SIBFORD ROAD, HOOK NORTON (HOSIR17) – HUMAN SKELETAL REMAINS
by Lauren McIntyre (26/07/18)

Introduction

This report details the results of a specialist analysis of articulated and disarticulated inhumations and cremated bone, found during archaeological investigations at Hook Norton, Oxfordshire. They include seven inhumation burials (Skeletons 1184, 1191, 1199, 1205 1219, 1252, and 1493), one disturbed juvenile from demolition layer (1276), one context containing unburnt disarticulated bone (1396, the basal fill of ditch 1395), and one unurned cremation deposit (1193).

A variety of burial positions were observed amongst the inhumation burials, including two supine burials (SK 1219, Group 50013; SK 1493, Group 50018), two supine burials with the crania removed and placed elsewhere in the grave (SK 1184, Group 50005; SK 1252, 50014), one flexed juvenile in a pit (SK 1191, Group 50006), and two prone burials (SK 1199, Group 50008; SK 1205, group 50012). The remains from 1276 represent the remains of juvenile it is unclear whether this skeleton was disarticulated or had been heavily disturbed sometime after burial. This skeleton is discussed below with the articulated inhumation burials because these are clearly the remains of a single individual. The original burial position of this skeleton is unknown.

Cremated human bone was found in fill 1193 (the only fill of earth cut pit 1192). The feature is likely to have been truncated horizontally by ploughing. The extent of this is unclear.

Methods

Recording of the unburnt articulated human remains was undertaken with reference to Brickley and McKinley (2004) and Mitchell and Brickley (2017). The articulated skeletons were scored for their condition (Grade 0-5+, after McKinley, 2004b: 16), completeness (0-25%, 26-50%, 51-75%, 76-100%) and fragmentation ('low', <25% of the skeleton fragmented, 'medium', 25-75% of the skeleton fragmented, or 'high', >75% fragmented). These scores were then employed to assign overall preservation as either ‘good’, ‘fair’ or ‘poor’. The age and sex of each skeleton was estimated, where possible, using relevant standards (Brookes and Suchey, 1990; Brothwell, 1981; Buckberry and Chamberlain, 2002; Lovejoy *et al*., 1985; Miles, 1962; Miles, 2001; Moorrees *et al*., 1963; Scheuer and Black, 2000; Fazekas and Kosa, 1978; Schwartz, 1995; Ferembach *et al*., 1980; Buikstra and Ubelaker, 1994; Phenice, 1969; WEA, 1980). A summary of the age categories used in this study are presented in Table 1. Juveniles were not sexed, as there are currently no accepted macroscopic methods available (Brickley, 2004). Standard metrical analysis was carried out and stature was calculated where possible, using regression equations devised by Trotter and Gleser (1952;1958) and revised by Trotter (1970). Non-metric traits were systematically recorded for adults with reference to Berry and Berry (1967) and Finnegan (1978) and any pathologies were recorded with reference to standard texts (e.g. Aufderheide and Rodríguez-Martín 1998; Ortner 2003).

Disarticulated bone was also analysed using the above methodology, as the remains were thought to belong to one individual. The MNI was determined based on the presence/absence of repeated skeletal elements, the comparative size of the bones (i.e. adult versus juvenile size), and the presence of fully mature versus unfused skeletal elements (O’Connell, 2004: 18). Observations pertaining to age, and pathology were made as appropriate.

All contexts containing cremated bone were subject to whole earth recovery, then processed by flotation and wet sieving which sorted them into >10mm, 10-4mm, 4-2mm and 2-0.5mm fractions. Floated residues were retained in a 250µ mesh. Once dried, the extraneous material (e.g. stones) from the >10mm and 10-4mm fractions was separated from the cremated bone and discarded. All cremated bone was examined in accordance with national guidelines (Brickley and McKinley, 2004; McKinley, 2004a).

A 20g sample of the 4-2mm sieve fraction was fully sorted. An estimation of the total bone weight was calculated for the entire fraction, based on the proportion of cremated bone present in the 20g sample. The estimated weights are included in the total weights presented below.

The smallest fraction (2-0.5mm) was not sorted but was rapidly scanned for identifiable skeletal remains and artefacts. An estimation of the proportion of bone present was made and recorded in the archive. This is provided in the results below, but is not included in the total bone weights.

Analysis of the cremation deposit involved recording its colour, weight and maximum fragment size. These observations can provide information on factors such as the efficacy of cremation (effectiveness of cremation, i.e. how well burnt the body was), relative quantity of fuel used, attained temperature within the pyre, length of time over which the cremation took place, degree of bone oxidation, and how well collected the burnt remains were from the pyre site (McKinley, 2004a: 10-11). Evidence for the presence of pyre goods and/or grave goods was also recorded. The weight and presence or absence of charcoal fuel waste was also considered in order to explore deposit type, i.e. whether the deposit represented a formal burial or pyre debris.

Each deposit was also examined for identifiable bone elements and the minimum number of individuals (MNI) was estimated. The MNI was determined based on the presence/absence of repeated skeletal elements and on the comparative size of bones (e.g. adult versus juvenile size: Buikstra and Ubelaker, 1994). Where possible, age, sex, evidence of normal morphological variation and pathological lesions were explored using the same methods outlined above for the examination of unburnt articulated inhumations.

Results

Articulated Inhumation Burials

Skeletons are described individually below. An osteological summary is presented in Table 2. Cranial and post-cranial indices, and non-metric traits are listed in Table 2. Full osteological data are recorded in the archive.

SK 1184

Skeleton 1184 was 85% complete. Bone surface condition was scored as grade 3 (most of the bone surface affected by some degree of erosion: McKinley 2004b: 16) and fragmentation was low. Overall preservation was therefore deemed to be fair.

The skeleton was categorised as female, based on multiple sexually dimorphic traits of the pelvis and cranium (Buikstra and Ubelaker, 1994: 15). Age was estimated as middle adult (36-45 yrs), based upon degeneration of the auricular surface (Lovejoy et al., 1985; Buckberry and Chamberlain, 2002) and dental attrition (Miles, 1962; Miles, 2001). Stature was calculated at 159.08cm (+/- 3.27cm: Trotter, 1970), based upon the maximum length of the left femur.

A total of 26 permanent teeth and 32 tooth positions/sockets were present. Four teeth were lost ante mortem. Five teeth had dental caries. Dental caries are the cavities resulting from the destruction of the enamel, dentine and cement by the acid produced by bacteria in dental plaque (Hillson, 1996: 269).

Dental calculus was observed on 23 teeth. This is a mineralised plaque deposit. It derives from a combination of saliva and micro-organisms associated with plaque deposits that may accumulate on tooth surfaces (Hillson, 1996: 255-6).

Two sockets had periodontal disease, a chronic inflammation of any of the periodontal tissues (gums, periodontal ligament and alveolar bone; Hillson, 1996: 260). The condition is identified in archaeological skeletons by observing loss of the alveolar bone (Ogden, 2005).

One socket had a periapical cavity, identified as a hole at the apex of tooth socket. Periapical cavities are caused by inflammation if the dental pulp and may result from several different

inflammatory responses to infection of the teeth, gums and underlying bone, including infection of the tissue surrounding the apex of the tooth root, periapical granuloma or abscess, and periodontal cysts (Dias and Tayles, 1997).

Several instances of skeletal pathology were observed. Peri-mortem trauma was present, including a small longitudinal fracture on the right lamina of one cervical vertebra (either the fourth, fifth, sixth or seventh) and an oblique fracture on the right ascending ramus of the mandible, resulting in complete separation of the gonial angle. It was not possible to determine which cervical vertebra was affected, because two cervical vertebrae (including CV3) were absent. There was no evidence of healing on either of the affected bones and it is likely that the fractures had resulted from radiating forces associated with chops delivered to the upper (missing) cervical vertebrae during removal of the head.

Cribra orbitalia (CO) was observed in the left and right orbits of skeleton 1184 (both orbits: grade 3, large and small isolated foramina; Stuart-Macadam, 1991). This condition predominantly occurs in infants and young children but is also visible as inactive or healed lesions in adults. The exact aetiology of CO is unknown, though it has been linked to a number of conditions including iron deficiency anaemia, infection and vitamin deficiency (Ortner, 2003; 102-6; Walker *et al*., 2009).

One thoracic and four lumbar vertebrae had Schmorl's nodes. These are visible as indentations on the superior or inferior surfaces of vertebral bodies, with the lesions representing sites of herniation of the intervertebral disc material through the vertebral body end plates (Rogers, 2000: 169-70). These are likely to result from a combination of activity related stresses placed on the vertebrae and intervertebral discs and developmental factors associated with vertebral formation and growth in early life (Dar *et al*., 2010: 675).

Marginal osteophytes were present in the left and right glenoid fossae of the scapulae (shoulder joint), right distal radius (wrist joint), and the left and right acetabulums and right femoral head (hip joint), as well as on the bodies of two cervical, seven thoracic, five lumbar and the first sacral vertebrae.

SK 1191

Skeleton 1191 was 45% complete. Bone surface condition was scored as grade 2 (more extensive surface erosion with deeper surface penetration: McKinley 2004b: 16) and fragmentation was medium. Overall preservation was therefore deemed to be fair.

The degree of dental development, coupled with maximum lengths of the left humerus and radius indicated that this individual was a neonate. No evidence of skeletal pathology was observed.

SK 1199

Skeleton 1199 was only 35% complete and highly fragmented. Surface preservation was scored at grade 2 (McKinley, 2004b: 16), so overall preservation was fair.

Very few sexually dimorphic traits were observable, comprising four cranial and only one pelvic. These were very mixed in terms of dimorphic expression, so the individual was categorised as indeterminate sex. Age was estimated as prime adult (26-35 years), although this was based solely on dental occlusal wear.

It was not possible to estimate stature or calculate the cranial or post-cranial indices. No non-metric traits were observed.

A total of 24 permanent teeth and 22 tooth positions/sockets were present. Four teeth were lost ante mortem. Six teeth had dental caries, two sockets had periodontal disease, and one periapical cavity was present. One tooth, the left mandibular second molar, was malaligned. Disto-lingual rotation of this tooth is likely the result of ante mortem loss of the adjacent third molar. Dental calculus was observed on 20 teeth. Two teeth had enamel hypoplasia, identified as linear, pitted or grooved defects on the tooth crowns as a result of disruption in the formation of the tooth enamel. The lesion location on the present teeth suggest the disruption had occurred between the

age of 3-3.9 years (Primeau *et al*., 2015). The most commonly cited cause of DEH is systematic metabolic disruption during childhood (Goodman *et al*., 1988).

The only skeletal pathology was marginal osteophytosis in the right hip joint. The changes were observed around the margin of the femoral head.

SK 1205

Skeleton 1205 was 95% complete. Bone surface condition was scored as grade 1 (slight and patchy surface erosion: McKinley 2004b: 16) and fragmentation was low. Overall preservation was good.

The skeleton was categorised as male, based on multiple sexually dimorphic traits of the pelvis and cranium (Buikstra and Ubelaker, 1994: 15). Age was estimated as middle adult (36-45yrs), based upon degeneration of the pubic symphysis (Brookes and Suchey, 1990) and auricular surface (Lovejoy *et al*., 1985; Buckberry and Chamberlain, 2002), and dental occlusal wear (Miles, 1962; Miles, 2001). Stature was calculated as 175.17cm (+/- 3.27cm: Trotter, 1970), based upon the maximum length of the left femur.

A total of 24 permanent teeth and 32 tooth positions/sockets were present. Six teeth were lost ante mortem. Six teeth had dental caries, seven had dental calculus, and five sockets had periodontal disease.

An unusual, irregular pattern of occlusal wear was observed affecting the maxillary and right mandibular teeth (18 in total). The occlusal surfaces of the tooth crowns in these locations were irregular and uneven. This was in marked contrast to the left mandibular teeth which had much more regular, flattened occlusal surfaces. It is possible that the uneven surfaces had been caused by habitual non-dietary activities, such as using the teeth as tools.

The crowns of six anterior teeth (left maxillary first and second incisor and canine; right mandibular first and second incisor; left mandibular second incisor) had possible ante-mortem hairline cracks. Tooth crowns rarely crack post-mortem because the enamel is very strong and resistant. Where post-mortem cracking does occur, the enamel tends to completely come away from the dentine and root. In this case, the hairline cracks, which were either transverse or longitudinal, ran through both the enamel and dentine, but terminated part way through the crown so that the tooth itself remained intact. The cracking is possibly related to non-dietary activity related wear.

A considerable amount of skeletal pathology was observed. Firstly, well healed ante mortem trauma was present on the cranium and left hand. On the cranium, two large, irregular depressions were present on the posterior and superior left parietal, as well as two smaller, subtler depressions on the right superior parietal and on the superior coronal suture. A very straight, healed, radiating fracture was also present, running anteriorly from the posterior left parietal and terminating on the left side of the frontal bone. These lesions likely represent one or more incidences of well healed blunt force trauma to the cranium. Fractures can occur in this region either as a result of interpersonal violence (i.e. deliberate blow to the skull by an assailant), or accidentally, e.g. head striking the ground after a trip or fall (Lovell, 1997: 155).

The proximal metacarpo-phalangeal joint of the first digit in the left hand was ankylosed. The proximal phalanx was flexed, slightly beyond the extent of the normal joint surface, and then completely fused. It is unclear whether this represents subluxion (partial dislocation) or fusion of a slightly hyperflexed joint. No evidence of other trauma e.g. fracture was present, and a confirmed diagnosis of subluxion is not possible without further investigation, e.g. radiography. Dislocation of this joint, in this direction is extremely rare, known clinically as a volar dislocation (Yüksel *et al*, 2017). This is typically treated with surgery (open reduction): the dislocation is difficult to reduce without surgery because of factors such as associated rupture of the ulnar collateral ligament, herniation of the metacarpal head (through a tear in the dorsal capsule) and subluxion of the tendons for extensor *pollicis longus* and extensor *pollicis brevis* (Ibid.).

A button osteoma was observed on the superior left parietal, just superior to the healed radiating fracture (see above). Osteomata are smooth-surfaced, sharply demarcated circular

protrusions, which are often solitary and occur on the outer table of the skull, although they can less commonly occur in other locations such as the mandible (Eshed *et al*., 2002).

Cribra orbitalia was observed in both orbits (left orbit: grade 3, large and small isolated foramina; right orbit: grade 1, capillary like impressions: Stuart-Macadam, 1991).

Osteophytes were present on five cervical, eight thoracic, all five lumbar and the first sacral vertebrae. Schmorl's nodes were present on three thoracic and three lumbar vertebrae.

Skeleton 1205 had osteoarthritis in several extra-spinal joints: the left and right acromio-clavicular joint, left and right sternoclavicular joint, left and right elbows, left and right wrists and left hand. Marginal osteophytes were also observed on the right glenoid fossa (shoulder), right hand (distal first, fourth and fifth metacarpals), left and right hips (acetabulum), left and right ankles (distal fibulae and right distal tibia), left and right feet (naviculars) and on the left and right metatarsophalangeal joint of the great toe.

Dense new bone deposits were present bilaterally on the medial surfaces of the tibial shafts. These deposits were thick, smooth, and well defined, roughly oval-shaped and confined to the proximal thirds of the shafts, in the location of the tibial medial collateral ligament. Symmetrical lesions like this, which involve the metaphyseal and diaphyseal regions of long bones, are seen in hypertrophic osteoarthropathy (HOA; Knipe and Gaillard 2005-2018; Yap *et al.* 2017). Hypertrophic osteoarthropathy is a syndrome which typically involves clubbing of the digits, periostitis of the long bones and osteoarthritis in multiple joints (Dhawan 2018). This condition may be primary (hereditary or idiopathic), or secondary (associated with an underlaying pulmonary, cardiac, hepatic or intestinal disease; ibid.). Cases of secondary HOA most commonly occur with pleural or pulmonary tumours, and the tibiae are one of the more commonly affected long bones (Ibid.). Although SK 1205 did not present clubbing of the digits or any periosteal new bone formation, osteoarthritis was present in multiple joints, as may be expected in HOA (ibid.; Swarup *et al.* 2016). Radiography and/or Computerised Axial Tomography (CAT) scanning the bones of skeleton 1205 would potentially aid the diagnosis of these lesions.

SK 1219

Skeleton 1219 was 60% complete. Bone surface condition was scored as grade 3 (McKinley 2004b: 16) and fragmentation was medium. Overall preservation was fair.

The skeleton was categorised as a probable female, based on multiple traits of the cranium and pelvis (Buikstra and Ubelaker, 1994: 15). Age was estimated as prime adult (26-35 yrs), based on dental occlusal wear (Miles, 1962; Miles, 2001). Stature was calculated as 158.58cms (+/- 3.27cm: Trotter, 1970), based upon the maximum length of the left femur.

A total of 23 permanent teeth and 27 tooth sockets/positions were present. Three teeth were lost ante mortem. Six teeth had dental caries, 15 had dental calculus, and three sockets had periodontal disease. Two teeth had enamel hypoplasic lesions, their locations indicative of growth arrest between the ages of 2-3.9 years (Primeau *et al*., 2015). Two periapical cavities were present and ante mortem enamel chips were observed on one tooth.

Cribra orbitalia was observed in both orbits (grade 2: Stuart-Macadam, 1991).

Marginal osteophytes were observed on the bodies of two cervical vertebrae. Joint surface porosity was present in the right acetabulum of the pelvis.

SK 1252

Skeleton 1252 was 95% complete, with low levels of fragmentation. Bone surface preservation was scored at grade 1 (McKinley, 2004: 16), so overall preservation was good.

The skeleton was judged to be of adolescent age (13-17 years), based on epiphyseal fusion, dental development and dental eruption (Moorees *et al*., 1963; WEA, 1980; Scheuer and Black, 2000). Although the individual was juvenile, most of the skeletal elements which contribute to height were skeletally mature (i.e. fully fused). Where bones were still in the process of fusing (e.g. the fibula), fusion was almost finished, with just a fusion line present to indicate that the process

was not complete. Stature was calculated as 158.58cm (+/- 3.27cm: Trotter, 1970), based upon the maximum length of the left femur.

Thirty-two permanent teeth and 30 tooth sockets/positions were present. Nineteen teeth had dental calculus. One tooth had enamel hypoplasia. The location of the lesion indicated that this had formed between the age of 9-9.9 years (Primeau *et al*., 2015). One socket had periodontal disease. An unusual dental anomaly was present, affecting the left maxillary first incisor in the form of an accessory root, on the lingual side of the tooth, attached to the lingual side of the incisor crown by a second, under developed tooth crown.

Evidence of peri-mortem trauma was observed. A peri-mortem cut, indicative of sharp force trauma to the body of the fourth cervical vertebra, with the inferior portion of the body being absent. The direction of the cut indicated it was likely delivered from the anterior side. A further two cervical bodies and one arch were present: it is unclear precisely which vertebrae these belong to, although they must be from the lower cervical region (CV5-7). The larger of these two bodies exhibited a possible peri-mortem fracture through the right superior articular facet. Peri-mortem fracture was also observed on the left lamina of the unidentified cervical arch. A similar peri-mortem lamina fracture was present on the right side of the first thoracic vertebra. Evidence of healing was absent in all cases. This trauma was likely caused during removal of the head.

Further peri-mortem trauma was present on the superior aspect of the medial right clavicle, with the cut oriented antero-medial to postero-lateral. Oblique cuts to the clavicle(s) often accompany evidence for head removal, and may be the continuation of blows aimed at the head/neck (Loe *et al*., 2014: 115). The discrepancy between the direction of cuts observed on the cervical vertebra and clavicle in this case is indicative of multiple blows.

SK 1252 also exhibited porous lesions on the left and right femoral necks. These are consistent with a diagnosis of cribra femoralis. The precise aetiology of cribra femoralis is unclear, although it has been postulated that the lesion may be indicative of nutritional stress, or be associated with the retention of red bone marrow in the proximal femoral metaphysis during childhood growth (Djuric *et al*., 2008; Lewis, 2017: 196). Cribra orbitalia was also observed in the right orbit (grade 3: Stuart-Macadam, 1991).

Osteochondritis dissecans was observed on the joint surface of the medial epicondyle of the left femur. This lesion is a non-inflammatory, benign condition where small areas of necrosis are produced in epiphyseal areas of the diarthrodial joints, resulting in complete or partial detachment of a fragment of subchondral bone (Aufderheide and Rodríguez-Martin, 1998: 81). The condition is thought to be the result of repeated microtrauma at specific locations, and in modern populations is seen frequently in athletes (Aufderheide and Rodríguez-Martin, 1998: 81, Schenk and Goodnight, 2006: 449).

SK 1276

This skeleton was only 15% complete. Bone surface condition was scored as grade 2 (McKinley 2004b: 16) and fragmentation was medium. Overall preservation was fair.

The bones of this individual were not quite complete enough to take measurements, although comparison of these to other juvenile remains suggested that this skeleton was that of a neonate. No evidence of skeletal pathology was observed.

SK 1493

Skeleton 1493 was 95% complete. Fragmentation was low and bone surface preservation was scored at grade 1 (McKinley, 2004: 16), so overall preservation was good.

The skeleton was categorised as a probable male, based on multiple sexually dimorphic traits of the pelvis and cranium (Buikstra and Ubelaker, 1994: 15). Age was estimated as middle adult (36-45 yrs), based upon degeneration of the pubic symphysis

(Brookes and Suchey, 1990) and auricular surface (Lovejoy *et al*., 1985; Buckberry and Chamberlain, 2002), and dental occlusal wear (Miles, 1962; Miles, 2001). Stature was calculated as 168.51cm (+/- 3.27cm: Trotter, 1970), based upon the maximum length of the left femur.

Twenty permanent teeth and 29 tooth sockets/positions were present. Eight teeth were lost ante mortem. Nine teeth had dental caries, and four had calculus. Four sockets had periodontal disease and one had a periapical cavity. Additionally, three teeth exhibited irregular patterns of wear, which may be activity related. This included severe lingual/distal wear and, in one case, a mesio-distal groove across the occlusal surface.

Healed trauma was noted in the spine and right foot. The body of TV9 was slightly wedged anteriorly, suggesting a possible healed compression fracture (Galloway, 1999: 178). The proximal phalanx associated with the first metatarsal of the right foot exhibited a transverse fracture line and small remodelled callus around the midshaft. This bone was also shortened compared to the same bone from the left foot. The first proximal foot phalanx may fracture in this location if kicking an object or stubbing the toe (Ibid: 307).

An additional, sixth lumbar vertebra was present. This additional vertebra was completely sacralised. The adjacent fifth lumbar vertebra had bilateral spondylolysis, with the inferior articular facets and spinous process being completely separated from the rest of the vertebra.

Joint disease was also present in the spine. Seven thoracic vertebrae had Schmorl's nodes. Spondylysis deformans was present in five cervical, four thoracic and all six lumbar vertebrae. Osteophytes were also present on the bodies of a further one cervical and four thoracic vertebrae. Extra-spinal osteoarthritis was present in the left and right acromioclavicular joint, right shoulder, right hip and left knee. Marginal osteophytes were present on the left sternoclavicular joint, left shoulder, left and right elbow, left and right wrist, left hand, left hip and right knee. Rotator cuff disease was present in the left shoulder.

Unburnt disarticulated bone

A small quantity of unburnt bone was recovered from sample 1092 (fill 1396, the fill of ditch 1395). The bones comprised one unsided rib shaft, one left zygomatic, two unidentified cranial fragments and three developing, unerupted deciduous teeth from the left maxilla. The size and morphology of these fragments indicated these are all likely to belong to the same neonate individual. A more precise age could not be estimated. No evidence of skeletal pathology was present.

Cremated bone

Deposit 1193 was the fill of an earth cut pit. Cremated human bone from this context is summarised in Table 3. Only one individual was present based upon the number of discrete features containing burnt bone, and absence of repeated skeletal elements.

The total weight of bone from this deposit (280.74g) falls well below the weight range cited by McKinley (2013: 154) for cremations which have been recovered archaeologically (600-900g). The feature may have suffered some horizontal truncation by ploughing, which may partially explain this weight discrepancy. However, the extent of truncation (if at all) is unclear and it is possible that the original deposit did not contain the remains of one whole cremated individual.

A summary of fragmentation is presented in Table 4. The largest fragment was 39.0mm in length and was a fragment of the cranial vault. The largest proportion of bone came from the 10-4mm sieve fraction, although moderate proportions of bone were also present in the >10mm and 4-2mm fractions. A small proportion of cremated bone was also present in the 2-0.5mm residue (Table 5), although the total bone weights could not be estimated.

A summary of skeletal representation is presented in Table 6. Of the identified fragments, bone from the lower limb was most frequently observed. Bone fragments from the skull, axial skeleton and upper limbs were also identified in smaller proportions.

The majority of bone recovered was unidentified. Small proportions of unidentified bone were from the long bones, joint surfaces, and hands or feet, but most of the unidentified bone could not be identified to an anatomical region.

Most bone fragments were white in colour (Table 3). This indicates a generally efficient cremation process with the majority of bones being burnt at a temperature in excess of 600ºc, and is a common observation in archaeological cremation burials (McKinley, 2006: 84). This indicates that the majority of the corpse was placed in a location on the pyre where maximum and consistent heat and oxygen supply was available (McKinley, 2013: 158). Smaller proportions of bone were coloured grey, blue and black.

There was no evidence for repeated skeletal elements, therefore this deposit represents the remains of (at least) one individual. The size and morphology of the identified bone fragments are in keeping with those of adults, aged over 18 years (Scheuer and Black, 2000). No evidence of biological sex, non-metric traits or pathology was observed.

Three fragments of burnt animal bone were co-mingled with the cremated human remains (Table 3). These were identified as juvenile pig. Burnt juvenile animal remains (including pig) are a common feature of cremation deposits dating to the Iron Age and Romano-British periods in Britain (McKinley, 2006: 84).

Unburnt animal bone was also found co-mingled with burnt bone from deposit 1193. These could not be identified to species.

A small quantity of charcoal (estimated <2.5g) was present in the 4-2mm fraction. The small quantity suggests that an attempt was made to deliberately exclude charcoal from the buried deposits.

Summary and discussion

The assemblage comprises the remains of a minimum number of seven articulated inhumation burials, one heavily disturbed neonate skeleton from a demolition layer, fragments of one incomplete, unburnt disarticulated skeleton and the cremated remains of one individual. The assemblage is relatively typical for the period, comprising adults and juveniles, and both adult males and females. Interpretation is limited by the small assemblage size, but there are a number of points of note.

Physical Attributes

The observed male and female statures at Hook Norton are close to the average for Roman Britain (male, 169cm; female, 159cm: Roberts and Cox, 2003: 163). The exception to this is skeleton 1205, who, at just over 175cm, is taller than expected for the period. However, this skeleton would probably still fall within the top quartile of the expected stature range for Roman populations.

Discontinuous Skeletal Traits

A substantial number of cranial (n = 22) and post-cranial (n = 22) non-metric traits were observed, considering the small size of the assemblage. The most common of these were accessory supraorbital foramen (n = 5, observed in three skeletons) and lateral tibial squatting facets (n = 6, observed in three skeletons). Accessory supraorbital foramen has a likely genetic origin, whereas lateral tibial squatting facets are more likely have a mechanical aetiology (Veldman, 2013: 75, 81). Presence of the latter trait may indicate that these individuals habitually adopted a stance which involved hyperdorsiflexion at the ankle joint (Boulle, 2001).

Diet and Activity

Generally, the dental health of this population was poor. All the adult skeletons from Hook Norton had experienced ante mortem tooth loss, with the number of teeth lost ranging between three and eight. Similarly, all the adult individuals had dental calculus and caries, and four out of the five adults had at least one periapical cavity. Caries tend to form as a result of consumption of cariogenic foods (e.g. certain sugars, starch and fermentable carbohydrates; Moynihan, 2012: 107) and indeed, caries may cause the formation of periapical cavities and subsequent tooth loss. Additionally, clinical studies have suggested that individuals who lose teeth change their dietary habits as a result. As tooth loss occurs, masticatory efficiency and chewing ability declines, which in turn is likely to influence choice of food for consumption (Hutton *et al*., 2002: 183; Hung *et al*., 2005: 172). Harder foods such as raw vegetables, raw fruit and meat can become increasingly difficult to chew as fewer teeth are present (Hutton *et al*., 2002: 183). Thus, tooth loss may result in an even poorer quality of diet. In the Hook Norton assemblage, poor diet may have influenced oral health, leading to tooth loss, and perhaps further dietary decline.

Two skeletons (1205 1493) exhibited atypical dental wear, which may have been activity related. The type of wear produced by non-dietary activity can be highly varied, particularly if the teeth are being used for a wide range of non-dietary tasks (Molnar, 2008; Waters-Rist *et al*, 2010). Furthermore, excessive activity induced occlusal wear may cause the development of periapical lesions, a further facilitator of tooth loss (Molnar, 2008), so non-dietary use of the dentition may further exacerbate poor dental health.

Health and Environment

Four skeletons from Hook Norton had cribra orbitalia, and one of these (SK 1252) also had cribra femoralis. There is an increase in frequency of cribra orbitalia in Romano-British populations from the preceding Iron Age (Roberts and Cox, 2003: 140). Rather than a dietary cause (e.g. low iron intake), it has been suggested that this increase may reflect an increase in pathogen loads (Ibid.).

The most stand out individual in the Hook Norton assemblage is skeleton 1205. As well as being relatively tall and robust, with poor dental health and possible activity related tooth wear, this individual exhibits evidence of substantial (healed) trauma to the cranium as well as possible minor trauma to the left thumb, and a possible rare pathological condition which is typically associated with an underlying pulmonary condition. The observed cranial trauma is likely to have been blunt force, although it is unclear whether one or multiple blows occurred to the back of the head, or even one or multiple traumatic events. It is also unclear whether this trauma was accidental (e.g. after a fall) or deliberate (e.g. by an assailant). However, the degree of healing does suggest that at least some medical attention/treatment and perhaps aftercare by a second individual.

Funerary Rites and Burial Context

The recovery of disarticulated neonate remains from ditch fill 1396 is unremarkable. The burial of neonate skeleton 1191 within a large (possibly rubbish) pit, is unusual, but comparative examples do exist. At rural sites, the remains of very young children may be found within a wide variety of features e.g. rubbish pits/middens, large pits (e.g. for storage), gullies, ditches, and are also frequently associated with buildings, shrines, animal burials and corn driers (Philpott, 1991: 98; Moore, 2009; Pearce, 2013: 94, 100). Infant remains (aged <18 months) of Roman date have been recovered from rubbish pits at Poxwell in Dorset (Hurst and Wacher, 1986: 71) and at Radwinter in Essex (Hooper, 1975: 76). A study of infant and baby burial in domestic contexts found that internment within pits (rubbish or otherwise) was most common in the earlier Roman period (first and second century), declining steadily throughout the third and fourth centuries (Moore, 2009: 40).

The neonate bones in demolition layer 1276 may represent remains originally deposited somewhere in association with the building, but disturbed during demolition. Examples of babies and infants interred within or adjacent to domestic structures occur throughout the Romano-British

period (Ibid.: 39-40). Such burials may occur internally or externally to the structure, e.g. under internal corridors, general domestic living rooms, kitchen/food preparation areas, storerooms and/or workshops, beneath structures as porticos, within yards and from other areas which abutted the main domestic structure (Ibid. 41).

Two of the inhumation burials from Hook Norton had their heads removed and placed elsewhere in the grave. The osteological evidence indicates that each of these were removed via at least one heavy chopping blow to the neck. This is consistent with other Romano-British evidence for head removal as part of the burial rite (Tucker, 2014).

Similarly, the prone and supine inhumations and the unurned cremation are all burial types found elsewhere in Roman Britain (Philpott, 1991: 45, 71-4).

Conclusion

The assemblage from Hook Norton is largely typical for the time period. The variety of observed burial types are all found elsewhere in Roman Britain, although examples of neonate burials within rubbish pits are uncommon. Notable observations pertaining to this assemblage include general poor oral health (perhaps caused by poor diet and exacerbated by non-dietary activity utilising the dentition), and one possible example of a rare pathological condition (HOA) which may be associated with pulmonary disease. Further work such as radiography or CAT scanning is required for a confirmed pathological diagnosis.

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