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HUMAN BONE REPORT

JS/P

Chelmsford Dominican Priory - Human bone report

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The bones from a hundred and thirty-five burials were examined. Bone condition varied from good to very poor, sometimes even in one skeleton. Most of the bones showed at least some erosion of the surface or the articulations. About a quarter of the burials included intrusive bones from other individuals; in some cases parts of several individuals were included with a single burial. These bones have not been individually recorded as there are most probably just parts of individuals buried elsewhere in the cemetary whose bones were disturbed prior to excavation. It is interesting to note however, that the graves of two females (nos 1 and 46) also contained infant fragments.

The population as a whole.

Table 2: Population Summary

	Age	Male	Female	Total No
Juveniles	0-1			1
	1-3			2
	3-7			0
	7-11			4
	11-16			7
Adults	17-25	8	11	19
	25-35	21	11	33
	35-45	18	7	25
	45+	11	4	16
	'Adult'	11	11	31
		68	44	138

The total no. column includes those individuals for whom no sexing was possible.

As can be seen from table 2, the population is not quite that which would be expected for complete community. In particular the numbers of juveniles, especially in the younger age group, is far lower than normal. Among the adults there are more males than femals and their average life expectancy seems to be higher. There is also a higher proportion of elderly (45+) individuals than is normally found.

The estimations of age were based on the eruption of teeth(3) and fusion of epiphyses for immature individuals and on dental wear and/or the appearance of the pubic symphysis for adults.(1)

As would be expected the males are on average taller than the femals, the tallest individual having an estimated maximum stature of 181 cm. (just under 6'0"). The tallest female was 166 cm (approx. 5'6"). The results are summarised below in Table 3). All statures were calculated from the formulae of Trotter and Gleser(4)

Table 3: Stature Summary

Stature (cm)	Number of Individuals	
	Males	Females
145-149		1
150-154		9
155-159		4
160-164	2	6
165-169	16	3
170-174	13	
175-179	6	
180-184	2	

Table 1: List of burials

Grave No.	Sex	Age	Stature (cm)	
1	Prob. F	25–35	165	
2	M	40–45	c180	
3	M	30–35	160	?
4		Prob. Adult		
5	Poss. F			
6	Prob. F	15–20		
7	M	22–24	163	Frags. of at least 9 individuals
8		All Adult		
9	M	30–40	172	
10		Adult		
11	M	? 30–35	175	
12	Prob. M	Ad.		
13	M	25–35	167	
14A	Prob. M	25–35		
14A	Prob. F	17–21	158	
16A	M	45–50	160	
16B	Prob. F	35–45	164	
18	Juvenile	12–16		?
19	Infant			
21	M	30–30?		?
22	Juvenile	11–13		?
23		40–50?		
24	F	17–25	166	?
25	Prob. F	35–45+	156	
26A	M	25–35		
26B	F	? 30–40	156	
27		Adult		
28	F	25–30	?151	
29	Prob. M	? 40+	160	?
30	Prob. M	40–50	171	
31	Infant	1–2		
32	Prob. M	? 25–35		
33	Prob. F	? 25–35		?
34	Juvenile	10–15		
35	M	30–40	171	
36	Poss. F	25+		?
37	M	35–45		
38		? 20–30		?
39	Prob. M	16–18		
40	M	25–35	160	?
41	Juvenile	12–16		
42	Prob. M	20–25		?
43	Juvenile	2–3		
44A	M	35–40	174	
44B	Poss. F	20–30		?
45	M	17–25	173	
46	F	17–25	154	
47	Juvenile	9–10		
48	Poss. M	17–25	164	
49	Poss. M	Adult		
50	F	45+	158	?

Grave No	Sex	Age	Stature (cm)	
51	F	17–25		U
52	M			
53	Poss. M	Adult		
54	Juvenile	14–16		
55	M	45–50		
56	M	30–40	166	U
57	M	40–50	171	
58	Prob. M	25–35		U
59	F	25–35	153	U
60	M	17–25		
61	Poss. F	40+		
62	M	35–45		
64	M	30–35	167	
65	Prob. M	30–40	170	
66	Poss. M	? 30+		
67	Poss. F	25–35	172	
68	F	Adult		
69/70A	M	20–25		
69/70B	M	25–35?	176	
71	Poss. M	25–35		
72	Prob. M	35–45	167	
73	M	50+	169	U
74	Prob. F	35–45		
75	Juvenile	13–16		
76				U
79	F	35–45		
80	Prob. M	35–45		U
81	F	Adult	157	
82	Prob. M	? 40+	173	
83				
84	Prob. F	Adult	163	
85	M	20–30	165	
86	M	25–35		
87	Prob. F	Adult		
88	Prob. M	35–45	171	
89	M	30–35	169	
90	M	30–40		
91	F	? 35–45	160	
92	Poss. F	17–25	151	U
93	Juvenile	8–9		
94				
96	M	30–40		
97	Prob. F	25–35	165	U
98	M	15–20		
99	Poss. F	Adult		
100	Prob. F	Adult	149	
101	M	35–45	171	U
102	M	35–45	171	
103	Prob. M	45–50	169	U
104	M	25–30	170	U
105	M	Adult	173	
106/107	Prob. M	25–35	169	U
108	Poss. M	Elderly	165	
109	F	? 20–30	161	
110	Prob. F	17–25	161	U

Grave No	Sex	Age	Stature (cm)	
111	F	17–25	153	U
112	F	Adult	16?	
113	F	Elderly	152	
114	Prob. M	Adult		
115	F	17–25		
116		Adult		
117	Juvenile	7–?		U
118	Prob. F	? 25–35		
120	M	Adult		U
121	Prob. M	? 35–45		U
122	F	25–35	159	U
123	F	30–40?		
124	Prob. F	? 30+		U
126	M	25–35	169	
127	Prob. M	Adult	171	
128	Juvenile	10–11		
129	Poss. F	25–35		
130	Juvenile	11–13		
131	Prob. M	Elderly	174	U
132	Prob. M	25–35	176	U
133		Adult		U
134	M	Adult	175	
136	Poss. M	22–26	166	
137	Poss. F	Elderly		
138	F	17–25		
139	Poss. M	35–45		
140	Poss. M	35–45		
142	M	30–35		U
143	Poss. F	Adult	158	
145	Poss. F	217–25		

The skull measurements are summarised in table 4. It can be seen that on average the female skulls were smaller than the males although the ranges of each measurement usually overlap considerably. Mandibular measurements seem more variable than those of the crania.

Non-metrical variants

These skeletal anomalies are quite distinct but would have had little or no functional effect on the individual concerned. Their occurance is thought to be genetically linked and so higher frequencies then normal would possibly indicate some familial links in the population.

A high proportion of the crania examined had one or more wormian bones in the lambdoid suture. (See table 1 for list of burials affected). A few (Burials 18, 58, 104, 129 and 131) also had wormian bones in the sagittal suture. Seven burials (Nos 3, 13, 76, 91, 101, 122 and 132), had parietal notch bones, the last three bilaterally. Seven burials (Nos 14, 16, 33, 50, 101, 111 and 122) had epipteric bones and three (Nos 1, 6 and 101) showed fronto-temporal articulation at pterion.

Three skulls (Nos 42, 59 and 102) had a metopic suture and two (Nos 46 and 139) had a partly closed metopic suture, the ventral half being obliterated in both cases. One further skull (No 21) was probably also metopic but this and the other sutures too have been obliterated. Three skulls (Nos 21, 55 and 104) had inca bones although the extra sutures are almost totally obliterated in No 21 and partially so in No 104.

Eleven individuals (Nos 7, 13, 14, 16B, 21, 24, 32, 59, 74, 101 and 117) show some signs of orbital osteoporosis although this varies from slight to severe.

Seven individuals (Nos 16B, 21, 25, 59, 101, 102 and 103) show some signs of torus palatinus; two (Nos 103 and 111) have maxilliary tori and one (No 138) has tori mandibularis.

In one individual (No 46) there is a foramen of Huschke in the right auditory canal.

Skeletal anomalies

These anomalies of the post-cranial skeleton are most often noted in the spine.

An extra vertebra or a change in the junction of the final vertebra of a section is the most common anomaly. In Burial 46 the sacrum has six, rather than the normal five, vertebrae. In Burial 89 the final lumbar vertebra is partly sacralised and in Burial 104 the final (seventh) cervical vertebra is almost completely thoracic in function; the transverse foramina have disappeared and a small cervical rib was present on both sides, although only one was recovered in excavation.

A number of burials (Nos 28, 33, 50, 58, 85 and 104) have double transverse foramina in the lower cerival vertebrae. Some are bilateral but some only on one side or the other. Either one or several vertebrae may be affected.

Three burials (Nos 16A, 23 and 40) show spondylolysis of the fifth lumbar vertebra.

Two individuals (Nos 14A and 102) had perforate coronoid fossae in the humeri.

Table 4: Adult skull measurements (all in mm)

Measurement	Males Ranges	Males Average	Males Sample Size	Females Range	Females Average	Females Sample Size
L	171 -199	183.5	20	169 -183	175.7	18
B	131 -153	143.2	26	131 -149	139.1	17
B´	92 -106	98.8	27	89 -104	95.8	19
H´	124 -141	133.3	18	113 -137	127.2	13
LB	87 -111	101.1	18	86 -108	96.3	13
S1	120 -137	129.1	19	120 -132	126.2	15
S2	114 -135	124.1	17	115 -135	121.3	14
S3	110 -133	119.2	15	93 -123	113.5	13
S1´	104.0-118.9	111.3	19	103.6-114.2	109.6	15
S2´	105.0-120.3	111.5	17	99.8-119.0	108.8	14
S3´	92.7-103.3	98.9	15	81.2-101.8	90.2	13
BiastB	106.6-120	113.2	20	99.7-124	110.9	15
GH	69.1- 73.9	70.9	6	62.7- 67.1	65.4	3
GL	84.3-100.7	93.9	5	89.3- 91.5	90.4	3
GB	89.6-102.5	94.3	7	93.8- 96.6	95.2	3
G2	39.3- 45	41.6	7	34.2- 42.9	40.2	6
G1	42.9- 48.8	46.5	11	41.7- 46.5	43.3	3
J	132.3-140.3	137.9	5	119.5-133.9	127.2	5
O1	36.7- 42.9	39.1	5	37.9- 39.9	38.3	3
O2	30.7- 37.6	33.4	7	33.4- 37.3	35.1	3
FL	31.7- 39.3	35.2	15	29.6- 37.4	34.5	13
FB	28.9- 35.5	31.9	13	27.2- 33.3	29.4	12
NB	21.8- 25.1	23.6	4	21.9- 25.6	24.2	4
NH´	50.3- 56.6	52.3	7	46.7- 50.7	48.7	3
SC	8.1- 11.9	10.2	7	6.6- 10.2	9.3	7
DC	1 .8- 26.1	23.9	4	20.2- 23.9	21.9	2
W1	107.5-126.1	119.1	9	104.3-122.9	114.9	6
ZZ	40.6- 47.6	44.6	20	39.9- 48.8	43.9	14
RB´	26.1-35.6	31.3	20	28.5- 32.2	29.1	13
H1	32.5- 37.9	34.5	17	24.8- 36.4	31.9	11
ML	99.5-110	104.6	12	88.5-106	99.8	8
RL	58.5- 70	63.9	12	47.5- 64	57.7	8
M_2H	23.9- 29.7	27.1	14	19.2- 28.4	24.9	12
$C\acute{y}L$	16.3- 24.9	20.7	15	16.2- 26.2	20.0	11
CrH	58.3- 73.3	66.4	16	48.9- 67.3	57.1	12
M<	113 -129°	122.6°	12	121 -136	126.5°	8

The measurements, except those described below, are defined in Boothwell (1972)

RL - Maximum projected length of the ramus.
M_2H - Height of the mandible at the second molar.
$C\acute{y}L$ - Maximum length of the mandibular condyle.
M< - Mandibular angle.

Trauma

Two individuals (Nos 25 and 57) have a well healed spiral fracture of the right tibia and fibula. In the first case the bones healed with severe angulation, about, 30° out of line, but in the second case they were far nearer the original alignment, although some shortening had taken place. One individual (No 88) had a well-healed fracture of the patella.

The skull from burial 106/107 had a well-healed cut on the right side of the frontal and that from burial 21 had a small depression about 2cm above the right orbit, probably also due to a well-healed cut. The skull from burial 76 had a well-healed cut on the upper border of the occipital, just to the right of lambda. A disc of bone (approx 40 x 20 mm) had been detached but was obvious held in position by the overlying soft tissue as it had later re-joined to the rest of the skull. The blow was inflicted from the right side from behind by a sharp edged implement (see photograph).

Pathology

Most of the adults over about 30 years old show some signs of osteoarthritis. In seven individuals (Nos 16A, 29, 52, 73, 74, 82, 90 and 121) this had progressed further and become ankylosing spondylitis which showed itself as "poker spine", the vertebrae fused by bands of ossified ligament. This condition is far commoner in males then females(2), a fact which is born out by the bones from this site where seven of the eight individuals affected were male.

Many of the skeletons had Schmorl's nodes in the thoracic and lumbar regions of the spine. These are caused by a normal but genetically linked degeneration of the intervertebral disc material. In one case (No 69/70B) there was also a larger depression (approx 20 x 30 mm x 5 mm deep) on the upper articular surface of the first saeral vertebra, probably also due to degeneration of the adjoining disc.

Burial 16A showed a wide range of pathological changes. Apart from the"poker spine" noted above, the lumbar vertebrae showed collapse of the centres of the vertebral bodies suggesting that this individual suffered from Pott's disease (tuberculosis). Small areas of osteoporosis were noted on the inner and outer tables of the skull and widespread osteoporosis and periostitis was present on the pelvis and proximal part of theright femur. The tibiae and right humerus also showed widespread periostitis. There was also a suggestion of a small cyst at the distal articulation of the left fibula.

Three other burials (Nos 48, 73 and 132) also showed widespread periostitis on limb bones, probably due to some sort of infection in the soft tissue of the bones.

In burial 101 the was a round depression (9mm diameter) on the inner surface of the mandible at the base of the right ramus. This was probably due to the presence of a cyst.

Burial 27 had a small pit (approx 7 mm diameter and 7 mm deep) in the distal articulation of the right tibia. This was probably due to osteochondritis dissecans. In burial 3 a similar but smaller pit was noted in the proximal articular surface of the right halux.

The skull in burial 139 is rather thicker than normal with the parietals up to 12 mm. This may be a normal variation or may be due to some pathological condition.

Burial 76 : Rear view of the skull showing the detached roundel of bone.

Five individuals (Nos 1, 9, 43, 85 and 103) had rather bowed leg bones with the femora and/or the tibiae affected. This might be due to some dietary deficiency which led to softening of the bones.

Dental anomalies

The commonest dental anomaly is the absence of one or more of the third molars. Twenty-one individuals show this anomaly, six (Nos 26A, 30, 42, 54, 110 and 126) having one tooth missing, twelve (Nos 6, 14, 22, 24, 46, 52, 56, 60, 96, 101, 103 and 104) having two missing, in most cases the mandibular pair; and three (Nos 32, 74 and 111) having three missing.

Other teeth are also congenitally absent, although this is far less common. In burial 52 $\underline{5}$ is absent and in burial 69/70A $\overline{1}$ is absent. In burial 101 both the upper lateral incisors $\underline{2}$ and $\overline{2}$ are probably missing, although the bone condition makes it difficult to be sure.

Sometimes milk teeth are retained, especially when the corresponding permanent tooth is not present to push the milk tooth out of the jaw. This is commonest with the second milk molar. Burial 6 has one retained milk molar and burial 44B two. Burial 22 has one retained milk molar and two retained upper canines. In burial 138 just one upper canine is retained.

Malformation of teeth also occurs, usually showing up as much reduced "peggy" teeth. This is commonest in the upper lateral incisors and three cases (Nos 18, 33 and 93) occur in this site. In burial 3 it is the right upper lateral premolar that is affected and in burial 88 the lower left medial premolar.

In burial 54 the lower right canine has a double root, another type of dental anomaly. Burial 142 has an impacted third molar. Burial 72 has a supernummary tooth in the maxilla between the two medial incissors. It is completely contained within the jaw and is pointing upwards towards the nasal cavity.

Dental pathology

Most of the jaws examined had slight calculus deposits on the teeth and a few were more severely affected. These heavier deposits usually occurred where the occluding teeth had been lost and the deposits had not been worn away as they formed.

About two thirds of the jaws showed some alveolar recession which was due to periodontal disease. About half of these showed medium to severe signs but the other half were only slightly affected.

Some teeth in almost all the jaws showed slight signs of hypoplasia. This is a disturbance in the enamel and indicates either an illness or a dietary deficiency while the enamel was forming before the tooth erupted.

Most of the jaws showed some caries cavities in the teeth. These varied from slight to very severe, and led eventually to exposure of the tooth pulp cavity which was usually associated with an abscess around the tooth root. This in its turn would lead to ante mortem loss of the diseased tooth and resorption of the bone of the jaw. In a few cases (Nos 13, 36B, 29, 73, 82, 113 and 131) virtually all the teeth had been lost ante morten.

References

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