AML SITE FILES

1171

1171

Ancient Monuments Laboratory
Report 62/88

BEESTON CASTLE, CHESHIRE- THE HUMAN BONE

Janet D Henderson MA Hons (Cantab)

AML reports are interim reports which make available the results of specialist investigations in advance of full publication They are not subject to external refereeing and their conclusions may sometimes have to be modified in the light of archaeological information that was not available at the time of the investigation. Readers are therefore asked to consult the author before citing the report in any publication and to consult the final excavation report when available.

Opinions expressed in AML reports are those of the author and are not necessarily those of the Historic Buildings and Monuments Commission for England.

Ancient Monuments Laboratory Report 62/88

BEESTON CASTLE, CHESHIRE- THE HUMAN BONE

Janet D Henderson MA Hons (Cantab)

Summary

The sample consisted of three nearly complete skeletons. All were young adult males and all had some degree of dental and/ or skeletal pathology present.

Author's address :-

Ancient Monuments Laboratory
Historic Buildings & Monuments Laboratory
23 Savile Row
London
W1X 2HE

01 734 6010 x528

© Historic Buildings and Monuments Commission for England

Beeston Castle - The Human Bone

The following report incorporates the findings of two human bone specialists, Justine Bayley and Janet Henderson. Burials 1 and 2 were examined and reported on by the first author (Bayley, 1974) and BCIW004-6 by the latter. The attached catalogue gives details of the methods used and the results obtained for BCIW004-6 together with tables of metrical and morphological findings for all three skeletons. All other records are kept in the Ancient Monuments Laboratory.

Examination of the human skeletal remains from this site showed that all three skeletons were nearly complete and that bone preservation was fairly good with only minor damage to the shafts and ends of the bones. Observations were made for age, sex, stature, metrics, morphology and any abnormalities.

The results for sex, age and stature are given in Table 1 (below).

Table 1. Results for Sex, Age and Stature

Burial No.	Sex	Age (in years)	Stature	
			Metric	Imperial
1	Male	17-25	1.66	c.5'5"
2	Male	20's	1.76	c.5'9"
BCIW004-6	Male	20-25	1.71	c.5'7½"

Given the small size of the sample detailed comment on the metrical and morphological results could not be justified. However it was noted that all of the skulls had a number of accessory ossicles present in the skull and, in particular, several wormian bones in the lambdoid suture.

Evidence for pathological changes was noted on both the teeth and the bones of these individuals. Oral disease was seen on all three skeletons with occlusal surface wear, tooth absence, ante-mortem tooth loss, caries, abscesses and periodontal disease all present. Wear of the occlusal surfaces of the teeth was slight in all three cases, a finding which was used in estimating age. Both Burial 1 and BCWI004-6 had teeth absent from the dentition, in both cases mandibular third molars (left on Burial 1 and both sides on BCWI004-6). Ante-mortem tooth loss affected Burial 2 and BCIW004-6; on the former the left maxillary first and second right mandibular molars had gone and on the latter it was both mandibular first molars. In neither case was it possible to establish the cause of such loss but given the ages of both of these individuals it was thought that disease was most likely (eg. caries). Caries and abscesses were found at the following sites: on Burial 1 there was a large cavity on the maxillary left first molar with exposure of the pulp cavity and an adjacent abscess. On Burial 2 there were carious lesions on both maxillary second molars, on the maxillary left third molar and on the mandibular right first molar. There was an abscess adjacent to the maxillary left first molar. On BCIW004-6 there was a cavity on the maxillary left first molar and evidence for abscesses at the roots of both mandibular second premolars. It was noted that with the exception of one lesion on the maxillary left second molar of Burial 2 all of the caries were located on the occlusal surfaces of the teeth and that in all cases it was molar teeth that were involved. Only on Burial 1 was there an abscess in the bone immediately adjacent to a tooth with a caries such that there was a probable association between the two. Elsewhere the cause of the abscesses could not be determined. Bony recession of the alveolar margin, commonly thought to be indicative of periodontal disease, was slight on Burial 1, moderate to severe on Burial 2 and moderate on BCIW004-6. There was some slight evidence for calculus

deposits and enamel hypoplasia on Burials 1 and 2.

Pathological affections of bone attributable to trauma, joint disease and other causes were seen on all three skeletons. Both Burials 1 and BCIW004-6 had sacra that were bifid posteriorly at the level of the first vertebra (spina bifida occulta). Burial 2 had a left femur which was described by Dr. J.L. Price (Bayley 1974) as follows:

"There is corticated new bone formation on the outer mid-shaft of the left femur. The original cortex is narrowed with an ill-defined outer margin. The outer cortical bone is smooth and merges with the upper cortex but at the lower end there is a notch. From this it appears that the periosteum and some cortical bone has been elevated from below and new bone formed underneath. One could speculate that trauma from a sharp implement directed upwards could produce this effect. Repetitive trauma is possible but unlikely at this site. There is no radiological evidence of infection."

Burial 2 also had a healed transverse fracture in the distal third of the shaft of the right ulna. There was no evidence for infection. There was also some periosteal new bone on the mid-shaft of the right fibula, which, it was suggested, was the result of "a long-standing adjacent soft tissue inflammatory process" (op.cit.).

Changes attributable to joint disease were not marked. For both Burials 1 and 2 slight traces were recorded on the ribs and vertebrae only. On BCIW004-6 there were Schmorl's nodes on a number of thoracic vertebrae and some slight degenerative changes to the posterior joints of T2-5. There were also two lesions on the left calcaneus and first metatarsal, in both cases described as "erosive, non-proliferative, para-articular lesions" (Rogers, pers. comm.). Although the site on the first metatarsal is the preferred one for gout there was no other evidence to substantiate such a diagnosis, therefore the only possible conclusion was 'cause unknown'.

Any comment on the overall findings for these skeletons is severely hampered by the small number of individuals available for examination. However it may be noted that all three were assessed as young adult males and that in each case there was both dental and skeletal pathology present. None of the findings, whether anomalous or abnormal, can be regarded as particularly exceptional.

Acknowledgement

I should like to thank Dr. Juliet Rogers for commenting on the foot bones of BCIW004-6.

Beeston Castle - Human Bone Catalogue

Skeleton BCIW004-6

Nearly all of the skeleton present (85%).

Sex: Male, based on pelvic morphology and metrics and the overall robustness of the bones (see Henderson (1984) for references).

Age: 20-25 years, based on dental wear, epiphyseal union and metamorphosis of the pubic symphysis

Stature: 1.71 m +/- .0299, c.5'7½"
Estimate based on Trotter's method (1970), using the femora and tibiae

Dental Pathology

Dental Wear: Occlusal surface wear was very slight on the teeth of this individual.

Ante-mortem Tooth Loss: 3 + 4,6 Loss of these teeth must have occurred some time prior to death as there had been complete resorption of the tooth sockets (traces were visible on x-ray). The cause of the loss was not clear but it was noted that as this was a young adult, disease (eg. carious infection) would have been most likely.

Caries: 2,6 Small fissure caries on the occlusal surface of the tooth.

Abscess: 3,5 Small abscess at the apex of the tooth root, visible only on radiographic examination.

4,5 Moderate abscess at the apex of the tooth root, visible only on radiographic examination. Most of the crown of this tooth was missing and there had been exposure of the pulp cavity. It was suggested that the most probable cause of loss of the tooth crown was a caries, possibly associated with the antemortem loss of the first molar. (Plates)

Periodontal Disease: Moderate alveolar bone recession

Absence: 3 + 4,8 Both lower third molars were absent from the dentition.

Skeletal Pathology

Developmental

Spina Bifida Occulta: The posterior arches were open along the length of the sacrum. There was no evidence for any associated pathology. (Plate)

Joint Disease

Spine: Bones present: C1-7, T1-12, L1-5, sacrum complete (S1-5)

Apophyseal: Slight marginal osteophytes and surface porosity affecting T2-5.

Costovertebral: Changes absent

Bodies: Schmorl's nodes at the anterior margin, superior surface of T2-4 and centrally, superior surfaces of T5, T6, T9 and T11 and inferior surfaces of T8-11.

Foot: Bones present: R + L, all tarsals, metatarsals and proximal phalanges. 5 medial and 7 terminal phalanges.

The left calcaneus and first metatarsal both had 'holes'. On the former it was located on the posterior surface and on the latter immediately proximal to the distal articular surface. Both could be described as "erosive, non-proliferative, para-articular lesions" (Rogers, pers. comm.). Although on the metatarsal the location is well-known as the preferred site for gout there was no other evidence to substantiate such a diagnosis.

Three of the terminal phalanges showed evidence for degenerative changes. Cause unknown.

Metabolic Disease

Cribra Orbitalia: Right orbit only (left missing), slight traces - porotic type.

Note: The "nick" noted in one of the phalanges of the left hand is a post-mortem. It is not a pathological lesion.

Bibliography

Bayley J.: Beeston Castle - Human Bone Report.
Ancient Monuments Laboratory Report No. 1632 (unpublished) 1974.

Henderson J.D.: The Human Skeletal Remains - Carlisle, Blackfriars Street.
Ancient Monuments Laboratory Report No. 4350 (unpublished). 1984.

Trotter M.: Estimation of stature from intact long limb bones. In: Stewart T.D.(ed.): Personal Identification in Mass Disasters, p.71-83. Washington, National Museum of Natural History. 1970.

Skull Metrics

Number	L	B	H'	LB	GL	B'	S1'	S2'	S3'	BiB	FL	J	G'H	GB	O2	O1'	NH'	NB	SC	MAL	MAB
1	191	143	131	98	93	96	116	124	96	112	35	130	66	87	34	39	50	24	5	-	-
2	186	161	141	97	85	96	126	113	98	108	37	131	72	94	32	40	52	24	11	-	-
BCIW004/6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49	23	9	-	-

Index of Abbreviations

Note: All measurements are given in millimetres (mm)

L: Maximum length
B: Maximum breadth
H': Basion-bregmatic height
LB: Basion-nasion length
GL: Basion-alveolare length
B': Minimum frontal breadth
S1': Frontal chord
S2': Parietal chord
S3': Occipital chord
BiB: Biasterionic breadth
FL: Foramen magnum length
J: Bizygomatic breadth
G'H: Upper facial height
GB: Facial breadth
O2: Orbital height
O1': Orbital breadth
NH': Nasal height
NB: Nasal breadth
MAB: Maxillo-alveolar breadth
MAL: Maxillo-alveolar length

Mandible Metrics

Number	H1	ML	GoGo	W1	CrH Right/Left		CyL Right/Left		RB' Right/Left		ZZ	M2H Right/Left		M2B Right/Left	
1	29	105	-	-	-	70	-	-	-	32	42	-	25	-	-
2	33	104	-	-	-	69	-	24	-	30	41	-	28	-	-
BCIW004/6	34	98	-	-	61	-	-	-	-	31	45	25	-	14	-

Index of Abbreviations

Note: All measurements are given in millimetres (mm)

H1: Symphyseal height
ML: Condyle-symphyseal length
GoGo: Bigonial diameter
W1: Bicondylar width
CrH: Height of ascending ramus
RB': Minimum ramus breadth
M1/2: Body height at M1/2
M2: Body thickness at M2

Cranial Morphology

Number	1	2 R/L	3	4 R/L	5	6 R/L	7	8 R/L	9	10 R/L	11 R/L	12	13 R/L	14 R/L	15 R/L	16 R/L	17 R/L
1	0	-/-	-	0/0	1	1/1	-	10	0	-/-	0/0	0	-/-	-/-	-/-	1/0	-/-
2	0	-/-	-	0/0	1	0/1	-	7	0	-/-	0/0	0	-/-	-/-	-/-	1/1	1/1
BCIW004/6	-	1/-	-	-/-	0	0/1	1	3/-	0	-/-	0/0	0	-/-	-/-	0/-	-/-	-/-

Note: The figures for Numbers 1 and 2 for lambdoid suture wormian bones (no. 8) are totals as the results by side were not available.

Index of Abbreviations

R = Right
L = Left

The following are all scored on an absent (0), present (1) basis, except where otherwise stated.

1. Metopism
2. Supra-orbital foramen (1 = notch, 2 = foramen, 3 = notch + foramen, 4 = other)
3. Bregmatic Bone
4. Coronal suture - wormian bones (1...x denotes number of bones present)
5. Sagittal suture - wormian bones (1...x denotes number of bones present)
6. Parietal Foramina
7. Wormian bone at lambda
8. Lambdoid suture - wormian bones (1...x denotes number of bones present)
9. Os Inca
10. Mastoid foramen
11. Torus maxillaris
12. Torus palatinus
13. Occipito-temporal suture - wormian bones (1...x denotes number of bones present)
14. Asterionic bone
15. Os japonicum
16. Parietal notch bone (1 = notch, 2 = parietal notch bone present)
17. Pterion Form (1 = H=shaped, 2 = K-shaped, 3 = X-shaped articulation)

Mandible Morphology

Number	1 R/L	2 R/L	3 R/L
1	-/-	0/0	-/-
2	-/-	0/0	-/-
BCIW004/6	0/0	0/0	1/-

Index of Abbreviations

R = Right
L = Left

The following are scored on an absent (0), present (1) basis, except where otherwise stated.

1. Mylo-hyoid groove (1 = spur, 2 = bridge)
2. Mandibular Torus
3. Gonial Eversion (1...x denotes increasing severity)

(1) and (2) of the above are scored on an absent (0), present (1) basis.
(3) is scored be degree of severity: 1.....x

Upper Extremity Metrics

Number	ClL1 Right/Left		HuL1 Right/Left		HHD Right/Left		HuE1 Right/Left		RaL1 Right/Left		UlL1 Right/Left	
1	-	-	313	311	-	-	-	-	227	222	-	234
2	-	-	336	330	-	-	-	-	248	242	258	259
BCIW004/6	140	-	331	329	43	-	61	-	-	-	261	255

Index of Abbreviations

Note: All measurements are given in millimetres (mm)

ClL1: Clavicle - Maximum length
HuL1: Humerus - Maximum length
HHD: Humerus - Maximum head diameter
HuD1: Humerus - Maximum diameter at the mid-shaft
HuD2: Humerus - Minimum diameter at the mid-shaft
HuE1: Humerus - Epicondylar breadth
RaL1: Radius - Maximum length
RHD: Radius - Maximum head diameter
UlL1: Ulna - Maximum length

Femoral Metrics

Number	FeL1 Right/Left		FeL2 Right/Left		FHD1 Right/Left		FeD1 Right/Left		FeD2 Right/Left		FeD3 Right/Left		FeD4 Right/Left		FeE1 Right/Left	
1	440	435	-	-	-	-	29	28	34	31	-	-	-	-	-	-
2	473	482	-	-	-	-	31	32	34	35	-	-	-	-	-	-
BCIW004/6	452	454	450	451	43	43	28	27	29	31	31	29	25	26	76	75

Index of Abbreviations

Note: All measurements are given in millimetres (mm)

FeL1: Maximum length
FeL2: Oblique length
FHD1: Maximum head diameter
FeD1: Sub-trochanteric antero-posterior diameter
FeD2: Sub-trochanteric medio-lateral diameter
FeD3: Mid-shaft antero-posterior diameter
FeD4: Mid-shaft medio-lateral diameter
FeE1: Bicondylar breadth

Lower Extremity Metrics

Number	TiL1		FiL1	
	Right/Left		Right/Left	
1	349	348	-	-
2	382	383	-	-
BCIW004/6	374	375	361	-

Index of Abbreviations

Note: All measurements are given in millimetres (mm)

TiL1: Tibia - Maximum length
FiL1: Fibula - Maximum length

Axial and Upper Extremity Morphology

Number	Sternum		Scapula				Vertebrae			Humerus	
	1	2	1 R/L	2 R/L	1 R/L	2 R/L	3	4 R/L	5	1 R/L	2 R/L
1	-	-	-/-	-/-	-/-	-/-	-	-/-	-	-/-	-/-
2	-	-	-/-	-/-	-/-	-/-	-	-/-	-	-/-	-/-
BCIW004/6	0	0	-/-	2/2	0/0	0/0	Bifid	0/0	0	1/0	0/0

Index of Abbreviations

R = Right
L = Left

The following are all scored on an absent (0), present (1) basis, except where otherwise stated.

Sternum
1. Manubrio-corpal synostosis
2. Sternal aperture

Scapula
1. Os acromiale
2. Suprascapular area (1 = straight, 2 = notch, 3 = deep notch, 4 = foramen)

Vertebrae
1. Atlas - posterior bridge (1 = spur, 2 = bridge)
2. Atlas - lateral bridge (1 = spur, 2 = bridge)
3. Level of open sacral hiatus (eg. S3 = open to the level of the 3rd sacral vertebra)
4. Accessory sacral/iliac facets
5. Lumbo-sacralisation of a vertebra

Humerus
1. Septal aperture
2. Supracondylar process

Lower Extremity Morphology

Number	Femur			Patella		Tibia	Talus		Calcaneus
	1	2	3	1	2	1	1	2	1
	R/L	R/L	R/L	R/L	R/L	R/L	R/L	R/L	R/L
1	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
2	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-
BCIW004/6	0/0	0/0	2/2	3/3	0/0	0/0	0/-	1/1	3/2

Index of Abbreviations

R = Right
L = Left

The following are all scored on an absent (0), present (1) basis, except where otherwise stated.

Femur
1. Third trochanter
2. Allen's fossa
3. Poirier's facet or plaque (1 = facet, 2 = plaque)

Patella
1. Vastus notch (0 = absent, 1 = notch, 2 = fossa, 3 = notch and fossa)
2. Bipartite patella

Tibia
1. Squatting facets (tibia and talus)

Talus
1. Os trigonum
2. Shape of talar facet (1 = single, 2 = double)

Calcaneus
1. Calcaneal facet - shape (1 = single, 2 = waisted, 3 = double)