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Ancient Monuments Laboratory
Report 87/87

THE HUMAN BONES FROM ULWELL.

Tony Waldron PhD MD

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Summary

There were 49 discrete inhumations from this site of which 39 were adult (14 male, 19 female, 6 of uncertain sex), 9 juveniles and 1 infant. Several of the inhumations contained intrusive human bones and one contained animal bone. The bones had suffered a considerable amount of post-mortem damage which severely limited the data which could be obtained from them.

Twelve of the adult skeletons had dental disease and one of the juveniles had heterotopic canines. Eight skeltons had osteoarthritis of the large joints; 1 juvenile and 2 females had cribra orbitalia and 2 females had hyperostosis frontalis interna.

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Introduction

There were 49 discrete inhumations from this site and a small number of bones from an instratified context. The condition of the bones was poor; there was evidence for a great deal of post mortem damage and many of the bones were broken and their surfaces badly eroded, presumably as the result of adverse soil conditions. The degree of post mortem damage present indicates that the site was disturbed after the burials had taken place. Further evidence for this comes from the fact that in just over a fifth of all the case (10 out of 49, 20.4%), intrusive bones were found with the main burial. In one case (inh 53), a portion of sheep pelvis was also present. (There was part of a sheep calcaneum amongst the unstratified bones.)

Demography

The age and sex of the skeletons was determined using standard anthropological methods (see for example, Workshop of European Anthropologists, 1980). Wherever possible, sex was determined on the basis of the morphology of the pelvis and when the pelvis was either too damaged for proper inspection or was absent, the probable sex of the skeleton was assigned using other criteria. No attempt was made to sex the immature skeletons.

Age was generally determined from the dental wear charts of Mills (1963) or from the morphology of the pubic symphysis or the state of closure of the cranial sutures. The height of the individuals was determined from Trotter's (1970) formulae using the bone (or bones) which gave the estimate with the least standard error.

(Further details are to be found in the catalogue of the remains in Appendix 1.)

Sex and age: Of the 39 adult skeletons present, 8 were definitely and 6 probably male; 14 were definitely female and 5 probably female. The remaining 6 adults could not be sexed (table 1). The significance of the preponderance of females is uncertain given the small numbers involved.

Ages could be estimated for 31 of the adult skeletons and these are shown in ten year ranges in table 2. There were 9 juveniles - by definition aged between 5 and 15, and 1 infant, aged less than 5 years. The ages of the adults are distributed evenly throughout the four age ranges shown.

Height: Estimates of height were obtained for only 4 male and 6 female skeletons and are shown in table 3. It will be seen that only 1 of the female skeletons fell within the male range of height but the numbers are too few to permit speculation as to the significance of this observation or how typical the heights are of the population from which these burials were drawn.

Dental health

A great many of the permanent teeth had been lost from the adult skeletons as a consequence of the post mortem damage. From 39 adults a total of 1248 (39 x 32) teeth would have been expected. As it was, there were only 616 present to which must be added 86 empty sockets from which the teeth had been lost post mortem, 33 teeth which had been lost during life and 29 unerupted teeth, a total of 764 or 61.2% of the expected number.

Twelve of the adult skeletons had dental disease, almost a third of the total. In four cases this amounted to the ante mortem loss of teeth only but there was no evidence which could indicate that the loss was due to anything other than dental disease. Six of the skeletons had dental caries and 3 had a single dental abscess (table 4).

There was no caries or ante mortem tooth loss (from dental disease) amongst the juveniles but in one case (inh 4) there were two supernumary canines which were erupting through the hard palate behind the normal upper incisors. Heterotopic teeth are by no means uncommon in palaeopathological material and a case with one supaernumary canine in a position similar to those described here is illustrated by Ortner and Putschar (1981: fig 747).

Measurements

Measurements of the bones were made as recommended by Brothwell (1981). The condition of the bones was so poor, however, that it was seldom possible to obtain more than a handful from each skeleton and in no case could any measurments of the skull be taken. On this account, I have not thought it worthwhile to include these data in the report but they form part of the original records and will be made available should anyone wish to consult them.

Non-metric characteristics

The poor state of preservation of the bones also made it

impossible to make a reasonable estimate of the frequency of non-metric characteristics. The results of such examination as was made are shown in summary form in table 5. The most notable feature is the large number of cases in which an observation was not possible.

The intrusive material

In the 10 contexts with intrusive human bones there was evidence for 9 adult individuals, 6 juvenile and 1 infant. Of the adults, 2 were probably male (one of whome was aged over 45 years of age to judge from the dental wear); a third adult who could not be sexed was considered to be aged between 25-35 on the basis of the dental wear.

Pathology

Nineteen of the 49 skeletons (38.8%) showed some evidence of pathology. However, this is likely to be an underestimate of the true frequency given the fact that in 27 cases the skeleton was either so damaged or so incomplete that it was impossible to determine whether or not any pathology was present. In 3 cases only was it possible to be sufficiently confident that the skeleton bore no stigmata of disease. As might be expected, the skeletons with no evident pathology (inhs 3, 15 & 38) were young, one aged between 15-25 and the other two between 25-35.

The pathological changes are grouped into their aetiological categories in table 6 and are described in detail in Appendix 2. As is almost invariably the case in palaeopathological material, dental and degenerative diseases (which include the

arthropathies) account for the greater part of the total. There was one congenital condition - lumbarisation of the 1st sacral segment, and 2 cases of trauma, a well healed fracture over the right orbit in a male of 35-45 (inh 42) and a possible crush fracture of a thoracic vertebra in a male of 45+ (inh 12).

Osteoarthritis: There were eight cases which fulfilled the criteria for osteoarthritis (Rogers et al, 1987), 4 female, 3 male and 1 case of undetermined sex. All but was was aged at least 45 years. As may be seen from table 7, the disease was confined to three sites, shoulder, spine and hips. This predominance of large joint disease, however, is almost certainly due to the vagaries of preservation and/or recovery at the site which has led to a marked absence of the small bones of the hands and feet and often of the vertebrae also.

Cribra orbitalia: Mild degrees of cribra orbitalia were found in 1 juvenile and 2 adult females. This condition is often said to be an indicator of 'stress', perhaps the result of iron deficiency anaemia in childhood (Stuart Macadam, 1986).

Hyperostosis frontalis interna: Two female skeletons showed irregular thickening of the internal table of the frontal bones. This is a relatively common condition in women and almost never seen in men. In modern populations hyperostosis frontalis interna is particularly common in post-menopausal women (Revell, 1986) but the two cases here were young (one aged 17-25 and the other, 25-35). Whether this is a chance observation or truly reflects a different aetiology one cannot say. In modern populations the condition is associated with obestity and virilism and on this

account some hormonal imbalance has been suggested as it cause. It is interesting that one of the women with hyperostosis frontalis interna (inh 15) also had cribra orbitalia.

Pathology in the intrusive material

There was only one case of pathology amongst the intrusive material. A fragment of an acetabulum with inh 36 shown eburnation and pitting on its surface consistent with osteo-arthritis.

Comment

The fact that these bones were poorly preserved has greatly limited the amount of information which could be derived from them. Even had they been recovered in perfect condition, however, the numbers would have been too small to permit any statistical analysis. The frequency of pathological change is almost certainly underestimated and the distribution of the osteo-arthritis found is probably misleading. The bones here were like those of St Ignatius who was given to the lions and we are told (Bentley, 1985: 37) that 'only the hardest bits of his holy remains' survived. The more fragile small bones of the hands and feet were seldom present in sufficient numbers here for a proper pathological study any by virtue of their absence, much valuable information was lost.

Table 1

Sex of the skeletons from Ulwell

Probably male	6)	
	)	14
Male	8)	
Probably female	5)	
	)	19
Female	14)	
Adult, sex unknown		6
Juvenile		9
Infant		1
TOTAL		49

Table 2

Ages of the adult skeletons from Ulwell by sex

	Male	Female	Sex Unknown	Total
15-	4	3		7
25-	2	6	1	9
35-	3	3	1	7
45+	4	4		8
Age unknown	1	3	4	8
TOTAL	14	19	6	39

Table 3

Heights in metres of the adult skeletons from Ulwell

Male	Female
1.69	1.50
1.70	1.55
1.71	1.57
1.73	1.60
	1.63
	1.70

Table 4

Distribution of dental disease in adult skeletons from Ulwell

	Inhumation	Caries	Ante-mortem Tooth loss	Dental Abscess
	2		2	
	8	2	1	1
	12		5	1
	21	1		1
	28		1	
	30		5	
	39	1		
	41	1	5	
	44		8	
	46		4	
	47	1		
	57	1	2	
Total	12	7	33	3

Figures in columns 2-4 refer to the number of affected teeth

Table 5

Frequency of non-metric characteristics in adult skeletons from Ulwell

Cranial

	Present	Absent	Not known
Metopism	2	21	16
Ossicle at lambda	5	9	25
Ossicles in coronal suture	1	14	24
Palatine torus	1	5	33

Post cranial

Exostosis in trochanteric fossa	4	6	29
Septal aperture in humerus	2	6	31
Vastus notch	6	16	17
Inferior talar articular surface double	3	1	35
Anterior calcaneal facet double	3		36

For further details see Berry & Berry (1967) and Finnegan (1978)

Table 6

Pathological changes grouped into aetiological categories

Congenital	Trauma	Metabolic	
1	2	4	
Degenerative	**Dental**	**None**	**Unknown**
9	9	3	27

Note that the total number in the table exceeds the total number of inhumations since more than one condition co-existed in some skeletons.

Table 7

Distribution of sites of osteo-arthritis in skeletons from Ulwell by age and sex

Age	Sex	Shoulders	Spine	Hips
35-45	M	X		
45+	F	X		
45+	F	X	X	
45+	F	X		X
45+	F	X	X	X
45+	M		X	
45+	M		X	
45+	UK			X

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Appendix 1

Catalogue of human remains from Ulwell

In this catalogue the methods used to sex and age the skeletons are indicated in brackets as are the bone(s) which were used to determine the height. Heights are shown in metres with the standard error. Details of intrusive material are shown below the main catalogue.

2. Very fragementary skeleton represented by frontals, parietals, petrous temporals and mastoids; mandible, fragments of both clavicles, both humeri, radii and ulnae; right acromion, both femoral heads and fragments of both femora; acetabular fragments; atlas, axis, 3 cervical and 1 thoracic vertebral bodies, fragment of sacrum; 3 metacarpal fragments; 1 proximal phalanx of hand.
Probably female (skull).
45+ (dental wear).

3. Substantially intact skeleton with some post-mortem damage; small bones of hands and feet missing and much of axial skeleton and both lower legs; ca 75%.
Probably male (pelvis; skull).
25-35 (dental wear).
1.69 $\pm$ 0.0405 (right humerus).

4. Substantially complete juvenile skeleton but with much post-mortem damage and surface erosion; ca 90%.
13-15 (dental eruption; epiphyseal fusion).

5. Fragmentary skeleton with much post-mortem damage and surface erosion. Most of axial skeleton and pelvis missing; lower legs and feet missing. Ca 50%.

Female (pelvis; skull).

25-35 (dental wear).

6. Infant burial represented by right petrous temporal bone, left proximal ulna, fragments of humeri and femora and many rib and vertebral fragments.

7. Extremely scrappy adult skeleton with much post mortem damage. Probably female (bone morphology).

8. Partial skeleton with much post-mortem damage and surface erosion. Most of lower legs and both feet missing; ca 60%.

Female (pelvis; skull).

45+ (dental wear).

1.63 $\pm$ 0.0372 (left femur).

9. Juvenile skeleton represented by fragments of skull including both petrous temporals and mastoids; mandible; fragments of clavicles, both humeri and femora; proximal fragment of right ulna, fragments of 1st sacral segment and some vertebral bodies; other limb bone frament.

8-10 (dental eruption).

10. Juvenile skeleton represented by skull fragments including both petrous temporals and mastoids, basi-occiput, right occipital condyle; mandible; fragment of right scapula; part of both clavicles; right humerus; fragments of atlas and axis; other limb bone fragments.

6-8 (dental eruption).

11. Very fragmentary skeleton lacking most of vertebral column and pelvis; left hand, both feet, ribs and sternum also missing. Ca 60%.

Female (skull; pelvis).

25-35 (dental wear).

12. More or less complete skeleton with a good deal of post-mortem damage. Many small bones of the hands and feet missing;

ca 80%. Evidence for three other partial skeletons also present.

Male (pelvis; skull).

45+ (dental wear).

14. Virtually intact but much damaged juvenile skull and 1st four cervical vertebrae.

6-8 (dental eruption).

15. Partial skeleton with much post-mortem damage and surface erosion. Lacks both scapulae, ribs, sternum, and most of the small bones of the hands and feet; ca 60%.

Female (skull; pelvis).

25-35 (dental wear).

16. Partial adult skeleton in very poor condition; ca 33%.

Probably male (bone morphology).

17. Reasonably complete skeleton but with much post-mortem damage and surface erosion; ca 75%.

Female (pelvis; skull).

17-25 (dental wear; cranial sutures).

1.70 $\pm$ 0.0424 (both radii).

18. Partial immature skeleton with considerable post-mortem damage. Represented by skull fragments; fragments of left clavicle and right scapula; distal ends of both humeri; proximal fragments of both ulnae; fragments of radii; both femora, left proximal end fused both distal ends unfused; both tibiae, proximal ends unfused, distal ends fused; unfused 1st sacral segment; both calcanea; 2 metacarpal, 3 metatarsal fragments; several phalanges and many unidentified fragments. Additional bones from another inhumation.

Probably male (bone morphology).

20-23 (epiphyseal fusion).

20. Fragmentary skeleton represented by frontal bones, petrous

temporals, left zygoma, parietal fragments; mandible; fragment of left clavicle; fragments of both humeri, ulnae and radii; part of both femora; fragments of pelvis, atlas and some metacarpals and phalanges.

Female (skull).

17-25 (dental wear).

21. Fragmentary skeleton with considerable post-mortem damage and surface erosion. Represented by skull fragments; mandible; fragments of both humeri, radii, ulnae, femora and tibiae; right femoral head; fragments of pelvis; both tali and fragment of left calcaneum; some metacarpals and phalanges.

Probably female (measurements of talus and femoral head).

35-45 (dental wear).

22. Fragmentary adult skeleton with much post-mortem damage. Represented by skull fragments including left mastoid; fragment of right glenoid; distal left humerus; proximal left radius and ulna; distal right radius; proximal right ulna; fragments of pelvis, both femora and tibiae; left calcaneum and right talus; odontoid peg; vertebral fragments. Intrusive bones from a juvenile.

Male (pelvis).

35-45 (dental wear).

23. Juvenile skeleton represented by skull, including petrous temporals and mastoids; mandible; fragments of both clavicles; humeri, radii and ulnae, left femur and both tibiae; atlas and a number of unidentified fragments.

10-12 (dental eruption).

25. Incomplete skeleton represented by fragments of skull, mandible, both humeri, both iliac crests, both sciatic notches, both femora and tibiae.

Probaly male (pelivs; morphology of long bones).

20-25 (dental wear; tooth eruption).

26. Very scrappy skeleton represented by fragments of frontal and parietal bones, part of mandible, distal fragments of both humeri; fragments of both ulnae and radii; fragments of acetabulum and sciatic notches; proximal ends of both femora and fragments of both tibiae; left scaphoid and fragments of 2 metacarpals and 1 phalanx; fragments of some lumbar vertebrae; many unidentified fragments.

Male (pelvis; skull).

45+ (dental wear).

27. Partial juvenile represented by fragments of skull including both petrous temporal bones, right mastoid, left frontal, left maxilla, mandible; fragments of both humeri, radii and ulnae; distal femoral ephiphyses (unfused); both tibiae with all epiphyses unfused; left and right calcaneum and talus; 5 left metatarsals, 2 right metatarsals, 4 tarsal bones.

12-15 (dental eruption; epiphyseal fusion).

28. Substantially intact skeleton with much post-mortem damage and surface erosion; ca 90%.

Female (pelvis; skull).

25-35 (dental wear).

1.50 $\pm$ 0.0372 (left femur).

29. Skeleton represented by fragment of (left) tibia and some unidentified fragments.

Adult (bone size).

30. Much damaged skeleton with most of axial skeleton and pelvis missing; feet missing. Ca 60%.

Female (skull; pelvis).

45+ (dental wear).

31. Incomplete skeleton with most of the vertebral column and

both feet missing; ca 75%.

Male (pelvis).

17-25 (dental wear).

1.70 $\pm$ 0.0432 (right radius).

32. Fragmentary juvenile with much surface erosion. Represented by fragments of the skull including both petrous temporal bones, left mastoid and mandible; atlas, axis; fragments of both clavicles, right scapula, both humeri, radii and ulnae, femora and tibiae; right calcaneum and talus; 3 metacarpal fragments; 1 metatarsal fragment; 2 bodies of thoracic vertebrae; many rib fragments.

8-12 (dental eruption).

33. Fragmentary juvenile represented by skull fragments including both petrous temporal and mastoid bones and mandible; fragments of both clavicles, humeri, radii, ulnae, femora and tibiae; fragments of atlas, pelvis and ribs.

8-12 (dental eruption).

34. Very incomplete juvenile represented by fragments of skull and mandible; left petrous temporal boane; fragments of some cervical vertebrae and limb bone fragments.

4-6 (dental eruption).

35. Fragmented skull with both petrous temporal and mastoid bones; fragment of maxilla; right mandibular ramus; fragments of base of skull, atlas, both humeri and some unidentified long bone fragments. Much surface erosion.

Female (skull).

17-25 (dental wear).

36. Much damaged skeleton with surface erosion. Most of vertebral column and all but one of the bones of the feet lost; ca 75%.

Female (pelvis).

35-45 (dental wear).

1.60 ± 0.0424 (right radius).

37. Extremely fragmentary adult skeleton represented by skull fragments including left petrous temporal and mastoid bones and right petrous temporal; distal end of right humerus and both femora; proximal end right ulna; distal end left tibia, fragment of left tibia; fragments of pelvis; right second metacarpal; one vertebral body; rib fragments and unidentified long bone fragments. Intrusive human bones.

Probably male (skull).

37. Extremely fragmentary skeleton with much post-mortem damage. Represented by many skull fragments, both petrous temporal and fragments of mandible; fragments of right humerus, both radii, ulnae, femora, tibiae and pelvis; fragment of left clavicle; fragments of 4 lumbar vertebrae; fragments of 8 metacarpals and 3 phalanges.

Probably female (sciatic notches; morphology of bones).

35-45 (dental wear).

39. Substantially intact skeleton but with both feet missing. Much post-mortem damage; ca 85%.

Female (pelvis; skull).

25-35 (dental wear).

1.55 ± 0.0372 (left femur).

40. Skeleton lacking most of vertebral column and upper limb bones. Much post-mortem damage and surface erosion; ca 75%.

Probably male (pelvis; skull; femoral head diameter).

35-45 (dental wear).

41. Incomplete skeleton with much post-mortem damage and surface erosion. Virtually all axial skeleton and pelvis missing; hands and feet absent. Ca 40%. Intrusivs human.

Male (skull).

45+ (dental wear).

42. Fragmentary skeleton with most of vertebral column, pelvis, hands and feet missing; ca 40%.

Male (skull).

35-45 (cranial sutures).

43. Substantially complete skeleton but with considerable post-mortem damage and surface erosion; ca 90%.

Female (pelvis; skull).

25-35 (dental wear).

1.57 $\pm$ 0.0372 (left femur).

44. Fragmentary skeleton with much post-mortem damage; ca 50%.

Female (pelvis; skull).

45+ (dental wear).

46. Substantially intact skeleton with much post-mortem damage; ca 95%. Intrusive human bones.

Male (pelvis; skull).

45+ (dental wear; pubic symphysis).

1.73 $\pm$ 0.0299 (right femur + tibia).

47. Badly damaged skeleton lacking most of vertebral column, ribs and pelvis; ca 50%.

Probably male (pelvis; femoral head diameter).

25-35 (dental wear).

48. Adult skeleton represented by fragments of both humeri, ulnae, radii, femora and left tibia.

49. Adult skeleton represented by fragments of distal humeri, proximal left radius, both femora and tibia and other unidentified fragments. Fragment of right mandible.

50. Incomplete and badly damaged adult skeleton; ca 33%.

Probably male (morphology of bones).

52. Extremely fragmentary adult skeleton comprising fragments of left mandible, left humerus, right radius and ulna, both femora

and pelvis; 3 left and 2 right metacarpals, 2 phalanges. Intrusive human bones.

Female (pelvis).

53. Fragmentary adult skeleton comprising skull fragments, including right petrous temporal and mastoid bones; proximal right ulna, right calcaneum and talus; fragments of both femoral heads; proximal phalanx; many limb bone and vertebral fragments. Intrusive human bones.

Probably male (skull).

45+ (dental wear).

54. Incomplete skeleton with must post-mortem damage and surface erosion. Most of axial skeleton missing; ca 60%. Intrusive human bones.

Male (pelvis; skull).

25-35 (dental wear; pubic symphysis).

56. Extremely fragmentary adult represented by fragment of distal right humerus; fragments of right femur, both radii; several skull fragments and small part of mandible with no teeth. Much surface erosion.

57. Fragmentary adult skeleton represented by frontal bone, right zygoma, fragments of parietal bones and maxilla; mandible; fragments of both clavicles, right scapula, distal end right humerus, proximal ends both radii and ulnae; proximal ends both femora; fragments of both tibiae; distal end left fibula; left patella; left and right talus and calcaneum; axis; fragments of pelvis; 5 metacarpals, 4 metatarsals; 4 proximal phalanges; fragment of 1 lumbar vertebra. Intrusive human bones.

35-45 (dental wear).

Intrusive and unstratified material

12. Adult right proximal and distal left ulnae; 6th cervical vertebra. Juvenile skull and mandibular fragments; distal radii (unfused); fragments of pelvis and both proximal femora (unfused); unidentified limb bone fragments. Infant left ulna; both radii and right clavicle.

18. Adult skull and mandibular fragments; both ischial tuberosities; odontoid peg and some vertebral and rib fragments. 25-35 (dental wear).

22. Juvenile skull fragments; both femora; left distal humerus; left radius; many unidentified fragments.

36. Fragments of adult skull including both petrous temporal bones and left mastoid; one vertebral body; distal end of right humerus and both femora; fragments of pelvis; right second metacarpal; rib fragments; many unidentified fragments. Probably male (skull).

Unfused left femur and tibia; fragments of both humeri; left pubis; unidentified limb bone fragments.

41. Mandible.

Probably male.

45+ (dental wear).

46. Adult skull fragments including both petrous temporal and mastoid bones, right zygoma; distal fragments of both humeri; fragments of femora and tibiae and pelvis; odontoid peg; fragment of right glenoid.

52. Mid-shaft fragments of adult sized left and right femora and tibiae.

53. Distal end of juvenile left humerus; proximal ends of both (unfused) femora; fragment of left tibia and unfused iliac crests and other pelvic fragments. Also distal end of unfused right

tibia which on the basis of size does not belong to the previous skeleton. Fragment of sheep pelvis.

54. Head of right radius.

57. Proximal adult left tibia; proximal and distal ends right tibia; right talus; distal end left femur. Mid-shaft fragment of (probably juvenile) left tibia.

Unstratified. Mid-shaft fragment of adult sized left tibia and other unidentified fragments. Part of sheep calcaneum.

Appendix 2

Catalogue of pathology found in the human remains from Ulwell

This catalogue should be read in conjunction with Appendix 1 so that the extent of the skeleton is known.

Discrete inhumations

2. Osteoarthritis of both hips. Extant heads of both femora are eburnated, pitted and their contours are deformed. These changes are reflected in the acetabula. Degenerative disc disease on two surviving fragments of cervical vertebrae. Hyperostosis frontalis interna.

4. Supernumary canines erupting through the hard palate behind the upper incisors (behind 11 and 12 on the right hand side, and 22 and 23 on the left hand side).

8. Dental caries. Pitting at the sternal end of both clavicles and pitting and proliferation of new bone around the head of the left humerus in relation to the insertion of the muscles of the rotator cuff. These changes are consistent with osteo-arthritis of the shoulder.

12. Dental abscess. Degenerative disc disease of 4th, 5th, 6th and 7th cervical vertebrae and of the first thoracic. There is pitting and proliferation of the facet joints between C2/3 (left hand side), C3/4 (bilaterally) and C4/5 (right hand side). The 9th thoracic vertebra shows some wedging in the antero-posterior plane probably consequent upon trauma. Four thoracic vertebra show Schmorl's nodes and three lumbar vertebra have mild osteophytosis. There is partial lumbarisation of the 1st sacral

segment.

14. Mild (grade 1) cribra orbitalia in left orbit; right is too damaged to examine. Skull bones of normal thickness.

15. Mild cribra orbitalis (grade 1) in both orbits. Hyperostosis frontalis interna.

20. Cribra orbitalia in both orbits, grade 1 in right, grade 2 in left.

21. Dental caries and dental abscess.

28. Bilateral osteophytes on superior margin of distal articulation of talus and on latero-superior margin of distal articulation of calcaneum. No other demonstrable changes.

30. Dental disease. Pitting on sternal ends of both clavicles and pitting on inferior surface of left acromion; changes consistent with osteo-arthritis of the shoulders. Pitting and eburnation on the left hand facet joint of C2; two thoracic laminae fused around the facet joints, bodies missing. These changes are indicative of osteo-arthritis of the spine.

39. Dental caries.

40. Slight pitting on sternal end of right clavicle and mild degenerative disc disease affecting C6; changes consistent with osteo-arthritis. Some extra-spinal hyperostosis around the ischial tuberosities, along the iliac crests and along the linea aspera of both femurs.

41. Dental disease.

42. Depressed well healed fracture over the right orbit. The frontal bone has suffered post-mortem damage so that the full extent of the fracture is unclear. Only the anterior wall of the frontal sinus has been affected. There is no evidence of a supervening infection and no evidence of trauma elsewhere in the skeleton.

44. Dental disease. Pitting around sternal end of left (and only

extant) clavicle. Degenerative disc disease between C3/4/5/6. The facet joints between C2/3 show pitting and proliferation on the left hand side; there is proliferation between those of C3/4 on the left and proliferation around all the extant (L2-5) lumbar vertebrae. There is proliferation of bone around both acetabular rims and new bone on the femoral heads. These are the changes of osteoarthritis.

46. Dental disease. Degenerative disc disease between C3/4/5/6. Extra-spinal hyperostosis around the left elbow, the pelvic rim and pubis, both patellae, both linea aspera, right soleal line, both Achilles tendon insertions and on the acromial end of the left clavicle. Schmorl's nodes on 6 thoracic vertebrae. Slight periostitis at the distal end of the right fibula on the tibial surface; significance unclear.

47. Dental caries.

53. Pitting and eburnation on extant fragments of both femoral heads consistent with osteo-arthritis.

57. Dental caries. Extra-spinal hyperostosis around ischial tuberosity and patella.

Intrusive material

36. Eburnation and pitting on a fragment of acetabulum consistent with osteo-arthritis.