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Ancient Monuments Laboratory
Report 89/88

THE HUMAN REMAINS FROM GREAT CHESTERFORD, CAMBRIDGESHIRE.

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Summary

A total of 31 cremations (2 male adults, 16 unsexable adults, 3 children and 10 individuals of unknown age) and bones representing a minimum of 167 inhumed individuals (35 adult males, 43 adult females, 6 unsexable adults, 78 children and 5 unborn foetuses) were located at the Anglo-Saxon cemetery at Great Chesterford.
Analysis of the inhumations indicated that the majority of adults died before age 45 and men tended to live longer than women. The mean male stature was 1.66m; the corresponding figure for women was 1.61m. The principal diseases present were osteoarthritis, dental caries, ante-mortem tooth loss and dental abcesses. Other than two individuals showing ante-mortem tooth loss no pathologies were observed amongst the cremations.

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The human remains from Great Chesterford

Part I: The skeletons

The human remains from Great Chesterford originally comprised a number of discrete inhumations and some cremations. The inhumations will be dealt with in this section of the report and the cremations in the section which follows.

The site was excavated in the 1950s and the bones have suffered somewhat over the years. Although the bones from each of the inhumations must originally have been kept separate, this is no longer so. Almost none of the skeletons remains discrete and where this is the case, it is true only for some of the infant burials. Instead most of the bones have been kept together in anatomical groups; that is, all the femurs are together in a number of boxes, all the pelvises, all the scapulae, all the sacra, and so on. A substantial number of the bones have suffered post mortem breakage and other damage and it was frequently found that the two (or more) parts of a broken bone were in different boxes. Most, but by no means all the bones had been marked with the inhumation number. In some cases the number was indecipherable since it had been written on an unwashed bone surface and had become virtually erased over the years and several other bones clearly had the wrong number on them. For example, there were a few instances where more than two of the same long bones had the same number and some juvenile bones were marked with a number which belonged to an adult inhumation.

Where there was an excess number of bones apparently belonging to one inhumation, an attempt was made to exclude those which obviously did not belong. No attempt was made to match unmarked to marked bones, however.

The result of the rather poor state of these bones was greatly to slow down the work of examining them and to make several of the skeletons appear to be less complete than they should otherwise have been. For one skeleton (inh 131),

no bones could be identified at all although the grave plan clearly shows that some bones of the legs were originally present.

Thirty two of the skeletons (all but one judged to be female) and one of the juveniles had a number of bones with green staining on them. This had evidently come from copper or bronze objects which had been buried with them.

Methods of analysis

For each of the skeletons the age and sex was determined using the methods recommended by the Workshop of European Anthropologists (1980) or by Krogman and Iscan in their textbook of forensic anthropology (1987). A definite sex was assigned to an adult skeleton if either the pelvis or the skull was present and a probable sex if the determination was based on other criteria such as long bone measurements. Sex was not determined for juveniles or infants.

The age of the skeletons was determined from the pattern of tooth eruption in juveniles or epiphyeal fusion in immature adults. For very young infants or fetuses the age was assessed from measurements of the diaphyses of the long bones using the data published by Fazekas and Kosa (1978) and of Maresh (1955) for comparison. Ages obtained by these methods are generally reliable always assuming that dental eruption and long bone growth were the same as they for the modern comparative groups. In adults in whom the epiphyses had fused, age was estimated using tooth wear (Miles, 1963), the morphology of the pubic symphysis, or from the state of fusion of the cranial sutures. None of the methods of ageing adult skeletons is very reliable and I have given ages in ten year bands; even so these should be considered as approximations.

Stature was determined from the regression equations published by Trotter in 1970. In these equations, the length of one or more long bones is used to calculate height and each result has a standard error term. For example, the standard error associated with the equation which predicts male height from

the maximum length of the humerus is 0.405 cm. So if the height is calculated to be 170 cm then the 'true' height is likely to lie between 166 to 174 cm. In the calculation of heights, the long bone measurement which has the lowest standard error has been used.

The demography of the population

Age and sex: A total of 167 individuals was represented at the site of whom almost exactly half were infants or juveniles (aged 15 or less). Of the adults, 33 were judged to be male, 2 probably male, 43 were female and in 6 the sex could not be determined. The ages of the males were evenly spread but the majority of females were aged between 25 and 45 (see table 1); in 8 instances the age of the skeleton could not be determined.

The cumulative percentage distribution for males and females of known sex shows that the men in the population tended to outlive the women for whereas 14.3% of the women survived beyond the age of 45, 26.7% of the men did so. The tendency for males to outlive females in the past has been noted by other authors (see Brothwell, 1972, for example), and it is only comparatively recently that the converse has been the case, almost certainly as a result of improved obstetric care.

Of the infants and juveniles five were fetuses aged less than 40 weeks; in two cases (inhs 32 and 127) they were found in the pelvis of the mother who may have died of some complication of pregnancy. A further twelve skeletons were from stillborn children, that is, they were aged around the normal time of delivery which is 40 weeks. Twenty-six of the infants were in the neonatal period when they died being less than a month old at the time of their death and an additional twelve infants died within the first year of life. Most of the other children died before the age of ten; these data are summarised in table 2.

Height: Heights could be estimated for 28 of the adult males and 38 of the females (table 3). The males ranged in height from 1.51 - 1.83 m (4ft 11 ins -

6ft 0 ins) and the females from 1.46 - 1.71 m (4ft 9 ins - 5ft 7 ins). The mean heights were 1.66 and 1.61 m for males and females respectively. The mean heights of the modern population of England and Wales are 1.74 and 1.61 m; thus the men appear to be shorter than at present whereas the women at great Chesterford are no different from their modern counterparts. Given the small numbers, the difference for the males is more likely to be due simply to chance than to reflect any real biological significance.

Metrical indices

Cranial, platymeric and platcnemic indices were calculated for the adult skeletons where possible; these define the shape of the head and the upper parts of the shaft of the femur and tibia respectively. Relatively few of the skulls were intact enough to measure but femora and tibiae could be measured in about three-quarters of the cases. The results are shown in table 4.

The cranial indices tended to fall into the dolichocephalic (round-headed) category; virtually all the femora were platymeric and the tibiae mesocnemic. That is to say, the femora were relatively flattened from front to back and the tibiae flattened from side to side. The significance of these indices is discussed by Brothwell (1981).

Non-metric characteristics

Various non-metric characteristics in the cranial and post-cranial skeletons were noted following the schemes of Berry and Berry (1967) and Finnegan (1978), respectively. Those which were present most frequently are shown in table 5.

Ossicles in the lambdoid sutures were present in more than a third of the skeletons in which the observation could be made and in a smaller number of cases an ossicle was present at the lambda. Metopism was also relatively common. It has been suggested that a high prevalence of some of the cranial non-metric characteristics is indicative of a high degree of family relationship

and perhaps this is the explanation here.

Dental health

From the sample of 84 adults a total of 2,688 (84 x 32) teeth should have been found. In fact almost a quarter of the teeth were unaccounted for because of post-mortem damage to the skulls and mandibles, or because either the skull or the mandible was not present. The number of teeth actually present was 1,751; 7 teeth were unerupted, there were 159 sockets from which the teeth had been lost after death and 204 teeth had been lost during life. Thus 2,121 teeth, or 78.9% of the total, could be accounted for.

There was a good deal of dental disease present, including ante-mortem tooth loss, caries and abscesses. Twelve males and 23 females had one or more of these conditions and there was a marked age gradient (table 6). Although almost twice as many females as males had dental disease, not too much should be made of this, as it has almost certainly arisen by chance.

The most common observation was the ante-mortem loss of teeth which was found in 11 of the males and 18 of the females. Four males and 11 females had dental caries and 4 males and 6 females had dental abscesses.

Calculus

The presence of dental calculus was scored on an arbitrary four point scale from 0 - 3, the three grades 1 - 3 indicating different degrees of severity. The distribution of calculus in the 54 skeletons in which the assessment could be made was as follows:

Grade	Number	%
0	18	33.3
1	21	38.9
2	13	24.1
3	2	3.7

These results show that most skeletons calculus to some degree or other and that in well over a quarter of cases it was moderate to severe in degree. This high prevalence is no doubt related to difficulties in maintaining good dental hygiene.

Alveolar disease

Alveolar disease, shown by resorption of the alveolar margin, was also scored on a four point scale and the results confirm the poor state of the mouths of this population. Amongst the 56 skeletons in which this particular assesment could be made, the distribution was as follows:

Grade	Number	%
0	11	19.6
1	17	30.4
2	21	37.5
4	7	12.5

Half the group had moderate to severe alveolar disease which, in many cases, was associated with ante-mortem tooth loss.

Relationship between tooth loss, alveolar disease and age

There was no statistically significant difference between the numbers of males and females who had lost teeth but there was a highly significant association with age and alveolar disease (table 7). In 1964, Calvin Wells suggested in his celebrated book, Bones, Bodies and Disease that alveolar disease with tooth loss in Anglo-Saxon or Medieval skeletons might have been caused by scurvy. This condition was undoubtedly common at these periods in northen Europe, especially during the winter and early spring months when the supply of fresh fruit and vegetables was unobtainable (Wilson, 1975). The data from the present group of skeletons does not lend support to Wells' view, however, suggesting rather that the principal cause of the alveolar disease and tooth loss was primary disease of the gums or teeth (due to poor hygiene) and that this increased with age; this in turn lead to a concomitant increase in the likelihood of tooth loss. In none of the skeletons examined was there any other sign of scurvy. This is not to say that none of the individuals had had scurvy at some time during their lifetime but the signs resolve once supplies of the vitamin are restored and none seems to have had active disease at the time of their death.

Pathology

Many of the skeletons had pathological changes, in fact, there were only 31 in which none was observed. The major pathological findings are grouped into the major aetiological categories in table 8. From this it will be seen that in 70 cases the skeletons were either so damaged or too incomplete to allow a complete examination in which case, it is not possible to be sure whether there really were any abnormalities present or not. In some of the adult skeletons the hands or feet were missing or large numbers of vertebrae. The majority of skeletons in the 'not known' category were skeletons of infants (42) which tend to survive less well than adult skeletons and also to damage more easily.

This series of skeletons confirms what has been evident from other groups, that is, that where adult skeletons from early periods are sufficiently intact, they almost always show some evidence of disease, even if this is only dental disease. As may be seen from table 9, all the skeletons from individuals aged over 25 had some signs of disease and virtually all those over 15 did so also. By contrast, only a third of juveniles and 1 of the 25 infants able to be examined had pathological changes in their skeletons.

The most common pathological changes by far were dental disease and so-called degenerative disorders which include all the joint diseases and other changes such as degenerative disc disease and osteophytosis. This pattern is exactly as one would expect given that relatively few other diseases affect the skeleton to a very great extend.

Degenerative diseases

Amongst this group of disorders the most common were osteo-arthritis, degenerative disc disease and osteophytosis, quite often, two or more co-existing in the same skeleton.

Osteoarthritis: This is amongst the most frequently observed disease in any group of skeletons (Rogers et al, 1985) and it is one which is still extremely common. Twenty of the adult skeletons were affected, ten of each sex giving a crude prevalence rate of 28.6% and 23.3% for males and females respectively. Allowance has to be made, however, for the fact that six males and ten female skeletons could not be thoroughly examined and so the rates just quoted represented the minimum rate. If we assume that the unexamined skeletons all had osteoarthritis then the maximum rate would be 45.7% for men and 46.5% for women. These two figures represent the range within which the 'true' prevalence lies and they are not dissimilar from the rates in the modern population (Doyle, 1986).

The most common sites affected by osteoarthritis are shown in table 10; the

spine and shoulder were by far the most frequently the seat of the disease all other joints being much less commonly involved. (In four individuals more than one joint was involved; in two the spine and wrists and in one each, the spine and wrist and spine and tempero-mandibular joints.) This contrasts with the modern condition in which the hands, hips and knee are most frequently involved. There are two possible explanations for this. The causes of osteoarthritis are not known with much certainty (Nuki, 1980) but it is thought that occupational and other activity may be one factor in determining in which joints the disease is expressed in those with the inborn tendency to develop it. Thus, the difference in the pattern of the disease in the Great Chesterford skeletons and the modern population may reflect different patterns of activity. On the whole, the evidence which links occupational factors with osteoarthritis is not very convincing except in the joints of the hands where some forms of spinning do seem to predispose to the development of osteoarthritis (Hadler et al, 1978).

The second, and perhaps more convincing argument is that palaeopathologists see a more complete record of arthritic change because they have the opportunity to examine all the joints of the body in much more detail than their clinical colleagues are able to do. Even radiography is unable to detect changes in arthritic joints until the disease process is well advanced. It is known that osteoarthritis which is realtively commonly seen in some sites by palaeopathologists - on the odontoid peg and in the joints between the metacarpals - is unknown to clinicians and radiologists (Rogers and Waldron, forthcoming). Changes at the acromio-clavicular joints which are commonly seen in skeletal material are also rarely encountered in clinical practice. Indeed, clinicians are unlikely to see any patient with osteoarthritis unless the changes in the joint cause pain or interfere with some normal activity; they thus see a very skewed part of the population with the disease. Palaeopathologist also deal with non-random material and certainly have no means of knowing the extent to which the changes they see may have affected individuals during life. Sometimes they can make an informed guess but it is known that radiological and other changes in the joints do not correlate well with impaired function or with pain (Doyle, 1986). It is, therefore, not too

surprising that the patterns between modern and ancient disease apparently differ. What is certain, however, is that palaeopathological studies are likely to be able to increase our knowledge of osteoarthritis.

In one of the skeletons from Great Chesterford, we can ascertain the cause of osteoarthritis. A female (inh 160) aged between 35-45 had osteoarthritis of the elbow which was secondary to a fracture of the radius. The fracture had occurred just below the head of the radius, had healed well but with some angulation of the proximal portion. As a result, the normal mechanics of the joint had become disrupted and this had produced arthritic change in the the joint.

Degenerative disc disease

In this condition, the intervertebral discs and the end plates of the vertebrae undergo pathological change; the latter are evidence in skeletons and are commonly to be seen. The condition is exceedingly frequent in the contemporary population (Jayson, 1986). As can be seen in figure 1, it is the mid to lower cervical and the lower lumbar vertebrae which are most often involved. In this, ancient and modern populations do not seem to differ although the proportion of the Great Chesterford individuals affected (11 of 85, 12.9%) is considerably lower than has been reported in modern epidemiological studies.

Osteophytes

Osteophytes are formed of new bone which develops horizontally from the margins of the vertebral bodies. They are amongst the most frequently reported pathological change in skeletal populations. Their precise cause is not known but since their preponderance is found to increase considerably with age it is sometimes suggested that they are part of a 'normal' ageing process. This is a somewhat tautologous argument and does little to add to our understanding of their causation.

The Great Chesterford skeletons are no different from other groups in showing a high frequency of osteophytes; 24 of the adult skeletons had them.

The distribution of osteophytes within the spine is markedly different from that of degerative disc disease as may be seen by comparing figures 1 and 2. Osteophytes occur with increasing frequency towards the lower end of the spine which suggests that compressional forces in the spine may be in some way concerned with their production.

DISH: There was only one case of diffuse idiopathic skeletal hyperostosis (DISH; inh 120). DISH is a disorder in which the anterior spinal ligament calcifies and eventually several vertebrae, mainly but not exclusively in the thoracic spine may fuse. These spinal changes are accompanied by clacification into ligaments and tendons and, in extreme case, in the walls of blood vessels. The condition has generally been found to affect about 5% of skeletons (Rogers et al, 1985) and it is equally prevalent in contemporary populations. At Great Chesterford, therefore, DISH seems to be less common than would be expected although the reasons for this are not clear.

Trauma

Eleven skeletons had fractured bones and two had suffered from injuries to the head during their lifetime. There were eight fracture sites; the clavicle (3), rib (2), skull, thoracic vertebra, humerus, radius, fibula and right third metatarsal (one each). The skull fracture (inh 93) was a small, well healed depressed lesion such as might have followed a severe blow to the head. In inhumation 9, one of the thoracic vertebrae had evidence of a crush fracture which might have been caused by a fall. The metatarsal fracture (inh 11) was similar to a 'march' fracture which follows strenuous physical activity. None of the fractures was in any way remarkable and all were well healed and, except for the radial fracture to which mention has already been made, none was likely to have given rise to any complications.

Wounds: Two skeletons had evidently suffered head injuries during life. The

first (inh 75) had a large lesion in the right parietal bone which measured about 46 x 37 mm. The edges were bevelled over a distance of about 10 mm from outside inwards. The wound had healed well and had certainly been incurred a long time before death; the appearances were entirely consistent with the type of injury which might hae been made with a weapon such as a sword.

In the second skeleton (inh 101) the lesion had rather ragged, depressed edges and measured approximately 27 x 20 mm at its widest points. It was located in the left frontal bone just anterior to the coronal suture and also showed signs of having healed well. The most probable explanation for this injury was that the individual had been hit with a blunt instrument.

Developmental conditions

Schmorl's nodes: Schmorl's nodes are caused by small herniations of the disc compressing the cortex of the vertebral bodies and they are an extremely common finding in skeletons. There were eight skeletons from Great Chesterford with them.

Osteochondritis dissecans: Also in this group were four skeletons with osteochondritis dissecans which is a lesion generally considered to be due to the interuption of the blood supply to a small area of bone which subsequently becomes necrotic. The lesions may be secondary to repeated minimal trauma and are said only to occur on convex bony surfaces (Kelsey, 1982) but they are often found elsewhere in skeletal material. Perhaps on account of this the authenticity of some so-called cases of osteochondritis dissecans has been called into question (Birkett, 1982) but again it may be a case where the palaepathologist is able to see more than those who deal with the living. Of the four examples here, two were on the proximal joint surface of the first metatarsals, one was on the proximal surface of the navicular and the fourth was on the lateral plateau of the left tibia.

Spondylolysis: This is a condition in which the laminae of a vertebra become

detached from the body; most frequently a break develops in the pedicles and the vertebral body may slip forwards. The condition commonly present in adolescents and although its cause is uncertain, there is some evidence that it is secondary to trauma (Jayson, 1986). It is frequently present in skeletons from all periods and most often affects the fifth lumbar vertebra. In all five cases here, this was the vertebra involved.

Congenital disorders

The four cases with congential abnormalities all involved the spine and all are amongst the more common of the minor congenital defects noted in both skeletal and modern populations. In one skeleton (inh 51) the laminae of the atlas had failed to fuse; those of the first lumbar vertebra were unfused in another (inh 132), whereas in inhumation 127, the laminae of the fourth and fifth lumbar vertebrae were fused. There was no other abnormality in the spine of this skeleton. Finally, skeleton 100 had six lumbar vertebrae instead of the more usual five.

Nutritional diseases

There were only four skeletons in which there was any evidence for possible nutritional diseases. There was none with any evidence of rickets or scurvy and the four cases in this category all had bilateral cribra orbitalia. Of the four, one was a neonate, two were juvenile (aged 6-8 and 8-10) and one was a female aged 25-35. The degree of cribra was more severe (grade 2) in the juveniles than in the two other skeletons (both grade 1).

The significance of cribra orbitalia is not entirely clear but it is widely regarded as being evidence of severe iron deficiency (see Stuart Macadam, 1985, for example). If this is the case, then the low prevalence of cribra, together with the lack od evidence for any other nutritional disorders, suggests that there were no serious dietary deficiencies in the population as a whole.

Infections

During the period when the people from Great Chesterford lived, there must have been a great deal of infection in the population but one skeleton only (inh 137) had skeletal changes which might have been the result of a specific infection. This skeleton had erosive lesions on the anterior surface of the third, fourth and fifth lumbar vertebrae; the fourth and fifth vertebrae had collapsed and were fused. Very little reactive new bone had been formed and the changes were highly suggestive of tuberculosis. At this period the infecting organism was most probably the bovine tubercle bacillus which had been acquired from contaminated milk.

Neoplasia

Tumours of any kind are met with infrequently in palaeopathological studies and this was no exception. One skeleton (inh 137), however, had a small benign tumour. In the mid-line of the skull, approximately 60 mm from the nasion whas a circular osteoma about 12 mm in diameter. It is probable that the individual was never aware of it during his life time and it was certainly of no importance so far as his health was concerned.

Other pathological changes

A small number of pathological changes could not easily be fitted into an aetiological category. In two cases (inhs 68 and 125) two adjacent vertebrae were fused; and in one (inh 96) there was a small area of periostitis on the fibular surface of the right tibia in its distal third. There were no other lesions in the skeleton which might have given an indication of the cause of these changes and I am unable to give a reasonable explanation for them.

Comment

Perhaps the most interesting feature of this group of burials was the high number of infant and juveniles present which together accounted for almost half tthe total population. The large number of fetuses of various ages is also noteworthy.

If we assume that the skeletons are more or less representative of the community from which they came, then it is evident that child bearing was a considerable hazard; two of the females were found with fetuses in the pelvis and the assumption must be that their death had to do with some complication of pregnancy. Moreover, the death rates in infancy, including the still-birth rates must have been extremely high reflecting - presumably - a high level of infection in the community and poor facilities for the care of the newborn and very young.

The proportion of deaths in the younger age groups at Great Chesterford is similar to that seen in some under-developed countries nowadays (see table 11). For those dying under the age of five, the figure for Great Chesterford is almost identical with that for Egypt and Peru, but substantially more of those aged between 5 and 15 died than in the case in either of the modern populations for those countries. In the more developed countries of Europe it can be seen how the death rates in the youngest sector of the population has been dramatically reduced.

In table 11 I have included some data from the recent account of the Anglo-Saxon cemetery at Sewerby (Hirst, 1985) although the data are not strictly comparable. Amongst that, admittedly rather small group, there were only two skeletons aged less than 7 years of age, a proportion of 3.4%. It is extremely unlikely that this population really had a mortality rate for its children which approached those of some modern European countries and the children at this site must be substantially under-represented.

This point is also exemplified in Brothwell's much larger study of Anglo-Saxon

skeletons from southern England (Brothwell, 1972). Only eight of the 573 skeletons (1.4%) were less than one year of age (see table 11). As Brothwell himself suggests, these data suggest that the child samples are biased and have too few infants. This bias has some consequences for palaeodemography since it will tend to lead to an over-estimation of mean life-span and it will distort the view which one has about infant mortality.

It seems likely that the data from Great Chesterford reflect more accurately the true state of affairs at the time; that is, a population with a short average expectation of life, high still-birth, neonatal and infant mortality rates and a high prevalence of obstetric complications which resulted in a poorer expectation of life for women compared with men.

Figure 1

Distribution of degenerative disc disease in skeletons from Great Chesterford

C1	
C2	
C3	XX
C4	XX
C5	XXX
C6	XXX
C7	XXX
T1	X
L1	
L2	
L3	
L4	X
L5	XXXXX

C = cervical
T = thoracic
L = Lumbar

Each cross indicates one affected intervertebral space between the vertebra shown and the one below. Thus C3 indicates that the space between C3 and C4 is affected.

Figure 2

Distribution of osteophytes in skeletons from Great Chesterford

T1	
T2	
T3	XX
T4	XX
T5	XXX
T6	XXX
T7	XXXXX
T8	XXXXXX
T9	XXXXXX
T10	XXXXXX
T11	XXXXXXXX
T12	XXXXXXX
L1	XXXXXXXXX
L2	XXXXXXXXXXX
L3	XXXXXXXXXXXXX
L4	XXXXXXXXXXXXX
L5	XXXXXXXXXXXXXXXXX
S1	XXXXXXXXXX

T = thoracic
L = lumbar
S = sacral

Each cross indicates one vertebra with osteophytosis

Table 1

Age and sex of skeletons from Great Chesterford

	Male	Female	Unknown
0 -			67
5 -			16
15-	7	9	0
	(23.3)	(21.4)	
25-	7	10	3
	(46.7)	(45.2)	
35-	8	17	1
	(73.3)	(85.7)	
45+	8	6	0
	(100.0)	(100.0)	
Unknown	5	1	2
Total	35	43	89

Figures in parentheses show cumulative percentage of skeletons in each age group.

Table 2

Number of infant and juvenile skeletons at Great Chesterford by age group

Fetus	5
Stillborn	12
Neonate (0–2 months)	26
2 – 12 months	12
2 years –	11
6 years –	10
10 – 14 years	2

Table 3

Heights (m) of skeletons from Great Chesterford by sex

	Male	Female
1.45–		1
1.50–	3	3
1.55–	2	9
1.60–	7	14
1.65–	5	8
1.70–	6	3
1.75–	2	
1.80–	3	

Figures show number of skeletons within each height range.

Table 4

Cranial, platymeric and platycnemic indices in skeletons from Great Chesterford

	Male	Female
Cranial index		
Dolichocephalic	11	9
Mesocephalic	4	4
Brachycephalic	1	2
Total	16	15
Platymeric index		
Platymeric	24	29
Eurymeric	3	2
Total	27	31
Platycnemic index		
Platycnemic	4	1
Mesocnemic	25	34
Total	29	35

Table 5

Number of skeletons from Great Chesterford with non-metric characteristics

	Present	Absent	Not known
Cranial			
Ossicle at lambda	4	56	24
Ossicle in lambdoid suture	24	39	21
Parietal foramina	22	41	21
Metopic suture	9	54	21
Supra-orbital foramen open	49	16	19
Post cranial			
Plaque	12	56	16
Hypotrochanteric fossa	19	54	14
Exostosis in trochanteric fossa	10	56	18
Third trochanter	7	60	17
Medial squatting facet	8	60	16
Lateral squatting facet	8	59	15
Acromio-clavicular articular facet	23	21	40
Inferior talar articulation double	25	39	20
Anterior calcaneal facet double	20	39	25
Anterior calcaneal facet absent	4	53	27
Superior facet of atlas double	4	33	47
Tranverse formamen double	7	33	44

Table 6

Dental disease in skeletons from Great Chesterford by age and sex

	Male			Female		
	Lost am	Caries	Absc	Lost am	Caries	Absc
15-	0	0	0	1 (11.1)	0	0
25-	0	1 (14.3)	0	1 (10.0)	3 (80.0)	1 (10.0)
35-	4 (50.0)	0	2 (25.0)	10 (58.8)	6 (35.3)	4 (23.5)
45+	6 (75.0)	3 (37.5)	2 (25.0)	5 (83.3)	2 (33.3)	1 (16.7)
Unknown	1	1	0	1	0	0

Figures in parentheses are percentages of total in each age group

Lost am = teeth lost during life
Absc = dental abscess

Table 7

Number of skeletons from Great Chesterford with different categories of alveolar disease by age

Category of alveolar disease	15-	25-	35-	45+
1	8	2	1	0
2	2	12	2	0
3	1	1	14	5
4	0	0	2	4

Table 8

Pathological changes in skeletons from Great Chesterford grouped into major aetiological categories

Dental	Degenerative	Trauma
39	38	12
Developmental	Congenital	Nutritional
9	4	4
Infectious	Neoplastic	Other
1	1	8
Not known	None	
70	31	

Note that numbers in the table exceed the total number of skeletons since some skeletons showed more than one kind of pathological change.

Table 9

Presence or absence of pathological changes in skeletons from Great Chesterford by age

Pathological Change	Infant	Juvenile	15-	25-	35-	45+
None	24	6	1	0	0	0
Not known	42	7	8	7	3	1
Present	1	3	7	13	23	13
Total	67	16	16	20	26	14

Table 10

Distribution of osteoarthritis in skeletons from Great Chesterford

Spine	Shoulder	Hip	Wrist
10	6	2	2
Hands	Knee	TMJ	Elbow
1	1	1	1*

TMJ = tempero-mandibular joint

*Secondary to fractured radius

Table 11

Proportion of deaths at different ages

	0 -	5 -	15+
Great Chesterford	40.1	9.6	50.3
Sewerby*	3.4**		
Southern England†	1.4¶		
Egypt, 1980	40.8	3.8	55.4
Peru, 1982	38.0	4.0	58.0
Kuwait, 1982	29.6	3.3	67.1
Brazil, 1980	28.6	2.2	69.2
Venezuala, 1983	22.9	2.3	74.8
Greece, 1984	2.3	0.4	97.3
England & Wales, 1984	1.3	0.2	98.5
Sweden, 1984	0.8	0.2	99.0

*Data from Hirst (1984)

**Children aged less than seven years old.

†Data from Brothwell (1972)

¶Children aged less than one year old

Other data from World Health Organisation, World Health Statistics, Geneva, 1984; 1986

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Appendix 1

Catalogue of skeletons from Great Chesterford. An estimate is given of the amount of each skeleton present. The sex and age (in years unless otherwise stated) and height in metres (with the standard error) are also shown where these could be determined; the methods used in each case indicated in parentheses.

1. Substantially complete but lacking left clavicle, right fibula and a number of small bones: ca 90%. Green staining on left side of mandible and left side of third, fourth, sixth and seventh cervical vertebrae and right clavicle.
Female (pelvis, skull)
35-45 (dental wear)
1.56 +/- 0.0305 (left femur + tibia)

2a. Lacks both ulnae, sacrum, right pelvis, both patellae, left fibula and almost all bones of both feet; ca 80%.
Male (pelvis, skull)
25-35 (dental wear, pubic sympysis)
1.68 +/- 0.0299 (right femur + tibia)

2b. Partial adult skeleton represented by skull fragments, mandible, right humerus, lumbar and two cervical vertebrae, fragments of scapulae and right clavicle, part of sacrum, right femur, fragments of left femur, both tibiae and some small bones of hands and feet. Green staining on mandible, cervical vertebrae, right coracoid and right clavicle.
Female (skull)
1.60 +/- 0.0372 (right femur)

2c. Fetus represented by fragments of skull, ribs and left ulna.
40 weeks (ulnar length)

3. Virtually complete skeleton lacking sacrum, both fibulae and some small bones of the hands and feet; ca 90%.
Male (pelvis, skull)
25-35 (dental wear)
1.83 +/- 0.0327 (both femora)

4. Lacks left clavicle, right patella and both fibulae; ca 90%. Green staining on

upper surface of second cervical vertebra.

Male (skull)

15-25 (epiphyseal fusion)

1.55 +/- 0.0299 (both femora + tibiae)

5. Virtually intact but missing sacrum and some small bones of the hands and feet.

Male (pelvis, skull)

35-45 (pubic symphysis)

1.63 +/- 0.0299 (both femora + tibiae)

6. Juvenile skeleton represented by unfused proximal fragment of left femur and midshaft fragment of right femur and both tibiae.

7. Lacks much of skull and upper vertebral column, both scapulae, right clavicle, right humerus, both ulnae, much of pelvis, right fibula, right foot and many other small bones. Green staining on left clavicle.

Female (pelvis, skull)

25-35 (dental wear)

1.62 +/- 0.0355 (left femur + tibia)

8. Fragmentary skeleton represented by lower thoracic and lumbar vertebrae, sacrum, right clavicle and part of right scapula and humerus, substantial part of pelvis, both femora and proximal fragments of both tibiae.

Male (pelvis)

35-45 (pubic symphysis)

9. Virtually intact, lacking sternum, right patella, both fibulae, right foot and some other small bones; ca 90%. Green staining on left radius and right clavicle.

Female (pelvis, skull)

15-25 (pubic symphysis)

1.56 +/- 0.0355 (right femur + tibia)

10. Incomplete skeleton with considerable post-mortem damage. Lacks virtually all vertebral column and sacrum, left pelvis, left clavicle, radius and ulna, both fibulae, right patella, right foot and some other small bones.

Female (skull)

35-45 (pubic symphysis)

1.50 +/- 0.0366 (both tibiae)

11. Adult skeleton lacking skull, both patellae, left fibula and many small bones; ca 85%.
Male (pelvis)
1.71 +/- 0.0299 (right femur + tibia)
12. Very incomplete skeleton represented by skull and mandibular fragments, mid-shaft portions of right femur and tibia and left talus.
25-35 (dental wear)
13. Partial skeleton represented by skull fragments, and portions of right humerus, left ulna, and both femora and tibiae.
35-45 (dental wear)
14. Virtually complete but lacking right femur, both patellae, left tibia and fibula and some small bones; ca 75%.
Female (pelvis, skull)
35-45 (pubic symphysis)
1.70 +/- 0.0366 (right tibia)
15. Fragmentary burial represented by right femur only.
Probably male (femoral head diameter).
16. Incomplete juvenile lacking lower arm bones and all bones of legs and feet except right talus.
8-9 (dental eruption)
17. Partial juvenile represented by skull fragments, mandible, lower thoracic and lumbar vertebrae, distal fragment of right humerus, right tibia, some rib fragments and small foot bones.
8-10 (dental eruption)
18. Incomplete skeleton comprising left scapula, distal end of left clavicle, left pelvis and fragments of right, distal epiphysis of left femur, left patella, left tibia and part of right, both tali, left calcaneum and fragments of some ribs and vertebrae. Green staining on left first rib.
Female (pelvis)
15-25 (epiphyseal fusion)
1.60 +/- 0.0366 (left tibia)
19. Fragmentary adult burial represented by part of left scapula, fragment of right pelvis and mid-shaft fragments of both femora and tibiae.
Probably male (measurement of glenoid length)

20. Substantial skeleton but with post-mortem damage to skull. Lacks left radius, sternum, right patella and fibula and some small bones; ca 80%. Green staining on right scapula, first and second right ribs, first thoracic vertebra, both clavicles and right radius and ulna.
Female (pelvis, skull)
15-25 (epiphyseal fusion)
1.56 +/- 0.0372 (both femora)
21. Incomplete; lacks cervical and upper thoracic vertebrae, right patella and both fibulae and many small bones of hands and feet. Many long bones and skull have post-mortem damage; ca 75%. Green staining on left first rib and left clavicle.
Female (skull)
15-25 (epiphyseal fusion)
22. Lacks left humerus, radius and ulna, right ulna, right patella, both fibulae and several small bones; ca 66%.
Male (pelvis, skull)
25-35 (dental wear)
1.64 +/- 0.0299 (both femora + tibiae)
23. Incomplete skeleton which lacks sternum, right radius, sacrum and pelvis, right patella, both fibulae and many small bones. Lower thoracic and lumbar vertebrae badly damaged post-mortem; ca 66%.
Female (skull)
15-25 (epiphyseal fusion)
24. Lacks left ulna, both patellae, right tibia, both fibulae and many small bones; ca 75%.
Female (pelvis, skull)
35-45 (pubic symphysis, dental wear)
1.62 +/- 0.0355 (left femur + tibia)
25. Substantially intact infant.
0-2 months (long bone measurements)
26. Partial skeleton represented by skull fragments and mandible, distal end of left clavicle, right arm bones, right femur and distal portion of left, both tibiae and fibulae and some small bones.
Female (skull)

45+ (dental wear)

1.57 +/- 0.0357 (right femur)

27. Lacks cervical and first two thoracic vertebrae, left clavicle, right scapula, left pelvis, both patellae, right tibia, both fibulae and both feet. Many bones have post-mortem damage; ca 50%. Green staining on right clavicle.

Female (pelvis, skull)

45+ (dental wear)

1.54 +/- 0.0366 (left tibia)

28. Fragmentary adult represented by skull fragments, part of mandible, fragments of left humerus and both tibiae and right talus.

29. Virtually complete juvenile.

10-12 (dental eruption)

30. Substantial juvenile lacking left pelvis.

6-8 (dental eruption)

31. Virtually complete infant

12-18 months (dental eruption)

32. Lacks left ulna, right radius, right femur, both patellae, both fibulae and some small bones. Some post-mortem damage; ca 75%.

Female (pelvis, skull)

15-25 (epiphyseal fusion, dental wear)

1.63 +/- 0.0355 (left femur + tibia)

32a. Fetus represented by some skull bones, both humeri and both femora. Apparently found in the pelvis of 32.

32 weeks (long bone measurements)

33. Lacks right scapula, radius and ulna, right patella, both fibulae and some small bones; ca 80%.

Male (skull)

15-25 (epiphyseal fusion)

1.71 +/- 0.0327 (right femur)

34. Substantially intact infant burial.

1-2 (long bone measurements)

35. Partial fetal skeleton.

24-32 weeks (long bone measurements)

36. Substantial infant.

1-2 (long bone measurements)

37. Lacks mandible, both radii, left ulna, both patellae, left fibula and some small bones; ca 80%. Green staining on left clavicle.

Female (pelvis, skull)

35-45 (dental wear)

1.61 +/- 0.0355 (left femur + tibia)

38. Substantial fetus, lacking skull.

24-32 weeks (long bone measurements)

39. Substantial fetus.

24-28 weeks (long bone measurements)

40. Incomplete skeleton lacking lower thoracic and lumbar vertebrae, sacrum and most of right pelvis, both lower arms and all leg and foot bones except left talus; ca 33%. Green staining on left malar bone, left mandibular ramus and left mastoid.

Female (pelvis, skull)

15-25 (dental wear)

41. Fragmentary burial represented by skull fragments, part of mandible, proximal ends of both clavicles, fragments of both scapulae, mid-shaft fragments of right humerus and both femora and tibiae.

25-35 (dental wear)

42. Substantial infant.

0-2 months (long bone measurements)

43. Long bones from a fetal burial.

24-32 weeks (long bone measurements)

44. Four long bone fragments from an infant.

45. Incomplete and damaged burial represented by more or less complete skull and right mandible, proximal end of left clavicle, fragment of left scapula, manubrium, proximal end of left humerus and fragment of right, vertebral and rib fragments, proximal right femur and mid-shaft fragments of left femur and tibiae and some small bones of the hand. Green staining on some ribs and left clavicle.

Female (skull)

25-35 (dental wear)

46. Incomplete infant burial.

0-2 months (long bone measurements)

47. Partial infant burial.

0-2 months (long bone measurments)

48. Lacks both patellae and fibulae and some small bones; ca 90%. Green staining on right clavicle.

Female (pelvis, skull)

25-35 (pubic symphysis, dental wear)

1.69 +/- 0.0366 (left tibia)

49. Left humerus and femur, right clavicle and some rib fragments from an infant.

0-2 months (long bone measurements)

50. Substantial but damaged immature skeleton. Lacks cervical and upper thoracic vertebrae; sternum, both patellae and fibulae and some small bones; ca 85%.

Male (skull)

15-25 (epiphyseal fusion)

51. Incomplete and damaged skeleton. Lacks both scapulae, lower thoracic and lumbar vertebrae, sacrum, most of left pelvis, right radius, right patella, both fibulae, both hands and some small bones of the feet; ca 66%. Green staining on costal cartilages, first five thoracic vertebrae and distal end of left ulna.

Male (skull)

45+ (pubic symphysis, dental wear)

1.80 +/- 0.0299 (right femur + tibia)

52. Virtually complete juvenile.

8-10 (dental eruption)

53. Substantially intact juvenile.

6-8 (dental eruption)

54. Incomplete and damaged. Lacks right scapula, lower cervical and lower lumbar vertebrae, sacrum, left radius and ulna, both hands, right patella, both fibulae and some small bones of the feet; ca 66%.

Male (pelvis, skull)

45+ (pubic symphysis)

1.72 +/- 0.0299 (left femur + tibia)

55. Substantially intact skeleton. Lacks sacrum, right clavicle, both hands, both

fibulae, right patella and some small foot bones; ca 85%. Green staining on left clavicle, right radius and ulna and left radius.

Female (pelvis, skull)

35-45 (pubic symphysis, dental wear)

1.71 +/- 0.0355 (left femur + tibia)

56. Substantial infant.

4-6 months (long bone measurements)

57. Substantial infant.

2-4 months (long bone measurements)

58. Substantial infant.

2-4 months (long bone measurements)

59. Few fragments of bone from an infant burial.

60. Partial infant.

0-2 months (long bone measurements)

61. Substantial infant.

2-4 months (long bone measurements)

62. Fragmentary infant burial.

63. Incomplete infant burial.

0-2 months (long bone measurements)

64. Substantial infant.

0-2 months (long bone measurements)

66. Incomplete and damaged. Lacks right scapula, left clavicle, left radius, both hands, most of sacrum and right pelvis, right femur, both patellae and fibulae and right foot; ca 66%. Green staining on cervical vertebrae and both clavicles.

Female (pelvis, skull)

25-35 (pubic symphysis, dental wear)

1.70 +/- 0.0424 (right radius)

67. Substantial infant.

2-4 months (long bone measurements)

68. Lacks right clavicle, both scapulae, sternum, right ulna, both hands, patellae, fibulae and feet. Extant arm bones damaged; ca 66%.

Male (skull)

45+ (dental wear)

1.67 +/- 0.0299 (left femur + tibia)

70. Substantial infant.

0-2 months (long bone measurements)

71. Substantial infant.

0-2 months (long bone measurements)

72. Incomplete juvenile lacking skull, much of vertebral column, arm bones and right tibia and fibula and many small bones.

10-11 (long bone measurements)

73. Lacks both hands, patellae, fibulae and feet. Vertebrae badly damaged post-mortem; ca 90%.

Female (pelvis, skull)

25-35 (dental wear)

1.65 +/- 0.0355 (both femora + tibiae)

74 Partial infant.

0-2 months (long bone measurements)

75. Fragmentary skeleton represented by skull and mandible, thoracic and lumbar vertebrae, sacrum and most of pelvis, both clavicles, both humeri, fragments of both scapulae, right radius and fragments of both ulnae, manubrium, right talus and a few small bones of the hand.

Male (pelvis, skull)

45+ (dental wear)

1.63 +/- 0.0405 (both humeri)

76. Substantial skeleton lacking both scapulae and clavicles, both patellae, right fibula and both hands and feet; ca 80%.

Male (pelvis, skull)

35-45 (pubic symphysis, dental wear)

1.75 +/- 0.0299 (left femur + tibia)

77. Partial infant.

0-2 months (long bone measurements)

78. Partial infant.

0-2 months (long bone measurements)

79. Partial juvenile represented by skull fragments, right ulna, both pubic bones and fragment of right ilium and both tibiae.

6-8 (dental eruption)

80. Substantially complete lacking only both hands and both fibulae and some small bones of the feet. Some post-mortem damage; ca 90%
Male (pelvis, skull)
35-45 (pubic symphysis, dental wear)
1.61 +/- 0.0299 (both femora + tibiae)
81. Lacks both scapulae, sternum, right patelaa, left fibula and some small bones of the hands and feet; ca 90%. Green staining on both clavicles.
Female (pelvis, skull)
35-45 (pubic symphysis, dental wear)
1.60 +/- 0.0355 (both femora + tibiae)
82. Partial fetus.
36-40 weeks (long bone measurements)
83. Mixed burial with at least six fetuses present, all of the same age.
36-40 weeks (long bone measurements)
84. Partial and damaged skeleton. Lacks left radius and right ulna, both hands, both patellae and fibulae and some small bones of the feet; ca 75%.
Male (pelvis, skull)
45+ (dental wear)
1.73 +/- 0.0405 (both humeri)
85. Substantial fetus.
36-40 weeks (long bone measurements)
86. Juvenile lacking skull and mandible, many vertebrae and some small bones of the hands and feet, both fibulae and left tibia.
7-8 (long bone measurements)
87. Incomplete infant.
0-2 months (long bone measurements)
88. Substantial infant.
2-4 months (long bone measurements)
89. Incomplete and damaged infant.
0-2 month (long bone measurements)
90. Virtually intact. Lacks both hands and both patellae and some small bones of the feet; ca 95%.
Male (pelvis, skull)
35-45 (pubic symphysis, dental wear)

1.60 +/- 0.0299 (both femora + tibiae)

91. Partial infant.

0-2 months (long bone measurements)

92. Substantially complete skeleton. Lacks right scapula, both hands, patellae, fibulae and feet; ca 90%. Green staining on some ribs.

Female (pelvis, skull)

35-45 (pubic symphysis, dental wear)

1.57 +/- 0.0355 (both femora + tibiae)

93. Virtually complete skeleton lacking both hands, patellae and fibulae and some small bones of the feet; ca 90%.

Male (skull)

25-35 (pubic symphysis, dental wear)

1.66 +/- 0.0299 (both femora + tibiae)

94. Incomplete infant.

0-2 months (long bone measurements)

95. Mixed burial with at least two infants of the same age.

0-2 months (long bone measurements)

96. Partial skeleton lacking vertebral column and sacrum, sternum, left clavicle and arm, both hands, left fibula and most of the bones of both feet; ca 66%.

Male (pelvis, skull)

15-20 (epiphyseal fusion)

1.64 +/- 0.0299 (both femora + tibiae)

97. Incomplete and damaged. Lacks left clavicle and arm, both hands, right ulna, right patella, both fibulae and some small bones of the feet; ca 75%. Green staining on right clavicle.

Female (skull)

25-35 (dental wear)

1.57 +/- 0.0355 (both femora + tibiae)

98. Partial infant.

0-2 months (long bone measurements)

99. Incomplete infant.

1-2 (dental eruption and long bone measurements)

100. Substantially complete, lacking sternum, sacrum both hands and fibulae,

right patella and some bones of the feet; ca 85%. Green staining on lower cervical and upper thoracic vertebrae and right clavicle.
Female (pelvis, skull)
25-35 (pubic symphysis, dental wear)
1.65 +/- 0.0355 (both femora+tibiae)

101. Incomplete and damaged. Lacks vertebral column and sacrum, sternum, ribs, much of pelvis, both hands, both fibulae and most small bones of the feet; ca 50%.
Male (pelvis, skull)
45+ (dental wear)
1.53 +/- 0.0299 (both femora + tibiae)

102. Lacks right scapula and right arm, both hands, sacrum, right patella and fibula and some small bones of the feet; ca 75%.
Male (pelvis, skull)
25-35 (dental wear)
1.51 +/- 0.0299 (both femora + tibiae)

103. Incomplete lacking all but first two cervical vertebrae, both hands, both fibulae and most small bones of the feet; ca 80%.
Female (pelvis, skull)
35-45 (pubic symphysis, dental wear)
1.64 +/- 0.0366 (left tibia)

104. Incomplete fetus.
36-38 weeks (long bone measurements)

105. Substantially complete infant.
2-4 months (long bone measurements)

106. Substantial but much damaged juvenile.
4-6 (dental eruption)

107. Substantial infant.
6-12 months (long bone measurements)

108. Partial and damaged skeleton lacking skull and mandible, cervical vertebrae, sternum, right scapula and humerus, left clavicle, both hands, patellae and fibulae and many small bones of the feet; ca 45%. Green staining on right clavicle.
Female (pelvis)

35-45 (pubic symphysis)

1.65 +/- 0.0366 (left tibia)

109. Incomplete and much damaged skeleton. Lacks all vertebrae except for some lumbar fragments, sacrum, both scapulae, left clavicle, sternum, right arm, both hands, pelvis, and most of the bones of both feet; ca 40%.

Male (skull)

45+ (dental wear)

110. Substantial skeleton lacking both ulnae, left radius, both hands, cervical and uppper thoracic vertebrae, sacrum, some small bones of the feet; ca 80%.

Female (pelvis, skull)

25-35 (dental wear)

1.65 +/- 0.0366 (left femur + tibia)

111. Virtually complete infant.

12-18 months (long bone measurements)

112. Incomplete and damaged. Lacks right radius and ulna, both hands, tibiae and fibulae and many small bones of the feet; ca 50%.

Female (pelvis, skull)

45+ (dental wear)

1.63 +/- 0.0424 (left radius)

113. Substantial but somewhat damaged. Lacks right ulna, both hands, part of pelvis, right patella, both fibulae and many small bones of the feet; ca 80%. Green staining on mandible, right ribs and right clavicle.

Female (skull)

45+ (dental wear)

1.61 +/- 0.0355 (both femora + tibiae)

114. Substantially complete lacking right radius, both hands, both fibulae and both feet; ca 80%. Green staining on mandible and manubrium.

Female (pelvis, skull)

45+ (dental wear)

1.62 +/- 0.0355 (both femora + tibiae)

115. Incomplete and damaged adult. Lacks mandible, both scapulae and clavicles, cervical and thoracic vertebrae, both radii, ulnae and hands, right patella and many small bones of the feet; ca 50%.

Male (pelvis, skull)

1.72 +/- 0.0327 (right femur)

116. Partial skeleton lacking lower thoracic and lumbar vertebrae, sacrum, most of pelvis, sternum, right arm, right patella, both fibulae and most small bones of hands and feet; ca 45%. Green staining on left first rib, first three cervical vartebrae and distal end of right clavicle.

Female (skull)

35-45 (pubic symphysis, dental wear)

1.58 +/- 0.0355 (left femur + tibia)

117. Virtually complete skeleton lacking both hands, lower cervical vertebrae, both fibulae and some small bones of the feet; ca 90%.

Male (pelvis, skull)

35-45 (pubic symphysis)

1.56 +/- 0.0299 (both femora + tibiae)

118. Substantial juvenile.

4-6 (dental eruption)

119. Partial juvenile.

8-10 (long bone measurements)

120. Incomplete and damaged. Lacks cervical and upper thoracic vertebrae, sternum, left scapula and clavicle, both hands, patellae and fibulae and many small bones of the feet; ca 75%. Green staining on right ribs and right clavicle.

Female (pelvis, skull)

35-45 (pubic symphysis, dental wear)

1.56 +/- 0.0366 (right tibia)

121. Lacks skull and mandible, both hands, both patellae, right fibula and many small bones of the feet; ca 80%.

Male (pelvis)

15-25 (epiphyseal fusion)

1.52 +/- 0.0327 (right femur)

122. Incomplete and damaged. Lacks both clavicles, sacrum, right pelvis, both hands, patellae and fibulae and some small bones of the feet; ca 66%.

Male (pelvis, skull)

25-35 (pubic symphysis, dental wear)

1.82 +/- 0.0432 (right radius)

123. Few skull fragments of infant.

124. Virtually complete lacking both hands, right patella, right fibula and some small bones of the feet; ca 85%. Green staining on left mandible, right clavicle, right radius and ulna.
Female (pelvis, skull)
35-45 (pubic symphysis, dental wear)
1.67 +/- 0.0355 (right femur + tibia)
125. Lacks sacrum, both hands, both patellae, right fibula and most bones of the feet; ca 85%.
Male (pelvis, skull)
35-45 (pubic symphysis)
1.74 +/- 0.0299 (right femur + tibia)
126. Partial skeleton represented by skull fragments, mandible, right clavicle, part of right humerus, right pelvis and right femur, right tibia and fragments of vertebrae. Green staining on right clavicle.
Female (pelvis, skull)
25-35 (dental wear)
1.67 +/- 0.0366 (right tibia)
127. Virtually intact, lacking sternum, both hands, right patella and fibula and some bones of the feet; ca 90%. Green staining both clavicles and first and second left ribs.
Female (pelvis)
25-35 (pubic symphysis)
1.64 +/- 0.0355 (both femora + tibiae)
127a. Fragments of fetal skull and mandible apparently found in the pelvis of 127.
128. Substantial skeleton lacking both hands, right patella and fibula and some bones of the feet; ca 95%.
Male (pelvis, skull)
25-35 (dental wear)
1.68 +/- 0.0299 (right femur + tibia)
129. Incomplete and damaged. Lacks right mandible, both scapulae, left clavicle, sternum, sacrum, right radius, both hands, left patella, right fibula and some bones of the feet. Vertebrae very fragmented; ca 75%.
Female (pelvis, skull)

15-25 (epiphyseal fusion)
1.63 +/- 0.0366 (both tibiae)
130. Substantial skeleton lacking left scapula, left ulna, both hands, left patella, right fibula and most of both feet; ca 90%.
Male (pelvis, skull)
15-25 (epiphyseal fusion)
1.62 +/- 0.0299 (left femur + tibia)
132. Incomplete and damaged. Lacks cervical and upper thoracic vertebrae, both clavicles, sternum, both radii, both hands, left patella, both fibulae and some bones of the feet; ca 75%. Green staining on mandible and left ribs.
Female (skull)
35-45 (pubic symphysis, dental wear)
1.66 +/- 0.0366 (left tibia)
133. Incomplete fetus.
36-40 weeks (long bone measurements)
134. Adult skeleton represented by both tibiae, both tali, right calcaneum and some other foot bones.
135. Substantial skeleton lacking both hands, both patellae, left fibula and many foot bones; ca 95%. Green staining on mandible, right clavicle and distal end of right ulna.
Female (pelvis, skull)
45+ (dental wear)
1.57 +/- 0.0355 (left femur + tibia)
136. Incomplete infant.
12-18 months (long bone measurements)
137. Incomplete and much damaged adult. Lacks left ulna, both hands, most of left pelvis, both patellae and fibulae and some foot bones; ca 75%.
Male (pelvis)
1.70 +/- 0.0405 (right humerus)
138. Fragmentary fetus.
36-40 weeks (long bone measurements)
139. Incomplete infant.
0-2 months (long bone measurements)
140. Badly damaged and incomplete skeleton represented by skull fragments,

mandible, fragments of ribs, vertebrae, right scapula, both humeri, right radius and ulna, right pelvis, both femora and both tibiae; both patella intact.

Male (skull)

45+ (dental wear)

141. Substantial infant.

2-3 (dental eruption)

142. Scrappy adult represented by skull fragments and fragments of both humeri, femora and tibiae.

25-35 (dental wear)

143. Substantial infant.

2-4 months (long bone measurements)

144. Partial infant.

0-1 months (long bone measurements)

145. Substantial but somewhat damaged. Lack both hands, left patella and some foot bones; ca 90%. Green staining on manubrium, some rib fragments and right clavicle.

Female (pelvis, skull)

35-45 (dental wear)

1.60 +/- 0.0355 (right femur + tibia)

146. Fragmentary juvenile represented by damaged skull, right clavicle and some bones of the feet.

6-8 (dental eruption)

147. Virtually complete juvenile.

6-8 (dental eruption)

148. Substantial juvenile. Green staining on mandibular fragment and distal end of right clavicle.

3-6 (long bone measurements)

149. Virtually complete. Lacks right scapula, right radius, both hands, both fibulae and many foot bones; ca 90%.

Male (skull)

15-25 (epiphyseal fusion)

150. Mixed burial containing at least two infants of the same age.

2-4 months (long bone measurements)

151. Incomplete infant.

1-2 months (long bone measurements)

152. Substantial skeleton but lacking both hands, femora, patellae, fibulae and feet; ca 80%.

Female (pelvis, skull)

35-45 (pubic symphysis)

1.54 +/- 0.0366 (left tibia)

153. Damaged skeleton lacking left mandible, both scapulae, sternum, right radius, both hands, right patella, both fibulae and many foot bones; ca 85%. Green staining on both clavicles.

Female (pelvis, skull)

15-25 (epiphyseal fusion)

1.46 +/- 0.0355 (both femora + tibiae)

154. Incomplete infant.

1-2 (long bone measurements)

155. Substantial infant.

0-2 months (long bone measurements)

156. Virtually complete infant.

0-2 months (long bone measurements)

157. Substantially complete but lacks sternum, both hands, right patella, both fibulae and some foot bones; ca 95%.

Male (pelvis, skull)

35-45 (dental wear)

1.68 +/- 0.0299 (both femora + tibiae)

158. Incomplete infant.

2-3 (long bone measurements)

159. Very fragmentary infant.

160. Substantial but somewhat damaged skeleton. Lacks left scapula, both hands, left patella, both fibulae and many bones of the feet; ca 85%.

Female (pelvis, skull)

35-45 (pubic symphsis, dental wear)

1.60 +/- 0.0355 (left femur + tibia)

Appendix 2

Catalogue of pathological findings in human remains from Great Chesterford. This catalogue should be read in conjunction with Appendix 1 in order so that the extent of each skeleton is known.

1. 1. Ante-mortem tooth loss. 2. Osteoarthritis spine. Pitting and eburnation of left hand facet joint between C3/4. 3. Proliferation of new bone on insertion of both subscapularis muscles, left more pronounced than right. Also around proximal joint margins on left ulna, proximal and distal joint margins on right femur and flexor insertions of phalanges of hands. 4. Degenerative disc disease between C4/5. 5. Osteophytes on T3-T11, L2-5 and S1.
2a. 1. Fracture in proximal third of left clavicle. Well healed with some backward angulation. 2. Proliferative new bone on soleal line of left tibia.
2b. 1. Ante-mortem tooth loss. 2. Osteoarthritis spine and hands. Proliferation around both facet joints on first saccral segment. Eburnation on proximal end of one phalanx of the hand. 3. Degenerative disc disease between L5/S1.
3. Osteophytes on L3-5.
4. Osteophytes on L2-3.
5. 1. Dental crowding in mandible. Both first premolars have been pushed outside the arc made by the remaining teeth. 2. Osteoarthritis of right acromio-clavicular joint. 3. Degenerative disc disease between C3/4 with narrowing of the nerve outlet on the right hand side. 4. Proliferative new bone around proximal joint margins of both ulnae and along pelvic rim.
7. Dental caries.
9. Sixth thoracic vertebra is flattened in antero-posterior direction with degenerative disc disease and osteophytosis. Probably traumatic.
11. 1. Osteoarthritis spine and wrist. Right hand facet joint affected between C5-6 and both facet joints between L3-4. Proliferation of new bone and eburnation distal joint between right ulna and radius. Pitting on joint surfaces between left ulna and radius with new bone around margins. 2. Degenerative disc disease between C5-6 and L5-S1. 3. Osteophytes on T4-L5. 4. Fracture of third right metatarsal. Healed with much callus and some shortening.

14. 1. Ante-mortem tooth loss. 2. Osteophytes T11-L5. 3. New bone on antero-inferior rim of both humeral heads and into both subscapularis insertions. Also around proximal joint margins of both ulnae and proximal and distal ends of left femur.

16. Ante-mortem tooth loss.

17. Bilateral cribra orbitalia, grade 2.

19. Osteoarthritis right acromio-clavicular joint.

22. Osteophytes on L4-S1.

24. 1. Ante-mortem tooth loss and dental caries. 2. Osteophytes on L1 and L3-5.

26. Ante-mortem tooth loss.

27. 1. Ante-mortem tooth loss and dental caries. 2. Osteoarthritis spine affecting left hand facet joint between L5-S1. 3. Osteophytes L5-S1.

30. Bilateral cribra orbitalia, grade 2.

32. Schmorl's nodes affecting T11, 12, L2, L3.

37. 1. Dental caries. 2. Osteoarthritis of right manubrio-clavicular and acromio-clavicular joints. 3. Spondylolysis of L5. 4. Degenerative disc disease L5-S1. 5. Osteophytes on T8-L5. 6. Schmorl's nodes T10-12.

40. Ante-mortem tooth loss.

48. Ante-mortem tooth loss, dental caries and dental abscess.

51. 1. Ante-mortem tooth loss and dental abscesses. 2. Osteophytes on fragments of lower thoracic vertebrae. 3. Proliferative new bone around proximal joint of left radius and right ulna, left patella and on soleal line of right tibia. 4. Laminae of atlas vertebra unfused.

54. 1. Ante-mortem tooth loss. 2. Osteoarthritis of spine and both tempero-mandibular joints. Proliferative new bone on odontoid peg; arthritic changes around right hand facet joints between C3-4. 3. New bone around right humeral head and on rotator cuff insertions. Also around left glenoid, both acetabuliand left patella.

55. Dental caries.

66. 1. Overcrowding of anterior lower teeth with second right lower incisor displace backwards behind adjacent teeth. 2. Bilateral cribra orbitalia, grade 1.

68. 1. Ante-mortem tooth loss. 2. New bone on linea aspera of left femur, around right acetabulum, around margins of right sacro-iliac joint and soleal

line on left tibia. 3. Fragments of T5-6 fused anteriorly on right hand side. 4. Osteophytes L1-5.

73. Dental caries.

75. 1. Large traumatic lesion in right parietal bone measuring about 46 x 37 mm. Edges are bevelled from outside inwards over about 10 mm. Edges well healed; consistent with wound such as may have been made with a sword. 2. Healed fracture in middle of left clavicle. 3. Osteoarthritis affecting left acromio-clavicular joint.

76. 1. Osteophytes T9-L5. 2. New bone around proximal joint surface on right ulna and around both sacro-iliac joints with some new bone on sacral surfaces of the joints.

80. 1. Ante-mortem tooth loss and dental abscess. 2. Osteoarthritis left shoulder; pitting on inferior surface of left acromion and arthritic change in acromio-clavicular joint. 3. Osteochondritis dissecans proximal joint of both first metatarsals and on proximal joint surface of right navicular. 4. Osteophytes on T5-S1. 5. Schmorl's nodes T10-12. 6. New bone on soleal line and proximal and distal joint margins of right tibia, proximal joint margins of left ulna, proximal and distal joint margins of right ulna; both patellae; right glenoid.

81. 1. Degenerative disc disease C3-4 and L5-S1. 2. Osteophytes on T4-L5. 3. Schmorl's nodes T10-12. 4. New bone around distal joint margins of both femora.

84. 1. Ante-mortem tooth loss and dental abscess. 2. Osteophytes T7-12.

87. Bilateral cribra orbitalia, grade 1.

90. 1. Ante-mortem tooth loss and dental abscess. 2. Fracture in upper quarter of right fibula; well healed with no shortening. 3. Osteoarthritis of right acromio-clavicular joint. 4. New bone around left humeral head, proximal joint margin left ulna, right radial head, around both sacro-iliac joints and on obturator foramina.

92. 1. Ante-mortem tooth loss and dental abscess. 2. Osteoarthritis of left knee. 3. Osteophytes T5-S1. 4. New bone around right humeral head, proximal joint margin of left tibia and both ischial tuberosities.

93. 1. Small, well healed depressed fracture in left frontal bone. 2. New bone around proximal joint margin on right radius.

96. Periostitis on fibular surface of right tibia in its distal third.

97. Spndylolysis L5.

100. 1. Schmorl's nodes T6-12. 2. Osteochondritis dissecans proximal joint surface left first proximal phalanx of foot. 3. Six lumbar vertebrae.

101. 1. Ante-mortem tooth loss. 2. Lesion about 20 x 27 mm in left frontal bone with depressed edges. Suggests a healed wound. 3. New bone over insertions of both subscapularis muscles, around proximal joint margins of right ulna, around left acetabulum and on left soleal line.

102. Dental caries.

103. 1. Ante-mortem tooth loss and dental caries. 2. New bone around both pubic bones and head of right femur.

108. 1. Osteoarthritis of spine. Left hand facet joints between L4-5 and both between L5-S1 affected. 3. Degenerative disc disease between L5-S1. 4. Osteophytes L5-S1.

112. 1. Ante-mortem tooth loss and dental abscess. 2. Degenerative disc disease L5-S1. 3. New bone around both humeral heads and both subscapularis insertions.

113. 1. Ante-mortem tooth loss. 2. Osteoarthritis spine and left wrist. Facet joints between C4-7 affected. Eburnation, deformation of joint contour and new bone on distal ulnar joint. 3. Osteophytes L1-5.

114. Ante-mortem tooth loss and dental caries.

115. 1. Osteoarthritis of L5-S1 facet joints. 2. New bone on linea aspera of right femur, around margins of both sacro-iliac joints, both acetabula, both ischial tuberosities and on left soleal line.

116. 1. Ante-mortem tooth loss. 2. Osteoarthritis of spine affecting facet joints of C2-3 and C4-6. 3. Degenerative disc disease between C5-T1. 4. New bone around distal joints of both femora and proximal joint of right tibia.

117. 1. New bone around margins of both sacro-iliac joints. 2. Schmorl's nodes T12-L5. 3. Osteochondritis dissecans heads of both first metatarsals.

120. 1. Ante-mortem tooth loss and dental abscess. 2. Disseminated idiopathic skeletal hyperostosis. Right sided osteophytes on T5-12 with fusion of T8-9. Facet joints normal. Osteophytes on all lumbar vertebrae. Left sacro-iliac joint fused. 3. Schmorl's nodes on L2,3 and 4.

121. Partial spondylolysis L5.

124. 1. Osteophytes T3-S1. 2. New bone around pelvic rim and distal joint of right femur. 3. Schmorl's node T8.

125. 1. Ante-mortem tooth loss. 2. Well healed fractures of three left ribs. 3. Fusion of broken fragments of L3-4. Facet joints are fused and there is fusion across the invertebral space. 3. New bone around proximal joint margins of left ulna, both acetabula and sacro-iliac joints and right glenoid.

127. Lamina of L4-5 fused on right hand side.

128. 1. Osteoarthritis of left hip. 2. New bone around distal joint margin of right femur.

132. 1. Ante-mortem tooth loss and dental caries. 2. Lamina of L1 is unfused on right hand side.

134. Proliferation of new bone around and on joint between left talus and calcaneum; proliferation and pitting on base of left second metatarsal.

135. New bone around left glenoid, distal joint margin of both radii and around joint margins of both sacro-iliac joints.

137. 1. Ante-mortem tooth loss and dental caries. 2. Fracture in distal third of left clavicle. Healed with considerable backward angulation. 3. Erosive lesions on anterior surface of L3-5. L4-5 collapsed. Little reactive new bone. Possibly tuberculosis. 4. Osteophytes L1-2. 5. New bone around left glenoid and on right subscapularis insertion.

140. 1. Ante-mortem tooth loss and dental caries. 2. Osteoarthritis of spine affecting facet joints of C2-4. 3. Degenerative disc disease between C4-T2. 4. Well healed fractured left rib. 5. New bone around right glenoid and insertion of right rotator cuff muscles.

145. 1. Dental caries. 2. Spondylolysis L5.

152. 1. Ante-mortem tooth loss and dental abscess. 2. Osteoarthritis of left hip. 3. Osteophytes T3-7 ns L3-5. 4. New bone around right glenoid.

157 1. Ante-mortem tooth loss. 2. Small circular osteoma, about 12 mm in diameter, in the midline of the skull approximately 6 cm from nasion. 3. Spondylolysis L5. 4. Osteochondritis dissecans lateral table left tibia. 5. Osteophytes T7, 8-L3. 5. New bone around distal joint margins of right radius.

160. 1. Ante-mortem tooth loss, dental caries and abscess. 2. Fracture just below head of right radius. Healed with lateral displacement and production of secondary osteo-arthritis. 3. Degenerative disc disease C5-7. 4. Rim of new

bone around head of left humerus.

The human remains from Great Chesterford

Part II: The cremations

There were 31 cremations from the site varying in amount from a few fragments totalling less than 100 g to remains which weighed over a kilogram and must have represented a substantial part of the whole skeleton. (The full catalogue of the cremations is shown in the Appendix.) As reference to figure 1 makes clear, however, less than half the cremations weighed over 200 g suggesting that the collection of the cremated bones was very incomplete.

Size of cremated bone fragments

The bone fragments ranged in size from less than 5 mm to 86.0 mm but the average size tended towards the upper limit in virtually all cases. This suggests that the bones had not been crushed after cremation.

Colour and texture

In virtually every case the bones were white-black in colour and calcined, indicating that cremation had taken place at a high temperature.

Identified bone

There were relatively few fully identified bones, and the majority of these were cervical and thoracic vertebrae and proximal portions of the femur (see figure 2). The dense ends of some of the other long bones also tended to survive relatively well but it is rather surprising that only one tooth was present. Since the teeth are amongst the hardest structures in the body it is more likely that they were not picked up after the cremation than that they did not survive the fire.

Animal bone

Five of the cremations contained animal bone. In two instances small bird bones were present (crems 1, 19); there was one sheep tooth (crem 6), one sheep metatarsal (crem 20) and one fragment of cattle sized vertebra (crem 12).

Sex and age of the cremations

In two cases only could a probable sex be attributed to the cremated body. Both were considered to be male based on measurements of the diameter of the head of the humerus (crem 1) and of the head of the femur (crem 10).

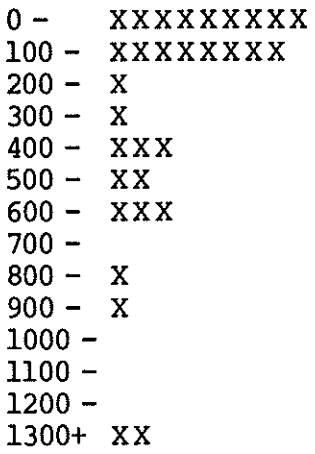
Eighteen of the cremations were of adults, two were juveniles (that is individuals aged between five and fifteen; crems 12 and 28) and one (crem 32) was of an infant (aged less than five years). In the remaining cases no estimation of age could be made.

Pathology

There were two cremations in which pathological changes were noted (crems 2 and 20). In both, there was evidence of ante-mortem tooth loss from the maxilla and the mandible respectively. This was presumably caused by disease of the teeth or gums.

Figure 1

Total weights (g) of cremations from Great Chesterford



Each cross indicates a single cremation

Figure 2

Number of identified skeletal elements from cremations at Great Chesterford

Cervical vertebra	XXXXXXX
Thoracic vertebra	XXXXXX
Proximal femur	XXXXXX
Distal femur	XXX
Metatarsal	XXX
Proximal humerus	XX
Mandible	XX
Scapula	XX
Distal humerus	XX
Pelvis	XX
Patella	XX
Maxilla	X
Ulna	X
Tibia	X
Tarsals	X
Metacarpal	X
Phalanx of hand	X
Phalanx of foot	X
Teeth	X

Each cross indicates one bone

Appendix

Catalogue of cremations from Great Chesterford

In this catalogue the colour and texture of the bones are shown followed by the length (in mm) of the longest and shortest fragments and an indication as to whether the average size tends to the longest or shortest. The weight (in g) of the different anatomical elements is then given and the number of bones indentified in each element in parentheses. Details of any individual bones identified are next given with any additional comments, including any pathological changes present. The entry ends with the age and sex of the cremated individual where this could be determined.

1. White-black, stony. Longest 73, shortest <5; average tending to longest. Cranial 75 (18), vertebral 80 (20), pelvis 120 (19), ribs 15 (5), long bone 555 (120), remainder 550. Left humeral head (diameter = 47 mm), two cervical and two thoracic vertebra. Bird bone present.
Adult
Probably male (humeral head diamater)

2. White-black, stony. Longest 63, shortest <5; average tending to longest. Cranial 100 (19), vertebral 15 (7), pelvis 18 (11), ribs 0.5 (1), long bone 140 (505), remainder 650. Distal ends of both radii, left patella, odontoid peg, fragment of mandible and maxilla. Ante-mortem tooth loss from maxilla.
Adult

3. White-black, stony. Longest 41.5, shortest <5; average tending to longest. Less than 100 fragments, total weight 80. Fragments of four lumbar vertebrae; fragment of petrous temporal bone.
Adult.

4. White-black, calcined. Longest 72, shortest <5; average tending to longest. Cranial 20 (9), vertebral 10 (4), pelvis 5 (2), ribs 1 (2), long bone 260 (5), metacarpals 0.5 (1), remainder 105. Medial and lateral femoral condyles, proximal end left first metatarsal.

Adult.

5. Ten fragments of burnt bone; weight ca 5 g.

6. White-black, calcined. Longest 68, shortest <5; average tending to longest. Cranial 50 (14), pelvis 20 (8), long bone 115 (29), metacarpals 0.5 (1), remainder 115. Sheep molar present.

Adult.

7. White-black, calcined. Longest 42, shortest <5; average tending to shortest. Long bone 80 (28), remainder 215. Fragment of humeral head.

Adult.

8. White, calcined. Longest 63, shortest <5; average tending to shortest. Long bone 100 (34), remainder 580.

Adult.

9. White-black, calcined. Longest 86, shortest <5; average tending to longest. Cranial 1 (3), vertebral 105 (17), pelvis 15 (3), ribs 2 (3), long bone 250 (43), metacarpals 0.5 (1), metatarsals 0.5 (1), phalanges 0.5 (1), remainder 200. First metatarsal head, first metacarpal head, head of proximal phalanx of hand, odontoid peg, one cervical, nine thoracic and one lumbar vertebrae.

Adult.

10. Grey-black, calcined. Longest 57, shortest <5; average tending to longest. Vertebral 10 (6), long bone 115 (28), remainder 305. Fragments of both femoral heads (diameter of left >45 mm), three thoracic and one cervical vertebrae, right mandibular head, distal humerus, fragment of right patella.

Adult.

Probably male (femoral head diameter).

11. White-black, calcined. Longest 49, shortest <5; average tending to longest. Cranial 0.5 (1), long bone 50 (18), remainder 105.

Adult.

12. White-black, calcined. Longest 67, shortest <5; average tending to longest. Cranial 75 (16), vertebral 0.5 (1), pelvis 60 (7), long bone 105 (28), remainder 275. Unfused proximal femur, both proximal femoral epiphyses and one proximal epiphysis of humerus, one fragment of deciduous molar. Cow vertebra present.

Juvenile.

13. Grey-black, calcined. Longest 64, shortest, <5; average tending to longest. Cranial 15 (6), pelvis 30 (5), ribs 5 (2), long bone 400 (71), tarsals 1.5 (1),

remainder 290. Mid-shaft fragment of femur, fragment of femoral head, navicular.
Adult.

15. White, stony. Longest 55, shortest 10; average tending to longest. Cranial 30 (10), ribs 1 (2), long bone 90 (17), remainder 30.
Adult.

16. White, calcined. Longest 59, shortest 18; average tending to longest. Twenty fragments, five of which are long bone; total weight 60.

17. Seven small fragments of burnt bone 10-15 mm in length; total weight < 5g.

18. White, stony. Longest 82, shortest <10; average tending to longest. Cranial 10 (7), long bone 315 (57), remainder 100. Right proximal tibia, fragment of left patella.
Adult.

19. Grey-black, calcined. Longest 81, shortest <10; average tending to longest. Cranial 25 (16), vertebral 15 (5), ribs 1.5 (2), long bone 190 (36), remainder 375. Lateral condyle right femur, left coracoid, one cervical and one thoracic vertebrae. Bird bone present.
Adult.

20. White-black, calcined. Longest 80, shortest <10; average tending to longest. Cranial 205 (13), vertebral 5 (4), long bone 580 (136), remainder 550. Fragments of parietal and frontal with sutures fusing, two scapular fragments, left mandibular fragment, one cervical vertebra. Ante-mortem tooth loss from mandible. Sheep metatarsal fragment present.
Adult.

22. Small number of grey-black, calcined fragments, about 5-10 mm in length. Total weight 50g.

23. Small number of large grey-black, calcined fragments, length 20-30 mm. Total weight 115g.

24. Small number of fragments, mostly long bone; grey-black, calcined. Length 25-40 mm; total weight 180g.
Adult.

25. Small number of grey-black, calcined fragments; mostly long bone but one cranial fragment with fusing sutures. Length 30-45 mm; total weight 125g.
Adult.

26. Seven grey-black fragments, 20-35 mm. Weight 25 g.
Adult
27. Small number of white-grey fragments, mostly long bone. Length 25-40 mm, weight 100g.
28. Black-white, not calcined. Longest 45, shortest <10; average tending to longest. Cranial 25 (10), rib 1 (1), long bone 75 (17), remainder 60. Fragment of unfused proximal femur.
Juvenile.
29. White-black, calcined. Longest 67, shortest <10; average tending to longest. Cranial 15 (9), pelvis 5 (3), ribs 5 (3), long bone 390 (70), metatarsals 5 (3), remainder 180. Left first metatarsal, distal end right femur, fragment of right ulna, fragments of maxilla.
Adult.
30. Small number of white-black fragments, 15-30 mm; total weight 20g.
Adult
31. Small number of white fragments; four cranial, remainder mainly long bone. Length 25-40 mm, total weight 95g.
Adult
32. White-grey; calcined. Cranial 50 (39), vertebral 5 (6), pelvis 5 (2), ribs 5 (3), long bones 35 (31), remainder 80. Left ischium, distal left humerus, proximal left femur, six vertebral bodies.
Infant.
33. Eleven white-black fragments. Mostly long bone. Length 25-55, total weight 55g.