4. THE FINDS

Material from secure contexts in Sections 1, 4, and 6 were submitted for specialist analysis and are discussed in turn below. Where material was retrieved from insecure contexts, or dumped material from construction of the 'rampart', this material was identified and catalogued in the previous excavation reports (Hill 2019; 2021). Only human remains from insecure contexts were further analysed in order to determine minimum number of individuals (see Human Remains, 4.5, below). All finds, along with those retrieved during the initial test pitting works completed in 2019, have been allocated to National Museums Scotland (NMS) by the King's and Lord Treasurer's Remembrancer and the Scottish Archaeological Finds Allocation Panel through Treasure Trove. The assemblage will be catalogued by NMS under allocation number X.2024.40.

4.1 Pottery assemblage

Derek Hall

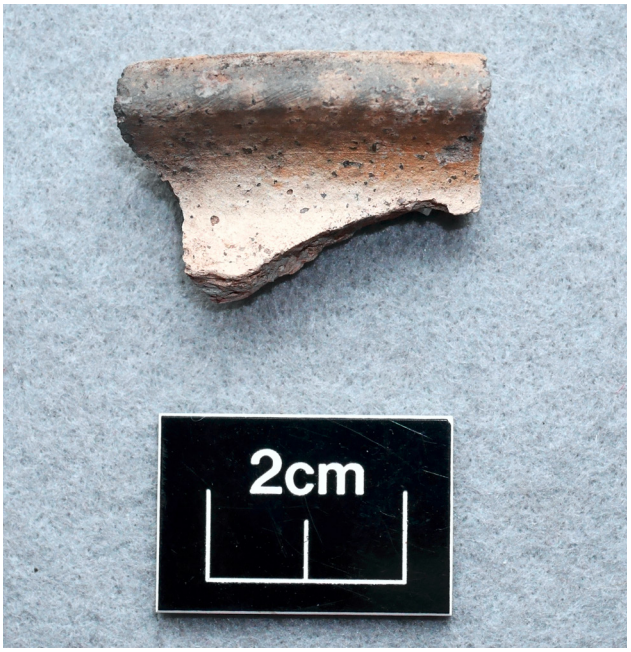
The excavations at Jedburgh Abbey 'rampart' produced a small assemblage of ceramics (12 pieces) ranging in date from the 12th to 19th/20th centuries. The assemblage includes sherds found during the earlier test pitting works. Four of the five sherds of medieval pottery from C026, C033, and C034 in Section 1 of these excavations would seem to date to the late 12th or early 13th century. All of the material has been examined by eye and x10 hand lens and where possible assigned to an accepted fabric name.

4.1.1 Unidentified redwares

Two rimsherds, SF5 and SF16, from C026 and C033 in Section 1 are from cooking vessels in this fabric type. The rimsherd from C033, SF16, is well made and of a fairly sophisticated design, the other sherd from C026 is a tiny fragment. Neither of these sherds seem comparable with the Coarse Redware fabrics that were first identified in the excavations at Jedburgh Abbey and Kelso Abbey in 1984, Whithorn Abbey in 1996, and Hayknowes Farm, Annan in 2001 which were suggested to represent an early 12th century fabric type possibly predating Scottish White Gritty Ware and to be potentially of a Northumbrian origin (Haggarty 1984: 395–7; Haggarty & Will 1984: 99; Clarke 1996: 510–8; Hall 2001: 130–2; Haggarty et al 2011: 7).

4.1.2 Scottish white gritty ware

Three sherds from C022, C033, and C034 (SF3, SF11, and SF13) are from vessels in this fabric; two (SF11 and SF13) are from cooking vessels and the third (SF3) is a strap handle fragment from a splash glazed jug. First identified in excavations at Kelso Abbey in 1984, it has long been identified as Scotland's earliest native pottery industry probably starting in the 12th century. Chemical analysis funded by Historic Scotland (now HES) in the 1990s identified production centres in the Scottish Borders, Lothians, and Fife. The basal angle from C033, SF11, would appear to be from a straight sided cooking vessel of a diagnostic Scottish Borders Type of 12th century date (Jones et al 2003: 49–50) and the rimsherd from C034, SF13, would also seem to be from a 12th century cooking vessel (Illus 12). The strap handle fragment, SF3, from C022 would seem to date to the 14th/15th centuries and has notches that have been cut into either side of the handle post-firing; these may be owners marks.



Illus 12 Rimsherd, SF13, from probable 12th century cooking pot (© Derek Hall)

4.1.3 Slipped Redware

There is a single redware rimsherd from C013 in Test Pit 3 that is from an open vessel form (bowl or dish) and is glazed yellow on a white slip. A glazed strip has been applied to the rear of the rim where it meets the body of the vessel to prevent the build-up of dirt in that gap. This sherd is of an unknown provenance although it has similarities to Slipped Redwares that were found in excavations at 13–19 Roxburgh Street, Kelso by the Border Burghs Archaeological Project in 1983–4 that have been dated to the late 17th century (Hall & Crowdy 2002: 85–6). Chemical analysis of sherds in that fabric from the 13–19 Roxburgh Street excavations as part of the Historic Scotland funded Scottish Redware Sourcing project suggested that they have a Tweed Valley signature suggesting an as yet unidentified local production site (Haggarty et al 2011: 48–50).

4.1.4 Wall tile

There is a single thin glazed tile fragment in a hard whiteware fabric from C049, SF36, in Section 6 that would appear to be of a 19th or early 20th century date.

4.1.5 Clay pipe

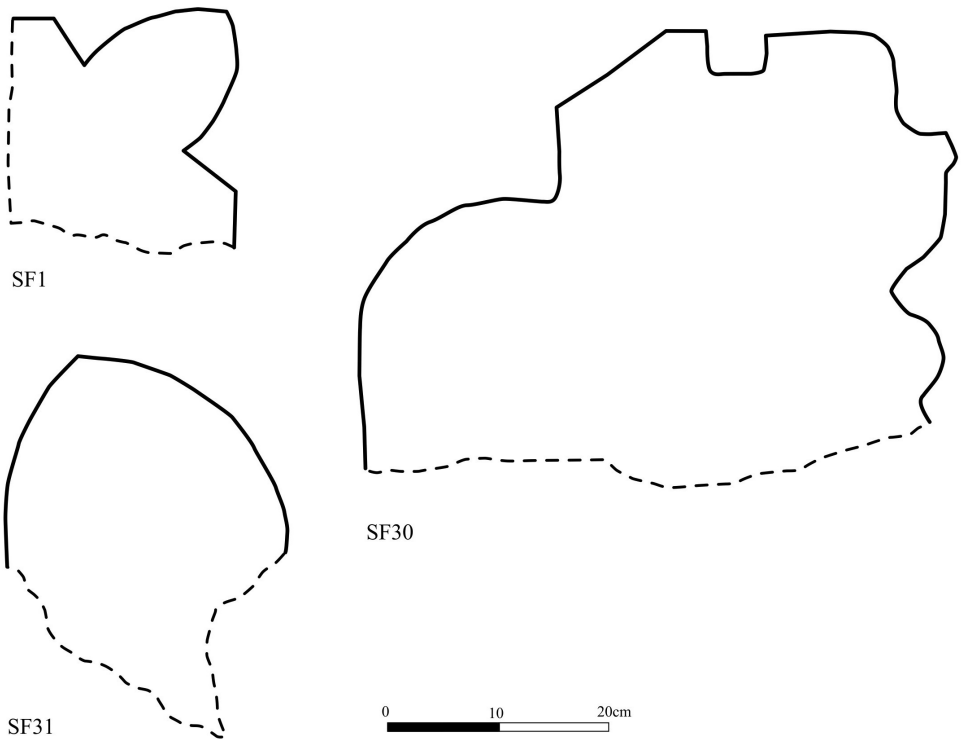
There are three clay pipe stems from C049, SF17 and SF27, in Section 6, and two from C013 in Test Pit 3 that are likely to be of 19th century date.

4.2 Architectural stones

Mary Márkus

During an excavation of the 'rampart' area at Jedburgh Abbey in 2020, three architectural stones were recovered (Illus 13). The large collection of ex situ architectural stones at Jedburgh Abbey (Márkus 1999–2001) was used for comparisons with these three excavated stones. A catalogue of the stones can be found below.

Two stones, SF1 and SF31, are very fragmentary, with the main moulded feature on each being a single pointed roll. This is a form that occurs frequently in Jedburgh's ex situ stone collection, and can be found in a wide range shapes and sizes,



Illus 13 Architectural stones retrieved from 'rampart' backing wall: SF1 Possible jamb or voussoir fragment; SF30 Fragment of window arch or jamb; SF31 Small, moulded fragment (Image by Heritage and Archaeological Research Practice from drawings by Mary Márkus)

and on various types of function, for example vault ribs, door jambs and smaller jambs, and voussoirs.

Narrowing the range of comparable stones in the collection by size and shape, SF1 can be related to a group of just three stones documented in the ex situ stones inventory. These are another jamb (Márkus 1999–2001: JED/j/49 (vol 16)) and 2 related voussoirs - jamb (Márkus 1999–2001: JED/v/6, JED/v/29 (vols 24 and 25)). Because of the relatively small-scale of the moulded elements on both the excavated stone and the inventory examples, it is likely that all of them originally came from a small arched opening, as might be found in a small doorway.

SF31 has much less detail remaining. For reasons of size and shape it cannot be related to SF1. Again, and for the same reason, it cannot be related to the many inventory stones with a pointed roll as part of their profile. The closest comparisons can be found in jambs and voussoirs in the abbey which are relatively small-scale, and as with SF1 it is likely that this originally came from a small arched opening, as might be found in a small doorway.

SF30 has a detail that makes it much more straightforward to allocate comparisons. A glazing check in the reveal indicates that it came from a window, and a roughly-finished flat surface opposite the reveal shows that it was not from a free-standing feature such as a mullion, or tracery. The small series of mouldings adjacent to the reveal contains ogee forms, indicating a 13th, but more likely a later 14th century date for the stone. An ex situ voussoir (or possibly a jamb) from Jedburgh jamb (Márkus 1999–2001: JED/v/40 (vol 26)) has a more complete version of the profile found on this window stone, including 1/4-rolls with lateral fillets.

While none of the comparisons between the three excavated stones and Jedburgh's ex situ collection provides definite and exact similarities, they do show sufficient parallels to make it highly likely that these finds came from the abbey originally.

4.2.1 Catalogue

▸ SF1 C022 1

Possible jamb or voussoir fragment, 13th century: 145mm × 200mm × 200mm. This small piece of coarse-grained sandstone is damaged, with both ends and sections of the sides broken away. The outer face is moulded, and the remaining profile consists of a damaged flat surface, chamfer, a pointed roll, chamfer, and a short section of another flat surface.

▸ SF30 C005

Fragment of a window arch or jamb; late medieval; 125mm × 220mm × 272mm. One end of this small piece of fine-grained sandstone is worked flat, with mortar still adhering. The opposite end and sections of the outer face are broken. A substantial glazing check remains on one side, and the profile consists of a small flat surface, ogee, 1/4-roll with a lateral fillet, the reveal with its glazing check, a chamfer, large 1/4-roll, and a roughly finished flat surface.

▸ SF31 C005

Medieval - 13th century; 62mm × 130mm × 190mm. This small moulded fragment is worked in medium-grained sandstone. Most of the original surfaces are broken away, but one end of the stone is worked flat, and the outer face is worked with a single pointed roll.

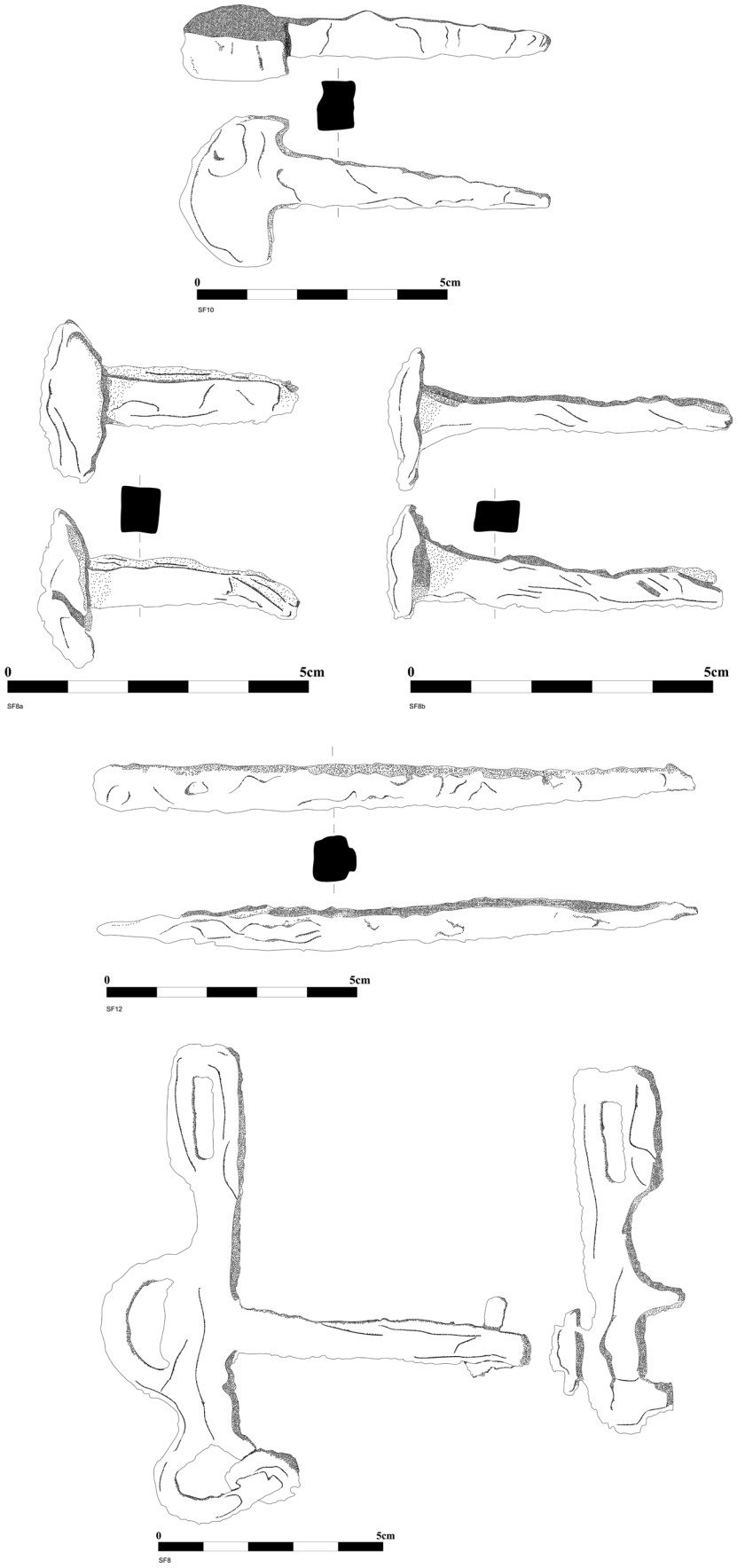
4.3 Metal assemblage

Alice Blackwell

A small ironwork assemblage and a piece of slag were recovered from secure contexts from excavations in Section 1 at Jedburgh Abbey Rampart (Illus 14). The assemblage consists of parts of a horse bit, a 'fiddle-key' horseshoe nail, a small tool, two wrought iron nails, and a piece of fuel-ash slag. Only the horseshoe nail is sufficiently diagnostic to be closely datable; it is from the medieval period. It was found in the hand of a skeleton, and was probably included in the grave as an amulet.

4.3.1 Discussion

The most striking find given its context is the horseshoe nail, SF10, found in the left hand of Individual 'B'. Fiddle-key nails date to the medieval period and were used to attach horseshoes (and specifically shoes of John Clark's types 1) formerly known as 'pre-Conquest', 2) formerly known as 'Norman' type, and 3) formerly transitional; Clark 2011: 75–97). The nail head would sit in a countersinking in the shoe but could project by up to about 5mm, meaning that many examples have



Illus 14 Metal finds: SF8 Iron curb 'Pelham' type bit; SF8a Iron nail; SF8b Iron nail; SF10 Fiddle key horseshoe nail; SF12 Fine iron tool (Image by Heritage and Archaeological Research Practice)

heads worn away to a T-shape. This example seems relatively unworn in comparison, and may well be unused. The size compares well to other examples; for instance, the 31 examples from Perth High Street ranged in length from 28–46mm, an average of 39mm (Franklin & Goodall 2012: 128–30). In England, type 3 horseshoes, the last to feature this form of nail, appear to have been replaced by the 15th century by a form lacking countersunk nails (Clark 2011, 96–7).

There is a long and extensive folk belief in the amuletic power of horseshoes and their nails, the origins of which are difficult to trace with certainty. The hammering of nails into trees for good luck appears to have occurred from at least the 15th century (see for example the Stock im Eisen, Vienna, which features nails from before it was felled around AD 1440; Czeike & Czeike 1999). A 14th-century preacher, Robert Rypon, noted that horseshoes and nails were reckoned among lucky finds (Harley MS 4894, ff32v–35). The symbolism of nails in the Passion in a Christian context is apparent in the medieval period, and may perhaps have merged with other folk connotations of horseshoe nails. The inclusion of amuletic objects in medieval graves is well attested, albeit not very common. An overview of evidence from Britain included, for example, single coins, beads, heirloom objects, and bullae, though no nails or horseshoes (Gilchrist 2008). Objects reviewed by Gilchrist were placed within the grave and occasionally on the body, though not specifically held in the hand, and were interpreted as usually performing a protective or 'healing' role for the corpse. It is possible that SF10 was likewise included in the grave as an amulet.

Also in the grave fill (C034), but not certainly associated with the skeleton was SF12, a fine iron chisel-like tool, its tapering point probably a slightly damaged tang for an organic handle. This indicates it was used with hand pressure rather than being struck, making it most likely for an organic medium (such as leather, bone, or wood) rather than metal. As other residual material came from the grave fills, it is likely that this too was an accidental inclusion in the grave, but it speaks of fine craft-working in the vicinity.

SF8 is an incomplete curb bit. Snaffle bits and curb bits were used throughout the medieval and post medieval periods. A snaffle bit consists of mouthpieces and simple looped cheek pieces, and delivers only the pressure applied by the rider. A curb bit is more complex with additional loops, linking bars and chains, with the potential for use with multiple sets of reins, and uses lever action to increase the pressure a rider can deliver to the horse. A curb bit works on several parts of a horse's head and mouth – the bit mouthpiece works on the bars, tongue and roof of mouth; the shanks provide leverage on the crown piece of the bridle acting on the poll (behind the horse's ears); and the curb chain acts on the chin groove. The severity of a curb bit depends on the curb chain, form of bit, and shank form and length. The lower shank may be curved, which gives the horse signalling time, effectively warning that the rider will engage the bit, or straight as on this example, which reduces or removes signalling time. A straight shank also generally means the horse has a fairly vertical head position (in modern riding, for example, in dressage), whereas curved shanks allow lowering, for example for grazing (as in some Western styles).

Curb bits occur in medieval illustrations and occasionally as medieval and post medieval archaeological finds (Clark 2011). This example does not belong to the early series of medieval hinged curb bits; instead, its cheek ring seems to suggest this is a 'Pelham' type, a bit that combines features of the curb and snaffle, enabling a second set of reins to be used (Clark 2020). The small number of surviving examples (as opposed to the many decorative bosses and hooks that survive) combined with the lack of parallels for some features here makes dating difficult. In particular, the use of a rectangular slot at the base of the lower shank (rather than a ring) has proved difficult to parallel, and appears to be absent amongst the (modest) corpus of medieval examples; modern curb bits occasionally have slots in this position but only when they appear in multiples, allowing the strap position to be adjusted. The apparently straight iron pin surviving at the junction in the jointed mouthpiece is also difficult to parallel – more usually the two halves have interlocking loops, although Ward Perkins' typology (1940) includes a form with a more complex arrangement of a separate joining piece of metal (in the shape of an hour-glass laid horizontal). On balance, the date is more likely to be post medieval than earlier.

The remaining two nails are undiagnostic and undated but could have been used in an architectural setting or perhaps in a coffin. The slag is fuel ash slag, undiagnostic of process, and could come from domestic rather than industrial activity.

4.3.2 Catalogue

▸ SF8 C026

Two parts of an iron curb 'Pelham' type bit. The more complete piece comprises (top to bottom): the purchase (that is, the upper part of the shank); the cheek ring, to which is attached an iron ring, presumably for linking to or part of the curb chain; a snaffle rein ring integral to the shank; one half of a jointed straight (ie no port) mouthpiece which is wrapped around the snaffle ring, and at the terminus wraps back around on itself, encircling a straight iron pin; a straight lower shank with a rectangular slot (rather than the more usual curb ring). The second piece of the curb bit comprises the lower shank and part of the snaffle ring and a short stub of the mouthpiece only. Dimensions of the more complete piece: overall length 104.5mm; length of lower shank (from bottom of snaffle ring to end of lower shank) 45mm; length of purchase (from top of snaffle ring to top of cheek ring) 24mm; internal diameter of snaffle ring 20mm; internal length of lower shank slot 18.5mm; internal thickness of slot 5mm; length of mouthpiece half 63mm; surviving length of pin in mouthpiece joint 16.5mm; internal max diameter of cheek ring 16mm.

▸ SF8a C026

Iron nail with rectangular-section tapering shank, incomplete, and a slightly domed head that is broadly square in plan. Slightly bent shank indicating it has been removed from something. Undiagnostic in terms of dating. Surviving length 42mm; maximum shank diameter 8mm × 9mm; head maximum 24mm × 25mm.

▸ SF8b C026

Iron nail with rectangular-section tapering shank, and a head that may be slightly domed and is now irregularly shaped in plan. Undiagnostic in terms of dating. Surviving length 55mm; maximum shank diameter 9mm × 8mm; head maximum 18.5mm × 22.5mm.

▸ SF10 C029

Fiddle-key horseshoe nail. Mushroom-shaped head, flat in section, off centre above a square-sectioned shank that tapers to a symmetrical, unbent point. The head is the same thickness as the top of the shank. Overall length 35.5mm; width of head 15mm; thickness of head 5mm; shank diameter 5.5mm – 1.5mm; shank length 25mm.

▸ SF12 C034

Small square-section fine iron tool, its size suggesting a role in shaping or decorating leather or wood. Tapering at one end to a broken point (probably the tang for an organic handle), and the other to a flat sharp working edge. Length 60mm; maximum thickness 4.5mm.

▸ SF12 C034

A small piece of undiagnostic fuel ash slag. Maximum size 32mm × 25.5mm × 13mm.

4.4 Animal bone assemblage

Jennifer Thoms

A small assemblage of bones was submitted for analysis, all of which were retrieved from midden deposit C026. There were 265 fragments in total, of which 192 were identifiable to element and, of those, 125 were identifiable to element and species. While this is a small assemblage the fact that all bones came from the same, secure context allows us a glimpse into the use of animals in Jedburgh at the time. Radiocarbon dating of a sheep radius from the midden has provided a date range in the early to mid-15th century.

The bones were identified as far as possible to element and species, and then examined under strong light and low magnification in order to assess their state of preservation and any taphonomic indicators. Taphonomic indicators are any signs or markings that are visible on bones and which might tell us about anything that has happened to the bone since the death of the animal. Examples would include butchery marks, charring or burning, and recent breaks. The state of preservation was assessed by visual appraisal of the surface of the bone, and how much, if any, had eroded away to expose the cellular inner structure of the bones. Most of the bones were in good condition – the surface entirely

present, or in fair condition, where less than half of the bone surface has been eroded away.

Identification followed metrical and morphological criteria detailed in Schmid (1972) and Hillson (1986), with distinction between sheep and goat following Boessneck (1969) and Payne (1985). It is not possible to distinguish every element on the skeleton between sheep and goat, so there are usually a large proportion of any assemblage that can only be classed as sheep/goat. Ageing followed Silver (1969), Grant (1982), Halstead (1985) and Payne (1973).

Five species of animal were represented: sheep (sheep/goat), cattle, pig, chicken, and dog. No bones could be positively identified as goat, so it is probable that all 'sheep/goat' are in fact sheep. Sheep make up 66% of the assemblage, cattle 23%, pig 4%, domestic fowl (chicken) 3%, and dog 2%. An unidentifiable shaft fragment from a large bird, such as a goose or swan, was also present, unfortunately lacking an articulating end which would have allowed it to be identified to species. Seventy-three fragments, unidentifiable to species were also present within the assemblage. These were not assessed for preservation state or for taphonomic markers.

The bones were well preserved with 85% of the total assemblage being in good condition, and the remainder being in fair condition. All 19 cranial bones were in good condition, reflecting the greater durability of teeth than bone, due to their higher mineral content.

The assemblage has a relatively high proportion of butchery marks, with 21% showing knife marks on the bone surface. As most butchery would not be expected to leave marks, this high percentage indicates that this is probably a deposit of food waste. Of the ribs and vertebrae, 28% were butchered, many showing signs of the animal being dismembered vertically into two halves, a method used from medieval times onwards.

A small assemblage such as this one might have derived from the butchery of one or two animals, however, the presence of four right mandibles from sheep of three different ages shows that at least four sheep are represented within the assemblage. One was a young animal of around six months of age, one was 1–2 years, one 4–6 years, the fourth had no teeth in the mandible so could not be aged. The presence of at least eight different individuals can be detected from the sample of left humeri from sheep present within the assemblage. A minimum number of four cattle were also represented. All the pig bones may have derived from one individual, as might all three dog bones.

The most commonly represented sheep bones were humerus, then pelvis, then radius, suggesting a mixture of waste from primary butchery (carcass preparation) and secondary butchery (kitchen and table waste). Cattle bones, on the other hand were mainly from the smaller bones of the foot, not prime meat producing parts of the carcass, although the tibia, scapula, and ulna were also present. The five pig bones were from a range of body parts, and may have derived from only one animal. Three dog bones were present, one was a fragment of the maxilla (upper jaw) and the other two were from the left foreleg, probably from the same individual. The dog bones showed no signs of butchery or other taphonomic markers, so it is unlikely they represent table waste. The assemblage appears to represent animal remains derived from a variety of activities relating to the disposal of carcasses.

The ages of cattle range from under 18 months to over four years, with no young or neonatal animals being present. This represents animals at their prime age for beef production. Similarly, the majority of sheep bones derived from animals that were over a year old, although one fragment of femur derived from a young animal, and a piece of pelvis (ilium bone) from a neonate. One sheep mandible came from an animal around six months old at death. The remainder of the sheep bones came from animals in their prime meat producing age, with the possible exception of one mandible from an individual aged 4–6 years.

The five pig bones were all post-cranial and only two were suitable for ageing purposes, they came from animal(s) aged around one year and under 12 months, so potentially all pig bones could have derived from the one animal.

The dog bones came from an animal over a year old and the chicken bones were from adult birds.

With the possible exception of the dog, the assemblage represents food waste. There is no evidence from the faunal assemblage of farming activities such as breeding, milking, or wool production, which would have yielded more neonatal, young, and old animals. The presence

of dog is slightly puzzling, but it may have been dumped on the rubbish dump /midden along with the other animal remains and rubbish. There are numerous ways in which bones can be removed from the place they have been deposited, and thus fail to enter the archaeological record, including scavenging by carnivores, which might include wolf, fox, dog, wild cat, and rats. Of course, the use of dog as food cannot be ruled out.

This well-preserved assemblage from a discrete context has provided evidence for the eating of prime animals, cattle, sheep, pig, and domestic fowl. The high proportion of butchery marks and low numbers of other taphonomic markers such as burning or gnawing, suggests a midden deposit of kitchen waste, which has not been left open to the elements very long after deposition.

4.5 Human bone analysis

Michelle Gamble

Repair works to the Jedburgh Abbey Rampart in 2020 revealed at least six articulated skeletons in situ, along with disturbed, commingled human and animal bone within the soil fill used to construct the 'rampart'. Amongst the articulated skeletons, two were completely excavated (Individuals 'A' and 'B'), another was heavily disturbed (Individual 'C'), while the other three were only observed once disturbed in section, with only a small amount of human bone removed during excavation and the rest of each skeleton left in the section. The two relatively complete and fully excavated articulated skeletons are the main focus of this analysis as the quantity of skeleton present means that more information can be interpreted from the remains. Previous reports (Hill 2019; 2021) have presented the complete inventories of the skeletal material recovered, therefore, this analysis includes a summary of the skeletal material, more detail regarding pathologies observed, and discussion of the contexts the skeletal material was recovered from.

A total of 496 human bone elements were recorded. On a strictly context basis (that is human remains in the different archaeological contexts), there are 31 individuals. However, given the highly fragmentary and commingled nature of some of the remains, this likely over-represents the number of individuals, with a more conservative minimum of 14 individuals more likely. In Section 1 two articulated adult individuals were completely excavated (Individual 'A' and Individual 'B'), one disturbed adult individual was partially excavated (Individual 'D'), and a minimum of five other adults from disarticulated, disturbed contexts (based on right tibiae) were recovered. The three non-adults in Section 1 are represented by an in situ cranium of an infant (Individual 'C'), and disarticulated fragments of a toddler, and a child. In Section 6 a further two articulated, but disturbed, adult individuals were identified (Individual 'E' and Individual 'F'), with a minimum of three more individuals present in disturbed contexts.

4.5.1 Methodology

Standard methods of observation and analysis of the human remains were employed and are in agreement with the recommendations from Buikstra and Ubelaker (1994) and Mitchell and Brickley (2019). This included age and sex estimation where possible (that is using bone fusion and development, tooth development or wear, and elements of the os coxa and cranium, respectively), and observations on pathological lesions which could be identified. Further details on the methods and the inventories can be found in Hill 2021. Given the commingled nature of the skeletal material, determining the minimum number of individuals (MNI) was crucial. The MNI within a context is determined by counting the number of the same bone present taking side, portion present, age, and sex into account. The largest number of the same aspect of a skeletal element present is then taken as the MNI (Buikstra & Ubelaker 1994). This number is not infallible and does not preclude the possibility that there may have actually been more individuals present.

4.5.2 Summary of osteological remains

A summary of the human remains identified and recorded, including MNI, is presented by context below (see also Table 1). This is followed by a discussion of the lifeways of the articulated individuals. Contextual information and interpretation of the burials of the articulated skeletal material is provided above (Sections 3.2 and 3.3).

4.5.3 MNI

The minimum number of individuals identified during the course of this excavation was established using skeletal development and multiples of the same bone element, as the remains were highly fragmentary and commingled in general. Based on the right humerus, there are 11 individuals present, however this does not account for all non-adult individuals. There are ten adults present, based on the right tibia, along with four non-adults: one 6–18-month-old (Individual 'C'), a toddler roughly 2–5 years based on the size of a femur fragment (C022), a child aged roughly 7–12 years based on size and fusion of a femur fragment (C022), and a 12–20-year-old adolescent (C049). This provides a more conservative minimum of 14 individuals, however, the true number of commingled and disarticulated individuals within this collection is not possible to determine with certitude. There are five adults and one infant present as in situ, at least partially, articulated skeletons.

4.5.4 Preservation

The surface preservation of the skeletal material varied across the site and the different contexts. Surface preservation and bone element completeness and fragmentation are crucial factors in the analysis and interpretation of human skeletal material. Individuals 'A' and 'B' were in excellent condition, though with some fragmentation, whilst the commingled material from the re-deposited infill

Table 1 Minimum number of individuals per context, with age and sex determinations where possible

Context	Section	Nature of Context	MNI	Adult	Sex	Non-adult
003/013	4	Upper fill	1	1		0
013	4	Fill	1	1		0
022	1	Infill behind 'rampart' wall	7	5	M	2 (7–10y, 2–5y)
022/023	1	Mixed infill and eroded wall	2	1		1 (child)
025	1	Slopewash east of (023)	2	1		1 (infant/child)
025/033	1	Mixed deposit above (028)	0	0		0
026	1	Infill west of (023)	1	1		0
027	1	Infilled topsoil	0	0		0
028	1	Skeleton – Individual A	1	1	F	0
029	1	Skeleton – Individual B	1	1	M	0
030	1	Skeleton – Individual C	1	0		1 (infant)
031	1	Skeleton – Individual D	1	1		0
032	1	Slopewash below (025)	0	0		0
033	1	Fill of grave of (028)	2	1		1 (infant)
034	1	Fill of grave of (029)	2	1		1 (infant)
035	1	Fill of grave of (030)	1	1		0
036	1	Fill of grave of (031)	1	1		0
049	6	Mixed infill deposit	3	2	F, F	1 (adolescent)
054	6	Skeleton – Individual E	1	1		0
061	6	Mortar bonding of foundation stones	1	1		0
064	6	Mixed infill deposit (similar to 025)	1	1	M	0
065	6	Skeleton - Individual F	1	1		0
Total			31	23		8

contexts were not only heavily fragmented but also typically displayed fair to poor surface preservation.

4.5.5 Section 1

In C022 there are a minimum of seven individuals present with five adult right tibiae, and two non-adults; one represented solely by a femur and a radius suggesting an age-at-death of 7–12 years based on size, and the second represented by a femur fragment suggesting a younger individual *c* 2–5 years-at-death based on size. There is at least one adult male present based on a robust and flared gonial angle of a right mandible fragment. The ilium present unfortunately does not survive around the sciatic notch, so sex cannot be determined. It is possible that there is a female individual present with a small gracile zygomatic, but given the variation in ages likely present, it could also represent a young individual of either sex.

The human bone from C022/C023 shows variable preservation and is unlikely to derive from the same person, though there are no duplicate elements. There are a minimum of two individuals present: an adult represented by four variably preserved bones, and a non-adult represented by a thin calvarium fragment.

There are a minimum of two individuals present in C025: An adult represented by several post-cranial bones, and a non-adult (infant-child) represented by a petrous portion and possibly a radius. No further age or sex estimation was possible.

C026 contains only one adult human right proximal hand phalanx.

C028 is an articulated skeleton, Individual 'A', and has been assessed as a young adult female, aged 22–30 years-at-death. There is approximately 90% of the skeleton present, with both feet missing due to disturbance by the original 'rampart' construction. The surface preservation of the skeleton is generally excellent, the teeth are in particularly good condition. Age estimation is based on both the pelvic region (auricular surface and pubic symphysis - Suchey-Brooks Phase 2 = 25+/-4.9 years) and dental wear (Lovejoy 1985, Phase D 20–24 years). Sex is based on a multitude of cranial and pelvic features, with a wide sciatic notch and pubic symphysis with ventral arc and subpubic concavity. The mandible is not gracile, rather robust but with few muscle markings, and thin ascending rami which suggests a female. The mental trigon is wide but not deep.

There are a series of pathological changes observed, which may be all related to a systemic condition or individually occurring. The skull is mostly present, though quite fragmented. The internal occipital protuberance is misaligned to the external occipital protuberance, and the groove of the transverse sinus on the right side is almost obliterated. This type of abnormality could possibly be linked to hydrocephalus and cisterna magna problems or aspects of handedness, but there is limited research into this, and thus, little evidence (Kim & Ahmad 2016). Along with two small inactive lesions on the endocranial side of the frontal, near the coronal suture towards the sagittal aspect, there is a perfectly circular hole, with smooth edges in the superior aspect of the left parietal bone which is difficult to characterise. It may be natural variation as an extra-large parietal foramen, or possibly insect burrowing. Alternatively, the calvarial vault lesions may explain this hole as a thinned area of bone which eventually broke through or was somehow created post-mortem. There are new bone formation patches on the internal side of the temporals. This individual's teeth are in excellent condition with only the anterior maxillary teeth missing post-mortem. The teeth present all show severe calculus accumulation along the cemento-enamel junction. There were no dental caries observed.

All the thoracic vertebrae show bony deposits on the surface of the vertebral bodies, predominantly the inferior side. This is an extension of the anular epiphysis/apophysis into the central depression of the body of the thoracic and lumbar vertebrae. While this is an understudied aspect of disc degeneration and age, it suggests degenerative disc disease (Moore 2006). Four of five lumbar vertebrae and six of the 12 thoracic vertebrae present also show Schmorl's Nodes, which are lesions on the body of the vertebra caused by extrusion of the vertebral disc, eroding the body (Faccia & Williams 2008; Plomp et al 2012). Ossification of the ligamentum flavum on most thoracic vertebral arches was observed, which is linked to aging and general activities in life (Geber & Hammer 2018). The cervical vertebrae do not show the same degenerative lesions that most of the intact and identifiable thoracic and lumbar vertebrae do.

There is some healed new bone growth on various post cranial bones, particularly along entheseal lines. The sternum and several other bones have a layer of healed new bone formation over them with microporosity in the bone. On the pelvis, there is bone growth on the iliac tuberosity on both sides, with the auricular surfaces not affected. In particular, the femora both have healed new bone growth around the neck, anterior-inferior aspect. New bone formation suggests a general response to a non-specific cause which could be systemic or localised, as the periosteum is very sensitive to trauma, neoplastic disease or infectious agents (Weston 2008: 49). The wide and rather shallow acetabulum could be related to the bony growth in the retroauricular area where the exostoses developed to stabilise the hips. While it is not possible to conclusively identify pregnancy on the pelvis, the pubic symphysis is rough with bone growth but still moderately billowy, and the exostoses suggest this woman may have had a child (Ubelaker & De La Paz 2012).

C029 is an articulated skeleton, Individual 'B', and has been assessed as a young adult male, aged 25–35 years-at-death. However, age estimation was somewhat complicated as described below. There is approximately 95% of the skeleton present, with only some of the foot bones missing due to disturbance by the 'rampart'. The surface preservation of the skeleton is generally excellent with good consistency of the bone, and the teeth are in particularly good condition. Age is based primarily on the pelvic region (auricular surface Phase 3–4 = 30–39 years; and pubic symphysis - Suchey-Brooks Phase 3–4 = 28.7–35.2 years), as dental wear seems incongruous with the rest of the skeleton. Age estimation was somewhat complicated by the ossification of the ligaments along the ventral side of the right pubis which suggests an older age at death; the pubic symphysis is rough along the ventral edge but retains some of the youthful billowing. There is some bone growth in the retroauricular area while the auricular surface is very smooth with increasingly uniform granularity. Age based on dental wear is complicated by the impaction of the left mandibular third molar, with heavy wear on the first molars suggesting an age of 35–50 years-at-death, while the other third molars show little-to-no wear and seem relatively recently erupted. In general, excluding the first molars from the dental wear age estimation, (Lovejoy 1985 is phase D 20–24 years) 'Individual B' seems too young given the os coxa age estimation, suggesting dental wear is not the best method to use in this case. Sex is based on a multitude of cranial and pelvic features. The cranial features are not very robust and masculine, leaning more to the gracile end of the scale with sharp and narrow orbital rims, a wide but short mastoid process and small glabella; however, the orbits are more square than rounded and the zygomatics are wide. The mandible is also a wide U-shape with a prominent square chin though a relatively small mental trigon. The pelvic features reflect male features with a narrow sciatic notch and the pubic symphysis has no subpubic concavity and no ventral arc.

This individual displays a number of pathologies throughout the skeleton. The cranium is highly fragmentary, though almost complete. The nasal aperature is narrow and appears to have a healed fracture line in the form of a groove on the left medial aspect of the orbit, the frontal process of the left maxilla, making the nasal aperture appear off-centre to the face; this was likely caused by a trauma. There are possible healed fractures of the nasals with a narrow and pronounced nasal protuberance suggesting a very prominent nose and possible fracture (Jacob & Prathap 2021). The surface of the cranium appears to have smooth but porous healed new bone formation across the frontal squama and superior aspect of the orbital rims. Visible metopic suture on the frontal, though completely fused, and all sutures are visible though completely fused and obliterated on the endocranial side. There is no evidence of cribra orbitalia or porotic hyperostosis. There is a deep meningeal vessel line along the coronal suture on the left half on the parietal, endocranially, and small patches of new bone formation in the maxillary sinus cavities, some active some healed, representing chronic sinus infections (Tovi et al 1992).

The teeth all present varying degrees of dental calculus, there is a carious lesion on the left maxillary third molar, as well as an impacted left third mandibular molar, and a peg tooth in the location of the left maxillary second incisor. The peg tooth is likely an inherited trait, and the impacted third mandibular molar could have resulted in pain and swelling, or no symptoms at all (Punwutikorn et al 1999). There is slightly more wear on the dentition

of the right side than the left, which suggests there was heavier use of the right side of the mouth.

The left scapula shows a very unusual variation, with a suprascapular foramen, as well as a small notch, which could be due to the ossification of the suprascapular ligament. This could result in suprascapular nerve compression which would have caused neuropathy and some pain in movement of the shoulder (Polguj et al 2012; Tubbs et al 2013).

There are significant robust entheses of the posterior edge of the radial tuberosity and clearly defined bicep brachii and deltoid tuberosity on the right side. The right humerus is slightly larger than the left. Overall, the left side seems less robust and slightly smaller than the right side. This difference in size and robusticity is typically associated with the preferred use of one side, though cannot necessarily establish handedness (Ubelaker & Zareko 2012).

There is a complete spine present. The seventh cervical, first thoracic, and fifth through eighth thoracic vertebrae show the most damage but all fragments are present and can be mostly reconstructed. There are various pathologies on all vertebra types; the first cervical vertebra shows a canal for the vertebral artery with the ossification of the lateral aspect of the posterior atlanto-occipital membrane, and bony changes to the lateral aspect of the lateral mass on the left side, adjacent to the articular surface (Paraskevas et al 2005). The second cervical vertebra has a lesion on the inferior aspect of the vertebral body, suggesting degenerative disc issues. All vertebral bodies appear porous with thick anular epiphyses and some bony islands forming within the central depression of the vertebral bodies (Wang et al 2012). In general, it is difficult to quantify, but the right and left sides of the vertebrae are not symmetrical. The right facets seem to be larger and the angle of the articular facets are different, with possible new bone formation on the transverse processes of the left side, which may reflect curvature or pressure on the spine towards one side (Masharawi et al 2008). The fifth and sixth cervical vertebrae in particular show bone grown within the transverse foramina suggesting an impingement (Weber et al 2003: 1422). Schmorl's Nodes begin to appear on the inferior surface of the fifth thoracic vertebra and then continue to appear on the inferior and superior bodies to greater or lesser extents on all the thoracic and lumbar vertebrae. The spinous processes of the thoracic vertebrae and the first lumbar vertebra angle variably to the left or right side. There is no ossification of the ligamentum flavum until the eleventh and twelfth thoracic vertebrae. There is new bone formation on the anterior and lateral sides of the bodies and changes to the morphology of several vertebrae bodies. An inherited trait with no symptoms, the bifurcation of the spinous processes of the cervical vertebrae, is present.

Both the right and left femora show Cam-type deformity of femoroaceteabular impingement, indicated by thick, tongue-shaped bone growth from the head on the anterior side of the neck (Sankar 2013; Roels et al 2014). Other observed changes to the femora include: the fovea capitis is barely visible, and there is smooth healed bone growth along the intertrochanteric crest on the posterior aspect, with a rough gluteal line, and smooth bone growth on the lesser trochanter on both sides. Finally, the distal epiphyses show some new bone formation around the articular surface on the anterior aspect. These osseous changes seem to reflect heavy use of the gluteal muscles (Niinimäki & Baiges Sotos 2013). The right acetabulum is quite wide, anteriorly angled and shallow, with pronounced new bone formation in the acetabular fossa generating changes to the articulation of the femur and ilium. There are also ossified entheses on the right pubis, ischio-pubic ramus, and ilio-pubic ramus into the obturator foramen and rough spikey bone on the ventral surface of the pubis, which are extensive enough to impact on age estimation.

There are five lumbar vertebrae and what appears to be a sacrilised sixth lumbar vertebra, however, this is likely a lumbarised first sacral vertebra which has partially re-fused, since there are only four sacral vertebrae. This is a transitional vertebra which is fused and morphologically adapted on the left side but is still not fused on the right side. This sacralised vertebra has fused on an angle which would have created an abnormal curvature of the spine by tilting down towards the right side, appearing pinched. A possible diagnosis is Bertolotti's Syndrome (Paraskevas et al 2009; Alonzo et al 2018). While it looks like a sixth lumbar vertebra, it is likely a lumbarised first sacral vertebra with an abnormality of the transverse process on the left side which has created an abnormal articulation with the left

os coxa. This is very classic Bertolotti's unilateral Syndrome (Jancuska et al 2015). The coccyx is complete and present though the final four coccygeal bodies are not fused.

C030 is the skeleton of Individual 'C', the partial remains of an infant. There is approximately 15% of a skeleton present with only a partial cranium and minimal post-cranial bone, including the right humerus and a single thoracic left half of a neural arch. It seems plausible that the right petrous portion from C025 is from this individual as the size and general preservation match well. With the root of the maxillary second incisor still forming, the age-at-death based on this single tooth is 9 months–1 year +/- 4 months (Ubelaker 1989). The cranium is highly fragmentary, but the occipital and the right parietal are present along with the left petrous and portions of the temporal, suggesting that the cranium, at least partially, collapsed in on itself. There was porosity and new bone formation observed on both the endo and ecto-cranial sides of some fragments, which may suggest either a systemic inflammatory response or a possible non-specific response to a metabolic or physiological stress. The bones present suggest that the individual was on their right side.

C031 is the context number assigned to Individual 'D', partially disarticulated with skeletal elements found in C033, C034, and C036. However, the majority of the skeleton of Individual 'D' has been left in situ, extending into the 'rampart', with the distal ends of two femora observed in the section above Individual 'A'. It is believed that the extra tibiae and tarsals recovered from the fill of grave C038 belong to this individual.

C033 contains an infant deciduous mandibular second molar, found adjacent to the hand of Individual 'A'. A right proximal epiphysis of a humerus with some porosity of the articular surface, a small fragment of an acromion process, two rib fragments, and three maxillary teeth in excellent condition could belong to Individual 'A' (based on preservation and being found just above). An extra right tibia has been associated with Individual 'D', as it was found adjacent to the left tibiae of Individual 'A'. There is also a left calcaneus labelled with C033 that does not fit with the other tarsals associated with Individual 'D'. Therefore, there are a minimum of two individuals present; an adult and an infant/child.

C034 contained a left tibia in very poor condition with an eroded surface, which has been associated with Individual 'D'. A small amount of human bone in terrible preservation and highly fragmented was recovered but does not belong to Individual 'B'. There are a minimum of two individuals; an adult represented by a portion of right maxilla, and a small infant metatarsal (possibly associated with Individual 'C', but this is inconclusive).

There is also a small amount of highly fragmented bone retrieved from the sieving of the soils around skeletons C028 and C029 (C033/034); none of this material can be identified.

C035 includes a possible adult tibia fragment which was found below and in contact with Individual 'C'. As well, a right adult maxilla fragment with the right canine, the right second premolar, and the right first molar in situ was recovered to the south of the cranium of Individual 'C'. This bone is stained black and fragmented, but the enamel is in good condition.

C036 is the fill containing the in situ remains of Individual 'D'; a right cuboid, left talus, and a small sciatic notch fragment. While the sciatic notch is possibly from the fill of this earlier burial, the tarsals likely belong to Individual 'D' (C031).

4.5.6 Section 4

C003/C013 contained a small amount of human bone which is highly fragmentary and all possibly from the same adult individual with new bone formation observed on several of the bones. C013 contained only a human right humerus.

4.5.7 Section 6

C049 contained a significant amount of human bone. There are a minimum of two adult individuals present, with two left ossa coxae, two sacra, and variations in the size of the long bones. Both ossa coxae are female with very wide sciatic notches but are also quite large with wide acetabula diameters. There is a possible third individual present with what appears to be an unfused distal epiphysis of a fifth right metatarsal and an unfused sternal end of the clavicle and fibula, which suggests an adolescent individual. The mandible present is very robust and suggests a male individual with robust muscle

attachments and a prominent mental trigon. This individual also suffered from dental disease with heavy attrition and ante-mortem tooth loss of the right first molar. The intact temporal bone which is present likely belongs to a female individual with a rather pointed and thin mastoid process. A lower thoracic vertebra is present, along with a right and left scaphoid and several long bone fragments.

C054 is the skeleton of Individual 'E', which was disturbed by the removal of the 'rampart' backing wall. The right arm and hand, a portion of the left arm, thoracic vertebrae, and ribs were recovered. This suggests, based on the positioning of the bones, that the lower part of the body, including the lower arms, legs, pelvis, and lower back, were all disturbed during the 'rampart' construction. The shoulders, neck, and head most likely extend west into the 'rampart'. There is a green stain on the eleventh left rib which suggests it was in contact with a copper-based metal at some point. The vertebrae display some wear and tear with some degenerative disc disease, but no evidence for osteoarthritis.

C061 contains cranial fragments and a tibia fragment found adhered to the stones of the 'rampart' backing wall.

C065 is the skeleton, Individual 'F', which extends southward into the 'rampart'. Only a partially articulated left foot was recovered and represents another burial disturbed by the 'rampart' construction.

C064 is a cranium which was found in hill wash behind the 'rampart' backing wall. It belongs to an adult male individual, with roughly 80% of the cranium present, including the complete calvarium, along with parts of the sphenoid, the temporals, and several endocranial bones. Sex was based on the orbital rims and the occipital protuberance. No age estimation was possible, though the sutures were still quite open and the cranium came apart along suture lines which minimised breakage. This suggests an adult under 35 years-at-death, but no further precision is possible.

4.5.8 Discussion

The human remains recovered from Jedburgh Abbey Rampart reflect two primary depositional events. Firstly, within the original ground level, there were articulated burials interred (Individuals 'A' through 'F'). These burials, in some cases, disturbed earlier burials, as evidenced by disarticulated remains with the fills of the graves. Secondly, there seems to have been at least one re-depositing of soil which included disturbed, commingled animal and human remains. Unfortunately, with the commingled skeletal material, there is little that can be interpreted as it is unclear if the remains originally derived from this site or elsewhere. Individual 'C' is too disturbed and partial to discuss further, and Individuals 'D' through 'F' remain mostly unexcavated. Further interpretation and discussion will therefore focus on Individuals 'A' and 'B', as both are excavated in their entirety and fairly well-preserved.

Individual 'A' is a female aged 22–30 years-at-death with pathological changes suggestive of a chronic condition, as well as degenerative changes to her spine. The abnormality of the occipital morphology is understudied, but seems unlikely to have caused noticeable issues for this individual (Kim & Ahmad 2016). The significant calculus accumulation on all the dentition suggests poor oral hygiene. While calculus has a multifactorial aetiology, including diet, salivary flow, mineral and silicon content in food, and nature and frequency of chewing, its presence suggests poor oral hygiene and it may have contributed to periodontal disease (Radini et al 2017). The Schmorl's Nodes and bony growth on the vertebral bodies are associated with daily activities and metabolic deficiencies, increased body weight, and a genetic predisposition (Plomp et al 2012: 572) and could likely have contributed to some back pain. Whilst Schmorl's Nodes themselves do not necessarily cause back pain, they are positively correlated with lumbar degenerative disc disease which does typically cause pain (Williams et al 2007). The combined presence of the osteological changes to the spine suggests significant physical activity during life, and a possible genetic predisposition to acquiring the bony changes. The osseous changes to the pelvis may reflect parturition, however, this cannot be confirmed and it is unlikely that the shallow acetabula would have led to any symptoms affecting her life (Lequesne et al 2004).

Overall, Individual 'A' is a young woman, with indications of a rather physically intensive life, poor oral hygiene, and a possible general systemic issue causing an inflammatory response in the bone. Her cranial malformations could possibly have resulted

in headaches and further issues, but there is not enough research into this deformation to be certain. There is no single diagnosis with this combination of pathologies which is evident; it seems, given her general health, it would have been reasonable for her to have acquired such a range of pathological lesions.

Individual 'B' is a male aged 25–35 years-at-death with skeletal changes which suggest heavy use of the legs and degenerative changes to his spine. This man seems to have lived an active life, with possible healed trauma to his nose, which has healed quite well. His dentition, like Individual 'A' suggests poor oral hygiene with significant calculus accumulation, though few caries. However, the angle and presence of the mandibular third molar still partially within the bone may have caused some pain due to impaction. Another quite unusual aspect of the skeletal changes observed include the presence of both a suprascapular notch and foramen, which is very rare and could have resulted in a neuropathy which may have had an impact on the differences in robusticity observed in the long bones of the arms of this individual (Polguj et al 2012). This means that this man could have had a chronically sore shoulder.

From cervical vertebrae to the sacrum there are pathological changes which indicate significant activities, degeneration of soft tissue causing bone changes, and some genetic predisposition to osseous changes of the spine. The canal for the vertebral artery on the atlas is more common in males and in labourers carrying heavy loads on their heads, though may be asymptomatic (Paraskevas et al 2005: 131, 135). With extensive degenerative disc disease from the cervical to the lumbar vertebrae it seems likely that this individual would have suffered from some form of back pain (Modic 1999). This is further exacerbated by what appears to be a curvature of the spine likely caused by the extra lumbar vertebra and the tilt to the articular plane of the sacrum due to what appears to be a case of Bertolotti's Syndrome (Jancuska et al 2015). This would have affected the individual from childhood development through to death, and likely resulted in lower back pain. The osseous changes to the pelvis and femora suggest heavy use of the lower limbs resulting in entheseal changes, spiky bone growth of fibrous attachments, and the Cam impingement, which in modern times is associated primarily with athletes (Roels et al 2014).

Overall, when the pathological and entheseal changes observed on the skeleton of Individual 'B' are considered together, it is not possible to distinguish a single aetiology. Rather, it seems that this young adult male would have had chronic back pain and possibly shoulder pain, and yet still seems to have been highly active, particularly in the use of his lower limbs. Additionally, there are at least two congenital traits, beyond the Bertolotti's Syndrome, which may warrant further exploration; the presence of the peg tooth and the bifurcation of the cervical vertebrae spinous processes. Further epigenetic research into this individual may prove fruitful for discussion of these traits in medieval Scottish populations.