Archaeological Watching Brief at the Jurys Inn Hotel, King Street, Derby.

Excavating inhumation burials at King Street, Derby

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Archaeological Research Services Ltd

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Executive Summary

An archaeological watching brief was undertaken on behalf of McAleer and Rushe Ltd by Archaeological Research Services Ltd in June and July 2009 at the Jurys Inn Hotel, King Street, Derby. The watching brief was required during groundwork for the construction of a bus lay-by and the reduction of the adjacent area. During the watching brief a single brick-lined grave was uncovered adjoining a path on the western side of the development area. The Development Control Archaeologist specified that the location and condition of the grave was to be recorded prior to the preservation of the remains in situ by the addition of a sand fill and concrete cap.

The groundwork within the area for the proposed bus lay-by revealed further graves with complete inhumation burials in situ as well as disarticulated human skeletal remains. Despite ground disturbance caused by the construction of a sub-way under the inner ring road (dual carriageway) and an associated path in the late 1960s as well as bioturbation, four skeletons were recorded and excavated in a good state of preservation. Some of them were complete with remains of coffin, dating to the 18-19th Century.

1 Introduction

1.1 During re-landscaping of the land adjacent to King Street, Derbyshire (Fig. 1), associated with the construction of the Jurys Inn Hotel. A single brick-built grave was encountered which relates to the former occupation of the site by Saint Alkmunds Church and associated consecrated grounds. After inspection by the Development Control Archaeologist for Derbyshire and consultation with the Diocesan Archaeologist, David Barrett, Archaeological Research Services Ltd were commissioned by the construction contractors, McAleer and Rushe Ltd, to record the position and condition of the grave prior to it being re-sealed with a sand fill and concrete cap.

1.2 Subsequent to this, a further watching brief was undertaken in July 2009 during landscaping of the land in the immediate vicinity of the grave. The watching brief identified *in situ* human remains which were recorded and excavated following the Institute for Archaeologist' Standards and Guidance for archaeological excavations and recording of human remains (IFA 2008 and 2004).

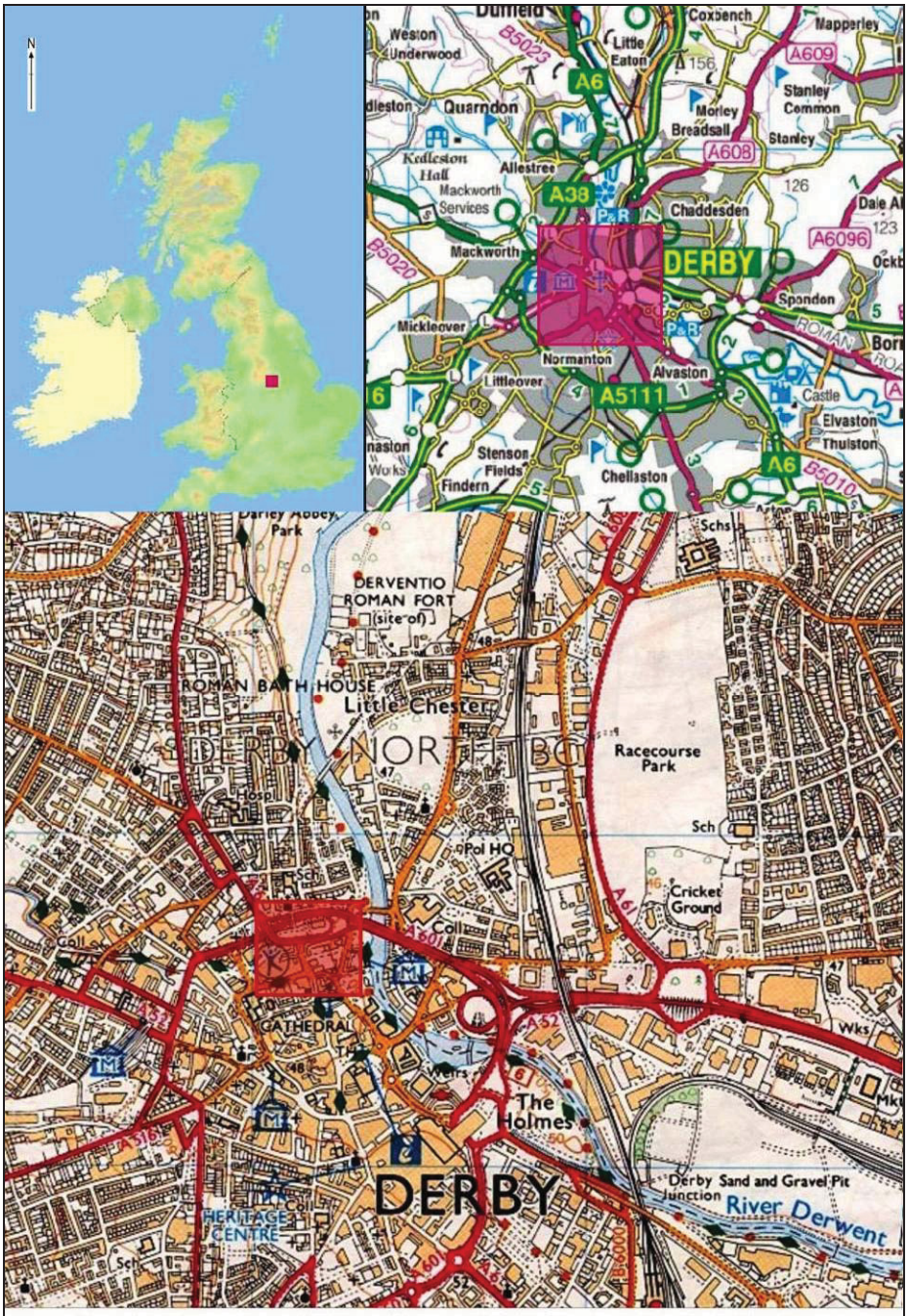
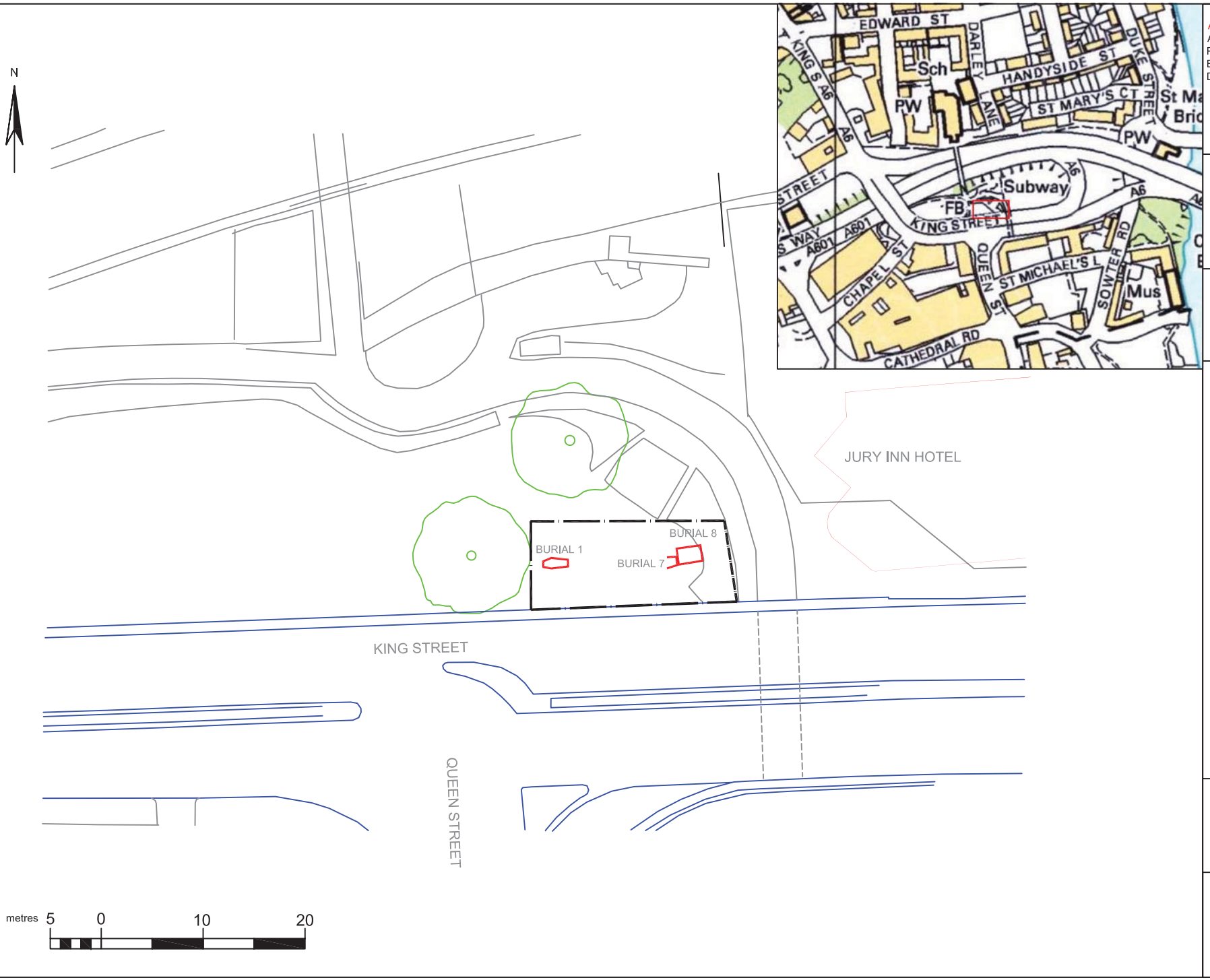


Figure 1: Site location

2 Location and Geology

2.1. The area monitored during the watching brief was located adjacent and immediately north of King Street, Derby (Fig. 2), which is within the former grave yard of Saint Alkmunds Church (centred at NGR: SK 35149 36693).

2.2 The underlying geology consists of Keuper Marl with Skerry Bands and overlying glacial sand and gravels.



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Site Code: KIN 09
Drawing Ref: Report Fig. 2
Date: 10 November 2009
Drawn: HS
Scale: 1:500 at A4

Title:

Figure 2: Detailed Location Plan

Key:

Limit of Excavation

Location of brick built graves

Notes:

3 Archaeological and Historical Background

3.1 The development site was formerly occupied by the church and associated consecrated grounds of Saint Alkmunds, which was demolished in the late 1960s.

3.2 The current development of the site incorporates the construction of the Jurys Inn Hotel and associated landscaping on the south fronting of the building to King Street.

4 Aims of the Project

4.1 A watching brief was requested by the Development Control Archaeologist for Derby City Council during groundworks at the Jurys Inn Hotel Site, King Street, Derby due to the discovery of a human burial during ground works. The site is close to the former St. Alkmund's Church which was demolished in the 1960s to make way for an inner ring road in Derby.

4.2 The aims of the project were as follows:

- To observe all groundwork for the presence of archaeology.
- To alert all interested parties to the possible destruction of archaeological features.
- To fully record and excavate any archaeological features encountered.

5 Methodology

5.1 All machine excavation on the site was observed by an archaeologist to ensure that no archaeological remains were disturbed. Any features or structures were fully cleaned and recorded in accordance with the standards stipulated by the Institute of Field Archaeologists (IFA 2001, 2004, 2008a and 2008b), the guidance provided in 'Archaeological Science at PPG16 Interventions' (English Heritage 2003), The Church of England/ English Heritage (2005) and English Heritage, Council for the Care of Churches (Church of England) and Cathedrals Fabric Commission (Church of England), Church Archaeology Human Remains Working Group Report (2009).

5.2 Any features or structures were photographed, recorded and where possible, fully excavated. All the contexts were recorded on pro-forma sheets and a context register was maintained.

5.3 Photographs were taken using a 35mm SLR camera with black and white print film and colour transparency, as well as with a digital camera (7.1 megapixel resolution).

5.4 All work was carried out wearing appropriate safety equipment. A system of hand signals was agreed before work commenced to allow for easy communication and a safe environment for examining the potential archaeological remains while supervising machine excavation.

5.5 Any human remains discovered were left *in situ*. If removal was deemed necessary, this was undertaken in accordance with the relevant Ministry of Justice regulations.

5.6 Disarticulated human remains were recorded by contexts within quadrant sub-divisions to assign spatial distribution. Disarticulated human skulls were treated as burials and thus were recorded individually, photographed and planned three-dimensionally. Articulated human remains were cleaned back by hand and any grave cuts identified were recorded on plan. Grave fills were excavated by hand to expose the skeleton contained therein. The skeletons were then fully recorded prior to removal. Any coffin fittings and/or other artefacts discovered associated with particular burials were retained and recorded in a manner to retain that association.

5.7 All elements of human bones were carefully removed from their original position and placed in boxes. They were then taken to the Archaeological Research Services Ltd. Office in Bakewell, Derbyshire.

5.8 An assessment report on any human remains removed was undertaken by a suitably qualified Osteoarchaeologist (Alexandra Thornton). The assessment advises on the necessity for further analysis and any recommendations which need to be implemented.

5.9 An assessment report on the coffin furniture recovered from the site was carried out by Dr Hugh Willmott of the University Sheffield.

5.10 The human remains will be re-buried at Nottingham Road Cemetery, Derby which already has a plot for unidentified human remains from St Alkmund's Church.

5.11 Cartographic records that relate to the site were consulted following the exposure of masonry structural remains and inhumation burials during fieldwork. This provided evidence of the chronological use of the site, including how the building, any associated structures and open spaces functioned and articulated and also how they changed and evolved through time.

6 Results

The area monitored during the watching brief was moderately disturbed by tree roots and general vegetation. The westernmost sector of the area revealed a single grave (Burial 001) which was recorded on the 11th of June 2009. Subsequent to this, a further watching brief was also undertaken during landscaping of the land in the immediate vicinity of the grave (Burial 001). This was undertaken in July 2009. The survey drawings are included in Appendix Five.

6.1 Burial 001

6.1.1 During the groundwork for the re-landscaping of the western area of the site, a single, brick-built grave was encountered. The grave itself consisted of a sub-rectangular brick built structure (context 001) orientated east-west and approximately 2.5m long, 1m wide and a minimum of 0.8m deep. However, the base was not exposed and a total depth may be much higher (Figure 3).

Figure 3: The brick-lined grave (001), looking south

6.1.2 The burial was located approximately 4.8m north of the curb line marking King Street and along the route of the pathway currently under construction, leading towards the entrance of the Jurys Inn Hotel.

6.1.3 The construction of the grave consisted of 8 or more courses of non-frogged red brick, with individual dimensions of 0.25m long, 0.12m wide and 0.07m thick. They were set within a white lime mortar and the internal surface appeared to have been treated with a wash, possibly of white lime (Figure 4).

6.1.4 Bricks in the upper course of the structure were set in a single skin and in a header fashion. However, the courses below this were set in a stretcher fashion and may or may not have been in a single skin.

6.1.5 Approximately 0.34m down along the internal surface of the structure, correlating with the fifth course of bricks, a raised band of mortar appears to have been added around the entire internal circumference. Speculation as to the purpose of this feature may be that it provided a lip upon which to rest a coffin lid, although no remains of such were obvious. Alternatively, it may indicate the use of the grave for multiple interments, the lip perhaps acting as a shelf for the next burial, although again no other corroborative evidence was observed.

6.1.6 Traces of white lime mortar were observed across the surface of the upper most course of bricks and presumably relates to the sealing of a lid of some description. This lid reportedly consisted of a sandstone slab, or series of slabs, although this had been

removed during the initial encounter with the feature and was not present on site during recording.

6.1.7 The brick structure was presumably set within a construction cut (context 003) yet this was difficult to detect given the level of interference around the surface of the feature.

6.1.8 The grave fill (context 002) and its contents had evidently been disturbed during the initial ground works and a large amount of modern hardcore material was evident across much of the fill surface. The eastern end of the grave fill had been extensively excavated to an approximate depth of 0.8m prior to encountering the human remains. Material to the western end of the grave appeared more or less intact reaching almost to the top of brick structure. The fill consisted of loose clayey silt.

Figure 4: The internal surface of the brick grave, viewed facing east.

6.1.9 Two pieces of human bone were observed within the fill of the grave (Figure 5). One long bone was fully exposed and lay in the south easterner corner of the grave extending east-west. It probably derives from the Tibia of an adult based upon the size and shape of the bone.

6.1.10 A further long bone was also evident extending vertically from the grave fill to the west of that described above and while only the distal end was visible, probably relates to a Femur bone of the same or another individual.

6.1.11 Two further pieces of bone were encountered, a section of the cranium and a single phalange (uncertain if from the foot or hand) but derived from re-deposited modern material around the upper external edge of the brick structure. The material was found in the grave but without further excavation of the remains it is uncertain, although highly likely, that it is from the same individual as that represented by material recorded within the grave fill. Following discussion with the Development Control Archaeologist for Derbyshire County Council, the grave was re-sealed and re-buried.

Figure 5: Detail of skeletal remains within grave

6.2 Burial 007

6.2.1 The groundwork reduction in the area immediately east to the grave uncovered and recorded on 11th June 2009 (Burial 001), revealed a similar brick-built grave (007) at 52.81 metres AOD (Above Ordnance Datum). This masonry structure was heavily truncated on the western side, providing an overall dimension of 1.10 metres (east/west) x 1.30 metres

(north/south). Grave (007) was built with hand-made orange bricks (9" x 4 ½" x 3⅛") bonded with lime mortar (up to 20mm thick) and laid to English bond. The eastern wall consisted of a brick veneer laid to stretcher bond and built against another existing brick grave (008) (Fig. 6).

6.2.2 The infill (013) of the grave was composed of a firm dark brown clayey silt deposit and produced disarticulated human bones. The grave and infill were subsequently reduced c. 300mm down to a height of 52.16 metres AOD. The area immediately south of the grave was further excavated, exposing three brick courses (Fig. 7). No pit cut for the grave was identified. The upper layer above the grave consisted of a firm dark brown clayey silt deposit, very similar to fill (013). This layer was consistent throughout the groundwork excavation and produced disarticulated human bones and few animal bones described and quantified in Appendix Four.

6.3 Burial 008

6.3.1 A large rectangular brick-built grave (008) was revealed adjacent to the eastern wall of the grave (007) at a similar height of 52.88 metres AOD (Figs 6 and 7). This masonry structure was well preserved, aligned east/west with an overall dimension of 2.60 metres (east/west) x 1.80 metres (north/south). The structure was built with hand-made orange bricks (9" x 4 ½" x 3⅛") bonded with lime mortar (up to 20mm thick) and laid to English bond. The north-west corner was moderately damaged. The upper fill (009) of the grave was similar in character to fill (013). A small sondage, measuring 600mm long (north/south) x 430mm wide (east/west) x 300mm deep, was excavated against the internal northern wall reaching a lower fill (010) at a height of 52.16 metres AOD. The fill was similar to the above context (009), but with a firmer composition. The sondage was undertaken in order to establish whether a reduction of the grave may encounter any human interment. The result was negative and consequently the grave and upper fill were reduced c. 300mm without disturbing any *in situ* burial. However, the upper fill (009) produced disarticulated human bones.

6.3.2 The alignment of the southern and western walls of the grave was used as a base for the establishment of quadrant sub-divisions within the area monitored.

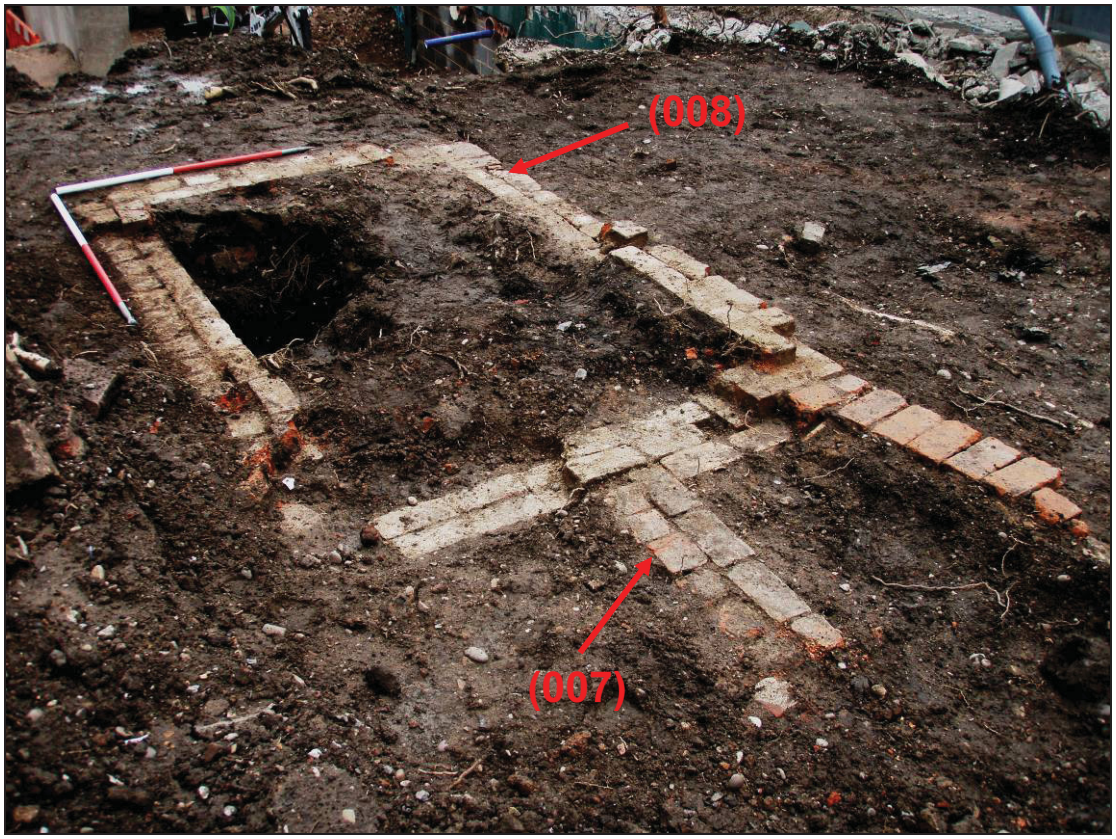

Figure 6: Remains of grave (007) and rectangular brick grave (008), looking east

Figure 7: Graves (007) and (008) with exposed brick courses, looking north-east

6.4 Burials 004, 005, 006, 014, 021 and 022

6.4.1 A series of disarticulated human skulls were found during the re-landscaping of the area monitored during the watching brief. They were recorded individually with burial numbers, context sheets, photographs and plans.

6.4.2 Burial (004) consisted of the skull of an adult which was found within the NE quadrant (context 032) at 52.56 metres AOD.

6.4.3 Burial (005) consisted of the skull of an adult which was found within the SE (context 033) quadrant at 52.59 metres AOD.

6.4.4 Burial (006) consisted of the skull of an adult which was found within the SW (context 034) quadrant at 52.52 metres AOD (Fig. 8).

6.4.5 Burial (014) consisted of the skull of an adult with some of the upper cervical vertebrae which was found within the NE quadrant (context 032) at 52.56 metres AOD (Fig. 9). This burial was recorded with associated shroud pins, a few shirt buttons and two coffin ferrous handles located over the skull area. The skeletal remains might have been found *in situ*, as the rest of the missing body could have been disturbed during the construction of a sub-way path in the late 1960s located immediately east of the remains.

6.4.6 Burial (021) consisted of the skull of an adult which was found within the SE quadrant (context 033) at 52.47 metres AOD, projecting out from the vertical section of the sub-way path on the east.

6.4.7 Burial (022) consisted of the skull of an adult which was found within the SE quadrant (context 033) at 52.37 metres AOD.

Figure 8: Burial (006), looking west

Figure 9: Skeletal remain (014) with shroud pins highlighted by red arrow

6.5 Burial 015

6.5.1 This consisted of an inhumation interment (Skeleton 015) within the remains of a coffin (011). There was no associated brick grave and instead it was deposited in a wooden coffin contained within a pit, although the pit was not identified during the excavation. The position of the burial was consistent with the rest of the burials with the head orientated towards the east and the feet to the west (Figs 10 and 11).

6.5.2 The skeleton (015) was well preserved and appears to be a complete articulated specimen of an adult, placed in supine position with the right hand over the right femur and the left hand fully extended between the pelvis and the remains of coffin (011). It was found at 52.57 metres AOD on the SE quadrant.

6.5.3 The fragmentary remains of a coffin (011), consisting of a wooden base and side boards was identified within the burial. No traces of a lid were observed, however, eight ferrous handles were recorded in their original location within the remains of the wooden boards of the coffin. Small iron coffin nails and iron studs associated with the coffin were uncovered within the grave fill (012). The fill was equivalent to the main soils within the aforementioned grave structures.

Figure 10: Skeleton (015), looking north

Figure 11: Skeleton (015), looking west

6.6 Burial 020

6.6.1 This consisted of an inhumation interment (Skeleton 020) within the remains of a coffin (019) and a grave pit [016]. This burial was revealed after the area immediately east of grave (008) was reduced to 52.90 metres AOD (Figs 12, 13 and 14).

6.6.2 The position of the burial was consistent with the rest of the burials. The grave pit [016] was fairly oval with a coffin shape although the edges were defectively recognized.

6.6.3 The skeleton (020) was well preserved and appears to be an almost complete adult, placed in supine position with the hands fully extended between the pelvis and the remains of coffin (019). The area around the feet seemed to have been disturbed. The remains of the coffin (019) consisted of small fragments of grip or chest plate and decayed wooden boards. The fill (018) was equivalent to the main soils within the aforementioned grave structures.

Figure 12: Skeleton (020), looking south

Figure 13: Skeleton (020), looking north

Figure 14: Skeleton (020), looking west

6.7 Burial 025

6.7.1 This burial was composed of skeleton (025), coffin (024) and grave pit [027]. This burial was revealed after the area immediately south of grave (008) was reduced to 52.34 metres AOD. The position of the burial was consistent with the rest of the burials (Figs 15-18). The grave pit [027] was only recognized along the northern side of the burial and it was a straight-sided cut.

6.7.2 The skeleton (025) was well preserved and appears to be an almost complete adult, placed in supine position with the hands fully extended over the femur bones. However, the skull and the upper part of the right arm appear to be absent. The lower part of the feet was likely to have been cut by an adjacent burial (030).

6.7.3 The remains of a coffin (024), consisting of a wooden base and side boards was identified within the burial. The state was extensively fragmented. No traces of a lid were observed. However, five ferrous handles were recorded in their original location within the remains of the wooden boards of the coffin. Small iron coffin nails and iron studs associated with the coffin were uncovered within the grave fill (023). The fill was equivalent to the main soils within the aforementioned grave structures.

Figure 15: Skeleton (025), looking north with skull of skeleton (030) on the eastern side

Figure 16: Skeleton (025), looking west with skull of skeleton (030) on the foreground

Figure 17: Detail of coffin handles of skeleton (025)

Figure 18: Detail of feet bones of skeleton (025) and skull of skeleton (030)

6.8 Burial 030

6.8.1 This burial was composed of skeleton (030) and coffin (029), which was revealed after the area immediately south of grave (008) was reduced to 52.34 metres AOD. This burial was located mostly underneath burial (015) on the lower level of the SE quadrant.

6.8.2 The skeleton (030) was well preserved and appeared to be of an adult, placed in supine position with the hands fully extended around the outer side of the pelvis. The position of the burial was consistent with the rest of the burials. The lower limbs appear to have been disturbed (Figs 19 and 20). However, a series of long lower limb bones were identified in the near vicinity as if they had been partially pulled out and subsequently left partially undamaged.

6.8.3 The fragmentary remains of a coffin (029), consisting of a wooden base and side boards was identified within the burial. No traces of a lid were observed. However, one ferrous handle was recorded in their original location within the remains of the wooden boards of the coffin. The fill (028) was equivalent to the main soils within the aforementioned grave structures.

Figure 19: Skeleton (030), looking north

Figure 20: Skeleton (030), looking west

6.9 **Osteoarchaeological analysis** (by Alexandra M. Thornton, MSc)

6.9.1 Site Context

Excavation of the area for the proposed bus lay-by at King Street, Derby uncovered articulated *in situ* inhumation burials and a large quantity of disarticulated human skeletal remains. Ultimately the excavation revealed four complete inhumation burials; Skeletons 015, 020, 025 and 030, and six contexts which contained disarticulated remains; NW quadrant (context 031), NE quadrant (context 032), SE quadrant (context 033), SW quadrant (context 034), SE quadrant lower level (context 035) and SW quadrant lower level (context 036). Within the areas of disarticulated remains six disarticulated burials were found; Burial 004 found in the NE quadrant, Burial 005 found in the SE, Burial 006 found in the SW, Burial 014 found in the NE, Burial 021 found in the SE and Burial 022 also found in the SE. Contexts 009 and 013 also contained human remains. Context 009 was the upper fill of the disturbed brick-lined grave (008) and context 013 was the upper fill of another similar grave (007). The assemblages of both articulated skeletons and disarticulated remains were exposed, recorded and photographed and then lifted for osteoarchaeological analysis. The location of the site itself and the depositional contexts of all human remains occur in the preceding text and will not be re-iterated here. The photographs included below were taken by the author unless otherwise stated.

6.9.2 Articulated Human Bone Analysis

Methods

The methods which were applied for analysis of the bones correspond to those within Brickley and McKinley's *'Guidelines to the Standards for Recording Human Remains'* (2004). Surface preservation of the remains was graded from 0 to 5+, where grade 0 was equivalent to the 'surface morphology (of the bone being) clearly visible with (a) fresh appearance to (the) bone and no modifications' (Brickley and McKinley 2004, 16). A fragment of bone determined to have a grade 5+ level of preservation would be described as having 'heavy erosion…across (the) whole surface, completely masking normal surface morphology…with extensive penetrating erosion resulting in modification of (the) profile' (2004, 16).

For each articulated skeleton, a skeletal inventory and a record of the completeness of the skeleton was produced. The dentition of the skeletal remains was recorded using the Zsigmondy system (van Beek 1983, 5). Measurements of complete femur, tibia and humerus were made for the articulated burials where possible and integrated into Trotter's Caucasian stature estimation calculations (1970). This particular set of calculations was used for the bone assemblage from King Street as this skeletal population was presumed to be of Caucasian descent.

Sex of the skeletal remains was analysed using as many methods as possible, particularly focusing on the pelvis (overall shape, greater sciatic notch, pubic symphysis height, sub-pubic angle, sub-pubic concavity, medial ischio-pubic ridge) and skull (overall shape, nuchal crest, supra-orbital margins, supra-orbital ridges, zygomatic bone, glabella, mastoid process, mandibular mental eminence, ramus and body). For each sexable skeletal element a grade of female, probable female, indeterminate, probable male or male was given to the bone.

The age at death of the adult skeletons was determined using pubic symphysis degeneration (Brooks and Suchey 1970), auricular surface morphology (Lovejoy *et al.* 1985, Buckberry and Chamberlain 2002), degeneration of the fourth sternal rib ends (Iscan and Loth 1984, Iscan *et al.* 1985), cranial suture closure (Meindl and Lovejoy 1985), fusion of the medial clavicle (Cox and Mays 2000, 65) and dental attrition (Miles 1963, 2001, Brothwell 1981). For the juvenile skeletons, age at death was estimated due to level of epiphysis fusion (Schwartz 1995) and tooth formation and eruption (Ten Cate 1989 in Schwartz 1995).

A detailed description of any trauma and pathological lesions identified on the skeletal remains was created including information on the which bone was affected, the location of the abnormality on the bone, the nature of the abnormality, the type of bone formation or destruction, the distribution pattern and the potential diagnosis (Buikstra and Ubelaker 2004, 35).

6.9.3 Disarticulated Human Bone Analysis

Methods

There are inherent problems associated with the osteological analysis of disarticulated human remains, particularly when they exist within a cemetery location. When, how and why the remains have become disarticulated are questions which often remain unanswered. Some of the contexts of disarticulated bones from King Street appear to form almost complete skeletons, although whether the bones are actually from different individuals is unknown. Wherever possible any observable differences including age, sex, size, musculature and pathology have been used to determine if the bones came from one or more individual. Each bone has been analysed separately and has been classified into element and side before the number of bones of each type was counted. The type of bone which had the highest figure indicates that this was the minimum number of individuals within this assemblage.

As with the articulated skeletons, the surface preservation of the bones was recorded and averaged for each depositional context. It was deemed important to grade the surface preservation of the bones from the disarticulated burials separately to the quadrants in order to present a more accurate level of preservation for each burial. Age and sex of the bones was determined wherever possible, using the methods highlighted above. Further to this, any evidence of trauma and pathologies were recorded.

6.9.4 Surface Preservation

The condition of the bones from the four articulated burials was fairly good (Table 1) as they were all classified as grade 2 where there is ‘more extensive surface erosion than grade one...with deeper surface penetration' but the surface of the bone remains preserved (Brinkley and McKinley 2004, 16). As with the articulated burials, the surface preservation and thus the condition of the bones from all six quadrants of disarticulated remains was good (Table 2). The preservation was scored from grade 1 where the bone has ‘slight and patchy surface erosion’ (Brinkley and McKinley 2004, 16), to grade 2 in most contexts. Only one context had a poorer level of preservation which was graded as 3 where 'most of (the) bone surface (is) affected by some degree of erosion;...(the) general morphology (is) maintained but detail of parts of (the) surface (are) masked by erosive action' (Brinkley and McKinley 2004, 16). The disarticulated burials were

generally grade 1 or 2 (Table 3) but Burial 021 and Burial 022 had a grade 4 level of preservation where 'all of (the) bone surface (was) affected by erosive action; (although the) general profile (is) maintained and (the) depth of modification (is) not uniform across (the) whole surface' (Brinkley and McKinley 2004, 16). Overall, the high level of surface preservation of the bones suggests that little surface detail has been lost, allowing for accurate examination of sexing and ageing features and of pathological lesions.

Burial	Preservation
15	2
20	2
25	2
30	2

Table 1: Surface preservation of the articulated burials

Context	Preservation
31 - North West	1
32 - North East	2
33 - South East	2
34 - South West	2
35 - South East Lower	3
36 - South West Lower	1

Table 2: Surface preservation of the disarticulated contexts

Burial	Preservation
4	1
5	2
6	1
9	1
13	1
14	2
21	4
22	4

Table 3: Surface preservation of the disarticulated burials

6.9.5 Articulated burials

Skeletal completeness

The completeness of each skeleton can be seen in Appendix One, which contains the skeletal recording sheets. The percentage of the completeness of each skeleton can be seen in Table 4. The completeness for the articulated skeletons is very good and will give an accurate depiction of the individual.

Burial	Completeness
15	96%
20	63%
25	70%
30	90%

Table 4: Completeness of the articulated burials

6.9.6 Skeletal analysis of articulated burials

Burial 015

This skeletal assemblage was the most complete of any context containing human remains. It was also well preserved which allowed for accurate ageing, sexing and pathological analysis.

The skull and pelvis were used to estimate the age and sex of the skeleton. From the skull, the mastoid process, supraorbital margin and glabella were identified as from a probable male and the nuchal crest was identified as male. The jaw was square, but the mental eminence and gonial angle were typical of a female mandible. From the pelvis, the sciatic notch and the pubis had features that suggested they were from a male. Overall the skeleton was determined to be a probable male (Appendix Three).

The skeleton's age at death was estimated from the cranial suture closure to be between 48 and 56 years, from the degeneration of the auricular surface of the pelvis to be 45 to 47 years and from the degeneration of the pubis symphysis to be between 44 and 50 years old. Therefore the individual's age was concluded to be c. 45 to 50 years old at death (Appendix Two).

There was evidence of juvenile bones from the assemblage including the unfused humeral head, pubic bone and iliac crest of the pelvis. The bones of the humerus and the pelvis fuse at around 15 to 20 years and therefore these fragments were from a child aged c. 10 to 14 years old at death (Appendix Two).

The dental inventory from the mandible and maxilla of the adult from Burial 015 shows that there has been resorption of the bone over the sockets of most of the teeth which is indicative of ante-mortem tooth loss (Table 5). Abscesses or caries can ultimately cause ante-mortem tooth loss, but in such a severe case as this it is likely that periodontal disease was the causal factor. This type of dental disease has been prevalent throughout history and is one of the most common explanations for tooth loss (Roberts and Manchester 2005, 73). It begins as dental calculus, observed on some of the teeth that were still present in the maxilla, which causes inflammation of the soft tissue and subsequent transmission to the bone (Roberts and Manchester 2005, 73). This will lead to resorption of the bone and eventually the loss of the teeth (Robert and Manchester 2005, 73). There is also enamel hypoplasia on the left maxillary canine which can be caused by metabolic stress such as a nutritional deficiency, or a childhood illness. Enamel hypoplasia is often most visible on the canines (Roberts and Manchester 2005, 75) which explains why it was not observed on the other teeth.

Left																Right
	x	x	x	5	4	3ca,eh	x	x	1ca	2ca	3ca,eh	x	x	x	x	x
	x	x	x	x	x	x	x	x	x	2	3	x	x	x	x	x
Left																Right

Table 5: The dental inventory for Burial 015

Key to dental inventory tables (adapted from Connell in Brinkley and McKinley 2004)
~~1~~ scored through the tooth number indicates
tooth lost post mortem
- scored through with a horizontal line indicates
tooth present but socket missing
x tooth lost ante mortem
np tooth not present
--- jaw and teeth not present
c caries (cavity) in tooth
b broken tooth
a abscess
e tooth erupting
u tooth unerupted
ca calculus
eh enamel hypoplasia

On the adult skeleton from Burial 015, osteophytes (excess bone formation or lipping) were identified on most of the joint surfaces of the cervical, thoracic and lumbar vertebrae (Fig. 21). The cervical vertebrae also showed signs of eburnation on the joints. This type of pathology develops with age as a consequence to the stresses placed upon the spinal column and therefore in this case, the individual suffered from primary vertebral osteoarthritis. Furthermore there was lipping on the joints of the ribs. This may be linked to the vertebral osteoarthritis as the stresses on the spine may have placed stress on the attachment points of the ribs to the vertebrae. Evidence of primary osteoarthritis in the hip was identified from observation of osteophytes on the joint surface of the femur and at the muscle attachment point of the femur within the acetabulum of the pelvis. Lipping and eburnation on some of the metatarsals and phalanges of the feet indicates the presence of rheumatoid osteoarthritis in the feet.

Figure 21: Osteophyte formation seen as lipping on the body of the vertebrae

The coastal cartilage which attaches the manubrium to the first rib had ossified to the costal notches (Figs 22 and 23). This is extremely unusual. It may be linked to the lipping observed on the ribs.

Figure 22: The ossified 'arms' of the manubrium seen at the top of the picture

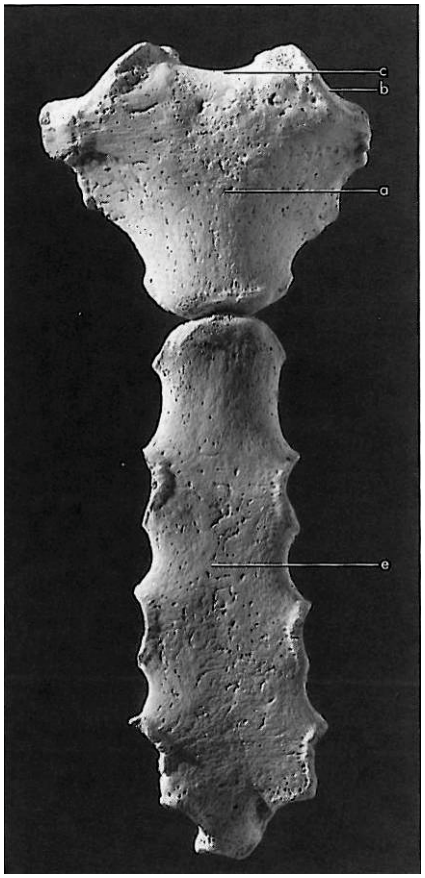

Figure 23: The shape of a normal manubrium (White 2005, 158)

The minimum number of individuals from Burial 015 is two.

6.9.7 Burial 020

The skeleton from Burial 020 was fairly complete, although it was missing the maxilla and part of the mandible. From the fragment of mandible that was present, many of the teeth had been lost during life, probably due to periodontal disease (Table 6). Further evidence of dental disease could still be seen as a large carie on the right first premolar and pitting on the right mandibular first molar.

A right maxillary canine was also present in the context but this was a deciduous tooth and was not consistent with the tooth wear in the mandible. This was the only juvenile skeletal element from this assemblage.

Left			Right
	---		
x	---	x x 3 4c x 6 x x	
Left			Right

Table 6: Dental inventory for Burial 020

The cranial and pelvic features which could be sexed were used to identify that Burial 020 was a probable female (Appendix Three). The cranial sutures of the skull were almost obliterated suggesting that the skeleton was an older adult (45 years old onwards). Unfortunately, without the complete skull, this ageing methodology cannot be used to give a precise age. The lack of teeth also prevented ageing of the skeleton although the ante-mortem tooth loss suggests that the individual was probably over 45 years at death. Although the pelvis was present, the auricular surface and pubic symphysis were too fragmentary to use to age the skeleton. Overall, the skeleton was deemed to be an older adult (Appendix Two).

The skeleton's skull had pitting and evidence of bone formation on the inner surface suggesting that bacterial or viral infection was causing inflammation, possibly from meningitis (Robert and Manchester 2005, 178). There was also some evidence of osteoarthritis on the vertebrae as there was lipping on the anterior spinous processes and the bodies of many of the vertebrae, particularly the thoracic vertebrae. This was probably due to the ageing process and primary osteoarthritis.

Green stains were observed on the skull, clavicle, scapula, right lunate and blade of the pelvis of Burial 020. These stains may have formed due to close proximity of the bone to metal objects such as coffin nails. The presence of the metal object against the skull has preserved some of the skin and hair and therefore there is potential of obtaining DNA data from this organic material.

The minimum number of individuals from this context is two.

6.9.8 Burial 025

This skeleton is well preserved and could be both aged and sexed as the pelvis was fairly complete. The sciatic notch and ventral arch indicated that the skeleton was a probable male. Using the degeneration of the auricular surface and pubic symphysis, the individual was estimated to be aged between 30 and 44 years at death (Appendix Two). The skull could not be used to sex or age the individual due to its fragmentary nature. However

the few cranial sutures which were present were fused suggesting the individual was a middle or older adult (35 to 50 years of age) (Appendix Three).

There were potentially three sets of different juvenile bones identified within the assemblage from Burial 025. There was the unfused right femur and fibula from a child aged less than 13 years old, another fibula which had a considerably smaller circumference, from a child probably aged at less than 9 years old, and the unfused blades of the scapula from a child aged less than 6 years old. Therefore it appears that within this assemblage, there may be an adult aged between 30 and 44 years, an older child aged around 10 to 12 years, a child aged c.6 to 9 years and a young juvenile aged below 6 years old (Appendix Two). However because the smaller fibula cannot be accurately aged by size alone, the minimum number of individuals from this context is three.

There is evidence of bone loss on the adult ribs which was probably caused by an infectious disease (Fig. 24). There are also Schmorl's nodes on the vertebrae but no osteophytes suggesting that the individual was probably at the onset of primary osteoarthritis. This matches the estimated age of the adult skeleton as degenerative bone changes in the vertebrae often start at the third century of life (Robert and Manchester 2005, 140).

Figure 24: Bone loss on the ribs of Burial 025 (left) compared with normal ribs (right)

6.9.9 Burial 030

Due to the completeness and level of preservation of the skeleton, the skull and the pelvis were both present to use to make an estimation of the sex of the individual. However the results did not produce a clear distinction between male or female and therefore Burial 30 is of an indeterminate sex (Appendix Three).

Analysis of the dental attrition resulted in an age estimation of between 16 and 20 years old at death (Table 7). Furthermore, some of the bones were unfused, for example the

clavicle, iliac crest and the ulna, or recently fused such as the humerus. The ulna is the earliest of these bones to fuse at the age of c.13 to 17 years and therefore the skeleton was probably aged somewhere between 13 and 20 years old at death (Appendix Two). This individual may not yet have completed puberty which may explain the difficulty in sexing the skeletal remains.

Left														Right
8u	7eh	6eh,c	c5,eh	4eh	3eh	2eh	1c,eh	1eh	2eh	3eh	4eh	c5eh	6eh	7eh 8u
8u	7eh	6eh	5eh	4eh	3eh	2eh	1eh	1eh	2eh	3eh	4eh	x	6eh	7eh 8u
Left														Right

Table 7: Dental inventory for Skeleton 030

The dental inventory shows that all of the teeth which were present in the mandible and maxilla had enamel hypoplasia (Table 7). This indicates that the individual underwent a period of metabolic stress due to poor nutrition or a childhood illness. Dental caries in the maxillary left first molar, second premolar and first incisor, right second premolar and ante-mortem tooth loss of the mandibular right second premolar confirms that the individual had periodontal disease during life. Striations of new bone formation and porous woven bone were identified on the shafts of the second and third left ribs and sixth through to the tenth right ribs. This was probably caused by non-specific inflammation or periostitis. The only other pathology identified from Burial 30 was an unhealed cut mark trauma on the anterior surface of the right femur.

6.9.10 Stature

Estimation of stature requires the femur, fibula, humerus, radius or ulna (Brothwell and Zakrewski 2004, 33). Trial studies of stature estimation have resulted in the femur and humerus being deemed the most useful of the long bones in determining stature.

In skeletons older than 30 years of age, 2cm is deducted from the estimation result to compensate for the loss in height as the individual ages. The estimated stature of each articulated skeleton can be seen in Table 8. Burial 015 was c.159.77cm, Burial 020 was c.169.78cm, Burial 025 was c.165.83cm and Burial 030 was c.167.47cm. These stature estimations are normal for a post medieval population (Roberts and Cox 2003, 308).

Burial	Bone	Stature (cm)
15	Humerus	163.62 ±4.05
	Femur	155.91 ±3.417
20	Humerus	169.782 ±4.05
25	Ulna	166.03 ±4.32
	Radius	165.84 ±4.32
	Femur	165.627 ±3.417
30	Humerus	167.47 ±4.05

Table 8: Stature estimations for the articulated burials

No stature estimates were made from the disarticulated skeletal remains due to the fragmentary nature of the assemblage.

6.9.11 Disarticulated remains

Completeness
The completeness of the disarticulated burials which came from the quadrants of disarticulated human remains can be seen in Table 9 and the completeness of the remains from the contexts which contained human bone can be seen in Table 10. As is expected from disarticulated remains, there were no complete skeletons within any of the contexts.

Burial	Completeness
4	23%
5	32%
6	18%
14	20%
21	10%
22	17%

Table 9: Completeness of the disarticulated burials

Context	Completeness
9	10%
13	10%

Table 10: Completeness of the human remains from the disarticulated contexts

6.9.12 Skeletal analysis of the human remains from the NW quadrant (031)

This context contained a fragment of humerus, rib fragments, a femur and a tibia. The humerus, ribs and femur were all adult in size. The tibia was extremely small and was probably from a very young juvenile, possibly as young at less than one year old at death (Appendix Two). Although the preservation was good, little more could be analysed from the bone.

The minimum number of individuals from this assemblage is two.

6.9.13 Skeletal analysis of the human remains from the NE quadrant (032)

There are fragments from almost all areas of the skeleton within this assemblage; however most of the upper arm bones, ribs and vertebrae are missing. Half of the mandible was present and was used to estimate that it was from a male aged between 40 and 45 years old at death (Table 11) (Appendices Two and Three). One of the fragments of pelvis was determined to be from a female. The degeneration of the pubic symphysis showed that she was aged at around 30 to 35 years old at death, although the auricular surface morphology suggested she might have been slightly older at 38.2 years old at death with a standard deviation of 10.9 years (Appendix Two). A separate fragment of pelvis contained the sciatic notch which was from a probable female (Appendix Three). This individual may have been younger than the other female as the auricular surface morphology suggested that she died at between 25 and 29 years old (Appendix Two).

There was also a recently fused humeral head which was aged at 13 to 15 years old and the unfused left and right tibia, aged at less than 14 years old at death (Appendix Two).

Left		Right

	--- x x x xa xa x 7c x	
Left		Right

Table 11: Dental inventory of mandible from North East Quadrant

The mandible from the male had evidence of ante-mortem tooth loss, cavities and the tooth root was visible in the jaw above the right first and second premolars, caused by abscesses. These pathologies suggest that the individual had periodontal disease during life and probably had a fairly poor oral hygiene and possibly a diet rich in sucrose.

The second proximal phalanges had lipping around the muscle attachment suggesting that one of the individual's from the assemblage may have had rheumatoid osteoarthritis in the hand. There was also lipping on the superior facet of the first lumbar vertebrae, possibly indicating lower back pain and the onset of primary osteoarthritis. The right femur appeared to be slightly bowed which may have been caused by vitamin D deficiency. This metabolic disease is particularly evident in children and manifests itself more obviously in younger individuals. This femur also showed evidence of trauma on the posterior side on the mid shaft. The trauma appeared as an oval addition of bone possibly evidence of healing of a past accident. On the neck of the right tibia was pitting and the cortex of the bone was joined and fused. This is indicative of non specific inflammation of the bone or periostitis which was possibly caused by trauma.

Potentially there is evidence of five individuals from this assemblage; a male aged 40 to 45 years old, a probable female aged between 25 and 29 years, a female aged 30 to 40 years and either one or two children aged less than 14 years. It is not usually acceptable to take one skeletal element as confirmation of age or sex and therefore, from the duplication of two right pelvic fragments and two left tibia skeletal elements, the minimum number of individuals from this assemblage is two.

6.9.14 Skeletal analysis of the human remains from the SE quadrant (033)

There were fragments of most parts of the skeletal from this context, although there were very few ribs or vertebrae within the assemblage. Most of the bone was adult; however there were two pubic regions of the pelvis and due to the level of fusion of one of the fragments it was deemed to be from a probable juvenile (Appendix Two). There was also a recently fused femoral head and an unfused humerus, possibly from the same individual, indicating that an individual aged c.13 to 15 years was present in the assemblage. There was also an unfused fibula shaft from a juvenile aged c.6 years old at death. No bones were present that could be sexed.

The only pathological lesions observed from this context were on the tibia and femur. The lesions were probably caused by periostitis or infection. The striations of bone on the shaft of a tibia are typically found on this bone as it is close to the skin surface and is 'subject to recurrent injurys' (Roberts and Manchester 2005, 172). Periostitis in the form of excess porosity can be found on bones such as the femur, but it is less frequent.

6.9.15 Skeletal analysis of the human remains from the SW quadrant (034)

The most common skeletal elements from this context were long bone fragments. This is typical for a disarticulated assemblage as they are easy to remove from their original burial location. Most of the bones were adult, although the right and left humeri and the right radius had only recently fused suggesting that they came from an individual aged between 15 to 20 years at death (Appendix Two).

A complete adult radius was slightly bowed which may have been caused by vitamin D deficiency in childhood. There is also evidence of trauma on the posterior head of the left femur which can be seen as a clear slash mark (Fig. 25). There is no evidence of healing and therefore this trauma may have caused the individual's death.

Figure 25: The head of the femur found in the SW quadrant which shows a cut mark trauma

The minimum number of individuals from this assemblage is two.

6.9.16 Skeletal analysis of the human remains from the SE quadrant lower level (035)

The skeletal remains from context 035 appear to form an almost complete skeleton as there are elements from the skull, upper skeleton, axial skeleton, pelvis and lower skeleton. However because these are disarticulated remains whether this is one individual or simply appears as one cannot be confirmed at this time. The mastoid process from the skull suggests that the skull is female and the sciatic notch from the pelvis suggests that the pelvis was also female. The auricular surface degeneration of the pelvis was used to estimate that it was aged at around 30 years. These results indicate that a middle aged female was present within the assemblage (Appendices Two and Three). One of the right tibia found with the remains appeared to be much smaller than the adult tibia which suggests that it might be from a juvenile.

Pitting was observed on the condyles of the adult right tibia and the right calcaneus suggesting that these joint surfaces may have been inflamed, possibly due to joint disease or arthritis. There was also lipping and excess bone formation at the muscle attachments on the outer edge of the acetabulum of the pelvis. This may have been caused by joint disease, or may be evidence of parturition (see Cox 2000). Striated bone formation was observed along the surface of the shaft of the fibula which was probably caused by non-specific inflammation, or periostitis.

The minimum number of individuals from this context is two as there are two right femora.

6.9.17 Skeletal analysis of the human remains from the SW quadrant lower level (036)

This context contained very few human remains although the preservation of the fragments of the skull, humerus, ulna, ribs and femur was good. All the remains appeared to be adult (Appendix Two). Periostitis was observed on the ulna shaft and there was lipping and ostephyte formation on the distal joint surface of the bone which may have been caused by rheumatoid arthritis.

The minimum number of individuals from this context is one.

6.9.18 Skeletal analysis of disarticulated burials

Burial 004

Burial 004 was found in the NE quadrant (032) of disarticulated remains and consisted of a partial burial of the skull and cervical vertebrae only. The skull and cervical vertebrae were articulated with each and were therefore in their primary burial location. The rest of the skeleton must have been disturbed and removed sometime after burial. Analysis of the cranial suture closure of the skull resulted in an age estimation of between 40 and 50 years old at death. The tooth wear from the maxilla (still present within the skull) and mandible were aged at 18 to 24 years old at death (Table 12). This significant difference in age estimation may be explained by the difference in preservation of the sets of bones. The skull was determined to be of grade 2 surface preservation whilst the rest of the skeleton was of grade 1. This may have affected how the cranial sutures appeared thus producing an older estimation. It has also been suggested that cranial suture closure is not the most reliable ageing technique (Hoppa and Vaupel 2002, 63). Whatever justifies the discrepancy, the individual from Burial 004 was certainly an adult (Appendix Two).

Analysis of the features of the skull and jaw indicate that the individual is a probable male (Appendix Three).

Left		Right
	u 7ca 6ca np 4ca, c np np np np np 3ca 4ca np np np u	
	u 7ca 6ca,c5ca 4ca 3ca 2ca 1ca np np 3ca np x x 7 u	
Left		Right

Table 12: Dental inventory for Burial 004

The mandible and maxilla from this skeletal assemblage both had evidence of calculus on all of the present teeth and there was a dental carie on the mandibular first left molar (Fig. 26), suggesting that the teeth were not particularly well cared for during life and that the individual probably had dental disease. The absence of enamel hypoplasia shows that this individual had a good dietary nutrition during childhood.

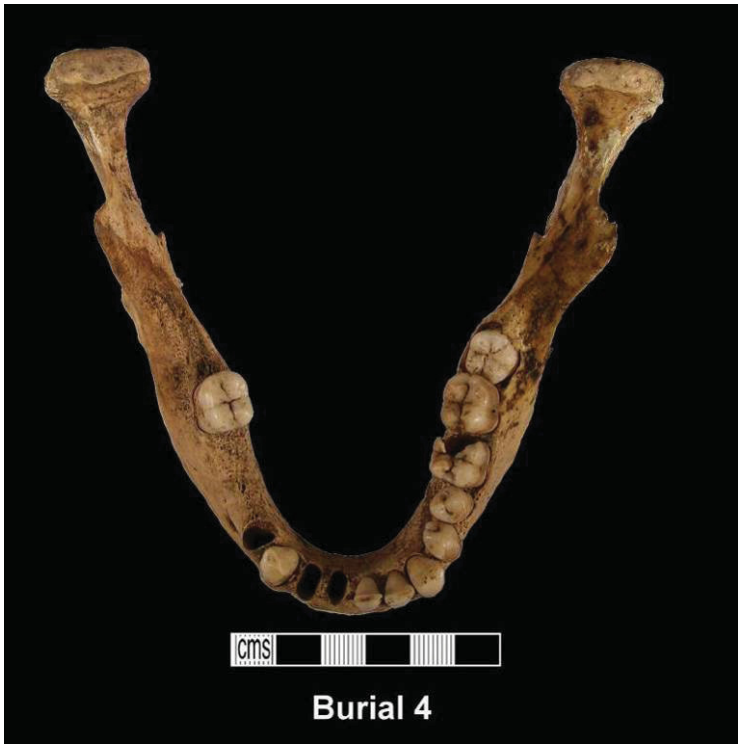

Figure 26: The mandible from Burial 004 showing ante-mortem tooth loss and a large dental carie on the left first molar

The only other pathology which was observed on the skeleton was an injurys caused by a sharp object that has severed part of the sixth and seventh cervical vertebrae (Fig. 27). The vertebrae were not healed and as the skeletal assemblage from Burial 4 stopped at this point, the trauma may have been made after death and burial when a spade hit the skeleton's vertebrae during digging in the ground. Perhaps at this point the rest of the skeleton was removed. An alternative explanation may be that the head and neck of the individual had been severed during life and then buried separately from the rest of the body. This suggestion seems unlikely as a punishment of this kind would not have resulted in the burial of the head in a consecrated churchyard, if at all. Furthermore, if as suggested from the use of coffins elsewhere in the churchyard, this individual was buried

in the 18th or 19th century, this type of punishment was not usually deemed fitting in this period.

Figure 27: Superior view of the sixth and seventh cervical vertebrae showing evidence of severing of the transverse process, located on the left (top) and the inferior view of the seventh cervical vertebrae showing the diagonal slash mark, on the right (bottom)

The minimum number of individuals from this assemblage is one.

Burial 005

This burial, found in the SE quadrant (033), contained a partial, although well preserved skeleton. The maxilla contained all of the teeth, although many were missing from the mandible (Table 13). The roots of some of the teeth of the mandible were exposed in the jaw due to dental abscesses and periodontal disease. The holes in the bone may have weakened the jaw and this may be why some of the teeth from the mandible have fallen out and are missing from the assemblage.

Left		Right
	8 7 6 5 4 3 2 1 1 2ca,eh 3 4 5 6 7 8	
	np np 6 5 np np np np --- 2 --- np,a np,a	
Left		Right

Table 13: Dental Inventory for Burial 005

Analysis of the cranial suture closure of the skull determined the skeleton to be aged at 45.2 years at death with a standard deviation of 21.6 years. Analysis of the dental attrition placed the skeleton in an age range of 40 to 50 years old at death. Combining these age estimations, it was assumed that the skeleton died aged 40 to 50 years (Appendix Two). From the skull and mandible, the skeleton was determined to be male (Appendix Three).

There was intensive bone destruction and evidence of healing on the cranium (Fig. 28). This may have been due to syphilis although there was no evidence of this disease elsewhere on the skeleton or possibly non-specific infection. The second right maxillary incisor from Burial 005 had calculus and showed signs of enamel hypoplasia indicative of a period of poor nutrition in childhood. The vertebrae showed clear signs of primary osteoarthritis as there were Schmorl's nodes and lipping on the cervical vertebrae and the ribs had evidence of bone formation at the heads where they attached to the vertebrae. Finally, the axis and third cervical vertebra were fused together along the right superior auricular facet and transverse process (Fig. 29). This may have been caused by trauma to the neck and a soft-tissue injurys. As a result of the injurys new bone formation occurred at the impact site (Roberts and Manchester 2005, 84) and this may have caused the fusion of the cervical vertebrae.

Figure 28: Bone loss visible on the skull of Burial 005

Figure 29: The second and third cervical vertebrae which have fused along the transverse process seen on the right of the picture

The minimum number of individuals from this context is one.

Burial 006

The human remains from Burial 006 were found in the SW quadrant (034). Unfortunately the skull could not be aged more precisely than that it was an adult, as it was too incomplete to undertake analysis of the cranial suture closure. However, certain features of the skull could be sexed and it was estimated to be a probable male (Appendix Three). The first, second and third right molars of the maxilla were present and through examination of the dental attrition the individual was deemed to be aged between 18 and 22 years old at death (Table 14 and Appendix Two). There were various unfused bones from this assemblage including the clavicles, the humerus, the radius, the ulna and the coracoid process of the scapula. There were also relatively small second and third ribs, juvenile phalanges and the left second metacarpal, the cartilaginous glenoid fossa of the left scapula and deciduous teeth. These bones signify that a juvenile was present along with the adult bones. The ulna fuses at the age of 12 to 13 years, the humerus and radius fuse at c.15 to 20 years and the glenoid fossa remains cartilaginous until 15 years. Therefore these bones were probably from a child aged between 7 and 13 years old at death (Appendix Two).

The dental inventory shows that many of the teeth from the adult maxilla were not present (Table 14). From the teeth that were available in the maxilla the first left molar had a carie in the mesial side and there was evidence of abscesses above the right premolar 1, premolar 2 and the left first molar, as the tooth root was showing through the bone of the jaw. This pathological evidence shows that the individual from Burial 006 had dental disease.

Left															Right
	8	7	6c	np	np	np	np	np	np	np	np	4a	5a	6a	np	np	
			---			3		---			3			6			
Left															Right

Table 14: Dental inventory of Burial 006

The minimum number of individuals from this burial context was two.

Burial 014

Although this skeleton, found in the NE quadrant (032), was fairly incomplete there were still bones which could be used to estimate the sex and age the assemblage. The sex of the mandible was determined by observing the shape of the mental eminence and gonial angle which suggested it was from a probable female (Appendix Three). The dentition of the skeleton was fairly complete (Table 15) but the third molars within both the maxilla and the mandible had not yet erupted. The dental attrition was low and using Miles' methodology, the skeleton was aged at between 12 and 18 years old at death (Appendix Two).

Left															Right
	u	7eh	6eh	5eh	4eh	3eh	2eh	np	1eh	2eh	3eh	4eh	5eh	6eh	7eh	u
	u	7eh	6eh	5eh	4eh	3eh	2eh	np	1eh	2eh	3eh	4eh	5eh	6eh	7eh	u
Left															Right

Table 15: Dental Inventory from Burial 014

All the teeth had enamel hypoplasia suggesting that a period of dietary deficiency occurred during early childhood. This is confirmed by the presence of *cribra orbitalia*, porosity in the orbits of the skull, which is a typical sign of iron deficiency anaemia in children (Fig. 30). There was also evidence of pitting and bone loss on the occipital and parietal bones of the skull, which was possibly linked to the metabolic disease (Fig. 31).

Figure 30: The left orbit of the skull from Burial 014 showing pitting caused by cribra orbitalia

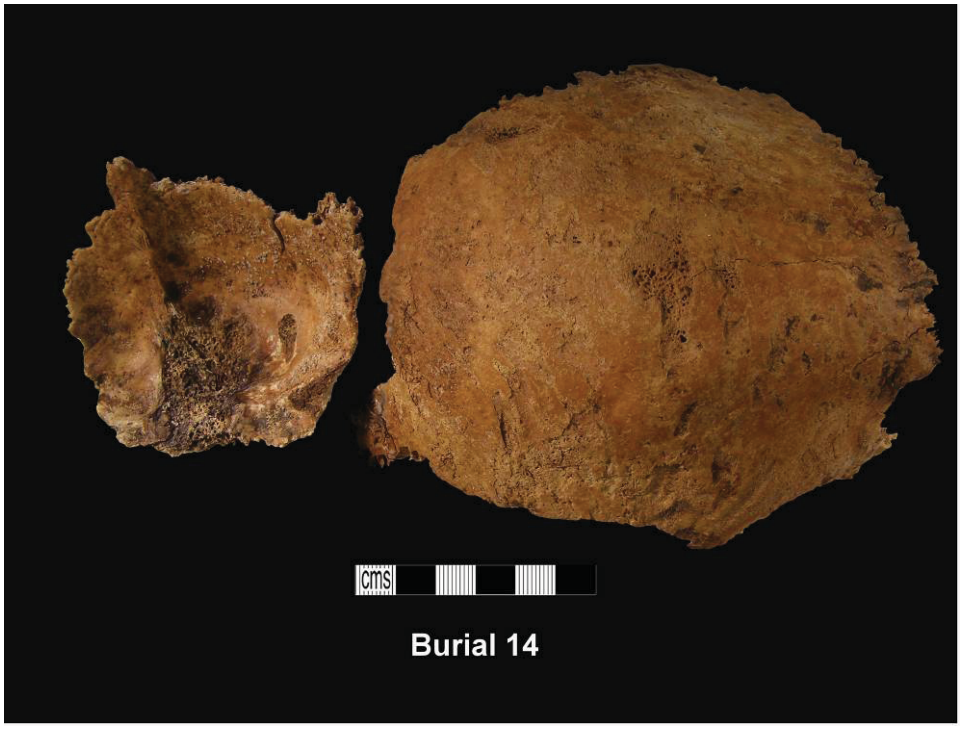

Figure 31: The inner and outer cranium of the skull from Burial 014 showing pitting and bone loss

The minimum number of individuals from Burial 014 is one.

Burial 021
This burial, found in the SE quadrant (033), contained a skull only. It may have originally been an articulated skeleton, although it is more likely that the skull was removed from its original burial location and reburied where it was excavated.

The skull was partially complete and from the glabella was determined to be a probable female (Appendix Three). The cranial sutures were almost completely obliterated and fused suggesting that the individual was an older adult (Appendix Two). The only pathology which was seen was evidence of blunt trauma to the left parietal bone near to the occipital bone (Fig. 32). The trauma was caused by a blunt but vertical object and does not appear to be healed.

Figure 32: Blunt trauma visible on the left parietal bone of Burial 021

The minimum number of individuals from this context is one.

Burial 022
Similarly to Burial 021 the only bones which were present in this burial, found in the SE quadrant (033), were a poorly preserved skull. The orbits of the skull were square and the supraorbital ridges were prominent suggesting that the skull was a probable male (Appendix Three). However, the mastoid process and glabella were of an indeterminate sex and therefore the approximate sex estimation of the skull is a probable male (Appendix Three).

The dental record (Table 16) shows that the skeleton had a complete set of maxillary teeth but the mandible was missing, possibly lost when the skull was moved from its original burial location. All of the maxillary teeth have calculus but there was no enamel hypoplasia observed. The tooth wear indicates the skeleton was between 20 and 35 years of age at death (Appendix Two).

Left														Right
	8a	7ca	6ca	5ca	4ca	3ca	2ca	1ca	1ca	2ca	3ca	4ca	5ca	6ca	7ca	8ca
Left														Right

Table 16: Dental Inventory from Burial 022

The minimum number of individuals from this context is one.

6.9.19 Skeletal analysis from contexts which contained human remains

Context 009
The human remains from this context consisted of fragments of the parietal bone of the cranial, mandible, left humerus, right tibia and right fibula. Although the bones were extremely well preserved, there were no features present that could be used to sex or age the skeleton, although from the size of the bones they were determined to be from an adult. There was no evidence of pathological lesions on the bones.

A red stain was visible on the anterior surface of the shaft of the right tibia which may have been caused by close association of the bone with an iron object. This object was probably a coffin nail.

The minimum number of individuals from context 009 is one.

Context 013
Burial 013 consists of a fragment of skull, fragments of the left and right humeri and fragments of the ribs. Unfortunately the skull was too fragmentary to be used to age or sex the skeleton, but from the size of the bones it can be assumed that the bones were adult.
There was evidence of very strong muscle attachments on the humeri at the attachment point of the *pectoralis major* and *deltoid* muscles indicating that the individual may have undertaken work which required a strong upper body.

The minimum number of individuals from this context is one.

6.9.20 Discussion

The watching brief at King Street, Derby revealed four articulated burials: Burial 015, 020, 025 and 030. Osteological analysis of the remains ascertained that Burial 015 was a probable male aged between 45 and 50 years at death. A juvenile aged 10 to 14 years old was also found with this skeleton. Burial 020 was a probable female aged at over 45 years. Burial 025 was a probable male aged between 30 and 44 years old at death. Potentially, three juveniles were also found with the skeleton, aged less than 6 years, between 6 and 9 years and between 10 and 12 years old. Burial 030 was a juvenile skeleton aged between 13 and 20 years and was of an indeterminate sex.

The juvenile bones found within Burial 015 and 025 were probably not originally buried with the skeleton. It is more likely they were from burials around Burial 015 and 025 which have become mixed into the assemblage.

The excavations also exposed six areas of disarticulated bones, some of these areas containing incomplete burials. The north west quadrant of disarticulated remains contained an adult of indeterminate age and sex. The north east quadrant contained a male aged between 40 and 45 years old, a female aged between 30 and 40 years, another female aged between 25 and 29 and one or two children aged less than 14 years old. Burials 004 and 014, found in this quadrant were a probable male aged between 18 and 50 years old and a probable female aged between 12 and 18 years old at death respectively. The south west quadrant contained adult bones of indeterminate sex and the lower level of the south west quadrant also contained an adult of indeterminate sex. The burial (Burial 006) from the south west quadrant was of a probable male aged c.18 to 22 years. There were also juvenile bones aged between 7 and 13 years. The south east quadrant contained the remains of at least one adult of indeterminate sex, a juvenile aged c.13 to 15 years and another juvenile aged less than 6 years old at death. The lower level of the south east quadrant contained a female aged c. 30 years and a possible juvenile. The burials from the south east quadrant were Burial 005, 021 and 022 and were of a male aged between 40 and 50, a probable female aged as an older adult and a probable male aged between 20 and 35 years respectively. The contexts 009 and 013 contained adult human remains.

From the four articulated skeletons, the six disarticulated burials and the eight other contexts containing human remains the most common pathology observed on the remains was periodontal disease in the form of caries, abscesses or ante-mortem tooth loss. This is to be expected from a skeletal population dating from the Post-Medieval period (Roberts and Cox 2003, 323 and Roberts and Manchester 2005, 73). Subsequently the most prevalent pathologies were lipping and excess bone formation on the vertebrae and at joint surfaces, probably due to primary arthritis caused by the ageing process. Non-specific inflammation, particularly of the ribs, was seen in four cases. This can be caused due a multitude of reasons such as soft tissue trauma, infection or pulmonary disease (Roberts and Manchester 2005, 171-2). Enamel hypoplasia was identified on the teeth from three individuals. This can signify childhood disease or a period of nutritional or metabolic stress. Further evidence of metabolic disorders was seen on two individuals, one showing signs of vitamin D deficiency or rickets on the femora and one showing *cribra orbitalia* in the orbits of the skulls, signifying iron deficiency anaemia. One of the skulls had considerable bone loss within the cranium which might be due to syphilis, although there was no other evidence on the skeleton. Therefore it was more likely to be due to non-specific infection.

The human remains from King Street also showed signs of healed and unhealed trauma. Three individuals had cut mark trauma, one of which was on the skull. Evidence of a blunt impact trauma and a separate healed compression fracture were found on two other skulls. Another probable blunt impact trauma was seen on a tibia and a soft tissue injury was found which had caused the fusion of two cervical vertebrae. It is highly likely that some of these traumas caused the individual's deaths.

6.9.21 Conclusion

The excavation at King Street, Derby, revealed four articulated human burials and six quadrants of disarticulated human remains which contained six disarticulated incomplete burials. Evidence of twenty two adults and at least seven immature individuals was recovered. More specifically, these individuals were aged as zero neonates (0 to 1 years), two infants (1 to 5 years), four juveniles (6 to 11 years), four teenagers (12 to 18 years),

three young adults (18 to 30 years), five middle adults (31 to 45 years), three older adults (46+ years) and one juvenile and seven adults who could not be accurately aged (Appendix Two). Furthermore within this assemblage there were three males, four probable males, four of indeterminate sex, three probable females and three females (Appendix Three). These age and sex ranges are fairly average and are typical for a churchyard assemblage.

The deposition patterns proved that articulated burials had been moved after burial and partially, or as completely as possible, reburied at a later date, for example the skulls from Burials 021 and 022. This was probably due to the re-arrangement of the churchyard to make way for new burials or due to the recent ground disturbance.

Various pathologies including evidence of the ageing process in the form of primary osteoarthritis and rheumatoid arthritis, childhood illnesses and nutritional deficiencies in the form of anaemia, possible rickets and enamel hypoplasia, non-specific infection and healed and unhealed trauma were found. There was also a high prevalence of dental disease from a sugary diet and poor oral hygiene. Again all of these diseases were typical for a Post-Medieval churchyard skeletal assemblage.

6.10 An Assessment of the Coffin Furniture (by Dr Hugh Willmott)

A rapid assessment of a group of coffin fittings from King Street, Derby was undertaken in order to ascertain the broad nature of the interments and provide provisional dates for the burials where possible. These results are summarised at the end of the report. These conclusions must be treated with some caution, and it is possible that in some cases with further analysis, and x-ray evidence, more precise dating might be achieved, although this cannot be guaranteed.

All the material culture is highly degraded, although it is clear that the burials are Post-Medieval in date and belong to the later 18th and 19th centuries. In almost all cases the coffins receive some embellishment with elements that are specifically manufactured for burial. The most obvious of these are the iron grips (or handles) which are types that are only found on coffins (Figs 33 and 34). Significantly more degraded, but potentially more informative, are the fragments of iron chest and grip plates. These were mass-produced die-stamped items that were decorated with a variety of designs that can sometimes be quite accurately dated by reference well preserved and inscribed examples from crypt burials. In broad terms the stamped plates can be dated to the period 1740-1820, after which plainer plates often made from tin or base metal became more fashionable. This is also confirmed by the suggestion that coffin (024) was cloth covered- this was a practice that fell out of favour by the 1840s when French polished caskets became the fashionable norm.

Two burials might be slightly earlier in date. Coffin (019) had no evidence for this more elaborate material culture, but instead produced just shroud pins (Fig. 35) and the preserved evidence for a shroud. It is therefore tempting to suggest that this burial might be 17th-early 18th century in date. However it is also possible it is associated with the burial of an infant or juvenile who might also be buried in a more conservative fashion. The other interesting piece of potentially earlier material culture is a large portion of lid hinge SF 7 (disturbed fitting). This is an ordinary domestic furniture hinge, as might be found on a chest or tallboy, yet these are not in frequent finds on earlier coffins dating to the 17th century. Despite this, by the middle of the 18th century the practice of having a hinged lid on a coffin appears to have ceased, therefore this piece could provide an interesting *terminus ante quem*.

6.10.1 Summary of the Coffin Furniture

Coffin 011 *Late 18th-19th century*
1 nail
Small fragments of grip or chest plate

Coffin 017 *Late 18th-19th century*
Very fragmented chest? plate

Coffin 019 *18th century, may be earlier?*
2 nails
3 shroud pins
Organic, winding sheet?

Coffin 024 Mid 18th - mid 19th century
SF 19: Organic, internal upholstery
SF 20: Grip plate
SF 21: Grip
SF 23: Grip
SF 24: Grip. Strap end
SF 25: Grip
SF 26: Grip
SF 27: Grip plate
SF 28: Organic, possible velvet/fabric coffin covering

Coffin 029 Late 18th- 19th century
SF 22: Grip
Fragmented chest? plate

Disturbed coffin fittings
SF 1: Grip *Late 18th-19th century*
SF 30: Grip *Late 18th-19th century*
SF 4: Grip and grip plate. Second grip. *Late 18th-19th century*
SF 5: Grip *Late 18th-19th century*
SF 7: Hinge *17th-early 18th century??*
SF 8: Lead cloth seal uncertain

Coffin 011 Late 18th-19th century
SF 9: Large grip
SF 10: Grip
SF 12: Large grip and grip plate
SF 13: Grip
SF 14: Grip. Nails
SF 15: Grip
SF 16: Grip
SF 17: Grip

Figure 33: Handle SF 16 of coffin (011)

Figure 34: Handle SF 23 of coffin (024)

Figure 35: Shroud pins of burial (020) and nail of coffin (019)

7 Overall Discussion

7.1 A number of historic maps were consulted in order to establish development of the site over time. Ordnance Survey maps of a suitable scale have been included in a map regression exercise. The maps are reproduced by permission of Ordnance Survey on behalf of the Controller of her Majesty's Stationary Office. Crown Copyright –All Right Reserved. Licence Number 100045420.

7.2 From the Ordnance Survey mapping, it is demonstrated that the site lies within the former burial ground of Saint Alkmunds Church, which is illustrated in the 1899, 1901 and 1947 OS maps (Figs 36-38). The church is mentioned in the 1086 Domesday Book but it was rebuilt in 1843. Subsequently it was demolished in 1967 in order to build the present inner ring road. Photographs of the demolition work of the church are available online (www.derbyphotos.co.uk/oldphotos/lsc/index.htm). Prior to the re-development of the Jurys Inn Hotel and the adjacent area, including the land immediately west of the subway, the site consisted of grassland with some trees without sign of any grave stones or associated building remains.

7.3 Excavation in preparation for the landscaping of a pathway leading from King Street, north towards the entrance of the Jurys Inn Hotel, resulted in some considerable disturbance to a brick built grave, of mid 19th century date. This disturbance completely removed the grave capping which reportedly consisted of a sandstone slab, or series of slabs. Further excavation within the interior of the grave had substantially reduced the grave fill, largely towards the eastern end of the grave, and had evidently disturbed the remains of one or more individuals.

7.4 A further watching brief, carried out in the land adjacent to King Street, revealed four *in situ* articulated burials (contexts 015, 020, 025 and 030) and six disarticulated incomplete burials (contexts 004, 005, 006, 014, 021 and 022). Furthermore, elements of twenty two adults and at least seven immature individuals were also recovered. Despite moderate disturbance, the burials were found in fairly good state of preservation, particularly within the lower levels of the land. The *in situ* remains were orientated east-west, all with wooden coffins. Occasional iron and metal objects were recovered from around these graves and are thought to be coffin furniture such as handles, hinges, nails etc but no other grave-goods were encountered. This is fairly typical of Christian graves, being generally modestly adorned. Coffin furniture was also recovered from some of the graves but the metal objects were typically eroded. However, it was possible to identify the date of the majority of them, which corresponded to the 18-19th century. No coffin plates bearing the names of the deceased (which were commonly used from 18th century onwards) were recognized.

7.5 The development area was excavated to the maximum depth of 52.15 metres AOD. Following the removal of the lowest burials (contexts 025 and 030), no additional graves and/or burials were noticed. Although it is possible that further burials may be present at lower levels, no additional excavation was considered necessary as these would not be disturbed.

7.6 Various pathologies including evidence of the ageing process in the form of primary osteoarthritis and rheumatoid arthritis, childhood illnesses and nutritional deficiencies in the form of anaemia, possible rickets and enamel hypoplasia, non-specific infection and

healed and unhealed trauma were found. There was also a high prevalence of dental disease from a sugary diet and poor oral hygiene. Again all of these diseases were typical of a Post-Medieval churchyard skeletal assemblage.

7.7 In the absence of documentary evidence for the clearance of the burial ground and the extensive evidence for *in situ* graves from this watching brief, it appears reasonable to infer that no formal clearing of the burial ground was undertaken prior to construction of the ring road in the late 1960s. There has been substantial disruption and loss from the burial ground, but this appears to relate to the impacts from construction and demolition in the late 1960s rather than the managed removal of graves.

7.8 In terms of future mitigation, the remaining land of the former burial ground may be under threat from groundworks, particularly if the reduction of the ground is below c. 500mm in depth.

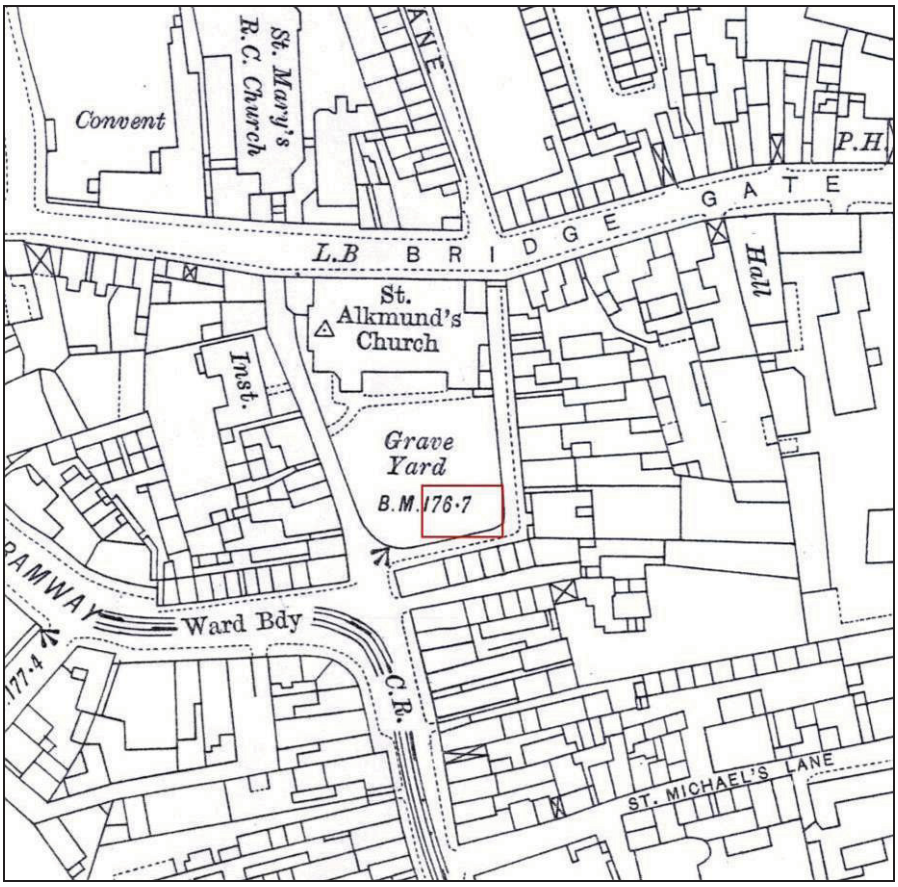

Figure 36: Extract of the 1899 OS map showing the site in red

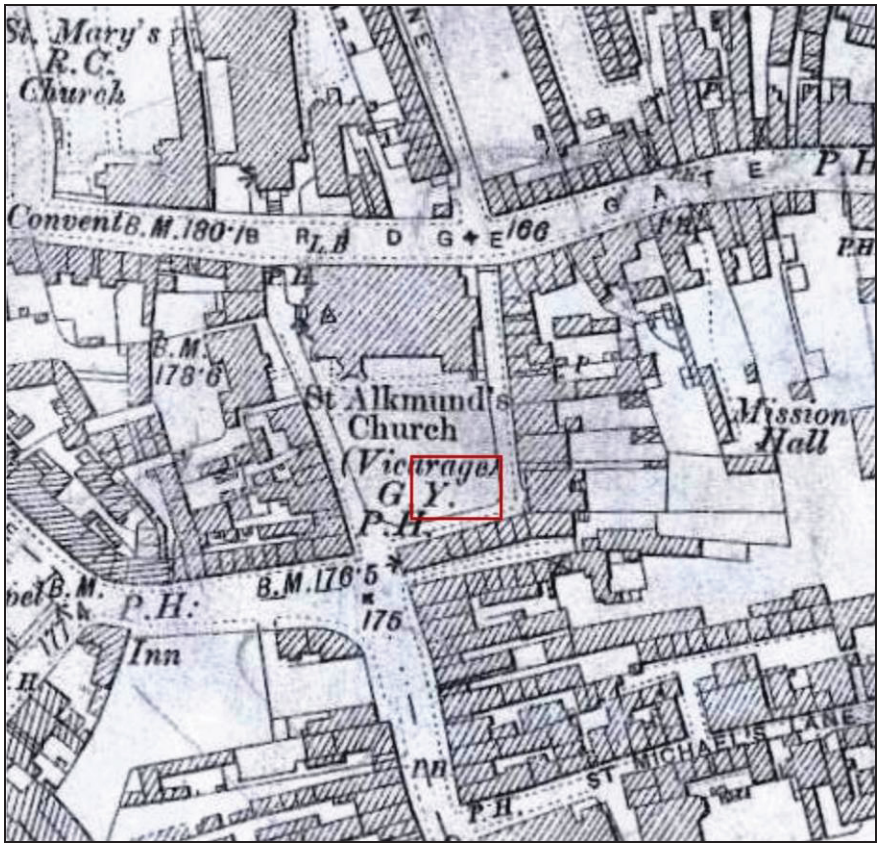

Figure 37: Extract of the 1901 OS map showing the site in red

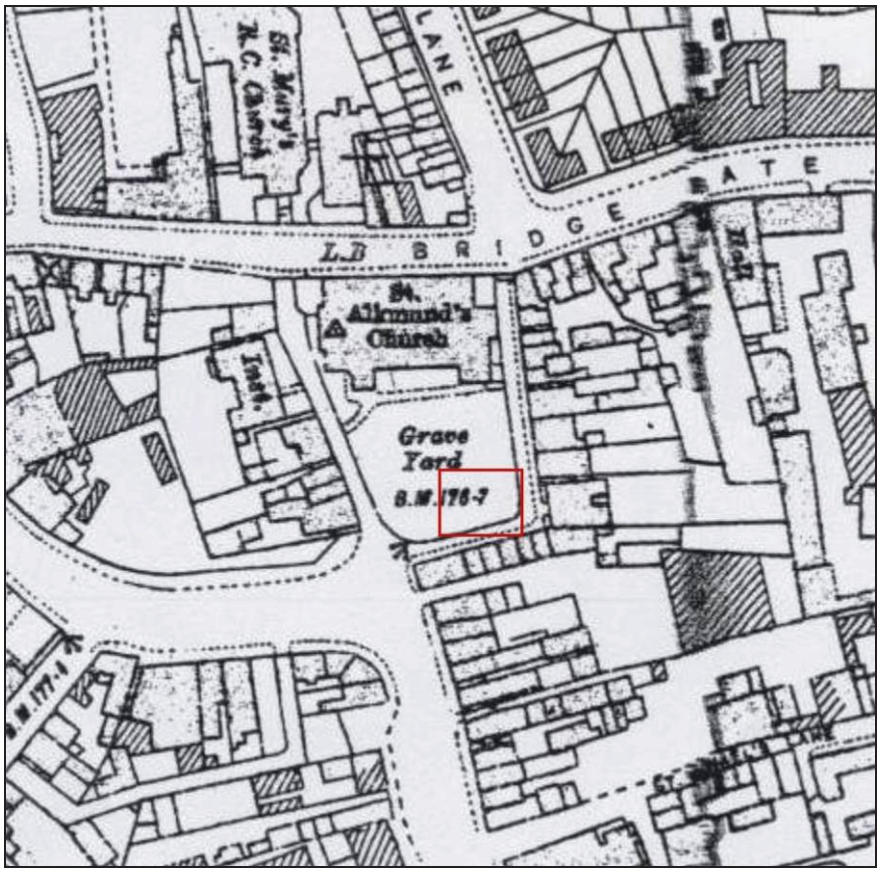

Figure 38: Extract of the 1947 OS map showing the site in red

8 Conclusions

8.1 An archaeological watching brief was carried out at the Jurys Inn Hotel, King Street, Derby in June and July 2009. During the groundworks related to the re-landscaping of the land west of the Jurys Inn Hotel and next to King Street, three brick-lined graves were revealed. In addition to this, four *in situ* articulated burials, six disarticulated incomplete burials and elements of twenty two adults and at least seven immature individuals were also recovered. Despite moderate disturbance, the burials were found in fairly good state of preservation, particularly within the lower levels of the land.

8.2 Most of the burials were within graves and/or coffin. They were all on an east-west alignment (heads on the west side). The date of the inhumations was determined through analysis of the remains of the associated coffin fittings, which yielded a date to the 18-19th century. These graves survive c. 500mm below the present ground surface. Bioturbation and modern disturbance, linked to the construction of the ring road and sub-way path, have consistently intruded upon the graves within the higher ground. Thus the graveyard has the potential to remain intact to the west and north of the development area. In accordance with accepted practice the human bones were carefully removed and rebagged for later reburial.

9 Publicity, Confidentiality and Copyright

9.1 Any Publicity will be handled by the client.

9.2 Archaeological Research Services will retain the copyright of all documentary and photographic material under the Copyright, Designs and Patent Act, 1988.

10 Archive Deposition

10.1 A digital, paper and artefactual archive will be prepared by Archaeological Research Services Ltd, consisting of all primary written documents, plans, sections, photographs, electronic data and retained artefacts, which will be deposited at the Derby City Museum and Art Gallery (accession number: DBYMU 2009-212) in March 2010.

10.2 The skeletal remains will be reburied at Nottingham Road Cemetery, Derby which already has a plot for unidentified human remains from St Alkmund's Church.

11 Statement of Indemnity

11.1 All statements and opinions contained within this report arising from the works undertaken are offered in good faith and compiled according to professional standards. No responsibility can be accepted by the author/s of the report for any errors of fact or opinion resulting from data supplied by any third party, or for loss or other consequence arising from decisions or actions made upon the basis of facts or opinions expressed in any such report(s), howsoever such facts and opinions may have been derived.

12 Acknowledgements

12.1 Archaeological Research Services Ltd would like to thank all those involved in this project, in particular and consultation with the Diocesan Archaeologist, David Barrett, Archaeological Research Services were commissioned by the construction contractors, Peter Devlin of McAleer and Rushe Ltd, for commissioning this work and Steve Baker, the Development Control Archaeologist for Derbyshire, for giving advice and recommendations throughout the project.

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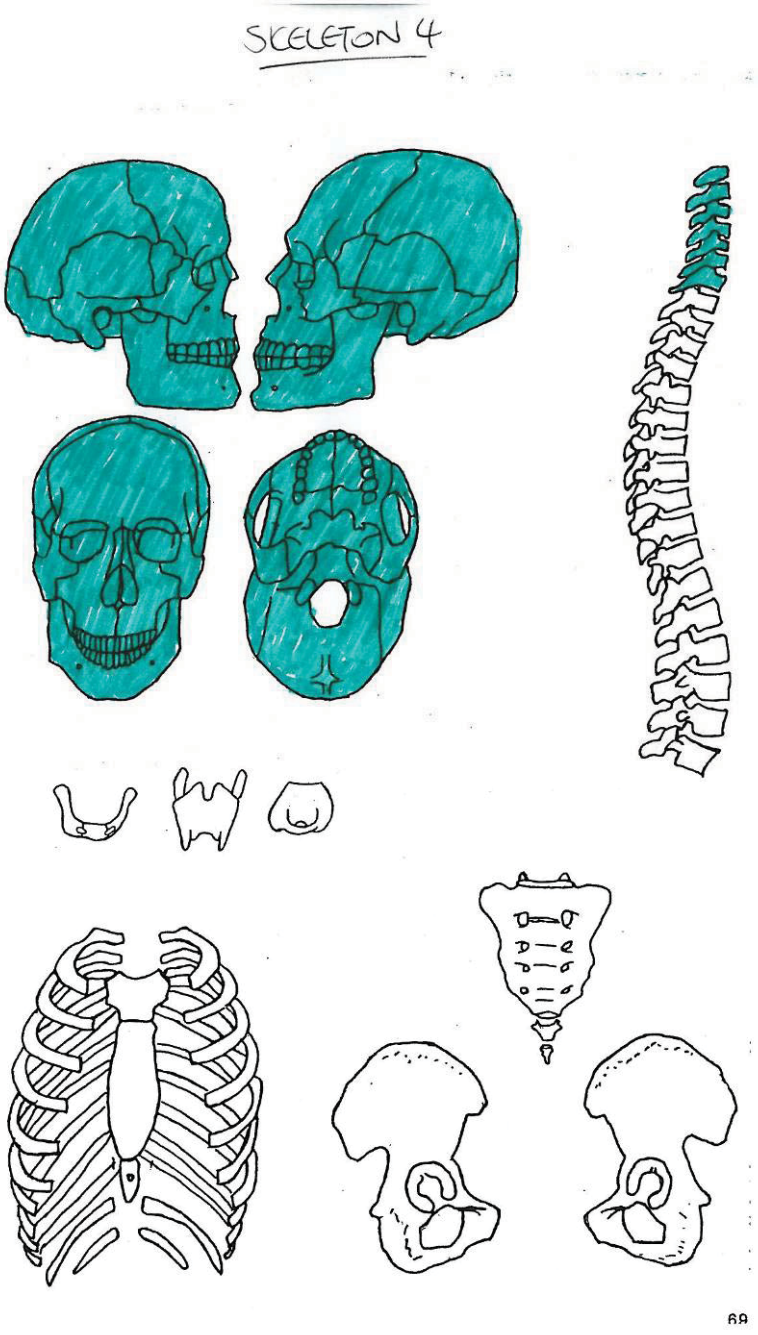
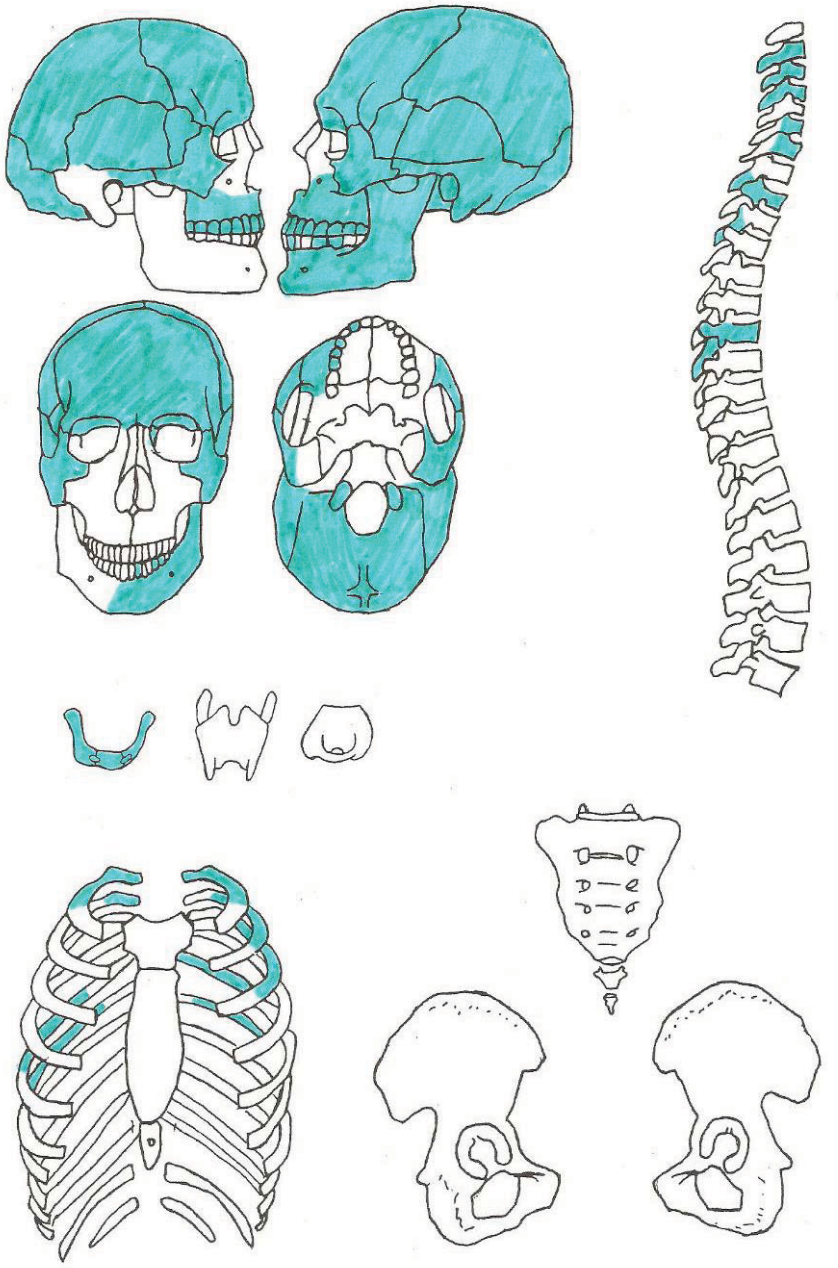
Appendix One: Skeletal Completeness Recording Sheets



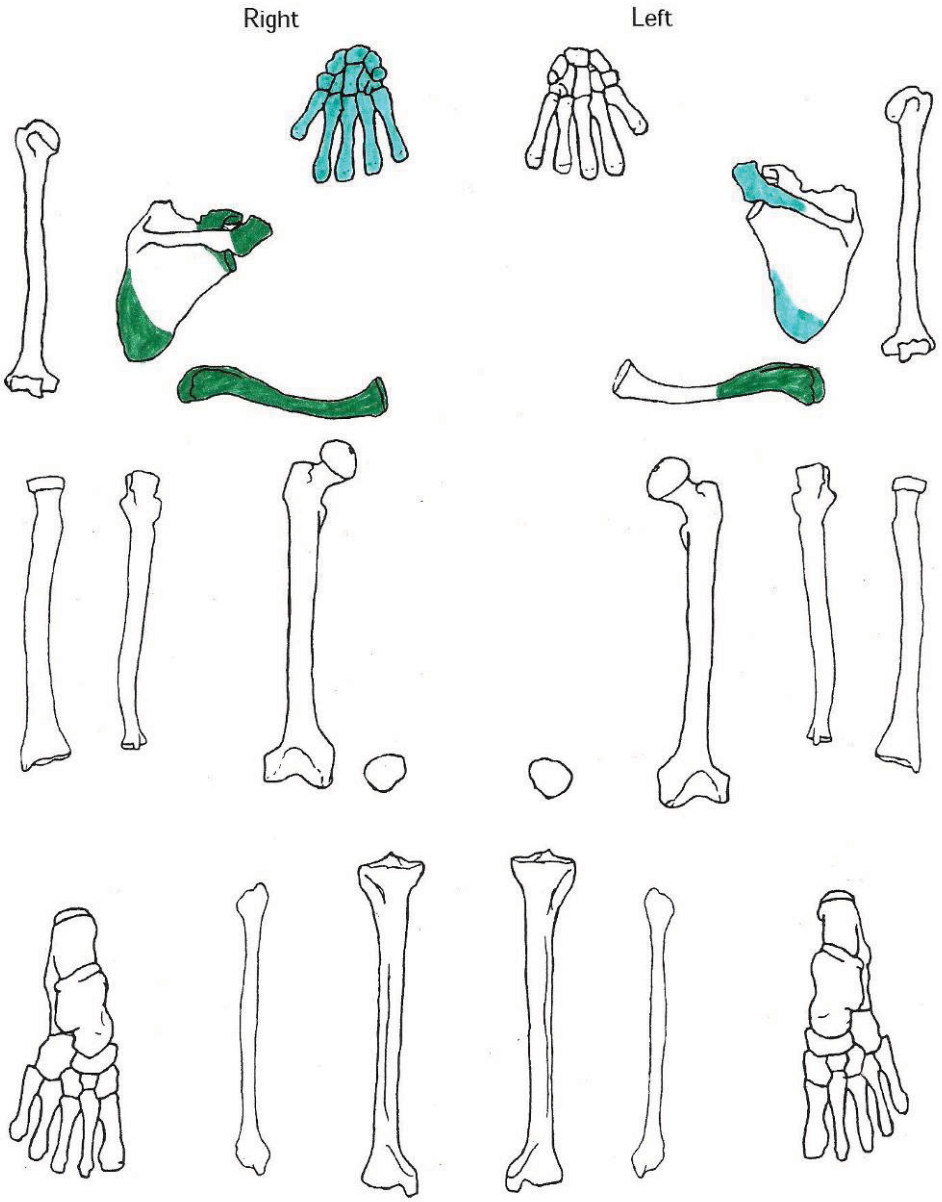
SKELETON 5.

Appendix 3 Adult skeletal record sheet



SKELETON S

Appendix 3 Adult skeletal record sheet (cont)



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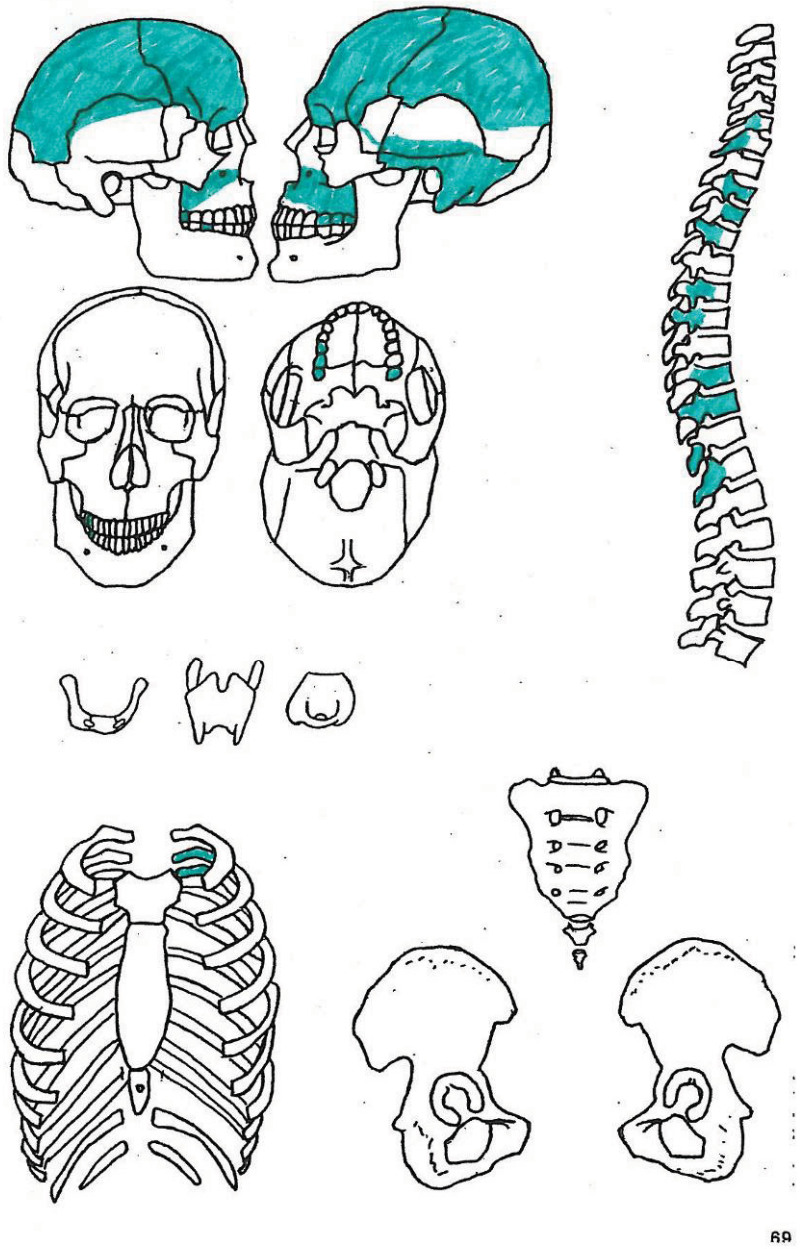

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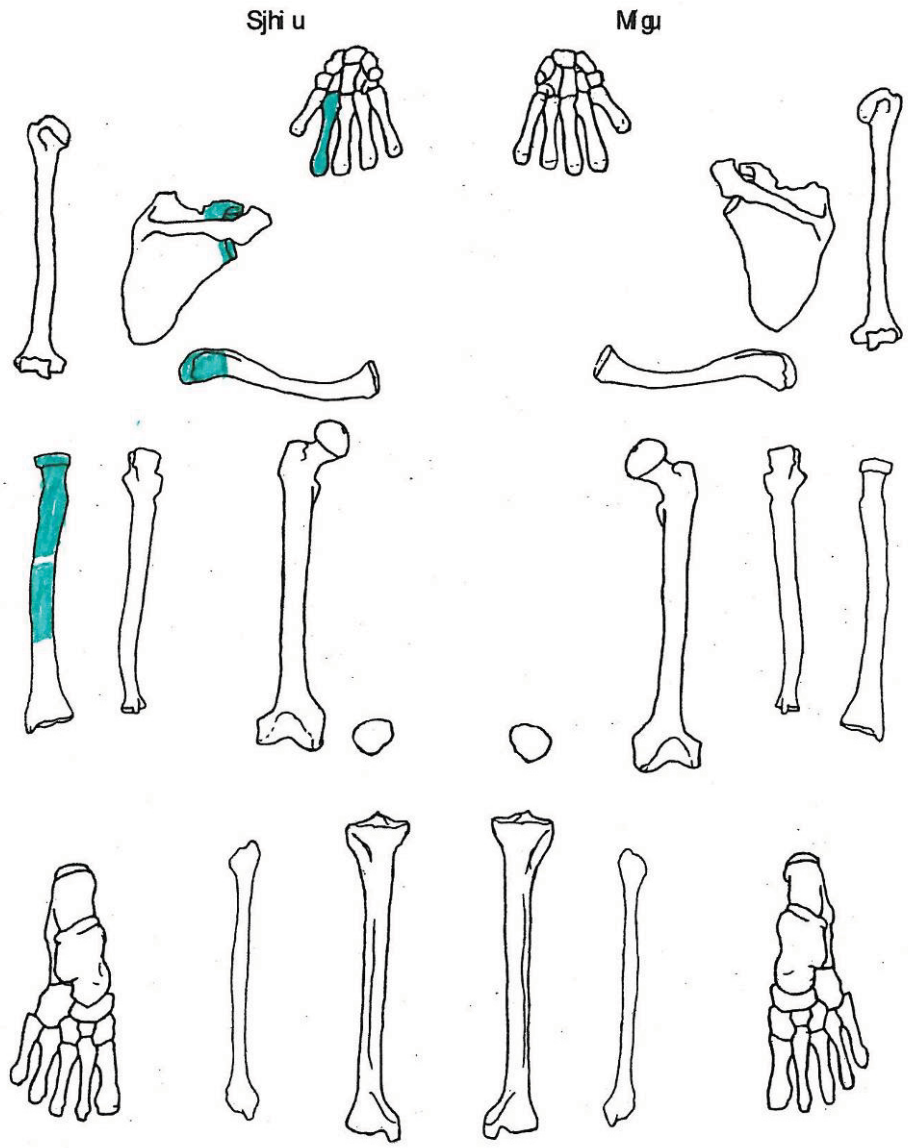

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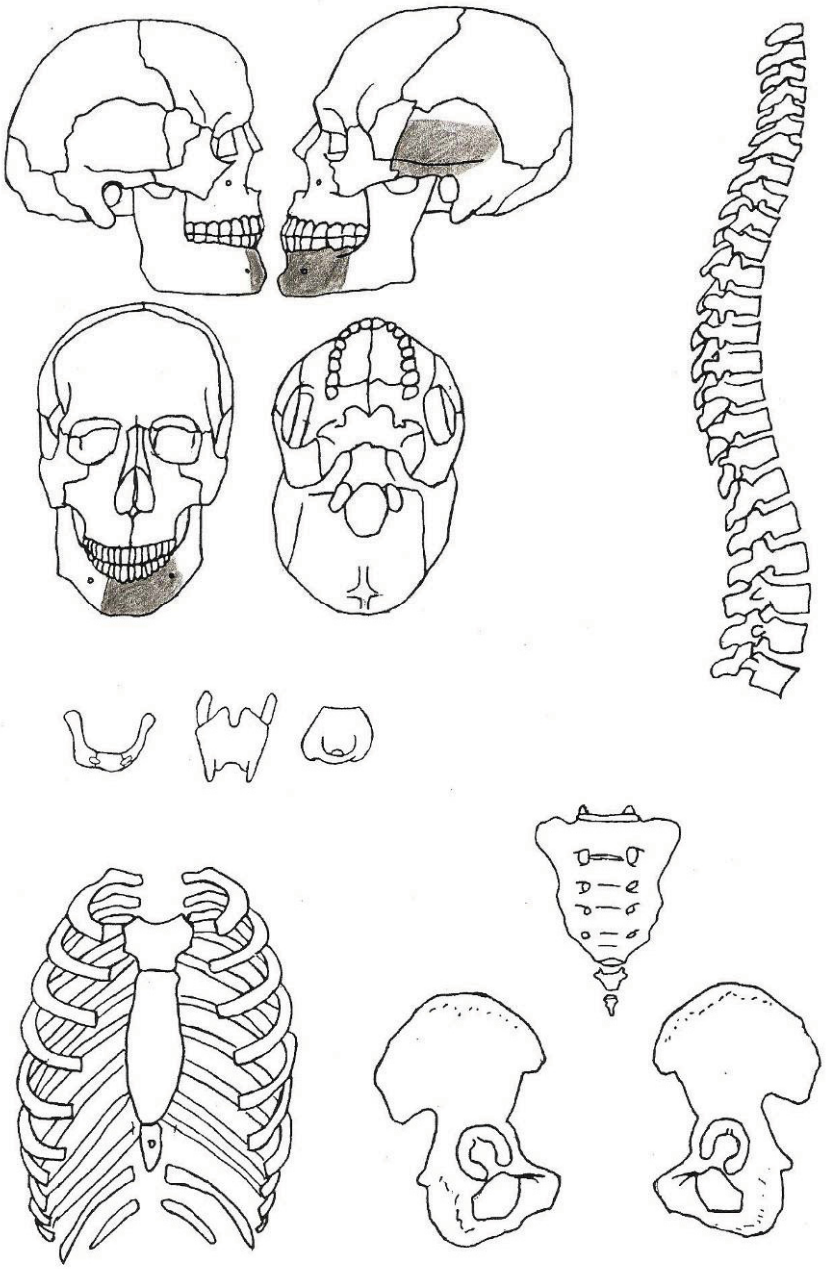

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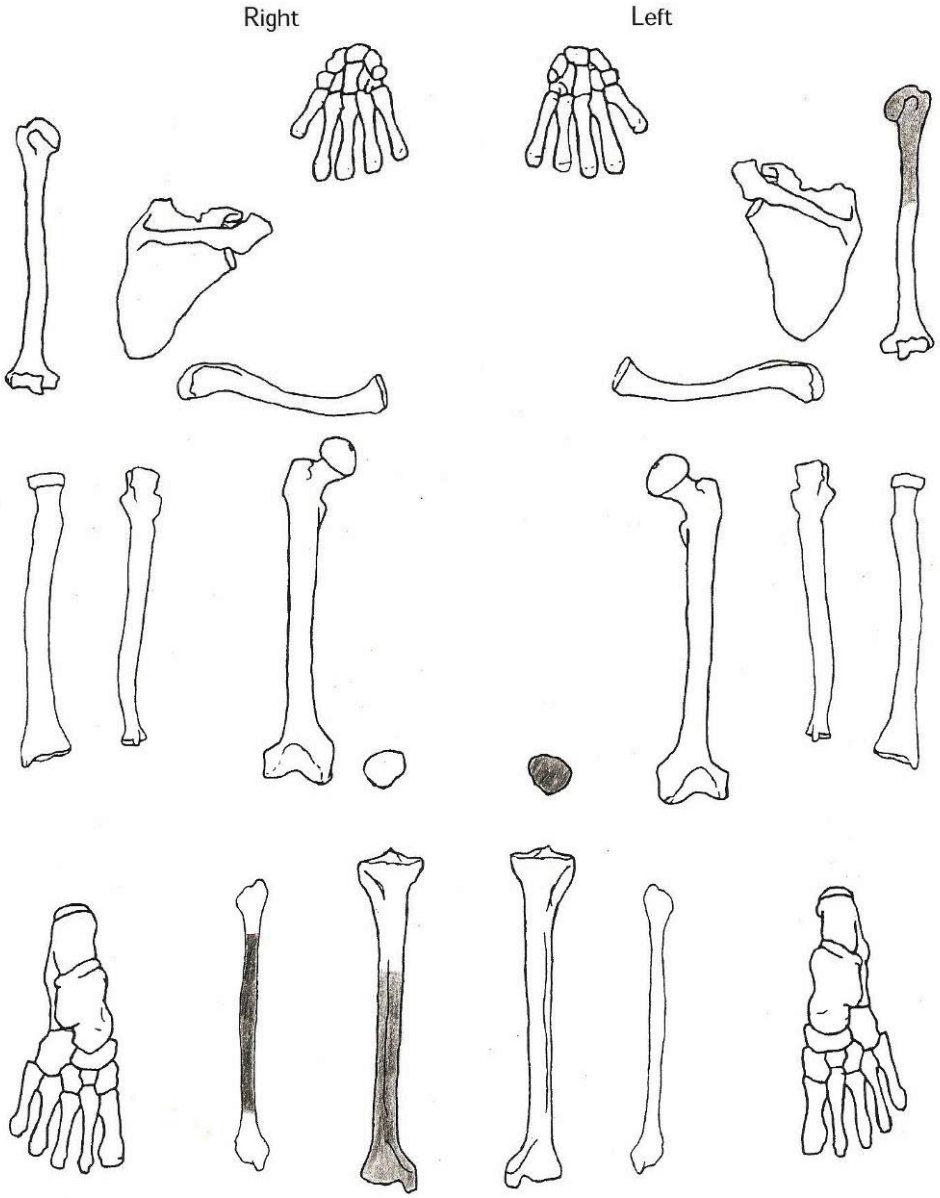

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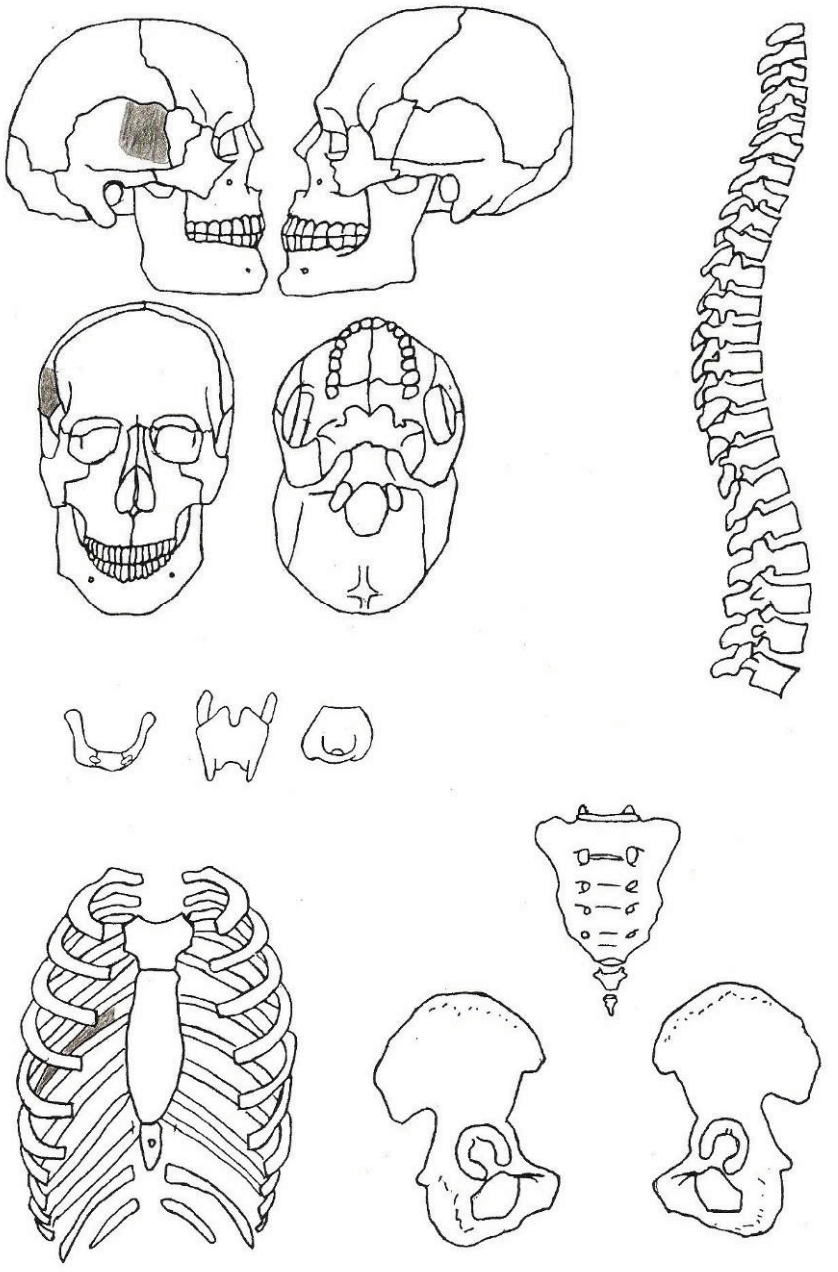

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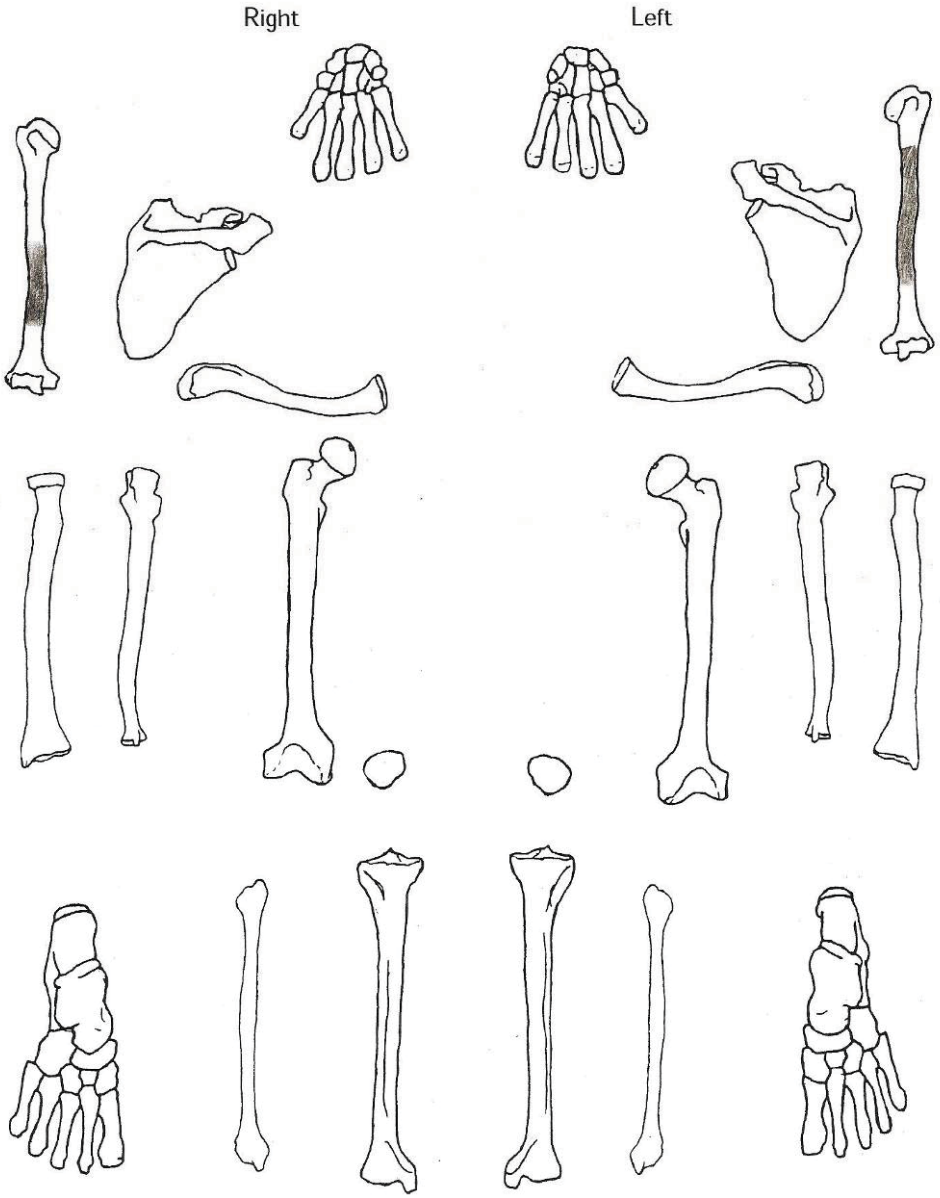

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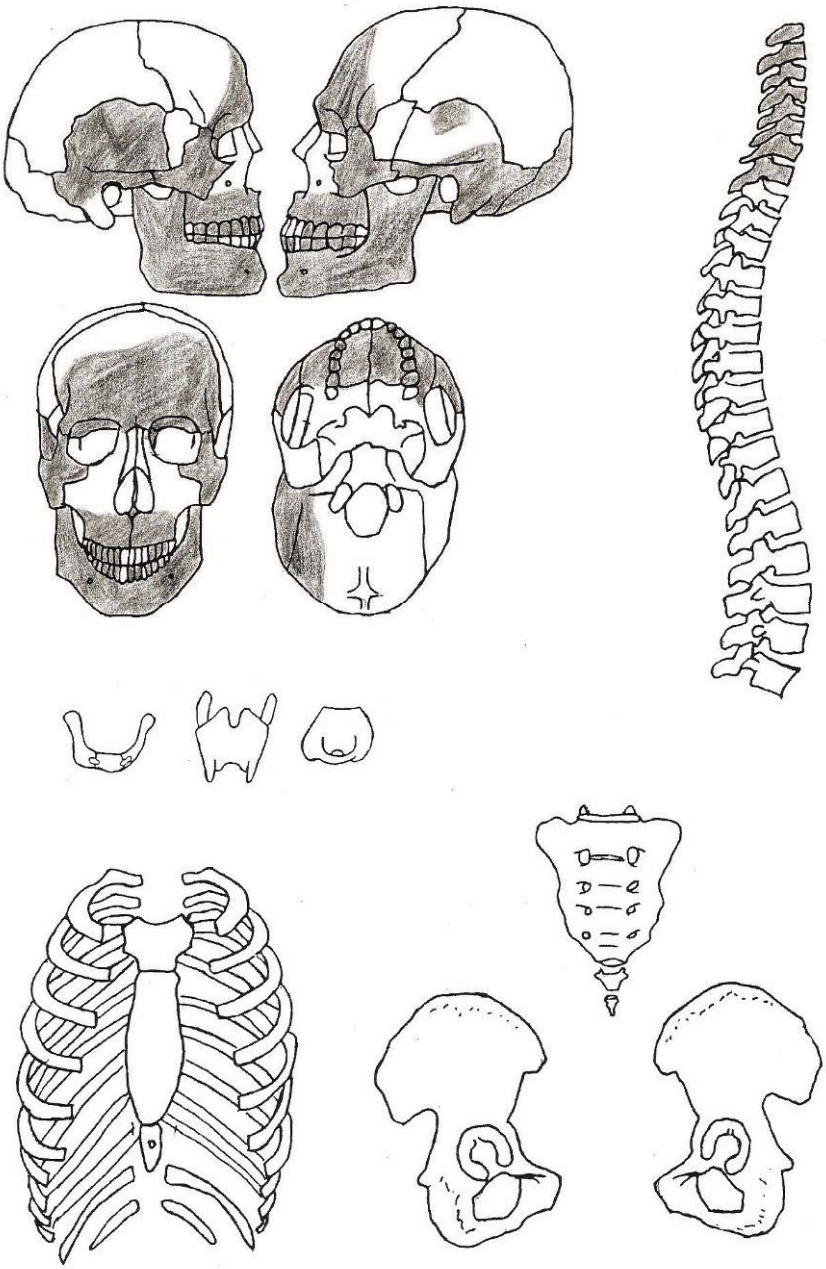

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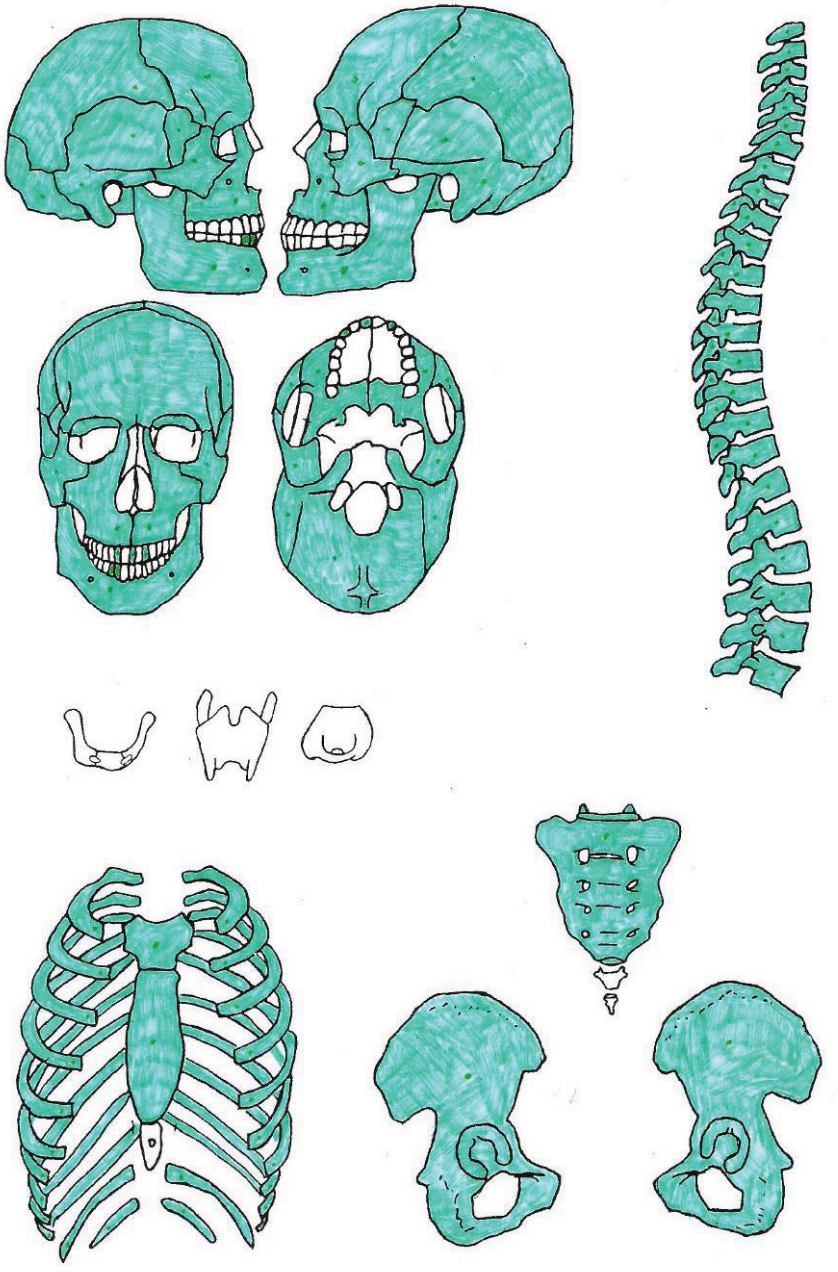

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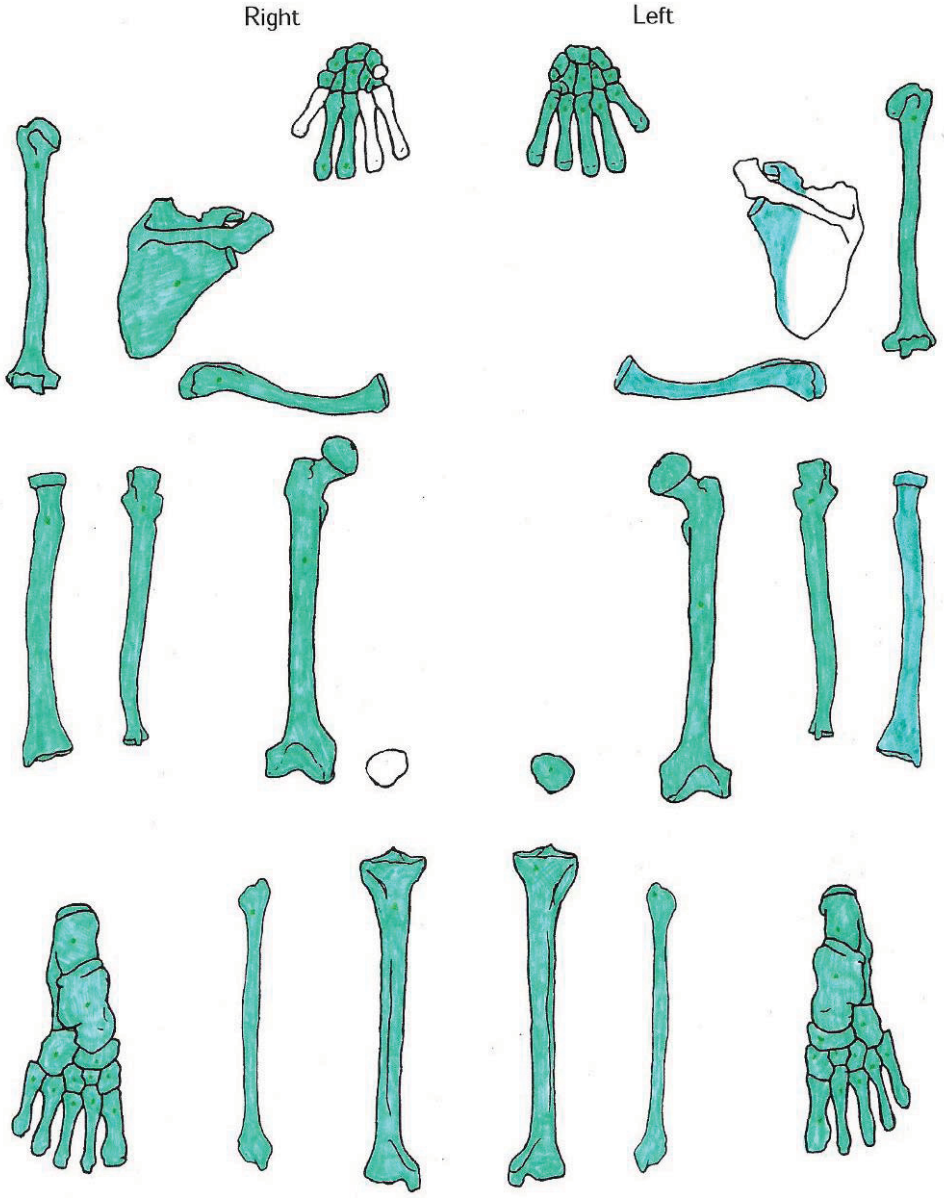

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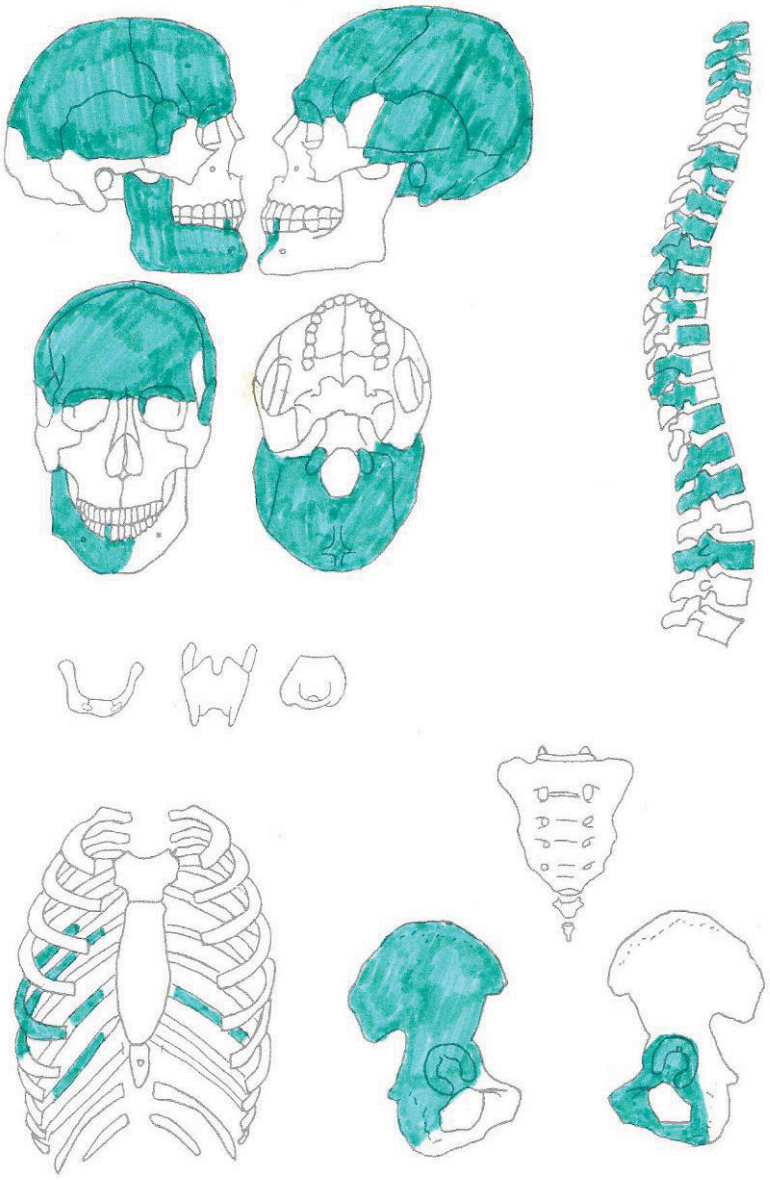
Appendix 3 Adult skeletal record sheet



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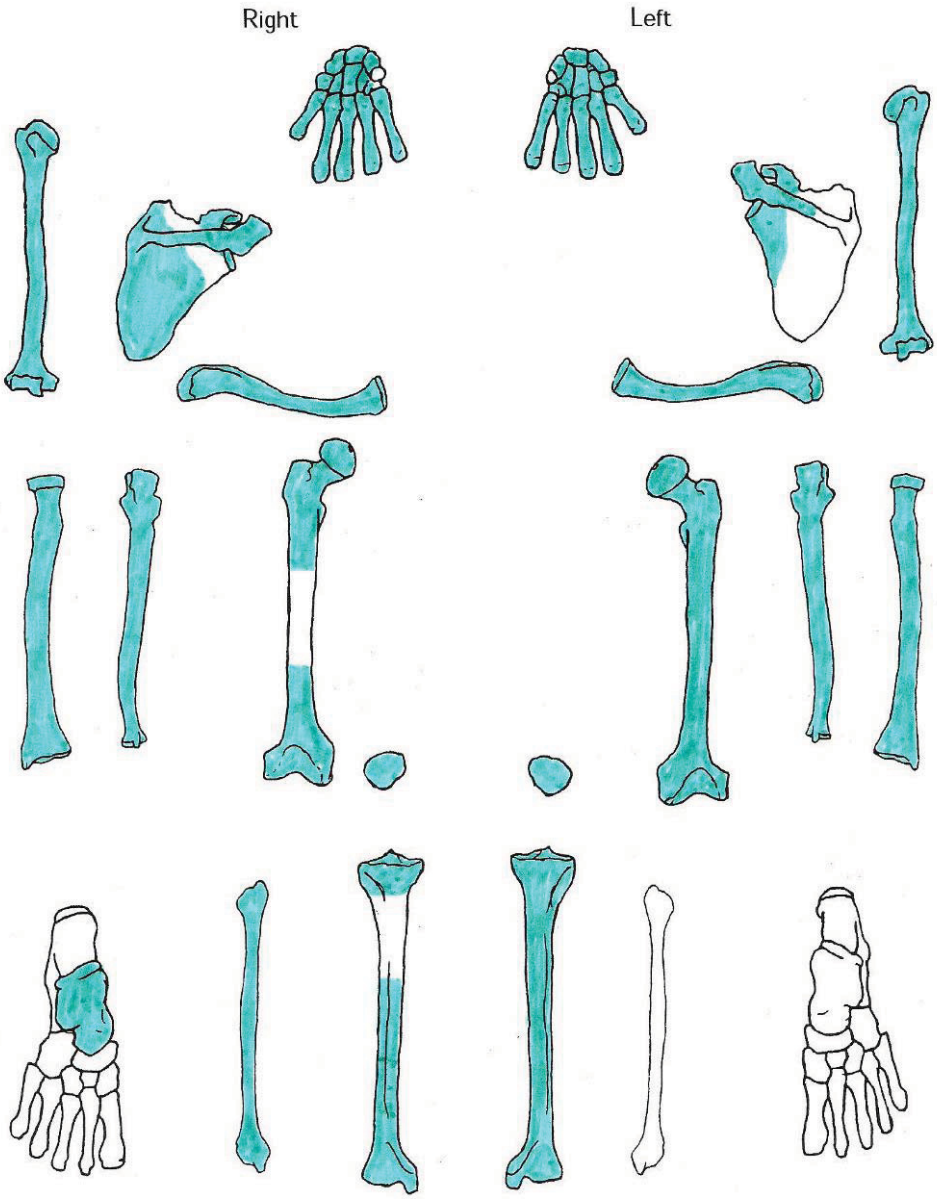

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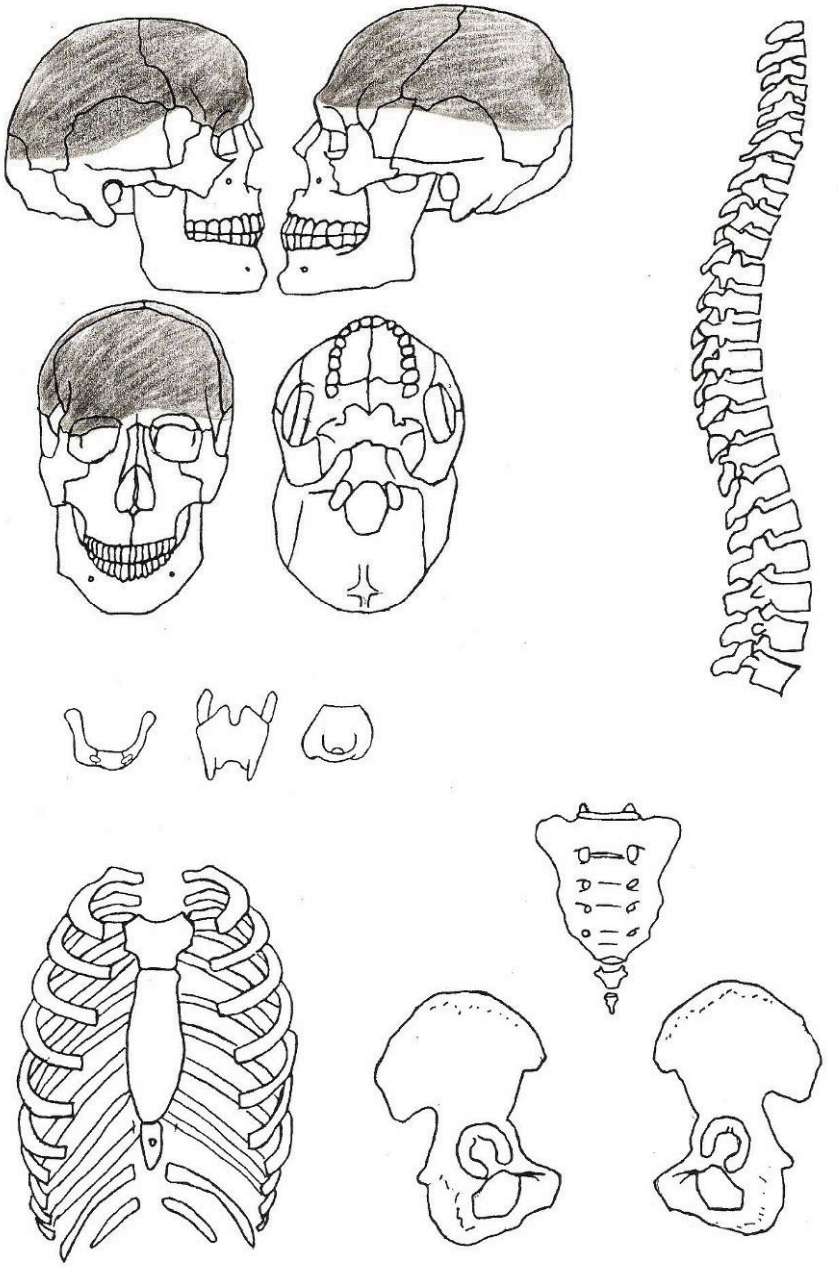

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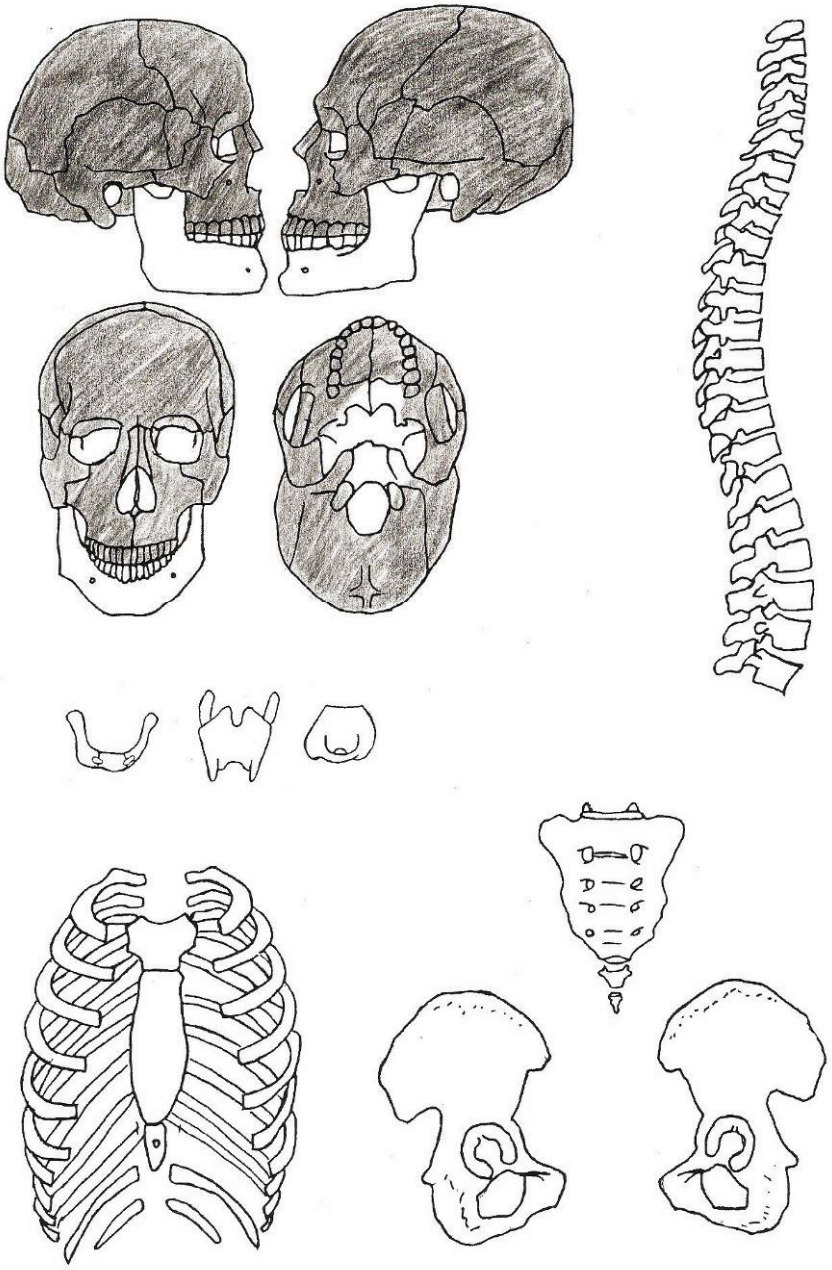

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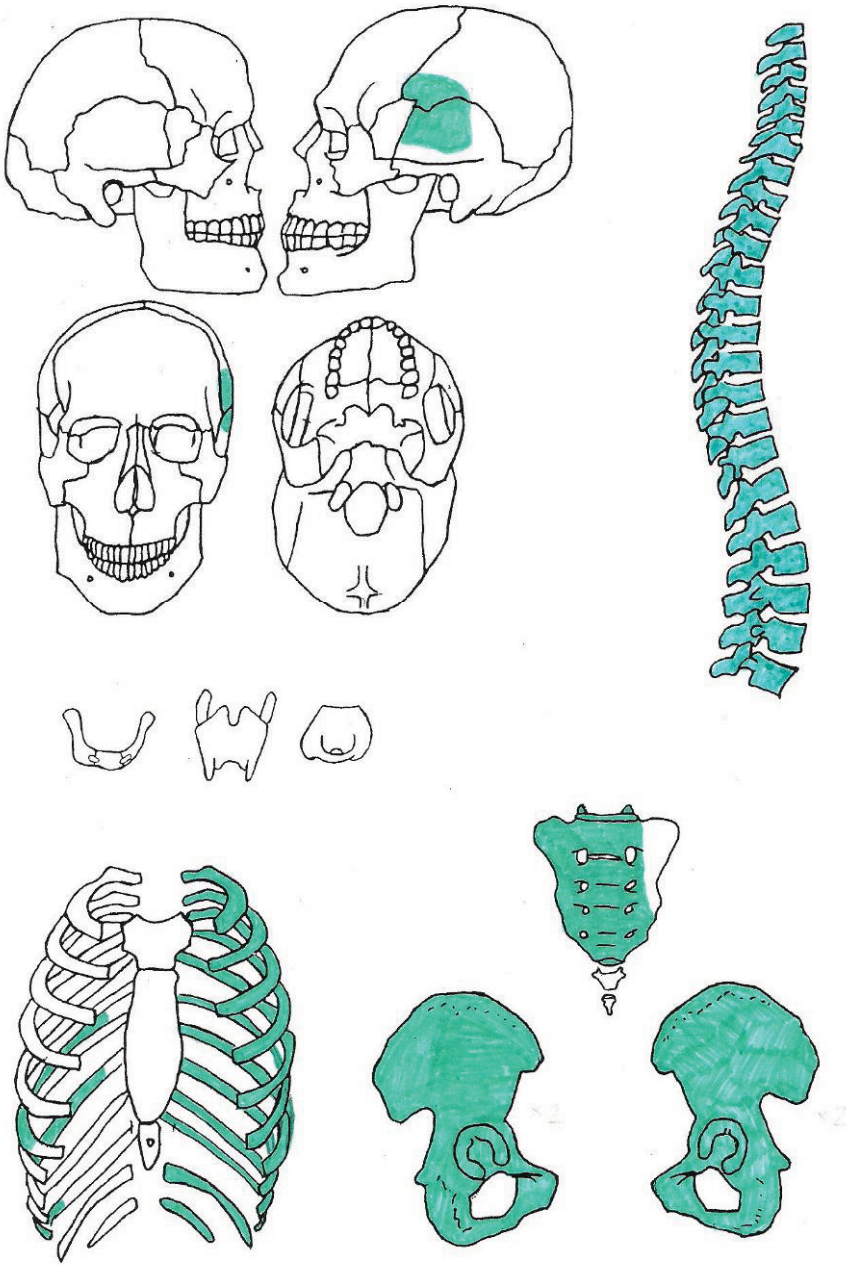

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SKELETON 25

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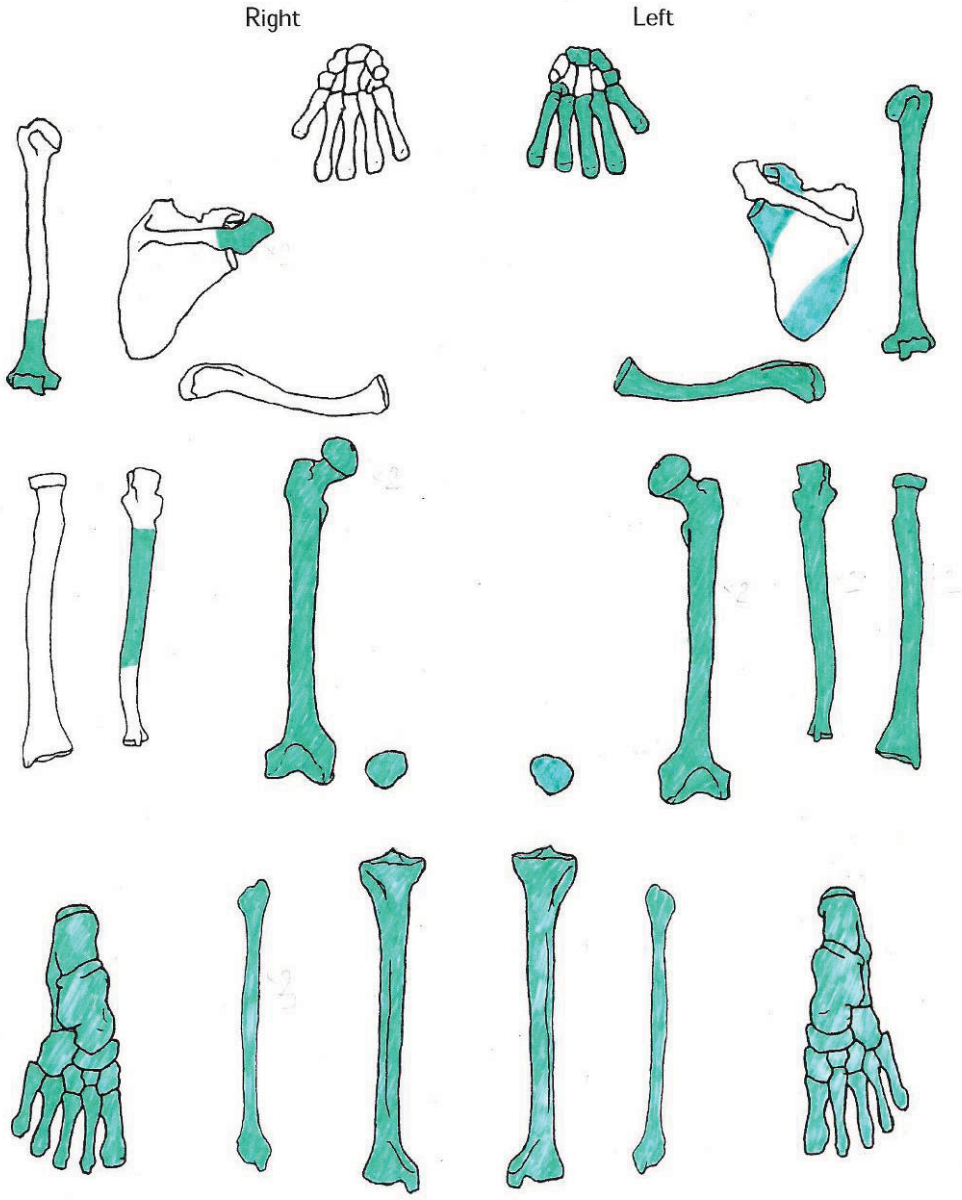

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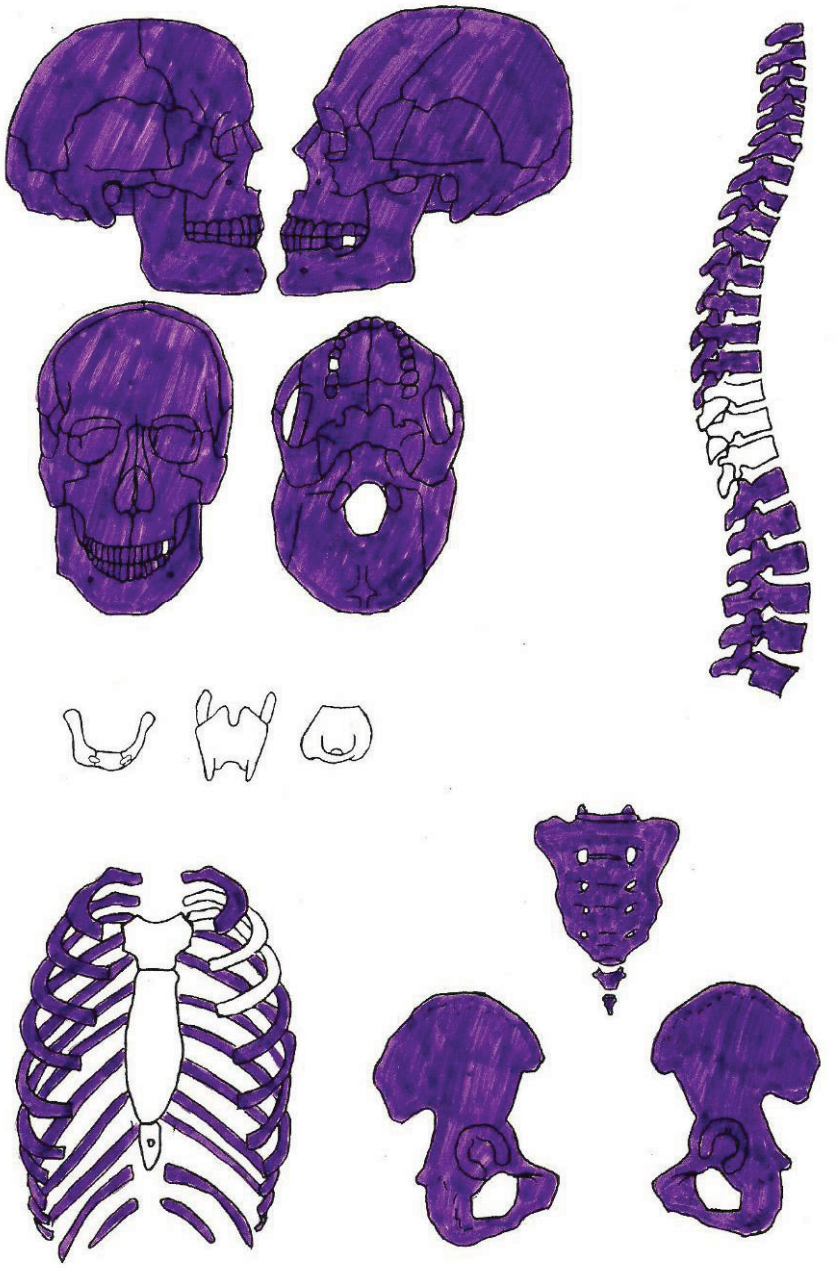

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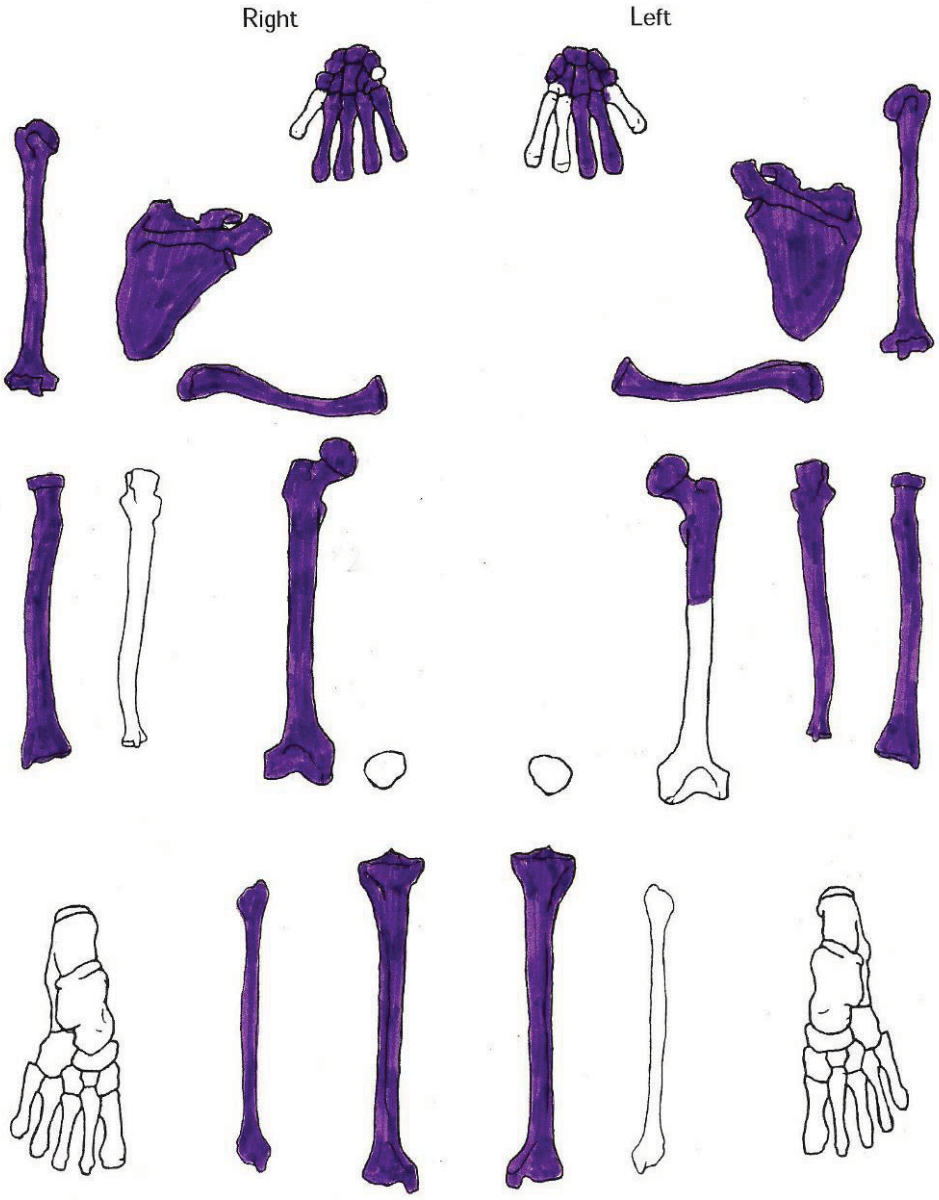


Appendix Two: Skeletal elements used to estimate age at death

Burial	Method	Age (years)
5	Cranial Suture Closure	45.2
	Tooth Wear	40-50
14	Maxillary and mandibular tooth wear	12-18
15	Cranial Suture Closure	48-56
	Auricular surface	45-47
	Pubic symphysis	44-50
	Humerus – unfused	<15
20	Vertebrae and ribs – minor lipping	Middle adult
	Mandible and maxilla teeth	Adult
	Maxillary canine	Deciduous
22	Maxillary tooth wear	20-35
25	Auricular surface	c.40
	Pubic symphysis	39-44 (VIII)
	Cranial Suture Closure	Obliterated sutures
	Auricular surface	30.5
	Femur head - unfused	<13
30	Tooth Wear	16-20
	Humeral head – recently fused	15-17
	Ulna – unfused	13-15
	Clavicle – unfused	<21
	Auricular surface	c.20
	Iliac crest – unfused	<14

Burial	Method	Age (years)
NE	Mandible tooth wear	40-45
	L3 – undulations	Juvenile
	Pubic symphysis wear	30-35
	Auricular sufrace	25-29
	Auricular sufrace	38.3, SD 10.9 (Phase IV)
	Tibia – unfused	<14
	Femoral head – recently fused	13-15
NW	Size of tibia	<1
SW	Humeral head – recently fused	15-17
	Humerus	Adult
	Pubic region of pelvis	Adult
	Pubic region of pelvis	Juvenile – fusion
	Femur – recently fused	16-21
	Fibula – unfused	c.6 years
	Radius – recently fused	13-15
SE	Humeral head – unfused	<15
	Femur – recently fused	13-15
	Fibula – unfused	<13
SE Lower	Auricular surface	30
	Tibia	Juvenile

Appendix Three: Skeletal elements used to estimate sex

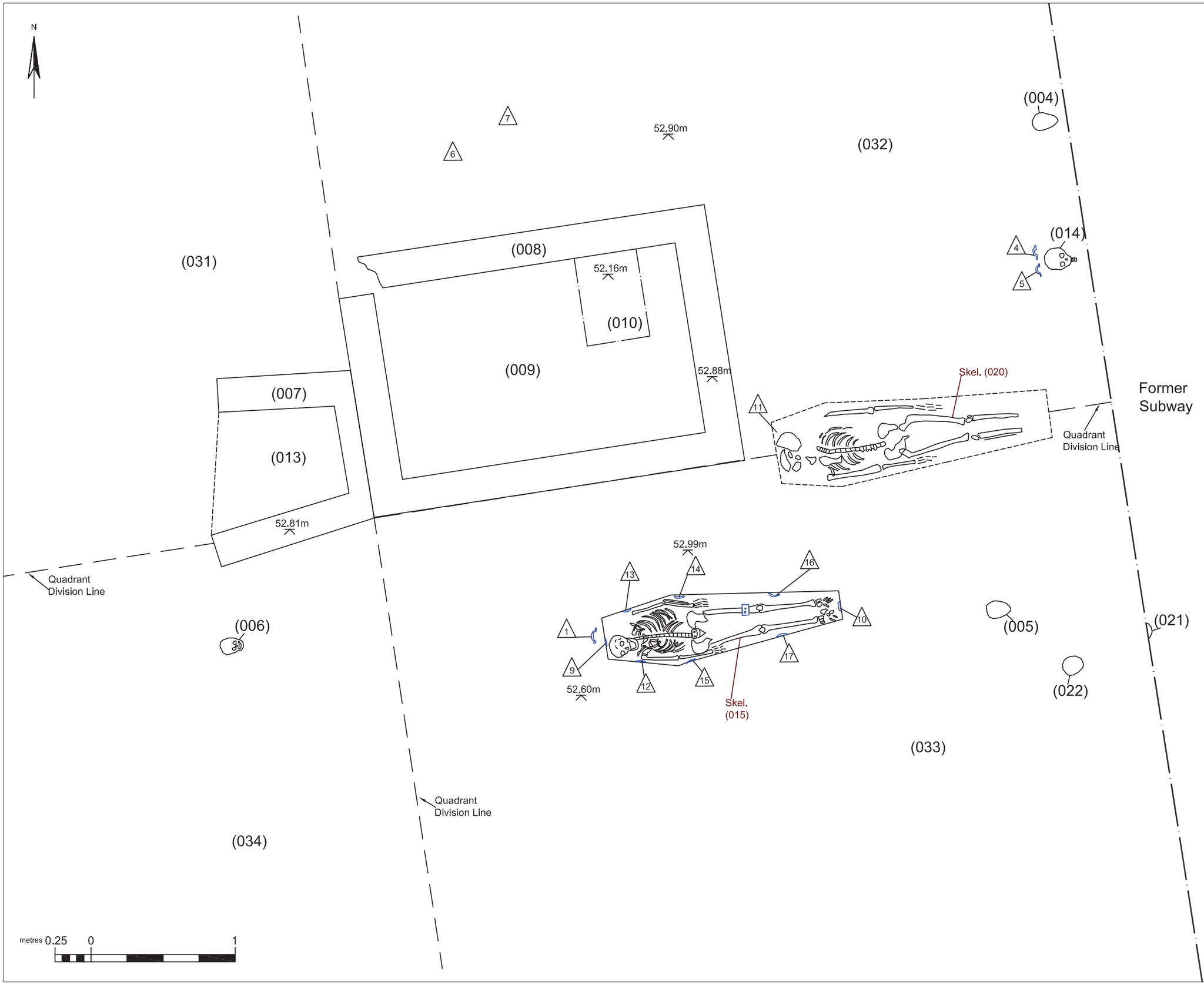
Burial	Skeletal Element	Grade	Sex
5	Mastoid process	5	Male
	Glabella	5	Male
	Supraorbital ridge	5	Male
	Gonial angle	5	Male
14	Mastoid process	3	?
	Gonial angle	1	Female
	Mental eminence	2	?Female
15	Mastoid process	4	?Male
	Nuchal crest	5	Male
	Supraorbital ridge	4	?Male
	Glabella	4	?Male
	Square jaw	4	?Male
	Mental eminence	2	?Female
	Gonial angle	2	?Female
	Sciatic notch	5	Male
	Pubic bone	5	Male
20	Nuchal crest	2	?Female
	Gonial angle	1	Female
	Mandible	2	?Female
	Sciatic notch	2	?Female
21	Glabella	1	Female
22	Square orbits	5	Male
	Mastoid process	3	?
	Glabella	3	?
	Supraorbital ridge	4	?Male
25	Sciatic notch	4	?Male
	Ventral arch	5	Male
30	Mastoid process	3	?
	Nuchal crest	4	?Male
	Mental eminence	1	Female
	Gonial angle	1	Female
	Square jaw	5	Male
	Sciatic notch	3	?

Burial	Skeletal Element	Grade		Sex
NE	Mandibular rami			Male
	Gonial angle			Male
	Ventral arch			Female
	Sciatic notch			?Female
SW	Tibia	Size		?Female
	Tibia	Size		?Male
SE Lower	Mastoid process		1	Female
	Sciatic notch		1	Female

Appendix Four: Basic observations of animal remains

Context	No. of bones	No. of teeth	Identified bones
4	0	0	
5	0	0	
6	0	0	
9	3	0	
12	1	0	
13	2	0	
14	0	0	
15	3	1	Metacarpal
20	3	0	
21	0	0	
22	0	0	
25	3	1	
30	3	0	
North West	1		
North East	3	0	
South East	13	2	Rib Tibia - butchered, cut marks, marrow removed Scapula x4
South East Lower	8	1	Cattle metatarsal
South West	4	0	Juvenile vertebra
South West Lower	1	0	

Appendix Five: Survey drawings of the watching brief



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Site Code: KIN 09
Drawing Ref:
Date: November 2009
Drawn: HS
Scale: 1:25 at A3

Title:

Survey Plan of the Upper Level

Key:

Notes:

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Site Code: KIN 09
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Title:

Survey Plan of the Lower Level

Key:

Notes: