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FICHE 3: CONTENTS

CONTENTS

ARTEFACTS

Pottery catalogue

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Notes on abbreviations:

F.No. Feature number.

Ph. Phase.

Fab. Fabric type.

Wt. Weight.

Th. Thickness.

Notes on fabric types:

A White earthenware; 19th-20th Century.

B Red earthenware; 19th-20th Century.

C A medium to coarse, uneven, buff to pink fabric containing frequent angular quartz and mica grits, reducing to a mid to very dark grey; some examples are unglazed, but others have an uneven light green glaze; late 13th-16th century.

D A coarse to very coarse uneven mid brown grey sandy fabric containing frequent angular quartz and large mica grits; probably Craggan Ware.

Find	F.No.	Ph.	Fab.	Wt.	Th.	Description
113	1001	6	A	11g	6mm	
213	2014	6	A	7g	3mm	
219	2004	6	A	6g	4mm	
			A	<5g	3mm	
			A	<5g	3mm	
			C	63g	8mm	Flat base sherd in three pieces in a partly reduced fabric bearing traces of a pale green glaze on the underside; incomplete, but at least 120mm in diameter.

			C	24g	6mm	Flat base sherd, unglazed and with carbonized deposits both internally and externally.
			C	7g	6mm	Flat base sherd, unglazed and with carbonized deposits both internally and externally.
			C	5g	4mm	Body sherd bearing an uneven light green glaze.
			C	5g	4mm	Body sherd with external cordoning and dark green glaze.
227	2020	6	A	8g	4mm	
233	2016	5	C	12g	6mm	Body sherd bearing an external pale green glaze and carbonized deposits.
239	2028	5	C	9g	7mm	Body sherd, unglazed and bearing external carbonized deposits.
263	2062	5	D	14g	7mm	Body sherd bearing carbonized deposits.
			D	7g	5mm	Body sherd bearing carbonized deposits.
303	2004	6	C	5g	5mm	Club rim sherd bearing an external brown-green glaze; possibly C15th-C16th.
314	2083	5	A	<5g	3mm	
325	---	-	C	13g	6mm	Body sherd bearing an external dark green glaze.
375	2077	6	B	60g	18mm	Buckley-type ware.
377	2023	,	C	<5g	6mm	Unglazed body sherd.
388	2013	5	A	<5g	—	
408	2034	5	D	7g	5mm	Body sherd, unglazed and bearing an incised decoration.
			D	8g	5mm	Body sherd, unglazed and bearing an external residue.
			D	6g	5mm	Body sherd, unglazed.
409	2034	5	B	<5g	6mm	Undiagnostic unglazed body sherd.

413	2079	5	C	<5g	4mm	Body sherd bearing an external green glaze.
415	2096	-	C	6g	7mm	Unglazed body sherd.
419	2020	6	C	<5g	4mm	Unglazed body sherd.
425	2020	6	A	<5g	3mm	
441	2094	6	D	8g	7mm	Probable body sherd or possible base sherd, unglazed and bearing an internal charred residue.
442	2094	6	C	<5g	4mm	Body sherd bearing an external green glaze.
446	2045	6	C	<5g	7mm	Unglazed body sherd.

SOIL SAMPLES ANALYSIS

Stephen Carter

Table 3: results of routine analysis

F.No	Phase	pH	% LOI	Phos.	CaCO3
1006	1	7.8	1.5	H	0
2010	1	7.8	1.0	H	0
2011	1	7.6	0.7	H	0
2097	1	8.1	1.1	H	2
2119	1	8.1	0.0	H	0
2130	1	8.2	2.7	H	2
2160	1	8.2	0.8	H	0
2166	1	8.1	1.9	H	2
2141	2	8.1	1.6	H	2
2143	2	8.1	0.0	H	0
2148	2	8.0	2.6	H	2
2155	2	8.2	1.9	H	2
2167	2	8.3	2.5	H	0
2170	2	8	0.9	H	2
2173	2	8	2.1	H	2
2123	3	8.3	4.2	H	4
2127	3	8.1	1.6	H	2
2133	3	8.2	1.8	H	0
2139	3	8.9	0.9	H	3
2140	3	8.1	1.6	H	3
2164	4	8.6	1.0	H	4
1003	5	7.9	1.9	H	0
1007	5	7.7	1.8	H	0
1009	5	7.5	0.8	H	0
1011	5	7.7	1.6	H	0
1013	5	8.1	2.5	H	0

1015	5	7.8	0.9	H	0
1017	5	7.9	1.0	H	0
1023	5	7.9	1.1	H	0
1025	5	7.8	2.2	H	0
2013	5	8.0	1.0	H	2
2016	5	8.3	4.0	H	4
2017	5	8.0	1.0	H	4
2025	5	7.8	1.2	H	4
2028	5	8.0	1.1	H	4
2034	5	8.0	0.0	H	4
2046	5	8.2	4.0	H	4
2051	5	8.0	1.6	H	3
2052	5	8.3	3.8	H	4
2056	5	8.0	2.1	H	3
2062	5	8.0	1.0	H	4
2067	5	7.7	1.6	H	4
2069	5	8.1	2.1	H	3
2071	5	8.1	0.0	H	4
2073	5	8.2	7.3	H	4
2075	5	8.1	6.3	H	4
2079	5	8.1	3.2	H	4
2081	5	8.2	6.1	H	4
2083	5	7.9	2.5	H	4
2084	5	7.9	0.9	H	4
2095	5	9.1	1.8	H	4
2098	5	8.2	0.9	H	4
2107	5	8.1	4.0	H	3
2115	5	8.1	0.0	H	2
2116	5	8.5	0.0	H	4
2117	5	8.2	0.0	H	4
2121	5	8.2	4.5	H	4
2128	5	8.3	1.9	H	3

2131	5	8.4	2.2	H	4
2135	5	8.1	1.9	H	2
2137	5	8.2	2.4	H	2
2149	5	8.3	1.8	H	4
2150	5	8.2	1.8	H	3
2154	5	8.0	2.0	H	2
2165	5	8.2	2.1	H	3
2169	5	8.4	2.1	H	4
1001	6	7.7	3.2	H	1
2020	6	8.2	2.9	H	4
2023	6	8.2	3.0	H	4
2045	6	7.8	2.0	H	4
2049	6	8.1	5.2	H	4
2094	6	9.1	2.1	H	4
2125	6	8.4	1.0	H	4
2061	U/S	8.3	3.1	H	4
2096	U/S	9.0	3.2	H	4
2152	U/S	8.9	3.4	H	4

MORTAR ANALYSIS

Dianne Dixon

Inventory of mortar samples

Phase 3 Earlier walls, foundations of St Ronan's Church.

The four samples, 208, 209, 210 and 213, are all Type A, the finely comminuted (1 mm) white shell fragments with some fine quartz particles, mixed to a smooth paste with lime and water, applied to the stone wall surfaces more as a plaster than a limewash, presumably smoothing minor irregularities and filling gaps between stones where it came into contact with the bonding clay. Some mixing may have occurred, muddying the lime plaster a little. The smoothed surfaces show bubbles formed during "trowelling" (or however the surfaces were smoothed).

Phase 4 St Ronans Church, early 13th Century.

202 - Type B. South wall. Comparatively low concentration of coarse sand plus scattered coarse gravel, mostly rock and mineral, grains in smooth, buff coloured, possibly clay-contaminated, lime matrix. Sharp junction with paler, shell-rich mortar

203 - Type B. South wall. Essentially the same as 202, coarse sand grains are set in a fine, smooth, buff-coloured, clay contaminated, lime matrix. Attached to this is a whiter, open textured, shell-rich variety. The shell debris is not as fine as Type A, is greenish-tinged and possibly crushed. Perhaps these are examples of repointing, (or a deliberate two-layer process to eliminate clay contamination for a whiter effect).

204 - Type B. East wall. Coarse sand and gravel grains of mineral, rock and shell, plus large (*circa* 1 cm) chunks of dark grey, coarse shell. Lime has dissolved and recrystallised coating cavity surfaces.

207 - Type A, South wall. The typical finely comminuted shell paste plus *circa* 15% gravel grains and white shell. This was not a superficial plaster, as in Phase 3, but a more substantial lump of mortar.

205 - North wall. Rebuilt? This is a hybrid (AB) which appears similar to Type B, with gravel, (mineral, rock and shell) grains supporting the mix, but also contains Type A finely comminuted shell in the lime.

Phase 5 These often voluminous samples were recovered from post-medieval grave fills, and are clearly random samples of all earlier wall binding materials.

234 - A: 7 small pieces; B: 6 small pieces; Algal: attached to Ross of Mull granite & flaggy stones. Calcite nodule. Clay: 1 small piece.

237 - A: coating small stone; B: 2 pieces attached to flagstone; Lime lump stuck to slate.

246 - A: 1 small piece; B: plus grey coarse shell.

267 - A: containing lime-clots; B.1: hard lumps, coarse shell rich; B.2: soft and pale, shelly gravel without coarse shell; Algal: 1 small piece; Chert, white, silicified chalk from Gribun? Clay, brownish with wood remains.

273 - A: coating 2 stones & 2 small lumps; B: with coarse shell; Lime lump; Bone.

284 - A: adhering to flagstone.

288 - A.1: micaceous; A.2: frothy texture.

300 - A: containing lime-clots, coating small stones; B: with coarse gravel, lower shell content.

306 - A: coating small stones, 6 small lumps; B: lower gravel, huge shell chunks.

310 - A: micaceous, coating flagstone; B: plus dark shell, one attached to spotted slate; lime lump; Calcite nodule.

318 - A: with a few lime-clots and coarse shell pieces.

341 - A: containing lime-clots, coating slate slab.

346 - Clay, wall packing?

350 - A: containing lime-clots & fewer gravel grains

Phase 6 Later Restorations

296 - A: with few lime-clots & gravel grains plus coarse shell pieces; lime lump.

220 - A: 1 small piece; B: with coarse shell fragments; Algal, with shell debris and lower gravel content.

212 - B: recent; Although very much coarser gravel used, it is composed of much the same blend of rock and mineral types as the earlier examples. Possibly cement has been added to judge from the hardness.

HUMAN BONES

Daphne Lorimer

Reports on individual skeletons

Skeleton 369 - F.No 2173

Only a few small fragments of skull bone and some teeth were retrieved from the U-shaped cut in the central section trench on the east side of the early wall F.2127 (Phase 3).They probably belonged to a female (Keen 1950) and a tentative age of death between twenty-five and thirty-three is suggested by the dental attrition.

There was a possible small "button" osteoma on the fragment of the vertical portion of the frontal bone and the right central incisor was noticeably worn in the centre, although not grooved.

Skeleton 109 - F.No 1003 (Infant)

The bones of the infant skeleton no. 109 were principally from the skull and were very fragmented, partial reconstruction of the frontal bone, only, was possible. The age at death was estimated to be about 1 year old since the root of the first deciduous right incisor was not closed, while the crown of the first permanent molar was complete, but its roots had yet to form and the crown of the first permanent incisor was incomplete.

Sexual determination of immature skeletons is notoriously difficult, but Schutkowski (1993), from work on the Spitalfield's material, has recently suggested certain distinctive morphological traits for possible use with the one to five year-olds. The fragment of symphysis mentis available from skeleton 109 extended from the region of two deciduous molars. Seen from above, the chin appeared wide and angular against the body of the mandible and on either side of the mid-sagittal plane it was possible to see slight rough structures which faded distally into shallow indentations. Schutkowski considered these features indicative of the male. Examination was also made of the supraorbital margins of the frontal bone which appeared slightly thickened.This is also considered a

male characteristic apparent from birth (Acsádi & Nemeskéri 1970). Bearing in mind that characteristics can vary from population to population, it is tentatively suggested, therefore, that the infant was possibly male.

Skeleton 110 - F.No 1017

The bones of skeleton No.110 were very fragmented and friable.The pelvis was missing, but the morphological traits of the small skull (Bass 1987) indicated that it belonged to a female of between thirty-three and forty-five years old at the time of death. It was not possible to estimate stature from the bone fragments (an *in situ* measurement of five feet one inch was given) and, with the exception of a minor degree of torus mandibularis in the region of the lower premolars and first molar, the possible non-metrical variations were few.

Cribra orbitalia were noted on the roof of each orbit and a fragment of calcified laryngeal cartilage - possibly coracoid. Most teeth were loose but could be fitted into the alveolar sockets. They were worn, with a moderate degree of calculus on both sides and periodontal disease was noted on the alveolar margin of both jaws in the region of the premolars and molars. No hypoplasia was noted. The two lower third molars were unerupted.

Skeleton 241 - F.No 2028

Skeleton No.241 was supine, extended with the arms by the side. The bones were gracile and were those of a female of about forty to forty-five at the time of death and about four feet eight inches in height. There was evidence of systemic disturbance during childhood and of degenerative changes, probably age-related, in the vertebrae, ribs, clavicles, humeri and the post-auricular area of the ilia. There was a healed fracture of the distal end of the right radius and, possibly, of the left fifth phalanx. Enthesopathies as well as lesser marked areas of muscle attachment and non-metrical data (See table 5) of the humeri and femora indicated an active life-style. There was very marked platymeria of both femora.

Sex was determined from the pelvis and confirmed by criteria from other bones and age from attrition of teeth and morphological changes of the

auricular area of the ilium, while the stature was estimated using the left femur, humerus and tibia.

Pathology: An x-ray of the tibia revealed Harris's lines of arrested growth. There was evidence of trauma in a healed fracture of the distal end of the right radius with palmar displacement (i.e.Smith's rather than the more usual Colles' fracture) and a possible healed fracture of the head of the first phalanx of the fifth carpal digit with an osteophytic growth.

The many minor changes seen on the skeleton were probably age-related: On the left tempero-mandibular joint there was osteoporosis of the glenoid fossa of the temporal bone and the condyle of the mandible which also had slight osteophytic lipping. Small lytic lesions, suggestive of small cysts were also present on the lesser tuberosity and adjacent margin of the head of the left humerus.

In the spine, osteoporosis was seen on right side of the inferior surface of the bodies of the fourth and fifth and on the left side of the superior surface of the sixth cervical vertebrae.In the thoracic spine, there were osteophytes round the margins of the facet on the right transverse process of the sixth, the left transverse process of the ninth and the facets on both processes on the tenth. Osteophytic lipping was also seen round the margin of the inferior articular facets on the body of the eighth, both facets on the body of the eleventh and the left facet on the body of the twelfth. In the lumbar spine, slight lipping was noted round the superior margins of the third, fourth and fifth vertebrae.

In the ribs, osteophytic lipping was seen round the tuberosities of the third, sixth, seventh, eight and ninth left ribs and round the tubercles of the third, fourth, fifth, sixth and seventh right ribs.

In the shoulder joints, there was osteophytic lipping round the margin of the acromial facets of the scapulae and both ends of the clavicles where the sternal ends also showed some osteoporosis. Osteoporosis was seen on the lesser tuberosity of the left humerus.

In the elbow joint, small osteophytes were seen in the olecranon and coronoid fossae of the right humerus and in the region of attachment of the

triceps muscle on both ulnae.

In the pelvis, marked reactive changes were also seen in the post-auricular area and, in both femora, the fovea capitis was deep with slight osteophytic lipping round the margin.

Enthesophytes were found on the lesser tuberosity of the right humerus and the tuberosity of both radii and on the attachment areas of the flexors and pronators on both ulnae. In addition, both the posterior and anterior bicipital ridges on the humeri were very marked forming a pronounced bicipital groove. Gray (1977) suggested that "when the forearm is fixed, the Biceps and the Brachialis anticus flexes the arm upon the forearm as seen in the efforts of climbing".

Spurs were also found on both anterior iliac spines and on the superior margin of the left patella. The upper one-third of the shaft of the right femur was bowed antero-posteriorly when compared with the left and the pilaster index on the right side was 100 and, on the left 97.6. Allen's fossa was present on both femoral necks and exostoses were seen in both trochanteric fossae. The gluteal ridges were very marked.

A small lytic lesion was seen on the anterior part of the iliac portion of the right acetabulum of the pelvis, while on the lower ends of both femora a sub-pereostial cortical defect or "tendon lesion" (Hrdlicka 1914) was seen. This is a crater like lesion located above the medial condyle and is thought to be due to repeated stress or to acute trauma of the gastrocnemus muscle (causing localised resorption due to hyperaemia or increased blood supply. Charles' facet was also found above the medial condyle. The head of the tibia was damaged but there was also a possible rounding of the lateral tibial condyle. These markers may indicate hyperflexion of the knee with extension of the hip. There was also evidence of possible medial and lateral squatting facets at the lower end of the tibiae indicating dorsiflexion of the foot.

Note: the hole bored into the medial side of the head of the fourth left metatarsal was *post mortem* and probably due to a beetle.

Skeleton 243 - F.No 2051

Skeleton 243 came from an extended supine inhumation, orientated with the head to the west, but only the bones of the lower half wof the body were recovered. The individual was female, aged over sixty at the time of death and just under five feet in height and had probably given birth to one or more children. The non- metrical variations (see table 5) and marked muscle attachments indicated an active life-style, and there was antero-posterior flattening of the femur.

Sex was determined from the pelvis and confirmed by the sacrum and femur, age from the morphological changes in the auricular surface of the pelvis and stature was calculated from the lengths of the right femur and tibia.

Pathological changes seen on the bones consisted of slight osteophytes (probably age-related) on the superior margins of the three extant lumbar vertebrae and on the anterior margin of the left ala of the sacrum. Two shallow circular depressions, nine millimetres in diameter were found in the upper and lower posterior quarters of the left acetabulum and were possible healed scars of osteochondritis dessicans.The surface round the fovea capitis of the left femoral head was uneven with a small area of periostitis. A small 'ivory' osteoma was found on the posterior part of the lateral condyle of the left femur.

The pre-auricular sulci of both ilia were large, being about seven millimetres in width (and extending round the inferior and medial margins of the auricular surface). They showed evidence of at least three or four primary depressions on either side.

Evidence of activity: Marked development of the linea aspera on the posterior border of the shaft of the femur showed extensive use of the abductor muscles of the thigh (the pilaster index was 109 for the right side and 96.4 for the left); extension of the hip was implied by the presence of the cervical fossa of Allen on the posterior surface of the femoral neck, Poirot's facet on the anterior surface and small exostoses in the hypertrochanteric fossa. The latter characteristics were also indicative of flexion of the knee together with

Charles's facet above the medial condyle and the rounded posterior border of the lateral tibial tuberosity. The very marked medial and lateral squatting facets at the distal end of the tibia was the result of marked dorsiflexion of the foot (Bacon 1990) and, also, in this part of the extremity on the left side, the posterior border of the calcaneus bore slight vertically orientated exostoses.

Skeleton 247 - F.No 2052

Only the lower half of Skeleton No. 247, (from the twelfth thoracic vertebra) was recovered and the bones were those of a female of fifty to fifty-nine at the time of death and about five feet three inches in height. Platymeria was present on both femora and non-metrical traits indicative of squatting. There was lumbarization of the first sacral segment and probable age-related changes of the lower lumbar vertebrae and sacrum.

Sex was determined from the pelvis, age from the degree of metamorphosis of the auricular surface of the posterior ilium (Phase 7) and stature calculated from the lengths of the right femur and right tibia.

Congenital anomaly: The first segment of the sacrum was partially lumbarized, the body being separate from the second segment. The left ala was united with the lateral mass but, on the right side, an articulation had formed between the two segments, the tip of the auricular process lying above the joint. The breadth of the right ala was noticeably narrower than the right side (28mm to 32.7mm) but there did not appear to be any scoliosis of the spine.

Pathological conditions: The bone changes all appeared to be age- related and consisted of osteophytes on the superior anterior borders of the bodies of the fourth and fifth lumbar vertebrae and on the margins of their posterior inferior articular facets; degenerative changes in the retro-auricular areas of the ilia; one osteophyte on the posterior margin of the left calcaneal facet and one on the right side of the inferior margin of the right patella. Both patellae had small bony projections (enthesopathies of the quadriceps tendon) growing on the supero-anterior face. Osteophytes also occurred on the terminal

phalanges of the first digits of the feet.

There was marked pilasterism of the femur (Index 143.7).

Skeleton 249 - F.No 2057

Skeleton No.249 was truncated and the skull and bones of the legs and some arm bones missing. They belonged to a female aged between forty and forty-four at the time of death and about five feet four inches high. There was no platymeria present, but changes of the upper end of the femur indicated extension of the hip joint. There were degenerative changes on the left sacroiliac joint.

The sex was determined from the pelvis and the age from the morphological changes on the auricular surface of the ilium (phase five) and on the pubic symphysis. The stature of 163.7 cm, or about five feet four, was the mean of the heights calculated from the lengths of the right and left humeri and the left ulna.

The pathological conditions noted were an osteoporotic area, twenty-five by thirteen square millimetres in size, situated in the centre of the auricular surface of the left ilium and the corresponding surface of the sacrum. A small osteophyte was also seen on the sacrum, on the anterior margin of the left ala.

Skeleton 251 - F.No 2060

Skeleton No. 251 was that of an infant of about two years old at the time of death and was probably female. Measurements *in situ* give a length of 100cm. Cribra orbitalia were present on the roof of the right orbit.

The age was determined from the stage of eruption of the deciduous teeth, using the charts given by Brothwell (1981:64) and the sex using the criteria given by Schutkowski (1993): in the pelvis the sacro-sciatic notch made an angle greater than ninety degrees and was shallow, while an "arch" drawn as a cranial extension from the vertical side of the greater sciatic notch crossed the auricular surface. Viewed from the top the curvature of the iliac crest showed only a faint "S". In the mandible, the gonial angles were aligned with

the horizontal ramus and the chin was not prominent (female criteria), but the canines protruded slightly against the adjacent molars which Schutowski considered indicative of the male.

Skeleton 256 - F.No 2034

The bones of skeleton 256 were gracile and belonged to a female of over forty-five at the time of death and about five feet four inches in height. Age-related changes were noted on the joints of the extremities as well as evidence of osteo-arthritis of the left knee joint and, possibly, the right thumb. Cribra orbitalia were present on the roofs of the orbits. There was marked platymeria of both femora and marked platycnemia of the left tibia but not of the right. The non-metrical variations (see tables 4 and 5) included accessory sacral facets.

The sex of the individual was deduced from the pelvic criteria and confirmed by the gracile shape of the bones and the smallness of the articular surfaces. The criteria of the skull were also all female with the exception of the root of the zygomatic process which extended over the external auditory meatus on to the supramastoid crest. This feature is usually associated with the male but, in this skull may possibly have been associated with attrition of the teeth and have indicated masticatory stress.

The age was determined from the attrition of the teeth, but the sutures showed no sign of union. Suture closure can be highly variable and is now considered an unreliable marker and the presence of multiple depressions for Pacchionian bodies along the sagittal suture on the inner table of the parietal bone suggested an age of over forty. Osteoporosis and osteophytic lipping seen on the articular surfaces, are also an indicator of an older age group.

Stature was calculated from the lengths of the right femur and right tibia to be 162.66 cm or about five feet, 4ins.

Pathological conditions: Cribra orbitalia were seen in both orbits and further evidence of possible juvenile stress was seen in the wormian bones in the lambdoid suture.

There was evidence of osteo-arthritis of the left knee with osteosclerosis and eburnation on the posterior articular surface of the medial condyle of the left femur and the corresponding articular surface of the tuberosity of the left tibia. Osteophytic lipping occurred on the posterior margins of the condyle and the tuberosity.In the left wrist, eburnation was found on the navicular in the area of articulation with the greater multangular and at the proximal end of the first metacarpal which also showed osteophytic lipping and remodelling

Osteophytic lipping was found, in the pelvis, round the margins of the superior articular facets of the first sacral segment and on the auricular surfaces of both ilia; in the upper extremity, round the trochlea and in the olecranon fossa of the left humerus and round the olecranon process of the left ulna; in the lower extremity, osteophytes were found round the condyles of both femora and round the margins of the tuberosities of both tibiae and on the left tibial spine. There was slight ossification of the quadriceps tendon on both patellae. Osteoporosis was found on the heads of both femora in the region of the fovea capitis and in both acetabula. Two deep cysts (three and two mm in diameter) found were on the posterior margin of the body of the right os pubis which seemed too deep for scars of parturition. In the tarsal bones, osteoporosis was seen in both cuboids.

The internal surface of the iliac portion of each acetabulum showed a pronounced groove just below the margin and a groove was also found on the anterior inferior iliac spine (the right was missing). A raised "tendon lesion" (Hdrlicka 1914) was seen above the medial condyle at the attachment of the gastrocnemus muscle but there was no cortical defect. The depth of the trochlea fossa in the left femur appeared unusually great (12mm),but greater pilasterism was noted on the right femur (122.7) than the left (113). The right femur also showed considerably more torsion than the left. Although enthesopathies were not present,the popliteal line and the area of attachment of the interosseous ligament of the tibiae and of the lower end of the fibulae appeared very marked. There was marked medial bowing of the shaft of the fibula. In the tarsal bones posterior calcaneal spurs were found.

There was heavy attrition of the teeth with exposure of dentine. Caries

was present on the left side at the root of the upper first molar and the labial side of the lower third.

Skeleton 257 - F.No 2067

Skeleton no. 257 was that of an infant, possibly female, of about two years old at the time of death. The child was supine, with the arms at the side and *in situ* measurements gave a length of 70cm. The grave cut into the fill of the grave of skeleton 304 to whom the small fragments of adult bone (which included a carpal scaphoid) probably belong.

The skull was, unfortunately, missing, but the ilium fulfilled the criteria for sexing the pelvis given by Schutkowski (1993).Age was determined from the stage of ossification of the vertebrae which, since the bodies were still separated from the laminae (less than three years old), but the laminae were mostly united behind (more than a year old) indicated an age of about two at the time of death.

Skeleton 272 - F.No 2073

The skull, ribs, right upper arm and feet of skeleton No.272 were not recovered, but the remaining bones were those of a female of about forty-five to forty-nine at the time of her death and about five feet two inches in height. There were osteophytes, probably age-related, on the thoracic vertebrae and possible disc lesions in the lumbar region. Platymeria was present in the femur. A small fragment of alveolar bone indicated *ante mortem* tooth loss.

The sex was determined from the pelvis and sacrum and the age from the morphological changes of the auricular surface and the symphysis pubis of the pelvis. Stature was estimated from the left femur and tibia.

Pathological conditions were seen in the spine where osteophytes were noted round the diarthrodial joints of the thoracic vertebrae (i.e. the transverse facets of the second and ninth thoracic, the posterior inferior facets of the ninth and tenth and the posterior superior facets of the tenth and eleventh). Schmorle's nodes occurred in the lumbar vertebrae (on the inferior surface of the first and second and the superior surface of the third), indicating possible

disc lesions. The anterior surface of the tuberosities of the right tibia was very roughened and irregular in the region overlaid by the infrapatellar bursar. Remodelling in the molar sockets in the fragment of alveolar margin suggested *ante mortem* tooth loss.

The linea aspera was well marked and the margin of the lateral tuberosity in both tibia was rounded and Charles's facet was present, indicating flexion of the knee and extension of the hip joint. Non-metrical variations (see table 5) included well marked lateral and medial squatting facets at the lower end of the tibiae. The talus, unfortunately, was missing, but there had obviously been acute dorsi-flexion of the foot. These bony changes could indicate squatting or sitting on a low stool, but, in view of the roughened appearance of the anterior surface of the tuberosity of the right tibia, it is tentatively suggested could be due to kneeling.

Skeleton 276 - F.No 2075

The adult inhumation, No.276 was extended with the hands folded over the pelvis and was that of a female of over sixty years of age at the time of death and about five feet one inch in height. The bones were very light and osteoporotic, platymeria was present in the femur and the non-metrical variations (see Table 5) indicated that the individual had habitually squatted or sat on a low seat. There was osteophytic development on the lumbar spine and metatarsals. Development of muscle attachments on the upper extremities suggested the possible use of a rotary quern.

Sex was determined from the pelvis, age from the morphological changes in the auricular surface and stature from the left femur and left humerus.

Pathological changes: All the bones appeared osteoporotic (probably age-related) and osteophytes were found on the left inferior anterior margins of the third and fourth lumbar vertebrae, on the lateral margins of the condyles on the inferior medial margins of the patellae, inferior surfaces of both talt and left navicular, on the head of the left first and the proximal end of the left

second metatarsals.

Possible occupation-related changes: There were small spurs on the left anterior inferior iliac spine (the right side was missing), exostoses in the hypertrochanteric fossa of the left femur and the gluteal ridge was very marked suggesting extension of the hip. The presence of a tibial imprint on the posterior aspect of the distal end of both femoral diaphyses, rounding of the posterior margin of the available fragment of lateral tibial condyle indicated flexion of the knee (Kennedy 1989:143-144). Medial squatting facets at the lower end of both tibiae and medial squatting facets on the tali are considered the result of acute dorsi-flexion of the foot. All are conditions which can be produced by squatting or sitting on a very low seat, but could be produced by kneeling or, since the greater trochanter was very uneven and the reconstructed right ulna appeared bowed, could suggest that the woman had sat cross- legged.

The scapulae were too fragmented to provide information and the right humerus missing, but on the left humerus, there was an enthesopathy of the Pectoralis major and the attachments of the posterior part of the Deltoid and the Teres major were very marked. This suggested considerable circumduction and adduction of the arm. In both lower arms, the roughened portion of the bicipital tuberosity of both radii was very marked, while the normally rounded and smooth posterior surface (covered by the Supinator brevis muscle) was marked (especially on the left side) by pronounced, oblique, parallel ridges from the inner to the outer margins. On the ulna, there appeared to be slight hypertrophy of the left supinator crest and, on both radii and ulnae, the attachments for the interosseous ligaments were marked. It is tentatively suggested that an activity using this combination of muscles in the upper arm could be the use of a rotary quern, particularly as the attachments for the inter-metacarpal ligaments appeared marked.

Skeleton 278 - F.No 2079 (Infant)

Skeleton No.278 was that of an infant. The stage of dental development (Brothwell 1981:64) suggested an age of about eighteen months at the time of

death. The bones were very fragmented and not suitable for attempted sexing. It was noted, however, that the crest of the ilium was strongly S-shaped which conformed to Schutkowski's male criterion. This appeared to be confirmed by the rather blunt supra-orbital margin on the small fragment of frontal bone.

Skeleton 286 - F.No 2084

The skull and most of the left side of Skeleton 286 were missing, but the bones present were those of a female of about forty to forty-four at the time of death and about four feet eight inches in height. There was possible evidence of parturition and evidence of lesions of the intervertebral discs and osteophytic bone growth on the margins of the bodies of her lumbar vertebrae. Bone changes in her elbow and marked muscle attachments of her metacarpal bones suggested some manual activity and very marked attachments for the interosseous ligaments and some hypertrophic bone at the lower end of her left fibula was possibly the result of a healed sprain. She had antero-posterior flattening of her femur.

Sex was determined from the pelvis, age from the morphological changes at the auricular surface of the ilium and the changes round the glenoid fossa of the scapula given by Stewart (1968:146). The stature was estimated from the lengths of the right tibia and fibula.

Pathological conditions: In the lumbar vertebrae, Schmorle's nodes occurred on the inferior surface of the second and superior surface of the 4th lumbar vertebrae, while osteophytes were seen on the left side of the superior margins of the second, third and fifth and the inferior margin of the fourth vertebral bodies. On the right humerus very small bony spurs were found in the olecranon and coronoid fossae. Slight hypertrophic bone growth was noted above the fovea capitis on the head of the femur.

Possible scars of parturition (5.8 x 3 mm) were noted on the dorsal and exostoses on the broken anterior surfaces of the symphysis pubis due to the stretching and tearing of ligaments and haemorrhaging during birth. (Similarly four deep pits were found in the preauricular sulcus (total area 19.0 x 7.5 mm)

of the ilium).

The attachments for the interosseous membrane at the lower ends of both fibulae were marked, particularly on the left side where there was some hypertrophic bone growth suggesting torn ligaments and a sprained ankle.

Poirier's facet at the head of the femur and slight exostoses in the trochanteric fossa and a marked gluteal ridge suggested extension of the hip; marked medial and lateral squatting facets at the lower ends of both tibiae indicated acute dorsiflexion of the foot, but the heads of the tibiae were too damaged to see bone response to flexion of the knee.A crescentic area of eroded cortex at the proximal end of the first phalanx of the right great toe was noted and could have been due to kneeling with bare feet.

Very strongly marked attachments for the ligaments of the intermetacarpal joints of the left hand were noted, particularly on the first and the fifth, but there was no obvious osteoarthritis. It is tentatively suggested that this might be due to spinning where the yarn has to be kept on a spread hand.

Skeleton 298 - F.No 2081

The bones of skeleton 298 were gracile and belonged to a female of about forty years old at the time of death and about five feet four inches in height. There was evidence of systemic disturbance during childhood and possible iron deficiency anaemia, of trauma in a healed fracture of the lower end of the right ulna and of herniation of the intervertebral discs shown by the presence of Schmorle's nodes on the lumbar vertebrae. Osteophytic lipping and remodelling of four diarthrodial joints were found in the thoracic vertebrae and one terminal phalanx from the upper extremity. There was a congenital absence of three third molar teeth and among other non-metrical traits (see tables 4 and 5),the presence of an ossicle at the lambda and the lambdoid ossicles were particularly noted as they seem to be allied with non-closure of the sutures of the skull.Some non- metrical variations and enthesopathies suggested hyperflexion of the ankles and knees.

Sex was principally determined from the pelvis and skull, and age from the degree of attrition of the teeth. Stature was calculated from the mean of

the heights obtained from the femur, the humerus, the radius and the ulna.

Pathological conditions: Porotic cribra orbitalia were seen on the roofs of both orbits (especially the right) and enamel hypoplasia on the two upper central incisors.

There was evidence of trauma in a healed fracture forty mm above the distal end of the right ulna where bone resorption was not complete. It was not possible to detect similar injury to the right radius, but fractures in this region are thought to be due to raising the arm in defence against a blow . Schmorle's nodes were seen on the superior surfaces of the bodies of the first, second and third lumbar vertebrae and on the inferior surface of the second. There were slight signs of DJD on the amphiarthrodial joint of the third cervical vertebra (osteophytic lipping) right arthrodial joints of the sixth and seventh thoracic vertebrae and the proximal end of the terminal finger phalanx (osteophytes and remodelling). Very slight porosity was noted on the heads of the humeri and the ischial portion of the right acetabulum in the pelvis.

In the teeth, the enamel was chipped on the lower first right and lower second left molars with possible caries. The socket of the lower right second molar showed evidence of periodontal disease which may have caused the tooth to become loose in its socket with consequent *post mortem* loss. Hypodontia or absence of three of the third molars was noted.

Each femur showed a distinctive facet (Charles' facet) on the posterior surface of the shaft immediately above the medial condyle where there was a slight elevation of the attachment area for the Gastrocnemeus. This is usually associated with an extended articular surface of the medial tuberosity of the tibia (missing) and indicated marked hyperflexion of the knee joint. The linea aspera and the gluteal ridge were well marked.

Skeleton 299 - F.No 2081

Few bones were retrieved from skeleton 299 and were those of a young adult of indeterminate sex and age. The normal sex and age markers were missing: The available sex indicators were ambiguous since the fragment of

occiput showed a very marked external occipital protuberance, a male characteristic, but the guttering of the fragment of the axillary border of the scapula faced obliquely, which is female. Discriminant function analysis (using the calculations of France given by Bass 1987:153) of the lower end of the humerus placed it just within the male side of the cut-off point, but the humerus is considered an unreliable sex indicator. No complete long bones were available , so the length of the humerus was calculated from the lower end and the approximate stature obtained from this.

The development at the external occipital protuberance indicated very powerful neck muscles and might be an occupational development.

Platymeria was present on the fragment of femur.

Also found with this skeleton was the head of a rib and a right humerus (72.3 mm long) of an infant of probably about a year old. The bone is smaller than that of Skeleton 278 which overlies this burial.

Skeleton 304 - F.No 2069

Skeleton No.304 was that of a female of over forty-five at the time of death. There were no complete long bones, but the length of the humerus (two hundred and eighty-four millimetres) was calculated from its lower end and used to estimate the approximate stature of about five feet. The few non-metrical variations are given in Table 5.

In the upper jaw, the second molars and the right first molar and canine had been lost *ante mortem* and the alveolar margin remodelled. There was hypodontia of the third molars, the right canine was misplaced and the right first molar was very worn with the dentine completely exposed. In the lower jaw caries was found on the mesial buccal quarter of the occlusal surface of the first right molar and on the mesial distal quarter of the left first molar..Recession of the alveolar margin and calculus was seen on the lingual side of all the teeth.

In the lower jaw torus mandibularis was present on both sides.

In the cervical vertebrae, osteophytes were found round the odontoid peg of the axis (second) and osteoporosis on both surfaces of the bodies of the

fourth and fifth vertebrae, on the superior surface of the sixth and the inferior surface of the third.

Skeleton 315 - F.No 2071

This skeleton was supine but truncated along the whole of the right hand side and the head and neck were turned to the south or right-hand side. The bones were those of a female of between eighteen and twenty-five at the time of death and about five feet two inches in height. Platymeria was present on the femur.

The sex was determined from the pelvis and the age from dental attrition and the morphological changes in the auricular surface of the ilium and symphysis pubis.

On the os pubis of the pelvis, there was some hypertrophic growth in the region of the region of the adductor longus and a pronounced spine for the attachment of the rectus abdominis and a very marked attachment for the sacro-iliac ligament. In the femur the gluteal ridge and the attachment for the gluteus medius on the greater trochanter was strongly marked and Poirier's facet was present. The surface of the lateral condyle of the tibia extended on to the posterior surface of the bone and the squatting facets at the lower end (especially the lateral) were very well formed. All these changes indicated extension of the hip, flexion of the knee and dorsiflexion of the foot as in squatting or sitting on a very low stool.

In the teeth, caries was seen on the occlusal surfaces of both second lower molars and

						3	2	1	|		2				
8				1	|	1	2	3	4	5	7	8			

were loose and lost *post mortem*. The enlarged socket area of the two lower third molars and exposed roots of the teeth *in situ* suggested periodontal disease.

Skeleton 321 - F.No 2056

Only fragments of pelvis and lower leg were found of an adult of unknown sex and age. The bones were gracile and the stature was estimated

from the lengths of the left tibia and fibula to be about four foot eleven inches if female or about five foot three inches if male. There was no platycnemia, or flattening from side to side in either tibia.

Bone changes and non-metrical variations on the bones suggested adoption of the squatting posture or sitting on a very low seat: at the proximal end of both tibiae, the posterior margin of the lateral tibial condyle was rounded, suggesting flexion of the knees and there were very marked medial and lateral squatting facets at the lower end of left tibia (right tibia broken) with very marked lateral extensions on both tali. On the left side there was hypertrophic bone growth on the extension.This indicated marked dorsi-flexion of the foot (Bacon 1990). The metatarsal bones were missing, but the superior surface of the proximal end of the first phalanx of the great toe had a crescentic roughened area suggesting dorsiflexion of the toes when kneeling with bare feet (Ubelaker 1979; Molleson 1992). It was possible that all these bone changes were the result of kneeling rather than squatting. Exostoses due to the pulling stresses of the interosseous membrane were seen at the lower ends of the shafts of both fibulae. These can reflect 'sprains' and are fairly common among elderly individuals (Mann & Murphy 1990).

Skeleton 321B - F.No 2056

Both tibiae and a left talus and part of a left calcaneum from another adult skeleton were found with No. 321 and were called 321b. Age and sex were unknown, but they were gracile and the stature was estimated to be just under five feet if female or nearly five feet two inches, if male. Platycnemia was not present and there was evidence of flexion of the feet and ankles.

Skeleton 328 - F.No 2032

In Skeleton No. 328, the post-cranial skeleton was almost complete, but, in the skull, only the posterior cranial and some facial bones were found. The individual was that of a young adult female of between seventeen and twenty-three and about five feet two inches in height. Platymeria and platycnemia were both present. Non-metrical traits and enthesopathies suggest

activities over rough country and a squatting or even kneeling posture.

The sex was determined from the innominate bones, the criteria of the skull and the measurements of the articular surfaces. The sacrum, however, was narrow and its criteria male (the transverse diameter of the ala was far less than that of the superior surface of the first sacral segment), but in a young adult the secondary sexual characteristics of the bone may not be fully developed.

The age was estimated from the attrition on the teeth to be between seventeen and twenty-three. Since the attrition on the first molar was to the enamel only, there was only slight polish on the second and the third molar showed no wear at all, it is thought that the individual's age lay in the lower part of the range. The epiphyses of the clavicles had not started to unite, which usually occurs between seventeen and twenty-two (Bass 1986) and the lines of union of most of the epiphyses were still very visible. Morphological changes on the auricular processes of the ilia indicated a similar age group.

Stature was calculated from the lengths of the left humerus, femur and tibia.

The pathological conditions were few: there was periostosis of the lower ends of both fibulae - greater on the right than on left - which may have been due to a skin lesion. In the teeth, there was caries on the buccal side of the lower right second molar, periodontal disease in the alveolar margin round the lower right second premolar (which was mis-aligned in the jaw) and slight calculus on the lingual side of all the teeth in the mandible.

Platymeria of the femur and platycnemia of the tibia, together with changes in the reaction area of the femoral neck (Allen's fossa and Poirier's facet) are thought to be the result of walking or running over hilly country (Angel 1964a). The gluteal ridges were very marked but the linea aspera was normal on both femora. There was evidence of hyperflexion in both the knee and ankle joints: in the knee, the posterior margin of the medial tibial tuberosity was rounded and there was also a smooth round facet, Charles's facet, on the posterior portion of the lower end of the femur above the medial condyle. This extended to the adductor tubercle and was part of the Gastrocnemius bursa.

In the ankle, there were lateral squatting facets at the lower ends of the tiblae which articulated with lateral extensions of the articular surface of the talus. This evidence for both hyperflexion of the knees and ankles and hyperextension of the hip joint suggests either squatting, or, possibly, kneeling as well as the more active occupation.

Skeleton 332 No 2036

Skeleton 332 was represented by the skull, vertebrae, thorax and bones of the left upper extremity,only, and was that of a female of between twenty-five and thirty-five years of age at the time of death and about five foot one inch in height (155.746 +/- 4.57). The non-metrical data are given in Tables 4 and 5.

The sex was determined from the skull and confirmed from the diameter of the head of the humerus (37 mm) and the length of the glenoid fossa of the scapula (31.8 mm) which were both well within female limits. Age was determined from the degree of attrition of the molar teeth. Stature was estimated from the length of the left humerus.

Pathological conditions: There had been some remodelling of the condyle of the right side of the mandible as the head was angled forward and was enlarged antero-posteriorly with some porosity and small osteophytes round the margin (possible healed fracture). Possible degenerative changes were seen at the root of the zygomatic process of the temporal bone. Osteophytes were also seen on the first cervical vertebra, round the articular facet for the odontoid peg and there was some porosity on the sternal ends of both clavicles.

There was a possible healed lytic lesion (6.9 x 3.7 x 0.8 mm) on the infraglenoid tubercle of the right scapula, at the site of attachment for the long head of the triceps muscle. The floor of the lesion was smooth and covered with cortical bone suggesting a healed tear to the ligament. It was also noted that the spinous process of the first thoracic vertebra was deviated to the right.

Hypoplasia was found on the two upper central incisors and left canine indicating a systemic disturbance in early childhood. Calculus was seen on all teeth and caries on the occlusal surface of the upper left third molar. The biting edge of the upper right first incisor was grooved (possibly *post mortem*) and the lower right first premolar was double-rooted. Both the lower third molars were absent.

Skeleton 333 - F.No 2038

Skeleton 333 was represented by an almost complete cranium, the upper cervical vertebrae, fragments of both right and left ribs the body of the sternum and fragments of the left scapula, clavicle the left humerus (with exception of the lower end) and the shaft and lower end of the right femur. The bones were those of a female, probably in her late twenties at the time of death and about five feet tall. There was evidence of systemic disturbance during childhood.

The sex was determined from the dimorphism of the cranium and age from the attrition of the teeth. The approximate stature of about five feet was obtained from the length of the humerus (calculated from available fragments of the bone).

No pathological conditions were seen on the bones and the muscle attachments, in particular, the linea aspera, were not strongly marked. Platymeria was present on the right fragment of femur. In the teeth, however, there was some hypodontia, the upper second incisor being represented by a peg. This, together with the adjacent canine suffered from hypoplasia. There was recession of the alveolar margin in the molar regions and a slight torus mandibularis on both sides of the mandible especially on the region of the lower second and third molars. The lower left third molar was missing (see x-ray).

Skeleton 336 - F.No 2030

Skeleton No.336 was an extended inhumation but only bones of the right femur, tibia, fibula and foot and the left fibula and some foot bones were recovered. Sex and age were unknown, but epiphysial union was complete so

the skeleton was that of an adult. The stature was about five feet three inches if female or about five feet five inches if male and was estimated from the lengths of the right tibia and fibula.

There did not appear to be any pathological changes in the bones, but the non-metrical variations and the enthesopathies indicated a fairly active life-style. There was marked pilasterism of the femur (137) with platymeria of the upper part of the shaft: the bone was markedly curved, the anterior convexity of the femur being compensated for posteriorly, by a very well developed pilaster. This is said to indicate upright posture and to be found among those connected with sea and fishing habits (Oeteking 1930). There was also platycnemia of the tibia with considerable prominence of the oblique line (i.e. origin of the soleus muscle which, in standing, steadies the leg upon the foot and prevents the body from falling forward), and four parallel bony ridges marking the insertion of the popliteus muscle. This muscle assists in flexing the leg upon the thigh and, when flexed, rotating it inwards. It is especially called into action at the commencement of the act of bending the knee. A lateral squatting facet found at the distal end of the tibia and crescentic roughened areas on the superior surface of the shaft of both first metatarsals just below the head suggested acute dorsiflexion of the foot (Bacon 1990) and toes (Ubelaker 1978,1979). On the right calcaneum, there are vertically orientated exostoses at the point of insertion of the Achilles tendon (occurring also in a depression which might be evidence of a healed osteochondritis dessicans).

It was unfortunate that the hip joint was missing, but it is tentatively suggested that using the treadle of a weaving loom might possibly call into play the muscles which made the changes on the bones of the lower limb. Weaving became a cottage industry which was normally undertaken by the male but Symmonds Report (1839) showed that by the early nineteenth Century, women and children were undertaking weaving in the absence of the male.

Skeleton 337 - F.No 2042

Only the lower leg bones of an adult, age and sex unknown, survived. None of the long bones were complete but the length of the tibia was calculated from dimensions of its lower end and the approximate stature estimated from the result to be about four feet eleven inches if female and five feet one inch if male. The non-metrical variations at the ankle suggest dorsiflexion of the foot (Bacon 1990) and the extension of the lateral condyle of the tibia on to the posterior surface of the bone suggested flexion of the knee, possibly due to squatting. Osteophytes were found on the terminal phalanx of the right great toe.

Skeleton 342 - F.No 2101

The bones from this grave were from three individuals, two adults and one juvenile. There were two right pubes, one of which did not match the single bone from the left side. This was considered to belong to a second adult and regarded as intrusive. The adult skeleton was called 342a and the juvenile 342b.

Skeleton 342a

The bones consisted of a few fragments of skull, vertebrae, ribs and pelvis and bones of the lower extremity. They were gracile and possibly belonged to a female of about twenty to twenty-eight at the time of death and about five feet in height.

The sex was determined from the os pubis and the skull, the age was estimated from the morphological changes on the symphysis pubis and the auricular surface and the stature was deduced from the left femur.

There was platymeria of the left femur and examination of the available bones of the lower limbs suggested flexion of the knee and extension of the hip joint: i.e. Poirier's facet was present on the neck of the left femur and Charles's facet behind and above both femoral epicondyles while the posterior margin of the lateral tibial condyle was rounded. This may suggest sitting on a low seat, but both pubes showed a very marked area on the anterior surface for the

attachment of the rectus abdominus muscles and vigorous forward lipping of the forward margin, especially of the tubercle. The gluteal ridge was also especially marked and there was an exostosis in the left trochanteric fossa which might suggest abduction of the limb and the fact that the individual might have been sitting cross-legged.

Skeleton 342b (Juvenile)

Skeleton No. 342b consisted of one rib fragment and the bones of the lower extremities, only. They belonged to a juvenile of about four years old at the time of death, the age being computed from the length of the shaft of the femur, using tables given by Johnston in Bass (1987:217). Sex was unknown.

Skeleton 343 - F.No 2115

Bones from neither the skull nor the lower extremity were found with this disturbed infant burial. Sex was unknown, but from the length of the humerus (77.3 mm), using the tables of Johnston (op. cit.) the infant was estimated to be about a year old at the time of death.

Skeleton 344 - F.No 2109 (Juvenile)

Only the shafts and diaphyses of both tibiae and the left femur (with the distal epiphysis) were found. The sex was unknown, but from the length of the femoral shaft, the age was estimated using the tables given by Johnston (op. cit.) to be between 4.5 and 5.5 years old at the time of death.

Skeleton 354 - F.No 2046

Skeleton 354 was an extended, supine burial which was orientated east-west. The chart records lower limbs being present and the left upper extremity missing, but no lower limbs were found with the bones and a left humerus, scapula and clavicle were present as well as two other skulls, (called 354b and 354c respectively) and two right innominate bones (called 354d and 354e) and other intrusive fragments of bone. The left clavicle and scapula fragments, when reconstructed, had the same characteristics as those of the

right side and the humerus articulated with the left glenoid fossa and they are tentatively assumed to belong to the same individual (i.e.354).

The bones of 354 were those of a female aged between fifty to sixty at the time of death and about five feet four inches in height. Oral health appeared poor and degenerative changes, possibly age-related, were noted in the spine. Unusually marked muscle insertions were noted on the right ilium and enthesopathies on the left humerus which, if belonging to the same skeleton, might tentatively be explained by the use of a crutch to compensate for the loss of use of a leg.

Age was determined from attrition of the teeth and the auricular surfaces of the ilium and sex from the pelvis and skull. The sexual dimorphism of the sacrum was, however, ambivalent since the bone was curved and the body of the first segment was almost twice the breadth of each ala, (both male characteristics), but the auricular surface extended well on to the third sacral segment as in the female. The articular surfaces of the humeri and the oblique direction of the guttering of the axillary border of the scapula also confirmed the female sex.

Pathological conditions: osteophytes were found round the odontoid peg of the second cervical and the inferior margin of the body of the fifth lumbar vertebrae and in the sacrum. They were also found round the inferior margins of the humeral heads and round the tuberosity of the left radius. Calculus was noted on the labial surface of all teeth with periodontal disease in the region of the upper left premolars and first molar. A root abscess was found round the upper left second molar. There was possible reactive bone (the upper anterior surface of the manubrium sternum which might have been due to an overlying skin lesion.

The pre-auricular sulci on both ilia were very large and extended on to the sacrum where pits were found: on the right side, one pit 17.8 x 5.7 mm and five smaller ones and on the left one pit 31.3 x 5.1 and three smaller ones. In the absence of the symphysis pubis, these can not be assumed to be

parturition scars, but to indicate a "loose" joint.

The external surface of the right ilium was markedly crevassed and roughened between the superior and middle curved lines in the area of attachment of the Gluteus medius muscle. This supports the body in the erect posture, particularly when standing on one leg (Gray 1977). The bone was very thin and appeared "crinkled" on the inner surface, but, unfortunately, both lower extremities were missing. The right ilium was damaged and the ridging, while present, was slight and the bone appeared thicker. On the upper extremities, however, muscle attachments appeared normal on the right humerus, but, on the left side, the lesser tuberosity which receives the insertion of the subscapularis muscle, was very large. (This muscle rotates the head of the humerus inwards and prevents its displacement). On the shaft of the bone, the pectoral ridge and the deltoid impression were very strongly marked, indicating considerable use of the muscles which raise the arms from the side and fix the humeral head in the glenoid cavity. On the scapula, the Teres process, while not making a fourth border, was very pronounced and, on the clavicle, the head was very rounded with the articular surface extending on to the shaft. After consideration of all these changes, the possibility is tentatively suggested that if the bones all belonged to the same individual, she only had the use of the right leg and compensated for the loss by using a crutch under the opposite arm - such a condition being depicted in Breughal's "Procession to Calvary" (1564).

Skull 354b - F.No 2046

This was the skull of a female of between twenty-five and thirty- five years of age at death. The cranial index was within the medium range but the mean height index was slightly low. A mandible was found with the skull which not only articulated with the glenoid cavity, but whose teeth showed a wear pattern comparable with those of the skull's maxilla. The non-metrical variations were few and given in Table 4. No pathological conditions were seen on the skull, but, in the teeth, root abscesses were found round the lower right third and the lower left first molars and the teeth lost *in vivo* as there was some

remodelling of the alveolar bone. Calculus was found on all the teeth and caries on the lingual side of the lower right second premolar which extended into the root. No hypoplasia was noted.

Skull 354c - F.No. 2046

This was the skull of a female of over forty-five at the time of death. Damage to the base of the skull and to the right parietal region made measurements unreliable, but the skull appeared to conform to the mesiocranic shape common to the group. The non- metrical variations were few (see Table 4) and no pathological conditions were seen on the skull except in the alveolar region of the maxilla, where reactive bone tissue in the left molar region and on the right tuberosity suggested periodontal disease. Calculus was seen round all the teeth, but no caries was found on the teeth still present in the jaw. The missing teeth appeared to have been lost *post mortem* as there was no remodelling of the alveolar surface. No hypoplasia was seen.

Os Innominatum 354d

The right os innominatum 354d belonged to a female of about thirty to thirty-four at the time of death and could, possibly have belonged to the individual of skull 354b. A large pre- auricular sulcus was the only non-metrical variation present and no pathological conditions were noted.

Os Innominatum 354e

The right os innominatum 354e was that of a female of between forty-five and forty-nine at the time of death. A shallow pre- auricular sulcus was the only non-metrical variation seen and it is possible that the os innominatum belonged to the same individual as skull 354c.

Skeleton 356 - F.No 2110 (Juvenile)

Skeleton No.356 was that of a juvenile of about 8 years old at the time of death. Porotic cribra orbitalia was present on the roofs of both orbits. No non-metrical variations were seen in the post-cranial skeleton and, in the skull

only lambdoid ossicles and a foramen of Huschke were seen. (The foramen of Huschke would normally be present at this age).

Skeleton 358 - F.No 2131

Skeleton No.358 was represented by the skull and cervical vertebrae, one phalanx and four rib fragments. Attrition of the teeth indicated that they belonged to a female of about twenty- five to thirty-five at the time of death. Damage to the base of the skull and to the left parietal bone made measurements suspect, but a tentative cranial index placed the skull in the dolichocranic or long-headed range. The non-metrical variations were few (see Table 4), but there was a marked Torus mandibularis of the lower jaw. The parietal bone appeared slightly thicker than normal and cribra orbitalia was found on the roof of the right orbit. Hypoplasia was present on the lower canines and right second premolar which suggested a systemic disturbance during the period of growth and may have occasioned the iron deficiency anaemia changes in the skull. Degenerative changes were seen on the diarthrodial joints of the fifth and sixth cervical vertebrae.

In the teeth, the right upper canine was impacted (see x-ray) and there was possible periodontal disease round the upper canine on the left side. Calculus was found on the palatal side of all the extant upper teeth and on the lower molars.

Skull 358b - F.No 2131

Only fragments of the skull were present, but the small frontal sinuses suggested the female sex. No measurements could be taken and very few non-metrical variations could be scored, although metopism was present.

Skeleton 360 - F.No 2128

Only part of the skull, upper part of the trunk and the right humerus were retrieved from this burial. The sex appeared to be female from the available skull markers and the oblique direction of the guttering on the axillary border of the scapula. The age was fully adult since the epiphysis was completely

united to the sternal end of the clavicle, the sagittal suture was completely obliterated and appeared to have started in the coronal and lambdoid sutures, but owing to breakage, was difficult to ascertain. Suture closure is now considered an unreliable age marker, but an age at death in the third decade is suggested as there are no depressions for Pacchionian bodies on the parietal bone. There were no complete long bones, but the length of the humerus was calculated from measurements of its lower end and the approximate stature calculated from the result to be about five feet and one half inch.

The parietal bone was thick and cribra orbitalia noted on a fragment of orbital vault. The lateral one-third of the left clavicle was very wide from front to back (23.5 mm at its widest point and 19.4 mm at its narrowest).The conoid tubercle and the oblique line for the trapezoid ligament were very marked, the under surface being very concave. The left clavicle was broken at the tip, but appeared to be similarly shaped.

Skeleton 362 - F.No 2107

Skeleton 362 was represented by the skull and some bones of the upper extremity, only. (The skull was reconstructed but distorted). The skeleton was that of a juvenile of about four or slightly under at the time of death. Examination of the teeth indicated an age of between three and four (Brothwell 1981:64) since the crowns of the first molars were complete and those of the second molars started, while union had not taken place between the condylar and basilar parts of the occiput, which normally occurs about the fourth year (Gray 1977: 58). Non-metrical variations were few (see Table 4).

Cribra orbitalia was present on the roof of the right orbit and loss of enamel in oval patches on the anterior surface of both lower deciduous canines and pitting on the surface of the upper right second deciduous incisor.

Skeleton 366 - F.No 2154

The bones of skeleton No.366 were very fragmented and abraded. Only partial reconstruction of the skull was possible and the fragmentary nature of the long bones precluded estimation of stature. The secondary sexual

characteristics of the skull were those of a female and the age was determined from the attrition of the teeth to be over forty-five at the time of death. It was also noted that all the cranial sutures present had been endocranially and ectocranially obliterated which also indicated an older age group. There were few non-metrical variations noted (see Table 4), but there was a considerable degree of Torus mandibularis in the mandible. This, with the auditory torus, has been considered the result of environmental conditions. An auditory torus was not present, but the inferior margin of the external auditory meatus appeared to be thickened and slightly osteoporotic. As well as the attrition of the teeth, which was probably age-related, gross calculus was seen on all the dentition present and there was periodontal disease on both jaws in the premolar and molar regions. Caries was seen on the lower right second molar. There was no hypoplasia.

Skeleton No.367 F.No.2112

Skeleton 367 was that of an extended inhumation represented by an articulated left femur and tibia. Also found with it were the bones of an infant's skull (called No. 367b) and disturbed bones of one or more adult skeletons.

Skeleton No.367 was an adult of age and sex unknown but, since the bones were gracile, was probably female. The stature was 159 cm or five feet two inches (if female) or 163 cm or about five feet four (if male). A Charles's facet was present at the lower end of the left femur and the lateral articular surface extends on to the posterior portion of the lateral tuberosity which indicated flexion of the knee joint. Squatting facets were seen at the distal end of the tibia, indicating flexion of the ankle joint, but no platycnemia of the shaft.

Skeleton 367b - F.No 2112 (Infant)

The infant's skull was represented by bones of the occiput, parietal, frontal and petrous parts and one loose upper right first deciduous molar. Since the roots of the teeth were only half complete, the infant was under two years old at the time of death. Ossicles were seen in the lambdoid suture.

Disturbed bones found with Skeleton 367

Among the disturbed bones was a right os innominatum from a female whose age from the morphological changes on the auricular surface was about forty to forty-four at the time of death. The remaining bones consisted of the right shaft and the left shaft with lower end of humeri. The left humerus had a septal aperture, (possibly an *ante mortem* non-metrical variation) in the olecranon fossa); fragments of the left radius and ulna; fragments of femoral shafts and one broken and abraded right lower end; fragment of the upper one-third tibial shaft with the lateral tuberosity and a fragment of a right fibula. The bones would be consistent with belonging to the same skeleton as the right extremity.

Skeleton 370 - F.No 2121

Find No. 370 consisted of numerous human bones which were interpreted, by the archaeologist, as disturbed Phase five burials. They consisted of vertebrae, some ribs, fragments of sternum and bones of the upper extremities. There appeared to be the complete thoracic vertebrae of two individuals which were separated by examination of their condition, articulation and disease pattern. They have been called 370a and 370b. The condition of the cervical and lumbar vertebrae appeared to conform to 370a (See Inventory). All the bones indicated small gracile individuals and there was probably at least one female since the guttering on the axillary borders of the scapulae faced laterally (Bainbridge & Genoves 1956:112) and the width of the glenoid fossae was less than 26.1 mm (24mm). The age of this individual was possibly between thirty to thirty-five at the time of death from the degree of lipping round the margin of the glenoid fossa (Stewart 1968:146). Stature of one individual from the length of the radius was about five feet two and a half inches. The only non-metrical variation seen was a circumflex sulcus on the axillary border of the scapulae.

Examination of the vertebrae called 370a showed possible age- related changes in the vertebrae, together with evidence of disc lesions in the lower thoracic and lumbar vertebrae. In the cervical region, there was porosity of the

superior surface of the body and the left superior articular facet of C4 and the left superior articular facets of C5 and of C6 (where a small smooth exostosis was seen in the centre)>. The spines of C5 and C6 both deviated to the right. In the thoracic region,small osteophytes were found on the right anterior superior margins and the whole of the inferior margins of the bodies of T5 and T6. The inferior surface of T5 and the superior margin of T6 were osteoporotic. A large osteophyte was found on the right side of both superior and inferior margins of the body of T8. Schmorle's nodes were found on the superior surface of T8, on both surfaces of T9, T10 and T11 and on the superior surface of T12. In the lumbar vertebrae, Schmorle's nodes were also seen on both surfaces of L1 and L2 and osteophytes were found on the anterior margins of the body of L2.

Apart from a slight deviation to the left of the spinous process of the first vertebra, no pathological conditions were seen in the seven thoracic vertebrae of 370b.

Skeleton 372 - F.No 2113

Apart from a fragment of parietal bone, the sacrum and one fragment of rib shaft, skeleton no.372 was represented by the bones of the right lower arm and wrist (only fragments of the radius were present from the left side), the pelvis and both femora.

The skeleton was that of a female of about fifty at the time of death and about five feet five inches in height. It was possible that she had given birth to one or more children. Both femora, as well as being platymeric, were bowed antero-posteriorly, compensation being made by a marked pilasterism or thickening of the linea aspera. The non-metrical variations at the hip (Poirier's facet, exostosis in the trochanteric fossa) indicated flexion of the hip and Charles's facet suggested flexion of the knee. The presence of sacral facets was indicative of heavy vertebral loading in flexion with compression of the vertebral column i.e. carrying babies etc on the back.

The sex was deduced from the pelvis and the age from the morphological changes on the auricular surface of the ilium. The changes at

the symphysis pubis gave a result in an older age- group, but since there were marked parturition scars on the ventral surface of the os pubis, the changes on the dorsal surface of the symphysis could be due to tearing during birth. The parturition scars consisted of a series of shallow pits about three millimetres wide along the ventral margin of the symphysis which could be due to the tearing and stretching of the ligaments during birth.

Skeleton 376 - F.No 2026

Bones belonging to a second individual were found among those of skeleton 376 and called 376b.

The skull and upper cervical vertebrae were missing from 376, itself, and it was represented by the rest of the vertebral column, a small number of rib fragments, the upper extremity (with the exception of the bones of the hands), the pelvis and the lower extremity.

Skeleton 376 was that of a female of about fifty to fifty-nine years old at the time of death and about five feet three inches in height. There was evidence of a healed fracture of the shaft of the left femur with gross shortening and a possible Colles fracture of her left wrist. Osteoarthritic changes were seen in the spine and knees.

The female sex was deduced from the pelvis, the most reliable indicator since the diameters of the heads of the humerus and femur lay within the indeterminate region. The age of the skeleton was obtained from the morphological changes of the auricular surface of the ilium. The stature was the mean of the heights obtained from the lengths of the humerus (30.8 cm) and the femur (42.9 cm).

Pathological conditions: There was evidence of degenerative arthritis in the spine and joints. Lesions of the intervertebral discs in the lumbar region were noted, where extrusion of nucleus pulposus material had caused erosive lesions on the superior surfaces of the bodies of first and fifth and on both surfaces of the second and fourth. Florid osteophytes were present on both margins on the right side of the body of the third lumbar vertebra and on the superior margin

of the fourth. (It was also noted on both amphiarthrodial joints of the sixth cervical vertebra). Osteophytes were also seen round the margins of all the diarthrodial joints of the lumbar vertebrae and at the sacro- iliac joints of the pelvis.There was a small cystic area on the inferior margin of the left glenoid fossa of the scapula and osteophytes round the anterior inferior margin of the left humerus. The lesser multangular bone of the left wrist joint was eburnated in the facet for articulation with the navicular. In the knee joints, the margins of the lower end of the left femur and head of the left tibia were both covered with exuberant hypertrophic bone and the head of the fibula was ankylosed on to the tibia, while there was eburnation and grooving on all the articular surfaces. On the right knee, there was eburnation and grooving on the medial articular surfaces but minimal osteophytes round the margins. There was an oval area of hypertrophic bone (21.5 x 13 mm) on the lateral aspect of the articular surface of the medial condyle of the right femur which could be the scar of osteochondritis dessicans.

Evidence of trauma was presented by healed fractures of the left femur and radius and ulna and possible tearing of the interosseous ligament at the lower end of the left fibula.The fracture of the distal end of the shaft of the left femur had produced a forty-centimetre overlap of the two ends, causing gross shortening of the limb (see x-rays and photographs). The area was surrounded by massive callus formation - on the anterior surface of which was a large oblong cloaca, measuring 15 by 12 millimetres, which indicated the presence of infection. Although there was no medio-lateral deviation of the femoral shaft, the degree of longitudinal overlap suggested considerable traumatic force and the fracture may well have been compound, leading to the infection. (Evidence of compound fractures of the femur in archaeological material is low (Ortner & Putschar 1987))z. Although there was flattening of both femora, the degree of platymeria (Index 53) was exceptionally marked on the left side and the linea aspera was very strongly marked on both sides. Although the left ala of the sacrum was narrower than the right, it was remarkable that the shortening of the femur had not produced wedging or obvious evidence of scoliosis of the spine. It was possible that the fracture had occurred late in

life and that in view of the severity of the arthritis, the degree of activity after the accident had been limited and weight-bearing small.

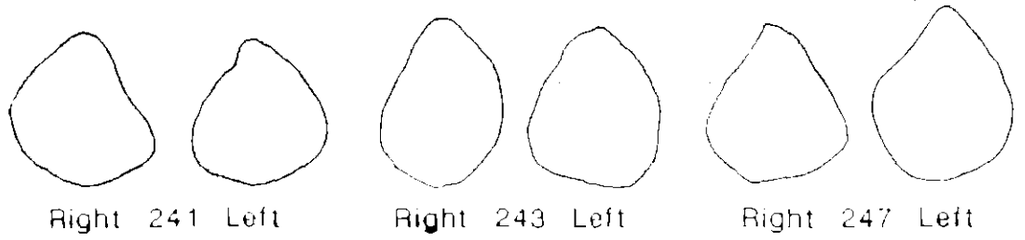
Enthesopathies and a marked exostosis due to the pull of the Interosseous membrane at the lower end of the left fibula suggested a possible tearing of the Interosseous ligament - probably at the time of the accident. The nutrient foramen was markedly larger than normal.On the left ankle bones there was an extension of the facet for the talus onto the lateral surface of the calcaneum and a smooth articular facet in the region of the peroneal tubercle.

There was a Colles fracture of the left wrist with slight caudal displacement of the lower end of the radial shaft (where resorption was not complete) and remodelling of the styloid process of the distal end of the ulna. A slight irregularity on the anterior surface of the lower end of the left radius might indicate a fracture of the right radius, also. The Colles fracture is typical of a trip where the hands are stretched out to break the fall.

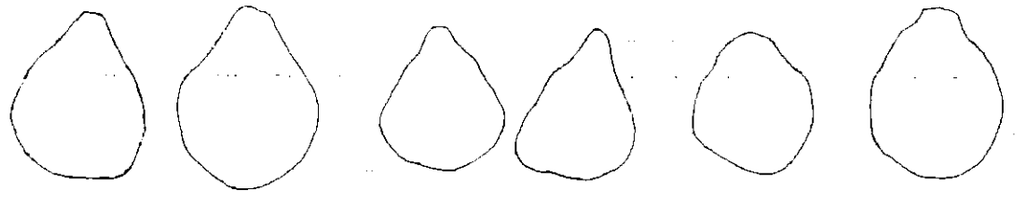
Skeleton 376b - F.No 2026

Skeleton 376b was represented by a right os innominatum, fragment of head of a right femur, two left tarsal bones, metatarsal bones of both sides and a right radius. A sacrum was found which did not articulate with the ilium.

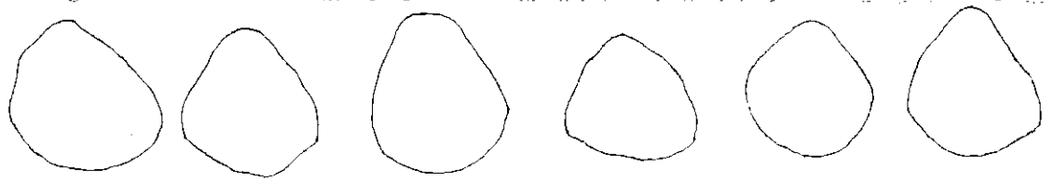
The bones were those of a female of over sixty at the time of death and about five feet four inches (164 cm) in height.



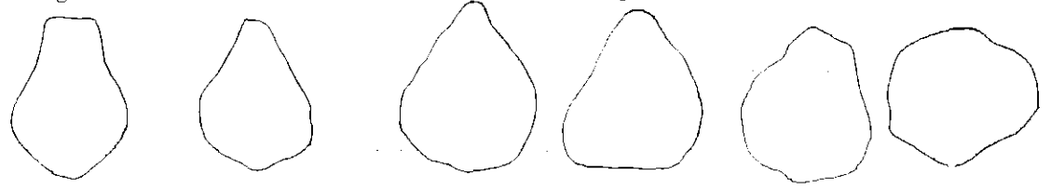
Right 241 Left Right 243 Left Right 247 Left



Right 256 Left Right 272 Left 276 Left 286 Right



Right 298 Left 315 Left Right 328 Left 110 Left



336 Right 342a Left Right 372 Left Right 376 Left

Cross section of mid-shaft of femur

illus 10

Human bones - Table 4: incidence of platymeria

Skeleton	Right femur	Left femur
110	missing	missing
241	70	68.4
243	72.2	70
247	76	missing
249	85 (none)	missing
256	69	68.8
272	84	82.2
276	missing	73.2
286	71.7	missing
298	70.5	73.8
299	missing	missing
304	missing	missing
315	missing	79.2
321a	missing	missing
321b	missing	missing
328	68.4	63
332	missing	missing
333	80	missing
336	65	missing
337	69.7	missing
342a	missing	71.66
354	missing	missing
358	missing	missing
360	missing	missing
366	missing	missing
367	missing	missing
370	missing	missing
372	62	65.9
376	74	53.65

Human bones - Table 5: pilaster index of femur

Skeleton	Right femur	Left femur
110	missing	108
241	100	97.6
243	109	96.4
247	143.7	missing
249	missing	missing
256	122.7	113
272	126	97
276	missing	145.66
286	102.2	missing
298	100	102.4
299	missing	missing
304	missing	missing
315	missing	115
321a	missing	missing
321b	missing	missing
328	115	110
332	missing	missing
333	missing	missing
336	137	missing
337	missing	missing
342a	missing	108
354	missing	missing
358	missing	missing
360	missing	missing
366	missing	missing
367	missing	missing
370	missing	missing
372	106.6	102
376	129	80

Human bones - Table 6: cnemic index in the tibiae

Skeleton	Right side	Left side
110	missing	missing
241	missing	68
243	68	71
247	69.93	missing
249	missing	missing
256	67.8	59.50
272	72.36	69
276	66.7	62.3
286	73.62	70.42
298	missing	missing
299	missing	missing
304	missing	missing
315	missing	74.4
321a	75	68
321b	70	70
328	61.9	60.1
332	missing	missing
333	missing	missing
336	55.8	missing
337	68	missing
342	missing	missing
354	missing	missing
358	missing	missing
360	missing	missing
362	missing	missing
366	missing	67.7
370	missing	missing
372	missing	missing
376	65.2	67.9