UNIVERSITY OF WINCHESTER

FACULTY OF HUMANITIES AND SOCIAL SCIENCES

“Whence this Severance of the Head?”: The Osteology and Archaeology of Human Decapitation in Britain

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ABSTRACT

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Doctor of Philosophy

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Katie Tucker

Decapitation burials (burials in which the cranium and mandible are displaced from correct anatomical position and replaced elsewhere in the grave) are a relatively common minority burial practice in Romano-British cemeteries. They have usually been ascribed to a post-mortem funerary ritual with various different motives being postulated. However, these interpretations seem to have largely been based on assumption rather than evidence from the archaeological context or the human remains, only small numbers of which have been subjected to detailed skeletal analysis. Decapitated burials are also found in the early medieval period, and, conversely, these are normally concluded to be the victims of judicial execution, an interpretation that is only very rarely used when discussing Romano-British examples.

This thesis examines the archaeological and osteological data from a large sample of Romano-British decapitated burials and compares them with the wider Romano-British cemetery population, in order to better understand the differences between decapitated individuals and the rest of the population, in terms of burial practice, demographics, and ante-mortem health status. The evidence for decapitation in the Neolithic, Bronze and Iron Ages, early medieval, medieval and post-medieval periods was also examined, with the analysis of samples of decapitated individuals being undertaken where possible, in order to provide comparanda for the Romano-British examples, and assess whether there is any evidence for continuity in the practice between the periods.

The thesis focuses particularly on the evidence for decapitation-related peri-mortem trauma, and this data is used to identify and describe a number of different types of decapitation amongst the samples of individuals. The complete body of evidence is then used to discuss the feasibility of each of the different interpretations previously suggested for the practice of decapitation, with the intention that it can be used to inform any future discussion of such burials.

"Whence this severance of the head?" is quoted from Royce (1883: 77)

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Glossary

Anterior (ventral) – front

Distal – furthest from the centre of the body

Inferior - bottom

Lateral – furthest from the midline of the body

Medial – nearest to the midline of the body

Palmar – anterior surface (palm) of the hand

Plantar – distal surface (sole) of the foot

Posterior (dorsal) – back

Proximal – nearest to the centre of the body

Superior - top

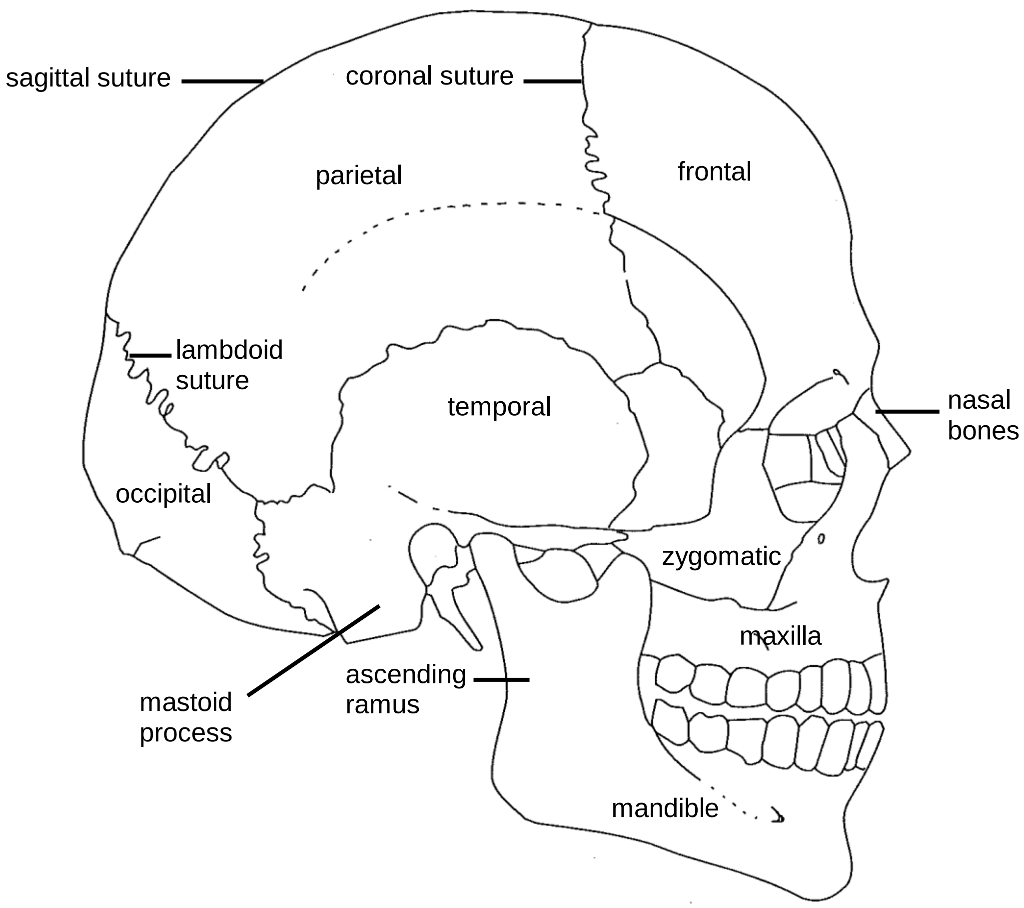


Figure i: the bones of the cranium and mandible, lateral view (adapted from Buikstra and Ubelaker 1994)

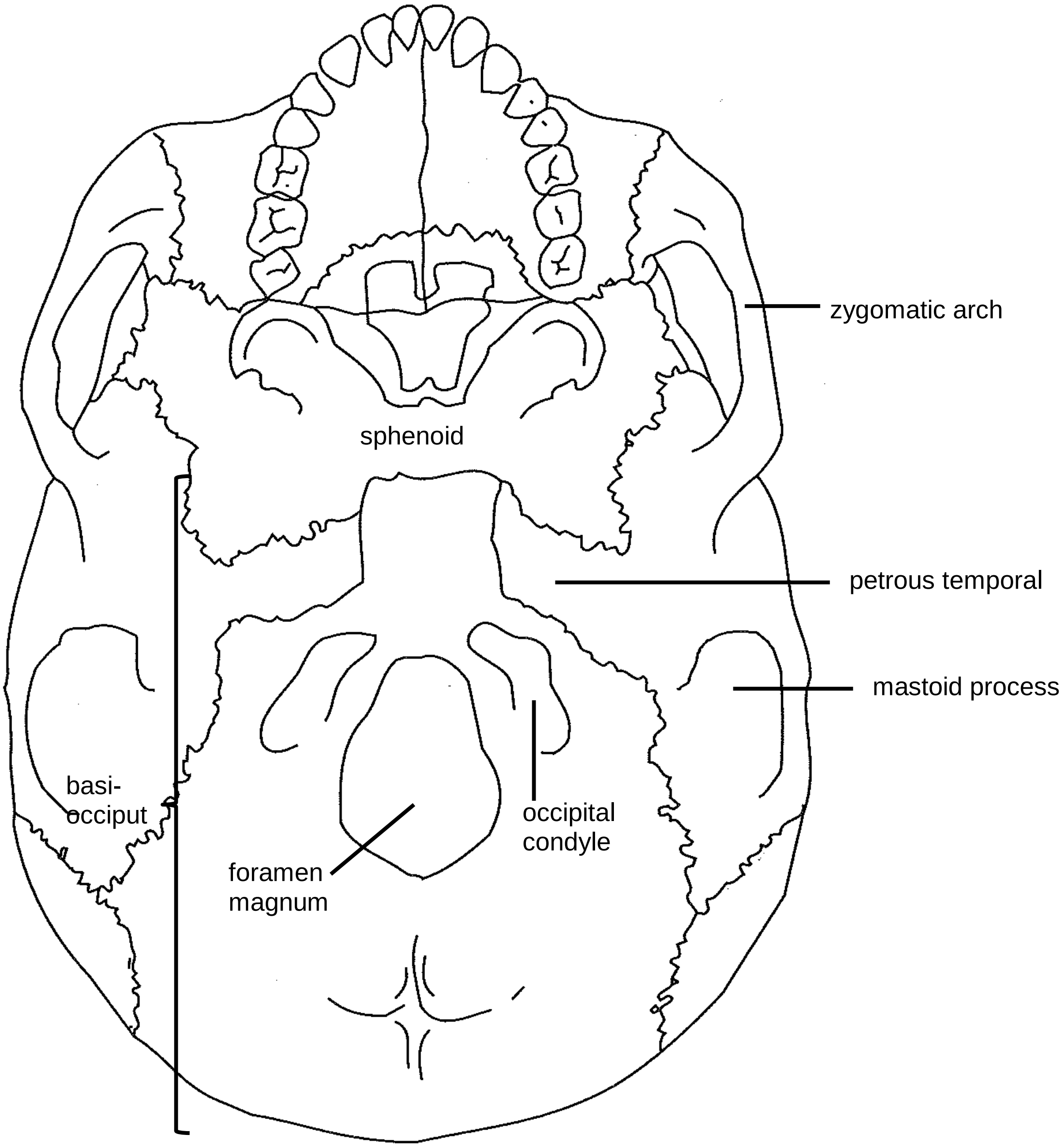


Figure ii: the bones of the cranium and the mandible, basilar view (adapted from Buikstra and Ubelaker 1994)

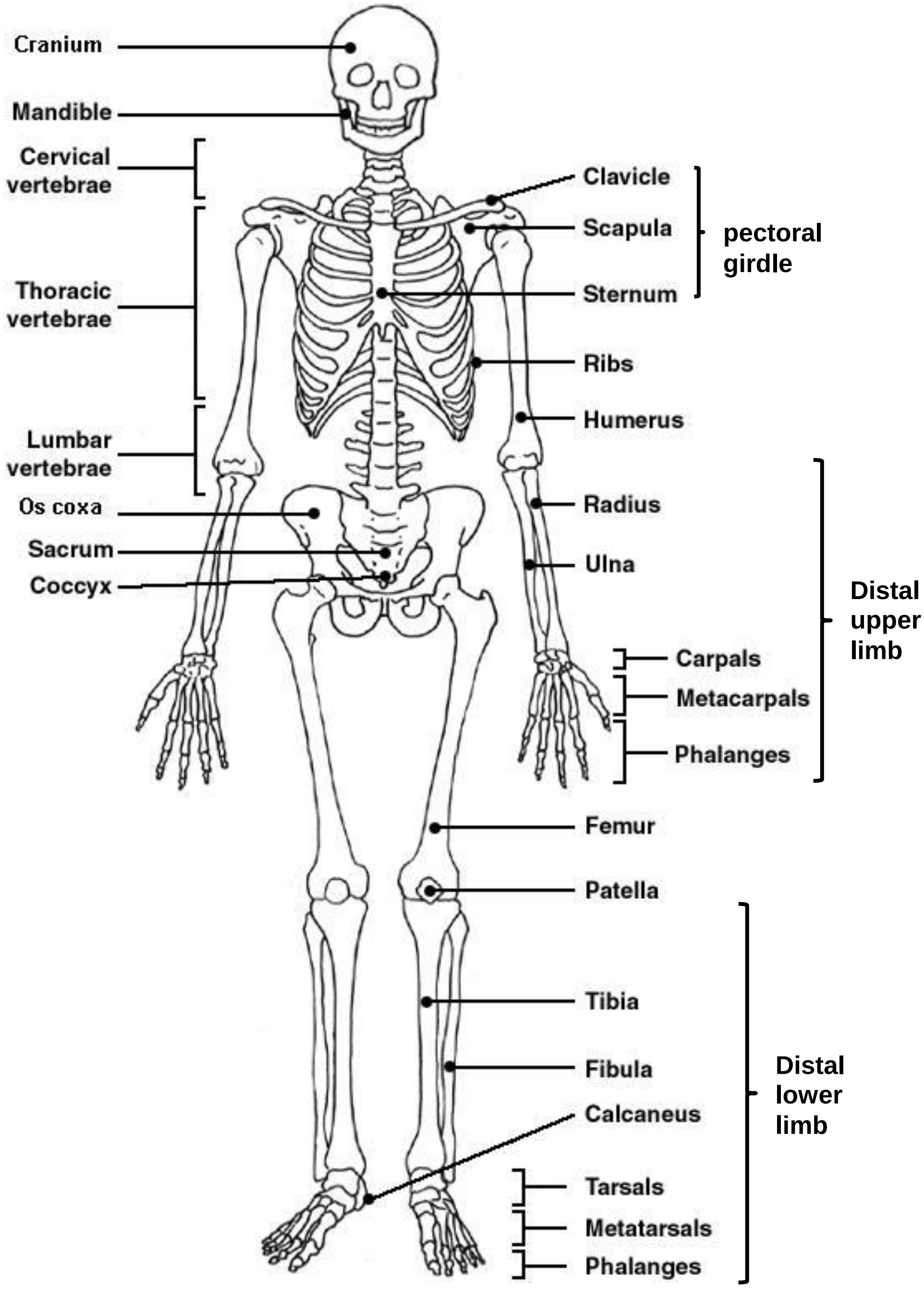


Figure iii: bones and skeletal areas of the adult skeleton

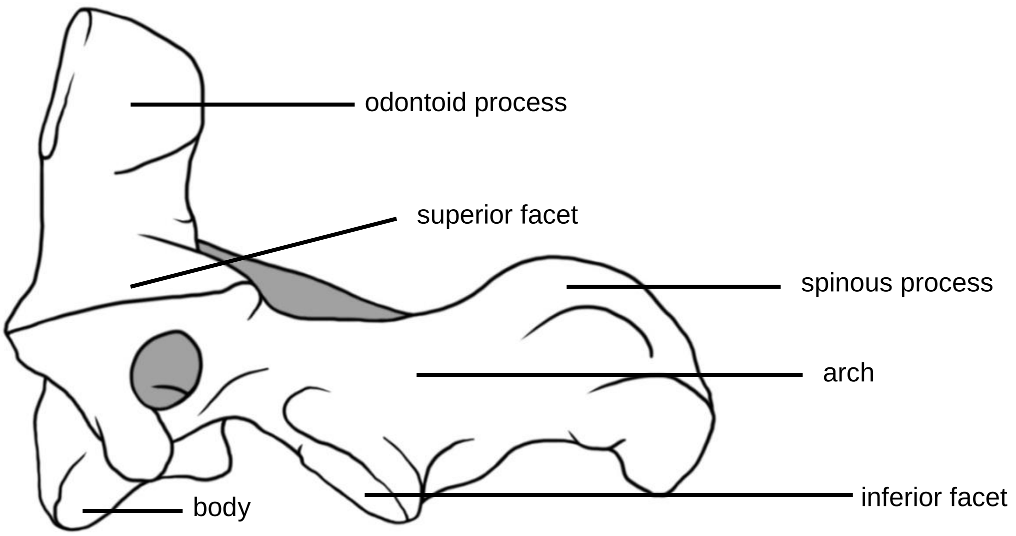
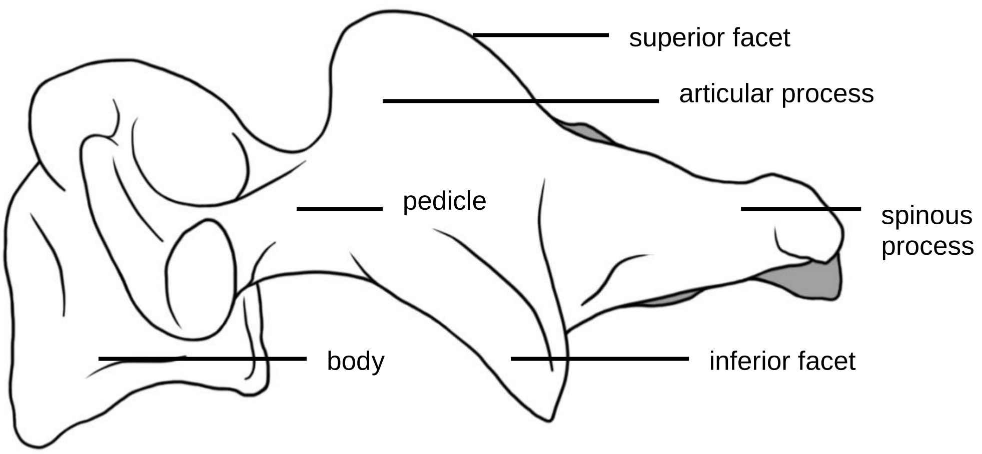


Figure iv: lateral view of a second cervical vertebra (C2)



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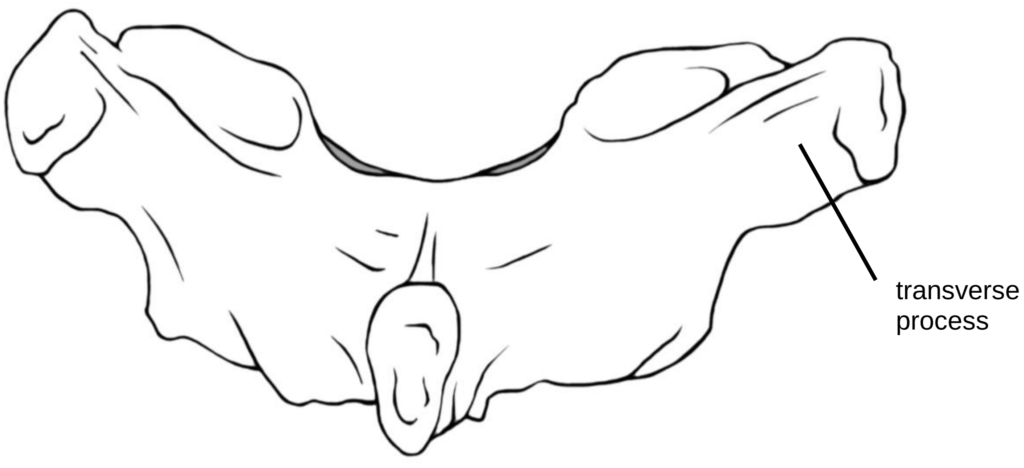

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Introduction

Decapitated burials are fairly frequently identified in Britain, mainly in Roman period cemetery sites, but the practice is little understood, with cases being most commonly ascribed to a post-mortem minority burial ritual. They are usually found in small numbers in any one cemetery site, with Philpott (1991: 79-80) noting a frequency of 6.1% of all inhumations from cemeteries where examples of decapitation were recorded. The research contained in this thesis was prompted by the discovery of a large group (forty-eight individuals) of decapitated burials from the site of Driffield Terrace, in the southern cemetery area of Roman York, and the subsequent analysis, undertaken by the author, which identified clear evidence of peri-mortem trauma associated with the decapitation in forty-five of the individuals (see Montgomery *et al*. 2011). The nature of this trauma, with the majority of individuals demonstrating blows directed to the posterior of the neck (see Chapter 5 for a detailed analysis and discussion of this site), did not seem to easily conform to the "post-mortem burial ritual" interpretation initially given for the burials at the site. They also seemed to be very different in nature, in terms of the number of cases present in any one location, the demographic profile of the individuals affected and the nature of the decapitation trauma (with the majority of previously examined decapitation burials reported as displaying no evidence for any peri-mortem trauma), to the comparative material consulted during the limited research allowed as part of the project. This apparent disparity, both between the osteological evidence from the Driffield Terrace burials compared to that reported for other decapitated burials, and the osteological evidence when compared to the archaeological interpretations, was the major impetus for the research contained within the thesis as it was evident that the practice was poorly understood, with the interpretation given for it seeming to be based on assumptions rather than the evidence.

Aims of the research

1. To examine previous research on the extent and nature of the practice, as well as the interpretations given for it.
2. To examine the evidence for decapitation from the prehistoric to the early post-medieval period in Britain in order to place the Romano-British decapitations in context

3. To provide a comprehensive database of examples of decapitated burials from all of these periods
4. To undertake detailed skeletal analyses on a large sample of decapitated burials from all periods, but with a particular focus on the Romano-British period, with an emphasis on the nature of the peri-mortem trauma associated with decapitation
5. To compare the samples of decapitated burials with wider skeletal populations in terms of burial practice, demographics, stature, pathology and trauma in order to determine whether, and in what ways, those individuals subject to decapitation were different to the rest of the population
6. To examine ancient literature, iconography and ethnographic sources for evidence of the practice of decapitation and its possible meanings
7. To interpret the practice of decapitation in these periods based on the osteological, archaeological, historical and ethnographic sources.
8. To provide evidence to aid in the recording, analysis and interpretation of decapitation burials excavated in the future.

Structure of the thesis

The first chapter provides a detailed examination of previous work undertaken on decapitated burials from prehistory to the early post-medieval period, including early research, syntheses of the practice, the nature of the decapitation-related trauma previously reported and the different interpretations that have been given for the practice. The second chapter details the materials and methodology employed in the compilation of the database of decapitations and in the primary analysis of the skeletal remains. Chapters three, four, eight and nine contain the analyses of the samples of decapitated burials from prehistory, the Romano-British period, the early medieval period, and the medieval and early post-medieval periods, with comparisons to larger skeletal populations, detailed descriptions and analysis of the evidence for peri-mortem trauma and discussions of what the evidence for decapitation in each of the periods may mean. Chapters five, six and seven outline the evidence for decapitation in Roman York, the evidence for the practice in ancient literature, iconography and ethnographic sources, and the evidence for decapitation burials outside Roman Britain, respectively. Chapter ten contains a comparison between the evidence for the practice in the Iron Age, and Romano-British and early medieval periods, whilst chapter eleven examines the different interpretations given for the practice in the light of the osteological, archaeological, literary, iconographic and ethnographic evidence. Chapter twelve provides a list of the different types of decapitation that have been identified during the research in order to aid the future description and analysis of decapitated burials, whilst the final chapter outlines the conclusions of the research and the possibilities for further research. The appendices included as part of the thesis are: 1. a list of sites and individuals analysed as part of the research and used in chapters four to nine; 2. the lists of sites used as comparative samples in chapters four and nine; 3. a comprehensive database and GIS distribution map of decapitated burials from Britain; 4. a database of the data on the individuals that were either examined as part of the research or obtained from secondary sources, and that were used for the detailed skeletal analyses in chapters three, four, eight and nine; and 5. the original photographs taken of the analysed individuals. Appendices 1 and 2 are included at the end of the text, whilst Appendices 3, 4 and 5 are provided on an accompanying CD.

The original paper recording proforma completed for each skeleton analysed as part of the research are held at the University of Winchester and are available to view on request.

Chapter 1: The Phenomenon of Decapitation in Britain as Discussed in the Archaeological and Osteological Literature

1.1 Definition of a Decapitation Burial

For the purposes of this research, a decapitation burial is defined as a burial in which the head has been removed from its anatomical position and replaced elsewhere in the grave, is missing entirely from the burial, or where it is in correct or approximately correct anatomical position, but the presence of cut-marks to the cervical vertebrae, cranial base, mandible or shoulder girdle confirms it as a decapitation (see Fig. 1.1-1.4 for typical examples of decapitation burials). For non-articulated skeletal remains, it is the modification and manipulation of the whole fleshed head or "skull" (comprising both the cranium and mandible in osteological terminology) that is of interest and so isolated crania and cranial fragments are not generally included. However, in much of the archaeological literature, "skull" is used very freely to describe the whole head as well as isolated complete crania, partial cranial vaults and cranial fragments (see, for example, Bradley and Gordon 1988; Mays and Steele 1996; Verano *et al.* 1999). This does present problems with deciding whether to include certain examples. The decision has been made that cases will be included only when additional information, either from the text or from photographs and plans, suggests it is a whole head that is represented, or where there is evidence for decapitation-related peri-mortem trauma to an isolated cranium or mandible.

1.2 Early Research into the Practice of Decapitation

The presence of decapitation burials in archaeologically excavated cemeteries was first recognised in the late nineteenth century, with examples being published by Pitt-Rivers from the Romano-British sites of Wor Barrow (1898) and Woodyates, Dorset (1892: 211) and the Iron Age to Romano-British settlement at Woodcutts, also in Dorset (1887: 18, 36). Cut-marks were not noted on the decapitations from the Romano-British sites or from the female buried in a hypocaust from Woodcutts who was reported as probably having the head removed before burial (*ibid.*) but the cranium of a child who was found

Figure 1.1: Romano-British decapitation burial (SK8) from 6 Driffield Terrace, York (courtesy of York Archaeological Trust)

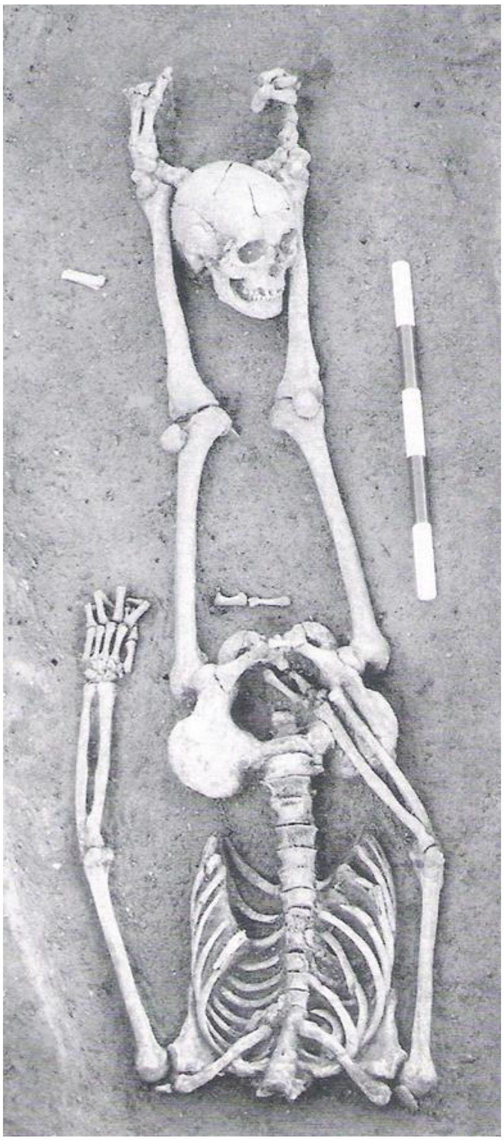

Figure 1.2: Romano-British decapitation burial (SK1665) from Stanwick, Northamptonshire (from Mays 1998: 174)

Figure 1.3: Romano-British decapitation burial from Boscombe Down, Amesbury, Wiltshire (courtesy of Wessex Archaeology)

Figure 1.4: Romano-British decapitation burial (SK38) from 1-3 Driffield Terrace, York (courtesy of York Archaeological Trust)

“thrown head downwards” (Pitt-Rivers 1887: 36) into a pit at Woodcutts was recorded as displaying a sword cut to the occipital (*ibid.*). Another example, also from Dorset, was recorded at Todber by Mansell-Playdell (1893: 24), who noted the age and sex, body position, location of the head and which vertebrae were found with the cranium, as well as recording the head as having been “severed” (*ibid.*). Cut-marks were also noted on the sixth cervical vertebra (the vertebrae are hereafter referred to by their letter and number, i.e. C1-C7 (cervical), T1-12 (thoracic), L1-L5 (lumbar)) of a burial from Manton Down, Wiltshire, who was buried with the head between the feet, and an ampulla where the head should have been (Brooke 1892). Two decapitated burials from the Romano-British cemetery at Long Sutton, Somerset, were reported by Morland (1894) who recorded the position of the head and that hobnailed footwear had been present, but did not note the presence of any cut-marks. A single decapitation with the head between the knees and hobnails at the feet from Lambourn, Berkshire, was reported by Palmer (1871) and another two examples were noted by Royce (1882: 77) at Temple Guiting, Gloucestershire. Another Romano-British burial from Helmingham, Suffolk, was recorded by Cardew (1865) as having had the head cut off and the neck broken but then replaced in correct anatomical position.

Early medieval headless burials were reported at Stapenhill, Staffordshire, by Heron (1889: 167) and at Linton Heath, Cambridgeshire, by Neville (1854: 110), the latter case having an urn placed where the head should have been. Possible examples of early medieval decapitations were also reported by Foster (1883) at Hooper’s Field, Barrington, Cambridgeshire, where at least two burials had their heads displaced; by Akerman (1860) at Brighthampton in Oxfordshire, where one burial had the head on the pelvis; and by Thomas (1887) in the cemetery at Sleaford, Lincolnshire, who noted an adult male burial with the ‘skull’ of a child at his feet (*ibid.*: 395) and another burial who was reported as having the ‘skull’ by the hip and a shield boss where the head should have been (*ibid.*: 400). This example has featured in Wilson (1992: 94) and Reynolds (2009: 77) as a definite decapitation burial, although the original description makes it unclear whether the head had been removed and placed at the hip of a supine, extended burial or whether the body was doubled over with the shoulders and head at the level of the hips.

Possible examples of decapitation burials from the prehistoric period were described by Cunnington (1884: 107) at the Neolithic site of Bowl’s Barrow, Wiltshire, where three crania were found resting on their mandible and cranial base, suggesting they had been "detached from the body... when originally interred" (*ibid.*). A cervical vertebra was also found that had been "cut in two by some sharp instrument" (*ibid.*), although a recent re-examination has determined that the cut was made by a metal rather than a lithic blade and therefore most probably originates from an Iron Age, Romano-British or early medieval secondary burial (Smith and Brickley 2009: 144). A headless Neolithic burial was reported by Rolleston (1876) at Swell, Gloucestershire, with the suggestion that it had probably been interred without the head, as there was little room for it by the wall against which the contracted burial lay (*ibid.*: 146). Smith and Brickley (2009: 51) also re-analysed the remains from this monument and discovered a clavicle with peri-mortem cuts that were probably related to the removal of the sternocleidomastoid muscle (*M. sternocleidomastoideus*) during the process of decapitation. Headless burials and isolated skulls were also reported in the monographs published by Bateman (1861), Greenwell (1877) and Mortimer (1905) on their excavations in Neolithic and Bronze Age mortuary structures, although they were never specifically described as being examples of decapitation. A probable Iron Age decapitation was reported from Worlebury Camp, Somerset, that was described as having had the head cleanly severed through C1 and was found in a pit with the remains of seventeen other individuals, one of whom was reported to demonstrate seven separate cuts to the cranium (Dymond and Tomkins 1886).

Definite and possible decapitations, particularly from the Romano-British and early medieval periods, continued to be reported throughout the earlier part of the twentieth century, with a particular concentration in the 1920s to 1940s, with publications on Iron Age hill-fort burials by Hencken (1939), Wheeler (1943, 1954) and Kenyon (1954); Romano-British cemetery excavations by Fox and Lethbridge (1926), Moir and Maynard (1931), Rudsdale (1931), Lethbridge (1936b), and Calkin (1947); and early medieval "execution cemeteries" by Lethbridge and Palmer (1929), Lowther (1931), Dunning and Wheeler (1932), Stone (1932), Liddell (1934) and Hill (1937) amongst many others. A number of these publications are distinguished by their detailed analysis of the skeletal remains by early physical anthropologists, such as Miriam Tildesley, CN Goodman, GM Morant and IW Cornwall, a practice which largely makes its debut in archaeological publications around this time, although the monographs published by Pitt-Rivers (1887, 1892, 1898) do contain tables of measurements taken from the cranium, mandible and long-bones and very detailed engravings or photographs of the crania and mandibulae. These analyses were concerned with determining the age and sex of individuals and also contained comprehensive details on the evidence for decapitation and other peri-mortem trauma, for example, at Sutton Walls (Cornwall 1954), Meon Hill (Tildesley 1934a) and Maiden Castle (Morant and Goodman 1943). The detail contained in these publications on the skeletal remains from sites with possible or definite decapitations was not really matched until the 1990s and onwards as the analysis of human remains seemed to fall out of favour from the 1950s through to the late 1980s, with the exception of publications by authors such as Wells (1964a,b, 1967a,b, 1976), Manchester (1978) and Brothwell (1971).

1.3 Previous Syntheses of the Extent and Manner of the Practice

The first published synthesis of the practice of decapitation in British archaeological samples was by Clarke (1979: 372-375) and was produced as a comparison with the seven decapitated burials excavated from the Romano-British cemetery at Lankhills, Winchester. It, therefore, only included examples ascribed to the Romano-British and early medieval periods. Interestingly, decapitation burials where “the head was altogether missing, or where it lay only a little distance from the shoulders” (Clarke 1979: 372-374) were not included, as they were assumed to represent entirely different practices. Twenty-nine sites were listed for the Romano-British period (four of these were contained in an addendum with no information about the number of examples or their demographic profile (Clarke 1979: 454)), with a total of seventy-six individual decapitations. The largest number found at any individual sites were fifteen out of ninety-four burials (16%) at Cassington, Oxfordshire, and all of the twenty four burials at Rushton Mount, Northamptonshire (although this site is probably not Romano-British in date, see below), with the majority of sites containing single examples of the practice. For the early medieval period, six sites were listed with a total of eight affected individuals, the only site listed as containing more than a single example being Chadlington, Oxfordshire, with three adult male decapitations (Clarke 1979: 373-374). Of the seventeen Romano-British examples where an age or sex was recorded, eight were adult females, three were adult males and two were non-adults, whilst for the six early medieval examples where demographics were noted, three were adult male, three were adult but with no sex given and there were no adult females or non-adults specifically recorded (Clarke 1979: 373-374). The head was recorded as being located in a variety of positions for both periods, including in the lap, between the knees, by the lower legs or ankles or at the feet. Clarke (1979: 374-375) used this list to conclude that decapitation was a predominately late Roman rural practice, restricted to the southern and central-southern counties of England with noticeable absences from Kent and the north.

The next major synthesis of the subject was that published by Harman *et al.* (1981), which listed forty-nine sites from the Romano-British period, with a total of “at least 144” (*ibid.*: 166) individual decapitations and fourteen sites from the early medieval period, with twenty-nine separate affected burials. Examples were included if they demonstrated displacement of the head or had been recorded as decapitations by the original excavator (*ibid.*: 161), with osteological evidence in the form of cut-marks on cervical vertebrae being recorded for thirty-five individuals from the two periods (*ibid.*: Table 7). They were stated as being mainly found in the later Romano-British period with a distribution roughly between the Severn to the west and the Wash to the east, with smaller numbers of sites to the north-east and south-west and a concentration in rural areas, although examples from urban areas and small-towns were also recorded (Harman *et al.* 1981: 163, 166). Those from the early medieval period were recorded as having a similar distribution to that found in the Romano-British period and an association with earthworks was noted (Harman *et al.* 1981: 164). In discussing the nature of the decapitations, no distinction was made between the two periods, with both males and females being described as being affected and with a disproportionately small number of non-adults (Harman *et al.* 1981: 164). If the lists of decapitations contained within the paper are analysed to obtain the demographic information about affected individuals, thirty-one adult males, twenty-nine adult females and seven non-adults were affected in the Romano-British period, whilst in the early medieval period, twenty-two of the affected individuals were adult males, one was an adult female and one was a non-adult (Harman *et al.* 1981: 170-188). Heads were noted as being most commonly placed by the lower part of the body, although other locations were recorded, such as by the pelvis or in correct anatomical position, and the cuts were stated as having been made most commonly to the upper part of the neck although the exact vertebrae affected did vary (Harman *et al.* 1981: 165). Cuts were stated to be most commonly made to the front of the neck, with blows directed from both the left and right side (Harman *et al.* 1981: 166).

This survey was followed ten years later by Philpott's (1991) work, which included a gazetteer of over seventy sites where decapitation occurred in the Romano-British period, and included examples where the head was in correct anatomical location, or missing altogether, as well as where it was found in a displaced position (Philpott 1991: 305-309). The head was stated to have been most commonly cut from the front between the third and fourth cervical vertebrae with a sharp instrument, and a degree of care and precision, on a body that was either already drugged or dead, and then replaced in the grave, "almost invariably adjacent to or on the lower part of the body" (Philpott 1991: 78, 80). He also recorded a distribution mostly south-east of the Severn-Wash line, with rare examples in the East Midlands and West Yorkshire and a near total absence in the south-eastern counties of Kent, Surrey and East and West Sussex, which he ascribed to the predominance of cremation in these areas (Philpott 1991: 78). This burial practice would preclude the identification of head displacement and obscure the presence of cut-marks to the vertebrae, although a number of analyses of Romano-British cremations, including those at Braughing, Hertfordshire (Wells 1981: 279) and Brougham, Cumbria (McKinley 2004a: 301), have recorded a total absence of skull fragments in a small number of such deposits that may indicate deliberate removal of the head, whilst possible cut-marks on a cervical vertebra from a cremation have also been observed (Sue Jones *pers. comm.* 2009). Philpott (1991: 79, 81) also concluded that the dating evidence supported Clarke's (1979: 374) assertion that the rite was a mostly rural one that spread to urban sites during the fourth century. The demographic profile of those affected by decapitation suggested that, with the exception of infants and children, they reflected the "normal life expectancy" for the period with more females subject to the practice than males, with thirty-six adult male and fifty-one adult female decapitations recorded in the main text (Philpott 1991: 79, Table 14). However, when the demographic data is extracted from the included tables, fifty-three of those affected were adult females and fifty were adult males with eight non-adults also affected, indicating there is not actually that much difference between the numbers of adult male and female decapitations when the complete sample is taken into account (Philpott 1991: Table A24, A25, A26). The presence or absence of a body container and deliberate grave inclusions were also found to mirror the wider patterns in Romano-British cemeteries as a whole (Philpott 1991: 81).

The next author to provide a gazetteer of sites where decapitation was present was O'Brien (1999). This focused more on examples from the Post-Roman and early medieval period, with Philpott’s (1991: 440-441) distribution map being used to illustrate those from the Romano-British period, although a small number of new sites were introduced (O’Brien 1999: 7). The gazetteer included brief information about each site with decapitations recorded only as present, absent or possible and with no numbers or demographic information provided, and there was no detailed discussion of the practice as a whole, although some sites were described in more detail in the body of the text. The gazetteer also made no distinction between Romano-British and later sites, making it difficult to draw any conclusions about the distribution, demographics and appearance of the practice in the Post-Roman and early medieval periods.

Another recent survey of decapitation burials was that given in Roberts and Cox (2003: 153, 158, 168-169). This publication was an attempt to collate the evidence for pathological changes and trauma evident in skeletal remains from a large number of published and unpublished reports from the Upper Palaeolithic to the post-medieval period in Britain (Roberts and Cox 2003: 26-30). They state that, for the Romano-British period onwards, they only included sites from which more than fifty individuals had been excavated (Roberts and Cox 2003: 27) which totalled fifty-two sites from the Romano-British period with 5716 individuals and seventy-two sites from the early medieval period with 7122 individuals (Roberts and Cox 2003: Table 1.2). They noted nine sites from the Romano-British period where decapitation was confirmed through the presence of cut-marks to the cervical vertebrae, cranial base or mandible, with a total of fifty-eight affected individuals and nearly twice as many males as females (Roberts and Cox 2003: 158), although the majority of these had already appeared in Philpott’s (1991) study, and state that the practice “appears for the first time in this period” and “was a cause of death [*sic*]” (Roberts and Cox 2003: 153). They also recorded four sites from the early medieval period with a total of fifteen decapitations and with females representing nearly half of this figure (Roberts and Cox 2003: 169). They also state that the practice was a “continuing tradition” from the Romano-British period and suggest that may have been the result of “contact and aggression” between native populations and newcomers (Roberts and Cox 2003: 168).

The most recent synthesis of the practice was in Reynolds (2009), which concentrated on examples from the early medieval period and included individuals from attritional cemeteries where the head was displaced or absent, as well as individuals from specific “execution” cemeteries (for a definition see below). From the earlier part of the period, he notes fifty-four individuals from thirty-two sites where the practice was found, with a distribution over much of the eastern part of England from the southern counties as far north as Yorkshire. Males were much more commonly affected than females, with twenty-seven adult males, six adult females, nineteen adults of unknown sex and two non-adults affected. However, the antiquarian nature of many of the excavations did not allow any conclusions as to the presence or nature of any cut-marks (Reynolds 2009: 76-81). For the later part of the period, he provides a detailed list of twenty-seven "execution cemeteries" (Reynolds 2009: 97-151), defined as cemeteries usually containing "prone burials, multiple interments, decapitation, evidence of restraint, shallow and cramped burial and mutilation" (Reynolds 2009: 44), and commonly including intercutting graves, varied burial orientation and an absence of finds apart from low-status dress fittings. They are usually located on "principal administrative boundaries [or] associated with earthworks such as barrows or linear earthworks" (Reynolds 2009: 44). Fourteen of these sites have evidence for decapitation with a total of ninety-nine possible decapitations, at least eighty-five of which were "confidently said" (Reynolds 2009: 166) to be decapitated, and their distribution is similar to the sites from the earlier part of the period. Males were again much more commonly affected than females, who only accounted for nine of the decapitations, and non-adults (Reynolds 2009: 166-169) and the cuts to the neck were described as "multiple or excessively violent" (Reynolds 2009: 38).

Other authors have also commented on the practice, although without including the numbers of examples contained in the works cited above. For the Romano-British period, they state that the vast majority of cut-marks were recorded as having been made to the front of the neck with a "very high degree of skill" (Reece 1988: 98) and little bone damage. They conclude that the cuts must have been made on a corpse as a live body would have produced large amounts of blood when the arteries in the neck were severed, obscuring the view and making precise cuts impossible. They also suggest that a live body would have struggled, again making precision very difficult to obtain (Reece 1988: 98; Stirland 1998: 121; Boylston, Knüsel, Roberts and Dawson 2000: 250; Jones 2003: 35; Taylor 2003; Witkin 2005: 184; Harman 2007: 43). However, other writers, commentating on sacrificial practices, have made the point that the shedding of blood was an integral part of the ritual process of sacrifice (Bradley 1995: 9-10; Green 1998: 173, 2002: 40; Armit 2006: 3), and no account has been taken of the possibility that the blood could have been released through initial cutting of the soft tissues of the neck, which may have left limited or no traces on the skeleton, leaving the head to be removed once the blood flow had ceased.

For the early medieval period, it is the “execution cemetery”, as defined by Reynolds (2009), which is most commonly discussed, with a preponderance of younger adult males found buried in shallow graves with heads often absent and hands sometimes tied. Cut-marks are often described as “heavy” and “clumsy” (Cessford 2007: 212) and are reported as being most commonly directed at the back of the neck with the claviculae, scapulae and cranium also often being affected (Hayman and Reynolds 2005; Buckberry and Hadley 2007; Cessford 2007; Buckberry 2008; Cherryson 2008: 122).

For prehistoric periods, there have been no detailed surveys of the practice, although possible or probable examples are contained within gazetteers and/or commented on in Whimster (1981), Bristow (1998), Schulting and Wysocki (2005), Armit (2006), Schulting (2006), Armit and Ginn (2007) and Smith and Brickley (2009), whilst compilations of nineteenth century barrow and tomb excavations by Bateman (1861), Greenwell (1877) and Mortimer (1905) also include some possible examples. The most common finding was of isolated crania/crania and mandibulae from settlement sites, burial areas and defensive ditches, and include the crania and mandibulae from the Iron Age Glastonbury Lake Village with evidence for peri-mortem sharp force trauma (Barber *et al.* 1995), although none of them show definite evidence for peri-mortem decapitation; and the isolated cranium and mandible with attached cervical vertebrae from the Neolithic causewayed enclosure at Yeoveney Lodge, Staines, that was reported to show evidence for blunt force trauma to the frontal and cuts to the mastoid processes and vertebrae (Robertson-Mackay 1987). Headless skeletons, such as the headless adult male within a tree-trunk coffin in the Bronze Age “King Barrow” (Arne 19) in Dorset (Grinsell 1959: 25, 87), were also recorded, especially of a Bronze Age date, with Bateman (1861: 186) stating that they were not very uncommon in his excavations of barrows in Staffordshire and Derbyshire.

Small numbers of burials with the head displaced from its correct anatomical position were also recorded for the Bronze and Iron Ages, for example, the crouched burial of an adult with the cranium placed at the pelvis from a barrow at Hanging Grimston, Yorkshire (Mortimer 1905: 105), despite Taylor’s (2008: 101-102) assertion that specifically decapitated bodies do not seem to appear in formal graves in the British Iron Age. Very little mention is made of the possibility that cut-marks could be present on the majority of the examples, with Armit and Ginn (2007: 128) stating that no direct evidence had yet been found in Atlantic Scotland, although Smith and Brickley (2009: 51) did find cut-marks to clavicles from the Early Neolithic sites of Swell and West Tump, and cut-marks were originally recorded on the crania and mandibulae from Glastonbury Lake Village and Yeoveney Lodge, Staines (as mentioned above), suggesting the possibility that some heads were being removed from corpses whilst soft tissue was still present.

1.4 Interpretations of the Practice

For the Neolithic, Schulting and Wysocki (2005) and Schulting (2006) have suggested that examples of isolated skulls should be seen either in the context of ancestor worship or trophy-taking and that the two practices are not necessarily mutually exclusive, since the idea that the head is the core of personhood and of spiritual power could easily lead to both practices. If the head of an ancestor can be used in ritual practice to bring protection to the group, then the head of a member of a rival group could be used to remove that protection from the rival group and transfer it to that of the trophy-taker. They suggest that the placement of trophy-heads in causewayed enclosure ditches may have occurred alongside the deposition of ancestral remains, both activities serving to enhance a sense of group solidarity. For the Bronze Age, very little comment seems to have been passed on the findings of isolated skulls and burials with the head displaced or absent in the writings of Bateman (1861), Greenwell (1877) and Mortimer (1905), other than an acknowledgement that the majority of the remains appeared to have been originally buried as they were later found, suggesting that they were aware that some form of manipulation and modification of the body had occurred before burial. There has been very little written subsequently which specifically discusses possible examples from this period, apart from Grinsell (1936: 37), who, unusually, suggested a motive for these burials, namely that the heads may have been removed to prevent the ghosts of the dead from disturbing the living.

For the Iron Age, much more has been written on the phenomenon of isolated skulls, with the practice often being ascribed to a Celtic "cult of the head" which saw the human head as the seat of the soul and the essence of the individual. The heads could be those of enemies, collected as "trophies", or of revered ancestors, and were then used in rituals to ensure fertility, protection and good fortune for a community or to celebrate victory over one's enemies (Powell 1958: 108; Ross 1967: 127; Walker 1984: 453; Wait 1985: 120; Ross 1986: 121; Cunliffe 1990: 83, 87; Watts 1998: 81-82; Green 2002: 96). This cult is assumed to have been very widespread throughout the Celtic world, a "fact known and proven" (Ross and Feachem 1984: 340), and the symbol of the severed head "sums up the whole of pagan Celtic religion and is as representative of it as the sign of the cross in Christian contexts" (Ross 1986: 121). Other commentaries, interestingly by historians rather than archaeologists, have suggested that this presumed cult of the head was by no means as universal or widespread as previously thought (Hutton 1991: 195; Chapman 1992) and many authors, archaeologists and historians alike, suggest that many of the human skulls found were more likely to have been a result of battle-related head-hunting in an essentially "secular" context (Whimster 1981: 184; Wilson 1981: 162; Collis 2003: 215-216; Cunliffe 2005: 573; Armit 2006: 1), although it has also been suggested that Iron Age warfare was essentially a "ritualised" activity (Andrén 2006: 35-36).

From the Romano-British period, isolated head burials are occasionally found and have been interpreted as being possible offerings to the gods to ensure fertility (Henig 1984: 24; Watts 1998: 82), or as ritual items connected to skull-cults of trophies of war or of venerated ancestors (Wells 1976; Mays and Steele 1996; Wilkinson and Barker 1997; Mattingly 2006: 477). However, the majority of interpretations focus on articulated skeletons with displaced heads. This has occasionally been stated to be a continuation of earlier practices, usually of the Iron Age head-cult (Leech 1980: 342; Wilmott and Rahtz 1985: 173; Watts 1991: 197; Watts 1998; Holst 2004a: 11; Witkin 2005: 184; Mattingly 2006: 478-479; Timby *et al.* 2007: 156), or, in one case, from the early Bronze Age (Bugler and Drew 1974: 65). It has also been stated to have been a "barbarous and pathetic" (Frend 1955: 12) pagan practice (Green 1976: 63; Watts 1991: 66; Watts 1998; Foster 2001: 170; Petts 2003: 149; Sauer 2005: 52; Timby *et al.* 2007: 156) that may have been carried out in response to the breakdown of centralised control in the later Romano-British period (Esmonde Cleary 1989: 134; Williams 1999: 102), whilst Watts (1991) used an absence of the practice as a strong indicator that a cemetery should be regarded as Christian. It has also been stated to be a Germanic practice (Hollingworth and O'Reilly 1925: 17; Todd 1969: 76), although Reynolds (1997: 38) argues that it was much more a Roman form of execution, along with crucifixion, whilst hanging was more common in Germanic areas.

McDonald (1979: 416-417, and see Merrifield 1987: 72-74), writing on decapitations from Lankhills, Winchester, which were all associated with unusual and rich military burials or with cenotaphs, used this to suggest that the decapitations were in some sense sacrificial, used as vicarious substitutes to allow the souls of people who had been denied proper burial rites to enter the afterlife at the expense of their own souls. McDonald (1979: 420) believed that the individuals had been killed as part of a sacrificial ritual in which post-mortem decapitation was then carried out. Other authors have argued that there are a number of problems with this interpretation. Firstly, they state that human sacrifice was regarded as a weird and alien rite by Roman authors, such as Livy and Plutarch (Green 2002: 33), and had been banned in the Roman Empire in 97BC (Henig 1984: 23; Green 1998: 172; Watts 1998: 2). Philpott (1991: 85) argued that this meant that it was unlikely that human sacrifice at such a large and Romanised centre as Winchester would have escaped the notice of the authorities and been allowed to continue. However, other authors have suggested that the authorities may have had limited influence over death rituals (Williams 1999: 102) and that human sacrifice may have been applied by native Britons in exceptional circumstances, with the choice of victim possibly being determined by them having already been condemned to death under Roman law (Isserlin 1997; Green 1998: 174). It has also been shown that a number of the bog bodies found in Britain who are assumed to have been sacrificial victims, including the decapitated Lindow III and Worsley Man, are actually dated to the Romano-British period rather than the Iron Age (Garland, AN 1995; Housley *et al.* 1995). If the decapitated burials were presumed to have given up all chance of their souls entering the afterlife, it has also been asked why some of these burials were provided with hobnail boots and coins in the mouth, both of which are assumed to aid passage to the otherworld (Merrifield 1987: 74-75; Philpott 1991: 86).

It has also been suggested that decapitation of a corpse may have been an acceptable way to make a sacrifice under an administration that was believed not to allow live human sacrifices (Philpott 1991: 86; Esmonde Cleary 2000: 135; Anderson 2001: 404; Jones 2003: 35; Witkin 2005: 184-185; Timberlake *et al.* 2007: 57). Foundation sacrifices to ensure the immortality of a building has also been given as the interpretation of decapitated infant burials at Springhead Temple IV, Kent, and Ware, Hertfordshire (Penn 1961: 122; McDonald 1979: 416; Harman *et al.* 1981: 167; Taylor 2008: 94).

Decapitation has also been interpreted as being performed to aid the passage to the afterlife in cases where individuals were deemed to have died prematurely or in an unusual manner (Merrifield 1987: 75-76; Philpott 1991: 86; Boylston *et al.* 2000: 252; Henig and Booth 2000: 133; Casa-Hatton and Wall 2006: 19), although they give very little supporting evidence from Roman belief systems as to how and why decapitation would help (interestingly, however, there is a quote from Lucretius (III. 902-906), stating that "the head too when cut off from the warm and living trunk retains on the ground the expression of life and open eyes, until it has delivered up all the remnants of soul", which may be one of the ancient sources from which this interpretation was derived).

Contradictorily, some commentators have suggested that decapitation may have been performed in order to prevent the dead from reaching the afterlife (Wait 1995: 507-509; Watts 1998: 82; Green 2004: 330) or to prevent the dead from returning to haunt the living, in cases where the individual was a difficult character during life (Lethbridge 1936b: 117; Wait 1985: 203; Merrifield 1987: 71; Philpott 1991: 84; Jones 2003: 35; Taylor 2008: 111; McKinley and Egging-Dinwiddy 2009a: 58). This interpretation is also the one given for burials where the body has been weighted down with stones (Reynolds 2009: 93) or, in one case, where one individual from the Eastern Cemetery of Roman London was found to have been buried with a key, suggested to have been to ensure that the spirit remained "locked" within the tomb (Barber and Bowsher 2000: 320), although it was also suggested that the key was a symbolic act to ensure that the deceased could enter the gates of the afterlife! This interpretation was thought to be particularly appropriate for older females, who were regarded in these interpretations as possibly having been witches (Lethbridge 1936b: 117; Calkin 1947: 33-34; Green 1976; Green 1986: 131; Philpott 1991: 84). Seemingly connected with the previous interpretation is one that sees decapitation as a means of inflicting an indignity on the body of a corpse because the individual was deemed to have committed some crime or broken some taboo during their life, or because they were considered to be outcasts, as a form of *poena post-mortem* (Harman *et al.* 1981: 168; Watts 1991: 197; Woodward

1992: 94; Wait 1995: 509; Jones 2003: 35; Taylor 2008: 96). This was a practice usually carried out by mutilating and destroying the statuary and portraiture of a deceased and defamed individual (*damnation memoriae*) (Varner 2001, 2005), although cases are recorded of the decapitation of the corpses of hated and feared rulers in Rome whose heads were then displayed with the rest of the body being disposed of, usually into the sewers or Tiber (Hope 2000). There is even one example, that of Nero's successor Galba, where his head was later reunited with his body and interred (Varner 2001: 57; Janes 2005: 35).

Earlier writers were often willing to interpret decapitation burials as the result of executions (Brooke 1892: 412; Pitt-Rivers 1898: 79; Calkin 1947: 37; Wells 1976: 119; Matthews 1981; Wells 1982: 194), sometimes specifically as Christian martyrs (Morland 1894: 273; Peter 1905: 138; Sparey Green 1982: 74), or for unchastity (Moir and Maynard 1931: 257), although in more modern commentaries, judicial execution is often only given as an explanation for burials where the head is absent, presumably as it was assumed to have been displayed after the execution as was the norm in later periods (see, for example, Janes 1991; Ho 2000; Kilfeather 2002), rather than being buried in the grave with the rest of the body (Philpott 1991: 77; Jones 2003: 35; Janes 2005: 22, 34). This form of decapitation burial is rare in this period and the acceptance that only this type may be a result of execution masks a reluctance to see this as a possible explanation for other decapitation burials, with Watts (1998: 74) specifically stating that when discussing Romano-British decapitation burials, she is not talking about executions. Philpott (1991: 84) and Harman *et al.* (1981: 168) have argued that the careful treatment, provision of coffins and grave goods and location in normal cemeteries of the majority of decapitation burials mitigates against any of them being victims of execution. They do admit that the bodies of those executed by decapitation could have been retrieved by their families for normal burial but argue that if this was the explanation, the proportion of criminals in the general population was surprisingly high.

One final explanation which argues for decapitation as the mechanism of death suggests a small number of individuals were decapitated as a result of armed conflict or massacre (Richardson 1982; Wedlake 1982: 85; Boylston *et al.* 2000: 249; Anderson 2001: 405).

In the early medieval period, occasional findings of isolated head burials have been interpreted as either trophy heads (Bidder 1906; Meaney 1964: 18), venerated heads of important community ancestors (Wells 1967a: 170-171), or as representing individuals who died far away from home with only their heads being brought back for burial (O'Brien 1999: 7). However, the most common explanation for decapitation burials in the early medieval period is as executions (Lethbridge and Palmer 1929; Lowther 1931; Dunning and Wheeler 1932; Stone 1932; Liddell 1934; Hill 1937; Poulton 1989; McCulloch 1991; Wymer 1996; Reynolds 1997: 37; Lucy 2000: 75; Lucy and Reynolds 2002: 21; Carver 2005; Hayman and Reynolds 2005; Buckberry and Hadley 2007; Cessford 2007; Buckberry 2008; Cherryson 2008: 122; Reynolds 2009). Although Reynolds (1997: 38) has stated that hanging is a much more Germanic form of execution than decapitation (and indeed there are a few burials from "execution cemeteries" where the mechanism of death has been interpreted to have been by hanging (Lowther 1931; Waldron and Waldron 1988)), decapitation as a form of execution is also seen in early medieval burials from elsewhere in northern Europe (see, for example, Bennike 1985; Starý 2005; Wiltschke-Schrotta and Stadler 2005; Pinhasi and Mays 2008: 320) and the influence of the Danelaw on areas outside their control, as well as the possibility of the continuation of Roman forms of execution, cannot necessarily be discounted in the "Germanic" areas of Britain in this period.

Some burials have also been interpreted as battle victims (Lethbridge 1929: 103; Lowther 1931: 30; Manchester 1990: 90), whilst ritual human sacrifice has occasionally been suggested as an interpretation (Carver 2005: 348; Leahy 2007: 56-57), such as for a young headless female from the cemetery site of Cleatham, Lincolnshire, who was found buried with a bird. Her cranium and mandible were found two metres away next to an urned cremation burial that contained the individual that the young female was interpreted as having been killed to accompany (Leahy 2007: 56-57).

Whilst the majority of interpretations given for decapitations in this period assume that it was the mechanism of death, a few commentators have given very similar reasons to those assumed in the Romano-British period, such as it prevented ghosts from walking and disturbing the living (Meaney 1964: 18; Meaney and Hawkes 1970: 31; Wilson 1992: 92). At the site of Rushton Mount, Northamptonshire, where the remains of twenty-four decapitated individuals were found, with the heads either placed by the legs, buried separately or absent, Watts (1998: 88) saw the heads as having been retained by the families as some form of cult item until the mandibles became detached, during which time they would benefit from the power and protective qualities of the head. The families had then buried the skulls seemingly indiscriminately, either because there was confusion over where individuals had been buried or because the remains were being buried covertly at night. However, when all the characteristics of the cemetery are examined, it appears to conform to all of those expected for an "execution" cemetery and should probably be seen in this light rather than as the expression of a very local continuation of head-veneration cults.

For the medieval and early post-medieval periods, very little has been written about decapitations, with the few that are well known being interpreted as battle victims (Wilson and Hurst 1960: 140; Stroud 1993a; Novak 2000a; Holst 2005a; Osgood 2005: 95) or executions (Daniell 2002: 245; Lewis, ME 2008).

Therefore, it can be seen from the above discussion that, as well as the phenomenon of isolated skull burials and other forms of possible evidence for decapitation, there are two very distinct types of decapitation burial discussed by previous authors, which are summarised below:

Type 1

- Usually Romano-British in date
- Found in community cemeteries
- Carefully laid out in the grave sometimes with a coffin and other grave inclusions
- Head displaced, usually found by the lower limbs or feet
- More females than males or non-adults affected (although a detailed analysis of the lists of examples contained within a number of the previous syntheses do not seem to support this assertion)
- Cut-marks are to the front of the neck and described as precise and incised
- Usually interpreted as the result of a post-mortem burial ritual

Type 2

- Usually early medieval in date
- Found in community cemeteries or in distinct "execution cemeteries"

- Often carelessly positioned in the grave, usually with no coffin or other grave inclusions
- Head often absent or buried some distance from the rest of body
- Substantially more males than females or non-adults affected
- Cut-marks are to the back of the neck and sometimes affect the cranium and shoulders and are described as heavy and clumsy
- Decapitation interpreted as the cause of death, usually as the result of judicial execution

It is this apparently simple and clear-cut dichotomy between the types of decapitation found in the two periods, which previous research by the author has already shown to be over-simplistic, that the following chapters aim to question and address.

Chapter 2: Materials and Methods

The initial stages of the research involved an in-depth literature search through published monographs, national and local journals and unpublished grey literature to identify sites where decapitation was recorded as occurring or where, although the specific word was not used, the descriptions of skeletons suggested that decapitation may have been present, such as a recorded absence or displacement of the cranium and mandible or the presence of an isolated cranium and mandible. The search was restricted to sites from England, Wales and Scotland, but a long time period, from the Neolithic through to the early post-medieval period, was examined. This was in order to place decapitations from the Roman and early medieval periods into a wider temporal context, and to assess whether there were continuities from earlier periods in the manner and geographical distribution of the practice, as suggested by the "Cult of the Head" theory (see Chapter 1). Literature from later historical periods was examined in order to identify sites where decapitations existed that could be ascribed to a more definite motive, such as known executions and battle victims, in order to compare the manner of the decapitations to those from earlier periods.

Once suitable sites were identified, a number of pieces of data were collected for each individual, including presence or absence of a body container, clothing and deliberate grave inclusions, body position, placement of head, age, sex and presence or absence of osteological evidence for decapitation. This data was inputted into a Microsoft Access 2007 database along with other details of the site, such as National Grid reference, county, site name, date, total number of burials and their demography, number of decapitations and the bibliographic references for the site. The database is included with this thesis, both as an Access database and as a searchable GIS distribution map (Appendix 3).

A number of sites were then selected from this database for the skeletal remains to be subjected to a full osteological examination. The selections were based on a number of criteria, including the date and type of the assemblage and how well preserved the skeletal remains were, in order that as large a variety of samples as possible were examined and so that the maximum amount of osteological data could be obtained from them. However, the selection of samples was ultimately determined, in a number of cases, by the availability of the remains for study, as some samples, especially those excavated in the nineteenth and earlier twentieth centuries, were either not retained for study, or could not now be traced.

Once collections had been identified and located, osteological analysis took place at various holding institutions and, in rare cases where the institutions gave permission for the remains to be removed from their premises on loan, in the laboratories of the University of Winchester. As the collections to be examined comprised the remains of once living people, there were specific ethical considerations that had to be taken into account that would not have applied to other classes of archaeological material. Skeletal remains were handled with care and respect at all times in accordance with the BABAO (British Association of Biological Anthropologists and Osteoarchaeologists) Code of Ethics (BABAO 2010).

For a number of collections where time and space allowed, or where cemeteries were within certain study areas, all individuals within the collection were subjected to a visual assessment of the cervical vertebrae, cranium and mandible to determine the existence of decapitations not previously recognised during excavation, either because the position of the head within the grave did not suggest decapitation had occurred and therefore the vertebrae were never previously examined in detail, or because of poor original site recording which did not allow body positions to be determined. The data from these assessments, which comprised a list of skeleton numbers and the presence or absence of the cranium, mandible and each of the cervical vertebrae for each individual, were inputted into Microsoft Excel 2007 spreadsheets, and are held with the rest of the archive. Any individuals who were then found to have osteological evidence for decapitation were subjected to a full skeletal analysis in the same manner as the already identified decapitations.

The skeletal analysis involved each individual being laid out in anatomical order with an inventory of dentition and skeletal elements then being completed, both on written and diagrammatic proforma. This allowed the presence or absence of each skeletal element to be taken into account during the data analysis where it could have an effect on the diagnosis of pathological conditions or trauma. The individual was then subjected to a range of osteological techniques used to determine age-at-death, sex, metric and non-metric data, as well as a detailed examination of pathological changes and trauma. The methods used for each of these aspects of the analysis are detailed below.

A total of 169 decapitated individuals from fifty-two different sites were osteologically examined for the purposes of this research. A number of other individuals were subjected to a visual examination in order to assess whether they had been decapitated but were not subjected to a more detailed analysis when no such evidence could be found, either because of missing skeletal elements, poor skeletal preservation or a lack of bony trauma. Where a visual assessment was the only analysis completed, this is noted in the "description" section of the database of sites within square brackets (Appendix 3). The sites from which decapitated individuals were selected and the numbers of such burials osteologically analysed are tabulated in Appendix 1 and all skeletal data on these individuals included in the thesis derives from this analysis. Where the skeletal analysis undertaken by other researchers on further individuals was deemed to be of sufficient quality (age and sex determinations were made, stature was calculated, and information on pathological changes and decapitation trauma was recorded) this data was also used in the detailed analyses contained within this thesis. All data recorded by other researchers is correctly credited at the appropriate place in the text. Appendix 4, a Microsoft Access 2007 database, contains the detailed skeletal data on the 169 skeletons analysed as part of this research, together with that from a further 176 individuals where the data was obtained from secondary sources.

2.1 Age Determination

There are two distinct types of age determination from the human skeleton, with age in non-adults being dependent on measuring the growth and development of the skeleton, while in adult individuals it is a record of the degeneration of certain elements. The age of non-adult skeletons in this project was assessed by the development of the dentition, long bone length and fusion of ossification centres. The dentition is commonly used for age determination of non-adults, as it survives the burial environment well and the development of the teeth takes place over the whole of the non-adult age range, although there are periods, especially in the older age stages, when there is little change in the dentition, making accurate age at death determinations difficult. Dentition is also used as, in skeletal collections of documented sex and chronological age (such as those from Christ Church, Spitalfields, St. Bride's Church, Fleet Street and St. Luke's Church, Islington) it was found to vary less from the chronological age than did the skeletal age (Molleson and Cox 1993: 149; Bowman *et al.* 1992; Boyle *et al.* 2005: 200-201). The dental age determination methods used in this research were based on the visual charts of Ubelaker (1978), which were originally developed from Native American samples but are widely used for archaeological populations from many parts of the world (Scheuer and Black 2000a: 160) and were used for more complete dentitions where teeth were *in situ* in the alveolar bone and the root formation could not be assessed. In cases where the roots were observable, the charts devised by Moorrees *et al.* (1963) and revised by Smith (1991) were used. This is the most commonly used method for archaeological material but the times for M1 crown completion and M1 root formation are stated to be too low (Scheuer and Black 2000a: 158).

Long bone length is used in non-adult age estimation as it records the linear growth of the individual which advances during the same period as dental development and skeletal maturity but not necessarily in synchrony as factors such as poor nutrition and exposure to disease can have a greater adverse effect on long bone length (Scheuer and Black 2000b: 11, 13). Measurements were taken of diaphyseal lengths of all complete non-adult long bones and these were compared against the standards for age estimation from long bone lengths as given in Scheuer and Black (2000a), adapted from Maresh (1970) for older non-adults and adapted from Scheuer *et al.* (1980) for very young individuals. Both these sets of standards were devised using living populations and are commonly used for archaeological samples (Scheuer and Black 2000a: 306). Where dentition was also available for the same individual, the age from the dentition was preferred for the reasons given above but, by comparing both sets of data, any degree of delayed skeletal growth could be assessed.

The fusion of skeletal ossification centres is a process that occurs between one or more primary centres, such as between the ilium, ischium and pubis in the pelvis, or between a primary centre and its epiphyses, such as long bones, and is the final stage of bone growth at those centres. The age at which it occurs varies greatly between different centres, with the vertebrae completing fusion between the centra and neural arches by around the age of six years (Scheuer and Black 2000a: 218), whilst the sternal end of the clavicle does not complete fusion until around thirty years of age (Scheuer and Black 2000a: 252). However, the majority of ossification centres complete fusion during adolescence and the age at which this occurs differs between males and females, with females generally completing fusion around two years earlier than males (Scheuer and Black 2000b: 12). This method was, therefore, very useful for age determination of older non-adults during the period of static dental development. The degree of fusion (whether absent, partial or complete) was recorded for a number of sites for all non-adults on a proforma based on data in Scheuer and Black (2000a). The method was also used to assess age in individuals where long-bone lengths and dentition were not obtainable due to poor preservation and was used as a comparison for the ages obtained from dental development and long bone length for other individuals.

For adult individuals, age was assessed from two areas of the *ossa coxae*, namely the pubic symphysis and the auricular surface. Assessments were made from both left and right sides and an age estimation was made based on the most common age category and taking into account any evidence for pathological alteration of the area. Standards for age determination from the pubic symphysis were first devised by Todd (1920, 1921a,b, 1923), and there were a number of later revisions of the method (McKern and Stewart 1957; Gilbert and McKern 1973; Acśadi and Nemeskéri 1970), including that of Brooks and Suchey (1990), which was the technique employed in this research and which has recently been further revised by Hartnett (2010), although this has so far only been tested on North American samples. There are a number of problems with this method of age estimation, including the fact that the pubic symphysis is very prone to fragmentation and post-mortem loss because of its anterior position and thin cortical bone. This reduces the number of skeletons on which the method can be employed. More importantly, the published standards have very wide age ranges for each stage, with a large overlap, e.g. Stage 4 of the Brooks and Suchey method has a range of 26-70 years for males and 23-57 for females, whilst Stage 5 has ranges of 25-83 and 27-66 for males and females respectively (Brooks and Suchey 1990). All of the methods also seem to have the same defect of tending to overage younger individuals whilst under-ageing older ones (Cox 2000: 69). This method was therefore employed in conjunction with that for the auricular surface. This area of the *ossa coxae* tends to survive very well, increasing the number of individuals on which it can be used. The method employed for this research was that of Lovejoy, Meindl, Pryzbeck and Mensforth (1985). The method has been tested on a number of other samples, although has received less attention than the pubic symphysis technique, and, like the aforementioned method, has been found to over-age younger individuals and under-age older ones

(Murray and Murray 1991: Saunders *et al.* 1992), with less than 40% of individuals in one sample being assigned the correct age range (Osborne *et al.* 2004). However, its survivability in archaeological and forensic contexts has led to an attempt to increase its use with recent refinements of the method (Buckberry and Chamberlain 2002; Igarashi *et al.* 2005) and tests of the new methods (Mulhern and Jones 2005; Falys *et al.* 2006) that suggest the Lovejoy, Meindl, Pryzbeck and Mensforth (1985) method is more accurate for most age categories but is more difficult to apply. Despite the inherent problems with both of these methods of age determination, in combination they are the most commonly used on archaeological material and therefore the age estimations obtained from them during this research will be comparable to those reported for the wider archaeological populations of the same periods.

The final technique used to determine the age-at-death for younger adults was the recording of a number of late fusing ossification centres, such as the iliac crest and vertebral end-plates (which complete fusion at around the age of 21-25 years) and the sternal end of the clavicle (which, as already stated, completes fusion by around 30 years) (Scheuer and Black 2000a). The degree of fusion of the sternal end of the clavicle was particularly useful in adult individuals where other ossification centres had completed fusion but where there was no pelvis surviving.

There are a number of other age determination techniques that have been devised for adult skeletons, including the morphology of the sternal end of the rib (Isçan *et al.* 1984, 1985). The fourth rib was used in developing the technique, which means it can be a problematic technique to apply to archaeological samples as the ribs are often fragmentary, making it difficult to identify the fourth rib. This technique was not used in the current research for this reason, although there has been a recent attempt to devise standards for the first rib, which is much more easily identified in archaeological samples (Kunos *et al.* 1999). Cranial suture closure (a combined method is given in Buikstra and Ubelaker 1994: 32-35) was one of the first methods used to try to determine age-at-death in adult individuals (Dwight 1890; Todd and Lyon 1924, 1925a,b,c), a result of the predominance of studies of the cranium in early physical anthropology. From as early as the mid-twentieth century, the technique was found to be unreliable and erratic (Hrdlicka 1939; Singer 1953), a finding that more modern studies have only confirmed (Saunders *et al.* 1992; Hershkovitz *et al.* 1997). It is also a very time consuming technique and for these two reasons was not employed during this research. The final technique often used to determine age-at-death in adults is the degree of dental attrition. Miles (1963) was the first to devise a standard for this technique which was then adapted by Brothwell (1981). A number of studies have found that for a wide range of archaeological and modern populations the technique was relatively accurate in predicting the age-at-death (Lovejoy 1985; Lovejoy, Meindl, Mensforth and Barton 1985; Richards and Miller 1991; Mays 2002). However, it has to be borne in mind that dental attrition is affected by differences in diet and the use of teeth as tools and in one Roman population previously examined by the author and part of the data set used in this research (Tucker 2006), 62% of individuals had lower rates of dental attrition than expected for their age as assessed from the pubic symphysis and auricular surface. In order to confirm, or otherwise, this finding, the degree of dental attrition for each individual was recorded visually on the dental recording form to allow comparison with the chart as devised by Brothwell (1981).

Once age had been estimated using the above techniques, each individual was placed into a specific age category, as used by the Biological Anthropology Research Centre at the University of Bradford and recently advocated by Falys and Lewis (2011). These categories are as follows:

foetal (up to 40 weeks gestation)
neonate (40 weeks gestation to 2 months post-natal)
infant (2 months to 1 year)
younger child (1 to 6 years)
older child (7 to 12 years)
adolescent (13 to 18 years)
young adult (19 to 25 years)
young middle adult (26 to 35 years)
old middle adult (36 to 45 years)
mature adult (46+ years)

Where poor skeletal preservation did not allow for accurate age determination, or where the ages determined from the pubic symphysis and auricular surface were vastly different, wider age categories were used, such as middle adult (26-45 years), or skeletons were described as non-adult (under 19 years) or adult (over 19 years). However, the nature of the research, with a focus on more complete and relatively well-preserved individuals, meant that this was a rare occurrence.

2.2 Sex Determination

The determination of biological sex from the skeleton is dependent on the assessment of a number of sexually dimorphic features which reflect hormonal differences between males and females, with the features found in male individuals being dependent on the production of androgens, while the female phenotype is the “default setting” into which all foetuses will develop if not directed otherwise by these male hormones (Mays and Cox 2000: 117). Although the terms “sex” and “gender” are often used interchangeably, including in scientific publications (see for example, Steele and Bramblett 1988: 53-56; Sutton *et al.* 1996; Ambrose *et al.* 2003; Barrett and Richards 2004), the two terms do not describe the same thing, with “gender” being a social construct that may or may not depend on the biological sex of the individual. There are many cultures, both ancient and modern, where sex and gender are regarded as being entirely independent from one another and there are accepted sexes that are neither biologically male or female and genders that are neither masculine or feminine (Knüsel and Ripley 2000; Looper 2002; White 2003).

The sexually dimorphic features that are apparent in adult skeletons do not truly manifest themselves in younger individuals as the levels of androgen in the male body are much lower before puberty and therefore the determination of sex in non-adult individuals is much more difficult (Mays and Cox 2000: 118). There have, however, been a number of attempts to devise methods for assigning sex in neonates and infants that usually use the same morphological indicators applied to adult individuals (see, for example, Weaver 1980; Schutkowski 1993; Molleson *et al.* 1998; Rissech *et al.* 2003; Franklin *et al.* 2007). However, there have been mixed results using these methods, with some studies confirming sexual dimorphism in neonates and infants, whilst others have found no differences (Mays and Cox 2000: 121-123). For this reason, no attempt was made to assess sex in non-adult remains during this research.

Sex determination of adults employed a combination of sexually dimorphic features of the pelvis and cranium and mandible. Those in the pelvis reflect a combination of functional and evolutionary adaptations, with the female pelvis being a compromise between successful bipedalism and delivery of offspring (Tague 1989, 1992). The methods used during this research to assess sex from the pelvis were a combination of those of Phenice (1969) for the ventral arc, sub-pubic concavity and ischio-pubic ramus ridge, and Buikstra and Ubelaker (1994: 18) for the greater sciatic notch. The Phenice method has been found to have accuracies of 96% (Sutherland and Suchey 1991), 83% (Lovell 1989) and 59% (Maclaughlin and Bruce 1990) when tested on documented skeletal collections, although Bruzek (2002: 157) suggests that the average accuracy is around 80%. This method also has the disadvantage, like the age determination method employing the pubic symphysis, of being reliant on the preservation of the pubic bone. Sex determination from the greater sciatic notch, which tends to survive better than the pubic bone in archaeological samples, was found to have an accuracy of 80% in one recent study (Walker 2005), whilst a separate study was able to correctly sex 68% of females and 74% of males from the greater sciatic notch alone (Bruzek 2002: Table 2). Combined methods, using a number of features, including the greater sciatic notch and features of the pubic bone, were found to have an accuracy rate of around 95% (Meindl *et al.* 1985; Bruzek 2002).

Sexually dimorphic features of the cranium and mandible are a reflection of the extra somatic growth that males experience before their later puberty and the acceleration in muscle mass that occurs during this period, whilst females retain the more gracile juvenile form (Mays and Cox 2000: 119). The method of sex determination from the cranium and mandible used during this research was that of Buikstra and Ubelaker (1994: 20), which scores the size and shape of five different features (the nuchal crest, glabella, mastoid process, orbital ridge and mandible). Tests of the visual sexing method for the cranium have reported accuracies of 70% (Djurić *et al.* 2005) and 80% (St. Hoyme and Isçan 1989), with an increase to 90% when the mandible is included (*ibid*), although another study has found mandibles of individuals otherwise sexed as female were incorrectly assigned the male sex in 51% of cases (Maat *et al.* 1997). When sex determination methods from the pelvis and cranium and mandible are combined, the accuracy rates have been reported to increase to over 97% (Meindl *et al.* 1985; Mays and Cox 2000: 120).

Once the sexually dimorphic features of the pelvis and cranium and mandible of the individuals in this research had been assessed, they were placed into one of five categories, dependent on their combined scores, namely:

Definite female – F

Possible female - ?F

Indeterminate - ?
Possible male - ?M
Definite male – M

Individuals of indeterminate sex were ones where the features of the pelvis and cranium and mandible were either individually intermediate between male and female or where the sex from the cranium and mandible, and pelvis strongly disagreed. However, it most cases, the sex from the pelvis was preferred to that from the cranium and mandible due to the higher accuracy rates, and also because it has been suggested that older females can have more masculine crania whilst the crania of younger males tend to look more feminine, which reflects the hormonal changes taking place in post-menopausal females and the weaker androgen influence in younger males (Meindl *et al.* 1985; Boylston, Holst and Coughlan 2000: 47). For poorly preserved individuals where very few or none of the sexually dimorphic features could be assessed, the sex may have been recorded as "unknown", which is different from "indeterminate". However, the nature of the research meant that this term was very seldom used.

2.3 Metrical Analysis

A number of measurements from the cranium, mandible and post-cranial skeleton were recorded from non-adult and adult individuals. They were taken using an osteometric board, spreading calipers, linear calipers and a tape measure where appropriate. Measurements from the long bones were used to estimate stature for adult individuals using the formulae devised by Trotter (1970). These were based on modern North American samples, so there is doubt about their validity for use on European archaeological populations (Roberts 2009: 144) but, at present, they are the formulae most commonly applied to archaeological samples, making it possible to compare the present sample with larger datasets from the periods under study.

Adult stature is a combination of genetic and environmental factors, with environmental stresses (such as poor nutrition) preventing individuals from fulfilling their genetic growth potential and resulting in reduced skeletal growth and a reduced terminal (adult) stature (Larsen 1997: 349). Therefore, if the average stature of a specific group within a genetically homogenous population is lower than the average for that population, this may imply higher levels of environmental stress amongst that specific group (see, for example, Nickens 1976; Maat 2005; Masur 2009).

Measurements from the cranium and mandible were also used to aid in the assessment of ancestry of individuals. Ancestry from the human skull has long been a controversial subject due to its use in the nineteenth and earlier twentieth centuries to produce typologies of “higher” and “lower” races (Gosden 2006). However, it is generally accepted that there are three broad categories of skull type among modern populations, although with much admixing among certain populations, namely: European, sub-Saharan African and Far East Asian (formerly known as caucasoid, negroid and mongoloid), which all have a number of distinct cranial features (Bass 1995: 88). The crania of all individuals in this research were subjected to a visual assessment of their ancestry based on the criteria given in Bass (1995: 88-92) with complete skulls having photographs taken of their anterior and lateral view to aid in later analysis. If any distinctly non-caucasoid features were noted on a skull, these were recorded and an assessment of ancestry was made. These visual assessments were then checked by the inputting of cranial measurements into FORDISC 3.0 (Ousley and Jantz 2005), a discriminant functions software program based on Howells’ (1973, 1995) worldwide reference populations. This assesses how similar the sample skull is to each of the reference populations in the program and allows a skull to be identified as belonging to one specific population, a mix of different populations or as having no affinity with any known population.

Metrical analysis was also used in the assessment of long bone asymmetry, which is more commonly recorded in the upper limb as a result of increased mechanical loading of the dominant side (Steele 2000). Increases in bone length and dimensions of articular surfaces are often a result of large mechanical loads being placed on the dominant limb during adolescence whilst the long bones are still growing, whereas increases in diaphyseal cross-sectional shape and area, due to loading, are more common in adults (Steele 2000; Knüsel 2000).

2.4 Non-Metrical Analysis

A number of non-metric traits were recorded on each skeleton, most on the cranium and mandible but also some on the post-cranial skeleton and these were taken from the list in Buikstra and Ubelaker (1994: 85-94). In cases where two or more skeletons from a given population demonstrated a particular non-metric trait that was not listed on the recording form, this was also recorded. Non-metric traits are "minor variants of phenotypic expression" (Tyrrell 2000: 290), with some believed to have a genetic basis, whilst others may reflect environmental and activity-related pressures (Berry and Berry 1967; Trinkaus 1975; Finnegan 1978; Jurmain 1999: 179-182; Stojanowski and Schillaci 2006).

2.5 Musculo-Skeletal Stress Markers

Musculo-Skeletal Stress Markers, otherwise known as enthesopathies or entheseal changes, are expressions of stress at muscle attachment sites on the skeleton in the form of enthesophytic bone formation around the margins of an attachment site, or roughening, porosity or cortical defects of the surface of the attachment (Knüsel 2000: 397). Their formation has been linked to patterns of activity among certain populations (Lai and Lovell 1992; Stirland 1993; Hawkey and Merbs 1995), although a number of recent studies have advised caution as to their use as they have found that body size and age have a significant effect on their expression (Weiss 2003, 2004; Niinimäki 2009; Weiss *et al.* 2010). However, one recent study has confirmed that stress markers on the humerus correlated with activity patterns in a sample of populations of known occupation, with age not significantly affecting their presence and severity, and the study suggested that they could be used to reconstruct past lifestyles as long as the appropriate muscle attachment sites were properly recorded (Villotte *et al.* 2010). For this research, the presence of stress markers and at which muscle attachment site they occurred were recorded as well as the nature of their expression, i.e. whether enthesophytes, roughening, porosity or cortical defects, using the method of Villotte *et al*. (2010).

2.6 Pathological Changes

Any pathological changes to the skeleton were described in detail and, where necessary, photographed to aid in their diagnosis. Any pathological changes of the vertebral column were recorded on a separate proforma which allowed all body surfaces and articular facets to be individually assessed whilst dental pathologies were also recorded on a separate dental recording proforma. Diagnoses were usually made with reference to the descriptions and photographs in Aufderheide and Rodríguez-Martín (1998) and Ortner (2003), although other texts were used where necessary. All reference material used to aid in diagnosis are discussed and acknowledged at the appropriate places in the text.

2.7 Trauma Analysis

As one of the major aims of this research was to assess the manner of the decapitations through an analysis of the osteological evidence for the practice, evidence for cut-marks and other peri-mortem trauma, both directly and indirectly related to decapitation, were very carefully examined, described and photographed as well as being visually recorded on proforma. The proforma for the cranium, mandible and major bones of the post-cranial skeleton were taken from Buikstra and Ubelaker (1994), whilst a separate set for the cervical and upper thoracic vertebrae were specially designed for the project by Caroline Needham from the Centre for Anatomy and Human Identification, University of Dundee.

It was vital for this research that peri-mortem cut marks and fractures were distinguished from those made ante-mortem and demonstrating healing, indicating the individual survived the injury for some time before death, or post-mortem, either by ancient disturbances and truncations of the skeletal remains or by modern excavation damage.

Fresh bone, which retains its collagen content for a number of weeks after death depending on the conditions of the burial environment and is therefore more pliable, will fracture differently to dry bone which has lost this collagen content and become more brittle (Maples 1986). This difference in response to the application of force is the main factor used to distinguish between peri- and post-mortem fractures. The brittle nature of dry bone means that it tends to present with roughened fracture surfaces, undulating or jagged fracture margins and a tendency to produce fracture lines that run perpendicular to the long axis of the element (Lovell 1997: 145; Knüsel 2005: 52). However, fractures that occur in the earlier dry-bone stages can produce spiral or helical fracture outlines that resemble peri-mortem fractures in this regard, although not in the appearance of the fracture surface, a feature that can be used to distinguish fractures that are generally indicative of post-depositional disturbance and may have occurred as part of a secondary burial ritual (Knüsel 2005: 52-53). Post-mortem cranial fractures were distinguished by their slightly roughened broken edges and their linearity, with fractures often crossing cranial sutures and producing sub-rectangular and diamond shaped broken fragments (Lovell 1997: 145). Broken surfaces that are paler than the rest of the bone are also a distinguishing feature in post-mortem fractures of more modern origin, as, unlike the surrounding bone, the broken surface has not been exposed to staining by water, soil and vegetation (Lovell 1997: 145; Sauer 1998: 325; Knüsel 2005: 52). Excavation damage can also be identified as fractures with pale edges and with crushed bone and soil smeared across the broken surface, which are often the result of blows with a mattock or shovel, or by small penetrating marks with pale crushed edges, which are caused by the point of archaeological trowels (Aufderheide and Rodríguez-Martin 1998: 15).

Ante-mortem sharp-force and blunt-force trauma and fractures were distinguished by the presence of actively remodelling bony calluses around the area of the trauma or by healing having been completed. Studies, by Sledzik and Kelly (cited in Sauer 1998), on soldiers of the American Civil War, who had survived injuries for varying lengths of time, and for whom the type of injury, the length of time survived and the medical treatment received were known, found that osseous remodelling, in the form of periosteal woven bone, was seen, on average, thirteen days after the injury was sustained, with some individuals demonstrating changes after seven days. Therefore, trauma with evidence for healing can be assumed to have occurred at least seven days ante-mortem (Sauer 1998: 322). A bony callus will then start to appear around the site of the fracture, usually distinguishable on radiographs from two to three weeks after the injury is sustained (Cunha and Pinheiro 2009: 251). Consolidation of this woven bone callus into compact lamellar bone then occurs within weeks or months, depending on the element affected and bony remodelling of the site then takes place over the following years until the fracture becomes undistinguishable from the surrounding bone in around ten years (Hoppenfeld and Vasantha 2000).

All evidence for ante-mortem trauma was described in detail and photographed where appropriate. This included ante-mortem blunt and sharp force trauma and fractures of the cranial and post-cranial skeleton, with the descriptions of different types of fractures, including linear, comminuted, crush, compression, avulsion, greenstick and impaction being applied as defined by Lovell (1997). For cranial vault depressed fractures, features such as size, degree of healing and any associated infection were recorded, whilst for other types of fracture, the degree of angulation, misalignment and shortening, as well as the amount of healing and any associated infections were recorded as described in Lovell (1997: 150-151) and Roberts (2000a: 346-350).

Peri-mortem fractures were distinguished by their smooth un-stepped fracture surface with obliquely angled edges (Villa and Mahieu 1991; Knüsel 2005: 53). Long bones and other elements, such as the mandible, tend to splinter, with fragments often remaining attached to one another and with sharp and irregular fragments of bone (Sauer 1998: 325). Elements can also present with “butterfly” fractures (Fig. 2.1), so called because of the shape of the bone fragment produced, which often result from bending forces that cause fractures along the shear planes within the bone structure that run at 45º angles to the compressive stress (Knüsel 2005: 53; Turner 2006: 434). Peri-mortem fractures to the cranium present with a different appearance due to the spherical shape of the vault and often exhibit linear, radiating fractures from the point of impact of the blow that commonly extend to the cranial sutures and then follow the line of the less resistant and weaker suture rather than crossing it, and/or concentric fractures around the point of impact (Kimmerle and Baraybar 2008: 159). The point of impact on the ectocranial surface is often compressed, which can also produce an equivalent bowing of the endocranial surface, or the force of the blow can fracture both tables of the vault and push the resulting fragments into the intra-cranial space. These fragments can remain attached to the vault or can separate at the endocranial concentric fracture lines, producing an internal “bevel” (Loe 2009: 267), with or without the detached fragment being preserved (Fig. 2.2).

Figure 2.1: peri-mortem butterfly fracture of the midshaft of the ulna of SK3 from 6 Driffield Terrace, York (photograph by author, courtesy of York Archaeological Trust)

Figure 2.2: peri-mortem endocranial bevel with detached fragment of bone in SK17 from 6 Driffield Terrace, York (photograph by author, courtesy of York Archaeological Trust)

Peri-mortem sharp force injuries were distinguished from peri-mortem fractures by their linearity, well defined clean edges and flat, smooth, polished cut surfaces (Boylston 2000: 361). There are a number of different classes of sharp-force injury, including chopping blows, incisions and stab wounds, all of which produce different signatures on bone. Chopping blows (Fig. 2.3) were distinguished by their linear and broad appearance (Loe 2009: 272) with their width and depth being very similar (Kimmerle and Baraybar 2008: 267), and they sometimes present with striations running parallel to the short axis of the cut surface that are presumed to be produced by blades with defects in their cutting edge (Wakely 1997: 32). Incised cuts were distinguished by their narrow and fine appearance with striations often present which run parallel to the long axis of the cut (Fig. 2.4), a result of the blade being drawn across the bone surface rather than through it. These striations are particularly apparent in slicing/incised wounds inflicted by lithic tools and are considered to be one of the characteristic features of lithic as opposed to metal weapons, along with curvature of the walls of the cut (Smith and Brickley 2004: 20, 22), although striations have also been noted in incised cuts made with metal tools (Homes Hogue 2006). Stabbing injuries (Fig. 2.5) were distinguished by being deeper than they are wide, and manifested as punctures into or through the bone with polished margins (Novak 2000: 91). The angle of the cuts was recorded visually as well as being described, for example a cut could be described as being angled right-superior to left-inferior and postero-superior to antero-inferior, and the direction could usually be determined by the presence of small amounts of crushing of the cortical and trabecular bone on the margin facing the direction of the blow, and/or peeling of the bone surface on the far margin of the cut if the bone was bisected, or lifting of the bone on the far margin if the cut nicked into the bone (Boylston 2000: 361; Knüsel 2005: 55).

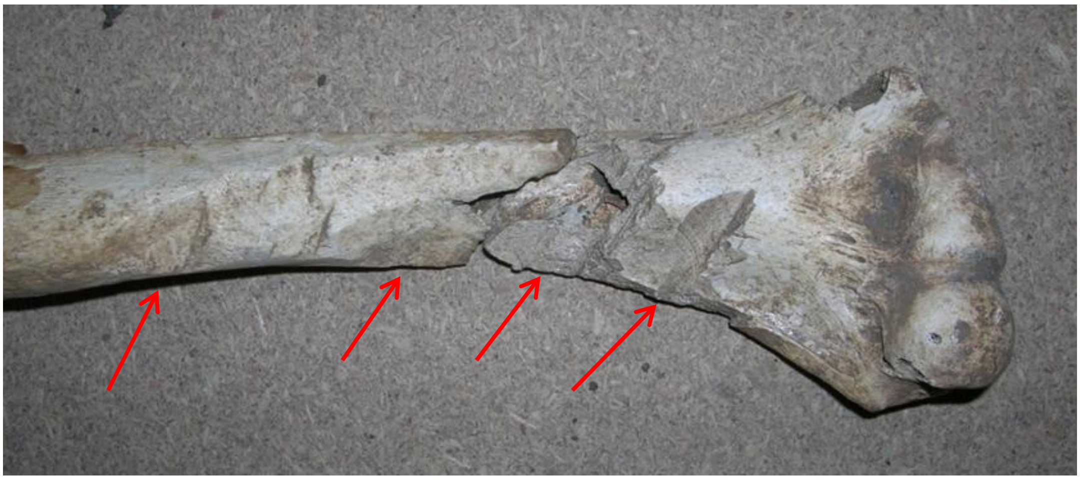

Figure 2.3: peri-mortem chopping injuries to the right humerus of Q1 from Maiden Castle showing fine striations running parallel to the direction of the blow

Figure 2.4: incised cut-mark to a bovine femur (from Lewis, JE 2008: 2004)

Figure 2.5: peri-mortem stabbing injury to the sacrum of SK16 from 1-3 Driffield Terrace, York (photograph by author, courtesy of York Archaeological Trust)

Various studies have attempted to identify distinguishing features of sharp force injuries produced by different types of metal instrument, including heavy and thick bladed tools such as machetes and axes, lighter and finer swords and knives (see, for example, Wenham 1989; Houck 1998; Humphrey and Hutchinson 2001). Alunni-Perret *et al.* (2005) compared the features of experimentally produced knife marks on defleshed human bone to those produced by an axe and found that axe marks were characterised by smooth cut surfaces, a characteristic of sharp force injuries, as well as the pushing back of the edges of the adjacent bone that are indicative of a blunt force mechanism, although, as Lewis, JE (2008: 2002) has pointed out, it is not known how the absence of soft tissue overlying the bone may have affected the results. Lewis, JE (2008) demonstrated clear differences between sharp force injuries made with swords compared to those produced by knives on bovine femora. Sword injuries demonstrated deeper and wider cuts with a straight floor and either a V-shaped section or a flat bottomed one, depending on how sharp the sword was, and had one smooth vertically curved wall and one rougher vertically straight wall. Knife wounds, on the other hand, were shallower and thinner with a meandering floor that was always V-shaped in section and with both walls presenting as vertical. Sword cuts also demonstrated more damage to the surrounding bone than those produced by knives. Lewis, JE (*ibid.*) concluded that it was possible to easily distinguish between marks produced by swords as opposed to knives, although he did seem to suggest that during the experimental study, the swords had been used to chop whilst the knives had been used to slice (*ibid.*: 2006). This, therefore, does not really assist in distinguishing slicing (incised) cuts made by swords from those produced by knives. The study also attempted to distinguish between the cuts made by different types of sword, including machetes, broadswords, katanas and scimitars and determined that the differences seen were dependent on how heavy and sharp the blades were as well as whether they were wielded with one or two hands. Heavier weapons tended to produce more breakage of the bone surrounding the cut whilst sharper weapons produced unilateral flaking of the sides of the cut as did weapons wielded single-handed, whilst bilateral flaking of the sides was produced by blunter weapons and those wielded with two hands (Lewis, JE 2008). This analysis was used during the present study to aid in the differentiation of slicing/incised knife marks and hacking/chopping blows made either by an axe or sword but the types of sword used during the study and their characteristics are not particularly applicable to the periods under study in the present research.

Peri-mortem trauma that was recorded as being directly related to the act of decapitation was restricted to the area from the mid to inferior part of the cranium down to the shoulders, and included trauma seen on the cervical vertebrae, the claviculae, the superior part of the scapulae and manubrium, the mandible, and the mastoid processes, occipital and cranial base. Trauma recorded on any other elements were assessed as to their likely aetiology, for example, peri-mortem trauma of the distal upper limbs, metacarpals and manual digits are most commonly recorded in individuals who have been the victims of assault and are related to attempts to ward off blows, so called "defensive injuries" (Lovell 1997: 166; Chacón *et al.* 2008: Fig. 6.53), whilst cuts to areas of significant soft tissue (cuts to the anterior of the *os coxae* or sacrum probably originated as blows into the abdomen), musculature or ligament attachments (such as the rotator cuff of the shoulder or the distal femur) might have been attempts to incapacitate by immobilising the individual (Chacón *et al.* 2008: 313).

2.8 Statistical Analyses

Statistical analysis was employed to make full use of the data where the sample size was judged to be large enough for such tests to be meaningful (Shennan 1997). Fisher's exact test for small samples was used for the majority of statistical analyses of categorical data, whilst the chi-square test was used for larger sample sizes, and the *t*-test and one sample *t*-test were used to compare the means of continuous data. The tests were performed using the GraphPad Quick Calcs Online Calculator (available at http://www.graphpad.com/quickcalcs/index.cfm). The probability value as calculated by the tests is given in the text as "*p* value".

2.9 Using the Appendices

The databases contained in Appendices 3 and 4 are both fully searchable. Appendix 3 is a database of the sites from Britain where decapitated burials have been identified, with short descriptions from secondary sources about the site and the decapitated individuals, and is searchable by site name, county and period. A full-text search can also be performed on the database. It is also searchable as a GIS map (a free GIS reader is available to download at http://www.esri.com/software/arcgis/explorer/index.html). Appendix 4 is a detailed database of each individual skeleton analysed as part of the thesis, as well as those examined by other researchers that formed part of the data-set. This is searchable by site name, county, skeleton number, sex and age, as well as allowing for a full-text search. The original paper proforma used to record all of the skeletal remains analysed as part of the research, including those that record the location of the peri-mortem trauma, are held as a separate paper archive and are not included in the final thesis. Appendix 5 contains the original record photographs taken of all individuals examined as part of the thesis and is organised in separate folders for each individual site. The photographs within each folder are then numbered and, where appropriate, identified to a skeleton number.

Chapter 3: Evidence for Decapitation in British Prehistory

3.1 The Neolithic

A total number of twenty-six sites were identified where there was the possibility of decapitation having occurred, with forty-four individuals being represented. Just over sixty percent of such individuals where a biological sex was stated were identified as adult males whilst just over thirty percent of all individuals were identified as non-adult.

3.1.1 Decapitated heads

The most common type of decapitation-related deposits (71.4%) were isolated crania and mandibulae, sometimes with associated cervical vertebrae. These were identified during the antiquarian excavations of Greenwell (1877: 500-501, 507) in the long barrows at Rudston and Market Weighton, East Riding of Yorkshire, and by Cunnington (1884) at Bole's Barrow, Wiltshire, where the neck vertebra of one individual had been "cut in two by some sharp instrument" (*ibid*.: 107), although, as stated earlier, the cut bore the characteristics of having been made by a metal blade, suggesting it was from a secondary burial, probably of Romano-British or early medieval date (Smith and Brickley 2009: 144). Isolated crania and mandibulae were also identified at Chute, Wiltshire (Passmore 1942: 100), and were described as having been laid in a circle on flat stones with bundles of long bones placed inside the circle.

More recently, a small number of associated crania and mandibulae were excavated from the ditches at the causewayed enclosure of Hambledon Hill, Dorset (Mercer and Healy 2008). Three of these crania and mandibulae were also associated with one to three cervical vertebrae, although no osteological evidence for decapitation was recorded (McKinley 2008: 513). A similar deposit was excavated from the ditch of the causewayed enclosure at Yeoveney Lodge Farm, Staines, Surrey, which was reported as displaying evidence for four blunt force injuries to the frontal, transverse cuts to the mastoid processes and cuts to C1-C4 (Robertson-Mackay 1987). A recent re-analysis of the cranium and mandible (Schulting and Wysocki 2005) found that they were very fragmentary and had been heavily reconstructed, precluding the identification of any evidence for peri-mortem trauma, but they were unable to locate the cervical vertebrae originally reported as being present. As part of the present research, the cranium and mandible were re-examined and the conclusions of the previous researchers as regards the impossibility of verifying the presence of traumata were confirmed, due to all broken bone edges being covered with plaster (Fig. 3.1). However, this time, the remains of the cervical vertebrae were located and closely examined for the presence of the cuts noted in the original report. Fragments of the left arches of C1 and C2, and the left arches and bodies of C3 and C4 were identified but there was no evidence for peri-mortem cuts or fractures to any of the elements (Fig. 3.2).

Figure 3.1: heavily reconstructed cranium (Skull B) from Yeoveney Lodge Farm causewayed enclosure, Staines, Surrey

Figure 3.2: parts of C3 and C4 from Skull B, Yeoveney Lodge Farm, Staines, Surrey, with no evidence for peri-mortem trauma

3.1.2 Other forms of decapitation

A number of the remaining Neolithic examples of possible decapitation are represented by headless bodies, such as the individual buried with a flint blade by their right hand found by Bateman (1861: 227-228) at Pickering, North Yorkshire, and the previously mentioned individual from Swell, Gloucestershire, found by Greenwell (1877: 146). The cremation of headless corpses was the interpretation of five multiple deposits of cremated human bone, containing a minimum number of fifteen individuals, excavated at Trostrey Castle, Monmouthshire (Mein 1997). The analysis indicated that the cremations represented samples of bone from each individual rather than complete cremated individuals but there was stated to be no trace of dentine or enamel present, which was taken to indicate that the bodies had been decapitated prior to cremation (*ibid*.: 60). However, enamel is very rarely found in cremations even where the whole body is represented as it shatters and disintegrates in the very high temperatures produced during the process (McKinley 2000: 410), and it is not mentioned whether cranial elements (which are easily distinguished from other bones in cremated deposits because of their distinctive shape) were also absent.

Three headless burials, of an adult female, an adult male and a non-adult of c.10-11 years, were excavated from Whitegrounds Barrow, North Yorkshire (Brewster 1984b), but, in this case, the crania of all three individuals and the mandibulae of the adult male and non-adult were found in a cache near to the prone burial of the adult female (*ibid*.). The brief report on the skeletal remains (Dawes 1984) made no mention of any evidence for peri-mortem trauma to the crania, mandibulae or cervical vertebrae of any of the individuals. The final example that should be mentioned is the contracted burial of an adult female found during the excavations of the chambered tomb at Ascott-under-Wychwood, Oxfordshire (Chesterman 1977). The original report stated that the first cervical vertebra did not articulate with the rest of the, complete, spine (*ibid.*), suggesting that the cranium, mandible and C1 were from a different individual. The presence of both the mandible and C1 would suggest either that the head was removed from its original post-cranial remains relatively early in the decomposition process as the mandible detaches from the cranium prior to the upper cervical spine (Duday 2009: 18) or there was a deliberate attempt to re-articulate the mandible with the cranium for its final deposition. However, this non-articulating vertebra was not mentioned in the recent re-analysis of the material from the site (Galer 2007: 207-208) and no peri-mortem cuts were recorded.

3.1.3 Evidence for peri-mortem trauma

Although a large number of these possible examples of decapitation from the Neolithic were reported in the nineteenth and earlier twentieth centuries and have never been subjected to detailed osteological analysis, none of the examples from more recent excavations that have been subject to such analyses have revealed any evidence for peri-mortem cuts or other traumata. This would suggest that the manipulation of crania and complete heads was occurring once decomposition was sufficiently advanced to preclude the necessity of cutting through soft tissue. This conclusion would also be supported by the observations, such as that made for the deposits at Rudston (Greenwell 1877: 500-501), that a number of the mandibulae were not found articulated with their crania or that mandibulae were articulated with crania to which they did not belong. However, recent re-analysis of commingled human remains from long barrows at Swell and West Tump, Gloucestershire, have identified two claviculae with a number of incised peri-mortem cut-marks (Fig. 3.3), made with a flint blade, to the superior surface (as mentioned in Chapter 1), that would seem to be consistent with the removal of *M. sternocleidomastoideus* at its clavicular origin (Smith and Brickley 2004; 2009: 51). As the cranium separates from the post-cranial remains early in the sequence of post-mortem decomposition (Roksandic 2002), the presence of cut-marks indicates that some heads were being removed from post-cranial remains before decomposition was very far advanced. Smith and Brickley (2009) and Schulting and Wysocki (2005) do not mention any crania with cut-marks to the insertion point of *M. sternocleidomastoideus* at the mastoid or to the area of the nuchal crest, where *M. semispinalis capitis* and *M. rectus capitis* insert, or any cuts to the posterior arches of cervical vertebrae where these muscles originate. This suggests that decomposition may have at least begun when these heads were removed or more cuts to the cranio-cervical skeleton should probably be expected. Such peri-mortem cuts have indeed been found on Neolithic human remains from outside Britain, for example, on cervical vertebrae at Tell Qaramel, Syria (Kanjou 2009), a mandible at Köşk Höyük, Turkey (Bonogofsky 2005), and both cervical vertebrae and mastoid processes at one of the predynastic cemeteries (HK43) of

Hierakonpolis, Egypt (Maish 2003; Dougherty 2004). Therefore, further research with the specific aim of identifying peri-mortem cut-marks to crania, mandibulae and cervical vertebrae of commingled remains as well as isolated head deposits and articulated skeletons may reveal more evidence for peri-mortem head removal in the Neolithic period in Britain.

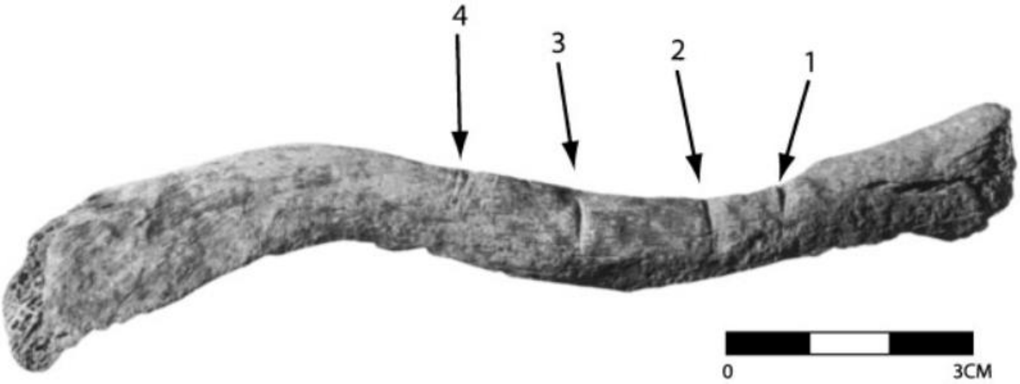

Figure 3.3: peri-mortem cut-marks on the shaft of a clavicle from West Tump, Gloucestershire (from Smith and Brickley 2004: Fig. 4)

3.2 The Bronze Age

There were nearly twice as many sites identified from the Bronze Age than the Neolithic (forty-seven) where there was the possibility of decapitation, with sixty-four individuals being represented. The percentage of adult males (just over seventy percent of adults for whom a sex was determined) was slightly higher than in the Neolithic, and, as a consequence, the percentage of adult females (just under thirty percent) decreased. The total percentage of non-adults also slightly decreased, although none of the differences were statistically significant.

3.2.1 Decapitated heads

Isolated head deposits were still the largest group represented, with half of all examples being from this category, and although this percentage represented a decrease from that found in the Neolithic, it was not statistically significant. A number of these head deposits were found in early excavations and, although a number of them were reported to have been found with attached cervical vertebrae, such as one of the three isolated crania and mandibulae found by Greenwell (1877: 206) in a barrow at Helperthorpe, North Yorkshire, or the cranium and mandible found on Pilling Moss, Lancashire, in 1824, that also had part of C1, surviving hair and associated jet-beads, all found wrapped in a coarse woollen cloth (Edwards 1970), the absence of any detailed analysis of the skeletal remains makes it impossible to determine whether they were the result of peri-mortem decapitation. Very poor preservation of bone also made this impossible to determine for the seven deposits of isolated heads excavated from a number of pits at Barns Farm, Dalgety, Fife, in which complete and directly associated maxillary and mandibular dentitions were the only surviving skeletal remains (Watkins 1982: 81-82). It is also now impossible to determine whether an adult male cranium and mandible, found with five attached cervical vertebrae, from a palaeochannel at Abbey Meads, Chertsey, Surrey, represented a deliberate decapitation or was simply the result of later truncation by quarrying of a complete burial (Jones n.d.) as the remains were stolen during the relocation of the Surrey Council Archaeological Unit stores in the 1990s (Rob Poulton *pers. comm.* 2011).

Osteological analysis was carried out on a cranium and mandible with C1 and part of C2 attached that was excavated from a chalk-cut cist under a round barrow and directly associated with a large roughly chipped block of flint, at Easton Down, Wiltshire (Stone 1934b). The inferior border of the mandible and C2 were stated to be poorly preserved and no cut-marks were observed on any of the elements (Tildesley 1934b). Interestingly, the remains are now claimed to be in both the Natural History Museum and the Salisbury and South Wiltshire Museum, although those in the Natural History Museum appear to match the descriptions provided by Tildesley (*ibid.*), which would correspond with the analysis having been carried out at the Royal College of Surgeons with the collections subsequently passing to the Natural History Museum. Unfortunately, the two vertebrae are now missing, making the original osteological observations impossible to verify.

There is only one example of an isolated head deposit from this period where osteological analysis did reveal evidence for peri-mortem decapitation and which was re-examined for the purposes of this research. This was a cranium, mandible, C1 and C2 found in a palaeochannel at the Watermead Country Park, Birstall, Leicestershire, along with a second cranium and a small number of post-cranial remains (Cook n.d.). The second cranium and post-cranial remains were radiocarbon dated to the Neolithic (*ibid.*), whilst the articulated cranium, mandible and cervical vertebrae were dated to

990-830 cal BC, which places them within the later Bronze Age (Ripper 1997). The cranium and mandible belong to a younger adult (based on the dentition) male with a possible healed depressed fracture to the anterior left of the frontal. There was no evidence for any peri-mortem injuries to the cranium or mandible, but there were four incised cuts to the posterior arches of C1 and at least nine separate incised cuts to the body and arches of C2 (Fig. 3.4). The majority of the cuts to C2 were made from the anterior and affect the posterior and inferior of the body as well as the anterior of the inferior articular facets. It has previously been suggested (Ripper 2003) that the individual had had their throat cut, but the placement of the cuts is more consistent with soft tissue initially being removed from the anterior and posterior of the neck and then, once the vertebrae were visible, the blade being used to cut through the intervertebral connective tissues from the anterior until the cervical column was severed at the level of C2-C3.

Figure 3.4: incised cuts to the posterior of the arch of C1 of the decapitated head from Birstall, Leicestershire

3.2.2 Other forms of decapitation

The majority of the remaining examples of possible decapitation from the Bronze Age were represented by headless skeletons (28%) and burials where the head was present but displaced (20%). The percentage of burials where the head was displaced showed a very slight, non-statistically significant, increase from the Neolithic, but the increase in headless burials was statistically significant (*p*=0.0270). Again, a number of these were excavated during the nineteenth and earlier twentieth centuries and were never subjected to any osteological analysis, such as the previously mentioned adult male burial found wrapped in deer-skins and with a shale cup within a log coffin beneath a barrow (Arne 19) in Dorset (Grinsell 1959: 25, 87), the partial burial with a beaker of an adolescent with the cranium, mandible and C1-C2 absent, from Fargo Plantation, Wiltshire (Stone 1939), or the contracted burial of an adult where the cranium was placed at the pelvis from Hanging Grimston, North Yorkshire (Mortimer 1905: 105). Even where burials have been excavated more recently, very few have ever had any osteological analysis performed or, at least, never published, with examples where this analysis is missing including a contracted burial of a non-adult of c.4 years whose cranium and mandible were described as having "disintegrated" despite the rest of the elements being well preserved (Bailey 1980: 23-24); and the headless non-adult who had been cremated *in situ* in a pit within a ring-cairn at Aber Camddwr, Cardiganshire (Hogg 1977). This makes it impossible to determine whether any of the cases do in fact demonstrate evidence for peri-mortem decapitation, or whether, like an adolescent male from Horsbrugh Castle Farm, Peebleshire, whose skeleton was slightly disarticulated, with the cranium, mandible and both pectoral girdles missing (Peterson *et al.* 1975), the absence of the head is more likely to be the result of post-burial truncation or disturbance.

One such burial, from Babraham Road, Wandlebury, Cambridgeshire, of a partially articulated adult male, with sixty percent of the skeletal elements absent, who had been interred in a semi-decomposed state in a large circular pit (Cambridge Archaeological Unit n.d.) did display evidence for an incised cut into the right petrous temporal (Duhig n.d.), suggesting that an attempt had been made to remove the cranium from the post-cranial remains before final deposition. This does suggest that some of the headless burials, or those with displaced heads, may actually reveal evidence for decapitation having been carried out before decomposition had become far enough advanced to allow the cranium to be removed without the need for cutting of soft tissue.

3.2.3 Composite skeletons

The final burial that should be mentioned and that seems to represent a different phenomenon is the seemingly completely articulated burial of an adult male found buried beneath the floor of a building at the settlement of Cladh Hallan, South Uist, which was found on analysis to be composed of the post-cranial skeleton of one individual, the cranium and cervical vertebrae of a second and the mandible of a third, with the cranium showing signs of abrasion (Parker-Pearson *et al.* 2005; 2007). The finding that the mandible is from one individual and the cranium and cervical vertebrae from another, along with the absence of any evidence for cut-marks, would suggest that these elements had been removed from corpses in advanced, but different, stages of decomposition. The abrasion of the cranium may suggest that the body from which it was taken had been allowed to decay above ground and the post-mortem loss of the maxillary anterior dentition (*ibid.*) would also support this interpretation. One of the most interesting aspects of this burial is the discrepancy between the radiocarbon dates for the cranium (1500-1260 cal BC), mandible (1500-1210 cal BC), post-cranial elements (a date of 1620-1410 cal BC from the tibia) and when the floor was constructed over the burial pits (1100-930 cal BC) (*ibid.*). This suggests that the composite skeletal remains were curated for at least one or two centuries before their final deposition, and there is also the suggestion that the individuals who provided the post-cranial and cranial/mandibular remains did not die during exactly the same period. It seems possible that the cranio-cervical skeleton of the main individual was removed some time after death and the remains were curated in a headless state for a number of years before replacement elements were united with the post-cranial skeleton to be further curated. Centuries later the remains were buried as a composite skeleton, possibly because it was seen as necessary or desirable that a body should appear to be whole when finally interred (there is also recent aDNA evidence that an adult female burial from the same site, previously assumed to have been a single individual, was composed of the remains of three different people, with the cranium and mandible belonging to an adult male (BBC 2011a)). It is possible that this may provide an interpretation for the Neolithic burial at Ascott-under-Wychwood with the cranium that did not appear to belong to the post-cranial remains (Chesterman 1977) although radiocarbon dating of cranial and post-cranial elements, coupled with a re-analysis of the remains to confirm whether the cranium does or does not belong to the rest of the skeleton, would be necessary.

3.2.4 Conclusion

In conclusion, there is limited evidence for peri-mortem decapitation and manipulation of heads in the Bronze Age, but re-analysis of skeletal remains in cases where the cranium and mandible are absent, or where a deposit of an isolated head has been found, would possibly provide more evidence, as has been suggested for the Neolithic.

3.3 The Iron Age

The number of possible or definite cases of decapitation increases again in the Iron Age, with sixty-one sites and one hundred and twelve individuals being represented. There is also an increase in the percentage of adult males represented (73.5% of individuals assigned a sex) and a decrease in the percentages of adult females (26.5% of individuals assigned a sex) and non-adults (14.9% of all individuals). The ratios of adult males and females are not statistically significantly different from those in either the Bronze Age or Neolithic, but the percentage of non-adults is significantly lower (p=0.0208) than in the Neolithic, although not the Bronze Age. Deposits of isolated crania and mandibulae were again the most commonly identified group (46.5% of all depositions), although this represented a slight, non-statistically significant, decrease from the Bronze Age. Individuals where the head was present but displaced were the second most commonly represented group (29.7%), followed by headless burials (16.8%), which represents a change from the Bronze Age, although it is not statistically significant. There was also a new group of burials identified from this period where the head was in correct position and osteological analysis identified definite evidence for decapitation (seven individuals or 6.9%), which may be a result of the greater frequency of such analysis, which was carried out on thirty-four examples of possible or definite Iron Age decapitations (including ten analysed as part of this research), compared with just two in both of the two previous periods.

3.3.1 Osteological data from the Iron Age sample

This sample of individuals where detailed osteological data was recorded allows some points to be made regarding their health status compared to non-decapitated individuals from the same period, as well as to the nature of the evidence for peri-mortem trauma amongst the group. Of the thirty-four individuals (or parts of individuals retrieved from commingled contexts), all those that could be assigned a sex were found to be male (eleven individuals), with a few non-adult individuals also being represented. Although this does reflect the small number of adult females represented in the larger sample, it has also resulted from an unforeseen bias in the sex of skeletal remains which were available for analysis, with the articulated cranium, mandible and cervical vertebrae of an adult female from a late Iron Age well at Odell, Bedfordshire (Dix 1980: 16), not being available for study due to major refurbishment of the local stores (Liz Pieksma *pers. comm.* 2010), whilst an older adult female from Stane Street, Baldock, who was possibly decapitated (Burleigh and Fitzpatrick-Matthews 2007: 66) has not yet been fully published.

The stature could be calculated for nine adult male individuals, with a range of 160.79-178cm and a mean of 174.5cm. This is statistically significantly higher (p=<0.0001) than the general Iron Age mean of 168cm calculated from 113 individuals by Roberts and Cox (2003: 103) and the mean of 169.2cm (n=49) (p=0.0004) calculated by Redfern for Iron Age populations in Dorset (2005: 87). This indicates that the individuals from the Iron Age who displayed evidence for decapitation were significantly taller than the wider population. This may indicate a higher level of nutritional health during childhood and adolescence (see Chapter 2), which is also supported by the lower level (8.8% of individuals) of *cribra orbitalia* amongst the decapitated sample, compared with 19% of 168 individuals given by Roberts and Cox (2003: 103) and 43% of male right orbits (n=46) in the sample analysed by Redfern (2005: 93), although the CPR (crude prevalence rate) given by Roberts and Cox (*ibid.*) is not statistically significantly higher (p=0.2140) than that in the present sample (the TPR (true prevalence rate) calculated by Redfern (*ibid.*) cannot be compared statistically with the CPR of the present sample). *Cribra orbitalia* is a porosity of the roof of the orbits that is probably a result of iron deficiency anaemia, whether through inadequate diet or parasitic infection, although it has recently been suggested that the condition may have more complicated aetiologies (Walker *et al*. 2009). The possibility that the decapitated individuals may have had a better non-adult health status is also supported by the limited presence of dental enamel hypoplasia (EH), which, at 2.9% of individuals, is lower than the 16.7% of individuals in Roberts and Cox's sample (2003: 101), although not quite statistically significantly so (*p*=0.0572). Enamel hypoplasia are areas of reduced enamel deposition on the dental crowns, usually manifesting as linear depressions and pitting and thought to relate to periods of acute ill-health and increased body temperature (Lewis and Roberts 1997).

Whether those individuals subject to decapitation were different from the rest of the population in other aspects of their health status was also assessed. Dentition could be recorded in ten individuals and, of these, three had evidence for dental caries (30% of those with dentition and 8.8% of the total sample). The percentage of the sample as a whole is slightly higher than the 5.1% given by Roberts and Cox (2003: 101), although not statistically significantly so (*p*=0.4156). The TPR for the number of teeth affected is five of 199 (2.5%) which is very similar to the 2.9% reported by Roberts and Cox (2003: 101) but statistically significantly lower (*p*=0.0202) than the 6.5% in Redfern's (2005: 111, 194) sample and two samples used by Wells (1975) and Brothwell (1959) which gave percentages of 10.3% and 10.42% respectively (*p*=<0.0001). Dental calculus was recorded in all ten of the individuals for whom dentition was present (29.4% of the total sample), which is lower than the 35.2% reported by Roberts and Cox (2003: 101), although it is not statistically significant (*p*=0.6714). The TPR is 190 of 200 teeth (95%), which is statistically significantly higher (*p*=<0.0001) than the 16% of the sample utilised by Roberts and Cox (*ibid.*) and the 61.8% of the sample used by Redfern (*ibid.*). Both dental caries and calculus are a reflection of poor levels of dental hygiene and high levels of protein and sucrose in the diet (Lieverse 1999; Hillson 2005: 291), although modern levels of dental hygiene are still not sufficient to prevent the build-up of dental calculus (Roberts and Cox 2003: 131). The fact that the decapitated individuals demonstrate statistically significantly higher levels of dental calculus whilst also demonstrating statistically significantly lower rates of dental caries suggests that the standards of dental hygiene may have been poorer amongst that group whilst the diet may also have been different, with lower levels of sucrose than was the norm.

Periodontal disease is an inflammatory condition that affects the periodontium and which manifests as porosity and resorption of the alveolar margin (Lavigne and Molto 1995). It should not be confused with continuing eruption of the dentition, a feature which is predominately recorded in individuals with high levels of dental attrition (Glass 1991), although a lower level of continuing eruption has been recorded in populations with limited attrition (Whittaker *et al*. 1990). Periodontal disease is usually associated with high levels of dental calculus, the bacteria within the newly deposited dental plaque being the predominant cause of the disease (see Williams *et al.* 1992) and so the decapitated sample should demonstrate higher levels of the condition compared with the wider population. However, only four individuals (11.8% of the total sample) displayed evidence for periodontal disease, which is slightly lower than the 16.7% in Roberts and Cox's (2003: 101) sample, although not statistically significantly so (p=0.7527).

Dental abscesses are associated with severe carious cavities and result from an infection penetrating into the alveolar bone from an infected tooth or tooth socket, although their appearance in dry-bone can be easily confused with periapical granulomata and apical periodontal cysts, both of which are also the result of infection and inflammatory processes but which are much more benign in nature (Dias and Tayles 1997), and so the levels should be lower in the decapitated sample, commensurate with the lower levels of dental caries. Two individuals (5.9%) had evidence for abscesses, which was very similar to the 5.6% in the sample used by Roberts and Cox (2003: 102).

Osteoarthritis (OA) and degenerative joint disease (DJD) manifest as osteophyte formation around joints, porosity and subchondral destruction of joint surfaces, with eburnation (polishing) of joint surfaces due to bones rubbing against bones through cartilage loss being specific to OA, and are a result of the ageing process and wear and tear on joints (Jurmain and Kilgore 1995). OA and/or DJD were recorded in six individuals (17.6%), a statistically significantly higher percentage (p=0.0113) than the 5.3% of affected individuals within the wider population sample used by Roberts and Cox (2003: 95). This cannot be accounted for by the age distribution of the decapitated sample, as, of the twenty-one individuals where a more accurate assessment of age was made, only three (14%) were mature adults, with the majority (eight individuals or 38%) being young adults. This may suggest that the decapitated individuals were subjecting their joints to more wear and tear than was the norm. This is supported by the presence of Schmorl's nodes in the vertebral bodies of four individuals (11.8%), which are depressions in the superior and inferior surfaces of the vertebral body that have a complicated aetiology but are probably the result of unusual compressive loading of the spine during adolescence and young adulthood, such as carrying heavy loads on the back or head (Faccia and Williams 2008). The percentage in the decapitated sample is statistically significantly larger (p=0.0012) than the 1% of affected individuals in the sample used by Roberts and Cox (2003: 95), although if the data presented in the accompanying table (Roberts and Cox 2003: 97) is used instead, which shows the sites where Schmorl's nodes were definitely found rather than the complete sample, the percentage is 11.7%, almost identical to that in the decapitated sample. Enthesopathies were also seen in four individuals (11.8%), which helps to support the interpretation of unusual and increased muscular stress amongst the decapitated individuals.

The unusually tall statures of the decapitated individuals, as well as the evidence for increased levels of wear and tear to joints and other increased mechanical loading and stresses to the skeleton may suggest that the individuals were behaving differently from the rest of the population during their adult lives. This, coupled with the fact that the majority of decapitations in this period are younger adult males, could indicate a martial status for such individuals. This may be supported by the presence of ante-mortem healed fractures in four individuals (11.8%), composed of two cranial depressed fractures, one rib fracture and one fracture of a metacarpal with subsequent shortening of the element. The percentage of individuals with fractures is not statistically significantly different (p=0.0886) to the 4.7% of the wider population quoted by Roberts and Cox (2003: 99) although it is interesting that there are no fractures of the long-bones or claviculae amongst the decapitated sample, which are well represented amongst the samples used by Roberts and Cox (2003: 100) and Redfern (2005: 136). The fractures that are represented amongst the decapitated sample are amongst those (hand and foot, cranium, nasal bones, ribs) that are, clinically, believed to have a high specificity for a diagnosis of assault (Lovell 1997: 166) with metacarpals often being fractured due to longitudinal compression fractures, such as occur in boxing (Lovell 1997: 164). Fractures of the ribs, metacarpals and cranium were also identified in two twentieth century individuals known to have been boxers (Hershkovitz *et al*. 1996). There is, therefore, the possibility that the decapitated individuals may have been engaging in interpersonal violence, although if a martial context is to be suggested, it is interesting to note that there are no examples of healed sharp force traumata, as were found, albeit rarely, amongst Iron Age burials from Dorset (Redfern 2005: 164).

3.3.2 Evidence for peri-mortem trauma amongst the sample

When the evidence for peri-mortem trauma amongst the group of thirty-four decapitated individuals who had been subjected to detailed skeletal analysis is examined, thirty-two of the individuals exhibited such evidence.

Some other examples of Iron Age individuals from Danebury hillfort, Hampshire, previously reported as displaying evidence for peri-mortem trauma were also re-analysed as part of this project. Deposition 238, the partial mandible of an adult ?male, was described as having a sword cut consistent with decapitation (Hooper 1991: 429) although, on re-analysis, this was clearly excavation damage with the "cut" surface demonstrating scrapes probably made with a shovel and pale, roughened broken bone surfaces. Excavation damage was also the explanation for the "cuts" recorded to the left gonial area of two non-adult crania and mandibulae (Deposition 245) found together with a third cranium and mandible in a pit (Craig *et al*. 2005), although one of the crania did display three small, very superficial nicks into the inferior margin of the mandible, as well as evidence for rodent gnawing (a series of shallow parallel grooves to the exterior and interior margins) of the nasal aperture (Fig. 3.5). This supports the suggestion by Craig *et al*. (2005) that the crania and mandibulae may have been displayed for a short time before deposition, indicated by the disarticulation of the mandibulae (*ibid.*).

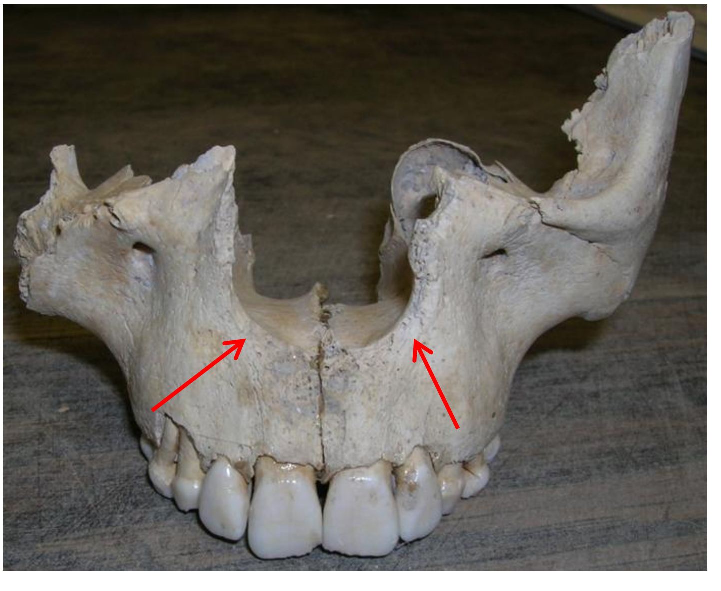

Figure 3.5: rodent gnawing around the nasal aperture of Skull 1, Deposition 245 from Danebury, Hampshire

3.3.3 Post-burial manipulation

Of the individuals who did not display any evidence for peri-mortem trauma, one was an articulated adult male from Suddern Farm, Hampshire (C20), buried prone with the upper limbs flexed beneath the torso and both lower limbs flexed at the knee (Cunliffe and Poole 2000a: 155, 167), who was found to be substantially complete except for elements of the feet, the cranium, mandible and first cervical vertebra. This burial can be compared with another individual from Danebury (Deposition 10) who was briefly examined for evidence of peri-mortem trauma but not subjected to a full skeletal analysis. This individual was the partially articulated skeleton of an adult female with the spinal column arranged around the lower limbs and feet and with parts of the pectoral girdle, both upper limbs and the cranium and mandible absent (Walker 1984: 450-451), who was also found to have the entire cervical column complete except for C1. The fact that both of these individuals were missing the cranium, mandible and C1 but displayed no evidence for peri-mortem trauma could suggest that the head was being deliberately removed once decomposition had progressed far enough that no cuts to the bones needed to be made but before the first cervical vertebra had become detached from the cranial base.

Post-mortem manipulation is also possible in the case of a pit burial (1111) from Winklebury, Hampshire, described as being articulated with the lower limbs crossed and drawn up and with the cranium and mandible “placed” at the base of the spine (Smith, K 1977: 75). The skeleton was found to be that of a young middle adult male with the right pectoral girdle and upper limb, both hands and most of both feet absent. There was no evidence for any peri-mortem trauma to the cervical column, which was complete, but there were ancient dry-bone fractures of the left pedicle and right inferior arch of C5 and the body and arch of C6 with some evidence for bone peel, with the distal left ulna and some of the right ribs demonstrating similar features. This fracturing may be indicative of some form of manipulation of the skeletal remains post-burial, especially as it seems to be restricted to areas in which there has been loss or movement of elements, namely the left wrist, right pectoral girdle and cervical spine. Post-mortem manipulation may also be assumed for the previously mentioned nest of three non-adult crania and mandibulae (Deposition 245) from Danebury, and the analysis of a larger sample of Iron Age burials may reveal more cases of such manipulation, including individuals with evidence for dry-bone fractures.

3.3.4 Decapitated Heads

Of the individuals who did display evidence for peri-mortem trauma, eight (25%) were represented by the cranium, mandible and attached cervical vertebrae only. Four of these individuals demonstrated chopping blows through the mandible or attached cervical vertebrae, three of which were from the posterior (the remaining example did not have a direction specified), and included the cranium, mandible and C1-C2 of a young adult ?male from the base of a ditch at Prebendal Court hillfort, Buckinghamshire (Farley 1986), who demonstrated a single chop through the arch of C2 (Fig. 3.6); and the cranium, mandible and C1 of a mature adult male from a palaeochannel at Joist Fen, Lakenheath, Suffolk who demonstrated at least four chops to the mandible (Anderson 2000b). One of the other examples was the previously mentioned cranium and mandible of a non-adult individual from Danebury (Deposition 245) with evidence for very small nicks to the inferior border of the mandible, whilst a second deposit from the same site (Pit 23), the cranium and mandible of a seven to ten year old child, demonstrated a peri-mortem fracture of the right mandibular body with extensive bone peeling on the anterior margin (Fig. 3.7). The gonial area was damaged post-mortem so it is impossible to determine whether this fracture resulted from a sharp-force injury but the anteriorly placed bone peel indicated that the blow was directed from the posterior.

Figure 3.6: chop through the spinous process of C2 of the decapitated head (SF4002) from Prebendal Court, Aylesbury, Buckinghamshire

Figure 3.7: peri-mortem fracture of the mandible of Skull 1, Deposition 23 from Danebury, Hampshire

The remaining two crania, mandibulae and cervical vertebrae were interesting as they both displayed evidence for non-decapitation related peri-mortem trauma as well as multiple incised cuts to the anterior of the cervical vertebrae. The first of these was the cranium, mandible and C1-C4 of a young adult ?male from a ditch at Stanwick hillfort, North Yorkshire, found in association with a sword and scabbard (Wheeler 1954). There were five chopping blows to the left and anterior of the frontal, right parietal, right maxilla and right zygomatic, directed from both the antero-superior right and left, and associated peri-mortem fracturing of the affected elements, as well as a probable *contrecoup* fracture of the occipital (a fracture caused by inertial stresses propagating towards the opposite end of the head from the area of impact (Hirsch and Kaufman 1975)). In contrast to these peri-mortem injuries, which appear to have been produced by a heavy blade, such as a sword or axe (Fig. 3.8), there are seven fine incised cuts to the anterior of the body of C4, as well as two other deeper incised cuts that affect the inferior of the spinous process and the anterior and inferior surface of the body, and the left superior facet and superior surface of the body (Fig. 3.9). These injuries are more likely to have been produced with a knife and their placement suggests the process was one of careful removal of soft tissue and disarticulation of the cervical column in order to remove the head. It is interesting that this was the method of decapitation chosen, rather than chopping through the neck with the same instrument that was used to inflict the cranial injuries and may suggest that the removal of the head was not undertaken at the same time.

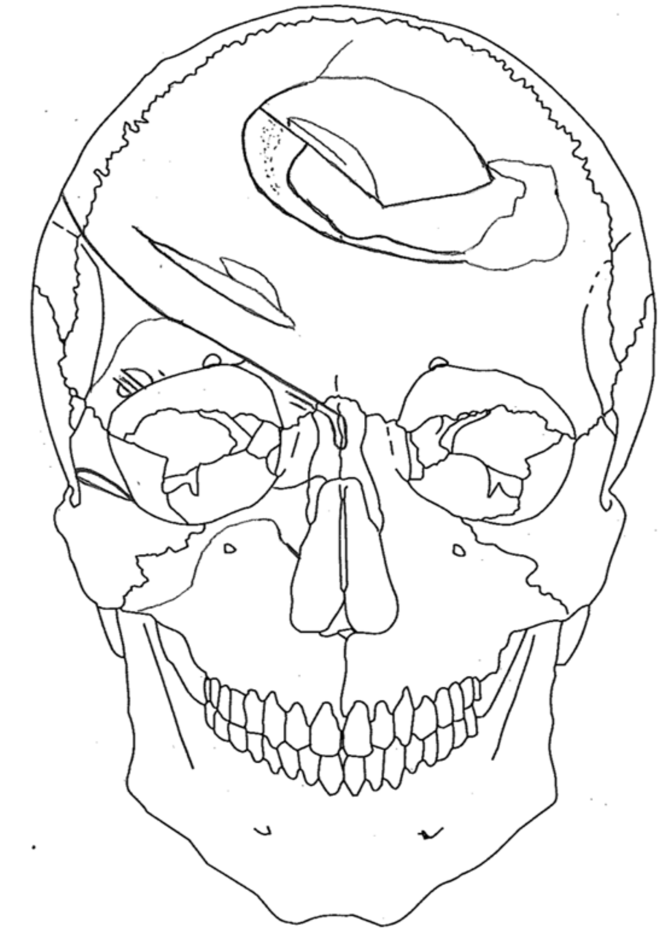

Figure 3.8: diagram of chops to the cranial vault and facial skeleton of the decapitated head from Stanwick, North Yorkshire (adapted from Buikstra and Ubelaker 1994)

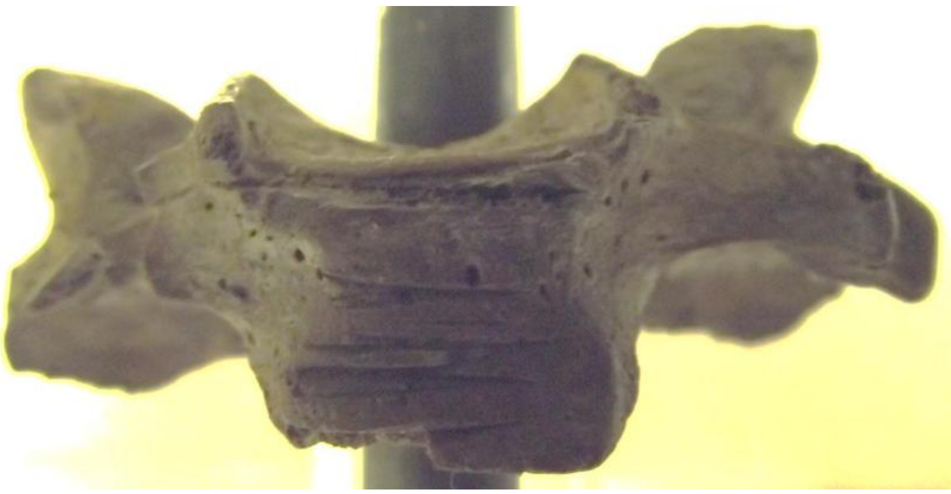

Figure 3.9: incised cuts to the anterior of the body of C4 of the decapitated head from Stanwick, North Yorkshire

The second example was the cranium, mandible and C1-C2 of a young middle adult male found face down in a small pit at the settlement site in Heslington, also in North Yorkshire (O'Connor *et al*. 2010). The individual had been hanged (there is a characteristic fracture of the arch of C2) and then decapitated, again by a careful process of soft tissue removal and disarticulation, indicated by at least nine small incised cuts to the anterior of the body of C2 and two stab wounds to the inferior and anterior of the body (Buckberry 2010) that are probably the result of inserting the blade between C2 and C3 to prise the elements apart (Fig. 3.10). The very similar method of decapitation in both of these examples is very different to that demonstrated by other deposits of crania and mandibulae (chopping blows directed from the posterior) and the fact they are both from the same area of the country may suggest a localised form of the practice, although the number of examples is very small and the appearance of the cut-marks is very similar to those seen on the Bronze Age head deposit from Birstall, Leicestershire.

Figure 3.10: incised cuts to the anterior of the body of C2 of the decapitated head from Heslington, York (from Buckberry 2010: 11)

3.3.5 Other forms of decapitation

The other examples of peri-mortem decapitation trauma were found in skeletons where the head was displaced from its anatomically correct position (three individuals or 9.4%), where the cranium and mandible were in correct anatomical position (six individuals or 18.8%), where the cranium and mandible were absent (one individual or 3.1%), or where cervical vertebrae, crania or mandibulae with evidence for peri-mortem trauma were found amongst commingled or disarticulated remains (fourteen examples, or 43.8%). All but one of these examples that had evidence for decapitation-related trauma demonstrated evidence for chopping blows (the exception was a C2 with an incised cut to the anterior of the dens from the hillfort at South Cadbury, Somerset (Jones 2008)), and the blows were directed from the posterior in all but three cases (84.2%). Amongst these examples were four decapitated individuals from a mass grave of twenty-five adolescents and adult males at the hillfort of Sutton Walls, Herefordshire (Cornwall 1954; Kenyon 1954), the skeletal remains of which, although a report was produced at the time which is relatively detailed in its treatment of the peri-mortem trauma (Cornwall 1954), can no longer be located, despite various attempts by the author and other researchers (Jo Buckberry *pers. comm.* 2010). Other cases included a C2 and C3 with five separate chops to the body and arch, all that remain of a group of three decapitated adults from the bottom of a ditch at the hillfort of Maiden Bower, Bedfordshire (Matthews 1976, 1989) and six cervical vertebrae (five C2s and one C1) from Sculptor's Cave, Grampian, that date to the Roman Iron Age (80-410AD) and demonstrate evidence for chopping blows, from a single bisecting chop to eleven separate chops to a single element, all of which were delivered from the posterior with the neck flexed (Schulting *et al*. 2010; Armit *et al*. 2011).

3.3.6 Individuals with extensive peri-mortem trauma

The remaining two Iron Age individuals who deserve a detailed description are both younger adult males, one found with the cranium and mandible in correct position and the other with the cranium and mandible absent. The former of these is a pit burial, described as lying on their right side with both upper limbs folded under the chin in a "sleeping" posture and with a layer of large flint nodules covering the body (Davies 1981: 122) from Old Down Farm, Andover, Hampshire. The head was found in correct anatomical position but the original analysis identified fourteen separate cuts to the cranium, neck, torso and left upper limb, including two cuts to the cervical vertebrae, a cut through the left elbow and a glancing blow to the posterior of the cranium. All of the blows were identified as being made with a slashing action, apart from some of those to the ribs and thoracic vertebrae, which were identified as thrusts (Davies 1981: 132-133).

The re-examination of the skeleton as part of this research identified it as that of a young adult male with a stature of 173.92cm. He had suffered an ante-mortem fracture of the proximal phalanx for the fourth metacarpal with some shortening, and demonstrated large cortical defects at the insertion sites for *M. pectoralis major* on both humeri, for *M. teres major* on the left humerus and the sites of origin of the costoclavicular ligament and *M. deltoideus* on both clavicles. These muscles are involved in adduction, extension, medial rotation, transverse flexion and transverse adduction of the shoulder, whilst the costoclavicular ligament stabilises the shoulder during these movements (Stone and Stone 2003). The left humerus was also 5mm longer than the right. The presence of cortical defects suggests repeated micro-trauma to the muscle insertion sites through particularly heavy use of the muscles, whilst the asymmetry in the length of the humeri indicates activity-related hypertrophy, probably whilst the limb was still growing, and suggests a left-sided dominance (Knüsel 2000). The possibility of participation in strong physical activity was also suggested by the presence of Schmorl's nodes and an avulsion fracture of the styloid process of the right third metacarpal, which was probably the result of sudden trauma to *M. extensor carpi radialis brevis*, which inserts at the process and is involved in extension of the wrist (Stone and Stone 2003: 134).

Twenty-four separate blade injuries were identified, including two to the cervical vertebrae, one of which (which chopped into, but not totally through, C3 and the posterior of the mandible) would have partially decapitated the individual (Fig 3.11). There was also a glancing blow to the posterior of the left parietal, a number of chops to the left side and posterior of the rib-cage and vertebral column, two chops to the left ilium (Fig. 3.12) and a chop into the left side of the left femur, as well as stab wounds to the anterior of the sternum (Fig. 3.13), left ilium, both scapulae and through the anterior and superior left of the rib-cage (possibly aimed at the area of the heart). There was also a chopping injury to the distal left humerus, and proximal left radius and ulna that align if the elbow joint is held at ninety degrees flexion. It is possible that this represents a defensive injury as these types of injuries are commonly found on the distal segment of the upper limb (Kimmerle and Baraybar 2008: 170-171; Cunha and Pinheiro 2009: 259), with a very similar injury being recorded on one individual from the War of the Roses mass-grave at Towton, NorthYorkshire (Novak 2000b: 257). It is interesting that it is the left limb which is affected, supporting the hypothesis that the individual was left-side dominant. The fact that the majority of injuries are to the left side and posterior of the skeleton could also suggest a right-handed assailant (Lew and Matshes 2005: 147), the possibility of more than one protagonist, or the continuation of the attack once the individual was already prone on the ground.

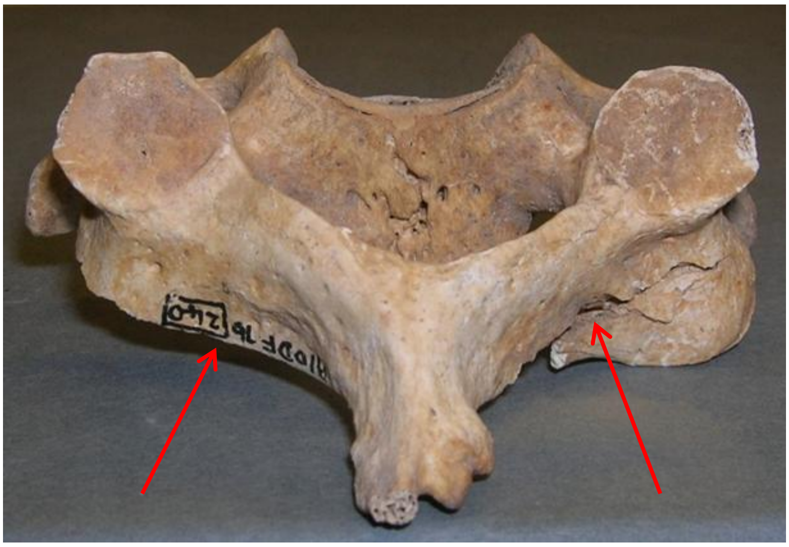

Figure 3.11: chopping blow into the arch of C3 of the young adult male from Old Down Farm, Andover, Hampshire

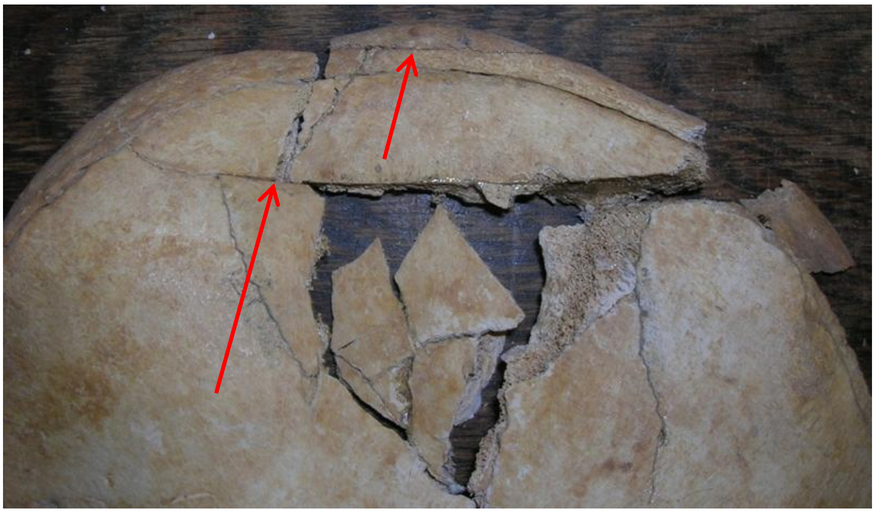

Figure 3.12: two chops to the blade of the left ilium of the young adult male from Old Down Farm, Andover, Hampshire

Figure 3.13: stab to the corpus sternae of the young adult male from Old Down Farm, Andover, Hampshire

The second individual, who bears close similarities to the Old Down Farm burial, is a young middle adult male from Sovell Down, Dorset, discovered accidently through rabbit disturbance and then subject to rescue excavation. The skeleton was in the base of a ditch lying slightly sprawled with his right lower limb tightly flexed and the cranium and mandible absent (McKinley 1997a: 1). Only a small area around the skeleton was excavated, so it is impossible to determine whether there were really absent or simply unexcavated. The individual was 170.9cm in stature with Schmorl's nodes on the lower thoracic and lumbar vertebrae and large cortical defects at the attachment site for the costoclavicular ligament on both claviculae. There were at least thirteen separate blade injuries identified, including three chops to the third and fourth cervical vertebrae (C1 and C2 were absent), including a total decapitation between C2 and C3 (Fig. 3.14), chops to the posterior and lateral side of the right side of the rib-cage, at least five separate chops to the posterior and lateral of the right scapula (Fig. 3.15), including ones that also affected the proximal right humerus and right clavicle, as well as a chop to the lateral side of the mid-shaft of the right femur. Although the number of separate injuries is fewer than at Old Down Farm, the placement is very similar, although the side is reversed. The chops to the right scapula and humerus may have been intended as incapacitating injuries to a victim who was right-side dominant, although there was no evidence for asymmetry of the upper limb, or the right-side placement of the injuries may be a reflection of the position of the assailant.

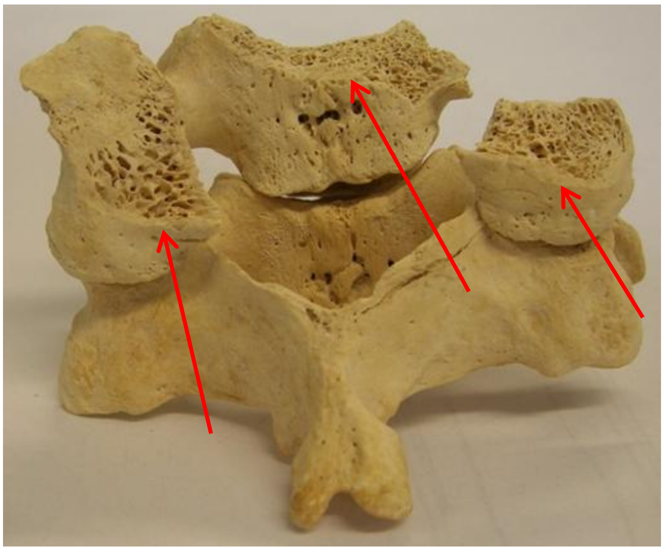

Figure 3.14: chop to the cervical vertebrae of the young middle adult male from Sovell Down, Dorset

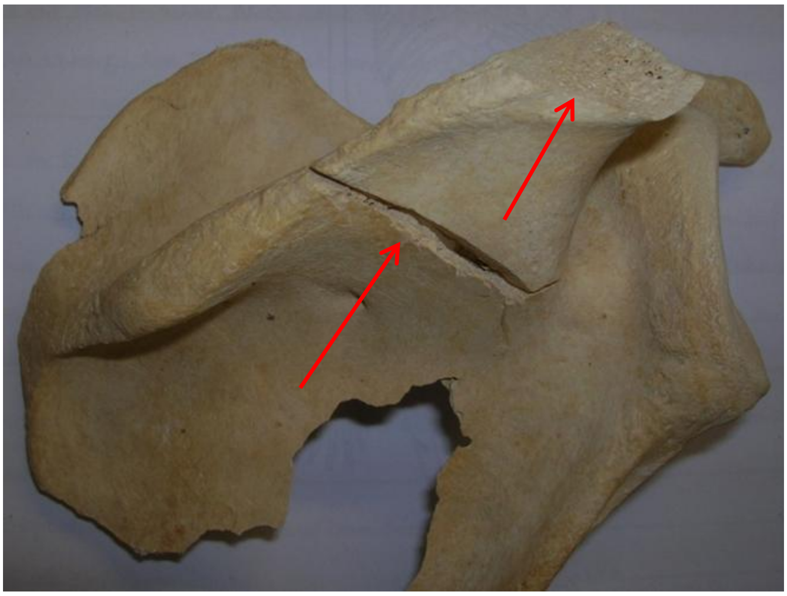

Figure 3.15: chops to the scapula of the young middle adult male from Sovell Down, Dorset

The possible interpretation of these two burials could be as victims of combat, whether formal or otherwise (it would also be interesting, if they are ever located, to see whether the individuals from Sutton Walls have evidence for non-decapitation related peri-mortem traumata, as they are assumed to have been victims of an attack on the hillfort by incoming Roman troops (Kenyon 1954: 4, 31)), as the age, sex, muscular development and stature of the individuals could suggest a martial context, as already argued for the larger Iron Age sample of analysed decapitated individuals. However, the burial context is very different, with one being placed in a formal pit burial, seemingly carefully positioned and covered with flint nodules, whereas the other is sprawled in a ditch (non-formal burial position is also seen in the Sutton Walls individuals). This could be a reflection of who carried out the burials: possibly friendly forces, who may attempt to follow traditional mortuary practices, in the former (this may also be the interpretation for the formally laid out burials from Maiden Castle with evidence for peri-mortem trauma, including at least one individual who may have been decapitated (Redfern 2011), although this was not recorded in the original publications (Goodman and Morant 1940; Morant and Goodman 1943)); and hostile in the latter, who would neither know or care about these practices, as argued by Spars (2005: 1) for more recent examples of such burial circumstances. The non-formal burial of the individual from Sovell Down may also suggest a surreptitious disposal after a violent assault.

3.3.7 Discussion

In summary, the evidence for decapitation-related peri-mortem trauma from all individuals in the Iron Age sample indicates that the vast majority were being decapitated with chopping blows directed from a postero-anterior direction. There were only two examples where this was not the case, with the head being removed by careful incised cuts to the anterior of the cervical column, both of which individuals, however, had evidence for other peri-mortem trauma not directly related to decapitation. There were also rare examples of individuals who had been partially or completely decapitated and who demonstrated a large number of other peri-mortem traumata, concentrated on the upper limbs and torso. The postero-anterior direction of the chops, the presence of non-decapitation related trauma in some individuals and the fact that most affected individuals were younger adult males, as well as the indications from the osteological analysis that the decapitated sample was taller than was the norm, and subject to more stress and strains on joints and higher levels of physical activity, may support the interpretation that decapitation was undertaken for head-hunting as a part of Iron Age warfare. This could also be supported by the fact that the practice is represented by both isolated crania and mandibulae (46.5% of the total sample of identified cases) and headless corpses (16.8%), although head-hunting would not explain the presence of individuals who had been fully or partially decapitated but where the cranio-cervical skeleton remained with the post-cranial skeleton, which represented 36.7% of the total sample. It seems likely that a number of these individuals (for example, Old Down Farm and Sutton Walls) were killed in some form of conflict, although it appears that taking of the heads for trophies was not as important in the Iron Age as has been previously assumed (if the individuals at Sutton Walls were indeed victims of a Roman attack, this may explain why their heads were not taken, although there are many references to such trophy-taking amongst Roman soldiers and auxiliaries, see Chapter 6).

The two crania and mandibulae from Stanwick and Heslington that have evidence for careful incised cuts to the cervical vertebrae do seem to represent a different practice, for, if the heads were removed as trophies during conflict, it would certainly have been quicker and easier to chop them off with a heavy blade, especially in the case of the individual from Stanwick who had already been subject to a number of such heavy chopping blows to the cranial vault and facial skeleton. The precise removal of soft tissue and disarticulation of the cervical column does suggest that this was done at leisure, possibly in some form of ritual context, after the individual had been killed by other means. However, if these are examples of the “Cult of the Head”, there is no evidence for subsequent curation and display of these decapitated heads, with the example from Heslington known to have been buried almost immediately after decapitation in an anaerobic environment, which led to preservation of a large part of the brain (O’Connor *et al*. 2010). The cranium and mandible from Stanwick were interpreted as having been displayed on the rampart of the hillfort with the sword found in association with the remains (Wheeler 1954), although the excellent bone preservation and presence of the mandible and cervical vertebrae would suggest that display had only been very temporary if it had occurred at all.

3.3.8 Post-mortem manipulation of cranial remains

There is better evidence for the “Cult of the Head” in a group of cranial remains from various sites in Britain with evidence for post-mortem manipulation, although none of them show definite evidence for decapitation (however decapitation can probably be assumed in a number of cases as the manipulation occurred in the peri-mortem period). These include a number of crania that have seemingly been drilled or pierced through the bone of the vault, including a non-adult frontal with a 8mm perforation through the right side of the element that appears to have been made from the endocranial side (there is a bevel on the ectocranial surface) from Hardingstone, Northamptonshire (Woods 1969: 40); a near complete adult cranium with three 9mm perforations through the crown in the shape of an equilateral triangle, and an adult parietal with one, and possibly two perforations of 10mm diameter, from Hunsbury, again in Northamptonshire (Parry 1928). There are also four examples from Roman Iron Age Scotland, including a partial cranium with a triangular pattern of perforations (Fig. 3.16) from Hillhead Broch, Caithness (Ross 1909: 18) and an adult male frontal from Cnip, Western Isles, with a hole through it, drilled from both sides (Tucker and Armit 2010). These crania could have been perforated or drilled to be suspended for display, which the absence of mandibulae and attached cervical vertebrae would suggest had been for an extended period of time before their final deposition.

Figure 3.16: perforated cranial fragment from Hillhead Broch, Caithness (from Tucker and Armit 2010)

Curation and display is also a probable interpretation for the calvarium of a mature adult found in the drip gulley of a roundhouse at Hurst Lane, Ely, Cambridgeshire, that had been separated from the cranial base and facial skeleton by radiating fractures as a result of two peri-mortem blunt-force injuries to the occipital and left parietal (Dodwell 2007a: 66). There were also a number of cut-marks to the parietals that probably represented soft-tissue removal or scalping (see Murphy *et al*. 2002 for a review of the evidence for scalping in Old World prehistory). The calvarium also had an unusual polished appearance (Dodwell 2007a: 66) that probably indicated prolonged handling. It would seem possible that this is an example of a “skull-cup”, referred to in ancient sources about Celtic head-hunting practices (Chapter 6, and see Bello *et al*. 2011 for skull-cups in the Upper Palaeolithic). A similar practice may be represented by a collection of cranial fragments from Billingborough, Lincolnshire, with evidence for peri-mortem removal of the cranial base and facial skeleton and polished and abraded surfaces (Bayley 2001). Fragments of the finished calvaria and “off-cuts” of the cranial base and orbital region are both present, suggesting “skull-cups” were being both manufactured and used at this site.

3.3.9 Conclusion

Although these examples of modified human crania do suggest there is evidence for the "Cult of the Head" in Iron Age Britain, they are much rarer than would be expected if the head-cult was as all pervasive as has been suggested, and the majority of individuals showing evidence for peri-mortem decapitation would seem to represent different practices: conflict-related head-hunting; complete or partial decapitation as a mechanism of death where the head was not subsequently removed; or ritual activity surrounding the human head where curation and display were not integral parts of the practice.

Chapter 4: Decapitation in the Romano-British Period

The sample of possible and definite decapitation burials identified from this period was the largest from any of the periods, with 512 separate individuals identified from 218 sites. For the purposes of this research, the decision has been made to separate the sites associated with urban areas to those found associated with "small-town" (settlements which can be of a large or small size but that do not appear to show much evidence of planning, amenities or building associated with local government (see Burnham and Wacher 1990; Millett 1990: 143-147)) and rural contexts, including villas. A number of authors have recorded differences in the types and numbers of artefacts and ecofacts found on urban sites compared with rural ones, including coins (Reece 1991, 1995), glass vessels (Cool and Baxter 1999), ceramics (Cooper 2000; Evans 2001) and animal bone (King 1984, 1999; Maltby 1994, 2007; Grant 2004: 376-381). The sites from small-town or rural settlements have not been separated further because it is often impossible to determine whether excavated graves, especially when found in small numbers in developer-led archaeological activity, are associated with a small-town or rural settlement that may be some distance from the cemetery area and has often not been subject to large-scale excavation that could determine its nature. It can also be very difficult, even where there has been larger scale excavation, to distinguish between large rural settlements and small-towns (Hingley 1989: 25-29; Burnham and Wacher 1990: 1) with the evidence from the coins suggesting the two types of site are similar in nature (Reece 1980a: 120).

The two samples of decapitated burials were then compared with data taken from twenty-nine published cemetery reports from small-town/rural contexts and sixteen from urban contexts, all of which had at least one decapitated burial amongst their number (see Appendix 2 for a list of these sites). This allowed for a more accurate comparison between the decapitated and non-decapitated samples as it excluded cemetery sites (such as the late Romano-British cemetery at Queensford Mill (Chambers 1987)) where decapitation does not seem to have occurred and would, therefore, better highlight any differences between the two samples in terms of their burial practice, as well as providing a good sample with which to compare health status and ante-mortem trauma.

4.1 Dating, geographical distribution and the rural/urban divide

The previous syntheses of the practice of decapitation, by Clarke (1979), Harman *et al*. (1981) and Philpott (1991), stated that the practice was largely restricted to the later Romano-British period. The majority of the sites identified during the present research do seem to be dated to the third or fourth centuries, although, occasionally, a decapitation burial has been dated to these centuries on the basis of it being decapitated, for example, a secondary burial from a barrow at Gayhurst Quarry, Buckinghamshire (Chapman 2007). There are some burials that have been dated, either by radiocarbon dating or on stratigraphic or artefactual evidence, as being from somewhat earlier in the Romano-British period, such as a burial from Cuxton, Kent, presumed to be from the late first century AD (Tester 1963), a burial from Rickinghall, Suffolk, radiocarbon dated to the first century BC- first century AD (Anderson 1995) and the burials from Driffield Terrace, York, some of which are dated to the late second to early third centuries (Richard Hall *pers. comm.* 2009). The presence of these decapitated burials from Roman York (*Eboracvm*) that date to the second and third centuries AD appear to contradict the assertion of Clarke (1979: 374) and Philpott (1991: 79, 81) that the practice spread from rural to urban areas in the fourth century (this group of burials, composed only of adult males and non-adults, and where over sixty percent of the individuals were decapitated, is very unusual compared with the majority of samples of decapitated burials from Britain, which tend to be composed of much smaller numbers of individuals with both adult males and females represented. It has, therefore, been singled out for separate discussion (in Chapter 5), although the data from the burials has also been included in the larger sample discussed below).

There are also a small number of burials that would appear, on stratigraphic and artefactual evidence, to be late Romano-British in date but which have been shown by radiocarbon dating to fall into the early post-Roman period, such as one from St. Johns, Worcester, with hobnails at the feet, radiocarbon dated to cal AD 430-640 (Wainwright, J 2010). This would suggest the possibility that a larger number of decapitated burials that initially appear to be late Roman, due to the presence of hobnails or by the fact of being decapitated in the absence of any good stratigraphic evidence, could also actually have a post-Roman date, or be a lot earlier than is assumed. This may have implications for the theory of continuity of the practice from the late Iron Age (although the “typical” decapitation burial, where the head is displaced but still present within the grave, is a rare occurrence in the Iron Age with headless bodies, isolated heads and decapitated skeletons in non-formal burial locations (ditches for example) being much more representative of the practice of decapitation in this period, as well as in the Neolithic and Bronze Age (although see below for isolated head deposits in the Romano-British period)) as well as the possibility of continuity into the early medieval period. There is already limited evidence for such continuity in cemeteries such as that at Wasperton, Warwickshire, where, in what appeared to be an early medieval cemetery, in use from the later fifth century to the seventh century, eighteen burials were actually found to be Romano-British, five of which were decapitated (the other five decapitation burials from the site dated to the fifth or sixth centuries), including one that was radiocarbon dated to cal AD 120-330 (Carver *et al*. 2009).

The previous syntheses also conclude that decapitation burials have a limited geographical distribution, being largely confined to an area roughly between the Severn to the west and the Wash to the east, with a very limited number of sites to the north-east and south-west. The distribution map produced for this research (Fig 4.1 and see Appendix 3) does seem to confirm that there is a concentration in the area south-west of the Severn-Wash line, although there are a number of sites in the Midlands and North East. There is a strong possibility that some of this bias is a result of underlying geology leading to very poor preservation, or absence, of human bone, which would preclude the identification of decapitation burials in some areas. The preservation of inhumed bone is largely dependent on the soil pH, with acidic soil conditions leading to destruction of the cortical bone surface or total loss of bone (Gordon and Buikstra 1981; Stephan 1997), although other factors, such as changes in the groundwater table or ground temperature can also have an effect (Jans *et al*. 2002). At certain sites where there has been near or total loss of bone (such as Sutton Hoo, Suffolk), the form of the inhumed corpse can still be discernible as a so-called “sand body” (Bethel and Carver 1987). The map produced by Cranfield University (NSRI 2002) which depicts the topsoil pH across the country does indicate that the areas from which there are larger numbers of decapitation burials largely coincide with those areas with a neutral or very low acidic pH (Fig. 4.1 and 4.2), although some areas where the pH indicates there should be good levels of bone survival, such as Lincolnshire, only have very small numbers of decapitation burials. Areas such as Kent, Surrey, and East and West Sussex, with small numbers of decapitated burials, which Philpott (1991: 78) ascribed to the predominance of cremation in these areas, are amongst those counties where bone preservation is likely to be poorest and so cremations, which do survive better in acidic soils, are the only types of human burial liable to be encountered in archaeological excavations.

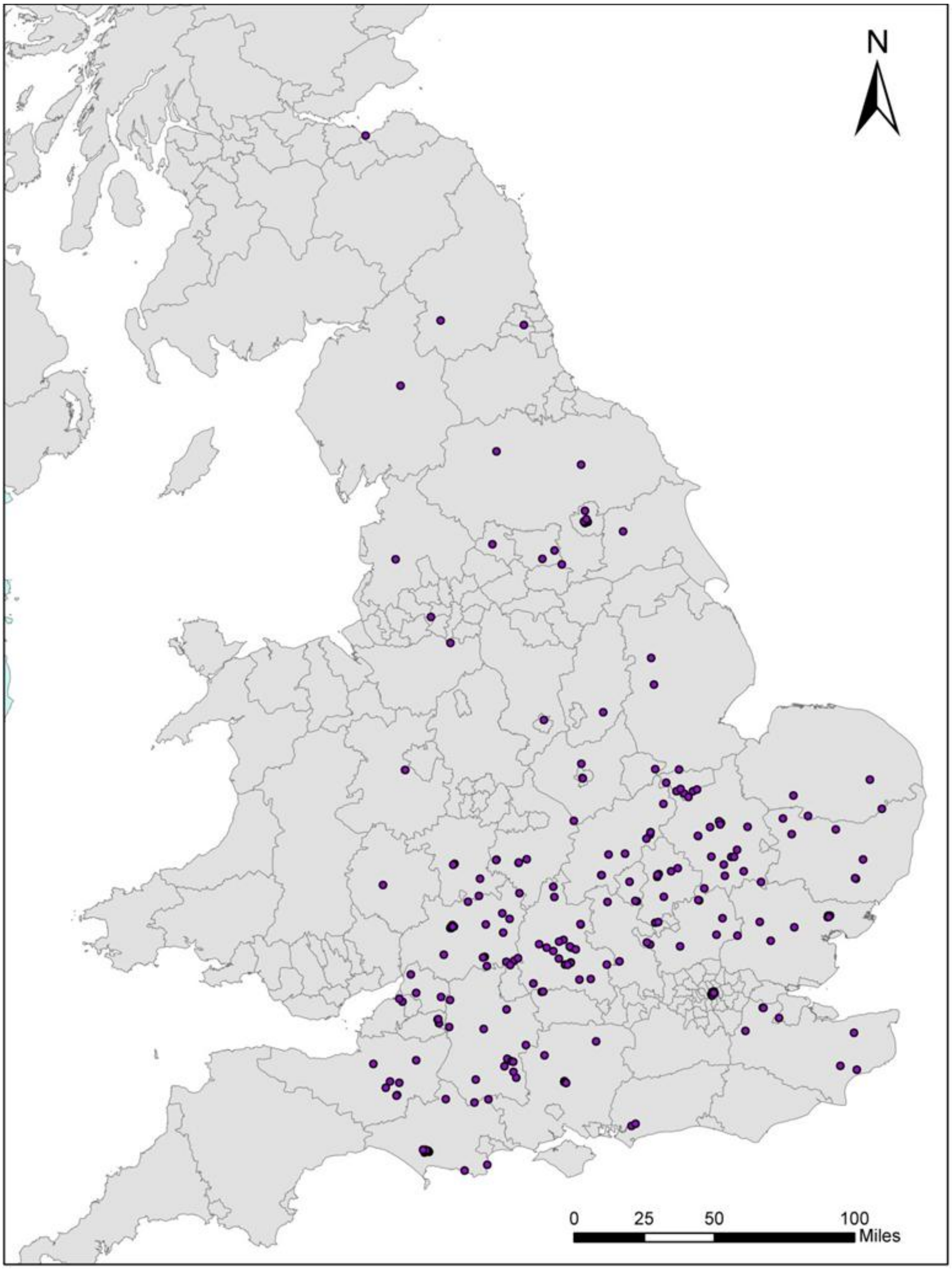

Figure 4.1: distribution map of Romano-British decapitated burials

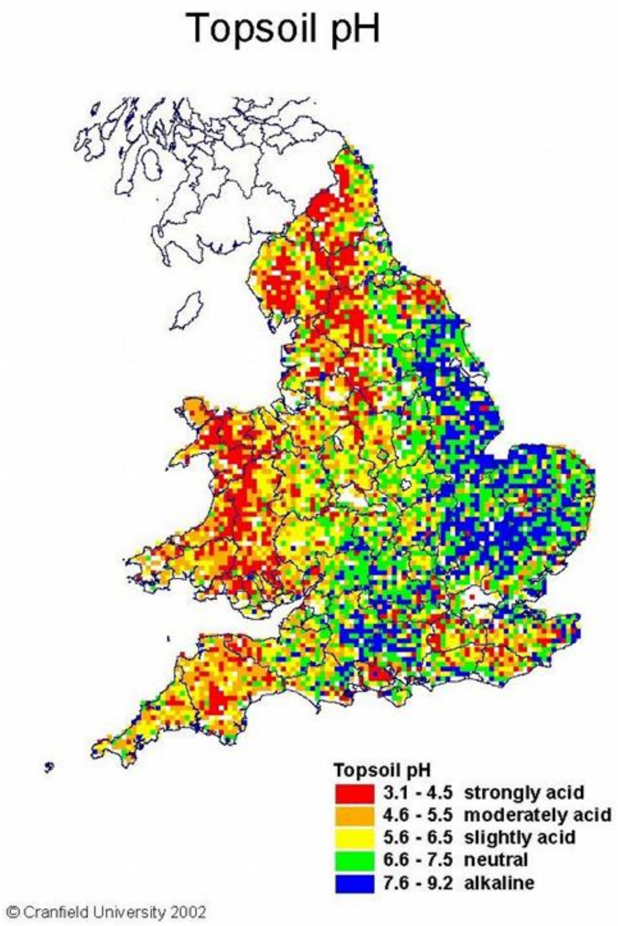

Figure 4.2: map of the topsoil pH values throughout England and Wales (from NSRI 2002)

The second factor that could bias the numbers of decapitated burials identified is the amount of archaeological excavation that has taken place, with the simple possibility that in areas where there has been more excavation, it would automatically follow that there would be more decapitated burials recorded. In order to test this theory, the number of excavated Romano-British cemeteries recorded in the Historic Environment Record for Lincolnshire (a county which, as has already been noted, has very few decapitations) was compared with the number from Cambridgeshire, a county which has a very high number of decapitations. Both counties have soil conditions conducive to very good bone preservation (NSRI 2002), so this would not bias the results. The HER for Lincolnshire and North Lincolnshire contained details of 109 sites where Romano-British inhumation graves had been found, whilst that for Cambridgeshire had 169 sites. The number of sites in Lincolnshire may be slightly underrepresented as a few of the entries contained details of a number of separate archaeological interventions in the same area that were given a single HER entry. The number of sites from which decapitation burials were recorded in Lincolnshire was only two, 1.83% of the total number of sites, whilst in Cambridgeshire, there were 23 sites, 13.6% of the total, which is statistically significantly greater (p=0.0005). This does suggest that in areas where decapitation burials are rare or absent, it may be a real absence rather than purely being a result of biases introduced by preservation conditions and the amount of archaeological excavation that has been undertaken.

The previous syntheses of Clarke (1979: 374-5) and Harman *et al*. (1981: 166) state that the practice of decapitation is largely confined to rural areas, with limited numbers of examples from urban and small-town cemeteries. However, the present research has identified such burials from Roman London, all four of the *coloniae* (Colchester, Gloucester, Lincoln and York) and five of the tribal cities (Wroxeter, Winchester, Leicester, Dorchester and Cirencester). Decapitations are found at fifty-seven separate sites from these urban areas with a total number of 156 decapitated burials. There are also decapitations from at least thirty-four sites from cemeteries that are very probably associated with small-towns with a total of eighty-nine burials. There are 127 sites from rural areas with 267 separate examples, which makes up 58.3% of the total number of sites from which such burials are found and 52.1% of the total number of individual decapitated burials. This indicates that, although there are more sites from rural areas, decapitations are anything but rare in cemeteries associated with small-town and urban areas.

4.2 Isolated head deposits

There are a small number of deposits of isolated crania and mandibulae from this period, with six from urban areas and ten from rural and small-town areas. They are all from non-normative burial locations, such as ditches, pits, wells and bogs, examples including the cranium, mandible, C1 and part of C2, with preserved soft tissue, of a young adult male from Worsley Moss, Lancashire, radiocarbon dated to cal AD 80-220, who demonstrated a blunt-force cranial injury, decapitation related chop-marks and had a cord of animal sinew encircling the neck (Garland 1995); and the cranium of a middle adult male with a number of decapitation-related chop-marks from a well at Rothwell Haigh, North Yorkshire (Manchester 2011). The osteological data on the peri-mortem trauma for examples that do show definite evidence for decapitation are included in the sample discussed later. There are also a small number of sites from which there are crania which, whilst they do not show any definite evidence for decapitation, do have evidence for peri-mortem trauma, such as the cranium of an adult male from a well at Churchill Hospital, Oxford (Young 1972: 16), with at least three blunt-force injuries to the frontal and parietals (Fig. 4.3), and two crania from a ditch just outside the legionary fortress at Balkerne Gate, Colchester, one of which had a blunt-force injury to the frontal, whilst the other had a sharp-force injury to the occipital (Luff 1984).

Figure 4.3: cranium from Churchill Hospital, Oxford, showing evidence for multiple peri-mortem blunt-force injuries

These examples could be taken to imply a continuation of practices from the Iron Age as regards unusual treatment of the human head, with disarticulated crania demonstrating evidence for peri-mortem trauma suggesting that some of these heads may have been displayed or kept for a period of time, although this does not necessarily imply continuity of practice as there is a good body of evidence from Roman literary sources (see Chapter 6) that the display of decapitated heads was a relatively common Roman phenomenon, especially amongst the military (three examples of these crania/crania and mandibulae with evidence for peri-mortem decapitation come from military forts). There is also limited evidence for modified crania excavated from religious sites in this period, namely the cranium of an adolescent male, with three peri-mortem blunt force injuries, as well as at least ninety cut-marks indicative of defleshing, that appeared to have been displayed before it was finally deposited in a pit outside the temple (the area around the foramen magnum was broken in antiquity and all of the anterior dentition was absent) at Folly Lane, St. Albans (Mays and Steele 1996); and fragments of nine separate crania, one of which had evidence for defleshing and one that may have been trimmed for use as a skull-cup, from the Baths Basilica, Wroxeter (Wilkinson and Barker 1997). The cranial fragments also had a distinctively greasy appearance and were stated to have tested positive for vegetable oil lipids, which was not identified from the animal bone fragments from the same site (*ibid.*). This has interesting echoes of the stories of Celtic tribes preserving the heads of their enemies in cedar oil, as mentioned by Roman writers (see Chapter 6), and the possible presence of a skull-cup has parallels, albeit rare, in the British Iron Age (see Chapter 3). This does suggest that there may have been some continuation of practices from the Iron Age into the Romano-British period, although evidence for the "Cult of the Head" is still relatively rare across both periods.

4.3 Burial practice

In order to assess whether the decapitated burials had been subject to different treatment at the time of their burial compared with the rest of the population, a number of aspects of burial practice (presence or absence of a coffin, coins, other objects and hobnails and whether the individual had been buried in a prone position) recorded in the sample of identified decapitation burials were compared to those seen in the sample of the wider cemetery population, separated into urban, and rural/small-town samples. Tables 4.1 and 4.2 show the numbers, percentages and statistical significance of these aspects for both samples.

	Decapitated sample		Larger sample		Statistical significance
	N (of 352)	Percentage	Number	Percentage	
coffin	68	19.3	165 of 738	20.9	p=0.5781
coins	8	2.3	18 of 757	2.4	p=1.0000
objects	57	16.2	91 of 750	12.1	p=0.0719
hobnails	33	9.4	65 of 667	9.7	p=0.1013
prone	30	8.5	54 of 916	5.6	p=0.9112

Table 4.1: burial practices of the rural/small-town decapitated sample compared with the wider cemetery population

	Decapitated sample		Larger sample		Statistical significance
	N (of 145)	Percentage	Number	Percentage	
coffin	43	29.7	2478 of 3690	67.1	*p=<0.0001
coins	4	2.8	139 of 3980	3.4	p=0.6375
objects	11	7.6	539 of 3980	13.5	*p=0.0347
hobnails	11	7.6	441 of 3599	12.2	p=0.1170
prone	11	7.6	113 of 3690	3.1	*p=0.0066

Table 4.2: burial practices of the urban decapitated sample compared with the wider cemetery population

The data contained in the tables indicates that, for the rural/small-town decapitated sample, there are no statistically significant differences between the burial practices received by that group, compared with the wider cemetery population. However, the urban decapitated sample were statistically significantly less likely to have been provided with a coffin or objects and significantly more likely to have been buried in a prone position. Harman *et al*. (1981: 166) and Philpott (1991: 74, 76) both noted a possible connection between prone and decapitated burials, and, if the samples for urban and rural/small-town decapitations are combined, the number of prone burials is also statistically significantly greater (p=<0.0001) than in the wider population.

When the samples are further divided into males, females and non-adults, there are no statistically significant differences in the way the different groups were treated in the rural/small-town sample, but in the urban sample, males were statistically significantly less likely to have been provided with a coffin (p=0.0119), objects (p=0.0068) or hobnailed footwear (p=0.0027) than females. This indicates that, not only are there differences in burial practice between the urban decapitated and non-decapitated samples, it was more likely to have been adult males who were singled out for different treatment.

4.4 Placement of the head

Previous syntheses of the practice have stated that the head is most commonly located in the region of the lower limbs or feet (Harman *et al*. 1981: 165; Philpott 1991: 80) and this seems to be confirmed by the present research (see Table 4.3), with the head being found by the lower legs or feet in 50.8% of urban examples of decapitation and in

75.3% of rural and small-town examples, a difference which was statistically significant (*p*=<0.0001). However, the head could also be located in any one of a number of different positions in the grave, in correct anatomical position or be totally absent, with the percentages of these all different locations being statistically significantly greater in the urban sample, with the exception of cases where the head was absent. This suggests that there was a much greater variety in where the head was placed in decapitations from urban cemeteries, whilst those from rural and small-town areas were much more likely to have the head placed in the area of the lower limbs or feet.

	lower limbs/feet	pelvis	upper body	correct position	absent
rural/small-town	232 (75.3%)	8 (2.6%)	11 (3.6%)	18 (5.9%)	39 (12.7%)
urban	63 (50.8%)	10 (8.1%)	13 (10.5%)	23 (18.5%)	15 (12.1%)
p value	*<0.0001	*0.0154	*0.0089	*0.0002	1.0000

Table 4.3: placement of the head in the rural/small-town and urban decapitated samples

4.5 Demographics

rural/small-town	decapitated (n=276)	non-decapitated (n=313)	*p* value
adult males	116 (42.0%)	129 (41.2%)	0.8671
adult females	122 (44.2%)	112 (35.8%)	*0.0428
non-adults	38 (13.8%)	72 (23.0%)	*0.0042
urban	decapitated (n=135)	non-decapitated (n=1777)	*p* value
adult males	96 (71.1%)	622 (35.0%)	*<0.0001
adult females	25 (18.5%)	564 (31.7%)	*0.0010
non-adults	14 (10.4%)	591 (33.3%)	*<0.0001

Table 4.4: demographics of the decapitated and non-decapitated samples

When the demographics of the samples are compared to the wider cemetery populations (Table 4.4), the number of decapitated females is statistically significantly greater (*p*=0.0428) and the number of non-adults statistically significantly smaller (*p*=0.0042) than the numbers represented in the population as a whole in rural and small-town cemeteries, whilst in urban areas, the number of decapitated males is statistically significantly greater (*p*=<0.0001), whilst the number of females (*p*=0.0010) and non-adults are significantly smaller (*p*=<0.0001). This indicates that in rural/small-town cemeteries, adult females were more likely to have been subject to decapitation than would be expected if the practice was carried out on a "random" basis across the population, whilst in urban areas, it was males who were more commonly decapitated. In both samples, non-adults were less likely to be decapitated than would be expected, which is another indication that there seems to have been selection in the individuals who were decapitated, and it was not simply carried out on a cross-section of the wider population. That the number of non-adults affected was disproportionally small was previously mentioned by Harman *et al*. (1981: 164), whilst it has also been suggested that adult females were the most commonly decapitated group (Green 1976: 48), although the present research indicates that this was only the case in rural and small-town cemeteries.

Rural/small-town cemeteries							
	Male	?Male	Female	?Female	Unknown	**Total**	%
Neonate							
Infant							
Young Child					3	3	2.3
Older Child					5	5	3.9
Adolescent				1	3	4	3.2
Young Adult	4	2	5		2	13	10.2
Young Middle Adult	8	1	11	2	1	23	18.1
Old Middle Adult	9	5	7	2	1	24	18.9
Middle Adult	12	2	6	1	2	23	18.1
Mature Adult	12	1	14			27	21.3
Adult	1	2		2		5	3.9
Total	59		51		17	127	
Urban cemeteries							
	Male	?Male	Female	?Female	Unknown	**Total**	%
Neonate					1	1	0.9
Infant							
Young Child					2	2	1.9
Older Child					1	1	0.9
Adolescent					1	1	0.9
Young Adult	8			2	1	11	10.5
Young Middle Adult	25	3	4			32	30.5
Old Middle Adult	27	3	4		1	35	33.3
Middle Adult	2	5	1			8	7.6
Mature Adult	4		2	2		8	7.6
Adult	1	5				6	5.7
Total	83		15		7	105	

Table 4.5: detailed age and sex profile of the rural/small-town and urban decapitated samples (see Chapter 2 for a definition of these age categories)

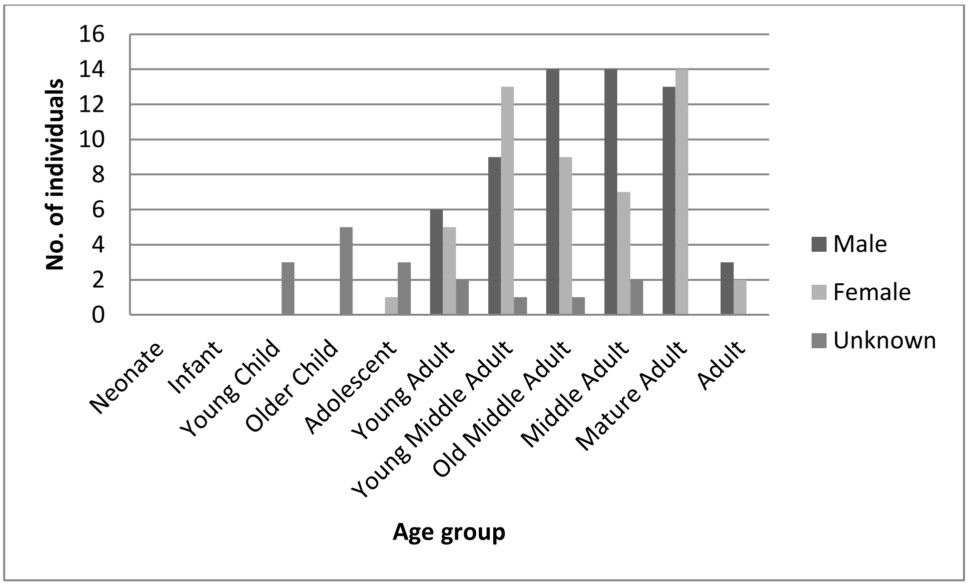

Figure 4.4: numbers of decapitated individuals in each age category from the rural/small-town sample

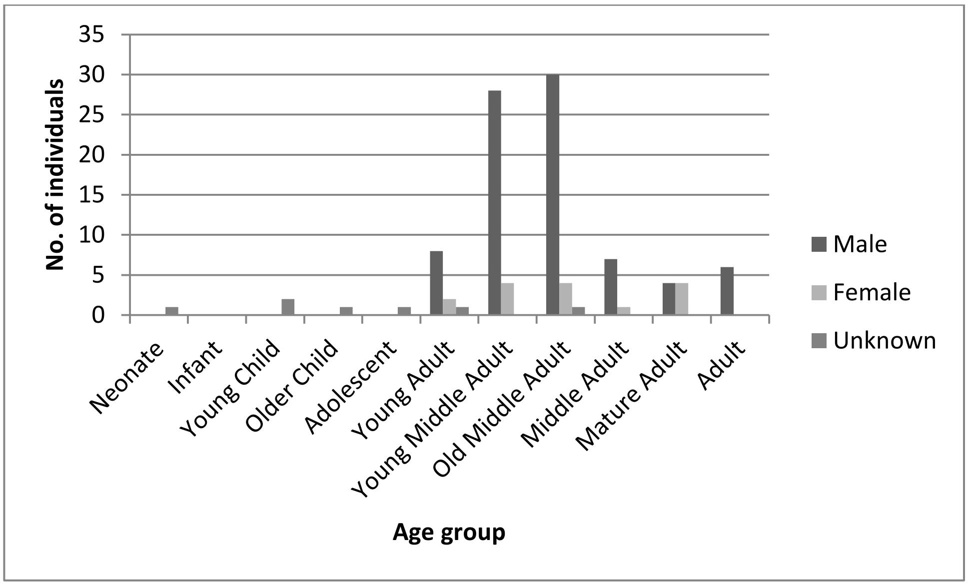

Figure 4.5: numbers of decapitated individuals in each age category from the urban sample

When the more detailed age and sex profile (obtained from the smaller sample of burials from which detailed osteological data had been recorded as part of the present research, as well as from skeletal analyses completed by others (Table 4.5, Fig. 4.4, 4.5)) is examined, it can be seen that, in both samples, there are relatively small numbers of non-adults represented (as expected from the larger decapitated sample), although nearly all the non-adult age categories do have at least one example of decapitation. The numbers of young and middle adults are very similar in both samples but there are statistically significantly fewer mature adults in the urban sample than in that from rural and small-town cemeteries (p=0.0052).

The samples can also be compared with demographic profiles from a number of large archaeological populations, in order to determine whether there are differences in the age profile of those individuals selected for decapitation compared with the wider population. This would be a more accurate method of comparing samples, rather than relying on model life tables (such as those produced by the Office of Population Research at Princeton University (Coale and Demeney 1983)) as archaeological populations very often show distinct discrepancies from the model life tables, even though it can be assumed that the age structure of the archaeological population must originally have resembled that of one of the stable populations used to produce the models (Chamberlain 2000: 104). These discrepancies include a peak in mortality in archaeological populations in the middle adult years with relatively small numbers of mature adults, a result of the tendency for anthropological methods of estimating age to under-age adults (see Chapter 2), as well as a shortfall in the number of non-adult individuals, particularly those from the younger age categories. This may be a result of differential burial practices for these individuals (see Lucy 1994; Becker 1995; Donnelly *et al.* 1999 for this practice in other periods), as well as the observation that the remains of non-adults are more susceptible to truncation and disturbance than those of adults, as well as being less easily recognisable to those without specific osteological knowledge (Evison 1987; Waldron 1987; Lewis 2000: 40; Buckberry 2000). However, the commonly used argument that non-adult remains are much more prone to post-burial degradation and decay than those of adults (Gordon and Buikstra 1981; Henderson 1987; Walker *et al.* 1988) has been more recently disputed by a number of writers, who have shown that non-adult remains show at least the same level of bone preservation as the rest of the cemetery assemblage (see, for example, Saunders 2000: 121; Lewis 2007: 20; Perry 2005: 91), with the bones of neonates often being more resistant to decompositional destruction as they do not possess any intestinal bacteria (Bell *et al*. 1996).

Figures 4.6 and 4.7 show the percentages of non-adults amongst the decapitated rural/small-town and urban samples compared with those in larger cemetery populations. It can be seen that for the urban samples, the percentages in each age group for the decapitated sample are very similar to those in the non-decapitated sample with the exception of the young child category where the percentage of decapitated individuals is nearly double that in the wider cemetery population. However, this may simply be due to the very small sample of decapitated individuals. In the rural/small-town sample, there were no neonate or infant decapitations analysed as part of the sample. However, there was a decapitated infant of three to six months recorded amongst the decapitated sample from the cemetery at Dunstable, Bedfordshire (Matthews 1981), an assemblage that was re-analysed as part of this research, although this infant was the only decapitated burial that could not be located. This does indicate that younger non-adults are represented amongst decapitations from rural and small-town areas. The other age groups are also represented amongst the decapitated samples in slightly different proportions than found in the larger cemetery populations, although this is not statistically significant for any of the age groups.

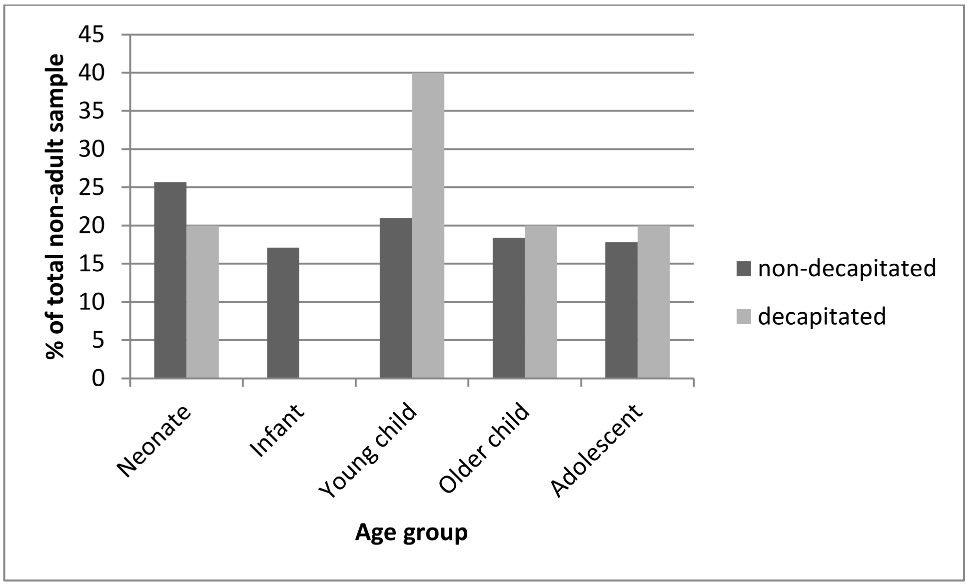

Figure 4.6: percentages of individuals in each non-adult age group in the decapitated and non-decapitated urban samples

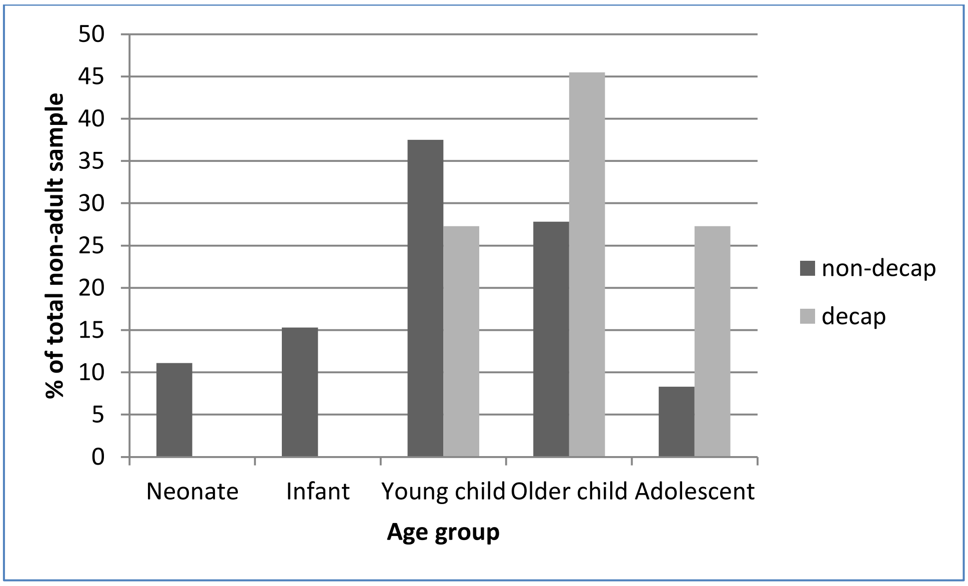

Figure 4.7: percentages of individuals in each non-adult age group in the decapitated and non-decapitated rural/small-town samples

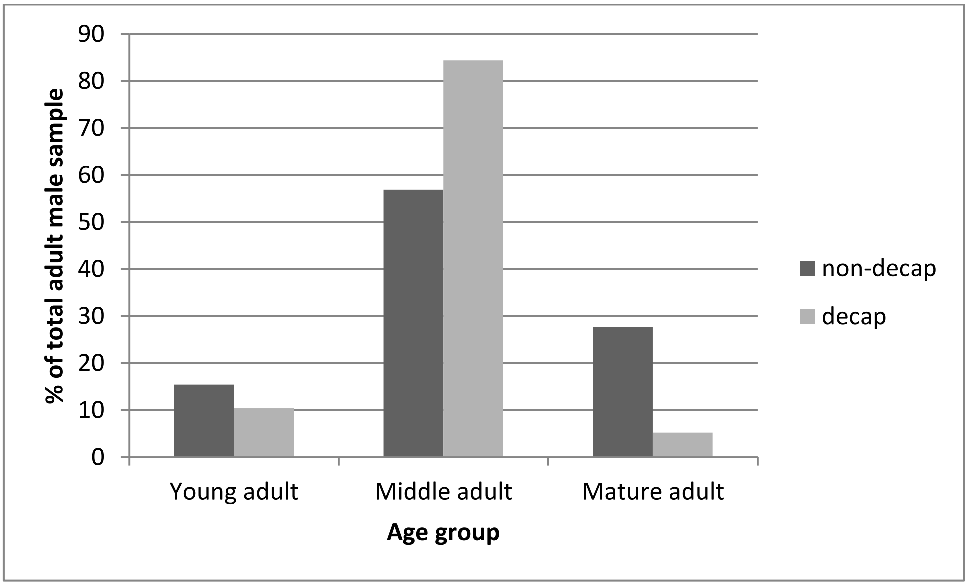

Figure 4.8: percentage of adult males in each of the age categories for the decapitated and non-decapitated urban samples

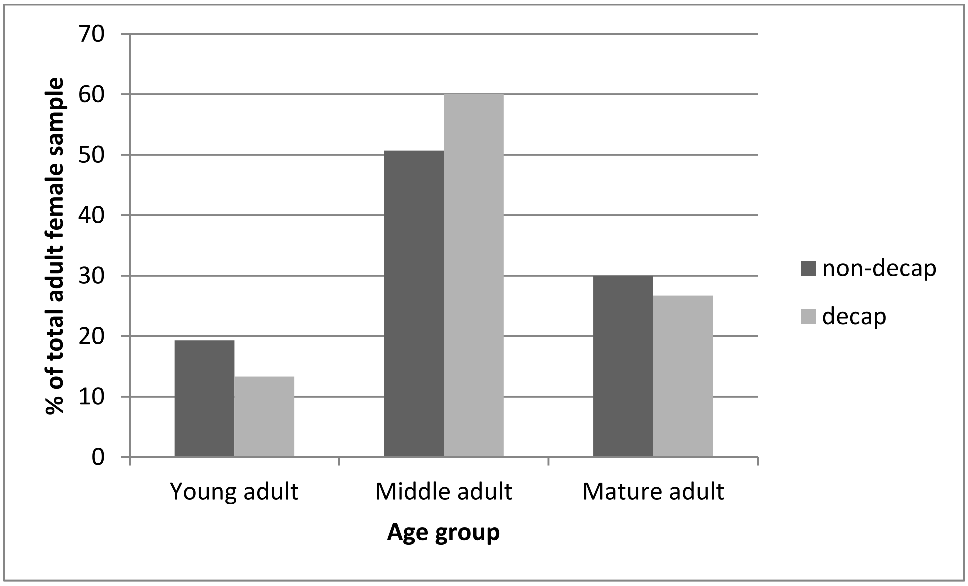

Figure 4.9: percentage of adult females in each of the age categories for the decapitated and non-decapitated urban samples

Figures 4.8 and 4.9 show the percentages of adult males and females in each of the age categories for the decapitated and non-decapitated urban samples and it can be seen that, in the female samples, the percentages are very similar for each age group and are not statistically significant for any group. However, in the male samples, the percentage of decapitated middle adults is statistically significantly larger (p=<0.0001) than in the wider population, whilst conversely, the percentage of mature adults is statistically significantly smaller (p=<0.0001).

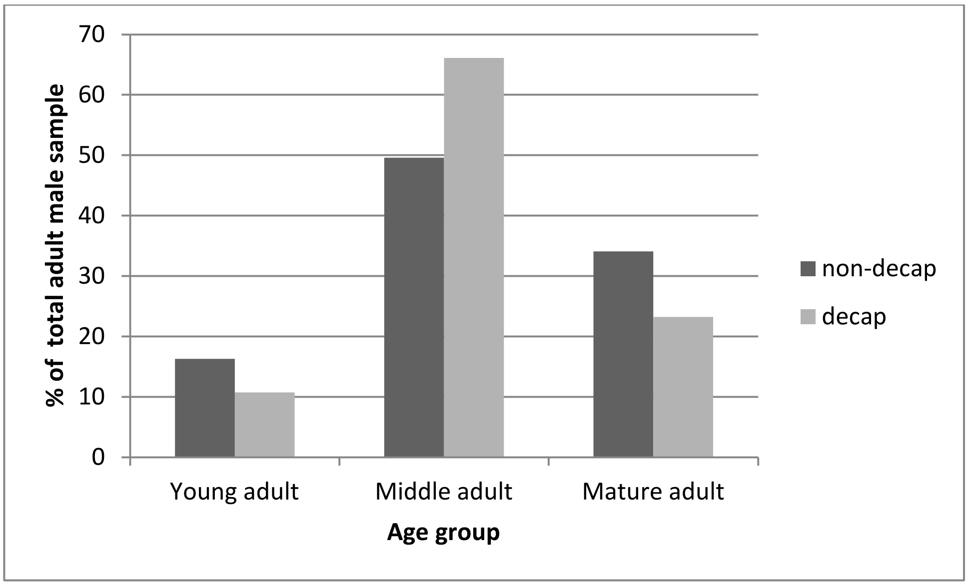

Figure 4.10: percentage of adult males in each of the age categories for the decapitated and non-decapitated rural/small-town samples

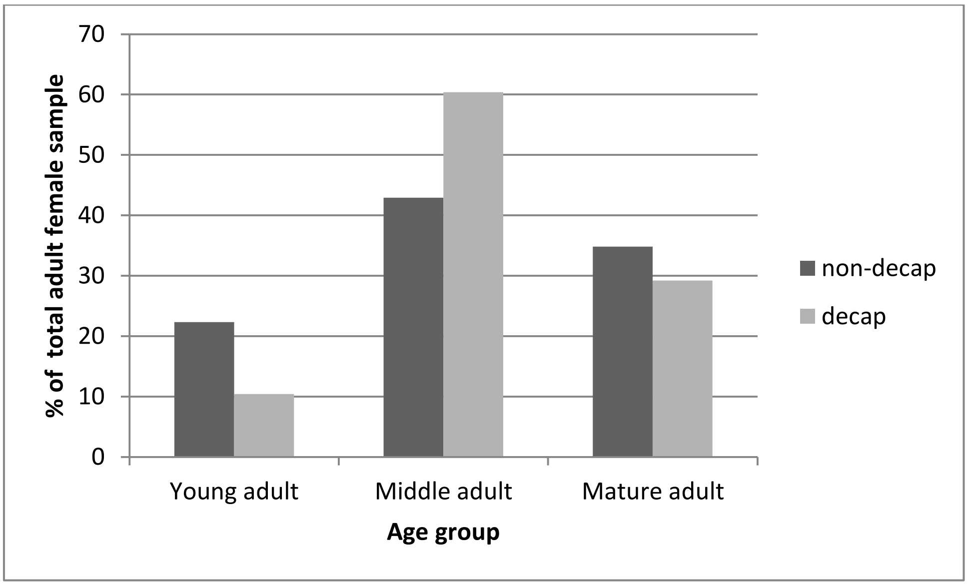

Figure 4.11: percentage of adult females in each of the age categories for the decapitated and non-decapitated rural/small-town samples

Figures 4.10 and 4.11 show the percentages of adult males and females in each of the age categories for the rural/small-town decapitated and non-decapitated samples and it can be seen that the percentages are more similar for each age group amongst both the adult male and adult female samples than in the urban male sample with the differences between the decapitated and non-decapitated samples not being statistically significant for any of the age groups. This indicates that for both sexes and the non-adults in the rural/small-town samples, and for the non-adults and adult females in the urban samples, the decapitated group show no apparent selection according to age compared with the wider population. However, the ages of the urban adult male decapitations do not mirror the findings in the larger population, indicating some degree of selection by age in this specific group.

4.6 Summary of data on the burial practice, head placement and demographics of the decapitated samples

- There are no differences in burial practice between the rural/small-town decapitated sample and the wider population
- Decapitations from urban areas are less likely to have been provided with a coffin or objects than the wider population

- Decapitations from urban areas are more likely to have been buried in the prone position than the wider population
- There is more variety in the location of the head in the urban sample compared with the rural/small-town sample
- There are more adult females in the rural/small-town decapitated sample than in the wider population
- There are more adult males in the urban decapitated sample than in the wider population
- There are fewer non-adults in both decapitated samples than in the wider populations
- There are fewer mature adults in the urban sample compared with the rural/small-town sample
- The demographics of the rural/small-town decapitated samples and the non-adults and adult females in the urban sample mirror those in the larger cemetery population
- There are greater numbers of middle adult male decapitations in the urban sample than in the wider population and fewer mature adults

4.7 Stature

Stature was calculated for all of the decapitated individuals analysed as part of this research and was obtained from as many of the smaller sample with detailed osteological data as possible. The mean stature was then calculated for the male and female samples, separated into the rural/small-town and urban groups. This was then compared with the average stature calculated for the equivalent non-decapitated samples using a one sample T-test. This data is contained in Table 4.6.

	decapitated	non-decapitated	*p* value
small/town/rural			
male	170.5cm	169.6cm	0.3307
female	159.6cm	159.1cm	0.4693
urban			
male	172.3cm	168.8cm	*<0.0001
female	157.9cm	157.9cm	0.5275

Table 4.6: mean statures for the decapitated and non-decapitated samples

It can be seen from the table that the decapitated and non-decapitated samples show no statistically significant differences in stature with the exception of the urban male decapitations, who are statistically significantly taller than the male urban cemetery population as a whole. This may suggest that there is some form of selection in which male individuals were subject to decapitation in urban areas, but no similar form of selection for rural and small-town decapitated males, or for females in either sample. This seems to correspond to the finding that urban male decapitations seem to have been afforded different burial practices to the rest of the population.

4.8 Non-adult health status/nutritional stress

There is the possibility that urban decapitated males may have been of a greater mean stature than the rest of the population because they had a generally better health status in earlier life and better levels of nutrition. This was assessed by comparing the rate of *cribra orbitalia* and enamel hypoplasia between the males and females from the urban decapitated sample. The same was also done for the rural and small-town sample to see if there were any differences in non-adult health status between the males and females from that group. The rate of urban male enamel hypoplasia was 47.6% (39 of 82 individuals) compared with a rate of 15.4% for the urban females (2 of 13 individuals), which was statistically significantly higher (p=0.0362). The rates of *cribra orbitalia* were 16.9% (14 of 83 individuals) for the urban males and 26.7% (4 of 15 individuals) for the urban females, which was not statistically significantly different (p=0.4670). This suggests that, if anything, the urban male decapitated sample had a lower nutritional health status than the female sample. When the rural/small-town decapitated male and female samples are compared, the rates of enamel hypoplasia (25% and 28.3% respectively) are not statistically different (p=0.8223), however, the rural/small-town male rate of *cribra orbitalia* (10.3%) is statistically significantly greater (p=0.0289) than in the female sample, where no affected individuals were recorded.

The percentages of pooled male and female affected individuals from the two different samples were also compared with the rates seen in the larger cemetery populations from rural/small-town and urban areas in order to determine whether there may have been differences in non-adult health status and nutritional stress between the decapitated sample and the rest of the population (see Table 4.7). The urban decapitated sample was found to have a statistically significantly higher rate (41.6% compared to 22.3%) of enamel hypoplasia (p=0.0002) than the population as a whole, whilst that in the rural/small-town decapitated sample was not significantly different from the rest of the population (p=0.2539). The rates for *cribra orbitalia* were also significantly higher in the urban decapitated sample compared with the rest of the population (p=0.0453), with no difference in the percentages in the rural/small-town decapitated and non-decapitated samples (p=0.2867). This suggests that the urban decapitated sample had a poorer general level of non-adult health and nutrition compared to the wider population, which would also contradict the suggestion that the mean stature of the urban decapitated males was greater because of a better level of non-adult health. This may further indicate that a taller stature may have been part of a selection process during adult life amongst those urban males who were subsequently decapitated.

	urban samples		*p* value	rural/small-town samples		*p* value
	decap	non-decap		decap	non-decap	
cribra orbitalia	18 of 105 (17.1%)	99 of 974 (10.2%)	*0.0453	8 of 126 (6.3%)	40 of 408 (9.8%)	0.2867
enamel hypoplasia	42 of 101 (41.2%)	86 of 385 (22.3%)	*0.0002	29 of 119 (24.4%)	89 of 454 (19.6%)	0.2539

Table 4.7: rates of *cribra orbitalia* and enamel hypoplasia for the decapitated and non-decapitated samples

4.9 Dental health

As there have already been differences noted between the urban male and female decapitated sample in terms of burial practice and health, the dental health of the two samples were also compared. Comparisons were also made between the male and female rural and small-town samples. Table 4.8 shows the percentages of males and females with dental caries, dental calculus, periodontal disease and abscesses in the urban and rural/small-town samples and it can be seen from these tables that there are no statistically significant differences between the adult males and females in the rural and small/town samples, whilst the urban male sample has statistically significantly lower rates of dental caries than the urban female sample, although there are no significant differences in any of the other indicators of dental health. This may be a reflection of the small number of mature adults amongst the urban adult male sample, with individuals dying before they could be affected by dental caries, although if this was the sole explanation, the levels of periodontal disease, calculus and abscesses would also be expected to be at lower levels than in the urban female sample. This may suggest that the lower rate of dental caries is a result of the urban male decapitated individuals having access to a different diet with lower levels of sucrose.

urban	adult males n=82	adult females n=13	*p* value
dental caries	32 (39.0%)	10 (76.9%)	*0.0152
dental calculus	74 (90.2%)	12 (92.3%)	1.0000
periodontal disease	38 (46.3%)	8 (61.5%)	0.3778
dental abscess	16 (19.5%)	1 (7.7%)	0.4517
rural/small-town	adult males n=56	adult females n=46	
dental caries	34 (60.7%)	24 (52.2%)	0.4261
dental calculus	41 (73.2%)	27 (58.7%)	0.0533
periodontal disease	24 (42.9%)	18 (39.1%)	0.8400
dental abscess	16 (28.6%)	13 (28.3%)	1.0000

Table 4.8: rates of dental disease amongst the adult male and female decapitated and non-decapitated samples

The rates of dental disease amongst the pooled decapitated samples were also compared to the larger cemetery populations. The crude prevalence rates are shown in Table 4.9, whilst the true prevalence rates (calculated from the total number of teeth affected) for dental caries and calculus are shown in Table 4.10.

urban	decapitated n=101	non-decapitated	*p* value
caries	42 (41.6%)	355 of 920 (38.6%)	0.5199
calculus	87 (86.1%)	215 of 786 (27.4%)	*<0.0001
periodontal disease	46 (45.5%)	420 of 877 (47.9%)	0.6751
abscess	17 (16.8%)	138 of 685 (20.1%)	0.5039
rural/small-town	decapitated n=119	non-decapitated	*p* value
caries	62 (52.1%)	246 of 512 (48.0%)	0.4763
calculus	79 (66.4%)	278 of 329 (84.5%)	*<0.0001
periodontal disease	45 (37.8%)	100 of 210 (47.6%)	0.1055
abscess	31 (26.1%)	54 of 332 (16.3%)	*0.0282

Table 4.9: crude prevalence rates of dental disease amongst the decapitated and non-decapitated samples

urban	decapitated	non-decapitated	*p* value
caries	124 of 1931 (6.4%)	799 of 15150 (5.27%)	*0.0406
calculus	1727 of 1927 (89.6%)	1645 of 3429 (48.0%)	*<0.0001
rural/small-town	decapitated	non-decapitated	*p* value
caries	64 of 945 (6.7%)	828 of 9266 (8.9%)	*0.0290
calculus	776 of 941 (82.5%)	1379 of 2672 (51.6%)	*<0.0001

Table 4.10: true prevalence rates of dental caries and calculus amongst the decapitated and non-decapitated samples

This indicates that when crude prevalence rates are calculated, the decapitated urban sample has a statistically significantly higher rate of dental calculus, and the rural/small-town sample a statistically significantly lower rate of calculus than the wider population. When the true prevalence rates are examined, the urban decapitated sample has higher rates of both caries and calculus than the rest of the population, whilst the rural/small-town sample has a lower rate of caries and a higher rate of calculus. This would suggest that whilst the numbers of individuals in both the decapitated and non-decapitated samples with caries was not different, those individuals with caries in the decapitated urban sample tended to have more carious teeth, whilst fewer teeth were affected among the individuals with caries in the rural/small-town decapitated sample. The higher true prevalence rates for calculus amongst the rural/small-town decapitated sample would also suggest that whilst the number of affected individuals was lower, they had many more teeth with deposits of calculus. This may indicate that the decapitated individuals, particularly those from urban areas, had access to a different diet than was the norm amongst the wider population.

4.10 Degenerative joint disease/activity related changes

urban	decapitated n=105	non-decapitated	*p* value
OA/DJD	54 (51.4%)	253 of 803 (31.5%)	*<0.0001
Schmorl's nodes	56 (53.3%)	164 of 583 (28.1%)	*<0.0001
enthesopathies	74 (70.5%)	-	-
humeral asymmetry	24 (22.9%)	-	-
os acromiale	13 (12.3%)	12 of 313 (3.8%)	*0.0032
rural/small-town	decapitated n=126	non-decapitated	*p* value
OA/DJD	77 (61.1%)	233 of 669 (34.8%)	*<0.0001
Schmorl's nodes	37 (29.4%)	58 of 242 (24.0%)	0.2620
enthesopathies	39 (31.0%)	-	-
humeral asymmetry	14 (11.1%)	-	-
os acromiale	2 (1.6%)	15 of 290 (5.2%)	0.1092

Table 4.11: rates of degenerative/activity related change amongst the decapitated and non-decapitated samples

Table 4.11 shows the rates of osteoarthritis/degenerative joint disease amongst the decapitated and wider urban and rural/small-town populations, as well as the rates of Schmorl's nodes, enthesopathies, humeral asymmetry of more than 5mm (these two conditions could not be compared with the wider cemetery populations as the information was not available, although sixteen of seventeen adult individuals with complete paired humeri from the 2000-2005 excavations at Lankhills, Winchester, had evidence for humeral asymmetry of more than 5mm (Booth *et al.* 2010: 359)), and *os acromiale*. This is a failure in fusion of the ossification centres of the acromial end of the scapula as a result of unusual and prolonged use of the rotator cuff musculature in early life before the expected fusion age of 22-25 years (Hunt and Bullen 2007). Higher rates of these conditions may imply an increase in stress and strain on joints and increased mechanical loading in earlier life. It can be seen from Table 4.11 that the rates of OA/DJD amongst both decapitated samples are statistically significantly higher than in the wider population, whilst in the urban decapitated sample, the rates of Schmorl's nodes and *os acromiale* are also significantly greater. The rates of degenerative joint disease in both samples cannot have been a result of there being a larger number of older adults represented, as it has already been demonstrated that the urban decapitated sample had fewer mature adults than in the wider population, whilst there was no difference between the numbers of mature adults in the rural/small-town decapitated and non-decapitated samples. This would suggest that the individuals in the decapitated samples were subjecting their joints to more wear and tear than would be expected, whilst the urban sample also had evidence for significantly increased rates of unusual and prolonged mechanical loading during earlier life, something that is also supported by the relatively high levels of humeral asymmetry and enthesopathies in the urban sample compared with the rural/small-town sample.

urban	males n=83	females n=15	*p* value
OA/DJD	44 (53%)	11 (73.3%)	0.1685
Schmorl's nodes	49 (59%)	6 (40%)	0.2580
enthesopathies	61 (73.5%)	11 (73.3%)	1.0000
humeral asymmetry	21 (25.3%)	3 (20%)	1.0000
os acromiale	12 (14.5%)	1 (6.7%)	0.6846
rural/small-town	males n=58	females n=51	*p* value
OA/DJD	38 (65.5%)	34 (66.7%)	1.0000
Schmorl's nodes	19 (32.8%)	16 (31.4%)	1.0000
enthesopathies	21 (36.2%)	12 (23.5%)	0.2099
humeral asymmetry	6 (10.3%)	8 (15.7%)	0.5676
os acromiale	0	2 (3.9%)	0.2166

Table 4.12: rates of degenerative and activity related changes in the male and female decapitated samples

The rates of the same conditions in males and females from both decapitated samples were compared in order to determine whether there were significant differences in the rates of the conditions between the sexes and this data is contained in Table 4.12. It can be seen from this that there are no significant differences between the male and female rates of any of the conditions in either decapitated sample.

4.11 Infectious disease

The rates of non-specific infection (NSPI), either in the form of osteomylitis, an infection of the medullary cavity of bones with diffuse compact bone, shaft expansion and cloacae for the expulsion of pus (Marcsik and Oláh 1991), or periosteal new bone, manifesting as porous woven bone and indicating an infection active at the time of death, or as compact remodelled bone, thought to indicate a healed infection (see, for example, Ribot and Roberts 1996; Larsen 1997: 82-92; Roberts 2000b, although it has recently been argued that new bone could have multiple aetiologies, including trauma, localized ulceration or *hypertrophic osteoarthropathy*, none of which are infectious diseases (Weston 2008)); sinusitis, an infection of the cranial sinuses manifesting most commonly as spicules of compact bone on the floor of the sinuses (Roberts 2007); and new bone on the visceral surface of the ribs, which indicates the presence of a non-specific pulmonary infection, and has a strong association with pulmonary tuberculosis (Santos and Roberts 2001; Matos and Santos 2006), were compared between the two decapitated samples and the wider cemetery populations, the data being contained in Table 4.13.

urban	decapitated n=105	non-decapitated	*p* value
non-specific infection	25 (23.8%)	107 of 996 (10.7%)	*0.0004
sinusitis	7 (6.7%)	38 of 1287 (3.0%)	0.0750
new bone on ribs	12 (11.4%)	6 of 284 (2.1%)	*0.0004
rural/small-town	decapitated n=126	non-decapitated	*p* value
non-specific infection	24 (19.0%)	43 of 444 (9.7%)	*0.0071
sinusitis	10 (7.9%)	3 of 85 (3.5%)	0.2497
new bone on ribs	4 (3.1%)	3 of 65 (4.6%)	0.6914

Table 4.13: rates of infectious disease in the decapitated and non-decapitated samples

It can be seen from the table that the rates of non-specific infection in the decapitated samples are significantly higher than in the wider cemetery populations, whilst in the urban sample, the rate of new bone on the ribs is also significantly higher than in the rest of the population. Table 4.14 shows the rates of the same conditions in the male and female decapitated samples to see if there is any difference in the susceptibility for infectious disease between the sexes.

urban	males n=83	females n=15	*p* value
NSPI	21 (25.3%)	3 (20%)	1.0000
new bone on ribs	12 (14.5%)	0	0.2034
sinusitis	4 (4.8%)	4 (26.7%)	*0.0178
rural/small-town	males n=58	females n=51	*p* value
NSPI	15 (25.9%)	4 (7.8%)	*0.0212
new bone on ribs	3 (5.2%)	0	0.2462
sinusitis	5 (8.6%)	4 (7.8%)	1.0000

Table 4.14: rates of infectious diseases in the male and female decapitated samples

It can be seen that in the urban sample, the females have a significantly higher rate of sinusitis, whilst in the rural/small-town sample, the males have a higher rate of non-specific infection. This does not seem to be related to sex specific differences between the conditions generally as the differences in the rates of both non-specific infection and sinusitis between the sexes in the wider rural/small-town samples are not statistically significant.

4.12 Ante-mortem trauma

Ante-mortem trauma was very common in both decapitated samples, with 51.4% of the urban sample (54 of 105 individuals) and 29.4% of the rural/small-town sample (37 of 126 individuals) having evidence for at least one ante-mortem fracture. Both these figures are statistically significantly greater (p=<0.0001) than the 17.3% and 12.6% of affected individuals in the wider urban and rural/small-town populations. Table 4.15 shows the elements or areas of the skeleton affected by fractures for males, females and non-sexed individuals in both decapitated samples.

	urban			**rural/small-town**		
	males	females	not sexed	males	females	not sexed
hand	13	3	0	3	2	0
rib	13	1	1	9	4	0
cranium	12	2	0	3	3	0
foot	10	0	0	1	1	0
vertebral arch	6	0	0	4	1	0
nasal bones	5	0	0	1	0	0
clavicle	4	0	0	0	3	0
fibula	4	0	0	5	3	1
humerus	3	0	0	0	0	0
ulna	2	0	0	2	0	0
radius	2	0	0	0	0	0
tibia	1	0	0	3	2	1
sternum	1	0	0	0	0	0
scapula	0	0	0	1	0	0
mandible	0	0	0	0	1	0
femur	0	0	0	1	0	0

Table 4.15: numbers of ante-mortem fractures in the decapitated samples

It can be seen from the table that the most common sites for fractures were the hands, ribs, cranium, feet, fibula, tibia, vertebral arch and nasal bones, with most sites being relatively equally affected in the urban and rural/small-town samples, with the exception of the tibia and fibula which were more commonly affected in the rural/small-town sample, although not statistically significantly so. Males and females also seem to have been equally susceptible to the same type of fractures with no statistically significant differences between the sexes for any of the fracture sites. The hands, feet, ribs, nasal bones, tibia and fibula were amongst the most common fractures in the wider cemetery populations from both urban and rural/small-town areas, with a number of these fractures (those of the hands, feet, cranial vault, ribs and nasal bones) being particularly associated with interpersonal violence (see Chapter 3). This does suggest that, whilst the fracture sites amongst the decapitated samples were the same as amongst the larger populations, they sustained more fractures than was the norm, with the possibility that this was the result of higher levels of interpersonal violence amongst the decapitated samples.

This assertion is supported by the presence of three males from the urban sample with maxillary trauma associated with ante-mortem loss of anterior dentition (Fig. 4.12); and of three decapitated individuals from the urban sample (all male) with healed blade injuries to the cranial vault. These include an old middle adult from Hyde Street, Winchester (Grave 3), with a healed injury just superior of the left orbit (Fig. 4.13), and a mature adult from Bath Gate, Cirencester (SK305), with a severe sharp-force injury to the right parietal with associated radiating fractures and a trephination of the frontal, both of which were healed but were suggested to have probably resulted in some form of brain injury (Wells 1982).

There were also five individuals (three males from the urban sample, and one male and one female from the rural/small-town sample) with evidence for ante-mortem amputations, manifesting as slightly atrophied elements compared with the antimere, shortening of the element with loss of the joint surface, and the presence of roughened masses of sclerotic bone at the extremity of the element. In four cases, these were of parts of the manual digits, and consisted of a young middle adult male from Lankhills, Winchester (SK427), with amputation of parts of the second and fifth digits of the left hand (Fig. 4.14); an old middle adult ?female (L) with an amputation of the distal segment of a distal manual phalanx, and a young middle adult male (CM) with an amputation of part of the fifth digit of the right hand, both from Dunstable, Bedfordshire; and the individual from Hyde Street, Winchester (Grave 3), with the healed blade injury, who demonstrated an amputation of part of the left thumb, as well as a traumatic flexion contracture of the proximal and medial phalanges of the left fifth digit. The other case of amputation was found in an old middle adult male from Northbrook Avenue, Winchester, who had an amputation through the distal ends of the right radius and ulna (Fig. 4.15). Ante-mortem amputation is a rare occurrence in archaeological skeletal remains and there are only a very few cases recorded for the period, namely, manual digit amputation in two male individuals from the 2000-2005 Lankhills, Winchester, excavations (Booth *et al*. 2010); two males from Horcott Quarry, Gloucestershire (Clough n.d.a); and one male from Kempston, Bedfordshire (Boylston and Roberts 2004), and, therefore, finding evidence for five such amputations amongst a relatively small sample of decapitated burials is striking.

Figure 4.12: ante-mortem loss of anterior dentition in SK8 from 6 Driffield Terrace, York (photograph by author, courtesy of York Archaeological Trust)

Figure 4.13: healed blade injury above the left orbit of SK3 from Hyde Street, Winchester

Figure 4.14: amputation of parts of the second and fifth manual digits of SK427 from Lankhills, Winchester

Figure 4.15: amputation through the distal right radius and ulna of the old middle adult male (SK57) from Northbrook Avenue, Winchester

Along with these amputations and ante-mortem blade injuries, there are a number of other individuals with evidence for traumatic injuries or other pathological alterations that would have been visible during life. These include other individuals with traumatic fusion of manual digits, including a mature adult female from Stanwick, Northamptonshire (SK6105), with the medial and distal phalanges for the right fourth digit fused in extension, and a young middle adult female from Lankhills, Winchester (SK297), with a fracture and shortening of the right fifth metacarpal and a flexion contracture of the digit. There were also three males, one from the urban sample and two from the rural/small-town sample, with evidence for torticollis (an abnormal lateral positioning of the neck with a degree of head rotation and tilt that can have either a muscular or non-muscular involvement and is usually the result of an underlying congenital or pathological disorder, or a response to trauma (Storm 2008: 169)); a young middle adult of indeterminate sex from Dunstable, Bedfordshire (BG), with severe trauma to the right scapula and humerus that resulted in a permanent dislocation and external rotation of the humerus (Fig. 4.16); an old middle adult male from Lankhills, Winchester (SK1289), with a remodelled fracture of the diaphysis of the right humerus with subsequent early fusion of the epiphysis and substantial shortening of the element; an adolescent from the Babraham Institute, Cambridge (SK51), with a healed fracture of the left tibia with angulation and shortening (Timberlake *et al*. 2007); a mature adult male from Jesus Lane, Cambridge (SK161), with septic arthritis (arthritis secondary to an infection of a joint as a result of organisms circulating in the bloodstream or through bacteria gaining direct access to the joint following trauma (Boylston and Lee 2008: 251)) of both hips that resulted in restricted movement (Alexander *et al*. 2004); and a young middle adult male from Mundford, Norfolk (SK4), with a number of ante-mortem traumata, including fractures of the shafts of the left tibia and right ulna, a shortened left humerus, fusion of the right foot, and a fracture of the left knee with resultant atrophy and abnormal gait and posture (Fig. 4.17), all of which seem to have been the result of a single incident during non-adult life.

This concentration of unusual and relatively rare traumata and pathological conditions amongst the decapitated individuals, seemingly equally spread between the sexes and urban and rural/small-town samples (although it is possibly found more amongst adult males) may suggest that possession of such a visible defect during life predisposed an individual to being decapitated, although by no means all decapitated individuals had skeletal evidence for such conditions, and having such a defect did not mean that you would definitely have been decapitated.

Figure 4.16: trauma to the proximal humerus and scapula of skeleton BG from Dunstable, Bedfordshire

Figure 4.17: trauma to the left knee of SK4 from Mundford, Norfolk

4.13 Summary of evidence from the stature and palaeopathological analysis

- The urban male decapitations have a greater mean stature than the wider population
- The urban decapitated sample has higher rates of enamel hypoplasia than the wider population
- The urban decapitated sample has higher rates of *cribra orbitalia* than the wider population

- The urban decapitated sample has higher rates of calculus, and the rural/small-town sample lower rates, than the wider population
- Both decapitated samples have higher rates of degenerative joint disease than the wider population
- The urban decapitated samples have higher rates of activity-related changes than the wider population
- Both decapitated samples have higher levels of non-specific infection than the rest of the population
- The urban decapitated females have a higher rate of sinusitis than the males
- The rural/small-town decapitated males have a higher rate of non-specific infection than the females
- The urban decapitated sample has a higher rate of new bone on the ribs than the wider population
- Both decapitated samples had higher levels of ante-mortem fractures than the wider populations, although the sites of fracture were the same
- Decapitated individuals have a high number of amputations compared with the wider population
- There is a possible association between visible trauma or pathology and decapitation

4.14 Peri-mortem trauma

Of the individuals in the smaller sample where a detailed skeletal analysis was undertaken as part of this research, or where information was available from previous analyses, 193 had evidence for peri-mortem trauma, the majority of which was directly related to the process of decapitation. Of these, ninety-six were from urban areas and ninety-three from rural and small-town cemeteries. Table 4.16 contains the data on the type of decapitating cut (whether chop, incised or a combination of both) for the two samples and it can be seen that there are no statistically significant differences between the samples, with chopping blows being predominant in both. There were also no significant differences in the type of cut between males and females in either sample. This is in contrast to the conclusions of previous syntheses, which have stated that decapitation is usually undertaken with incised, “careful” cuts, and it can be seen from the present data that incised cuts are very much a minority, with less than five percent of the urban sample, and less than ten percent of the rural/small-town sample demonstrating these cuts in isolation. In the vast majority of individuals, the chopping blows were very fine and clean with very little evidence for fracturing of the margins of the chop, suggesting that the instrument used was very sharp with a fine blade (Boylston 2000: 369).

type of cut	urban n=96 (m=78, f=12, a=2, na=4)	rural/small-town n=93 (m=45, f=34, a=5, na=9)	*p* value
incised	4 (4.2%) (m=2, f=0, na=2)	8 (8.6%) (m=3, f=4, na=1)	0.2299
chop	81 (84.4%) (m=67, f=10, a=2, na=2)	60 (64.5%) (m=28, f=20, a=4, na=8)	0.0662
both	11 (11.5%) (m=9, f=2)	16 (17.2%) (m=8, f=8)	0.3019
cut type not defined	0	9 (9.7%) (m=5, f=3, a=1)	

Table 4.16: type of cuts in the rural/small-town and urban decapitated samples (m=male, f=female, a=non-sexed adult, na=non-adult)

When the direction and the number of blows is analysed (Table 4.17 and 4.18), it can be seen that the urban sample has statistically significantly more individuals with decapitating blows directed from the posterior than the rural/small-town sample, with urban males representing significantly more of this number than urban females, whilst urban females had significantly more blows directed from the anterior. The urban sample also had significantly more individuals with a single cut than the rural/small-town sample, with males making up a significant proportion of that number. The urban females had significantly more individuals with two or three cuts, whilst the rural/small-town sample had significantly more individuals with four or more cuts. There were no differences in the direction and number of cuts between males and females in the rural/small-town sample.

	urban	rural/small-town	*p* value
anterior	9 (10.2%)	42 (50.6%)	*<0.0001
posterior	63 (71.6%)	24 (26.0%)	*<0.0001
lateral	2 (2.3%)	3 (3.9%)	1.0000
all directions	14 (15.9%)	14 (19.5%)	1.0000
1 blow	57 (59.4%)	39 (42.9%)	*0.0284
2-3 blows	20 (20.8%)	19 (20.9%)	1.0000
4+ blows	19 (19.8%)	33 (36.3%)	*0.0144

Table 4.17: differences in the direction and number of blows in the urban and rural/small-town samples

urban	males	females	*p* value
anterior	3 (4.1%)	5 (41.7%)	*0.0011
posterior	58 (79.5%)	4 (33.3%)	*0.0023
lateral	1 (1.4%)	0	1.0000
all directions	11 (15.1%)	3 (25.0%)	0.4082
1 blow	51 (65.4%)	3 (25.0%)	*0.0112
2-3 blows	13 (16.7%)	6 (50%)	*0.0169
4+ blows	14 (17.9%)	3 (25.0%)	0.6915
rural/small-town	males	females	*p* value
anterior	18 (43.9%)	17 (54.8%)	0.4756
posterior	13 (28.9%)	5 (16.1%)	0.1729
lateral	2 (4.4%)	1 (3.2%)	1.0000
all directions	8 (17.8%)	8 (25.8%)	0.5757
1 blow	20 (44.4%)	10 (31.3%)	0.3432
2-3 blows	10 (22.2%)	7 (21.9%)	1.0000
4+ blows	15 (33.3%)	15 (46.9%)	0.2466

Table 4.18: differences in the direction and number of blows between the males and females in both samples

This is also interesting in the light of previous assertions that decapitations were normally performed from the anterior, as it indicates that while this is predominately the case for decapitations performed in rural/small-town areas, those from urban areas, particularly of male individuals, were usually performed from the posterior with a single blow, whilst a number of blows was the norm in rural/small-town areas.

The number of individuals from each sample who had evidence for cuts to the cranium, mandible, clavicle or scapula directly related to the decapitation, as well as those with evidence for non-decapitation related peri-mortem trauma to the cranial and post-cranial skeleton, were also recorded (Table 4.19), and it can be seen that there were no differences between the urban and rural/small-town samples. There were also no differences between males and females in either sample (Table 4.20).

	urban	rural/small-town	*p* value
non-cervical decap	29 (30.2%)	29 (31.2%)	1.0000
cranial non-decap	11 (11.5%)	9 (9.7%)	0.8142
post-cranial non-decap	8 (8.3%)	3 (3.2%)	0.2133

Table 4.19: evidence for non-cervical peri-mortem trauma in the urban and rural/small-town samples

urban	males	females	*p* value
non-cervical decap	22 (28.2%)	6 (50%)	0.1798
cranial non-decap	11 (14.1%)	0	0.3478
post-cranial non-decap	8 (10.3%)	0	0.5910
rural/small-town	males	females	*p* value
non-cervical decap	16 (36.4%)	11 (32.4%)	0.8120
cranial non-decap	7 (15.6%)	2 (5.9%)	0.2864
post-cranial non-decap	2 (4.5%)	1 (3.3%)	1.0000

Table 4.20: evidence for non-cervical peri-mortem trauma in the males and females from both samples

4.15 Decapitation types

When the detailed information on the nature of the peri-mortem trauma in the two samples is analysed in detail, it becomes apparent that there are a number of different types of decapitation with different skeletal signatures, namely: 1. incised cutting of the cervical column; 2. incised cuts to the anterior of the cervical column associated with incised cuts or chops to the cranio-cervical skeleton; 3. chopping blows through the cervical column associated with additional incised cuts or chops to the vertebrae, cranium, mandible, scapula, clavicle or ribs; 4. single chop to the cervical column with no other cuts present; 5. chops to the cervical column associated with peri-mortem trauma to areas of the cranial or post-cranial skeleton that would indicate they are not directly related to the process of decapitation. Each type of decapitation is described and discussed below and possible interpretations given for how the different signatures may have been produced.

4.15.1 Incised cutting

There were a very small number of individuals (four from urban areas and three from rural/small-town areas, there not being any statistical difference between the two samples) who demonstrated this type of decapitation, consisting of a number of incised cuts to the cervical column with no other cuts or other evidence for peri-mortem trauma. Examples of this type of decapitation include an adolescent from Lankhills, Winchester (SK348), who had been buried supine with the lower legs flexed at the knee, and with the cranium, mandible, C1 and C2 placed by the right knee (Clarke 1979). There were a total of seven separate incised cuts to the anterior of the left and right superior articular processes of C4 and the anterior of the inferior articular processes of C3, with the cuts angled left-superior to right-inferior on the left arches, and right-superior to left-inferior on the right arches (Fig. 4.18). Another individual from the same cemetery (SK427), a young middle adult male buried supine with the cranium and mandible by the right knee and a coin found in the mouth (Clarke 1979), demonstrated five incised cuts to the anterior and inferior of the neural arch of C3, all of which were angled right-superior to left-inferior; whilst a young middle adult male (SK6) from Mundford, Norfolk, buried supine and extended with the lower limbs crossed at the ankle and the cranium and mandible found by the feet (Wells 1964a), had evidence for at least four incised cuts to the inferior surface of the body of C2 that must have been made with the neck extended (Fig. 4.19).

Figure 4.18: incised cuts to the anterior of the articular process of C4 of SK348 from Lankhills, Winchester

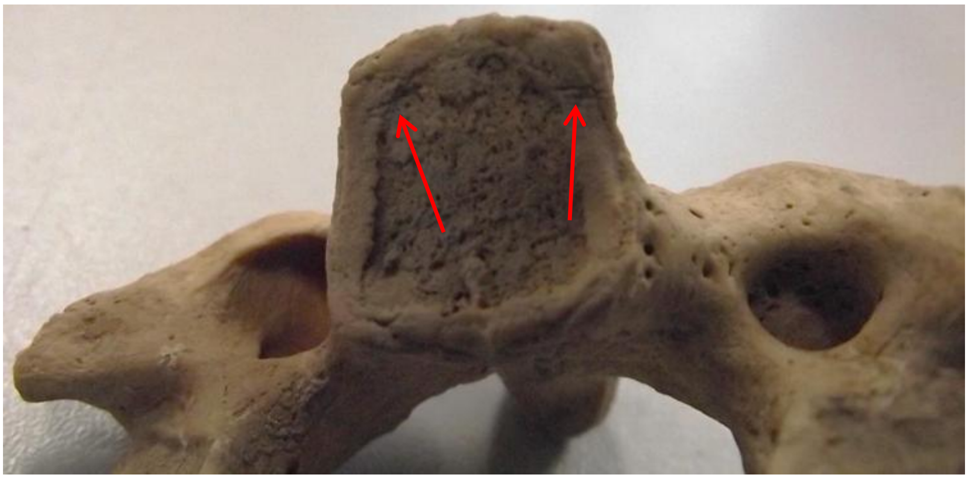

Figure 4.19: incised cuts on the inferior surface of the body of C2 of SK4 from Mundford, Norfolk

The position of these cuts and the fact that they were all made by incising the bone, along with an absence of any other peri-mortem cuts or fracturing of the cervical column, would suggest they relate to careful severing of the intervertebral ligaments and cartilage (see Klaus *et al*. 2010 for similar examples of cut-marks from Peruvian skeletal remains) after the soft tissue of the neck had been cut through (without leaving any cut-marks on the bone) and the head was then removed by careful disarticulation, without fracturing any of the elements. The absence of cuts associated with the severing of the soft tissue of the neck may suggest that these decapitations were carried out once decomposition of the corpse was already well advanced. However, the *in situ* photographs and drawn plans of the skeletal remains show the burials to be fully articulated with no obvious evidence of disarticulation of the hands and feet, areas of the skeleton which are the earliest to lose articulation in the decomposition process (Duday 2009: 27), indicating that they must have been interred soon after death. This would also suggest that the process of decapitation took place in the immediate peri-mortem period, whilst the precision in the placement of the cuts would suggest that the individuals were already dead when the decapitation was carried out. It is possible that they could have been unconscious rather than dead, although the sudden release of a large quantity of blood when the carotid arteries were severed (see Dedouit *et al*. 2007: Fig. 1 for a dramatic demonstration of this in a modern forensic case) would have made precise cuts difficult, and the decapitation process would need to have been an extended one to allow time for the blood flow to cease.

4.15.2 Incised cuts to anterior of vertebrae associated with additional cuts or chops

There was a larger minority of individuals (four from urban areas (4.2%) and sixteen from rural/small-town areas (19.3%), which was statistically significantly greater (p=0.0016)) who had evidence for incised cuts to the anterior of the cervical column associated with other incised cuts or chopping blows to the vertebrae. There was one mature adult male individual, from South Parks Road, Oxford, buried supine and extended with the cranium, mandible and C1-C3 found between the distal lower limbs and parts of an accessory vessel placed where the head should have been (Bradley *et al.* 2005), who demonstrated a single incised cut to the anterior and inferior of the body of C3 with no other associated cuts (Witkin 2005). There was also an older child/adolescent (11-13 years) from Woodyates, Dorset, buried supine and extended with hobnails at the feet and the cranium and mandible placed by the right distal lower limb (Pitt-Rivers 1892), who had evidence for a single incised cut across the anterior of C3 and C4 and a stabbing injury to the anterior and inferior surface of the body of C4. Three other individuals demonstrated an incised anteriorly placed cut associated with additional incised cuts, typified by a young adult male from Barrow Hills, Radley, Oxfordshire (SK1018), buried on the left side with the distal limbs flexed and the wrists crossed, and with the cranium and mandible beneath the right knee (Chambers and Boyle 2007), who had a single incised cut across the anterior of the body of C2, as well as at least thirteen separate cuts to the bodies and arches of C2 and C3, all of which were made from the anterior, including five cuts to the anterior of the spinous process of C2, which must have been made once the vertebrae were largely separated (Harman 2007).

Five other individuals (two from urban areas and three from rural/small-town areas) had evidence for incised cuts to the anterior of the cervical column associated with additional incised cuts and chopping blows. These included an old middle adult male from 1-3 Driffield Terrace, York (SK47), buried supine and extended with the cranium and mandible placed at the head end of the grave out of anatomically correct position (access to unpublished site archive for 1-3 Driffield Terrace provided by York Archaeological Trust), who had evidence for five incised cuts across the anterior of the bodies of C4-C7 (Fig. 4.20). There was also evidence for two additional small incised cuts to the right side of the arch of C3 that were directed from the posterior right, and five chopping blows to C2-C5 and the mandible (four of which were delivered from the posterior, including one that would have been struck when the neck was flexed), as well as a peri-mortem blunt-force injury to the right frontal and sphenoid with endocranial bevelling and radiating fractures (Fig. 4.21). Another individual in this category was the supine and extended middle adult female from Rickinghall, Suffolk, whose cranium and mandible were absent, although it may have been originally placed at the feet, which had been truncated (Boulter 1995). This individual had three or four incised cuts across the anterior of the body of C4, as well as at least eleven separate incised cuts to the posterior of the arches of C3 and C4 and a single chopping blow through the arch of C3 delivered from the posterior (Anderson 1995).

Figure 4.20: incised cut to the superior surface of the body of C6 of SK47 from 1-3 Driffield Terrace, York (photograph by author, courtesy of York Archaeological Trust)

Figure 4.21: blunt-force injury to the right side of the frontal of SK47 from 1-3 Driffield Terrace, York (photograph by author, courtesy of York Archaeological Trust)

The final group of decapitations in this category were those with an incised anteriorly placed cut with additional chopping blows. These include a mature adult female from Cowdery's Down, Basingstoke, Hampshire (SK5), who was supine and extended with the cranium and mandible placed at the edge of the grave, level with the right knee (Millett and James 1983). There were two incised cuts to the anterior of the body of C4, as well as three posteriorly directed chopping blows through the arches and bodies of C4-C6, only one of which totally bisected the element (that to C4). There was also a middle adult female from Lankhills, Winchester (SK445), tightly compressed on the right side with both hands and feet together (Clarke 1979), who demonstrated a single incised cut to the anterior of the body of C5 (Fig. 4.22) as well as two chopping blows to C3 and C4, both of which were directed from the anterior. The old middle adult male from Hyde Street, Winchester (SK3), buried in a slightly contracted position with the cranium and mandible by the left knee (Ottaway *et al*. forthcoming), had evidence for an incised cut across the anterior of the body of C3 (Fig. 4.23) as well as a number of chopping blows, including one that passed through the arch of C1, odontoid process of C2, the left ascending ramus of the mandible (with severe associated peri-mortem fractures) and the left occipital condyle and mastoid process, delivered from an antero-posterior direction. There were also two additional chops through the body of C2, one through the pedicles of C3, and one through the right ascending ramus and body of the mandible (Fig. 4.24), as well as two stabbing injuries to the posterior of the occipital directed from the posterior right.

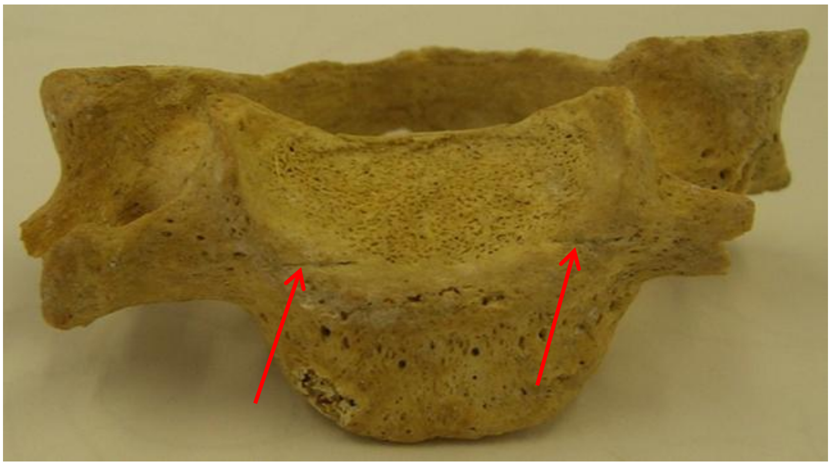

Figure 4.22: incised cut to the anterior of the body of C5 of SK445 from Lankhills, Winchester

Figure 4.23: incised cut to the anterior of the body of C3 of SK3 from Hyde Street, Winchester

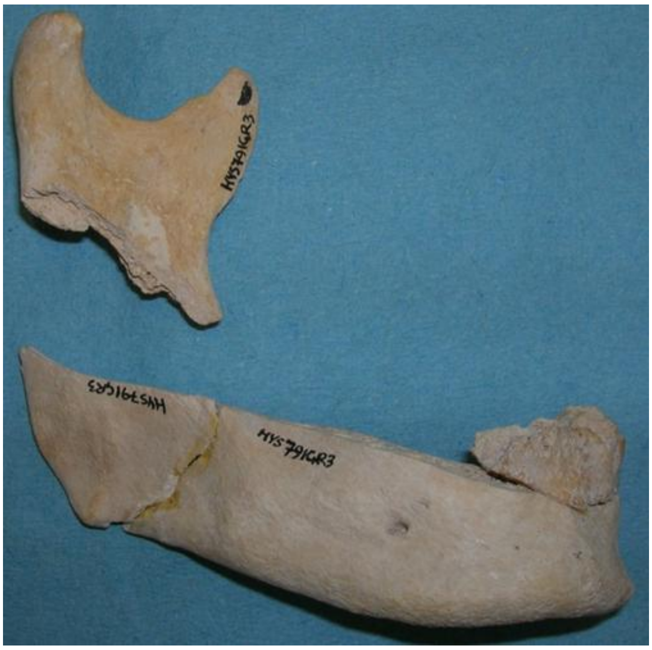

Figure 4.24: chop through the mandible of SK3 from Hyde Street, Winchester

The most interesting individual with this type of decapitation was the old middle adult male from Winchester Street, Andover (SK4), buried slightly on his left side with the right lower limb flexed and both hands together by the left femur, and the cranium and mandible to the right of the knees (Jennings 2000). There was evidence for at least two incised cuts across the anterior of the bodies of C3-C5, and at least twenty separate chopping blows affecting the inferior cervical and superior thoracic vertebrae, mandible (with associated fractures of the right ascending ramus), *corpus sterni* and manubrium (Fig. 4.25), right clavicle, right rib 1 and glenoid fossa of the right scapula. The individual also had evidence for multiple peri-mortem fractures of the anterior and posterior dentition (Fig. 4.26).

Figure 4.25: chops through the manubrium of SK4 from Winchester Street, Andover, Hampshire

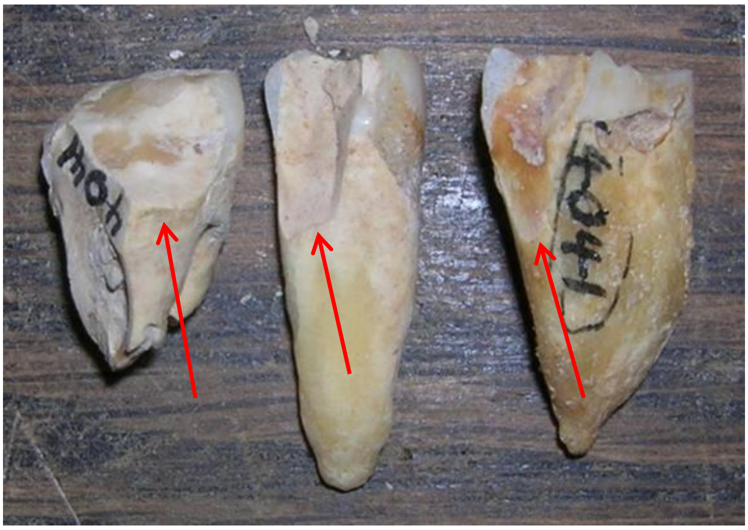

Figure 4.26: peri-mortem fractures of the dentition of SK4 from Winchester Street, Andover, Hampshire

The placement of the incised anteriorly directed cuts in all of these individuals would suggest that they relate to a cutting of the throat. A cut to the anterior of C3, very similar in appearance to the ones seen in these individuals and also suggested to be related to a cut-throat, is illustrated in Kimmerle and Baraybar (2008: Fig. 6.4, 6.5) and was from an individual found in a modern mass grave. Cutting of the throat has also been the interpretation of cut-marks to the anterior surfaces of cervical vertebrae in a number of South American skeletal samples (Verano 2000, 2008; Klaus *et al*. 2010). If these cuts are to be interpreted as relating to a cutting of the throat, this may suggest that this was being carried out whilst the individuals were still alive. Slitting of the throat of a corpse would seem to be an unnecessary part of the process of decapitation and, as can be seen from the relatively small numbers of individuals with such evidence for a cut-throat, was not common amongst the decapitated sample. It is possible that this throat cutting was undertaken in order to release the blood, considered to be an important part of any sacrificial process (see Chapter 1), and is something which would only happen in a live individual. There are also a number of bog bodies (usually considered to be sacrificial victims) who have evidence for having had their throat cut (Glob 1969: 48; Brothwell and Gill-Robinson 2002: 127), with sacrifice also being the favoured interpretation for the South American examples (Verano 2001; 2008). However, throat slitting is also seen in cases of murder (Dogan *et al.* 2010; Aich *et al*. 2011) and judicial and extra-judicial execution (Kimmerle and Baraybar 2008: Fig. 6.4, 6.5; Ning 2008: 129) so its presence in the Romano-British examples does not necessarily imply human sacrifice.

Once the throat of the individual had been cut, the additional cuts and chops would appear to be related to the removal of the head, sometimes by relatively carefully made incised cuts and sometimes by chopping blows. In cases where chops are identified, there is usually more than one blow administered, suggesting that there was a main decapitating blow and then additional chops undertaken in order to completely remove the head. These additional chops could sometimes be numerous, as in the individual from Winchester Street, Andover. The idea that this process of head removal was not necessarily always a quick and tidy one has been suggested by Reynolds (2009: 77-78) in reference to the post-mortem decapitation of Oliver Cromwell, which required eight blows even though he had died three years previously (Reynolds 2009: 77-78). However, in the original Sainthill manuscript quoted by Pearson and Morant (1934: 10), this number of blows was required largely because the body was wrapped in six layers of cere-cloth (strips of fabric impregnated in wax and used to wrap the dead) at the time of the decapitation.

The fact that these additional blows were administered, plus the displacement of the cranium and mandible in all of these individuals, would indicate that rather than it just being necessary to kill the individual, complete removal of the head was an important part of the process of decapitation. That this separation of the head from the rest of the body was not necessarily carried out once the individual was dead is suggested by a number of factors present in the individual from Winchester Street, Andover. These include a peri-mortem blade injury to the glenoid fossa of the right scapula that would not seem to be directly related to the decapitation process and may represent an attempt to cut through *M. pectoralis major*, which could be an incapacitating injury to the right pectoral girdle of a live and unwilling victim. The fact that the decapitating blows were directed from a number of different directions may also suggest that the individual had been moving during the process. Another possible piece of evidence is the multiple peri-mortem fractures of the dentition, which affected the right maxillary canine, left lateral incisor, canine, premolars and third molar, and the mandibular right fourth premolar, second and third molars and left third premolar. These manifested as oblique root-crown fractures or as fractures of the surface of the crown and root removing slivers of the tooth. Fractures of the anterior dentition are usually the result of direct force, such as a blow to the face, whilst fractures to the premolars and molars are a result of forced occlusion through indirect force, such as in forceful contact between the chin and a hard surface (Glendor *et al*. 2007). The presence of fractures on both the anterior and posterior dentition in this individual would suggest that a direct blow to the face, or a fall onto the face, had been sustained but also that indirect force had been applied. This may have occurred as a result of post-mortem damage to the decapitated head by being dropped or thrown onto the ground or another hard surface, or the fractures of the posterior dentition could have resulted from forced occlusion due to the act of decapitation. It is possible that the blows to the mandible could have produced the posterior dental trauma but it is difficult to determine whether this could occur in a corpse, or whether the individual would have had to have been alive to produce such forced occlusion.

The clinical and archaeological literature on peri-mortem dental trauma is very sparse, with one forensic case from Kosovo, described in Kimmerle and Baraybar (2008: 213-215), who presented with multiple incomplete dental fractures suggested to have been caused by upward blows to the mandible whilst the teeth were biting into a hard object. There are also only a small number of examples reported from archaeological sites but with no comment on their possible aetiology (Ogilvie and Hilton 2000; Tiesler 2007: 26), with the exception of a few individuals from the medieval Battle of Towton, who had suffered blade injuries to, and fractures of, the dentition as a result of trauma to the mandible (Holst and Coughlan 2000: 87-88). However, a peri-mortem fracture of the mandibular left second molar in Lindow Man (a bog body from Lindow Moss, Lancashire) was suggested to have been a result of forced occlusion from the peri-mortem blunt force injury to the frontal, as there was no post-mortem process than could have caused it (Connolly 1986: 60). Peri-mortem dental fractures were recorded in a further thirteen decapitated individuals during the present research and there is the potential that it is one means of distinguishing decapitation as a mechanism of death from that carried out as a post-mortem act.

Flexion of the neck when decapitating blows were delivered, which was recorded in one individual in this category (1-3 Driffield Terrace, York, SK47), may also be a very good method of distinguishing individuals where decapitation was the mechanism of death, as this neck position is virtually impossible to achieve in a corpse lying prone on the ground (Schulting *et al*. 2010). A total of nine individuals analysed as part of this research had evidence for decapitating blows delivered with the neck flexed, again supporting the assertion that a number of the decapitations were potentially performed on living individuals.

This may also be suggested by a slightly unusual burial position recorded in a few individuals, including the crossed wrists of one of the individuals (mentioned earlier) from Barrow Hills, Radley, Oxfordshire (SK1018), which may indicate that they had been tied. Another individual, this time from Lankhills, Winchester (SK451), a relatively poorly preserved adult male with no evidence for peri-mortem trauma on the surviving upper four cervical vertebrae, was buried prone with both upper limbs behind the back with the distal upper limbs parallel (Clarke 1979), suggesting some form of restraint. There were other individuals analysed as part of this research that also had evidence for having had their wrists tied, and this may be used, particularly where it is associated with possible incapacitating injuries, cut-throats or flexed necks, to suggest that decapitation may have been the mechanism of death.

4.15.3 Chopping blows associated with additional cuts or chops

Fifty-two individuals from within the decapitated sample had evidence for this type of decapitation, which was characterised by two or more chopping blows, usually associated with additional incised cuts or chopping blows. There was no significant difference between the urban and rural/small-town samples in the numbers of this type of decapitation (twenty-five and twenty-seven individuals respectively), although there were statistically significantly more females (66.7%) in the urban sample with this type of decapitation than males (20.5%) (p=0.0022). Examples of these type include an older child (8-10 years) from Stanwick, Northamptonshire (SK6038), buried prone with the lower limbs flexed at the knee and the cranium and mandible by the distal left lower leg (access to unpublished site archive for Stanwick provided by English Heritage), who had evidence for four separate chops to the arches of C2-C4, all of which were directed from the posterior right (Fig. 4.27), as well as peri-mortem fractures of the maxillary right second deciduous molar and mandibular permanent left first molar; and a mature adult ?female from Southfield House, Dorchester (SK66), buried supine and extended in a wooden coffin with the cranium and mandible between the ankles (Davies and Thompson 1987), who had two separate chops through the arches of C4 and C5, one of which must have been made when the neck was hyperextended, as well as peri-mortem fractures of the maxillary incisors. Other examples include a young middle adult male from 1-3 Driffield Terrace, York (SK41), who was supine and extended with the cranium and mandible on the left knee, and who demonstrated two separate posteriorly directed chopping blows, one of which affected the spinous processes of C2 and C3 and must have been made with the neck flexed (the occipital was not affected by the blow), and the other of which bisected the body and arch of C7 (Fig. 4.28).

Figure 4.27: chops to the arch of C2 of SK6038 from Stanwick, Northamptonshire

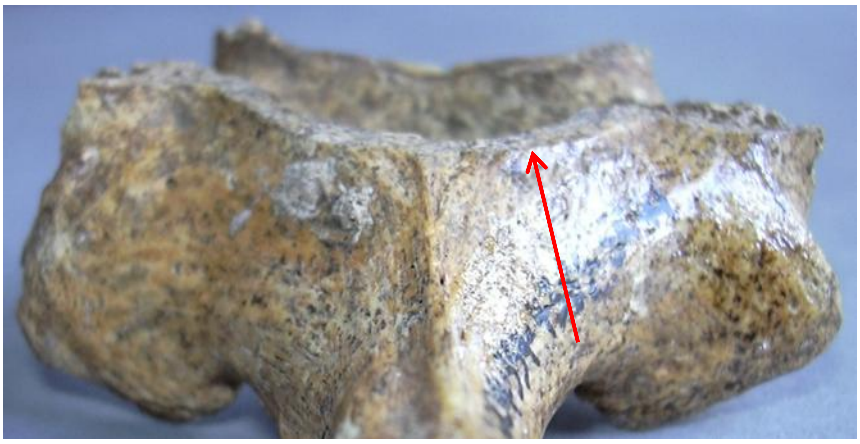

Figure 4.28: chop through the arch of C7 of SK41 from 1-3 Driffield Terrace, York (photograph by author, courtesy of York Archaeological Trust)

In examples such as these, with a, usually small, number of separate chopping blows, it is often not possible to determine whether there was a main decapitating blow and it seems possible that the head was removed using two to four or five separate blows delivered from the same direction. However, there are examples where this does not seem to be the case. These include a young middle adult male from Water Lane, Towcester, Northamptonshire (SK29), who was buried supine and extended with the cranium and mandible over the distal lower limbs (Walker *et al*. 2008), and who had evidence for five separate chops to C1 and C2 that also affected the right mastoid process and ascending ramus of the mandible, all of which were directed from the posterior. There was also a single incised cut to the posterior of the arch of C1 and a large number of incised cuts into the superior facets and odontoid process of C2, one of which overlays a chopped surface (Fig. 4.29). There were also a number of incised cuts into the gonial area and inferior border of the body of the left side of the mandible. Other examples of this type include a mature adult female from Mundford, Norfolk (SK6), supine and extended with the cranium and mandible by the feet (Wells 1964a), who had evidence for a posteriorly directed chopping blow that bisected the body of C3, as well as three additional blows, also directed from the posterior; one of which chopped into the right ascending ramus of the mandible and fractured the gonion (Fig. 4.30); one of which chopped through the acromial end of the left clavicle; and the other of which resulted in a peri-mortem fracture of the midshaft of the right clavicle. There was also a young adult of indeterminate sex from Dunstable, Bedfordshire (AD), who was buried supine and extended with both hands together by the right side of the pelvis and the cranium and mandible between the femorae (Matthews 1981), who had a chop that bisected the arch of C3 and body of C4, directed from the anterior, as well as two chops into the inferior facets of C4 that did not affect the arch or body of C5, that were also directed from the anterior.

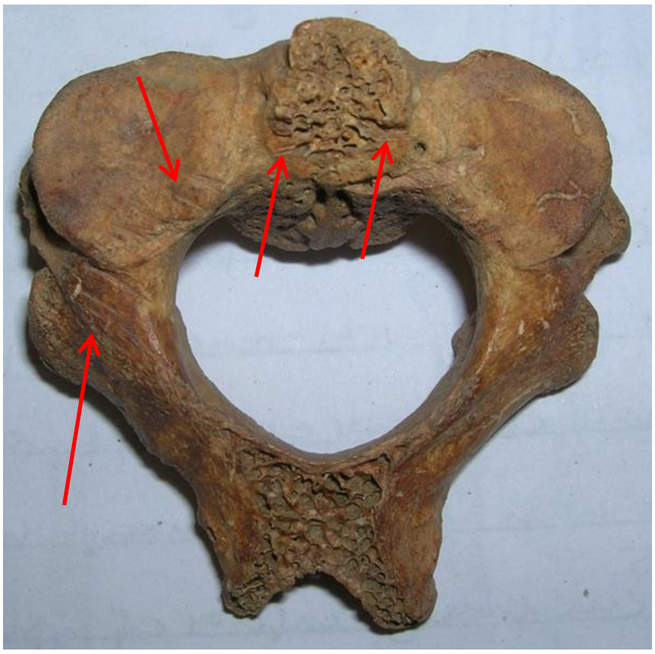

Figure 4.29: chop and incised cuts to the arch and odontoid process of C2 of SK29 from Water Lane, Towcester, Northamptonshire (the arrows indicate the incised cuts)

Figure 4.30: chop to the right mandibular ramus of SK6 from Mundford, Norfolk

The evidence from these individuals for a, usually, single main chopping blow followed by additional incised cuts or chops suggests that an initial decapitating blow was delivered and when this did not succeed in completely removing the head, additional chops or peri-mortem fractures were made in order to remove the remaining soft tissue (to the clavicle or mandible, or to parts of the cervical vertebrae that would have been inaccessible without the column being already partially severed), or a number of incised cuts were made to sever the intervertebral ligaments and cartilage. This also suggests that, in these types of decapitation, it was a necessary part of the process that the head was completely removed. In the majority of cases, it is not possible to determine whether the decapitation may have been the mechanism of death, although where there is evidence that the neck was flexed (the only case in this category being SK41 from 1-3 Driffield Terrace, York, see above), or where there were peri-mortem dental fractures (as in SK6038 from Stanwick, Northamptonshire, and SK66 from Southfield House, Dorchester, see above), or a suggestion of restraint in a slightly unusual burial position (such as may be the case with skeleton AD from Dunstable, Bedfordshire, with both hands together by the pelvis), there is the possibility that decapitation may have been carried out as the mechanism of death with subsequent removal of the head.

4.15.4 Single chopping blow only

There were seventy-four individuals within the decapitated sample who had evidence for this type of decapitation, making it the most widely identified type. It represented 47.9% of the urban sample and 33.7% of the rural/small-town sample, although these percentages were not quite statistically significantly different (p=0.0679), and there were no significant differences between the numbers of males and females affected in either sample. Typical examples of this type of decapitation included a young middle adult male from 1-3 Driffield Terrace, York (SK2), buried supine and extended with the wrists crossed over the chest, and with the cranium and mandible rotated and on the right side of the upper torso, who had a chop through the superior facets and body of C6, directed from the posterior (of the forty-six individuals from this site, and the associated sites of 6 Driffield Terrace and 129 The Mount, with osteological evidence for decapitation, sixty-three percent had evidence for this type of decapitation, see Chapter 6 for a detailed description and discussion of these and other decapitation burials from Roman York); and a mature adult ?female from the Old Vicarage, Fordington, Dorset (SK10), supine and extended with the cranium and mandible between the knees (Startin 1981), who had a single anteriorly directed chop that bisected the body of C5 and chopped into the right pedicle (Fig. 4.31). Individuals with a single chop directed from the anterior or from the left or right were rarer than those with a posteriorly directed chop, and represented twenty-six percent of individuals from urban areas and thirty-nine percent of individuals from rural and small-town areas.

Figure 4.31: chop through the inferior surface of the body and right inferior facet of C5 of SK10 from Old Vicarage, Fordington, Dorset

Posteriorly directed chopping blows are often associated with decapitation as a form of judicial punishment and it is the presence of these types of chop-marks in certain early medieval burials that has led to the interpretation of these individuals as the victims of execution (see Chapter 1, and Chapter 8 for examples of such burials analysed as part of this research). Post-medieval and modern decapitations by the sword or axe are often performed from the posterior, such as in Japan and the Middle East (Dower 2008; Weinberg 2008; Museum Syndicate 2010), where the victims kneel with their necks extended, or in Europe, where a block was often used (Daniell 1997: 81). There is the potential that a few individuals who display evidence for posteriorly directed chopping blows made with the neck held in extension (such as an old middle adult male from 6 Driffield Terrace, York (SK21), a supine and extended burial from a triple grave, with the cranium and mandible found by the right side of the torso, and a single chop through C5 and C6) may have been decapitated with the use of such a block, although this does not necessarily mean that the decapitation was definitely the mechanism of death in such individuals, as the extended neck could also have been produced in a corpse lying prone on the ground. However, as in the previous types of decapitation, there are some individuals with supporting evidence that the decapitation was the mechanism of death, such as SK2 from 1-3 Driffield Terrace, who had their wrists crossed in the grave, possibly suggesting they had been restrained, and three individuals with decapitating blows delivered with the neck flexed, as well as an old middle adult male from the Mount School, York (SK2), with a single chop through the arch of C2, body and arch of C3 and hyoid (Fig. 4.32, 4.33), and who had a peri-mortem fracture of the maxillary right second molar.

Figure 4.32: chop through the superior arch and body of C3 of SK2 from The Mount School, York

Figure 4.33: chop through the inferior surface of the hyoid of SK2 from The Mount School, York

It also appears that in certain individuals with this type of decapitation, it was not considered necessary to remove the head if it was not completely severed by the single blow. This is suggested by the position of the head in some individuals, such as SK2 from 1-3 Driffield Terrace, where the head was on the upper torso, and a second individual from the same site (SK4), a young adult male with a chop through the body and arch of C2 that also nicked into the posterior of both ascending rami of the mandible, whose head was found in correct anatomical position. This may also add weight to the possibility that decapitation was the mechanism of death in at least some of these individuals, as, if the removal of the head was one of the defining features of the act of decapitation (and it seems to be an important part of the process in the other types of decapitation), it would seem to have been unlikely that the partial decapitation of a corpse would have sufficed. However, if would have been sufficient to kill the individual if that, rather than complete decapitation, was the aim.

4.15.5 Chopping blows with non-decapitation related trauma

There were sixteen individuals from urban cemeteries (all of which were male, although this was not statistically significant) and ten individuals from rural and small-town areas (seven of which were male and three of which were female) with this type of decapitation, which is characterised by chopping blows (sometimes accompanied by additional chops and incised cuts) alongside peri-mortem injuries that could not be directly related to the process of decapitation. One group within this type have peri-mortem cranial injuries and include a supine and extended middle adult male from Dunstable, Bedfordshire (AR), with the cranium and mandible found on the top of the grave fill (Matthews 1981), who had at least twenty separate chops to the cervical vertebrae, affecting C2-T1, and the left pectoral girdle, at least some of which seem to be related to the removal of soft tissue to allow complete removal of the head. The individual also demonstrated two chopping blows to the left side of the frontal and parietal with associated fracturing (Fig. 4.34). There was also an adult ?male from Lankhills, Winchester (SK302), of whom only the cranium, mandible and some cervical vertebrae were excavated (access to unpublished site archive provided by the Winchester Research Unit), who had a single posteriorly directed chop through C1 and the ascending rami of the mandible, delivered whilst the neck was flexed, and a chop through the anterior of the right maxilla and left mandibular body. There was also a small group of individuals from Driffield Terrace, York, who had evidence for peri-mortem blunt force injuries to the cranium as well as decapitation related trauma, including SK47 (described above), and an old middle adult male (SK4 from 6 Driffield Terrace), who was buried supine and extended in a wooden coffin with the cranium and mandible on the knees (Hunter-Mann 2006), and who had two chopping blows to C4 and C5, directed from the posterior, as well as a blunt-force injury to the right parietal with endocranial bevelling.

The second group of burials had evidence for post-cranial peri-mortem trauma in addition to decapitation-related injuries. These include an old middle adult male from Little Keep, Dorchester (SK1118), buried supine and extended with the cranium and mandible on the right ankle (McKinley and Egging-Dinwiddy 2009a), who had evidence for a chop to the dorsal surface of two proximal hand phalanges (Fig. 4.35), as well as seven separate chops to the cervical vertebrae, right clavicle and left side of the mandible; a supine and extended young adult male from 6 Driffield Terrace, York (SK4), with the mandible found between the femorae (the cranium had been disturbed by later activity and was recovered from a later cremation deposit) (Hunter-Mann 2006), who had evidence for a single chop through C4 and C5 from the posterior, as well as three chopping blows to the posterior of the proximal and mid-shaft of the right ulna, and a butterfly fracture of the midshaft (illustrated in Fig. 2.1); and an adult male from the same site (SK9), who was supine and extended with the cranium and mandible between the femorae (Hunter-Mann 2006), who had four posteriorly directed chopping blows to C3-C5, as well as peri-mortem blunt-force injuries to the frontal and a peri-mortem fracture of the shaft of the right second metacarpal.

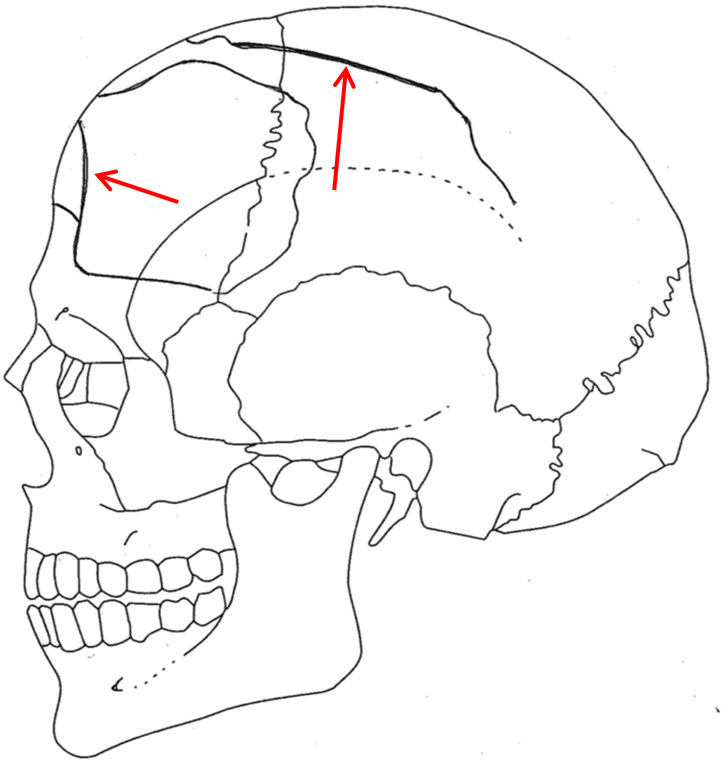

Figure 4.34: diagram of the chopping blows (indicated by red arrows) and associated peri-mortem fractures to the cranial vault of skeleton AR from Dunstable, Bedfordshire (adapted from Buikstra and Ubelaker 1994)

Figure 4.35: peri-mortem fractures of the shafts of two proximal hand phalanges of SK1118 from Little Keep, Dorchester

Other individuals in this group include an old middle adult male from 1-3 Driffield Terrace, York (SK16), who was supine and extended in a double grave with SK15 and whose cranium and mandible were found at the feet of SK16 (the cranium and mandible of SK16 had been placed at the neck end of the post-cranial remains of SK15), and who had a single posteriorly directed chop through the arch of C6, as well as a blunt-force injury to the left parietal with an associated radiating fracture, and a stabbing blow to the anterior of the right side of the sacrum (illustrated in Fig. 2.5); and a young middle adult male from the same site (SK45) who was supine and extended with the cranium and mandible underneath the right side of the pelvis, and who demonstrated a single chop through the arch and body of C5 and C6, delivered from the posterior, as well as a chopping blow to the distal metaphysis of the right femur that would have chopped through the major musculature of the leg, particularly *M. vastus medialis* (Fig. 4.36). There was also the young middle adult male from St. Martin's Close, Winchester (SK18/19a), who had a single chopping injury delivered from the posterior that bisected C1 and the odontoid process of C2 and chopped into the posterior of both ascending rami of the mandible. They also had evidence for a number of fine incised cuts and chopping blows to the mandible and basi-occiput, including at least seven chops to the right side of the occipital and mastoid processes from a supero-posterior direction, one of which aligns with the chop through the cervical column if the neck was flexed; three small nicks to the area around the foramen magnum; and at least ten incised cuts to the right ascending ramus of the mandible. There was also evidence for three fine chopping blows to the right side of the frontal (Fig. 4.37) and peri-mortem stab wounds to the posterior of L4 and L5 (Fig. 4.38), the anterior of the right ilium, the left pubis and the lateral side of a lower right rib.

Figure 4.36: chop to the medial and distal shaft of the right femur of SK45 from 1-3 Driffield Terrace, York (photograph by the author, courtesy of York Archaeological Trust)

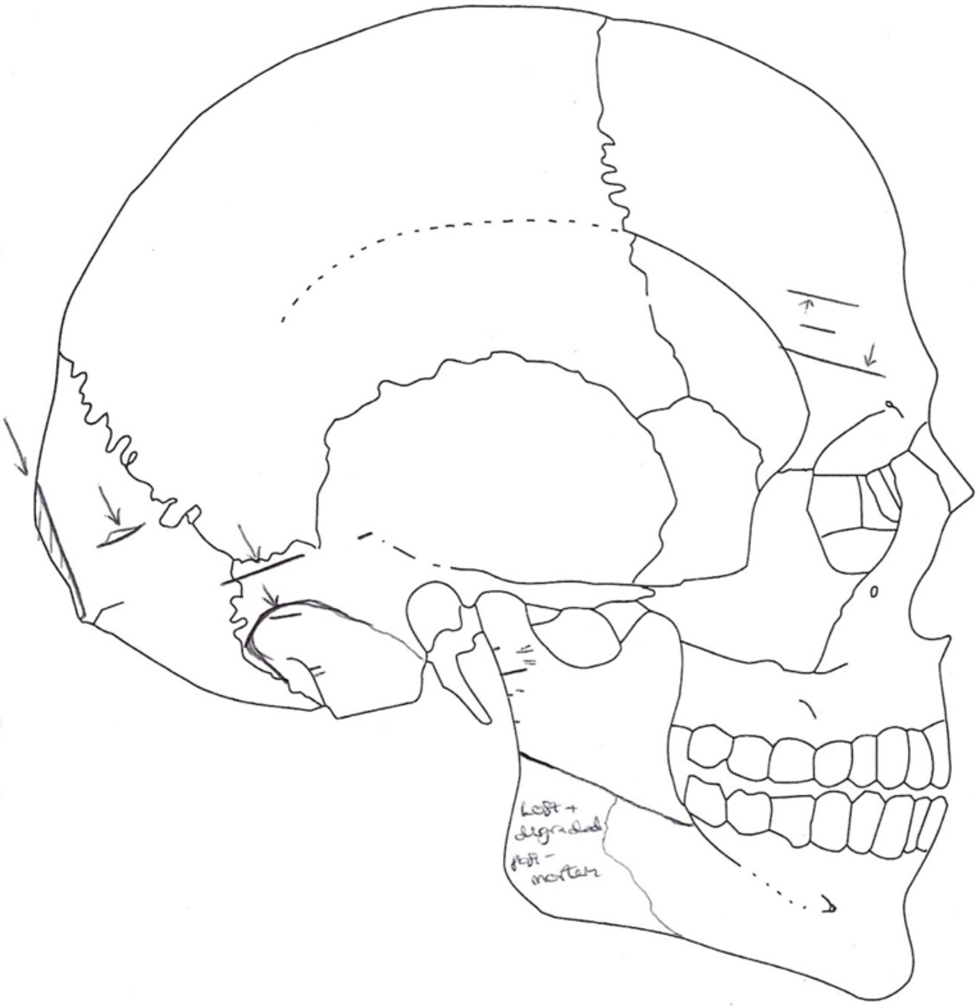

Figure 4.37: diagram of chops and incised cuts to the cranium and mandible of SK18/19a from St. Martin’s Close, Winchester (adapted from Buikstra and Ubelaker 1994)

Figure 4.38: stab to the posterior surface of the arch of L5 of SK18/19a from St. Martin’s Close, Winchester (the stab is partially disguised by post-mortem degradation of the bone surface)

The presence of peri-mortem post-cranial injuries on the hands and distal upper limb of three of these individuals would suggest that they were defensive injuries, made when the upper limbs are used to shield the face and head from attack (Kimmerle and Baraybar 2008: 170-171) and are, therefore, likely to indicate that decapitation was the mechanism of death in these individuals. The other injuries, focused as they are on the cranial vault, the abdomen, lower back and proximal lower limb, are probably to be interpreted as incapacitating injuries, designed to prevent the individual from escaping or, in the case of the cranial injuries, to render them unconscious. There is the possibility that the blunt-force cranial injuries could have occurred post-decapitation with the head striking a hard surface, although the presence of a "ring-fracture" of the cranial base (a fracture that can occur when a blow to the superior of the cranial vault causes the cervical column to be pushed against the basi-occiput, fracturing the area around the foramen magnum, although it can also be produced by falling from height and landing on the sacrum (Ta'ala *et al*. 2006: 1000)) of another decapitated individual (SK12 from 6 Driffield Terrace), whose cranium and mandible were found in correct anatomical position (Hunter-Mann 2006), suggesting that the head was not completely removed by the single decapitating blow, makes it unlikely that the cranial injury in this case could have been caused by post-decapitation rough handling of the head (Fig. 4.39). Therefore, there is also the possibility that decapitation was the mechanism of death in individuals who demonstrate evidence for cranial and post-cranial sharp and blunt-force non-decapitation related injuries.

Figure 4.39: ring-fracture of the cranial base of SK12 from 6 Driffield Terrace, York (photograph by author, courtesy of York Archaeological Trust)

However, there is one individual, an old middle adult female from Dunstable, Bedfordshire (L), who has evidence for a different type of peri-mortem trauma. The individual was supine and extended with the cranium and mandible between the femorae, and with the distal lower limbs removed and placed on either side of the torso (Matthews 1981). Osteological evidence for decapitation was not present, as the cervical vertebrae, maxilla and mandible were not located in the archive (although Matthews (1979b) reported that there were cuts present on C6 and C7), but there was evidence for peri-mortem trauma to the distal femorae and patellae, in the form of a number of incised cuts to the anterior of both patellae (Fig. 4.40) and chopping blows to the posterior and anterior of both femorae (Fig. 4.41). The pattern of the injuries suggests that the distal lower limbs were removed by initially chopping through the femorae from both the anterior and posterior, and then cutting through *M. quadriceps femoris* at its insertion on the patellae. This method of removal of the distal lower limbs suggests that it was undertaken post-mortem as it seems likely that it was not a quick procedure and may represent some form of mutilation of the corpse. Interestingly, a young/young middle adult female from Tubney Woods Quarry, Oxfordshire (SK1007), originally assumed to be late Romano-British in date but recently radiocarbon dated to cal. AD 535-640 (Simmonds *et al.* 2011: 121), who was found with the cranium and mandible on the knees, also had the lower limbs severed at the knee with the left distal lower limb being placed beside the torso, whilst the right lower limb was absent, although the poor skeletal preservation prevented any cut-marks from being recorded (Clough n.d.b).

Figure 4.40: incised cuts to the anterior surface of the patellae of skeleton L from Dunstable, Bedfordshire

Figure 4.41: chops through the distal shafts of both femorae of skeleton L from Dunstable, Bedfordshire

Possible mutilation was also suggested in the case of an infant/young child from Stanground, Peterborough, who was found with the cranium and mandible at the knees and with the limbs severed at the joints (Peterborough City Council HER 10090); and a mature adult female from Foxton, Cambridgeshire (SK3444), buried supine and extended with the cranium and mandible absent, and with the left humerus found lying on the lumbar vertebrae but still articulated with the radius and ulna (Goode and Bardill 1995). However, in neither case were any cut-marks reported and both individuals would require re-analysis in order to determine whether there is evidence for any peri-mortem trauma or whether the “mutilation” could be the result of post-burial disturbance. However, even if these cases are accepted as evidence for corpse mutilation, the practice is still exceedingly rare amongst decapitated burials and suggests that it may have represented a practice entirely separate from that of decapitation.

4.16 Summary of evidence for peri-mortem trauma

- The majority of decapitations were carried out with chopping blows in both urban and rural/small-town samples with incised cuts in isolation being very rare
- Decapitation was more often performed from the posterior in the urban sample than in the rural/small-town sample
- Urban males have more decapitations performed from the posterior and urban females have more decapitations performed from the anterior

- Urban decapitations are performed more often with a single blow than those in rural/small-town areas, which are more likely to have four or more blows
- Urban males are more likely to have one blow than urban females who tend to have two to three blows
- There are five distinct types of decapitation observable in both samples: 1. incised careful disarticulation of the cranio-cervical skeleton; 2. cutting of the throat followed by incised disarticulation or chopping blows; 3. chopping main decapitating blows with associated chops or incised cuts to remove soft tissue; 4. a single decapitating chopping blow; 5. chopping blows associated with defensive or incapacitating injuries
- There are more individuals with a type 2 decapitation in rural/small-town areas than in the urban sample
- There are more urban females than males with a type 3 decapitation
- Complete removal of the head was an important part of the process in the first three types of decapitation
- A type 1 decapitation is more likely to have been performed post-mortem
- Decapitation as a mechanism of death can probably be assumed for type 2 and type 5 decapitations
- Decapitation as a mechanism of death can probably be assumed for individuals with type 3 and type 4 decapitations in cases where there was evidence for a flexed neck, peri-mortem dental trauma or restraint of the upper limbs
- Mutilation of the corpse, as separate from decapitation but occurring in the same individual, was very rare

4.17 Discussion

The evidence from the large sample of Romano-British decapitations identified as part of this research suggests that previous statements made about the practice, namely that it is a specifically late Roman practice that was predominately found in rural areas but that spread to urban areas in the fourth century, may not be strictly accurate. There are a number of such burials that have been dated to much earlier in the Romano-British period and these include some from urban cemetery areas. There are also examples of the practice in all of the *colonia* and a number of tribal capitals, suggesting that it was as much an urban practice as a rural one, and that it was taking place during the same period in both areas. The differences between the methods of decapitation in the two samples would also suggest that the practice as performed in urban areas was not simply imported from rural communities, although there is the possibility that this may be due to differences in butchery techniques between the two areas (see below).

Previous statements on the geographical distribution of the phenomenon of decapitation, namely that it was largely restricted to an area south-west of the Severn-Wash line, were confirmed by the present research and it seems that this is not simply due to biases in the preservation and excavation of human remains, although this may play some part in the near absence of decapitation burials from some areas of the country, such as Kent and Sussex. The distribution of decapitation burials does seem to be very similar to that of villas in the fourth century (Ordnance Survey 2011), although there is a high concentration of villas in Lincolnshire and, as previously discussed, very few decapitation burials, even though the local geology predisposes towards good bone preservation. This does suggest that the practice of decapitation may have been linked with higher degrees of Romanisation, with some localised exceptions, which would also explain why there are relatively high numbers of decapitated burials from *colonia* and other urban centres. The very limited evidence for continuity of Iron Age practices of manipulation of the head into the Romano-British period (although this practice seems to have been rare in Britain in prehistory anyway) and the absence of the typical Romano-British decapitation burial in prehistory, would suggest that these burials, and the methods of decapitation that go with it, are very much Roman in type rather than representing a continuity of practice amongst less Romanised sections of the community, even though rare examples date to very early in the Romano-British period (and see Chapter 10 for comparisons between the nature of the peri-mortem trauma in the Romano-British and Iron Age decapitations). This would correspond to the contemporary literary evidence (see Chapter 6) that decapitation was very much a Roman practice and performed for a variety of reasons in a number of different circumstances. However, the archaeological evidence for decapitation burials outside of Roman Britain is very limited (see Chapter 7) and, although there is the potential that this may be partly due to differences in methods and research strategies, it does suggest that the phenomenon of decapitated burials with displaced cranio-cervical skeletons may be specifically Romano-British.

The practice does not, however, appear to be identical in all areas, with a number of differences between urban and rural/small-town decapitated burials. In rural and small-town cemeteries, the burial practices accorded the decapitated individuals show no differences to those seen in the rest of the population, with the decapitated individuals just as likely to have been buried in a supine and extended position in a coffin with hobnailed footwear and other grave inclusions as non-decapitated individuals, whilst in urban areas, the decapitated burials were much less likely to have been provided with a coffin or other grave inclusions, and were much more likely to have been buried in a prone position. This suggests that in terms of their burial, decapitated individuals in urban areas were singled out for “poorer” burial rites, whilst decapitated individuals in rural and small-town areas were not distinguished in this way from the rest of the population. This may suggest that those individuals subject to decapitation in urban areas were in some way marginalised, or at least treated differently, in death, whilst this was not the case in rural and small-town areas.

The demographic profile of the rural and small-town decapitated sample largely mirrors that of the wider cemetery population, although there are much smaller numbers of non-adult decapitations and greater numbers of adult females than would be expected. This may suggest that there was some degree of selection in terms of age and sex in who was decapitated in these areas, with adult females seeming to be the focus for the practice, although the age profile of the adult decapitations mirrors that of the larger population. This may suggest that decapitation was being performed on individuals who had already died from other causes (although see below) although it could just reflect a selection procedure that mirrored the general demographic profile of the population. However, in urban areas, the age and sex profile of the decapitations is very different from that recorded amongst the larger population, with small numbers of non-adults and greater numbers of adult males than would be expected, as well as there being too many middle adults and not enough mature adults amongst the decapitated burials. This indicates a greater degree of selection for age and sex amongst those singled out for decapitation in urban areas, with middle adult males seeming to be the focus. The possibility of selection is also suggested by the significantly greater average stature of the urban adult male decapitations than that recorded in the rest of the population, something not seen in the urban females, or in either sex in the rural and small-town decapitated sample, as well as the lower health status of the urban decapitations compared with the wider population.

The evidence from the palaeopathological analysis suggests that the decapitations from both samples had higher levels of degenerative joint disease and non-specific infections, and may have been eating a different diet to the rest of the population, with the urban decapitations showing further differences in terms of the rates of activity-related change and chronic chest infections. There was also a lot of evidence for ante-mortem trauma amongst both decapitated samples, with much higher rates of fractures than was the norm (most of which are associated with levels of interpersonal violence), as well as evidence for amputations and visible deformities. This also suggests that there was a degree of selection in terms of physical appearance and health status as to who was subject to decapitation, with this being more pronounced in urban areas. There is the possibility that this selection for decapitation could have been directly related to these physical differences, although this does not necessarily imply that all individuals with such differences were subject to decapitation, as evidenced by, amongst many other examples, the non-decapitated burial of a female mesomelic dwarf from Alington Avenue, Dorchester (Waldron 2002). It is also possible that the physical differences and poorer health status of some individuals were related to their position or function within society and it was this that led to their decapitation (see Chapter 5 for possible interpretations of the identity of decapitated individuals from Roman York).

The evidence from the decapitation related peri-mortem trauma identified in the rural and small-town and urban decapitated samples indicate that there are also some differences between how the practice was carried out in the two areas. Chopping blows were the most common method of decapitation in both samples, with careful, incised cutting being very rare, a finding that is in complete contrast to previously assertions about the practice, that may have consequences for the interpretations of the practice (see Chapter 11), although the urban decapitated sample had more individuals with blows directed from the posterior than those in rural and small-town areas. The urban decapitated sample also contained more individuals with smaller numbers of separate blows, whilst that from the rural and small-town areas had a much greater number of individuals with more than four separate blows, as well as a larger number of examples of decapitation which included cutting of the throat.

These differences may be related to differences in animal butchery techniques between urban and rural areas, something which has been noted in a number of analyses of animal bones from Romano-British sites (Maltby 1989, 2007, 2010: 283-287) and which seems to be related to a need to butcher carcasses much more quickly and in more volume in urban areas than would have been necessary on rural sites. This led to a change in implement use from a knife to a cleaver in urban areas and a subsequent reduction in the number of cuts needed to dismember the carcass (Maltby 1989; Seetah 2006). This may be reflected in the smaller number of blows seen in urban decapitated burials, although the predominance of knife use (to make incised cuts) in rural butchery techniques does not seem to have been mirrored in human decapitation, where chopping blows were still the most common method used. The presence of both chopping blows and incised cuts in a large minority of decapitated individuals from both samples may suggest that at least two different types of implement were being used to decapitate a single individual (it is relatively difficult to produce fine and carefully placed incised cuts with chopping implements such as axes and swords, as the blades are either the wrong shape or the placement of the grip is in the wrong position to allow for precise movements), although Seetah (2006: 112-113) has suggested that the Romano-British cleaver was essentially a dual-purpose tool, designed to slice as well as chop, in contrast to modern cleavers which are specifically designed as a chopping implement. This may mean that cleavers were being used in the process of human decapitation and were able to produce both chopping blows and incised cuts on the same individual (this may be supported by the presence of two peri-mortem chop marks, which have resulted in scoops of bone being removed from the bone surface (Fig. 4.42), on the clavicle of an individual from Lankhills, Winchester (SK297) that are virtually identical to that recorded on a cattle tibia (Fig. 4.43), also from Winchester (Maltby 2007: Fig. 2), demonstrated through experimental studies to have been produced by the tip of a cleaver in stripping meat from the bone (Seetah 2006)). This would also support the thesis (see above) that if complete removal of the head, which seems to have been an important part of the process in most types of decapitation, was not achieved by the main decapitating blow, removal of soft tissue by additional chops and incised cuts was undertaken until the head could be completely separated from the post-cranial remains.

Even within the urban and rural/small-town areas themselves, there was not much evidence for consistency in how the decapitations were performed, with at least five different types of decapitation identified, examples of nearly all of which could sometimes be found in the same cemetery (such as at Lankhills, Winchester). This does suggest that, rather than differences in how decapitations were performed being simply related to differences in butchery techniques and geographic area, the different (and distinctive) types may have been different because they were carried out for specific, and distinctive, purposes.

Figure 4.42: small “scoops” of bone removed from the surface of the right clavicle of SK297 from Lankhills, Winchester

Figure 4.43: “scoop” of bone removed from the surface of a cattle tibia from Winchester (adapted from Maltby 2007: Fig.1)

A number of individuals were demonstrated to display evidence that decapitation was likely to have been the mechanism of death and this discovery, which was a result of the very detailed analysis of peri-mortem trauma carried out as part of this research, is a very important contra-argument to the vast majority of previous researchers who have seen decapitation in the Romano-British period exclusively as a post-mortem act. There certainly are a small number of decapitations where the placement and nature of the cuts suggests that the individuals were indeed dead when decapitation was carried out, although they are outnumbered by examples where decapitation was probably the mechanism of death and cases where it could not be determined either way. This evidence that decapitation was probably the mechanism of death came in the form of cut-throats in a small number of individuals, as well as evidence for flexion of the neck, defensive and incapacitating injuries, peri-mortem dental trauma and the possibility that a few individuals may have been restrained, or in a state of cadaveric spasm (see Chapter 5), at the time of interment. All of these factors have been reported in the forensic literature as indicating vitality at the time the injuries were received and so there is a very good chance that, where they are found in the Romano-British examples, they have the same types of aetiology.

Comparisons between the types of peri-mortem trauma found in the Romano-British examples will be compared with that seen in individuals from other periods in Chapter 10, and a discussion of possible interpretations for all of the different types of decapitation from all periods, based on the osteological, archaeological, literary and ethnographic evidence, will be given in Chapter 11.

Chapter 5: Decapitations from Roman York, A Case Study

York (*Eboracvm*) was founded by the Romans in AD 71 and was the site of a legionary fortress and *colonia*, with many public buildings, including baths and temples (Ottaway 2004), as well as being an imperial residence on two separate occasions: during the reign of Septimius Severus (AD 193-211) and Constantine the Great (c. AD 306-337). The settlement was surrounded by cemeteries, a number of which have been identified by tombstones and *mausolea* recovered during building works in the eighteenth to early twentieth centuries (RCHM 1962; Ottaway 2004), whilst other areas have been subjected to more controlled excavation, including the Railway Station cemetery, excavated in the 1870s (RCHM 1962); Trentholme Drive, excavated in the 1950s (Wenham 1968); and various other smaller scale excavations undertaken by the York Archaeological Trust since the 1970s (Ottaway 2011).

It was also a series of York Archaeological Trust excavations, in the area of the Mount cemetery (1-3 and 6 Driffield Terrace and 129 The Mount), in 2004 and 2005 that brought to light a very unusual group of eighty burials with a very high percentage of individuals showing evidence for decapitation (see Montgomery *et al*. 2011). The burials on both sites were dug with a variety of different alignments and there was some intercutting of graves, indicating that the burials had taken place over a period of time (Ottaway 2005; Hunter-Mann 2006). The radiocarbon dates obtained from a small number of individuals suggest that burial was taking place at 1-3 Driffield Terrace from the second century onwards, with burial commencing at 6 Driffield Terrace in the third century and extending into the fourth century (Hunter-Mann 2006; Ailsa Mainman *pers. comm.* 2009). Most of the burials were in single graves, although there were two double burials from 1-3 Driffield Terrace, and one double, one triple and one quadruple burial from 6 Driffield Terrace (Ottaway 2005; Hunter-Mann 2006), with the evidence pointing to contemporaneous burial of individuals, rather than primary and secondary interments. Coffins were rare at 1-3 Driffield Terrace, with only four (out of fifty-four) graves showing any surviving evidence for them, whilst at least twelve of the graves (out of seventeen) from 6 Driffield Terrace had evidence for a coffin (Ottaway 2005; Hunter-Mann 2006). Pottery vessels were found associated with two burials from 1-3 Driffield Terrace, two individuals were buried with partial chicken skeletons, and five burials had evidence for hobnailed footwear (Ottaway 2005). At 6 Driffield Terrace, two burials had hobnails, whilst large numbers of horse bones, some of which had been butchered, were found within the coffins in two other graves (Hunter-Mann 2006).

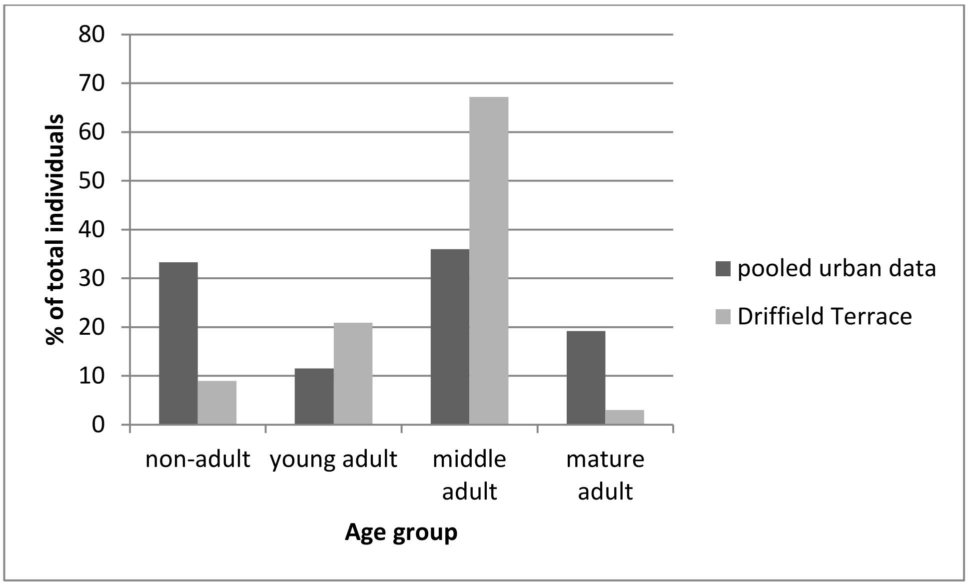

Figure 5.1: percentages of individuals in each age group in the pooled urban cemetery data compared to Driffield Terrace

Of the eighty individuals from the seventy-one graves, only six were under the age of eighteen at the time of death and comprised two foetuses/neonates, one young child, one older child and two adolescents, with the remaining seventy-four individuals being adult. Forty-five of these were middle adults, fourteen were young adults, and there were only two individuals who were mature adults (over the age of forty-six years at the time of death). When this age profile is compared with that obtained from other Romano-British cemeteries within urban areas (Fig. 5.1), it can be seen that the percentages of non-adults (p=<0.0001) and mature adults (p=0.0002) are significantly lower in the York sample than expected, whilst the percentages of young adults (p=0.0316) and middle adults are significantly higher (p=<0.0001), suggesting either that the population does not result from normal attritional processes, or that the area of the cemetery targeted by excavation was set aside for the burial of specific members of the population.

The sex ratio of the population is also very unusual, with sixty-five of the sixty-seven adults for whom a sex could be determined being male or ?male, with the remaining two being indeterminate in sex. The ratio of adult males to females in the cemetery population from Trentholme Drive was 3.6:1 (Wenham 1968), whilst at Cirencester (also a *colonia*) it was 2.2:1 (Wells 1982), which is higher than that seen in other urban cemeteries (1.7:1 in the Eastern cemetery of Roman London (Barber and Bowsher 2000) and 1.6:1 at Lankhills, Winchester (Clarke 1979: 123)), probably as a result of the numbers of retired military personnel taking up residence in *colonia*, which were originally founded as settlements exclusively for ex-military personnel (Millett 1990: 87; Lyon 2011: 5-7). Therefore, even though cemetery populations from York should be expected to have higher numbers of adult males than females, to find a sample with no adult females at all is highly unusual. This may also indicate that the excavated area of the cemetery was specially designated for the burial of particular individuals, especially as the excavated burials from Trentholme Drive (which included at least fifty-two adult females (Wenham 1968: 153)) are very likely part of the same cemetery as Driffield Terrace.

Of the eighty individuals, forty-five had osteological evidence for decapitation, with a further three demonstrating displacement of the cranio-cervical skeleton but no evidence for decapitation related trauma due to absence of the relevant skeletal elements (the osteological evidence for peri-mortem trauma in this group is described and discussed below). The presence of such a large number of decapitated individuals in one excavated sample, when decapitated burials had never been previously reported from York, was the catalyst for a re-examination of nearly all of the Romano-British skeletal remains that have been excavated from the city in order to determine whether these were really the only examples of the practice (the skeletal remains re-examined included those from the Railway cemetery, Sycamore Terrace, Trentholme Drive, Blossom Street, Marygate, The Avenue, County Hospital, The Mount School, plus many others (see Ottaway 2011 for summaries of the excavations of all these sites), which came to a total of 525 individual skeleton or part skeletons). The cranium, mandible and cervical vertebrae (where present) were subjected to a quick visual examination and if evidence for peri-mortem trauma was identified, the individual was then subjected to a detailed skeletal analysis.

Individuals with evidence for peri-mortem decapitation-related trauma were identified from amongst the burials at Trentholme Drive (four adult males); The Mount School (five adult males); and Moss Street Depot (three adult males, identified and analysed by the author prior to the commencement of this research, see Toop (2008) and Tucker (2008a)). There were also two additional decapitated burials (at 89 The Mount, and

Lord Mayor's Walk, both of which were adult males) identified by other authors but not available for re-analysis as part of this research (APC 2006; Robinson 2005). All but one of these burials were from the Southern cemetery area (centred on the Mount), which extended out on both sides of the road to Tadcaster (*Calcaria*), whilst the remaining example was from the Northern cemetery area (Fig. 5.2).

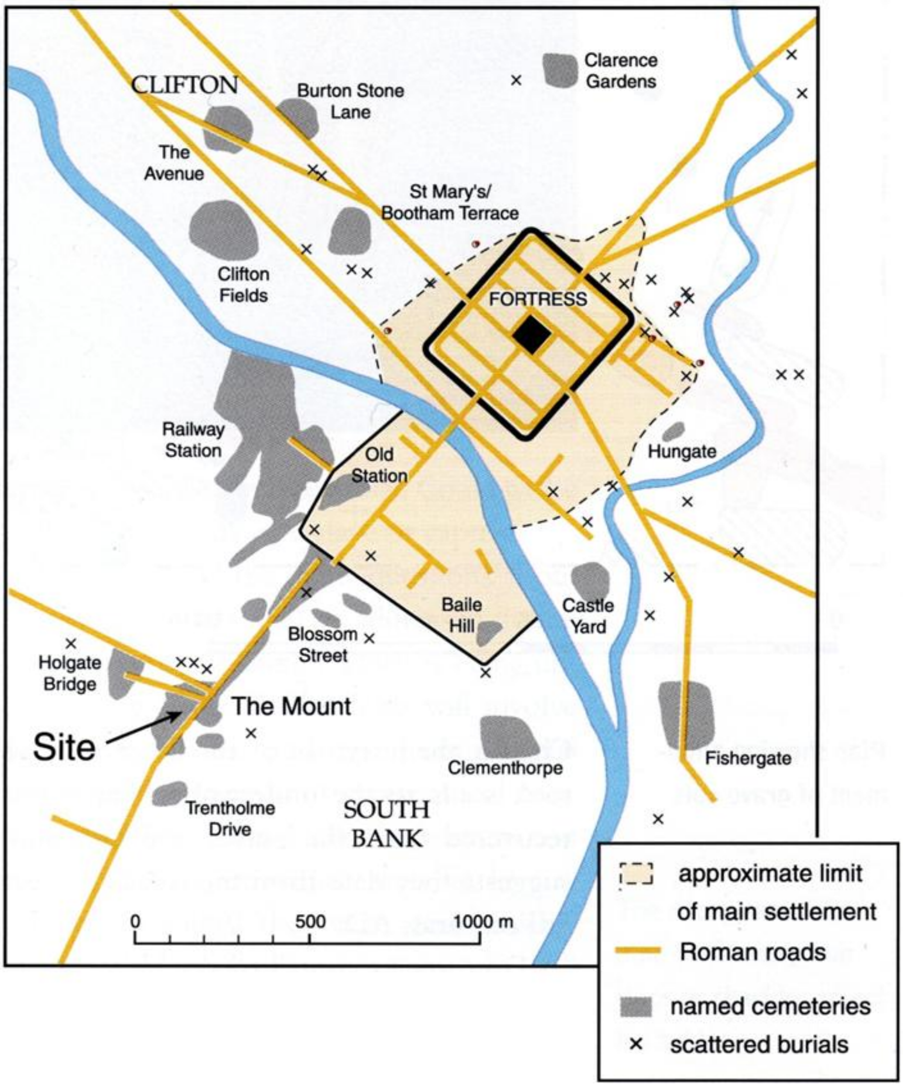

Figure 5.2: the Romano-British cemeteries of Roman York, "Site" marks the location of Driffield Terrace (courtesy of York Archaeological Trust)

The percentage of decapitated individuals (11.6%) amongst the re-examined York sample (sixty-two individuals out of 535, which includes ten burials from Moss Street Depot, 89 The Mount and Lord Mayor's Walk) is statistically significantly higher (p=<0.0001) than the percentage of such burials from Winchester (1.5%, nineteen of 1234 burials), and it is very interesting that they are all adult males (which is again in contrast to the decapitated individuals from Winchester, nine of which were adult males, with six adult females, one unsexed adult and three non-adults also being represented).

The mean stature of the decapitated sample from York is 172.8cm, which is very similar to that calculated for the larger urban male decapitated sample and significantly greater than the stature calculated for the urban male cemetery population as a whole. The group also had evidence for high levels of degenerative joint disease (50.8% of individuals), non-specific infection (42.6%), fractures closely related to low level interpersonal violence (45.9%), activity-related changes (96.7%), and increased robusticity, all of which were also relatively high amongst the non-decapitated individuals from Driffield Terrace. Isotope analysis of a number of the individuals from Driffield Terrace, both decapitated and non-decapitated, have indicated a very diverse range of origins, including individuals who seem to have their origins in the Mediterranean or North Africa, the Middle East, the Alps and eastern Scotland (Montgomery *et al*. 2011; Müldner *et al*. 2011). There were also two individuals who had isotope signatures characteristic of a mixed C_3 and C_4 diet, something that has never been recorded before in British skeletal remains from any period. This indicates that they must have been eating millet, the only C_4 plant cultivated in Europe, but not Britain, in antiquity, which suggests that these individuals had also originated from outside Britain (Müldner *et al*. 2011).

When the different types of decapitation represented amongst the sample from York are analysed, the majority of individuals (58.6%) had a Type 4 decapitation (single chopping blow), and where a direction could be determined, all of these blows were delivered from the posterior. At least twelve of these individuals, where a body position was recorded, had evidence that the cranium and mandible may not have been completely removed by the single chop as it was found in correct, or near correct, anatomical position. Twelve individuals (20.7%) had evidence for a Type 3 decapitation, including two individuals where there is the possibility that the multiple chopping blows to the mandible may have been an attempt to mutilate the face, although it could also relate to attempts to chop through very robust neck musculature in these individuals. One of these was a young middle adult male (1-3 Driffield, SK33), who was buried supine and extended with the cranium and partial mandible by the distal right lower limb. The individual had evidence for non-specific infection and healed fractures of the clavicle and rib, as well as a heavily scarred palate with large amounts of compact bone and ante-mortem fractures of the dentition, which is of unknown aetiology but could possibly be related to having had a foreign body held in the mouth (Fig. 5.3). There were four chopping blows through the cervical vertebrae that had been delivered from the posterior, including one which must have been made when the neck was flexed, as well as at least nine chops into the left and right body of the mandible, made from a variety of directions (Fig. 5.4). The anterior portion of the mandible was not recovered from the grave, suggesting that this part of the face had been entirely separated from the rest of the remains prior to interment. There were also peri-mortem fractures of the maxillary left incisors and second molar and mandibular left first molar.

Figure 5.3: heavily scarred palate and ante-mortem damage to the dentition of SK33 from 1-3 Driffield Terrace, York (photograph by author, courtesy of York Archaeological Trust)

Figure 5.4: multiple chops and peri-mortem fractures on the mandible of SK33 from 1-3 Driffield Terrace, York (photograph by author, courtesy of York Archaeological Trust)

There was also evidence that three other individuals from the sample had decapitating blows delivered when the neck was flexed, which, as has been previously discussed, probably indicates that decapitation was the mechanism of death. There were also two individuals where the body position would indicate they had possibly been restrained, including an old middle adult male (1-3 Driffield, SK37), who was supine and extended with the cranium and mandible by the left distal lower limb, and with the wrists together on the right side of the torso with the right wrist in hyperextension (Fig. 5.5). Interestingly, this individual was also found with iron rings encircling both ankles that had probably been cold-forged onto the lower limbs (YAT 2004: 6; Nicky Rogers *pers. comm.* 2005) and it is possible to say that these had been in place for some time before death as there were lesions on the tibiae associated with ulceration of soft tissues, as well as periosteal new bone on the tibiae and fibulae in the areas associated with the shackles. There was evidence for a posteriorly directed rough chop through the body and arch of C2 with associated fracturing that appeared to have been produced using a different type of weapon from that used to produce the very clean and fine chop-marks on the other decapitated individuals from the site, and a second chop into the posterior of the parietals and left temporal with associated fracturing and endocranial bevelling.

Figure 5.5: SK37 from 1-3 Driffield Terrace, York, *in situ* (courtesy of York Archaeological Trust)

There was also a young middle adult male (1-3 Driffield, SK31) who, whilst showing no evidence for restraint, had been placed in a very unusual position in the grave. He was supine and extended with the cranium and mandible in correct anatomical position, but the right upper limb was hyperflexed with the hand on the right shoulder and the left upper limb was flexed with the hand on the cervical column, the digits apparently encircling the neck (Fig. 5.6). It is possible that this individual was deliberately placed in the grave in this position for some unknown reason, or there is the very slight chance that this may be a case of cadaveric spasm. This is a very rare process in which certain groups of muscles, particularly in the hands, tighten at the moment of death and cannot be released until they decompose (Knüsel *et al*. 1996). It is an entirely different phenomenon to *rigor mortis,* a reversible chemical change of the muscles, which gradually stiffen from around two to three hours after death and then release again after approximately thirty-six to forty-eight hours (Clark *et al*. 1997: 152), and is usually restricted to individuals who have died a sudden and traumatic death, such as aircrash victims whose fingers have been recovered gripping seatbelts, or victims of falls from a height who are found with grass and brush in their hands that they had grasped in an attempt to break their fall (Knight 1991: 57, Fig. 2.6; Knüsel *et al*. 1996). This individual had a single posteriorly directed chop through the body and arch of C6 which, if this is a case of cadaveric spasm, would have been the mechanism of death, the position of the hand presumably being an automatic reaction to the delivery of the blow.

Figure 5.6: SK31 from 1-3 Driffield Terrace, York, *in situ*, showing unusual position of the left hand (courtesy of York Archaeological Trust)

All but one of the remaining individuals (who had evidence for a Type 2 decapitation and is described in Chapter 4) had Type 5 decapitations (19.0%). A number of these had evidence for peri-mortem blunt-force injuries to the cranial vault (described in Chapter 4) and, amongst the non-decapitated individuals from Driffield Terrace, there were a further six individuals with peri-mortem cranial trauma, including an older child of six to seven years (1-3 Driffield, SK25), who had a blunt-force injury to the right parietal with endocranial bevelling and radiating fracture lines. Other decapitated individuals had evidence for probable incapacitating or defensive injuries to the post-cranial skeleton (described and discussed in Chapter 4), and there was also one non-decapitated individual with this type of trauma, a young adult male (6 Driffield, SK15) with peri-mortem chops to the lateral and dorsal surfaces of the proximal phalanges for the left fourth and fifth metacarpals. Interestingly, this individual also had a small cranial vault and a comparatively large nose and face (Fig. 5.7), suggesting that they may have been microcephalic, although it cannot be assumed that this would have been accompanied by any degree of disability (Castriota-Scanderbeg and Dallapiccola 2005: 5-11, and see Richards 1985 and Syrmos 2011 for other archaeological cases of the condition). In fact, of the eighty individuals from the Driffield Terrace assemblage, fifty-five had evidence for decapitation and/or an incapacitating or defensive injury (69%, or 90% of those individuals where the cranium, mandible and cervical vertebrae were present).

Figure 5.7: the cranium and mandible of SK15 from 6 Driffield Terrace, showing possible microcephaly (photograph by author, courtesy of York Archaeological Trust)

All these very unusual aspects of the Driffield Terrace population have led to an amount of speculation as to their identity, with victims of a political purge (BBC Two 2006; Girling 2006) and gladiatorial fighters (Channel 4 2010; Moore 2010; Wainwright, M 2010) being amongst the more sensational theories seized upon by journalists and television documentary makers. The first of these theories is easily discountable with the evidence that the burials took place over a period of centuries (discussed earlier) but the second interpretation was supposedly supported by the presence of a "lion bite" (Wainwright, M 2010) to the scapula and pelvis of one individual. This individual, a young middle adult male (6 Driffield, SK19), was supine and extended with the left upper limb behind the back and was the uppermost interment in a triple burial contained within a single large wooden box (Hunter-Mann 2006). The individual had evidence for a single posteriorly directed chop through the arch and body of C3 that had also chopped into the posterior of both ascending rami of the mandible, as well as a single circular perforation of the cortical bone on the posterior border of the left ilium and two similar lesions to the lateral and anterior of the right ilium that appear to be consistent with carnivore tooth puncture marks (Fig. 5.8). Buikstra and Ubelaker (1994: Fig. 69b) illustrate a very similar case in a North American individual (the trauma to the scapula was not noted during the present research, undertaken before the "lion bite" theory was publicised). The uppermost position of this individual in the triple grave could have potentially made them accessible to scavenging animals (Roman law only required for a body to be covered with a few handfuls of soil to make it a legal burial (Hor. *Carm*. 1.28; Hope 2007: 109)) and the size and appearance of the puncture mark would suggest a relatively small carnivore, such as a dog, rather than a lion or tiger.

Figure 5.8: carnivore tooth-mark on the posterior surface of the ilium of SK19 from 6 Driffield Terrace, York (photograph by author, courtesy of York Archaeological Trust)

The presence of large amounts of peri-mortem trauma on the Driffield Terrace assemblage has also been used to support the gladiator theory, although there is an absence of ante-mortem blade injuries, and very few post-cranial peri-mortem injuries or cranial penetrating injuries, all of which were recorded on the skeletal remains of presumed gladiators from Ephesus, Turkey (Grossschmidt and Kanz 2002; Kanz and Grossschmidt 2006, 2009). Decapitation is also not recorded in any of the Ephesus individuals, although one has been reported to show evidence for a slit throat, whilst a second was recorded as having received a stabbing injury to the posterior of the neck that penetrated through the scapula and into the rib-cage (Grossschmidt and Kanz 2002: 70-71). Decapitation is also not mentioned in any contemporary literary sources as being the means of dispatching losing gladiatorial fighters.

The demographic profile and above average stature, and the evidence for activity related changes and interpersonal violence amongst the population, as well as their varied geographical origins, may also suggest a military context for the decapitated burials from York. The Roman army did have height standards for recruits (Roth 1998: 10), which in the case of elite soldiers was at least five foot ten inches (Veg. *Epit*. 1.5), and military personnel would have been used to a high degree of physical labour (Veg. *Epit*. 1.4, 1.19, 1.21). Anyone over the age of sixteen was considered suitable for military service (Veg. *Epit*. 1.4), and if strenuous physical training was begun at this age, this may explain the high rates of *os acromiale* (21% of those with scapulae present) and humeral asymmetry (61% of those with complete paired humeri) amongst the population. High rates of *os acromiale* and humeral asymmetry were also recorded amongst individuals from the mass grave associated with the medieval Battle of Towton (Knüsel 2000: 114), and from the skeletal remains from the Mary Rose (Stirland 1992: 173), which, although they are not ideal comparative samples due to their later date, are the most extensively studied groups of known military personnel from archaeological sites. The individuals from Driffield Terrace also had very similar rates of Schmorl's nodes (Coughlan and Holst 2000: 68-69) and cortical defects (Knüsel 2000: 114) to those seen amongst the sample from Towton, which may also suggest similar patterns of activity amongst the two groups.

The evidence would suggest that, in at least eighteen individuals from the decapitated sample, decapitation was the mechanism of death, with it also being a good possibility that this was the case for the majority of other individuals with posteriorly directed single chopping blows (see Chapter 4). This may indicate that the decapitated individuals within the Driffield Terrace population, as well as the other examples of decapitated burials from Roman York, which, apart from the isolated burial of a middle adult male, supine and extended with the cranium and mandible between the femorae, from Lord Mayor's Walk (Robinson 2005), were all located in the southern cemetery, were victims of some form of judicial execution. This would be consistent with the evidence from the literary sources for decapitation being one of the punishments used within the military, although other Roman citizens were also subject to decapitation (see Chapter 6), and it is possible that the population was composed of military personnel as well as non-military individuals. The area in which these decapitated burials are concentrated (Driffield Terrace, 129 The Mount and the Mount School) is directly alongside the main approach road from the south and on a small, steep glacial moraine, the highest point in the local landscape (Montgomery *et al*. 2011: 145), with Trentholme Drive and Moss Street Depot, where fewer numbers of decapitations were identified, being located at the foot of this prominent landscape feature. If the individuals were decapitated on this site as well as being buried there, this would suggest that there was a degree of "spectacle" involved in the act, with the location of the burials designed to promote remembrance of the act amongst the local population (see Foucault 1977 and Spierenburg 1984 for execution as spectacle in the early-modern period). The prominent burial location could also be a reflection of the potentially higher social standing of the decapitated individuals, which is suggested by literary sources stating that execution by decapitation was restricted to citizens or, after 211AD, *honestiores* (see Chapter 6), and supported by the relatively tall stature of the individuals (Montgomery *et al*. 2011: 168).

Although there have been three very different theories on the nature of the very unusual burial group from Driffield Terrace, all of them have relied on the probability that decapitation was the mechanism of death in the majority, if not all, of the individuals, something that is not contradicted by the other examples of decapitation from York identified as part of the present research. The theory that the burials were of a ritual nature with post-mortem removal of the head has not been considered since the earliest days of the excavation at 1-3 Driffield Terrace in 2004 (Alberge 2005), when the nature of the osteological evidence for decapitation in these individuals had not yet been determined. This does suggest that, in at least some cases of Romano-British decapitation, it is beginning to be more acceptable to describe the act as being the mechanism of death rather than as some form of post-mortem burial ritual.

Chapter 6: Decapitations in ancient European literature, art, material culture and ethnography

Whenever decapitation is mentioned in relation to the perceived "Cult of the Head" in Iron Age Europe, a number of Roman literary sources are quoted that refer to Celtic tribes "cutting off the heads of the slain" (Polyb. III. 67. 1-3) and then fastening them to the necks of their horses (Diod. Sic. V. 29. 4-5; Strab. IV. 4. 5), before nailing the heads to their houses and embalming the heads of their most distinguished enemies in cedar-oil to display to visitors (*ibid.*). Another source (Livy XXIII. 24) refers to a tribe called the Boii cutting off the head of the defeated consul Postumius and turning it into a gilded libation vessel in their temple. These texts are used to argue for a homogenous and wide-spread Head Cult across the whole of Northern Europe during the Late Iron Age (see Chapter 1), even though the Celtic tribes referred to in the texts are localised to Northern Italy and the Mediterranean Coast. Outside of these areas, there is very little literary evidence for head-hunting during the Iron Age, with the writings of Caesar (*De Bello Gallico*) and Tacitus (*De Vita Iulii Agricolae*) not making any reference to such a practice occurring in Gaul or Britain, although Diodorus Siculus (XIV. 115. 5) does refer to Gauls "cutting off, according to their custom, the heads of the dead" after defeating the Roman army outside Rome in 386BC, whilst Polybius (III. 67. 1-3) mentions Celtic auxiliaries betraying their Roman counterparts and killing them before cutting off their heads.

There is much more evidence in literary sources for decapitation being sanctioned by the Romans themselves, especially in military contexts, with Caesar (*BHisp.* 32) referring to the heads of dead enemies being fixed upon swords and lances by his Gaulish troops, and Livy (XXIII. 15. 2-7) writing of enslaved conscripts being so preoccupied with decapitating the bodies of the enemy to gain their freedom that they stopped fighting. Heads of the corpses of deposed leaders and rebels were often chopped off by Roman soldiers and paraded around on lances before being sent to Rome (Suet. *Galba* XX. 5-7; Hdn. III. 7. 7, V. 8. 9; Cass. Dio. LXXV. 8. 3; SHA. *Diadum.* 9. 4).

Some of these references provide interesting details on how and when heads were cut off, with Lucan (VIII. 668-674, 678-681) writing that Pompey's head was removed before he had drawn his last breath with his assailant "severing the neck sinews and hacking clumsily at the bones" (*ibid*.: 668-674) and then impaling it on a javelin "though the features still worked, the lips still moved and the open eyes were still unglazed" (*ibid*.: 678-681) whilst Galba's head was also cut off when he was "still half alive" (SHA. *Severus* 11. 6-9).

Decapitation was also recorded as the method of decimation for a treacherous legion with the soldiers being forced "down on the ground, traitors – prepare to lose your heads!" (Luc. V. 360-363), and as a form of execution for Christian martyrs and other criminals, as long as they were Roman citizens (Euseb. *Hist. Eccl.* V. 1. 47, V. 21. 4; *Dig.* XLVIII. 19; *Acta Pauli* X), or, after 211AD when citizenship was extended to everyone in the Empire (Robinson 1995: 11), *honestiores* (senators, soldiers and others in the service of the emperor and members of municipal councils and their families) (Wiedemann 1992: 69). A single member of the Imperial family (Constantius Gallus) was also subject to execution by decapitation in the 4th century AD whereby he had his "hands bound up, after the fashion of a convicted thief, and he was beheaded; then his face and head was mutilated" (Amm. Marc. XIV. 11. 23). The weapon to be used was specified as a sword (*Dig.* XLVIII. 19. 8; Berkowitz 2002: 746), although Eusebius (*Hist. Eccl.* VII. 12. 1) records that some martyrs were "slain with the axe, as in Arabia", and the families of the executed were permitted to recover the body for the purposes of burial (*Dig.* XLVIII. 24. 1, 3). Careful burial of the corpse and head of decapitated individuals is also referred to in the *Alia Acta*, a twelfth century translation by William the Monk of St. Albans of a purported late sixth century text on the martyrdom of Saint Alban (see Simpson 1982 for a complete translation into English of the Latin text), where his head was described as being "devoutly placed beside his body" in a specially dug burial pit (Simpson 1982: 72-73).

There are also depictions of Roman military personnel engaging in the decapitation of their enemies on Trajan's Column, including depictions of decapitated heads being presented to the Emperor (Scenes XXIV and LXXII, Voisin 1984: 285-289), auxiliary troops carrying severed heads whilst in battle (Scenes XXIV and CXIII, *ibid.*), and heads impaled on poles outside Roman fortifications (Scene LVI, *ibid*.). The Great Trajanic Frieze (slab VI and VII) and the Column of Marcus Aurelius (Scene LXVI) also include images of decapitated heads being presented to the Emperor by auxiliary troops (Fields 2005), whilst the Column of Marcus Aurelius (Scene LXI) and the

Tropaeum Adamklissi (metope VII/51) depict decapitations taking place (Fields 2005: 62, 66). The Portonaccio sarcophagus also appears to show a severed head wearing a helmet surmounted on a trophy (Varner 2005: 71), whilst there is a Republican coin of M. Sergius Silus (116-115BC) that shows a cavalryman with a sword and severed helmeted head held in his left hand (Voisin 1984: 253).

Martyrdom by decapitation is apparently depicted in a relief from a column in the catacombs of Domitilla in Rome which shows Achilleus hanging on a cross while another figure holds a curved sword to his throat (Lanciani 1892: 339), and is also the subject of an interesting inscription, again from the catacombs, this time at Nepi, near Rome, discovered in 1540 (Ingraham Kip 1854: 95). Inscribed above one of the graves cut into the rock walls was the phrase "martyrio coronatus capite truncates iacet" (he lies beheaded and crowned with martyrdom) (*ibid.*). There is also a body of data on the intentional decapitation of imperial statuary of deposed or hated rulers (*damnatio memoriae*, see Chapter 1), including two decapitated heads from bronze statues of Nero and heads from statues of Plautilla, Macrinus, Severus Alexander, Gordian and Trajan Decius, some of which were thrown into rivers or wells (Varner 2005: 71-72), as well as the attempted decapitation of a statue of Caligula with evidence for deep chisel gouges around the base of the neck (Varner 2005: 76).

In contrast to the absence of any literary evidence for decapitation in Britain, there is a small corpus of evidence from statuary and portable objects, including a stone distance slab from Bridgeness, West Lothian, depicting a cavalryman in full armour trampling four naked Britons, one of whom has been bound and decapitated (Green 2004: 328-329), and a tombstone of another cavalryman from Lancaster (Fig. 6.1), brandishing his sword and holding in his other hand the severed head of his opponent, whose body is slumped beneath the horse's hooves (Bull 2007). A second tombstone, of the cavalryman Aurelius Lucianus from Chester, depicts his groom displaying the severed and preserved head of an enemy (Fields 2005: 63). A copper alloy knife handle from South Kesteven, Lincolnshire (LIN-536F87), depicts three figures in an erotic scene, two of which are definitely male, with one of the males holding a severed human head in his arms (Portable Antiquities Scheme 2007). Perhaps the most interesting example of the depiction of decapitation in Romano-British statuary is the tombstone of a soldier that was re-used in the foundation of the bastion of the city wall of London at Camomile

Street, Bishopsgate, with the head removed and placed at the feet (Merrifield 1987: 104-105).

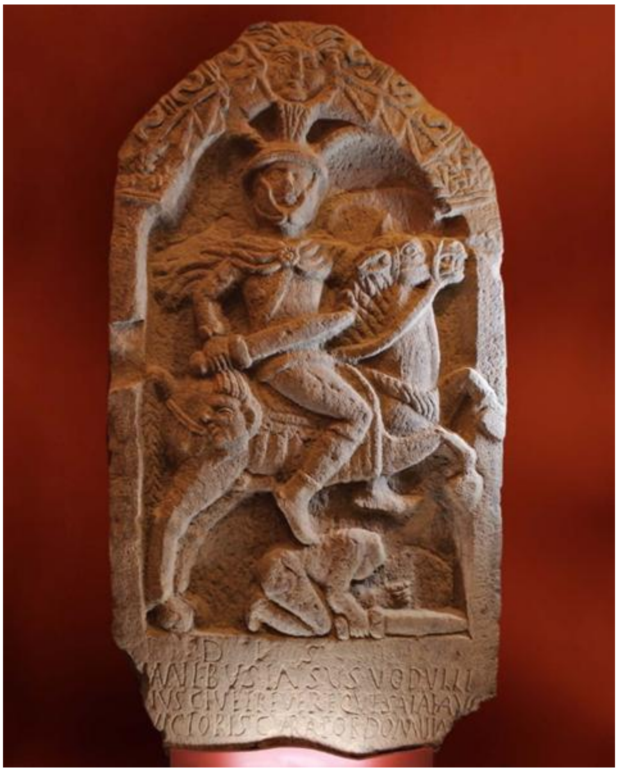

Figure 6.1: tombstone from Lancaster depicting a Roman cavalry soldier with the decapitated head of an enemy (from Heritage Lottery Fund 2011)

There is also limited evidence for decapitation in British Iron Age iconography, with Sueno’s Stone, Moray (from the post-Roman Scottish Iron Age), depicting a battle scene with rows of headless corpses and a pile of human heads (Armit 2007: 95). There are also a number of chalk figurines from Garton Slack, East Yorkshire, that have been beheaded, seemingly deliberately (Stead 1971: 32). Similar figurines were also found at Harpham Villa and Blealands Nook, both in East Yorkshire, as well as at Maiden Castle, Dorset (Stead 1971: 34; Mortimer 1905: Plate LXIV; Wheeler 1943: 181-183). There is also a coin of Cunobelinus showing a male figure holding a club or sceptre in his left hand and a severed human head in his right (Allen 1958: 61).

Iron Age sites in the South of France also have iconographic evidence for decapitation, including a pottery sherd from Clermont-Ferrand depicting a warrior on horse-back with a spear in one hand and with a severed head hanging from the neck of his horse (Collis 2003: 216); a coin of Dubnorix from the Dijon area, showing a figure holding a decapitated head in their left hand (Green 2010: 50); pillars and lintels carved with

niches to receive human crania at Roquepertuse (Armit 2006); and a pillar carved with decapitated heads, and a seated warrior figure holding severed heads in his hands and on his lap from Entremont (*ibid.*).
In order to find any references to post-mortem decapitation and why it may have been carried out, it is necessary to look at medieval sources, for example in the *Life and Miracles of Saint Modwenna* of Geoffrey of Burton, who wrote about the ghosts of two recently buried peasants returning to their village of Stapenhill, Derbyshire, and causing sickness and death amongst the inhabitants. In order to stop the haunting, the graves were re-opened and the heads of the corpses cut off and placed between their legs (Blair 2009: 539-540). Decapitation with a spade and re-interment was the response ordered by Bishop Foliot in a case from Hereford, recorded by Walter Map, of a man who had returned from the dead and caused all those whose names he called to die within three days (*De Nugis Curialium*, Book II, 22). In Icelandic literature, the *Saga of Grettir the Strong* contains two references to bodies of revenants being decapitated and their heads being placed between their thighs to prevent their ghost from returning (Hight 1914; Chapters 18, 32-35). Saxo Grammaticus (*Danish History*, Book I) also refers to the exhumation and decapitation of an individual who caused the death of anyone who came close to their burial mound.

Decapitation as a means of preventing revenants from returning to haunt the living is also recorded in European ethnographic literature. In a Lithuanian tale, the body of a man who had returned as a ghost was found to be lying face down in his coffin and was decapitated by three blows (Balys 1952), which, however, failed to prevent his ghost returning. It was only when the head was placed at the feet and the mouth filled with poppy seeds that the ghost was quietened (*ibid.*). The Romanians would, in persistent cases of vampirism, perform a very similar process, whereby they would cut off the head of the corpse and replace it in the coffin with the mouth filled with garlic (Gerard 1888: 185), whilst the Armenians are recorded as preventing revenants by either sticking nails into the head or heart of the corpse or cutting off the head (Abeghian 1899: 11). The East Prussians also advocated decapitation of the corpse with the head being replaced between the feet (von Tettau and Temme 1837: 276), whilst in one case, a supposed revenant who was thought to have been responsible for a great pestilence, had their head cut off and a live dog placed in the grave with them (Töppen 1867: 114). Decapitation of the corpse to prevent the return of ghosts or vampires is also recorded in Silesia, Moravia, Hungary, Poland and Russia (Calmet 1850: 32, 34, 52, 58, 63), whilst the remembrance of such a practice was also recorded in Yorkshire by Atkinson (1891: 127) who stated that, to lay a ghost, the head was severed from the body and laid between the legs, or placed under the arm or by the side of the chest.

Chapter 7: Decapitation Burials from Elsewhere within the Roman Empire

Only a very small number of decapitated burials similar in appearance to those from Roman Britain have been excavated from elsewhere in the Empire. There is more evidence from earlier periods within Europe, including isolated deposits of crania, mandibulae and attached cervical vertebrae with peri-mortem trauma (see Poplin 1985; Boulestin 1994; Green 2010: 183), and articulated and disarticulated skeletal remains (see Brunaux *et al*. 1999; Ardagna *et al*. 2005), and from later periods (see, for example, Bennike 1985: 106-108; Wiltschke-Schrotta and Stadler 2005; O'Donovan and Geber 2009, amongst many others).

In the Roman period, from Rome itself, there was a skeleton found whilst building the Bastione di Belvedere in the 19th century whose head was between the legs, and who had a mask or plaster cast of the head "reproducing most vividly the features of the dead man" found where the head should have been (Lanciani 1892: 273). A group of four very similar burials, dated to the 3rd century AD, were excavated from a brick-vaulted tomb in Cumae, near Naples (Pettigrew 1858: 298-299). In these examples, the skulls were absent but replaced in two of the burials by wax busts with glass eyes and hair on the head (*ibid.*). Elsewhere in Italy, this time dating to much earlier in the Republic (4th century BC), three skeletons with displaced heads were excavated from tombs at Metaponto (Carter 1998). Two of these, both adult females, had their skulls on the pelvis (Tombs 80 and 97) whilst a third adult female had the skull beyond the feet (*ibid*.). A very different type of burial deposit was recently excavated from a first century cremation cemetery outside Modena, where the unburnt skeletal remains of three adult males were found buried together in sprawled positions, with the cranium and mandible of one being found between their lower limbs (Killgrove 2011).

From outside Italy, there was the mature female (Burial 5) from Furfooz, Belgium, who was buried with the skull between the femorae (Nenquin 1953), and two burials from France where an extra skull was placed into the grave with a complete, articulated skeleton. One of these (from La Brèche) had the skull placed between the femorae (Charmasson 1968: 142), whilst the other example (from Pouzilhac) had nails forced into the ears and the top of the cranium (Carrière 1902: 20). Van Doorselaer (1967) lists three other sites in France with decapitated burials, including d'Albert, where two sarcophagi contained decapitated burials, and Rouvroy, where one burial had the head placed between the lower limbs, whilst from Germany, there was a headless individual found within a sarcophagus beneath the cathedral of St. Viktor in Xanten (Otten 2003: 415). In Serbia, the former area of *Moesia Superior*, the individual from Grave 8 at the Velika Kapija cemetery at *Viminacivm*, dated to the third century AD, had the cranium and mandible laid on the lower limbs of the corpse (Jovanović 2006: 28). It has also been reported that there were three decapitated Roman burials found in excavations beneath the cathedral of Santiago, Spain (Salisbury 2004: 72), although there is no reference to these burials in the given source (Chadwick 1976: 233).

None of the above mentioned examples of the practice had any osteological evidence for decapitation reported, but there are a few, usually more recently excavated, cases where such analysis has been undertaken. Firstly, there was the adult male (Grave 26) from Neuburg an der Donau, Germany, who was buried in a supine and extended position with the skull on the left femur, and who demonstrated chops through the left mandibular body, arch and body of C2 and arch of C3 (Fig. 7.1) that were directed from a postero-anterior direction (Keller 1979). Also from Germany, the partial remains of a mature adult male with a chopping blow through the inferior of the arch and body of C3 were recovered from a well at Jüchen (Becker 2009), whilst a mass-grave from Moravia, Czech Republic, with the remains of at least thirty-four individuals, was reported to include one young adult female with chop-marks to the mandibular rami (Dočkalová 2005: 32). The description of a second adolescent female from the same site, with C1-C3 and part of C4 described as being found with the displaced cranium and mandible, whilst the rest of C4 and C5-C7 were with the post-cranial remains (*ibid*.: 27), strongly suggests that this is also a peri-mortem decapitation.

From the late Roman period (5th-6th century AD), there is the young adult male from Canosa, Italy, buried supine in a plaster-lined tomb with the upper and lower left limb flexed and with the cranium and mandible rotated to the right with the base of the cranium resting on the bottom of the tomb (Saponetti *et al*. 2008). The individual displayed a single chop that severed the left mastoid and chopped through the left mandibular ramus, the left inferior facet of C1, and the odontoid process and superior surface of the arch of C2 before cutting into the left side of the maxilla. The blow was delivered from the posterior and superior left with the victim's head rotated and with his mouth open. There was also evidence that the individual had been scalped, and he also displayed evidence for probable defensive injuries to the left distal upper limb, arrow injuries to the cranium, and stab wounds to both tibiae, which suggested that the individual had been killed in combat (*ibid*.).

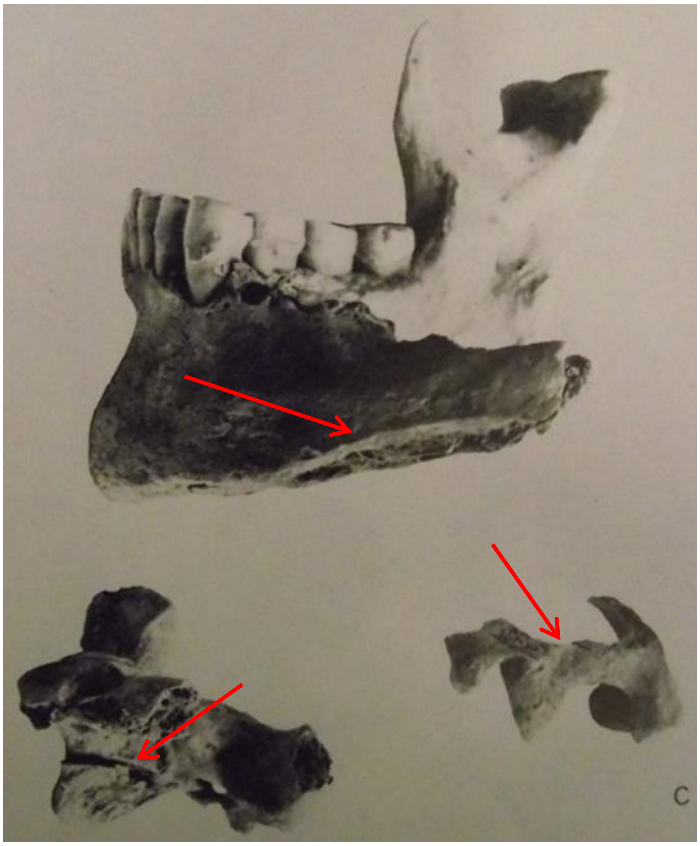

Figure 7.1: chop-marks on the inferior border of the mandible and the C2 and C3 of the adult male from Grave 26, Neuberg-an-der-Donau, Germany (adapted from Keller 1979: Plate 39c)

Execution was posited as the explanation for a cranium from a Roman period mass grave in Nubia that had the left mastoid process and occipital condyle severed by a chopping blow (Wood-Jones 1908), and this was also the favoured interpretation for the final examples of the practice found outside Britain, which were identified on skeletal remains from Israel. The first of these is a cervical vertebra with evidence for a "sword blow" found amongst commingled remains in a ritual bath at Horvat 'Ethri, which were suggested to have been evidence for the slaughter of the inhabitants by the Romans during the Bar Kokhba Revolt (Zissu and Ganor 2009: 100), whilst the remainder were found amongst the remains in ossuary burials. The first of these was from Tomb D at Mont Scopus, Jerusalem, and was a mature adult male, decapitated with two chopping blows through the inferior arch of C3 and the superior arch and body of C5, both of which were delivered from the posterior (Zias 1983). A mandible and C2 from Giv'at ha-Mivtar, probably from an adult female, demonstrated a chop through both rami and the odontoid process that were probably delivered from the posterior with the neck hyperflexed (Smith, P 1977), whilst a mandible and four cervical vertebrae (Fig. 7.2) from three separate crypts in the tombs of Ein Gedi demonstrated clear chop marks that penetrated through the entire element, although the blows were, in these cases, directed from an antero-posterior direction (Rak *et al.* 1976).

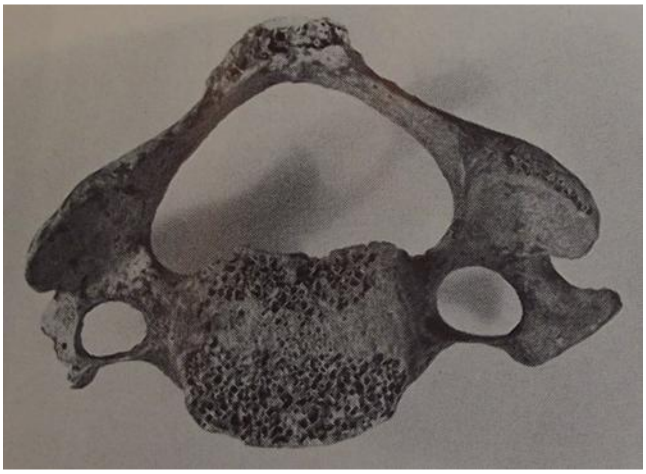

Figure 7.2: chop through the inferior surface of the body and right inferior facet of a cervical vertebra from Ein Gedi, Israel (from Rak *et al.* 1976: Plate 2a)

These small numbers of examples of non-British Roman period decapitation burials seems to indicate that the practice was a very localised phenomenon with the possibility that it spread, very rarely, into other parts of the Empire, rather than being a practice brought to Britain by incomers reluctant to give up their local customs, or a European wide continuation of pre-Roman traditions.

Chapter 8: Decapitation in the Early Medieval Period

The evidence for decapitation in the early medieval period in Britain was secondary only to the Romano-British period in the number of sites and individuals represented with a total number of 387 individuals from 129 sites. Decapitated or possibly decapitated individuals were identified in attritional cemeteries (ninety-one sites with 142 individuals), execution cemeteries (nineteen sites with 146 individuals) and isolated burials, settlement sites and mass-graves (nineteen sites with ninety-nine individuals). The evidence for decapitation from each of the different types of site are discussed below with comparisons made between the decapitations in order to determine whether there is any difference, both in the types of individuals affected and the methods used in each category of site.

8.1 Attritional cemeteries

This type of site is defined as a cemetery in which individuals of all ages and both sexes were buried with no evidence for selective burial based on age or sex. There were ninety-one such sites where possible decapitation burials were identified, with a total of 142 affected individuals. The majority of these sites have been dated to the fifth to eighth centuries AD, with a few sites, such as Wasperton, Warwickshire, and St. John's, Worcester (discussed in Chapter 4), showing evidence for continuity in the use of the cemetery and the occurrence of decapitation burials from the late Romano-British period. The cranium and mandible were recorded as being displaced from correct anatomical position in 47.9% of cases, whilst the head was absent in 40.7% of examples and in correct anatomical position in 8.6%. The remaining few examples (2.9%) were deposits of isolated crania and mandibulae. The numbers of males, females and non-adults affected by decapitation are shown in Table 8.1, compared with the numbers given by Cherryson (2005: Fig. 4.5, 4.6) for a pooled sample of early medieval cemetery populations from Wessex, which can be assumed to represent the expected numbers of males, females and non-adults in the wider cemetery population. From the table, it can be seen that there are significantly more adult males and significantly fewer adult females amongst the decapitated sample than in the wider population, whilst the numbers of non-adults in the decapitated sample was not significantly different to that in the wider sample.

	decapitated sample	wider sample	*p* value
males	60 (65.2%)	465 (44.5%)	*0.0002
females	20 (21.7%)	363 (34.7%)	*0.0112
non-adults	12 (13%)	217 (20.8%)	0.0791

Table 8.1: comparison between the numbers of adult males, adult females and non-adults in the decapitated and wider samples

The decapitated sample from which a more accurate estimation of age could be made was very small, with only seven individuals where this was the case. Of these, one was an older child (14.3%), two were young adults (28.6%) and the remaining four were middle adults (57.1%). There were no mature adults amongst the decapitated sample. Figure 8.1 shows the comparison between the age profile of the decapitated sample and the wider population, as taken from Cherryson (2005: Fig. 4.6) and although the decapitated sample is too small to provide any meaningful statistical analysis, it can be seen that the age profiles, with the exception of the "child" category (although this includes both younger and older children in Cherryson's (*ibid.*) data), in the two samples are very different.

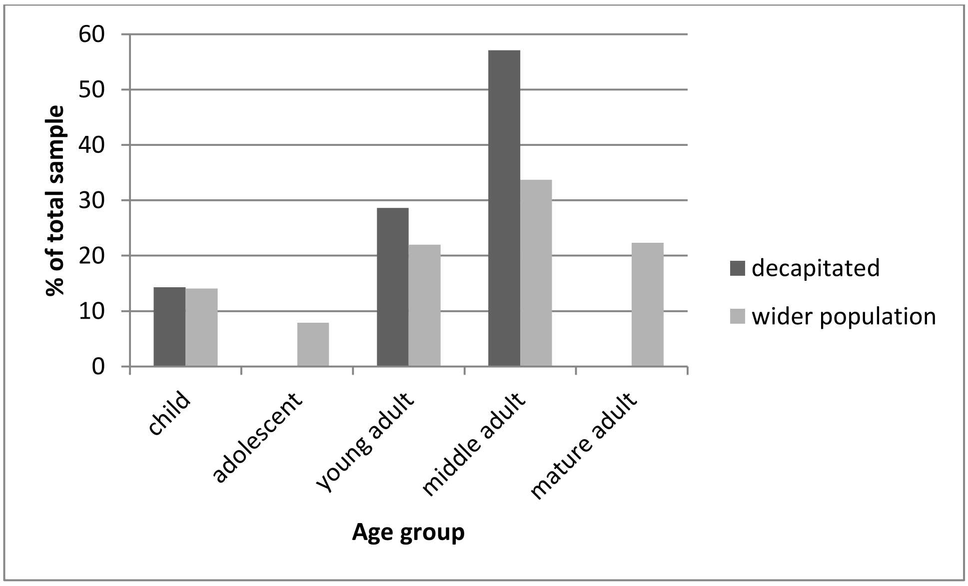

Figure 8.1: age profile of the decapitated and wider attritional cemetery populations

	decapitated sample	wider sample	*p* value
coffins	1 (0.7%)	253 (11.4%)	*<0.0001
objects	31 (21.8%)	355 (15.8%)	0.0607
prone	12 (8.5%)	9 (0.7%)	*<0.0001

Table 8.2: comparison between the burial practice in the decapitated and wider samples

Table 8.2 shows the burial practices in the decapitated and wider sample (taken from Cherryson 2005: 112, 121, Table 4.3) and it can be seen that the decapitated sample were significantly more commonly buried in a prone position and significantly much less likely to have been provided with a coffin than the rest of the population. The decapitated sample was also less likely to have been provided with objects than the wider population, although this is not quite statistically significant.

Examples of decapitated burials from attritional cemeteries included two individuals, one male and one female, from the eighth century cemetery at Winnall, near Winchester. The old middle adult female (SK11) was buried on her left side with the right lower limb flexed and the left lower limb extended. The cranium and mandible were found in correct anatomical position but the upper two cervical vertebrae were displaced in front of the face with no obvious sign of disturbance to the grave (Meaney and Hawkes 1970: 12). The young middle adult male (SK23) was supine and extended with the cranium and mandible absent (Meaney and Hawkes 1970: 14-15) and, although there was some evidence for animal burrowing, this was not thought to have been responsible for the loss of the cranium and mandible, with the suggestion being made that the body had been buried headless (*ibid*.: 30). Both of these burials were stated in the original publication to have been decapitated before interment, although caution was advised in the case of SK11 (*ibid*.: 30-31), and they have been given as examples of the practice in a recent synthesis (Reynolds 2009: Fig. 9). Both individuals were subjected to a detailed skeletal analysis as part of this research and it was found that three cervical vertebrae were absent from SK11, whilst SK23 was missing the cranium, mandible, first two cervical vertebrae and both claviculae, as well as displaying fragmentation of the ribs and scapulae. There was no evidence for peri-mortem trauma to either individual. It has recently been suggested that both of these graves may have been re-opened in antiquity in order to move the corpse of SK11 (offering a possible explanation for the unusual body position), and remove the head of SK23 (Aspöck 2011: 317), although the presence of modern scrape-marks on the superior surface of the arch of C3 of this individual may suggest that the cranio-cervical skeleton was truncated rather more recently.

Another case where it was stated in the original publication that decapitation had occurred was that of a double burial of two adult males (Grave 3) at Portway West, Andover, Hampshire, both of whom were headless (Stoodley 2006: 67). These individuals were subjected to a quick visual examination as part of this research and, although the absence of the cranium and mandible were confirmed, the poor preservation of the vertebrae precluded the identification of any peri-mortem trauma.

One very interesting site where decapitation was stated to have taken place was at Red Castle, Thetford, Norfolk, where two isolated crania, mandibulae and cervical vertebrae deposits, buried in hollows lined with flint and chalk, were excavated from a cemetery where the other burials were largely complete and articulated (Wells 1967a). Both crania and mandibulae were stated to display evidence of trauma to the mastoid processes, and one was also reported as displaying damage to the mandibular ramus, whilst the other had damage to the occipital condyles (*ibid.*). It was suggested that they may have been curated as decapitated heads for a time before being interred in the cemetery where they were found, based on the fact that they were much darker in colour than any of the other burials from the site (Wells 1967a: 171). The remains were examined for this research and, whilst the damage to the cranial base, mastoid processes, mandible and cervical vertebrae was noted, this was all probably of very recent origin, as the broken bone surfaces were much paler in colour than the surrounding bone and the fracture margins were roughened and irregular (Fig. 8.2). It is therefore very likely that these remains derive from disturbed and heavily truncated graves, and they certainly do not represent heads removed from the post-cranial skeleton in the peri-mortem period.

Other examples of the practice were stated to demonstrate evidence for decapitation-related peri-mortem trauma but were not available for analysis as they could not be located in archive. These included three burials from Caistor-by-Norwich, Norfolk, reported as having had the cranium and mandible located in the area of the lower limbs, and included a young adult male (SK37) who was said to demonstrate a peri-mortem fracture of the mandible (Myres and Green 1973).

Figure 8.2: posterior of the mandible of SK9 from Red Castle, Thetford, Norfolk, showing modern damage to the ascending rami

The examples given above make it apparent that a number of individuals from attritional cemeteries in this period, who have been stated to demonstrate evidence for decapitation, either have no evidence for peri-mortem trauma, the presence of trauma cannot be verified due to poor bone preservation, or the burials cannot be located in the archive, because they appear to have been reburied or lost, also making it impossible to verify whether they had been decapitated. This was the case for twelve sites selected for analysis for this research, with only three of the individuals analysed actually demonstrating any evidence for peri-mortem trauma (this evidence is discussed below). This suggests that caution should be applied when ascribing decapitation to individuals from attritional cemeteries, unless there is definite evidence for peri-mortem trauma or the articulated cranio-cervical skeleton is obviously displaced within the grave.

8.2 Execution cemeteries

These cemeteries have been identified as being specifically for the burial of execution victims, as a result of evidence for shallow burial, variability in burial alignments, evidence for restraint in the position of the skeletal remains (wrists crossed behind the back), and high numbers of decapitated individuals. The cemeteries are also often located on, or adjacent to, prehistoric monuments or hundred boundaries and appear to be placed in liminal positions in the landscape (see Chapter 1). Nineteen such execution cemeteries were identified where decapitated burials were found, with a total of 146 decapitated individuals (Reynolds (2009) has identified a few other burial sites where there do not appear to be any decapitations but where the presence of other features supports their identification as execution cemeteries). These sites are usually dated to the ninth to eleventh centuries AD, although one individual from Walkington Wold, East Yorkshire has been radiocarbon dated to cal AD 655-765 (Buckberry and Hadley 2007). Heads were displaced in 47.7% of individuals, headless burials represented 23.5% of cases, 16.7% of deposits were of isolated heads, and heads were in correct anatomical position in the remaining 12.1% of examples. Of those individuals to whom an age or sex was assigned, 91.3% of individuals were adult males, 6.5% were adult females and 2.2% were non-adults.

It was rare for objects to be found with the burials, with only four cases being recorded (2.7%), all of which seem to have been part of clothing or were worn or carried at the time of interment. These included an individual from Meon Hill, Hampshire (SK9), with a copper-alloy earring found adjacent to the right temporal bone (Liddell 1934), and a second individual from the same site with an iron buckle and strap-end found on the pelvis and a silver coin by the right hand (*ibid.*). There was also an individual from Stockbridge Down, Hampshire (SK19), where six silver coins were found in one small area next to the torso, and that had probably been contained in a purse or bag (Hill 1937: 254). There were two examples of burials being found in coffins (1.4%), including an adult male from Old Dairy Cottage, Harestock, Hampshire (SK580), who, because of the presence of the coffin, was assumed to have been Romano-British in date, but was radiocarbon dated to cal AD 770-970 (Cherryson and Buckberry 2011). Prone burial was relatively common amongst these burials, with eleven individuals (7.5%) being buried in this position.

In contrast to the previous category of burial, thirty-five individuals with definite and detailed evidence for peri-mortem trauma were identified (this evidence is discussed below). Eleven of these were analysed as part of the present research, whilst detailed published information by other authors was available for the remaining twenty-four individuals. These numbers could have been increased but for the impossibility of locating the skeletal remains from a probable execution cemetery at Rushton Mount, Northamptonshire, where twenty-four burials, all of which were reported as having been decapitated, were excavated during the 1960s (Wilson and Wright 1965: 210; Watts

1998: 86-87, and see Chapter 1). The absence of vertebrae in the assemblage from Stockbridge Down, Hampshire, also precluded the identification of decapitation-related peri-mortem trauma in the majority of this group of individuals, although chop-marks were noted on the posterior of two mandibular rami.

8.3 Isolated burials, deposits from settlement sites and mass-graves

Decapitations from these categories of site were identified from nineteen separate locations, with ninety-nine individuals being represented. Isolated burials, which by their very nature could not be ascribed to either an attritional cemetery or execution cemetery context, were typified by the burial of a young middle adult male from Stonehenge, Wiltshire, radiocarbon dated to cal AD 600-690, who had been buried in a supine position with the cranium and mandible in correct anatomical position but twisted round in order to fit the body into the pit in which it was buried (Pitts *et al*. 2002); and the burial of four non-adult individuals in a boundary ditch at Fordham, Cambridgeshire, two of whom had evidence for peri-mortem trauma to the cervical vertebrae (Patrick and Ratkai 2011). Deposits from settlement sites included an isolated cranium from the base of a pit at Cottam, East Yorkshire, dated to cal AD 647-877, that demonstrated evidence for weathering and a perforation through the vault, both of which were used to suggest that the cranium had been displayed on a pole before it was finally interred in the pit (Dobney *et al*. 1999); and a pit containing the partially disarticulated remains of at least eight individuals found on the foreshore at the confluence of the Fleet and Thames in London. The individuals may have been dismembered and decapitated before burial (Schofield and Maloney 1998: 284), although Reynolds (2009: 45) has stated that there was no evidence for peri-mortem trauma on any of the remains submitted for detailed analysis. The majority of sites from these two categories have been dated to the sixth to ninth centuries.

There were two mass-graves identified, one of which was excavated recently on the Ridgeway, Weymouth, Dorset, and dated to cal AD 910-1030, which contained fifty-one articulated decapitated heads and fifty-four post-cranial skeletons, all of which were of adult males, with extensive evidence for decapitation-related peri-mortem trauma, as well as defensive and incapacitating injuries (Score 2010). Unfortunately, the analysis of the assemblage is still ongoing and there is, as yet, no detailed report available on the skeletal remains. The other mass-grave was discovered beneath St. John's College, Oxford, and comprised the remains of between thirty-four to thirty-eight adult males who had evidence for extensive peri-mortem trauma. There were six individuals who had been at least partially decapitated, and there was evidence for charring and burning of some of the skeletal remains (Falys n.d.). The grave was dated to cal AD 960-1020 and isotopic analysis indicated a Scandinavian origin and diet for the individuals. It has been suggested that the burials resulted from the St. Brice's Day massacre, when Danish settlers were rounded up and killed on the 13th November 1002 in response to a decree issued by Aethelred (Keys 2010). The unpublished skeletal report for this site was available (Falys n.d.) and the data from it was used in the discussion of peri-mortem trauma, below.

Individuals with displaced heads were the most common type of decapitation burial represented in this category with 67.9% of examples, whilst headless burials comprised 17.9% of the sample. The head was in correct anatomical position in 9.5% of examples with the remaining 4.8% of cases being isolated head deposits. There was no evidence for a coffin in any of the burials and objects were rare, being found in only 4.0% of cases, whilst 3.0% of burials had been made in a prone position. Of the individuals where an age and sex was assigned, 92.1% were adult males, 2.6% were adult females and 5.3% were non-adults. Detailed information on the peri-mortem trauma was available for eleven individuals in this category but only one was analysed as part of this research, the data on the remaining individuals being obtained from published and unpublished reports by other authors.

8.4 Comparisons between the samples

8.4.1 Demographics

As previously stated, the decapitated sample from the attritional cemeteries had significantly more adult males and significantly fewer adult females than the wider population. Table 8.3 shows the demographics for all three decapitated samples and it can be seen that there were significantly more adult males in the execution cemetery

(p=<0.0001) and isolated burial/settlement site/mass-grave samples (p=<0.0001) than in the sample from attritional cemeteries, but that there was no difference between the numbers of males in the execution cemetery and isolated burial samples (p=1.0000). For adult females, the execution cemetery (p=0.0051) and isolated burial sample (p=0.0002) have significantly fewer individuals than the attritional cemetery sample but again there is no difference between the numbers in the execution and isolated burial samples (p=0.2955). For non-adults, the execution cemetery sample (p=0.0099), but not the isolated burial sample (p=0.1145), had significantly fewer individuals than the attritional cemetery sample, but there was no difference between the execution and isolated burial samples (p=0.4115).

	attritional	execution	isolated/settlement etc
males	60 (65.2%)	84 (91.3%)	70 (92.1%)
females	20 (21.7%)	6 (6.5%)	2 (2.6%)
non-adults	12 (13.0%)	2 (2.2%)	4 (5.3%)

Table 8.3: demographics in each of the three decapitated samples

More accurate estimations of age were available for seven individuals from the attritional sample (see above), thirty-four individuals from the execution cemetery sample, and nine individuals from the isolated burial/settlement site/mass-grave sample. Table 8.4 shows this data and, because the small sample sizes meant that there were no statistical differences between the samples, the pooled data was compared to that given by Cherryson (2005: Fig. 8.4) for the wider population (see Figure 8.3).

	decapitated sample (n=50)	wider population (n=772)	*p* value
child	3 (6.0%)	109 (14.1%)	0.1349
adolescent	3 (6.0%)	61 (7.9%)	0.7901
young adult	18 (36.0%)	170 (22.0%)	*0.0353
middle adult	26 (52.0%)	260 (33.7%)	*0.0134
mature adult	0	172 (22.3%)	*<0.0001

Table 8.4: comparison between the age profile in the decapitated sample and in the wider population

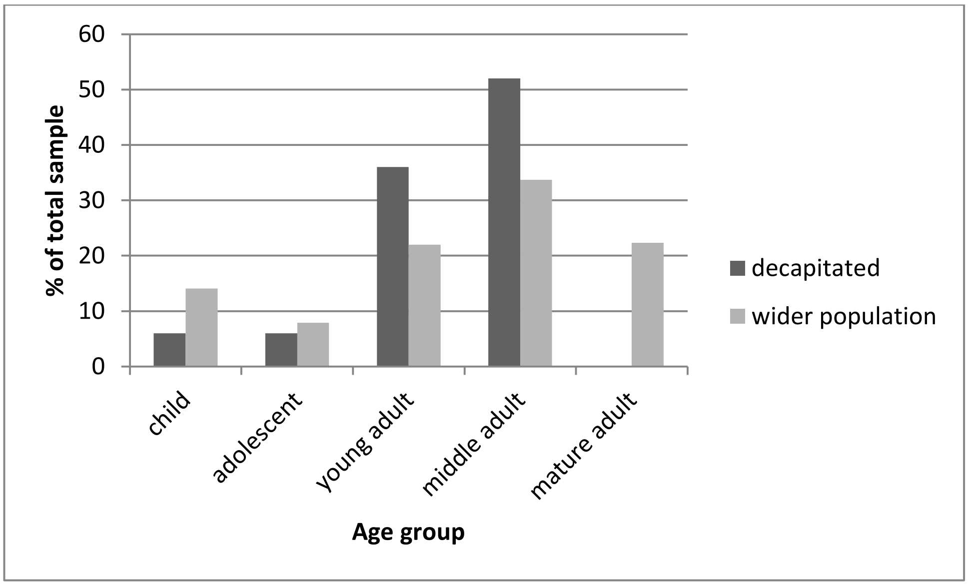

Figure 8.3: comparison between the age profile in the decapitated sample and the wider population

It can be seen from the table that there are statistically significantly more young adults and middle adults in the decapitated sample than in the wider population and significantly fewer mature adults.

8.4.2 Burial practice

Table 8.5 shows the numbers of individuals in each decapitated sample who had been provided with a coffin, had objects in the grave, or were buried prone. There were no differences between the numbers of individuals with coffins or those buried in a prone position between any of the samples, but there were significant differences between the numbers of individuals buried with objects in the execution cemetery (*p*=<0.0001) and isolated burial sample (*p*=<0.0001), compared to the attritional sample, although there was no difference between the execution cemetery and isolated burial samples.

	attritional	execution	isolated/settlement etc
coffins	1 (0.7%)	2 (1.4%)	0
objects	31 (21.8%)	4 (2.7%)	4 (4.0%)
prone	12 (8.5%)	11 (7.5%)	3 (3.0%)

Table 8.5: burial practice in each of the three decapitated samples

8.4.3 Placement of the head

Table 8.6 shows the numbers of individuals in each of the samples who were buried with the cranium and mandible displaced from correct anatomical position, with the cranium and mandible absent, and with the cranium and mandible in correct anatomical position, as well as those who were represented by a deposit of an isolated cranium or cranium and mandible. There were no differences between any of the samples in how many individuals had the cranium and mandible in correct anatomical position, whilst the execution cemetery sample had significantly more deposits of isolated crania and mandibulae than either the attritional (p=<0.0001) or isolated burial samples (p=0.0094). The isolated burial sample had significantly more individuals where the head was displaced than either the execution cemetery (p=0.0049) or attritional cemetery (p=0.0037) samples, whilst headless burials were significantly less common in the execution cemetery (p=0.0028) and isolated burial samples (p=0.0004) than in the attritional cemetery sample.

	attritional	execution	isolated/settlement etc
headless	57 (40.7%)	31 (23.5%)	15 (17.9%)
displaced head	67 (47.9%)	63 (47.7%)	57 (67.9%)
correct position	12 (8.6%)	16 (12.1%)	8 (9.5%)
head only	4 (2.9%)	22 (16.7%)	4 (4.8%)

Table 8.6: position of the head in each of the three decapitated samples

8.4.4 Summary of the demographics, burial practice and position of the head

- There were significantly more adult males and fewer adult females in the decapitated sample from attritional cemeteries than in the wider population
- There were significantly more adult males and fewer adult females in the execution cemetery and isolated burial samples than in the decapitated attritional cemetery sample
- There were significantly fewer non-adults in the execution cemetery sample than in the decapitated attritional cemetery sample
- There were significantly more young and middle adults in the pooled decapitated sample than in the wider cemetery population

- There were significantly fewer burials with coffins in the decapitated sample from attritional cemeteries than in the wider population
- There were significantly more prone burials in the decapitated sample from attritional cemeteries than in the wider population
- There were significantly fewer burials with objects in the execution cemetery and isolated burial samples than in the decapitated attritional cemetery sample
- There were significantly more isolated head deposits in the execution cemetery sample
- There were significantly more headless burials in the attritional cemetery sample
- There were significantly more burials with displaced heads in the isolated burial sample

8.4.5 Stature

The mean stature was calculated for each of the different decapitated samples and the results are presented in Table 8.7. It was only possible to calculate female stature in the execution sample, and there were only two individuals for which this could be done, with the mean stature being 172.56cm. There were no significant differences between the mean statures in any of the decapitated samples and there was also no difference between the separate and pooled mean statures for the decapitated samples when compared to the mean male stature of 172cm, which was calculated from 996 individuals excavated from various cemeteries from the period by Roberts and Cox (2003: 195).

	attritional	execution	isolated etc	pooled
male stature	172.9cm	173.1cm	176.0cm	173.7cm
female stature	-	172.56cm	-	-

Table 8.7: mean stature in the different decapitated samples

8.4.6 Palaeopathological analysis

A number of palaeopathological conditions were observed amongst the decapitated individuals from all three samples. Table 8.8 gives a list of these conditions with the numbers affected for each sample. As the individual samples showed very few significant differences between the rates of the conditions (probably largely as a result of the very small sample sizes involved), the data has also been pooled and compared to the rates in a sample of 7122 individuals excavated from seventy-two sites from the early medieval period as given in Roberts and Cox (2003: 28, 164-220). This comparison is given in Table 8.9.

	attritional (n=7)	execution (n=36)	isolated etc (n=11)
calculus	4	21	6
caries	0	1	3
periodontal disease	0	3	6
abscess	0	2	2
enamel hypoplasia	3	7	5
cribra orbitalia	0	2	3
OA/DJD	2	12	3
Schmorl’s nodes	1	10	6
enthesopathies	3	11	7
humeral asymmetry	2	2	0
os acromiale	0	1	0
fracture	1	8	0
healed blade injury	0	0	1
non-specific infection	0	6	4
tuberculosis	1	0	1

Table 8.8: numbers of individuals with various palaeopathological conditions in the decapitated samples

	pooled data (n=54)	Roberts and Cox (2003)	*p* value
calculus	31 (57.4%)	938 of 2690 (35.0%)	*0.0009
caries	4 (7.4%)	238 of 5035 (4.7%)	0.1831
periodontal disease	9 (16.7%)	722 of 2681 (26.9%)	0.1190
abscess	4 (7.4%)	213 of 4403 (4.8%)	0.1869
enamel hypoplasia	15 (27.8%)	640 of 3407 (18.8%)	0.1129
cribra orbitalia	5 (9.3%)	404 of 5334 (7.6%)	0.6023
OA/DJD	17 (31.5%)	628 of 7122 (8.8%)	*<0.0001
Schmorl’s nodes	17 (31.5%)	207 of 2326 (8.9%)	*<0.0001
enthesopathies	21 (38.9%)	-	-
humeral asymmetry	4 (7.4%)	-	-
os acromiale	1 (1.9%)	27 of 1057 (0.4%)	1.0000
fracture	9 (16.7%)	“trauma” 395 of 7122 (5.5%)	*0.0029
healed blade injury	1 (1.9%)	“weapon injury” 36 of 1364 (2.6%)	1.0000
non-specific infection	10 (18.5%)	460 of 7122 (6.5%)	*0.0023
tuberculosis	2 (3.7%)	18 of 2056 (0.9%)	0.0911

Table 8.9: comparison between the rates of pathological conditions in the pooled decapitated sample and the wider population

From the table it can be seen that there are no statistical differences between the decapitated and wider samples in the rates of the majority of pathological conditions. However, the rates of calculus, osteoarthritis/degenerative joint disease, Schmorl's nodes, fractures and non-specific infection are all significantly greater in the decapitated sample than in the rest of the population. The higher rate of calculus may suggest that the decapitated individuals were eating a different diet to the rest of the population, although there are no equivalent rises in the rates of dental caries, periodontal disease or abscesses as may be expected if this was the case. It does, however, certainly imply that the levels of dental hygiene were poorer amongst the decapitated sample and the absence of any mature adults amongst the individuals may suggest a reason why this poorer dental hygiene has not yet led to correspondingly higher rates of other forms of dental disease.

The higher rates of degenerative joint disease and Schmorl's nodes imply that the decapitated sample was subjecting their joints to more wear and tear than was the norm. This cannot be related to the age profile of the sample, which, as previously stated, has too many young and middle adults and no mature adults. Increased levels of physical activity also seem to be supported by the numbers of individuals with evidence for enthesophytes and cortical defects, although it is not possible to compare the rates of enthesopathies in the decapitated sample with a wider population sample. That this heavy use of muscles and joints seems to have been restricted to adult life is suggested by the relatively low rates of humeral asymmetry and *os acromiale*, which, in the case of *os acromiale*, is not significantly different from that seen in the wider population. If unusual muscular loading had occurred in earlier life, these factors could also have been expected to be higher amongst the decapitated sample.

The higher rate of fractures cannot, in contrast to the earlier periods, be ascribed to higher levels of interpersonal violence (the evidence for healed weapon trauma shows no difference between the decapitated and larger population), as there are only two individuals with rib fractures and no other examples of fractures that have a high specificity for assault (see Chapter 3). There were two individuals with compression fractures of the vertebrae, and single cases of fractures of the humerus, radius, ulna, clavicle, femur and tibia, all of which are likely to have resulted from accidental processes (Grauer and Roberts 1996; Kilgore *et al*. 1997; Djurić *et al*. 2006). This does suggest that, whatever these processes may have been, the decapitated sample had sustained more accidental fractures than the wider population, possibly because of differences in livelihood (see Cancelmo 1972 and Jimenez 1994 for fracture patterns that may be specific to different activities).

The higher rate of non-specific infection amongst the decapitated sample suggests that their health status may have been poorer, although there was no evidence for osteomylitis or sinusitis amongst the sample and the rates of tuberculosis were not significantly different in the decapitated sample compared with the wider population. The few pathological conditions that do show significant differences between the decapitated and larger samples do suggest that the diet, health status, and activity types and levels in adult life of the decapitated sample may have been different from the norm, although other markers for diet and health status, as well as activity-related changes in non-adult life, do not show any differences.

8.4.7 Peri-mortem trauma

The evidence for peri-mortem trauma in the three decapitated samples, including the types of cut present, from what direction they were delivered, how many cuts were present, and whether there was evidence for decapitation-related trauma to the non-cervical skeleton, as well as cranial and post-cranial non-decapitation related trauma, is given in Table 8.10. It can be seen that, apart from one individual who had evidence for both chopping and incised cuts, all of the individuals had evidence for chopping blows only. Blows were directed from the posterior more commonly in the execution cemetery sample, although this was not statistically significant. There were also no significant differences in the number of blows delivered, although single blows were more common in the isolated/settlement sample and execution cemetery sample. Decapitation blows that also affected the mandible, cranium or clavicle were common amongst the sample with no significant differences between the different groups. It was only the levels of cranial (p=0.0109) and post-cranial (p=<0.0001) non-decapitation related peri-mortem trauma in the isolated/settlement/mass-grave sample that showed significant differences with the execution cemetery sample, where no cases were recorded.

	attritional (n=3)	isolated etc (n=11)	execution (n=35)
chop	3 (100%)	10 (90.9%)	35 (100%)
both	0	1 (9.1%)	0
posterior	1 (33.3%)	4 (36.4%)	24 (77.4%)
anterior	0	3 (27.3%)	3 (9.7%)
lateral	0	1 (9.1%)	2 (6.5%)
all directions	2 (66.7%)	3 (27.3%)	2 (6.5%)
1 blow	1 (33.3%)	6 (54.5%)	20 (57.1%)
2-3 blows	1 (33.3%)	2 (18.2%)	10 (28.6%)
4+ blows	1 (33.3%)	3 (27.3%)	5 (14.3%)
clavicle/mandible etc	1 (33.3%)	7 (63.6%)	17 (54.8%)
cranial non-decap	1 (33.3%)	3 (27.3%)	0
post-cranial non-decap	1 (33.3%)	6 (54.5%)	0

Table 8.10: evidence for peri-mortem trauma amongst the decapitated samples

8.4.8 Summary of the stature, pathological conditions and peri-mortem trauma amongst the decapitated sample

- There are no differences between the mean stature in the decapitated samples and that in the wider population
- The decapitated sample show evidence for increased mechanical loading in adult life, a higher rate of fractures and possible evidence for a different diet and lower health status than the rest of the population
- All but one individual have evidence for chopping blows, delivered most commonly from the posterior in the execution cemetery sample
- A single blow was most common with high numbers of individuals where the blows also affected the clavicle, mandible or cranium
- The isolated burial/settlement site/mass-grave sample had significantly more individuals with non-decapitation related cranial and post-cranial peri-mortem trauma than the other two samples

8.5 Types of decapitation

When the detailed information on the nature of the peri-mortem trauma recorded in the decapitated individuals is analysed in detail, it becomes apparent that there are three different types of decapitation with different signatures. These are: 1. Single chopping blows; 2. Multiple chopping blows; 3. Chopping blows to the cervical column associated with evidence for other cranial and post-cranial peri-mortem trauma. Each type of decapitation is described and discussed below and possible interpretations given for how the different signatures may have been produced.

8.5.1 Single chopping blows

There were twenty-four individuals with evidence for this type of decapitation, and were comprised of one from the attritional cemetery sample, three from the isolated burial/settlement/mass-grave sample, and twenty from the execution cemetery sample. The single blow was directed from the posterior in all but three individuals, with two of these three demonstrating blows directed from the lateral, whilst the remaining individual demonstrated an anteriorly directed blow. Typical examples of this type of decapitation included an old middle adult male from the execution cemetery at Meon Hill, Hampshire (SK10), who was buried in a supine position but had been largely disturbed by a subsequent burial (Liddell 1934), and who demonstrated a chop through the superior facets and odontoid process of C2, directed from the left (Fig. 8.4); a young middle adult male from an isolated pit burial at Stonehenge, Wiltshire, who was buried supine and who had evidence for a single posteriorly directed chop through the superior of the body and arch of C4 that also chopped through the left gonion of the mandible (Pitts *et al*. 2002); and a young middle adult male from Bevis' Grave, Southampton, Hampshire (SK3), who was buried supine and extended with the cranium and mandible in correct anatomical position (Cole 2009), and who had evidence for a single posteriorly directed chop through the inferior of the arch of C3 and the superior of the body and arch of C4, delivered with the neck tilted to the right, that also chopped through the hyoid (Fig. 8.5).

The cranium and mandible were found in correct anatomical position in ten individuals, suggesting that it was not considered necessary to remove the head in every case. This may suggest, as discussed in Chapter 4, that the intention of the blow was simply to kill, rather than to effect head removal. That decapitation was probably the mechanism of death in this group is also suggested by the flexed neck position of one individual, a young adult male from Meon Hill, Hampshire (SK9), with a chop through the superior of the arch and body of C6 that did not affect C5 and was directed from the posterior. This individual was buried in a supine and extended position with the wrists crossed over the abdomen (Liddell 1934), suggesting they had possibly been restrained. Similar upper limb and wrist positions were recorded in a further five individuals with this type of decapitation, which also contributes to the thesis that decapitation is likely to have been the mechanism of death in a number, if not all, of these individuals.

Figure 8.4: chop through the superior facets and odontoid process of SK2 from Meon Hill, Hampshire

Figure 8.5: chop through the hyoid of SK3 from Bevis's Grave, Hampshire

8.5.2 Multiple chopping blows

There were eighteen individuals with this type of decapitation, one of whom was from the attritional cemetery sample, two from the isolated burial/settlement/mass-grave sample, and the remaining fifteen from the execution cemetery sample. Chops were directed from the posterior in nine individuals, with anteriorly directed chops recorded in four individuals, including both individuals from the isolated/settlement/mass-grave sample. Laterally directed chops were recorded in one individual from the execution cemetery sample, whilst chops were directed from a number of directions in four individuals, including the single individual from the attritional cemetery sample.

Six individuals had multiple chops to the cervical vertebrae but were buried with the cranium and mandible in correct anatomical position, suggesting that, even with a number of separate blows, the head was probably not completely removed by the decapitation in these individuals. These include an old middle adult male from the execution cemetery at Chesterton Lane Corner, Cambridge (SK8), with five posteriorly directed chops that affected C3 to C7 (Cessford 2007); and both individuals from the isolated ditch burial at Fordham, Cambridgeshire, namely an older child (HB2) who was buried supine and extended with the cranium and mandible in correct anatomical position but with the neck extended (Patrick and Ratkai 2011), and who had evidence for two anteriorly directed chops, one of which affected C4-C6 and one of which chopped into C1 (Brickley 2011a); and an older child (HB4), who was buried on the left side with the upper and lower limbs flexed (Patrick and Ratkai 2011), and who had two anteriorly directed chops that affected C5-C6 and T1-T2 (Brickley 2011a). As in the examples with a single chopping blow, the fact that the head was not removed by these multiple blows would suggest that the decapitation was the mechanism of death, and it was not then necessary to ensure that the head was completely separated from the post-cranial remains. This interpretation is supported by the body position of one individual (SK1 from Meon Hill, Hampshire), who had the lower limbs flexed, the feet together and the upper limbs behind the torso with the wrists crossed (Liddell 1934).

The position of the cranium and mandible in the remaining individuals indicates that the head was completely removed and these included one individual (SK7 from Walkington Wold, East Yorkshire) where the cranium and mandible were absent and who had evidence for two anteriorly directed chops to the body of T1 (Buckberry and Hadley 2007; Buckberry 2008). There were also three individuals from the same site who were represented only by a cranium, or cranium, mandible and associated cervical vertebrae, including one (skull 2) that had three posteriorly directed chopping blows to the occipital and parietals that must have been directed with the neck in extreme flexion (Buckberry and Hadley 2007; Buckberry 2008).

Four other individuals had multiple chopping blows to the cervical vertebrae with complete removal of the head and included a young adult male from London Road, Staines, Surrey (SK454), who was buried prone and extended with the cranium and mandible between the ankles (Hayman and Reynolds 2005), and who had four separate chops to the bodies and arches of C4 and C5, all of which were directed from the posterior (Fig. 8.6). In these individuals, it is not possible to determine whether there was a main decapitating blow with additional chops, but two individuals had evidence that the head may not have been removed by the initial blow and that additional chops were required in order to sever the remaining soft tissues, allowing the head to be completely removed. These comprised a young adult male from London Road, Staines, Surrey (SK451), buried supine and extended above another individual in a double grave, and with the cranium and mandible found in the space created by the flexed right upper limb (Hayman and Reynolds 2005), who had a chop through the superior arch of C4 directed from the posterior, as well as an anteriorly directed chop to the inferior border of the mandible (Fig. 8.7); and a young middle adult male from Meon Hill, Hampshire (SK7), with the cranium and mandible found between the femorae (Liddell 1934), who had three posteriorly directed chops through the arches and bodies of C3-C4, as well as two chops through the acromial end of the right clavicle (Fig. 8.8), one of which also chopped through the acromion of the right scapula, that were directed from the superior left. This individual was buried in a prone position with the upper limbs behind the torso and the wrists crossed (Liddell 1934) suggesting the possibility that the individual had been restrained.

Figure 8.6: two separate chops to the arch and body of C5 of SK454 from London Road, Staines, Surrey

Figure 8.7: fragment of the mandible of SK451 from London Road, Staines showing chop through the inferior margin

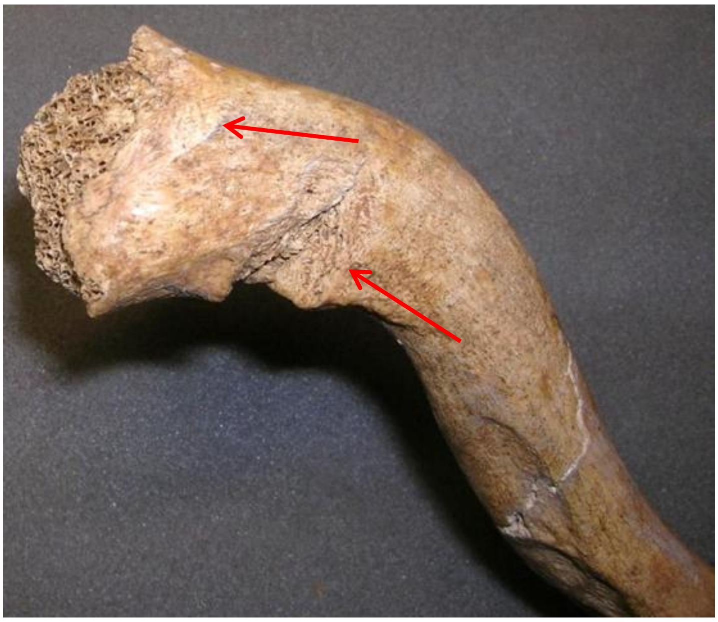

Figure 8.8: two chops to the right clavicle of SK7 from Meon Hill, Hampshire

The evidence of restraint, flexion of the neck, and correct anatomical position of the cranium and mandible even when a number of blows had been delivered, suggests that decapitation may have been the mechanism of death in the majority of these individuals.

8.5.3 Extensive peri-mortem trauma

There were seven individuals with evidence for extensive peri-mortem trauma, one of whom was from the attritional cemetery sample, with the remaining six coming from the isolated burial/settlement/mass-grave sample. The individual from the attritional cemetery sample was an old middle adult ?male from Great Chesterford, Essex (SK128), who was buried in a supine and extended position with the lower limbs crossed at the ankle, and with the cranium and mandible in correct anatomical position. The individual was buried with a pottery vessel at one shoulder, a glass beaker at the other, a knife at the right hip and a buckle on the pelvis (Evison 1994), and had evidence for healed tuberculosis of the right hip that had completely destroyed the head of the femur (Fig. 8.9). There was a single chop through the left mastoid process and two chops to the superior surface of the lateral side of the left clavicle, all of which were directed from the superior left and probably at least partially decapitated the individual, although there was no evidence of trauma to the cervical vertebrae. There were also three chops to the left side of the frontal and left parietal with associated radiating fractures, also directed from the superior left (Fig. 8.10), and a stabbing injury to the posterior and inferior margin of the right rib 12 that also nicked into the right superior facet of L1.

Figure 8.9: tuberculous destruction of the head of the left femur of SK128 from Great Chesterford, Essex

Five of the remaining individuals came from the mass-grave found beneath St. John's College, Oxford, and include a young adult male (1866) with a single chopping blow to the anterior of the arch and body of C2, two chops to the mandibular rami, five chopping blows to the frontal and left parietal, three chops to the right humerus, one to the left humerus and a penetrating injury to the anterior of the left ilium (Falys n.d.). There was also a heavily truncated adult male (1898) with a chop to the anterior and inferior of C5 that also chopped into the anterior of the left side of the mandible, as well as chopping blows to the distal left humerus and proximal radius and ulna, and puncture wounds to the cranium (Falys n.d.). The peri-mortem trauma in all of these individuals, including the one from the attritional cemetery sample, could possibly represent incapacitating blows or defensive injuries, directed as they are to the cranium, abdomen, upper limbs and lower back, and, as the cranium and mandible were found in correct anatomical position in all the individuals, complete decapitation does not seem to have been an important part of the assault. The injuries to the cervical vertebrae seem almost to be incidental, with the majority of individuals found in the mass-grave at St. John's College, Oxford, having no evidence for injuries to the cervical vertebrae despite having extensive cranial and post-cranial peri-mortem trauma (Falys n.d.). The presence of this extensive peri-mortem trauma in the decapitated individuals, with the focus being on incapacitating injuries, as well as the presence of defensive injuries in at least one individual, would suggest that the partial decapitation, or the other peri-mortem injuries, were the mechanism of death.

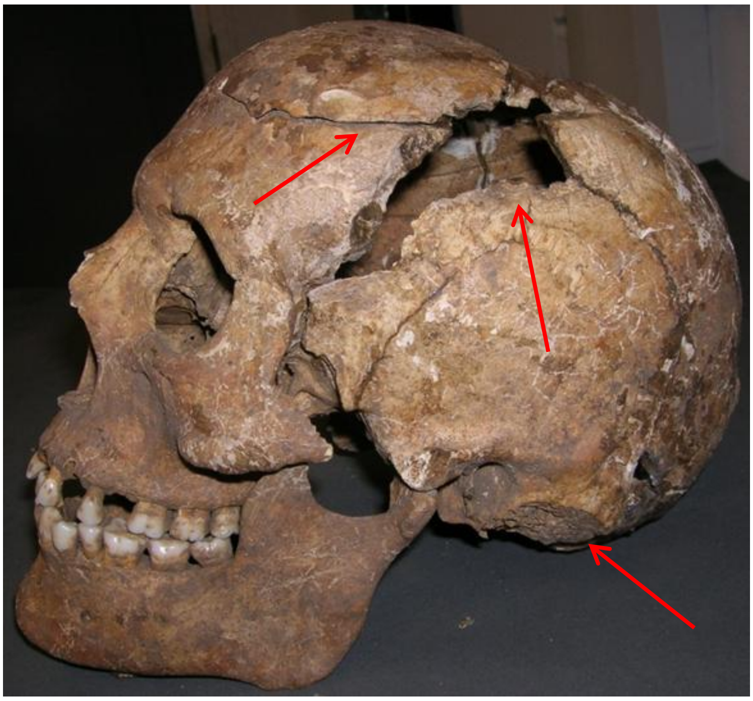

Figure 8.10: chops to the cranium of SK128 from Great Chesterford, Essex

The final individual from this category was an extremely interesting case and seems to represent an entirely different phenomenon. This was a young middle adult male (Q1) who was excavated from the Long Mound at Maiden Castle, Dorset, and was found partially disarticulated with some elements and joints, including the distal lower limbs, right os coxa and femur, distal upper limbs, hands and wrists, and feet and ankles remaining in articulation (Wheeler 1943). The burial was initially thought to be Neolithic in date but the identification of sharp force peri-mortem trauma made with a metal blade resulted in radiocarbon dating being carried out in the 1960s, which produced a date of cal AD 555-715 (Brothwell 1971). Previous analyses had been conducted with the remains embedded in the soil matrix in which they had been originally lifted and displayed but, for the present research, permission was granted by the Dorchester Museum to remove all elements from this matrix in order to conduct a detailed skeletal analysis.

There was evidence for at least fifty chopping blows (Fig. 8.11), along with two stabbing injuries, peri-mortem fractures of the dentition, and peri-mortem fractures of the shafts of the ribs. There were at least eight chopping blows and a penetrating injury to the cranial vault, as well as four chops to the endocranial surface that must have resulted from blows that penetrated completely through the vault and brain, and there also seems to have been an attempt to separate the facial skeleton from the cranial vault (Fig. 8.12). A chopping blow to the posterior of the mandibular rami seems to be consistent with an attempt, however successful, at decapitation, and there are numerous chopping blows to both pectoral girdles and upper limbs (chopping blows to the humerus are illustrated in Fig. 2.3) with complete separation through the elements and skeletal regions in at least five places. There are also similar chopping injuries to the lower limbs and pelvis with severance at five locations. The pelvis and spinal column had also been chopped through vertically (Fig. 8.13), with horizontal chopping blows through the lower lumbar vertebrae and superior surface of the ilia also being present (Fig. 8.14), whilst the rib-cage had been opened, resulting in fractures to the posterior shafts.

The severing of the limbs, decapitation, and vertical and horizontal separation of the torso into segments was also recorded in an individual from Hulton Abbey, Staffordshire, dated to cal AD 1215-1385 and interpreted as representing an individual who had been subject to hanging, drawing and quartering (Lewis, ME 2008, this individual will be described in detail in Chapter 9) and it is very possible that a similar process was responsible for the peri-mortem injuries in the individual from Maiden Castle.

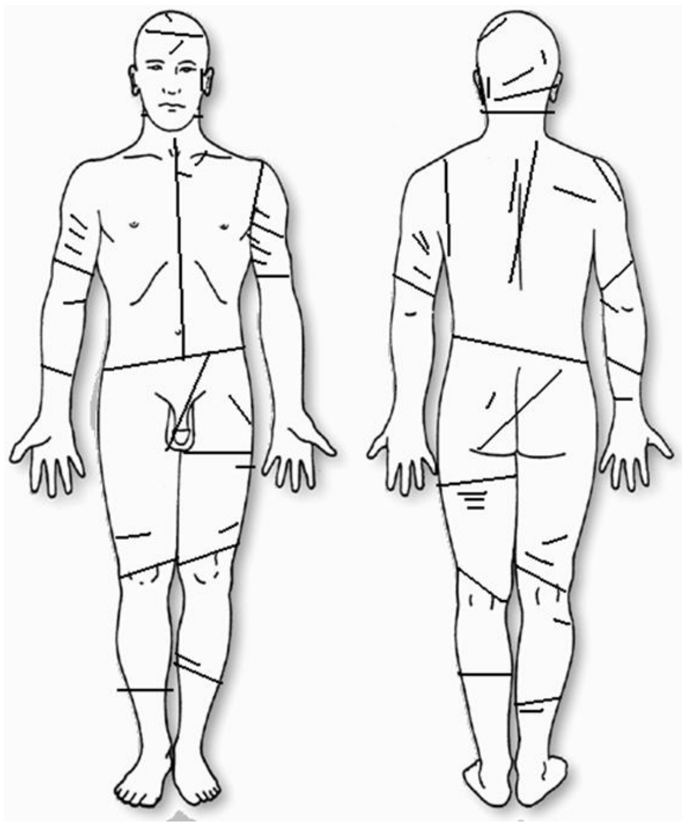

Figure 8.11: locations of the peri-mortem traumata recorded on skeleton Q1 from Maiden Castle Long Mound, Dorset

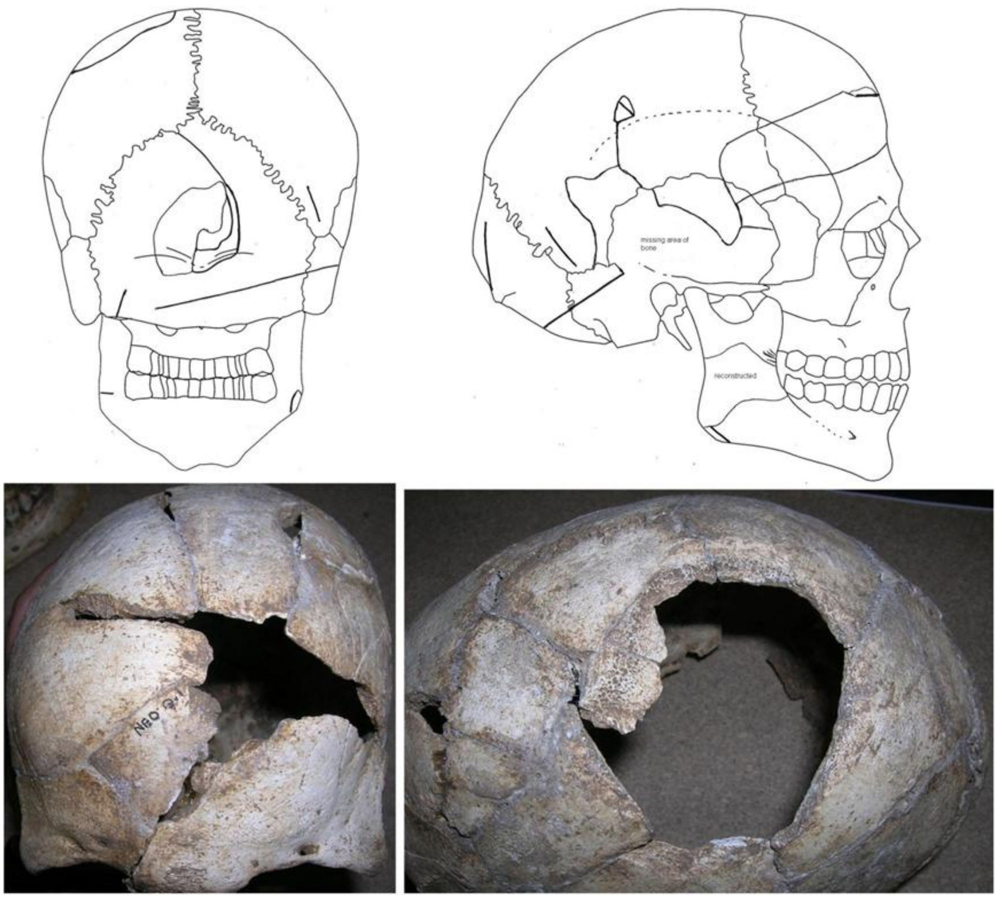

Figure 8.12: the peri-mortem trauma to the cranium of skeleton Q1 from Maiden Castle Long Mound, Dorset (diagrams adapted from Buikstra and Ubelaker 1994)

Figure 8.13: vertical chops through the arches of the thoracic vertebrae of skeleton Q1 from Maiden Castle Long Mound, Dorset

Figure 8.14: horizontal chop through the superior of the left ilium of skeleton Q1 from Maiden Castle Long Mound, Dorset

8.6 Summary of the data on the types of decapitation

- There are three different categories of decapitation from this period, namely: 1. Single chopping blows; 2. Multiple chopping blows; 3. Extensive peri-mortem trauma including decapitation

- Examples of the first two types of decapitation were found in all three samples
- Examples of the third type were found in the attritional cemetery sample and the isolated burial/settlement/mass-grave sample
- In the first two types of decapitation, removal of the head does not seem to have been necessary in all cases, which suggests the decapitation was the mechanism of death in these individuals
- In the first two types of decapitation, there is evidence for flexion of the neck, and restraint in the position of the body in some cases, suggesting that decapitation was the mechanism of death in these individuals
- In the third type, decapitation appears to have been largely incidental, with the majority of peri-mortem injuries appearing to be incapacitating and defensive injuries and suggesting that decapitation was the mechanism of death in these individuals
- The peri-mortem trauma in the individual from Maiden Castle appears to be related to quartering and decapitation of the body, indicating that this was likely to have been the mechanism of death.

8.7 Discussion

The analysis of the evidence for peri-mortem trauma, as well as the evidence for restraint in the position of the body, amongst the decapitated burials from this period has indicated that decapitation was either the probable mechanism of death in the majority of individuals, or it was an incidental part of a more extensive suite of peri-mortem injuries that were also very likely to have been the mechanism of death. This supports the thesis of previous researchers that, where decapitated individuals are found in specific "execution cemeteries", decapitation was the method of execution used. The nature of the decapitation-related trauma is also very similar to that previously reported, with posteriorly directed chopping blows, and associated injuries to the cranium, mandible, claviculae and scapulae in a large number of individuals. However, it is interesting that, although the numbers are very small, individuals showing evidence for decapitation from attritional cemeteries and isolated burials and settlements also demonstrate this type of decapitation, which may suggest that these burials also result from some form of judicial punishment.

Where radiocarbon dates are available, the attritional cemeteries in which decapitated burials are found date to the fifth to eighth centuries, with a number of the isolated burials and deposits from settlement sites also having a similar date range, whilst the majority of execution cemeteries seem to have been in use from the ninth to the eleventh centuries, although the dates from Walkington Wold, East Yorkshire, suggest that some sites had come into existence as early as the seventh century. This suggests that prior to the establishment of specific burial locations, decapitated, and therefore possibly executed, individuals were being accorded burial in attritional cemeteries or were being buried in isolation but that this ceased once these execution cemeteries had come into existence.

It is also interesting to note that a number of the isolated burials and both of the mass-graves with evidence for decapitation are associated with boundaries or earlier man-made landscape features, with the mass-grave from Oxford being on the site of a Neolithic henge monument (TVAS 2008), whilst the most obvious examples are the isolated burials at Stonehenge and Maiden Castle. This placement on or alongside boundaries or earlier landscape features is something that Reynolds (2009: 44) has noted for a number of the execution cemeteries. The association between monuments and sites of execution is also depicted in the early eleventh century Harley Psalter, with one scene showing three decapitated male bodies on, or within, a mound (Reynolds 2009: Fig. 7). The same scene shows decapitations in the process of being carried out, using both an axe and a sword, and the position of the body (flexed at the pelvis but with the neck straight, also shown in other medieval depictions of decapitation (see, for example, Reynolds 2009: Fig. 5), or upright with the neck extended) may explain why there are very few cases of analysed individuals where the decapitation seems to have been carried out with the neck flexed.

Although Reynolds (2009: 91) has suggested that decapitated burials in the earlier attritional cemeteries resulted from “superstitious motives” and were probably undertaken in the post-mortem period, the very small number of individuals with recorded evidence for decapitation-related trauma makes this very difficult to assess, and where peri-mortem trauma has been recorded, it is of an identical nature to that seen amongst the later “execution” burials. It is unfortunate that in the two cemeteries (Wasperton, Warwickhire and St. John’s, Worcester) where there is definite evidence of continuity in burial and decapitation from the Romano-British period into the early medieval period, poor bone preservation has precluded the identification of peri-mortem trauma, making it impossible to determine whether the method of decapitation also showed evidence of continuity. However, it has already been demonstrated in Chapter 4, that there is evidence that many Romano-British decapitations may also have been the mechanism of death, potentially making an interpretation of post-mortem decapitation in burials from early medieval attritional cemeteries less tenable.

Within the attritional cemeteries, decapitations were more likely to have had the head absent than in the other samples and this may suggest that the cranium and mandible were being removed in order that they could be displayed in other locations. This is suggested by the isolated cranium found at the base of a pit at Cottam, East Yorkshire, with evidence for weathering and a perforation through the vault, suggesting it had been displayed above ground for a period before being buried in the pit (Dobney *et al*. 1999), as well as the discovery of three crania and mandibulae, with associated cervical vertebrae that had evidence for sharp-force trauma, in a chalk-dug pit at Heytesbury, Wiltshire (Pastscape 2011a). However, in this case, the fact that they were excavated in an articulated state suggests that if they were displayed, it cannot have been for an extended period. However, isolated crania were still very rare amongst the isolated burial/settlement site sample (4.8% of the total), suggesting that many of the heads removed from burials in the attritional cemeteries have never been located. However, there is also the possibility that they were being reburied in the same, or another, cemetery (the isolated cranium and mandible of an adult female, unfortunately never subjected to skeletal analysis, accompanied by a copper-alloy pin and pottery vessel, was excavated from a stone-lined feature within the cemetery at Bidford-on-Avon, Warwickshire (Humphreys *et al*. 1925: 273)).

Isolated crania and headless post-cranial remains were relatively common in execution cemeteries (although the majority of burials had their cranium and mandible displaced from correct anatomical position) and there is evidence, especially from Walkington Wold, East Yorkshire, that the crania may have belonged to the post-cranial skeletons that were also found, but had, in the majority of cases, been displayed for an extended period of time, allowing the mandibulae and cervical vertebrae to detach from the cranium (Buckberry and Hadley 2007; Buckberry 2008). This is very interesting in the light of the discovery of an execution cemetery at Harestock, near Winchester, Hampshire, the derivation of the name “Harestock” being the Saxon *heafod stocc*, which has been suggested to refer to stakes set up on boundaries of ploughlands (Grundy 1919: 178), or to groups of pollarded trees (Kitson 1995: 96), but has more generally been accepted to refer specifically to places where the heads of criminals were displayed on posts or stakes (Skeat 1881: 492; Reaney 1960: 158; Meaney 1995: 30; Reynolds 2009: 31). However, there were no isolated heads found amongst the excavated burials at this particular site.

In all three decapitated samples, there were more males present than females and non-adults, and there was a total absence of mature adults. The lower numbers of adult females and non-adults would also support the theory that decapitation was the mechanism of death, although females and non-adults were not totally excluded from the practice (the tenth century Laws of Aethelstan state that anyone over the age of twelve would be put to death for stealing (II As 1)). The fact that decapitated individuals from attritional cemeteries were significantly less likely to have been buried in a coffin and significantly more likely to have been buried in a prone position than the wider cemetery population (the percentages of prone decapitated individuals in attritional and execution cemeteries are very similar), as well as having fewer objects in the grave (with objects and coffins also being very rare amongst the execution and isolated burials), also suggests that they were being treated differently to the rest of the individuals in the cemetery, something which may also support the idea that decapitation was the mechanism of death. The possibility that individuals who were subject to decapitation may have been different to the rest of the population is also suggested by the evidence that they had poorer dental hygiene, a poorer health status in adult life, increased mechanical loading and more wear and tear on their joints, as well as a higher rate of fractures.

These differences could possibly be a reflection of the lower social position of those individuals generally subject to capital punishment (theft, fighting and attacks on property are all listed as capital crimes in the ninth and tenth century law-codes (II As 1, Alf 7, II Edm 6)), although this is not to say that those amongst the higher social orders could not also have been decapitated (see Bradbury (2004: 125) for the beheading of 4500 Saxon nobles at Verden, Germany in AD785). However, in cases where kings and nobles were decapitated after they had been defeated in battle or murdered, bodies and heads appear to have been disposed of in marshes or rivers (Blair 2009: 551), in undergrowth (Clarke, D 1998: 114), or fixed to posts (Blair 2005: 62), although a number were later retrieved for burial in churches or monasteries (Thacker 1995: 101-102). It is not known whether any such high-ranking individuals would have been decapitated and then buried at specific sites of execution.

The evidence obtained from the skeletal remains of decapitated individuals from this period, including those from mass-graves, which has been discussed in detail above, will be compared with that from other periods in Chapter 10. The possibility that the decapitations were the result of judicial execution will be discussed in the light of evidence from other periods in Chapter 11.

Chapter 9: Decapitation in the Medieval and Early Post-Medieval Periods

There were only a very small number of sites from these two periods that had evidence for possible or definite decapitation burials, with forty individuals from twenty-six sites dating to the medieval period, and thirteen individuals from ten early post-medieval sites. Of those individuals where a biological sex was assigned, thirty-three (89.2%) were adult males, with two adult females (5.4%) and two non-adults (5.4%) also present. The cranium and mandible were found in correct anatomical position in twenty three cases (48.9%), with headless burials, and burials with the cranium and mandible displaced representing 19.1% each (nine cases in each case), and the remaining 12.8% (six cases) being represented by isolated deposits of crania and mandibulae. Decapitated individuals were identified from within cemetery assemblages (twenty-nine individuals, 56.9%), from within church buildings (eight individuals, 15.7%), from isolated burials or deposits (six individuals, 11.8%), and from mass-graves (eight individuals, 15.7%).

Among these examples of decapitation, there are a number of interesting reports, written in the nineteenth and early twentieth centuries, of non-controlled excavations in which decapitated individuals were found, including a headless skeleton from beneath a brick floor in the Saracen's Inn, Salisbury, Wiltshire (Brooke 1857: 50); a skeleton found with the cranium and mandible between the lower limbs beneath a brass at Freshwater Church, Isle of Wight (Venables 1860: 313); a coffined skeleton from beneath the floor at the church of Hooton Roberts, South Yorkshire, with one of the neck vertebrae "cut clean in half" (Gatty 1905: 89); and a skeleton from underneath Fordington Road, Winchester, that was dated to the thirteenth century from the associated artefacts, and that had the cranium, mandible and some cervical vertebrae absent (Andrew 1919). The most interesting description provided in one of these reports is that given by "L.M.M.R" (1852) about a lead coffined burial found in Nuneham Regis, Warwickshire, with preservation of soft tissue, hair and clothing, who had been beheaded. The head (with a peaked beard and long brown hair) had been wrapped separately in linen and placed at the neck end of the post-cranial remains that were dressed in a linen shirt (pulled up over the stump of the severed neck) with the initials "TB" embroidered on the front (*ibid.*). Unfortunately, the nature of these reports means that more detailed examination of the remains was not carried out at the time and none of the burials were removed from their original burial locations, making it impossible to now verify whether there was evidence for decapitation-related peri-mortem trauma to any of the individuals.

Other interesting cases where no osteological analysis appears to have been carried out, or where this data is not available, include an isolated cranium and mandible found at the level of the foundations in the chancel of Lammana Chapel, Looe, Cornwall, and “set upright” on the mandible (Andrew 1939); and the burial of an adolescent female found just outside the boundary of the churchyard at Hoo St. Werburgh, Kent, who had the cranium and mandible buried by the side of the torso (BBC 2009). Other cases are said to have had no evidence for peri-mortem trauma, including a medieval burial from Whithorn, Scotland, with the cranium, mandible and C1-C2 found beneath the left elbow (Cardy 1997: 551); the medieval burial of a juvenile from the cemetery of St. Mary Spital, London, with the cranium and mandible found at the feet (Thomas *et al*. 1997: 122); and a very interesting post-medieval adult male burial, found in an isolated grave adjacent to the church at Guestwick, Norfolk, who was buried in a contorted position with the left upper limb and both lower limbs flexed, and who had the cranium and mandible placed next to the right hand, which had copper-alloy eyelets on two of the digits (McKinley 1987). Unfortunately, this burial cannot now be located in archive and it was probably reburied soon after the original analysis.

A small number of other burials have limited information available on the evidence for peri-mortem trauma, including a post-medieval adult male burial from the prison cemetery at Oxford Castle, who had been subjected to a post-mortem craniotomy as well as having had the head removed with a saw cut through the cervical vertebrae (Mitchell *et al*. 2011), before the cranium was placed into the opened rib-cage (Tarlow 2011: 76-77); a poorly preserved skeleton from St. Mary Graces, London, with a posteriorly directed chop through the superior of the body and arches of C4 (Bekvalac and Kausmally 2011: Fig. 115); and the isolated deposit of an adult male cranium and C1-C3 from a gulley in the grounds of Basing House, Basingstoke, Hampshire, almost certainly dated to the Civil War siege of the house, and that had evidence for a sharp-force injury to the right parietal and a penetrating injury crossing the left lambdoid suture, as well as possible peri-mortem damage to C2 and C3 (Anderson 1999: 28).

9.1 Osteological data

More detailed osteological information was available for a sample of twenty-one individual skeletons from eight medieval sites, twelve of which were analysed as part of this research. Of the twenty-one individuals, only one was female (an adolescent/young adult (4.8%)), with the rest being adult males, including three young adults (14.3%), fourteen middle adults (66.6%), and three mature adults (14.3%). Table 9.1 shows the percentages of males and females and the age distribution in this sample compared with that obtained from the published reports of six different medieval cemetery populations (see Appendix 2 for a list of these sites). It can be seen that, whilst there are significantly more males and fewer females amongst the decapitated sample than in the wider population, there are no significant differences in the age distribution between the two samples.

	decapitated sample	wider sample	*p* value
males	20 (95.2%)	966 of 1673 (57.7%)	*0.0002
females	1 (4.8%)	707 of 1673 (42.3%)	*0.0002
adolescent	1 (4.8%)	29 of 1008 (2.9%)	0.4661
young adult	3 (14.3%)	189 (18.8%)	0.7810
middle adult	14 (66.6%)	555 (55.1%)	0.3766
mature adult	3 (14.3%)	235 (23.2%)	0.4386

Table 9.1: sex and age distribution amongst the decapitated and larger cemetery populations

The stature could be calculated for nineteen of the decapitated individuals and the mean stature was 172.8cm, which was not statistically significantly different (p=0.1814) from the mean stature of 171cm calculated from 8494 individuals from thirty-four different cemetery sites by Roberts and Cox (2003: 248).

Table 9.2 gives the rates of various pathological conditions amongst the individuals compared with the rates in the, above mentioned, sample of six cemetery sites for fractures, Schmorl’s nodes and *os acromiale*, and from a sample of individuals from sixty-three cemetery sites from the period (Roberts and Cox (2003: 221-286) for all other conditions.

	decapitated sample	larger population	*p* value
calculus	17 (81%)	961 of 1582 (59.2%)	0.0715
caries	5 (23.8%)	1376 of 2614 (52.6%)	*0.0138
periodontal disease	10 (47.6%)	584 of 1566 (37.3%)	0.3673
abscess	6 (28.6%)	506 of 1926 (26.3%)	0.8051
enamel hypoplasia	7 (33.3%)	628 of 1775 (35.4%)	1.0000
cribra orbitalia	5 (23.8%)	640 of 5752 (11.1%)	0.0768
non-specific infection	11 (52.4%)	631 of 4479 (14.1%)	*<0.0001
sinusitis	2 (9.5%)	276 of 2076 (13.3%)	1.0000
OA/DJD	14 (66.7%)	344 of 1233 (27.9%)	*0.0003
Schmorl’s nodes	12 (57.1%)	331 of 788 (42.5%)	0.1841
enthesopathies	19 (90.5%)	-	-
humeral asymmetry	2 (9.5%)	-	-
os acromiale	1 (4.8%)	18 of 186 (9.7%)	0.7000
fractures	8 (38.1%)	186 of 1390 (13.4%)	*0.0045

Table 9.2: rates of pathological conditions amongst the decapitated and wider cemetery populations

From the table, it can be seen that there are statistically significantly more individuals with dental caries amongst the decapitated sample than in the wider population. This cannot have been biased by differences in the age distribution between the two samples, as there was no evidence for this. Therefore, there is a possibility that the decapitated sample may have had access to a diet with higher levels of sucrose than was the norm for the period. There is also the possibility that the decapitated individuals were subjecting their joints to higher levels of stress than the rest of the population, as the rate of degenerative joint disease was significantly higher amongst the decapitated sample. Over ninety percent of individuals also had evidence for enthesopathies, although the rate of Schmorl’s nodes was not significantly different. There also does not seem to have been any evidence that the heavy muscular use of the decapitated sample extended back into non-adult life as the rate of *os acromiale* showed no difference to that in the wider population, whilst humeral asymmetry was also relatively rare. Health status in adult life seems to have been lower amongst the decapitated individuals, with a much higher rate of non-specific infection, whilst ante-mortem fractures were also significantly more common amongst this sample than in the wider population.

Table 9.3 shows the evidence for peri-mortem trauma amongst the sample and it can be seen that all but one individual had evidence for chopping blows. There were also very high numbers of individuals with evidence for non-decapitation related cranial and noncranial peri-mortem trauma, and blows were most commonly made from a number of directions in the same individual.

chopping blows	20 (95.2%)
incised cuts	1 (4.8%)
anterior	5 (23.8%)
posterior	5 (23.8%)
all directions	10 (47.6%)
post-cranial non-decapitation	16 (76.2%)
cranial non-decapitation	10 (47.6%)

Table 9.3: evidence for peri-mortem trauma amongst the sample

Of those individuals with detailed information available on the nature of the peri-mortem trauma, four (19.0%) had evidence for trauma related only to decapitation (three of these were from cemetery assemblages and one was from a mass-grave), whilst the remaining seventeen individuals (81.0%) had evidence for extensive peri-mortem trauma (fourteen from cemetery assemblages and three from a mass-grave), including individuals with chopping blows, incised cuts and stabbing injuries, located on the cranium, vertebral column, ribs, pectoral girdles, upper and lower limbs, hands and pelvis.

9.2 Decapitation-related trauma only

The individual from the mass-grave with evidence for this type of trauma was a young adult male from Towton, North Yorkshire (SK28), who was buried in an extended position with the cranium and mandible in correct anatomical position and who had a single incised cut to the anterior of the body of C3 (Novak 2000b), which is likely to be related to cutting of the throat rather than a definite attempt at decapitation and should probably be considered as the mechanism of death in this individual. The individuals from cemetery assemblages with this type of decapitation include a young adult male from Fishergate, York (SK50), buried supine and extended with the cranium and mandible absent, probably as a result of truncation (access to unpublished site archive provided for this site by the York Archaeological Trust), who had a chop to the anterior of the body of C5 (Fig. 9.1), a chop into the left superior facet of C5 from the superior left, and a chop through the inferior arch of C5 and superior arch of C6 directed from the anterior; and an old middle adult male from St. Michael's, Thetford, Norfolk (F62), with a single posteriorly directed chop through the odontoid process of C2 and inferior facets of C1 (Stroud 1993b) that also chopped into the posterior of the right mandibular ramus.

Figure 9.1: chop to the anterior of the body of C5 of SK50 from Fishergate, York

9.3 Extensive peri-mortem trauma

Individuals with this type of trauma include an old middle adult male from North Elmham, Norfolk (SK171), who had evidence for at least five separate injuries to the cranio-cervical skeleton, as well as seven separate post-cranial injuries. These include two chops to C4, one directed from the anterior and one from the posterior; a posteriorly directed chop through the inferior border of the mandible (Fig. 9.2) that completely bisected the element (the facial skeleton including the superior part of the mandible were not recovered from the grave, suggesting they may have been completely separated from the rest of the remains prior to interment); chops to both temporals from the superior that may have been attempts to remove the ears (Fig. 9.3); chops to the shaft of the left second metacarpal and corresponding proximal phalanx that are probably defensive injuries; two chops through the anterior of the manubrium; and a chop to the anterior of the distal left femur and proximal tibia with associated fracturing of the femoral shaft (Fig. 9.4). There was also an old middle adult male from Fishergate, York (SK101), who was buried supine and extended with the cranium and mandible in correct anatomical position, and who had evidence for twelve separate injuries to the cranio-cervical skeleton, as well as two post-cranial injuries. Two of the chopping blows to the cranium cut through the maxillae and left zygomatic and the anterior left of the frontal (Fig. 9.5). This part of the frontal, as well as the maxillary part of the facial skeleton, was not recovered from the grave, indicating that they had been completely separated from the rest of the individual at the time of burial.

Figure 9.2: chop through the mandible of SK171 from North Elmham, Norfolk

Figure 9.3: chop to the right temporal and parietal of SK171 from North Elmham, Norfolk

Figure 9.4: chop to the lateral and distal shaft of the left femur, with associated fracturing, of SK171 from North Elmham, Norfolk

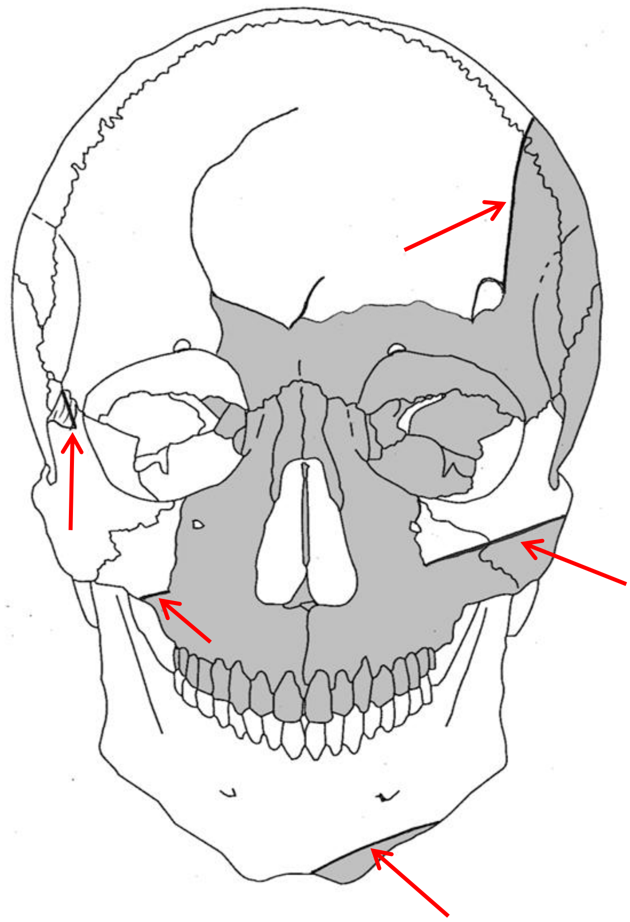

Figure 9.5: diagram of chopping blows (indicated by red arrows) and associated peri-mortem fractures to the cranium of SK101 from Fishergate, York. The shaded area represents the areas of bone absent from the grave (adapted from Buikstra and Ubelaker 1994)

Other individuals with this type of trauma include a young adult from Fishergate, York (SK41), buried supine and extended with the cranium and mandible in correct anatomical position, who had evidence for two chops to C4 and C5; nine separate chops to the cranial vault, facial skeleton and mandible, that were directed from the anterior, superior and left side; a chop to the midshaft of the left femur; a chop to the proximal shaft of the right femur; a chop to the dorsal side of one proximal hand phalanx that is probably a defensive injury; a stabbing injury to the lateral side of two left ribs (Fig. 9.6); and a stabbing injury, directed from the anterior left, that penetrated through the anterior of the torso, nicked the anterior of the bodies of T4 and T5 and stabbed into the blade of the right scapula. There was also an old middle adult male from George Street, York (SK65), buried supine and extended with the cranium and mandible in correct anatomical position (access to unpublished site archive provided by the York Archaeological Trust), who had three posteriorly directed chops to the arch of C2, three chops to the ribs, a chop to the transverse process of L3, a chop to the left ilium, and peri-mortem fractures of the shaft of the right clavicle, and right fifth metacarpal, likely to represent a defensive injury (Fig. 9.7). The only female from amongst the sample was an adolescent/young adult from Jewbury, York (SK2590), who was buried supine and extended with the cranium and mandible in correct anatomical position (Lilley *et al*. 1994), and who had evidence for five separate chopping blows to the cranium and mandible, including a chop to the left mastoid and zygomatic that seems to have been an attempt to remove the ear, and a chop directed from the anterior right that cut through the maxilla and right mandibular ramus, severing the roots of the maxillary right M2 (Brothwell and Browne 1994) and probably partially decapitating the individual.

Figure 9.6: stab to the lateral side of two left ribs of SK41 from Fishergate, York

Figure 9.7: peri-mortem fracture of the shaft of the right MC5 of SK65 from George Street, York (photo by author, courtesy of York Archaeological Trust)

The most interesting of the individuals with extensive peri-mortem trauma was the mature adult male from Hulton Abbey, Staffordshire (HA16), the remains of whom were found redeposited within the Chancel of the abbey, and who had evidence for at least sixteen separate peri-mortem injuries, including chops through the body and arch of C3 and stabbing injuries to the anterior of the bodies of C7 and L2. There were also chops through the left pectoral girdle that separated the left upper limb from the torso, and chops through the distal radii, both proximal femorae and left distal fibula and tibia. There were also vertical chops through the bodies of the thoracic and lumbar vertebrae and a horizontal chop through the body of L1 (Lewis, ME 2008). These chopping blows indicate that the individual was decapitated, and that the torso was separated into two sections, with the lower half of the body also being separated from the upper half, the left upper limb and both lower limbs separated from the torso, and the hands and left foot severed from the limbs. It was interpreted as evidence for a hanging, drawing and quartering and seems to be an almost unique case (*ibid.*) (see Chapter 8 for an early medieval individual from Maiden Castle, Dorset, who seems to have undergone the same type of treatment).

9.4 Discussion

There are relatively few individuals from the medieval and early post-medieval periods with evidence for decapitation and the vast majority of these are adult males. There does not seem to have been any evidence for selection by age or stature as to who was subject to decapitation, although there is some suggestion that the decapitated individuals may have had access to a different diet and had a harder physical adult life, with more fractures and degenerative joint disease and a poorer adult health status. There seems to have been evidence for two distinctive types of decapitation in the sample, with decapitation seeming largely to have been an incidental part of the suite of peri-mortem trauma demonstrated by the majority of individuals from the period, whilst only a very small number of individuals had evidence for decapitation-related trauma with no other injuries. The fact that the cranium and mandible were found in correct anatomical position in the majority of individuals would also suggest that decapitation was incidental, or, where it was the only form of trauma, that removal of the head was not an important part of the process. This may suggest that, as in the early medieval period (see Chapter 8), the decapitation may have been the mechanism of death, with it only being necessary to kill the individual, rather than completely separate the cranio-cervical skeleton from the rest of the remains.

In those individuals with extensive peri-mortem trauma, there were chopping blows (the most common type of cut), incised cuts and stabbing blows, with all areas of the skeleton potentially being affected. The high number of separate injuries to some individuals suggests that they were not purely defensive (although these type of injuries are present in some individuals) or incapacitating injuries, as, especially in individuals with multiple cranial injuries, it is very likely that they would have been successfully incapacitated by the first or second blow. The nature of these injuries in all individuals, regardless of their burial location, would suggest that they have a martial context, something that is confirmed by the burial location of four of the sample, namely in a mass-grave of thirty-six adult males at Towton, North Yorkshire. These burials can be safely assumed (from the location and type of the grave, an iron fragment that compares well in shape with a fifteenth century armour attachment, and a radiocarbon date of 1440-1640AD (Burgess 2000), as well as the demographic profile of the individuals and the evidence of extensive peri-mortem trauma) to be directly associated with the Battle of Towton that took place in 1461 and claimed the lives of between twenty and thirty thousand combatants (Boardman 2000: 25). Very similar peri-mortem injuries were recorded in a group of twenty-two adult male individuals from the cemetery associated with the priory of St. Andrew at Fishergate, York (Stroud and Kemp 1993: 232-241), nine of which were re-analysed as part of this research. In the past, these burials have been associated with the Battle of Fulford in 1066 (Boylston 2000: 371; Jones 2011: 236), although the original report does state that they are from at least three separate phases of burial (Stroud and Kemp 1993: 241). They are, therefore, more likely to have been associated with smaller episodes of conflict between the later eleventh and fourteenth centuries, although it is possible that some of the burials from the earliest phase may indeed relate to the battle. The adult male individual from George Street, York, is also possibly a battle victim as the traumata are located on the upper limbs, hands, vertebral column, ribs and pelvis, although there are no peri-mortem cranial injuries. This individual could also have been the victim of a less formalised type of interpersonal violence, which could also probably account for the cranial peri-mortem injuries in the adolescent/young adult female from Jewbury, York, supported by the fact that the injuries in this individual were focused on the cranium (there was also a young adult female from the George Street cemetery (SK86) with multiple peri-mortem cranial injuries as well as defensive injuries to the proximal humerus (Tucker 2007)). In all these individuals with multiple peri-mortem traumata, it is probably safe to assume that the injuries were the mechanism of death, with decapitation being an incidental part of the act.

The only individual with extensive peri-mortem trauma for whom a different interpretation has been offered is the mature adult male from Hulton Abbey, Staffordshire, for whom the decapitation was a prelude to quartering, with the limbs being severed from the body, the hands and feet removed and the torso separated into vertical and horizontal segments (Lewis, ME 2008). The decapitation and the chopping injuries to the limbs could have been the result of some form of conflict, although the vertical chops through the vertebral column have only been recorded in one other individual from the entire decapitated sample (the adult male from Maiden Castle) and seem to be the signature peri-mortem injuries for this type of judicial punishment.

Chapter 10 discusses all of the interpretations suggested for the different types of decapitation in the light of the evidence from the burials discussed above.

Chapter 10: Comparison between the Decapitated Individuals from the Iron Age, Romano-British and Early Medieval Periods.

There has already been some discussion in this thesis about whether there may be evidence from the dating of some cemeteries and burials for continuity in the practice of decapitation, both between the Iron Age and Romano-British period, and between late Roman Britain and the early medieval period. This chapter aims to look at whether there is any possibility of continuity between the periods in terms of the demographic profile of those affected by decapitation, the burial practice and position of the head within the grave and the health status and evidence for peri-mortem trauma amongst the different samples.

10.1 Demographics

Table 10.1 shows the numbers of adult males, adult females and non-adults represented in the decapitated samples from the Iron Age, the urban and rural/small-town Romano-British samples and the attritional cemetery and pooled data from the execution and isolated/mass-grave samples from the early medieval period, whilst Table 10.2 shows the statistical differences between the samples from the different periods. It can be seen that there are no differences in the demographics of the Iron Age sample compared with the Romano-British urban sample, and also no differences between the Romano-British urban sample and that from the early medieval attritional cemeteries. However, there are statistically significantly more adult females and fewer adult males in the Romano-British rural and small-town sample when compared with the numbers in both the Iron Age and early medieval attritional decapitated samples whilst there are statistically significantly more adult males and fewer adult females and non-adults in the early medieval execution/isolated burial sample than in either the Romano-British urban or rural and small-town decapitated samples.

	Iron Age (n=60)	Roman rural/small-town (n=276)	Roman urban (n=135)	early med attritional (n=92)	early med execution/isolated (n=168)
male	36 (60.0%)	116 (42.0%)	96 (71.1%)	60 (65.2%)	154 (91.7%)
female	13 (21.7%)	122 (44.2%)	25 (18.5%)	20 (21.7%)	8 (4.8%)
non-adult	11 (18.3%)	38 (13.8%)	14 (10.4%)	12 (13.0%)	6 (3.6%)

Table 10.1: demographics of the decapitated samples from the different periods

		p value
adult males	IA/RB urban	0.1378
	IA/RB rural and small-town	*0.0146
	RB urban/EM attritional	0.3830
	RB urban/EM execution	*<0.0001
	RB rural and small-town/EM attritional	*0.0002
	RB rural and small-town/EM execution	*<0.0001
adult females	IA/RB urban	0.6957
	IA/RB rural and small-town	*0.0013
	RB urban/EM attritional	0.6120
	RB urban/EM execution	*0.0002
	RB rural and small-town/EM attritional	*0.0001
	RB rural and small-town/EM execution	*<0.0001
non-adults	IA/RB urban	0.1628
	IA/RB rural and small-town	0.4186
	RB urban/EM attritional	0.5330
	RB urban/EM execution	*0.0206
	RB rural and small-town/EM attritional	1.0000
	RB rural and small-town/EM execution	*0.0005

Table 10.2: statistical differences between the demographics of the decapitated samples

Table 10.3 gives the more detailed adult age category data from the smaller samples for which detailed osteological information was available, with the statistical differences between the different periods being given in Table 10.4.

	Iron Age (n=17)	Roman urban (n=94)	Roman rural/small-town (n=110)	early medieval attritional (n=6)	early medieval execution/isolated (n=38)
young adult	8 (47.1%)	11 (11.7%)	13 (11.8%)	2 (33.3%)	16 (42.1%)
middle adult	6 (35.3%)	75 (79.8%)	70 (63.6%)	4 (66.7%)	22 (57.9%)
mature adult	3 (17.6%)	8 (8.5%)	27 (24.5%)	0	0

Table 10.3: more detailed adult age profiles in the decapitated samples from the different periods

		p value
young adult	IA/RB urban	*0.0016
	IA/RB rural and small-town	*0.0014
	RB urban/EM attritional	0.1734
	RB urban/EM execution	*0.0002
	RB rural and small-town/EM attritional	0.1725
	RB rural and small-town/EM execution	*0.0002
middle adult	IA/RB urban	*0.0004
	IA/RB rural and small-town	*0.0343
	RB urban/EM attritional	0.6030
	RB urban/EM execution	*0.0158
	RB rural and small-town/EM attritional	1.0000
	RB rural and small-town/EM execution	0.5640
mature adult	IA/RB urban	0.3695
	IA/RB rural and small-town	0.7605
	RB urban/EM attritional	1.0000
	RB urban/EM execution	0.1042
	RB rural and small-town/EM attritional	0.3335
	RB rural and small-town/EM execution	*0.0002

Table 10.4: statistical differences between the numbers in each adult age category in the samples from different periods

It can be seen that compared with the Iron Age and early medieval execution and isolated burial samples, the Romano-British samples have statistically fewer young adults and statistically more middle adults, whilst there are no differences between the numbers of mature adults in most samples, with the exception of the Romano-British rural and small-town sample compared with the early medieval execution and isolated burial sample, with there being statistically more mature adults in the former group. The very small size of the early medieval attritional cemetery sample can probably account for the absence of any differences between this sample and either of those from the Romano-British period.

10.2 Burial practice and position of the head

The decapitated individuals in the Romano-British urban sample and the early medieval attritional cemetery sample were significantly less likely to have been provided with a coffin than the wider population, whilst those in the former sample were also significantly less likely to have had objects buried with them (the decapitated individuals from the latter sample also had fewer objects than the wider population, although it was not statistically significant). Decapitations from both periods were also statistically significantly more likely to have been buried in a prone position than the rest of the population. Table 10.5 shows the different position of the head in the decapitated burials from the different periods and Table 10.6 shows the statistical differences between the different periods.

	Iron Age (n=101)	Roman urban (n=130)	Roman rural/small-town (n=318)	Early Med attritional (n=140)	Early Med execution/ isolated (n=216)
displaced	30 (29.7%)	86 (66.2%)	251 (78.9%)	67 (47.9%)	120 (55.6%)
absent	17 (16.8%)	15 (11.5%)	39 (12.3%)	57 (40.7%)	46 (21.3%)
correct position	7 (6.9%)	23 (17.7%)	18 (5.7%)	12 (8.6%)	24 (11.1%)
head only	47 (46.5%)	6 (4.6%)	10 (3.1%)	4 (2.9%)	26 (12.0%)

Table 10.5: position of the head in the decapitated samples from the different periods

		p value
displaced	IA/RB urban	*<0.0001
	IA/RB rural and small-town	*<0.0001
	RB urban/EM attritional	*0.0031
	RB urban/EM execution	0.0553
	RB rural and small-town/EM attritional	*<0.0001
	RB rural and small-town/EM execution	*<0.0001
absent	IA/RB urban	0.2566
	IA/RB rural and small-town	0.2432
	RB urban/EM attritional	*<0.0001
	RB urban/EM execution	*0.0283
	RB rural and small-town/EM attritional	*<0.0001
	RB rural and small-town/EM execution	*0.0057
correct position	IA/RB urban	*0.0178
	IA/RB rural and small-town	0.6329
	RB urban/EM attritional	*0.0299
	RB urban/EM execution	0.1047
	RB rural and small-town/EM attritional	0.3046
	RB rural and small-town/EM execution	*0.0321
head only	IA/RB urban	*<0.0001
	IA/RB rural and small-town	*<0.0001
	RB urban/EM attritional	0.5287
	RB urban/EM execution	*0.0217
	RB rural and small-town/EM attritional	1.0000
	RB rural and small-town/EM execution	*<0.0001

Table 10.6: statistical differences between the position of the head in the decapitated samples from different periods

It can be seen that there were significantly more individuals with displacement of the head in the Romano-British samples compared to the sample from the Iron Age, whilst there were also significantly fewer individuals where the head was absent or where only the cranium and mandible were found in the Romano-British samples. These samples also contained significantly more individuals with the head displaced than in the samples from the early medieval period and significantly fewer individuals with the head absent. There were also some statistical differences between the Romano-British and early medieval samples in terms of how many individuals had the head in correct anatomical position and how many were represented by an isolated cranium and mandible.

10.3 Stature and pathological analysis

The males in both the Iron Age and Romano-British urban decapitated samples had a statistically significantly greater mean stature than individuals from the periods as a whole, with the other samples showing no differences between their average stature and that calculated for the wider population. The pathological analysis suggested that the decapitated individuals from both the Iron Age and Romano-British decapitated samples may have had access to a different diet, whilst the decapitated samples from all three periods had evidence for higher rates of degenerative joint disease, Schmorl's nodes and fractures than in the wider population, with those fractures recorded in the Iron Age and Romano-British samples having a high specificity for assault. The samples from the Romano-British and early medieval periods also had higher rates of non-specific infection than the wider population, suggesting they may have had a lower adult health status.

10.4 Evidence for peri-mortem trauma

Table 10.7 shows the different types of peri-mortem trauma recorded in the decapitated samples from the three periods, whilst Table 10.8 shows the statistical differences between the different samples.

	Iron Age (n=34)	Roman urban (n=96)	Roman rural/small-town (n=93)	early medieval (n=49)
chop	25 (86.2%)	81 (84.4%)	60 (72.3%)	48 (98.0%)
incised	4 (13.8%)	4 (4.2%)	8 (9.6%)	0
both	0	11 (11.5%)	15 (18.1%)	1 (2.0%)
anterior	5 (19.2%)	9 (10.2%)	42 (50.6%)	6 (13.3%)
posterior	20 (76.9%)	63 (71.6%)	24 (26.0%)	29 (64.4%)
lateral	0	2 (2.3%)	3 (3.9%)	3 (6.7%)
all directions	1 (3.8%)	14 (15.9%)	14 (19.5%)	7 (15.6%)
1 blow	13 (54.2%)	57 (59.4%)	39 (42.9%)	27 (55.1%)
2-3 blows	8 (33.3%)	20 (20.8%)	19 (20.9%)	13 (26.5%)
4+ blows	3 (12.5%)	19 (19.8%)	33 (36.3%)	9 (18.4%)
non-cervical decap	8 (23.5%)	29 (30.2%)	29 (31.2%)	25 (51.0%)
cranial non-decap	3 (8.8%)	11 (11.5%)	9 (9.7%)	4 (8.2%)
post-cranial non-decap	4 (11.8%)	8 (8.3%)	3 (3.2%)	7 (14.3%)

Table 10.7: evidence for peri-mortem trauma amongst the decapitated samples from the different periods

		p value
chop	IA/RB urban	1.0000
	IA/RB rural and small-town	0.2063
	RB urban/EM	*0.0119
	RB rural and small-town/EM	*<0.0001
incised	IA/RB urban	0.0835
	IA/RB rural and small-town	0.5045
	RB urban/EM	0.3002
	RB rural and small-town/EM	*0.0255
both	IA/RB urban	0.0664
	IA/RB rural and small-town	*0.0106
	RB urban/EM	0.0600
	RB rural and small-town/EM	*0.0054
anterior	IA/RB urban	0.3045
	IA/RB rural and small-town	*0.0061
	RB urban/EM	0.5764
	RB rural and small-town/EM	*<0.0001
posterior	IA/RB urban	0.8023
	IA/RB rural and small-town	*<0.0001
	RB urban/EM	0.4313
	RB rural and small-town/EM	*<0.0001
lateral	IA/RB urban	1.0000
	IA/RB rural and small-town	1.0000
	RB urban/EM	0.3355
	RB rural and small-town/EM	0.4237
all directions	IA/RB urban	0.1845
	IA/RB rural and small-town	0.1130
	RB urban/EM	1.0000
	RB rural and small-town/EM	1.0000
1 blow	IA/RB urban	0.6511
	IA/RB rural and small-town	0.3623
	RB urban/EM	0.7225
	RB rural and small-town/EM	0.2142
2-3 blows	IA/RB urban	0.2790
	IA/RB rural and small-	0.2775

	town	
	RB urban/EM	0.5304
	RB rural and small-town/EM	0.5277
4+ blows	IA/RB urban	0.5600
	IA/RB rural and small-town	*0.0273
	RB urban/EM	1.0000
	RB rural and small-town/EM	*0.0336
non-cervical decap	IA/RB urban	0.5142
	IA/RB rural and small-town	0.5098
	RB urban/EM	*0.0108
	RB rural and small-town/EM	*0.0288
cranial non-decap	IA/RB urban	1.0000
	IA/RB rural and small-town	1.0000
	RB urban/EM	1.0000
	RB rural and small-town/EM	0.7740
post-cranial non-decap	IA/RB urban	0.5112
	IA/RB rural and small-town	0.0821
	RB urban/EM	0.2662
	RB rural and small-town/EM	*0.0322

Table 10.8: statistical differences between the evidence for peri-mortem trauma between the different samples

It can be seen that there are significantly more individuals with chopping blows in the early medieval samples than in those from the Romano-British period, as well as significantly fewer individuals with incised cuts in the former sample when compared with the Romano-British rural and small-town sample. There are also more individuals in the Romano-British rural and small-town sample that had evidence for both chopping blows and incised cuts than in the Iron Age and early medieval samples, as well as more individuals with multiple blows, and blows delivered from the anterior. The early medieval samples had significantly more individuals with decapitation-related peri-mortem injuries to the cranium, mandible, scapulae and claviculae than either of the Romano-British samples, whilst this sample also had more individuals with post-cranial non-decapitated related trauma than the Romano-British rural and small-town sample.

10.5 Summary

In terms of the demographic profile of the samples, there are more differences between the Romano-British rural and small-town sample compared to those from the Iron Age and early medieval period than there are between those periods and the Romano-British urban sample. There were also more differences in the burial practice, with decapitated individuals from Romano-British rural and small-town cemeteries receiving the same burial treatment as the wider population, whilst Romano-British urban decapitations and those in the early medieval period were much less likely to have been provided with a coffin and much more likely to have been buried in a prone position. There was a lot of difference in the position of the head between the periods, with isolated crania and mandibulae being much more common in the Iron Age compared with the Romano-British samples, whilst displaced heads were more common in the Romano-British period, and individuals with the head absent much rarer than in the other two periods.

The taller than average stature of the individuals within the Iron Age and Romano-British urban decapitated samples, and the possibility that the individuals had access to a different diet than the rest of the population, the higher rates of degenerative joint disease, Schmorl's nodes and fractures amongst the samples from all three periods, as well as the higher rates of non-specific infection in the Romano-British and early medieval samples, compared with the wider population, suggests that there were differences between the decapitated individuals and the rest of the population in all three periods.

In terms of the peri-mortem trauma, there were more differences between the Romano-British rural and small-town sample compared to those from other periods, with more individuals having evidence for multiple blows, blows from the anterior, and both chopping and incised cuts. The sample from the early medieval period had much more evidence for non-cervical decapitation trauma and post-cranial non-decapitation trauma than either of those from the Romano-British period.

10.6 Types of decapitation

There were a number of different types of decapitation recorded amongst the samples from the three periods. In the Iron Age, the most common type of decapitation was chopping blows directed to the posterior of the cervical column. Individuals with multiple peri-mortem traumata were rarer, as were isolated crania and mandibulae with non-decapitation related peri-mortem trauma, and individuals with incised cuts to the cervical vertebrae that seemed to be related to removal of musculature and connective tissue in order to remove the head from the post-cranial remains. There was also limited evidence for post-mortem, and/or post-decomposition, manipulation of the cranium for display or for use as "skull-cups". Evidence for cranial manipulation was also found in the Romano-British sample, although examples were very rare, suggesting that there may have been limited continuity of such practices between the periods.

The Romano-British sample also contained a small number of individuals where the cranium and mandible had been removed with incised cuts through the musculature and connective tissue, although the absence of any other evidence for peri-mortem trauma (unlike the Iron Age examples, where this trauma can probably be assumed to be the mechanism of death), and the possibility that these individuals were decapitated post-mortem, suggests that there is little continuity in this type of decapitation from the earlier period. There are a number of individuals with posteriorly directed chopping blows from this period, which may suggest some degree of continuity, although the additional chopping blows and incised cuts recorded in some individuals, performed in order to completely remove the cranium and mandible, are not seen in the Iron Age examples, suggesting that the motivation behind the act may have been different in the two periods (although there are a number of individuals in the Romano-British sample where the cranium and mandible were not completely removed). There is also an absence of individuals with multiple peri-mortem traumata in the Romano-British sample, although there are a few individuals who seem to have incapacitating and/or defensive injuries in addition to the decapitating blows. However, in the Romano-British period, the act of decapitation appears to be the main focus, which is not necessarily the case in the Iron Age individuals.

The most distinctive form of decapitation recorded amongst the Romano-British cases, and not recorded at all in the earlier period, is slitting of the throat followed by complete decapitation, a type that is also not recorded amongst the decapitated sample from the early medieval period. There are also no individuals from the later period with evidence for incised cutting of soft tissues and disarticulation of the cervical column, suggesting that this is also a uniquely Romano-British type of decapitation. The most common form of decapitation recorded amongst the early medieval sample is multiple or single posteriorly directed chopping blows. The fact that evidence for this type is also seen in the Iron Age and Romano-British periods suggests that there may have been some degree of continuity, although, again, there is no evidence for additional chopping blows and/or incised cuts to ensure the complete removal of the head in the individuals from the early medieval period. This period also sees a re-emergence of decapitation associated with extensive peri-mortem trauma in which the decapitation appears to have been an incidental part of the process, rather than, as in the Romano-British period, its main focus.

10.7 Discussion

The most obvious form of continuity observed between the three periods in the decapitated samples is in the lower health status, higher levels of activity-related changes and the possibility of access to a different diet than was the norm in the wider populations. It is also very noticeable that there are higher numbers of adult males affected by decapitation in the Iron Age, Romano-British urban, and early medieval samples. The individuals in the Iron Age and Romano-British urban male samples were also taller than was the average for the rest of the population. This suggests that there may have been continuity in the concept that decapitated individuals were somehow different to the wider population, although it is not possible to determine whether this was due to a deliberate selection of individuals based on their health status, or whether these differences during life were a result of specific roles and activities undertaken by the individuals, which then predisposed them to decapitation.

There also appears to be continuity in the “poorer” burial practices accorded to decapitated individuals in the Romano-British urban and early medieval samples and in the higher numbers of individuals who were buried prone. Burial in a prone position has often been stated to show disrespect or fear of the buried individual (see Chapter 4 and Reynolds (2009: 68-76)), although it has also been argued that, while it is certainly a minority burial rite, it does not necessarily have negative connotations (Wilson 1992: 82), and may, in some cases, have been the accidental inversion of a coffined corpse (Rolleston 1869: 477; Egging Dinwiddy 2010: 44). However, the association of poorer burial practices and prone burial amongst decapitated individuals does indicate that there were differences, both in life and death, between those individuals and the rest of the population and this concept seems to have continued from the Iron Age, through the Romano-British, and into the early medieval period.

However, in terms of the placement of the head, the sample from the Iron Age had many more individuals represented by only the cranium and mandible (sometimes with associated cervical vertebrae), whilst individuals with the head absent were also much more common in this, as well as the early medieval, period, than amongst the Romano-British decapitations, where displacement of the head was the most common form. The Romano-British period was also the only one in which chopping blows associated with additional chops and incised cuts, performed in order to separate the cranio-cervical skeleton from the rest of the remains, were recorded, which suggests that the act of complete decapitation was much more important in this period than in either of the other two. There is also no evidence in the Romano-British sample for individuals with multiple peri-mortem traumata where the decapitation appears to have been simply part of the suite of injuries rather than the main aim. Where non-decapitation related trauma does exist in the Romano-British sample, its sole intention seems to have been to subdue the individual in order to allow the head to be severed.

The possibility of continuity between the Iron Age, Romano-British and early medieval samples is also suggested by the presence of individuals with chopping blows directed to the posterior of the neck. Some of these individuals have single, or two, chopping blows and it appears that, in these individuals, the removal of the head was not necessarily an important part of the process, as it was sometimes found in correct anatomical position. It seems, therefore, that in these cases, the aim was to kill rather than remove the head and, in that sense, there was continuity in the motivation behind decapitation across the three periods.

There is also evidence for limited continuity between the Iron Age and Romano-British periods in manipulation of cranial remains, with crania being worked and altered, as well as probably being displayed, in both periods. This does suggest that this aspect of decapitation-related activity was associated with a “Cult of the Head”, although the evidence for it is relatively rare compared with other forms of decapitation in both periods. Isolated crania and mandibulae were also found in both periods, with chopping blows being the most common type of decapitation-related peri-mortem trauma. However, these types of deposit are very rare in the Romano-British period, suggesting that, if they are also to be related to a head-cult, it had largely disappeared by the later period, whilst it was never as prevalent during the Iron Age as previously assumed.

The only sample in which adult females were more likely to have been decapitated was the Romano-British rural and small-town sample. This sample also had more anteriorly directed blows than seen in either the Iron Age or early medieval periods, as well as more individuals with multiple cuts and chops to the cervical vertebrae. There were also no differences in the burial practice accorded to decapitated and non-decapitated individuals in this sample, and there were more individuals with cut-throats associated with decapitation than in the urban sample. This form of decapitation, along with anteriorly directed incised cuts performed in order to sever the soft tissues of the neck (and not associated with other peri-mortem trauma, as seen in two crania and mandibulae from the Iron Age), was restricted to the Romano-British period, suggesting that some forms of the practice, both in terms of who was subject to it and the manner in which it was performed, were a purely Roman type with no continuity from earlier, or into later, periods.

Decapitations in the early medieval period were the least variable in terms of the types of cuts, with nearly all individuals having evidence for chopping blows delivered from the posterior, indicating that other forms of decapitation utilising incised cuts showed no continuity from the earlier period. There were also many more individuals with decapitation-related chops to the cranium, mandible, scapula and clavicle than in the earlier period, suggesting a certain imprecision in the way decapitations were performed that was not common in the earlier period.

In summary, there is some evidence for continuity, in the types of individual who were most likely to have been subject to decapitation and in how the decapitation was performed, between the three periods. Adult males with evidence for higher activity-related changes and a lower health status were the most common victims, with chopping blows being the most common type of peri-mortem trauma, with the individuals then being subject to “poorer” burial practices than was the norm for the rest of the population. However, individuals with evidence for extensive peri-mortem trauma were restricted to the Iron Age and early medieval period, whilst there was also much less variety in the methods of decapitation used in the latter sample. An absence of continuity in certain aspects of the practice was also indicated by distinctive types of decapitation being restricted to certain periods, with at least one type being found only in the Iron Age (non-decapitation trauma with incised cuts to the cervical vertebrae), whilst the Romano-British period had at least four distinctive types (incised cutting and disarticulation of the cervical vertebrae; cutting of the throat associated with decapitation; decapitation associated with additional chops and cuts in order to completely remove the head; and complete decapitation associated with incapacitating and/or defensive injuries), suggesting that decapitation in the Romano-British period may have been, at least in part, a distinctively different phenomenon to that recorded in other periods.

Chapter 11: Interpretations of the Practice of Decapitation

This chapter will re-examine the evidence for each of the different interpretations that have been given for the practice of decapitation in different periods, focused mainly on the Romano-British period, and that were outlined in Chapter 1 (the Cult of the Head; aiding passage to the afterlife; preventing the dead from returning; *poena post mortem*; human sacrifice; execution; warfare/interpersonal violence), based on the evidence that has been described and discussed in previous chapters.

11.1 Cult of the Head

There appears to be limited evidence for the Cult of the Head amongst Iron Age and Romano-British examples of decapitation. In the cases of the isolated head deposits from Stanwick and Heslington, North Yorkshire, the head was removed from the post-cranial remains with incised cutting, which may suggest that it was performed in a ritual context after the occurrence of a different mechanism of death (in the case of Stanwick, this was almost certainly a number of sharp-force injuries to the cranial vault and facial skeleton, performed with a heavy blade, although the same weapon was not used to perform the decapitation). The possible ritual nature of the head removal may suggest that this is related to a Head-Cult, although the heads were definitely, in the case of Heslington, and probably, in the case of Heslington, not displayed, at least for any length of time after decapitation had taken place.

There is more evidence for the Cult of the Head in the examples of drilled crania and possible skull-cups from Iron Age Britain, and similarly modified cranial remains from Romano-British contexts, as well as in isolated cranial remains (a number of which have evidence for peri-mortem trauma although not necessarily decapitation) from settlement and temple sites. This may indicate that there was limited continuity in the practice (which was already rare) into the Romano-British period, although Roman literary sources contain much more evidence for decapitation and display of heads by the Romans themselves, particularly the military, than by northern European Iron Age tribes. There is also the possibility that a Head-Cult may have existed in earlier periods in Scotland, with the evidence of long-term curation of cranial remains from the Cladh Hallan Bronze Age burials, although the evidence that the post-cranial remains were also being preserved and curated in similar ways suggests that it was not purely the head that was the focus for cultic activities at this site.

There is very little evidence to suggest that the “typical” Romano-British decapitation burial is related to a Head-Cult, as there are very few parallels for this specifically Roman type of the practice in preceding periods, either in Britain or Northern Europe, and there is a gap of at least a century (the majority of Romano-British decapitations dating to the mid-second century or later) between the Iron Age practices and those seen in the following period. There is also very little evidence that the heads of these decapitation burials were used in any form of display as the crania usually remained articulated with the mandible and cervical vertebrae and the post-cranial remains were almost always fully articulated, indicating a single episode of burial of the cranio-cervical and post-cranial remains in the immediate post-mortem period (although there is evidence that the cranium may have been displayed on top of the coffin or grave fill in two individuals, from Dunstable, Bedfordshire, and Baldock, Hertfordshire (see Appendix 3)).

11.2 Aiding passage to the afterlife

This interpretation has been suggested for post-mortem decapitations in cases where individuals were believed to have died before their time or in unusual circumstances. The demographic profile of the complete decapitated sample compared with wider cemetery populations indicates that there are significantly fewer non-adults amongst the decapitations than would be expected, suggesting that individuals subject to decapitation were not dying at a younger age, whilst the demographic profile of the rural and small-town decapitated sample mirrors that of the wider population, again suggesting that selection for decapitation based on an unusual age profile was not occurring. There was significantly more evidence for non-specific infection amongst the rural and small-town decapitated sample than in the wider population, which may be evidence for disease processes that may have led to premature death, however, the presence of skeletal responses to disease indicate that the conditions were chronic and those suffering with them were "survivors", whilst acute illness would have killed individuals before bony changes could manifest, leaving no evidence on the skeleton (the osteological paradox (Wood *et al*. 1992; Wright and Yoder 2003)). This, coupled with the similarities between the adult demographic profiles in the decapitated and wider populations, would suggest that there is little evidence from the sample of burials to support this interpretation.

There is also little evidence from either sample for peri-mortem trauma not directly related to the practice of decapitation and, where this is present, it is in the form of single sharp-force traumata that are in locations commensurate with the injuries being incapacitating or defensive injuries that probably occurred at the same time as the act of decapitation, rather than being related to accidental or violent deaths. However, the urban decapitated sample, particularly the adult males, contained significantly more middle adults and fewer mature adults than the wider cemetery population, suggesting that there is an age bias for those selected for decapitation in this sample, potentially arguing that this interpretation could be correct for a number of individuals. It is also a possibility that the visible deformities and disabilities recorded in a number of individuals may have led to beliefs that they would find it difficult to enter the afterlife because of their visible imperfection ("beauty and wholeness" being regarded as a mark of divine favour, with "ugliness and deformity" interpreted as representing the opposite (Garland, R 1995: 2)), although it is then difficult to see how and why another physical mutilation in the form of decapitation could have aided their passage. There also does not seem to be any obvious evidence for a selection process as to which members of the community with disabilities and deformities may have been selected for decapitation, as individuals of both sexes and all ages were subject to decapitation, whilst there are also both sexes and a wide variety of ages represented amongst individuals with disabilities who were not subject to decapitation.

11.3 Preventing the dead from returning

The presence of individuals amongst the decapitated sample with visible deformities and disabilities could also support this interpretation, as it may have been thought to lead to the dead being restless, or in a state of limbo, as they were unable to enter the afterlife successfully (see above), with decapitation believed to prevent, or end, this liminal state. However, as previously stated, not all individuals with disabilities were decapitated, so presumably not all these individuals were thought to automatically return to haunt the living. The presence of decapitated individuals within the rural and small-town sample who had higher rates of infectious disease, which may have led to unusual deaths and restless corpses (although see above), could also support this interpretation. The fact that prone burial is much more common amongst decapitated burials than among the wider cemetery population, with burial in a prone position suggested to relate to attempts to keep the corpse in the grave and prevent haunting (Hirst 1985: 37), may suggest that decapitation was performed for similar reasons (although the meanings of prone burial are as much up for debate as decapitation (Harman *et al*. 1981: 167-168; Philpott 1991: 71-75; Arcini 2009)).

There is also very little evidence in decapitated burials for other methods that attempted to keep the individual in the grave, such as placing heavy stones on the body, although there are two adult females (from Dunstable, Bedfordshire, and Tubney Woods Quarry, Oxfordshire), who, as well as being decapitated, had had their distal lower limbs removed (by peri-mortem chopping blows and incised cuts in the case of the individual from Dunstable) and replaced beside their upper limbs. This could have been an attempt to prevent the corpses from "walking" and its association with decapitation in these cases could also suggest that head removal was supposed to have the same effect. As the occurrence of this type of mutilation is very rare, both in decapitated and non-decapitated burials (a non-decapitated adult male from Dunstable had a peri-mortem severance through the right distal tibia and fibula, with the severed elements being placed under the left distal limb (Matthews 1981: 37), whilst a young adult male from Alington Avenue, Dorset, demonstrated evidence for a peri-mortem amputation of the right upper limb (Waldron 2002) with the severed elements being absent from the grave), presumably decapitation on its own was assumed to keep the individual in their grave.

There is better evidence from the medieval and later ethnographic evidence that this interpretation could possibly account for a number of decapitated burials, as the only reason ever given for post-mortem decapitation in these sources is as a method of preventing the dead from returning to haunt the living, bringing episodes of haunting to an end, or ending the return of individuals believed to be revenants. However, there are no similar written sources for the Roman period and there is a danger of projecting medieval and post-medieval ideas back into the ancient past, a problem very similar in nature to those assumptions that have been made about the prevalence of the Cult of the Head in Northern Europe being based on literary sources that refer specifically to Mediterranean tribes.

11.4 *Poena post mortem*

The evidence that the urban Romano-British decapitated sample, and particularly the adult males, were significantly less likely to have been provided with a coffin or objects than the wider urban cemetery population, and more likely to have been buried in a prone position (although see above for the arguments about what prone burial may signify), may suggest that the decapitation and associated burial practice was some form of *poena post mortem*. This may also be the explanation for the two adult female burials (previously mentioned) with their lower limbs removed and rearranged in the grave, as well as a non-adult from Stanground, Cambridgeshire, whose body had been dismembered and decapitated (see Appendix 3). Early medieval decapitated burials were also significantly less likely to have been provided with a coffin and more likely to have been buried prone than the wider cemetery population, which suggests that this may also provide an explanation for decapitated burials in this period.

There is a body of evidence from Roman literary sources and material culture for *poena post mortem* in the form of decapitation of statuary of deposed and hated rulers, with the decapitation of corpses also being recorded, in one case with the head subsequently being carefully buried with the rest of the remains. However, it was usually the case that heads, and sometimes bodies, were displayed and then disposed of, rather than being formally interred (there is the possibility that this may account for the isolated cranial remains found in pits and ditches on Romano-British settlement sites), and the majority of the surviving statuary show evidence for extensive mutilation of the face, something that is also recorded in the sources but is not generally recorded in decapitated burials (with the possible exception of an individual from Lankhills, Winchester, with a single sharp-force injury to the anterior of the maxilla and mandible, and a small number of individuals from Dunstable and Driffield Terrace, York, with multiple chop-marks to the mandible).

The evidence from the sources as regards the extensive nature of post-mortem mutilation and display, and the casual way in which bodies and heads were subsequently disposed of does not, therefore, find a reflection in the formal manner in which Romano-British decapitated burials were interred, whether or not they were accorded the same types of funerary equipment as the majority of the population. There is also almost no evidence amongst these burials for display of the head (there are no penetrating injuries and the mandible and cervical vertebrae remained in complete articulation with the cranium, although display of the head on top of the coffin may have occurred in a very small number of cases, as mentioned above), with a number of burials showing evidence that the cranio-cervical remains had been placed into the grave before the post-cranial remains.

11.5 Human sacrifice

There is the possibility that this may be the interpretation for the small group of isolated head deposits from the Bronze and Iron Ages that display evidence for peri-mortem trauma in addition to decapitation with incised cuts to the cervical vertebrae, as they may be examples of the "over-kill" that is often recorded in Iron Age bog bodies, also often assumed to have been sacrificial victims (Brothwell 1986: 28; Green 1998: 179). The rapid burial of the head from Stanwick, North Yorkshire, in a small pit, and the deposition of the head from Birstall, Leicestershire, in a palaeochannel may be evidence for burial in liminal locations (usually watery), something that also occurred with bog bodies, as well as with deliberate deposits of metalwork that are also suggested to have been sacrificed, items being deliberately broken or bent before deposition (Bradley 1979; York 2002; Yates and Bradley 2010).

In the Romano-British period, there are a number of decapitated burials, with significantly more found in rural and small-town cemeteries than in urban areas, with evidence for slitting of the throat, something that is also recorded in a number of bog bodies, and is commonly associated with human sacrifice in a number of different cultures (although cutting of the throat is also recorded in cases of murder and judicial execution), with the release of blood being an important part of the sacrificial process. These individuals are assumed to have been live human sacrifices (as there does not seem to be any motivation for specifically cutting the throat of a corpse during the process of decapitation), something that is supported by the presence of peri-mortem incapacitating injuries in some of the individuals, as well as evidence for dental trauma, flexion of the neck at the time the decapitating blows were delivered, and restraint of the limbs in the grave. There does not seem to have been a particular group of individuals who were selected for sacrifice, with adult males and females, as well as a small number of non-adults, displaying evidence for this type of decapitation, and it is interesting that a number of individuals thus selected demonstrated visible deformities and disabilities (hand trauma and amputations, for example). This seems to be in complete contrast to the perfect and unblemished nature of the animals selected for Roman religious sacrifice, something that was also expected of the priests who would have carried out the sacrificial rites (Garland, R 1995: 64). However, there is evidence that a number of Iron Age bog bodies also had disabilities and deformities of various kinds, including polydactyly, fractured limbs with shortening, limited mobility, scoliosis and dyschondrosteosis (a form of mesomelic dysplasia with deformity of the distal upper limb (Herdman *et al*. 1966)) (van der Sanden 1996), and it has been suggested that this contributed towards their selection for sacrifice (Green 1998, 2002). It is, therefore, possible that Romano-British decapitated burials with slitting of the throat are a continuation, with major modifications in terms of burial practice and location, of this practice.

It is also interesting that significantly more individuals with this type of decapitation were found in rural and small-town cemeteries, which may suggest that human sacrifices were largely performed in areas where centralised control and influence were weaker, although there are examples of individuals with cut-throats from extra-mural cemeteries in Winchester (*Venta Belgarvm*) and York (*Eboracvm*). This either suggests that it was still possible to carry out human sacrifices in areas where Roman influence and control was, arguably, at its peak (although the burials from Winchester date to the third and fourth centuries, when this influence may have been waning, even in urban areas (see Reece (1980b) and Jones (1987) for the decline of urbanism in these centuries, although also see Brooks (1986), Frere (1983: 21) and Wacher (1975: 305) for contrary evidence), possibly indicating, at least, complicity by the authorities. The number of examples with this type of decapitation was, however, small, indicating that if they are cases of human sacrifice, it was a rare event in Roman Britain.

11.6 Execution

The demographic profile of the decapitated sample from the Romano-British urban cemeteries, with fewer mature adults than would be expected, suggests that these individuals were not necessarily dying natural deaths, and this, coupled with the fact that there were significantly more adult males amongst the sample, may suggest that these decapitations are examples of judicial execution. It is known from the Roman sources that decapitation was used as a military punishment, and a military context for at least some of the individuals may be indicated by the taller than average adult male stature (the Roman army had height restrictions for recruits (see Chapter 5)), as well as the evidence for activity-related skeletal changes and patterns of ante-mortem trauma that suggest involvement in low level interpersonal violence.

Judicial execution could also be suggested for those Romano-British decapitated burials where there was evidence for single posteriorly directed chopping blows, especially where the neck was flexed, and/or where there was evidence for dental trauma, bodily restraint, or the head not being completely removed, suggesting that the aim of the decapitation was not to separate the cranio-cervical skeleton from the post-cranial remains but to kill (a number of these examples were from within the urban sample). It should not necessarily be seen as a problem that there were some adult females and non-adults included amongst this number, as the age of criminal responsibility in Roman law was seven, with boys over fourteen and girls over twelve considered to be adult for this purpose (Mousourakis 2003: 320; Cipriani 2009: 73), whilst no distinction was made between adult males and females in terms of the types of punishment that could be meted out (Chilton 1955: 78; Coleman 1990: 66), although decapitation does seem to have been more commonly performed on males (Chilton 1955: 78). The literary evidence for decapitation as a method of execution states that it was initially reserved for citizens, although this does not necessarily preclude Romano-British decapitated burials from being executions, as universal citizenship was introduced in the early third century, whilst the majority of decapitated burials date to the later third and fourth centuries. The formal burial accorded to decapitated burials is also not necessarily to be seen as an argument against judicial execution as the families of the executed were permitted to recover the body for burial.

The evidence that execution could account for a number of the decapitated burials in the early medieval sample is very similar in nature to that seen in the preceding period, with nearly all individuals being adolescent or adult males with posteriorly directed chopping blows and evidence for flexion of the neck, bodily restraint, and heads often remaining in full or partial articulation with the rest of the body, but also, unlike the preceding period, the majority of individuals are buried in isolated locations (in earlier centuries) or specific burial areas (from around the ninth century onwards), rather than in community cemeteries. This may represent a change in attitude about who could be buried in these cemeteries, and/or greater control by the authorities in how and where executed individuals could be interred. The very small number of decapitated individuals that are found in community cemeteries (which have skeletal evidence very similar in nature to those from the other types of burial location) may represent less formalised/extra-judical executions conducted and controlled by local communities, possibly with the family then being allowed to recover the body for formal burial. The display of heads of the executed also seems to have occasionally occurred in this period, with some cranial remains being recovered separately from post-cranial skeletons in execution cemetery assemblages, and isolated cranial remains that show possible evidence for display also receiving final interment in pits on settlement sites.

11.7 Warfare/Interpersonal violence

The presence of significantly more adult males amongst the decapitated samples from the Iron Age, and urban Romano-British, early medieval and medieval periods might suggest that they represent deaths as a result of warfare or less formalised interpersonal violence. Active participants in warfare in the majority of periods and cultures are much more likely to have been adult males (Walker 2001), although Redfern (2008b, 2009) has demonstrated that adult females were actively engaging in interpersonal violence during the Iron Age in Dorset. In contrast, skeletal remains that seem to relate to massacres are much more likely to have been composed of adults of both sexes and non-adults (Willey and Emerson 1993; Frayer 1997). The decapitated samples from the Iron Age and early medieval periods either derived from single graves in cemetery locations, isolated burials, or multiple interments in a single pit or grave, whilst all those from the Romano-British and medieval periods were recovered from single graves, a finding that may reflect differences in whether it was friendly or hostile forces who undertook the burial. It may also be a reflection of how many individuals were involved in the conflict event, as large numbers of casualties may have been easier to inter in a single pit close to the site of the battle (as was seen at Towton, North Yorkshire, described as the "largest and bloodiest battle" ever to take place on British soil (Gravett 2003: 7)).

The taller than average stature of the individuals in the Iron Age and urban Romano-British decapitated samples, plus the prevalence of activity-related skeletal changes and ante-mortem traumata with a high specificity for assault, may also indicate a military context for the burials. However, it is interesting that those individuals from the medieval period who were from a definite military context were not statistically taller than the wider adult male population, suggesting there may have been more selection on the basis of stature in earlier periods.

The multiple cranial and post-cranial peri-mortem traumata recorded in a number of individuals from the Iron Age, early medieval and medieval periods, with decapitation almost appearing to have been an incidental part of the suite of traumatic injuries, would suggest that they resulted from warfare or less formalised interpersonal violence rather than from an act focused on decapitating the individual. This is also suggested by the fact that the cranium and mandible were found in correct anatomical position in a number of these individuals, indicating that complete removal of the head was not achieved, and suggesting that it was not an important part of the mechanism of death in these individuals. However, the pattern of peri-mortem trauma in the Romano-British examples is very different, with the majority of injuries being concentrated on the cervical vertebrae and associated areas of the skeleton. In individuals with evidence for non-decapitation related trauma, the injuries were usually restricted to one or two separate traumata that seemed to be incapacitating or defensive injuries, whilst some of the cranio-cervical injuries in these individuals were probably associated with the removal of remaining soft tissue in cases where the decapitation was not successfully completed with a single or double blow. This indicates that head removal was an important part of the process and suggests that decapitation was the sole aim and purpose of the act. This suggests that in the Romano-British period, warfare is probably not the interpretation for any of the decapitated burials.

11.8 Live or dead?

The preceding discussion has suggested that there is some evidence that could be used to support each of the different interpretations that have previously been suggested for the act of decapitation, with the same evidence often able to be used to argue for at least two separate (and often vastly different) interpretations ("equifinality"). The differing nature of the evidence from the burial practices, demographic profiles, health status and peri-mortem trauma amongst the sample of decapitated burials also suggests that there are a number of different types of decapitation that probably resulted from very distinct and different motives, although it may be impossible to ever definitively say what these were, particularly for the examples from the Romano-British period.

However, there is more definitive evidence from a number of individuals as regarding whether they were already dead at the time of decapitation or whether the decapitation was the mechanism of death. A small number of individuals from the Romano-British period, as well as a group of isolated head deposits from the Bronze and Iron Ages, had evidence for incised cut-marks on the anterior of the cervical vertebrae, including some that were positioned in locations that would have been inaccessible unless the intervertebral connective tissues had already been partially severed. The precise nature of these cuts would suggest that decapitation was being performed on a corpse, although there is evidence that the Iron Age individuals had been killed immediately prior to decapitation (by hanging and multiple cranial sharp-force injuries). There was no similar evidence of trauma on the Romano-British examples, suggesting a non-violent mechanism of death in these cases and probably indicating decapitation as some form of post-mortem ritual.

A second group of individuals from the Romano-British period had evidence for slitting of the throat, and/or flexion of the neck when the decapitation was performed, peri-mortem dental trauma, incapacitating or defensive injuries, or evidence for restraint of the upper limbs. All of this evidence, particularly that for flexion of the neck, suggests that decapitation (or slitting of the throat as part of the decapitation process) was the mechanism of death in these individuals and therefore an interpretation of human sacrifice or judicial execution can be favoured in these cases.

Chapter 12: Identifying Decapitations: Signature List

A number of different types of decapitation have been identified and described in the previous chapters, with data presented on the nature of the associated peri-mortem trauma, the periods and types of site in which the type of decapitation is found, the types of individuals affected, the associated burial practice and body position and the possible interpretations for each type. Each of these different types is summarised below and it is hoped that they may be used to provide better descriptions of decapitated burials excavated and analysed in the future.

Type 1: incised cutting to the cervical vertebrae

Type 1a

Peri-mortem decapitation trauma: multiple incised cuts to the bodies, arches and facets of the cervical vertebrae
Other peri-mortem trauma: none
Frequency: rare
Periods found: Bronze Age, Romano-British
Types of sites: palaeochannel, urban cemetery, rural and small-town cemeteries
Individuals affected: adult males, adult females, non-adults
Position of head: isolated, displaced
Ante- or post-mortem: post-mortem
Possible interpretations: Cult of the Head (prehistoric example), *poena post mortem*, preventing dead from returning

Type 1b

Peri-mortem decapitation trauma: multiple incised cuts to the bodies, arches and facets of the cervical vertebrae
Other peri-mortem trauma: cranial sharp-force trauma, peri-mortem vertebral fractures
Frequency: rare
Periods found: Iron Age
Types of sites: settlement site, hillfort

Individuals affected: adult males

Position of head: isolated

Ante- or post-mortem: ante-mortem

Possible interpretations: Cult of the Head, warfare

Type 2: incised cutting to the anterior of the cervical vertebrae

Type 2a

Peri-mortem decapitation trauma: incised cut to the anterior of the cervical vertebrae associated with additional incised cuts to the cervical column

Other peri-mortem trauma: none

Frequency: rare

Periods found: Romano-British

Types of sites: rural and small-town cemeteries (statistically more for whole of Type 2), urban cemetery (rare)

Individuals affected: adult males, adult females, non-adults

Position of head: displaced

Ante- or post-mortem: probably ante-mortem

Possible interpretations: human sacrifice

Type 2b

Peri-mortem decapitation trauma: incised cuts to the anterior of the cervical vertebrae associated with additional incised cuts and/or chopping blows to the cervical column

Other peri-mortem trauma: possible (blunt-force cranial injury)

Frequency: rare

Periods found: Romano-British

Types of sites: rural and small-town cemeteries, urban cemeteries

Individuals affected: adult males, adult females

Position of head: displaced

Ante- or post-mortem: probably ante-mortem, certain in cases where neck flexed, more certain in cases with incapacitating injuries or restraint of body

Possible interpretations: human sacrifice, execution

Type 2c

Peri-mortem decapitation trauma: incised cuts to the anterior of the cervical vertebrae associated with additional chopping blows

Other peri-mortem trauma: possible (sharp-force cranial injuries, incapacitating injuries)

Frequency: rare

Periods found: Romano-British

Types of sites: urban cemeteries, rural and small-town cemeteries

Individuals affected: adult males, adult females

Position of head: displaced

Ante- or post-mortem: probably ante-mortem, certain in cases where neck flexed, more certain in cases with incapacitating injuries or restraint of body

Possible interpretations: human sacrifice, execution

Type 3: chopping blows to the cervical vertebrae

Type 3a

Peri-mortem decapitation trauma: multiple chopping blows to cervical vertebrae with no additional chops or cuts

Other peri-mortem trauma: none

Frequency: relatively common

Periods found: Romano-British, early medieval, medieval

Types of sites: urban cemeteries, rural and small-town cemeteries, attritional cemeteries, isolated burials, execution cemeteries, priory cemetery

Individuals affected: adult males, adult females, non-adults

Position of head: displaced, correct anatomical position, absent, isolated

Ante- or post-mortem: unknown, ante-mortem where neck flexed, possible ante-mortem in cases with dental trauma or evidence of restraint of the body

Possible interpretations: execution, *poena post mortem*, prevent dead returning

Type 3b

Peri-mortem decapitation trauma: chopping blow to cervical vertebrae with associated additional chopping blows or incised cuts

Other peri-mortem trauma: none

Frequency: relatively common

Periods found: Iron Age, Romano-British, early medieval

Types of sites: settlement sites, urban cemeteries, rural and small-town cemeteries, execution cemeteries

Individuals affected: adult males, adult females

Position of head: isolated, displaced

Ante- or post-mortem: unknown, ante-mortem where neck flexed, possibly ante-mortem in cases with evidence of restraint of the body

Possible interpretations: Cult of the Head, execution, *poena post mortem*, prevent dead returning

Type 4: single chopping blow to the cervical vertebrae

Type 4a

Peri-mortem decapitation trauma: single chopping blow to cervical vertebrae delivered from the anterior

Other peri-mortem trauma: none

Frequency: relatively common

Periods found: Iron Age, Romano-British, early medieval

Types of sites: settlement sites, hillforts, urban cemeteries, rural and small-town cemeteries, execution cemetery

Individuals affected: adult males, adult females, non-adults

Position of head: displaced, correct anatomical position, absent

Ante- or post-mortem: unknown, possibly ante-mortem in cases with evidence of restraint of the body

Possible interpretations: Cult of the Head, execution, *poena post mortem*, prevent dead returning

Type 4b

Peri-mortem decapitation trauma: single chopping blow to cervical vertebrae delivered from the posterior

Other peri-mortem trauma: none

Frequency: common

Periods found: Iron Age, Romano-British, early medieval, medieval

Types of sites: settlement sites, hillforts, urban cemeteries, rural and small-town cemeteries, attritional cemeteries, execution cemeteries, isolated burials, church cemetery

Individuals affected: adult males, adult females, non-adults

Position of head: isolated, displaced, correct anatomical position, absent

Ante- or post-mortem: unknown, ante-mortem where neck flexed, possibly ante-mortem in cases with evidence of restraint of the body, dental trauma or head retained in correct anatomical position

Possible interpretations: execution, *poena post mortem*, prevent dead returning

Type 4c

Peri-mortem decapitation trauma: single chopping blow to the cervical vertebrae delivered from a lateral direction

Other peri-mortem trauma: none

Frequency: rare

Periods found: early medieval

Types of sites: execution cemeteries

Individuals affected: adult males

Position of head: correct anatomical position, displaced, absent

Ante- or post-mortem: unknown, ante-mortem when neck flexed, probably ante-mortem when evidence of restraint of the body

Possible interpretation: execution

Type 5: chopping blows associated with non-decapitation related trauma

Type 5a

Peri-mortem decapitation trauma: chopping blows to the cervical vertebrae sometimes associated with additional chops or cuts

Other peri-mortem trauma: sharp-/blunt-force cranial injuries

Frequency: rare

Periods found: Romano-British

Types of sites: urban cemeteries, rural and small-town cemeteries

Individuals affected: adult males, adult females

Position of head: displaced, correct anatomical position

Ante- or post-mortem: ante-mortem

Possible interpretations: execution

Type 5b

Peri-mortem decapitation trauma: chopping blows to the cervical vertebrae sometimes associated with additional chops or cuts

Other peri-mortem trauma: post-cranial sharp-/blunt-force injuries (defensive or incapacitating injuries)

Frequency: rare

Periods found: Romano-British

Types of sites: urban cemeteries, rural and small-town cemeteries

Individuals affected: adult males, adult females

Position of head: displaced, correct anatomical position

Ante- or post-mortem: ante-mortem

Possible interpretations: execution

Type 5c

Peri-mortem decapitation trauma: unknown

Other peri-mortem trauma: chops and cuts to remove lower limbs at the knee

Frequency: very rare

Periods found: Romano-British

Types of sites: rural and small-town cemeteries

Individuals affected: adult females

Position of head: displaced

Ante- or post-mortem: unknown

Possible interpretations: *poena post mortem*, prevent dead returning

Type 6: extensive trauma with incidental chopping blows to cervical vertebrae

Type 6a

Peri-mortem decapitation trauma: chopping blows to the cervical vertebrae (incidental)
Other peri-mortem trauma: extensive cranial and post-cranial sharp-force injuries
Frequency: common
Periods found: Iron Age, medieval
Types of sites: isolated burial, settlement sites, church cemetery, priory cemetery
Individuals affected: adult males
Position of head: absent, correct anatomical position
Ante- or post-mortem: ante-mortem
Possible interpretation: warfare

Type 6b

Peri-mortem decapitation trauma: chopping blows to the cervical vertebrae (incidental)
Other peri-mortem trauma: extensive cranial and post-cranial sharp-force injuries (restricted to defensive and incapacitating injuries)
Frequency: relatively rare
Periods found: early medieval
Types of sites: attritional cemeteries, isolated burials, mass-graves
Individuals affected: adult males
Position of head: correct anatomical position
Ante- or post-mortem: ante-mortem
Possible interpretation: warfare, massacre

Type 7: extensive dismemberment trauma with single chop to neck

Peri-mortem decapitation trauma: single chop to posterior of mandible or cervical vertebrae
Other peri-mortem trauma: extensive chopping blows to all parts of the skeleton with separation of elements and vertical chops to vertebral arches and bodies
Frequency: very rare

Periods found: early medieval, medieval

Types of sites: isolated burial, abbey cemetery

Individuals affected: adult males

Position of head: absent, displaced

Ante- or post-mortem: ante-mortem

Possible interpretation: execution

Type 8: incised cutting of the clavicle

Peri-mortem decapitation trauma: incised cuts to the clavicle

Other peri-mortem trauma: none

Frequency: very rare

Periods found: Neolithic

Types of sites: long barrows

Individuals affected: adults

Position of head: disarticulated

Ante-or post-mortem: probably post-mortem

Possible interpretation: unknown

Conclusion

This thesis has demonstrated that the practice of decapitation in Britain is much more varied than previously assumed, with a number of distinct decapitation types identified in burials from the Neolithic to the post-medieval period. The research has demonstrated the importance of the re-analysis of the skeletal remains in cases where decapitation is assumed, as a number of burials not previously reported to demonstrate any evidence for peri-mortem trauma were found to display very clear signs of trauma, both directly and indirectly related to the act of decapitation. Nearly without exception, where decapitated burials were subjected to detailed analysis during this research, such evidence for trauma was found, suggesting that this was the norm and that the act was one generally performed in the peri-mortem period, rather than being aided by the decomposition process, as has previously been stated for a number of such burials from the Romano-British period (see, for example, Bright 1998: 51; White 2000: 26; Mattingly 2006: 468 and Appendix 1). The thesis has also demonstrated that there is strong evidence that decapitation was the mechanism of death in a number of individuals from this period, in contrast to nearly all previous commentaries, which have seen the practice as being one only ever performed on a corpse.

The thesis has demonstrated that a small number of those individuals for whom decapitation was the mechanism of death may have been the victims of live human sacrifice during the Romano-British period. This is in stark contrast to previous assumptions that no decapitated Romano-British burials can have been the product of sacrifice, as it was a practice that had been banned throughout the Empire in 97BC (see Chapter 1). However, the ban was restated in the *lex Cornelia de sicariis et veneficiis* of 81BC (Paul. V.23.14-19), and it was also necessary for the Druidic religion, and its practice of human sacrifice, to be suppressed in Gaul and Britain during the first century AD (Plin. *Nat*. 30.4; Tac. *Ann*. 14.30). There is also a reference to a human sacrifice to Jove being carried out on Cyprus in the 2nd century AD, with the practice only being abolished during the reign of Hadrian (Lactantius *Div. Inst*. 1.21), all of which suggests that it continued despite official proscriptions. Bog bodies, such as Worsley Man, and the discovery of a 4th century *defixio* from Brandon, Suffolk, wishing for the sacrifice to Neptune of the thief who stole an iron pan (Isserlin 1997: 92), also indicate that the practice may have continued into the Romano-British period. The possibility that some decapitated burials from Roman Britain were the result of such live human sacrifice should, therefore, be reconsidered.

The thesis has shown that there do seem to be differences between the types of individuals on whom decapitation was performed in the Romano-British urban extra-mural cemeteries compared to those buried in small-town and rural cemetery sites, in terms of the demographic profile, health status, prevalence of ante-mortem trauma and burial practices. There were also differences between decapitated individuals and the wider cemetery population, especially in urban areas, which suggests that there was a degree of selection as to who was subject to decapitation, contrary to previous statements that the act of decapitation itself was the only aspect of the burial that distinguished it from the rest of the cemetery population (see, for example, Harman *et al*. 1981: 168; Philpott 1991: 80-81; Watts 1998: 74).

The thesis has also demonstrated that there seems to be very little evidence, either from the archaeological, literary, or ethnographic record, to support the majority of interpretations that have been used to explain the occurrence of decapitated burials in the Romano-British period, all but two of which (execution and warfare) are dependent on decapitation being a purely post-mortem act. Only one post-mortem interpretation, namely that decapitation was performed in order to prevent the dead returning to haunt the living, is supported by any evidence.

There appears to be limited evidence for the Cult of the Head in Britain during the Iron Age, with little evidence for continuity into the Romano-British period, and, where it does appear to have been a motivation for ritual practices, it resulted in post-mortem manipulation of cranial remains, rather than being the motivation for the “typical” type of decapitated burial where the cranium and mandible are interred with the post-cranial remains. This “typical” decapitation burial has been demonstrated to be largely limited to Roman Britain, with a very small number of such burials found elsewhere in the Empire, the majority of which, where evidence is available, seem to demonstrate very similar peri-mortem trauma to those examples from Britain where it has been demonstrated that decapitation was probably the mechanism of death. The existence of individuals on whom the decapitation was carried out post-mortem, or as a possible human sacrifice, therefore seems to be restricted to Britain, with the numbers of individuals for whom decapitation was probably the mechanism of death also being far in excess of anything seen elsewhere in the Empire. Although a limited number of the burials have been shown to date to the first to second centuries AD, the majority of decapitated individuals seem to belong to the third and fourth centuries AD, a period which has been argued to show a greatly increased regionalization across the Empire, in terms of trade (Millett 1990: 157-164) and building styles (see Hadman 1978 and Burnham 1988: 44-45 for the distinctively Romano-British aisled buildings). It would seem to be the case that decapitated burials were another form of this regionalization in Roman Britain. It could be argued that this was influenced by Celtic head-cult traditions of Ireland and Scotland, although, as this research has shown, there is as limited evidence for the Cult of the Head in the predominately Celtic areas of Britain as there is in England and Wales, suggesting that a different explanation needs to be sought.

By contrast, the thesis has largely confirmed the interpretations previously proposed for decapitations in the early medieval and medieval periods, namely execution and warfare, whilst providing striking evidence that a large number of Romano-British decapitated burials look very similar, in terms of the nature of the peri-mortem trauma, to burials from early medieval execution cemeteries. However, medieval victims of warfare have entirely different peri-mortem traumata signatures to Romano-British decapitations, indicating that this is unlikely to provide an explanation for such burials. The thesis has also provided further evidence to support Reynold's (2009: 245) assertion that specific execution cemeteries are a largely pre-Conquest phenomenon, with no such sites being identified that definitely date to the later medieval period. The thesis has, however, identified a small number of burials from parish church cemeteries and abbeys who show evidence for decapitation as a mechanism of death (or, in the case of the adult male from Hulton Abbey, Staffordshire, as part of a much more complicated process). This demonstrates that victims of judicial execution were no longer being buried in separate and specific locations, but had returned to being interred in community cemeteries, as was the case in the earlier centuries of the early medieval period. Reynolds (2009: 245-246) also notes this change in burial location, as well as a decrease in the number of executed criminals recorded in later medieval written sources, something that is also supported by the low numbers of decapitated burials from the period that have been identified in this thesis.

The variety of different types of peri-mortem signatures of decapitation demonstrated by this thesis (see Chapter 12) suggest that the act may have been performed for a number of different reasons, and that no one explanation can account for all such burials in any one period, although different interpretations should probably be given more weight in certain periods than others. Importantly, although equifinality may prevent decapitation burials that resulted from live human sacrifice from being completely separated from those produced by judicial and extra-judicial execution, the fact that decapitation has been demonstrated to have been the mechanism of death in a number of individuals argues that these interpretations should be given much more weight in any future discussion of Romano-British decapitated burials.

Directions for future research

The identification of so many distinct types of decapitation was not anticipated during the data collection phase of this research and the sample size was, therefore, not sufficient to allow separation into these different types for data analysis. A detailed osteological analysis of a larger sample of each type of Romano-British decapitation burial would provide data on whether there are any statistical differences, in terms of the demographic profile, stature, health status, ante-mortem trauma and burial practices, between individuals subject to each different type.

A limited sample of non-adult Romano-British individuals was available for the present research, a result of the cemetery sites selected for analysis having small numbers of such individuals, which made detailed discussion of the act of decapitation in such individuals impossible. A detailed osteological analysis targeted at decapitated non-adults would enable this discussion, based on the demographic profile, health status, ante-mortem trauma and the different types of decapitation related peri-mortem traumata observed in such individuals, to take place.

The thesis identified specific geographical areas within Britain, such as Lincolnshire and south-east England, where there were high levels of Romanisation but very few decapitated burials, and further research is needed to try and provide explanations for why this may be the case.

Only a very small number of decapitated burials from early medieval attritional cemeteries were available for analysis as part of this research, which did not permit detailed comparisons, both between the types of individuals affected and the types of decapitation performed, to take place for this period. This comparison needs to be undertaken in order to illuminate the possibility of continuity of burial practices, including decapitation, between the Romano-British and early medieval periods, which has already been suggested by the existence of cemeteries such as Wasperton, the use of which spans the fourth to seventh centuries AD. The analysis of a much larger sample of decapitated early medieval burials and their comparison with the Romano-British evidence would help to determine how prevalent this continuity actually was.

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Appendix 1: Skeletons Analysed

Site Name	**County**	**Period**	**No. Individuals**
Birstall	Leicestershire	Bronze Age	1
Maiden Bower	Bedfordshire	Iron Age	1
Prebendal Court, Aylesbury	Buckinghamshire	Iron Age	1
Sovell Down	Dorset	Iron Age	1
Danebury	Hampshire	Iron Age	3
Old Down Farm, Andover	Hampshire	Iron Age	1
Suddern Farm	Hampshire	Iron Age	1
Winklebury	Hampshire	Iron Age	1
Stanwick	North Yorkshire	Iron Age	1
Dunstable	Bedfordshire	Romano-British	13
Friary Fields, Dunstable	Bedfordshire	Romano-British	3
Gayhurst Quarry	Buckinghamshire	Romano-British	1
Alington Avenue, Dorchester	Dorset	Romano-British	1
Little Keep, Dorchester	Dorset	Romano-British	5
Maiden Castle Road, Dorchester	Dorset	Romano-British	1
Old Vicarage, Fordington	Dorset	Romano-British	1
Southfield House, Dorchester	Dorset	Romano-British	1
Woodcutts	Dorset	Romano-British	2
Woodyates	Dorset	Romano-British	1
Carfax, Winchester	Hampshire	Romano-British	1
Cowdery's Down	Hampshire	Romano-British	1
Eagle Hotel, Winchester	Hampshire	Romano-British	1
Hyde Street, Winchester	Hampshire	Romano-British	1
Lankhills, Winchester	Hampshire	Romano-British	13
Northbrook Avenue, Winchester	Hampshire	Romano-British	1
St. Martin's Close, Winchester	Hampshire	Romano-British	1
Victoria Road East, Winchester	Hampshire	Romano-British	1
Winchester Street, Andover	Hampshire	Romano-British	1
Mundford	Norfolk	Romano-British	2
Runham	Norfolk	Romano-British	1
129 The Mount,	North Yorkshire	Romano-British	1

York			
1-3 Driffield Terrace, York	North Yorkshire	Romano-British	30
6 Driffield Terrace, York	North Yorkshire	Romano-British	18
Moss Street Depot, York	North Yorkshire	Romano-British	3
The Mount School, York	North Yorkshire	Romano-British	5
Trentholme Drive, York	North Yorkshire	Romano-British	4
Mallows Cotton	Northamptonshire	Romano-British	1
Stanwick	Northamptonshire	Romano-British	6
Water Lane, Towcester	Northamptonshire	Romano-British	2
Great Casterton	Rutland	Romano-British	1
Maiden Castle Long Mound	Dorset	Early Medieval	1
Great Chesterford	Essex	Early Medieval	1
Bevis' Grave, Southampton	Hampshire	Early Medieval	1
Meon Hill	Hampshire	Early Medieval	10
Portway West, Andover	Hampshire	Early Medieval	1
Winnall	Hampshire	Early Medieval	2
Ketton Quarry	Rutland	Early Medieval	1
London Road, Staines	Surrey	Early Medieval	5
North Elmham	Norfolk	Medieval	1
St. Michael, Thetford	Norfolk	Medieval	1
Fishergate, York	North Yorkshire	Medieval	9
George Street, York	North Yorkshire	Medieval	1

Appendix 2: Comparative Sites

Chapter 4: Romano-British

Site Name	County	Reference
Rural and Small-Town Cemeteries		
Dunstable	Bedfordshire	Jones and Horne 1981; Matthews 1981
Friary Fields, Dunstable	Bedfordshire	Gardner 2004; Waldron 2004
Great Barford	Bedfordshire	Geber and Boston 2007; Timby *et al*. 2007
Kempston	Bedfordshire	Boylston and Roberts 2004; Dawson 2004
Gayhurst Quarry	Buckinghamshire	Anderson 2007; Chapman 2007
Babraham Institute	Cambridgeshire	Dodwell 2007b, n.d.; Timberlake *et al*. 2007
Camp Ground, Colne Fen	Cambridgeshire	Dodwell 2004a
Jeavons Lane, Cambourne	Cambridgeshire	McKinley 2009c; Wright *et al*. 2009
Market Deeping	Cambridgeshire	Gowland 2000; Trimble 2000
Milton Landfill	Cambridgeshire	Gibson *et al.* forthcoming; Wallis forthcoming
Yaxley	Cambridgeshire	Tucker 2008b
Chignall	Essex	Clarke, CP 1998; Stirland 1998
Ashchurch	Gloucestershire	Holst 2004a
Cotswold Community	Gloucestershire	Dean and Boston 2010; Powell *et al*. 2010
Frocester	Gloucestershire	Price 2000
Horcott Quarry	Gloucestershire	Clough 2009, n.d.a; Mullin *et al*. 2009
Roughground Farm, Lechlade	Gloucestershire	Allen *et al*. 1993
Cowdery's Down	Hampshire	Millett and James 1983
Winchester Street, Andover	Hampshire	Jennings 2000
Water Lane, Towcester	Northamptonshire	Walker *et al*. 2008
Cassington	Oxfordshire	Harman *et al*. 1981
Curbridge	Oxfordshire	Harman *et al*. 1981
Radley	Oxfordshire	Harman *et al*. 1981
Radley II	Oxfordshire	Chambers and Boyle 2007; Harman 2007
Stanton Harcourt	Oxfordshire	McGavin 1980; Harman *et al*. 1981
Great Casterton	Rutland	McConnell and Grassam 2005; Phillips and Leach n.d.;
Ilchester	Somerset	Everton and Rogers 1982; Leach 1982
Lakenheath	Suffolk	Anderson 2005; Caruth 2005
Birch Abbey, Alcester	Warwickshire	Denston 1994; Mahany 1994
Urban Cemeteries		

Alington Avenue, Dorchester	Dorset	Davies *et al*. 2002; Waldron 2002
Little Keep, Dorchester	Dorset	McKinley and Egging Dinwiddy 2009a; McKinley 2009b
Maiden Castle Road, Dorchester	Dorset	Smith *et al*. 1997
Poundbury, Dorchester	Dorset	Farwell and Molleson 1993
122 London Road, Gloucester	Gloucestershire	Simmonds *et al*. 2008
124 London Road, Gloucester	Gloucestershire	Foundations Archaeology 2003
Bath Gate, Cirencester	Gloucestershire	McWhirr *et al*. 1982; Wells 1982
Carfax, Winchester	Hampshire	Ottaway *et al*. forthcoming
Eagle Hotel, Winchester	Hampshire	Ottaway *et al*. forthcoming
Hyde Street, Winchester	Hampshire	Ottaway *et al*. forthcoming
Lankhills I, Winchester	Hampshire	Clarke 1979
Lankhills II, Winchester	Hampshire	Booth *et al*. 2010
St. Martin's Close, Winchester	Hampshire	Ottaway *et al*. forthcoming
Victoria Road, Winchester	Hampshire	Ottaway *et al*. forthcoming
Eastern London	London	Barber and Bowsher 2000
Trentholme Drive, York	North Yorkshire	Wenham 1968

Chapter 9: Medieval

Site Name	**County**	**Reference**
St. Nicholas Shambles	London	White 1988
North Elmham	Norfolk	Wells and Cayton 1980
Fishergate, York	North Yorkshire	Stroud 2003a
Helen-on-the-Walls, York	North Yorkshire	Dawes and Magilton 1980
Jewbury, York	North Yorkshire	Brothwell and Browne 1994
SS. James and Mary Magdalene, Chichester	West Sussex	Magilton *et al*. 2008