pillion j Chaffe sive hay		xvjs xxxxs
Hempe in all		xvs
In ye Howse Barne		
in winter Corne		xli
Barley		xli

Oates		iiij ^{li}
1 bushell 1 peck 1 riddle certaine pitchforkes and rakes		viijs
	In Wm Thompsons Barne	
pease		iiij ^{li} xs
	In Robt. Handfords Barne	
Buck and Fitches		iiij ^{li} xs
1 pitchforke		vjd
	At Goodman Barneys	
Item a liverye Bedstead matt and cord		vjs
one fetherbed, one fether Boulster one fether pillowe two		
Coverletts and a Blanckett		xls
a warmeing pan and a brass pan and a chess		xijs
	In ye yard orchard and Closes	
5 swyne		xxvx
3 Cowes		vj ^{li}
8 Turkeys 6 Ducks 19 geese 16 hens and Chickens		xxiiijs xd
2 horses		v ^{li} vs
a newe Cart		vjs viijd
ye Axelltree rope Chaine and buckett for ye Drawe Well		vs
muck in ye yard		iiijs
fruite		xxs
firewood		xs
one old sword & dagger & other lumber		ijs
in debts owing to ye testator and money in his purse		xix ^{li} xjs xjd
	Sum' total' is	Cx ^{li} vjs vijd
Ambrose Hassell clr:		
Ric: Pepys cler		
Willyam heese		
ye m'ke of  Thomas Smith		

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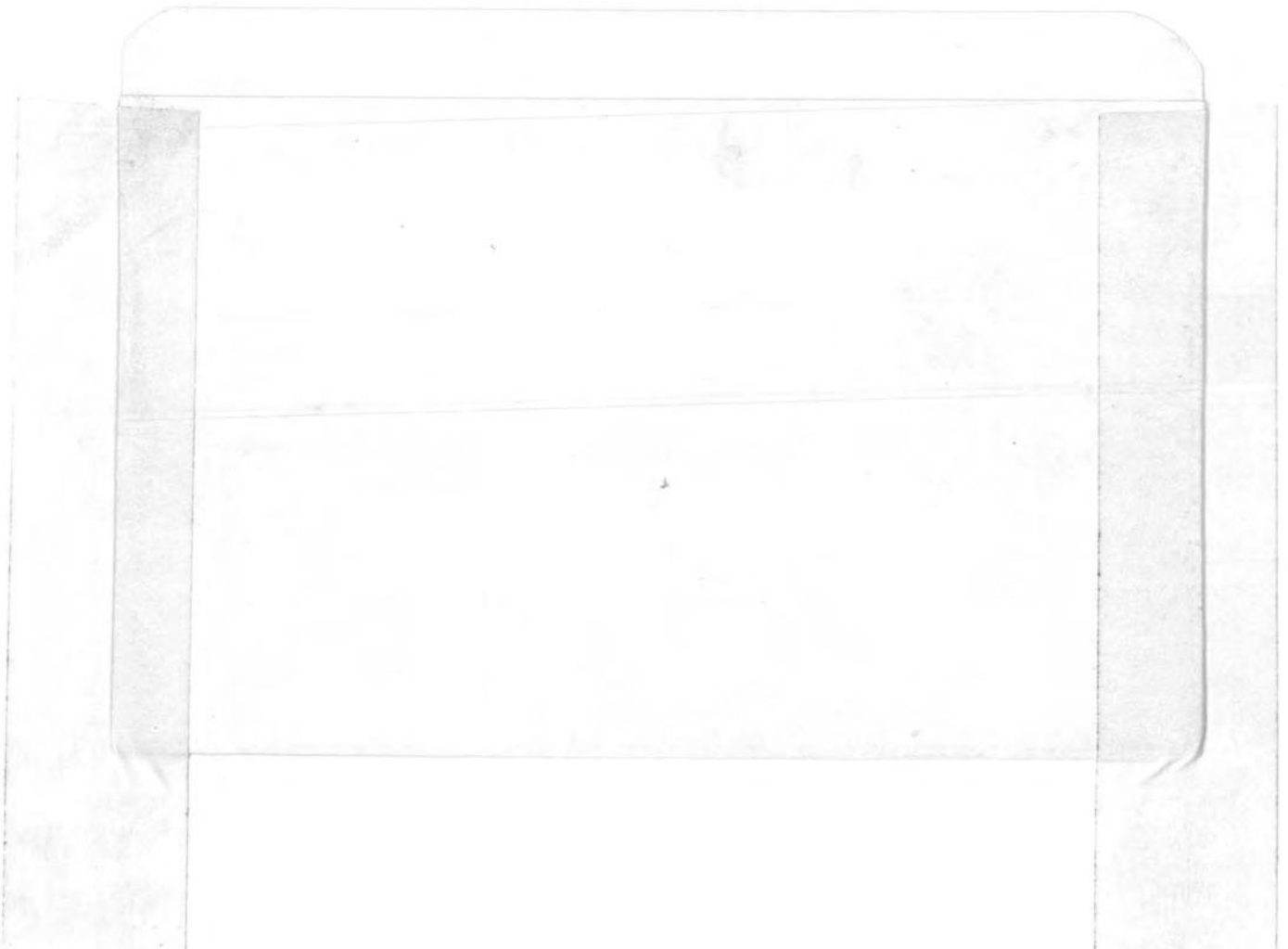
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