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Jedburgh Abbey Rampart: The Treatment of the Dead

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1. ABSTRACT

An archaeological watching brief was undertaken at the Jedburgh Abbey Rampart during repair and construction works to consolidate and secure the 'rampart' wall and its face, both of which had begun to deteriorate and fail. The watching brief followed on from earlier works to investigate the construction of the 'rampart', which had revealed the presence of disarticulated skeletal remains behind the wall. The excavations undertaken during the repair works have helped to infer the methods employed for the construction of the 'rampart', likely dating to the late 18th century. During construction several burials of the former Low Kirkyard were disturbed and displaced, with the disarticulated remains of several skeletons found within the construction deposits. The watching brief also revealed the remains of five burials that were partially disturbed during construction, with skeletal remains dating from the 15th century onwards. Disturbance to earlier graves, not disturbed by the construction, were also identified, the results of which indicate changing attitudes to skeletal remains through the post medieval and early modern periods.

2. INTRODUCTION

A formalised, raised walkway, known as 'The Rampart' (NGR NT 65041 20492), is located to the east of the current boundary of Jedburgh Abbey (SM1326, NRHE No. NT62SE 15, Canmore ID 57020); it is a flat, gravel topped walkway, standing at some parts over two metres above the adjacent Abbey Place, and runs from the Sheriff Court at the north to the war memorial at its southern end (Illus 1). The 'rampart' does not fall within the modern bounds of the site of Jedburgh Abbey, but is classified as part of the Jedburgh Abbey Scheduled Monument, falling under the guardianship of Historic Environment Scotland (HES). The 'rampart' retaining wall is constructed from cut and dressed sandstone blocks and is accessible from steps leading up from the war memorial, through the back of the Sheriff Court building, or from access stairs built into its eastern side. Local failures of masonry had been identified with patch repairs carried out in the past; however, a more comprehensive scheme of repairs was required for long-term preservation, with some sections needing a complete rebuild in order to stabilise and maintain the 'rampart' for future generations.

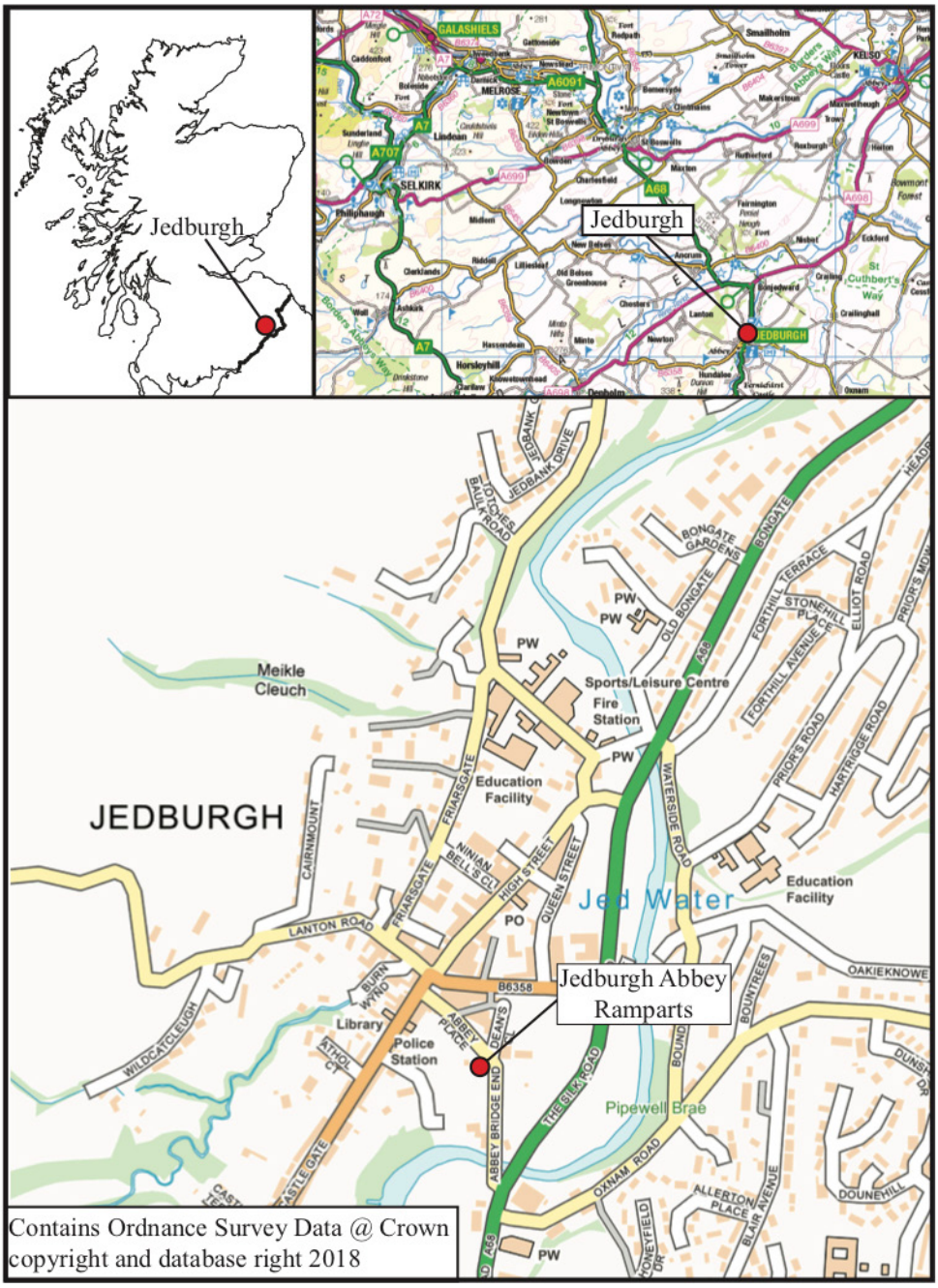
2.1 Background to the project

Heritage and Archaeological Research Practice Limited (HARP) was commissioned by Scottish Borders Council (SBC) and the Jedburgh Conservation Area Regeneration Scheme (CARS) to carry out a programme of archaeological works at the location of the Jedburgh Abbey Rampart (Illus 2 and 3), to complete works associated with Scheduled Monument Consent (SMC) Case ID 300042234, and Case ID 300046433. The works followed on from a series of investigatory works at the abbey 'rampart' that were conducted to determine the structural nature, and history of the 'rampart' and its retaining wall, including an assessment of historical records relating to them. Investigatory coring of the 'rampart' in 2018 suggested a rubble core backed by a sandstone inner wall that may have been an earlier construction. The excavation of four trial pits in 2019 (Hill 2019) formed the second stage of investigatory works, and was used to inform future conservation works to repair the 'rampart' wall.

The works consisted of Standing Building Recording (SBR) of the retaining wall, prior to an archaeological watching brief during repair works to the retaining wall and access stairs. Due to the location of the 'rampart', adjacent to the east of Jedburgh Abbey graveyard, there was a high potential to uncover archaeological remains, including both in situ and ex situ human skeletal material. The excavation of the test pits in 2019 indicated that the 'rampart' wall might have been constructed in two phases, with the rear part of the wall constructed in drystone, with visible voids throughout. Each test pit revealed an amount of dumped or in-filled material present directly behind the retaining wall, with deeper in-filled deposits present further to the south along the 'rampart'. These deposits were all sealed with more modern bedding deposits for gravels and tarmac. The nature of the deposits identified behind the wall suggested a deliberate ground-raising event, in order to either create the 'rampart', or to at least formalise it. The excavations uncovered fragmentary, re-deposited skeletal remains, of both humans and animals, indicating that the bones were in a secondary burial location, highly disturbed and deposited from elsewhere.

2.2 Historical background

The Augustinian Jedburgh Abbey dates to the 12th century and is located at the historic heart of Jedburgh, striking an imposing sight when approaching the town from the south. The abbey is one of four great abbeys located in the Scottish Borders and was subject to damage and destruction in the 15th and 16th centuries due to its position on an important north-south route in the Borders, forming a strategically defensive position (Lewis & Ewart 1995: 2–3) that was fought over by English and Scottish armies. Its demise was complete by the time of the Reformation in 1560, but the abbey was the main church of the town until the early 19th century, and remains a significant feature of Jedburgh as a draw to tourists over the centuries, with sketches and artistic impressions of the abbey dating back to the late 1700s. Military activity and defensive developments at the abbey, in particular the occupation of the town by a French garrison in 1548 (de Beagué 1708: 92) have led to the 'rampart'

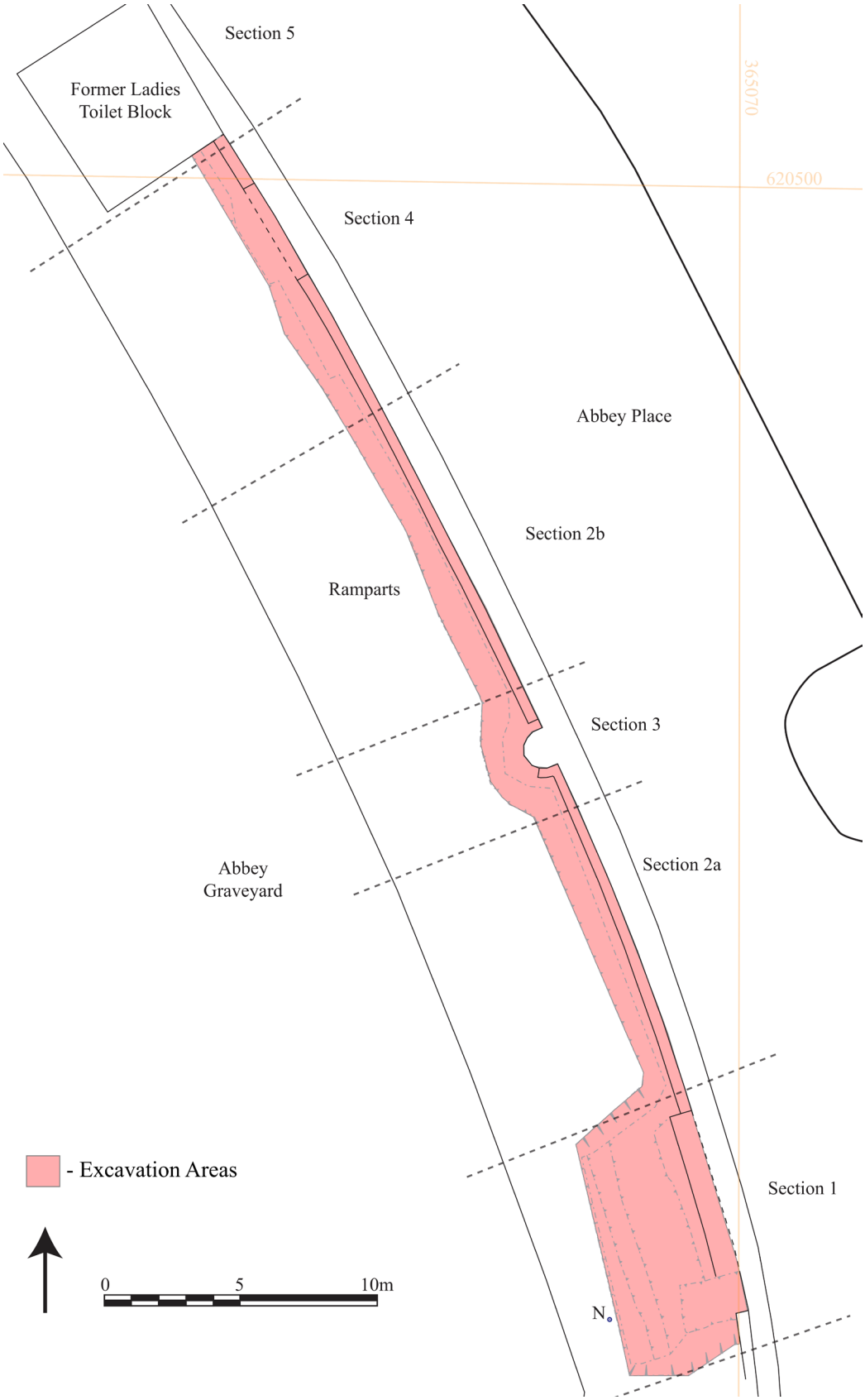


Illus 1 Location Plan (Image by Heritage and Archaeological Research Practice)

being attributed to earthworks constructed to the east of the abbey in the 16th century (Lewis & Ewart 1995: 2, 10; Brooke 2000: 207–8).

A boundary line potentially representing the 'rampart' is indicated on an untitled plan of Jedburgh from 1775, separating the 'High Kirk Yard' from the 'Low Kirk Yard', but by the time of John Ainslie's plan of 1780 the 'Low Kirk Yard' was no longer evident, with a 'Cattle Market' noted in its place. The 'Rampart' however, is not named until 1823 on John Wood's Town Plan of Jedburgh.

At a similar time to these early maps, particularly the untitled plan of 1775, George Hutton completed at least six drawings of Jedburgh Abbey in the late 1770s. Two sketches of the northern side of the abbey depict the building in its setting, with naturally sloping topography in the foreground, and no visible 'rampart' wall in either image (Hutton 1775; 1776). A third drawing, again completed



Illus 2 Excavation Areas Section 1 to 4 (Image by Heritage and Archaeological Research Practice)

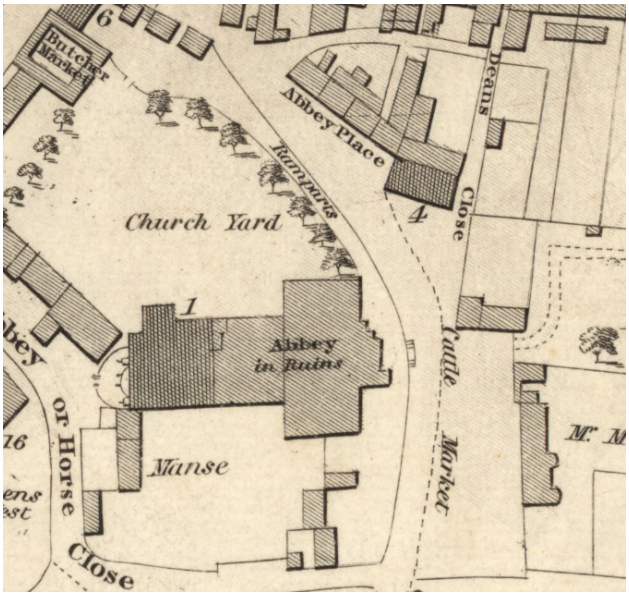
Illus 3 Excavation Areas Section 5 to 6 (Image by Heritage and Archaeological Research Practice)

by Hutton (1777), shows the northern side of the abbey in its setting of a graveyard, with a flatter looking landscape, and what appears to be a wall to the east of the eastern end of the abbey, which would be in the location of the 'rampart' wall, however it is difficult to be certain whether this represents the actual 'rampart'.

A drawing completed by a French prisoner of war, and dating to 1812, shows the abbey as viewed from the north-east (Forbes 1912). The churchyard is visible in the immediate foreground of the abbey, and enclosed by iron railings, much as is the case today. Immediately in front of the railings sits an elevated walkway, which follows a similar line to that of the present 'rampart'.

The Cattle Market depicted on Ainslie's map remains indicated in Wood's Town Plan of 1823 (Illus 4), however, the land to the west of the 'rampart' is now merely indicated as the 'Church Yard'. Wood's map denotes the 'rampart', and indicates a set of stairs located on the outside of the wall, directly to the east of the eastern end of the abbey. These stairs are not represented on the drawing of the 'rampart' dating to 1812.

By the time of the first Ordnance Survey Large Scale Town Plan of 1858, three sets of stairs are now indicated on the eastern side of the 'rampart', but all are located within the line of the wall, not externally as previously noted. The northernmost set of stairs provides access to the top of the 'rampart' at the 'museum', whilst the central set of stairs indicates one set of steps located opposite the school. The southern stairs consist of two sets of steps, and are located further to the north than those noted on Wood's map, to the north-east of the eastern end of the abbey, rather than directly to the east. The cattle market is still indicated to the east of the 'rampart' wall. The Ordnance Survey Name Book for Roxburghshire (1858–60: 75) indicates that at this time the area known as 'The Ramparts' consisted of a narrow strip of ground running parallel with Abbey Place, forming a promenade of the burgh and sitting approximately seven or eight feet high; no information on the origin of the 'rampart' is noted however.



Illus 4 Extract from John Wood's Town Plan of 1823 (Image by Heritage and Archaeological Research Practice)

Public toilets were added into the 'rampart' at the location of the northern set of steps, with the first mapped evidence of these indicated on the Ordnance Survey 25 inch to the mile of 1921, and are clearly located on the inside of the retaining wall. A second toilet was located between the northern and central sets of stairs, however these are not indicated on any of the Ordnance Survey maps up to 1964. At the time of the works, both sets of toilets had been closed and inaccessible for some time. The southern end of the 'rampart' was altered in 1921 with the erection of the Jedburgh War Memorial, designed by James B Dunn and first indicated in detail on the 1964 Ordnance Survey 1:2500 map series.

The mapping evidence and images suggest a possible change to the 'rampart' wall in either the late 18th or early 19th century. Early maps indicate a wall to the east of the abbey, but the walls in these maps are only partly on the alignment of the current 'rampart', with the wall represented as more angular and straight than its current guise. By the time of Wood's Town Plan of 1823, the wall appears to follow a route more representative of its current form, suggesting an alteration or change to the wall between 1780 and 1823. Drawings of the late 18th and early 19th century also help to support this possibility, with Hutton's drawings suggesting a natural topography surrounding the abbey, with no clearly visible 'rampart'. Whilst these images may have been stylised to imply a more rural idyll for the setting of the abbey, the drawing by a French prisoner of war in 1812 indicates a much more formalised 'rampart' wall, pertaining to the current route and style. It is

possible that the 'rampart' wall was originally lower, and less significant in the past, acting as a drystone boundary wall, as opposed to a retaining wall, with either a rebuild, or modifications made to the existing wall with an addition of a mortared face and capping stones. This would have created a more stable wall able to retain material dumped behind it used to raise and level the 'rampart'.

Further additions and alterations were also made once the retaining wall had been formalised, with Wood's plan indicating a set of access stairs to the 'rampart' located on the exterior of the retaining wall, and directly to the east of the eastern end of the abbey (altar). By the time of the Ordnance Survey Town Plan, three access stairs were visible, but all are located within the bounds of the 'rampart' wall, whilst the southern access stairs are located slightly further north than on Wood's plan, being located to the east of the North Transept, as opposed to east of the altar. Whilst it is possible that Wood's plan may not have been as accurate as the Ordnance Survey plan, and the stairs represented on both plans were the same, the mapping indicates a further period of alterations to the 'rampart' between 1823 and 1858 with the insertion of the sets of stairs on the interior of the retaining wall. Further changes occurred with the insertion of toilet blocks after the publication of the Ordnance Survey Large Scale Town Plan in 1858 and the construction of the war memorial in 1921, with a small cellar also inserted towards the north-western end of the 'rampart', possibly at the same time as the toilet blocks.

3. ARCHAEOLOGICAL RESULTS

3.1 Standing building recording

The repair works at the Jedburgh Abbey Rampart were carried out to consolidate, update, repair, and replace different sections of the 'rampart' walls. The works included the careful removal of significant portions of the face of the existing retaining wall in order to re-build the backing wall (where required), with the masonry face re-built and repointed in lime mortar to match the existing style and appearance of the 'rampart' wall; replacing three sets of steps leading from street level to the top of the 'rampart' (Illus 5); replacing the voussoirs above the existing cellar, and replacing its wooden doors; removing the concrete ceiling, and any internal fixtures and fittings of the former ladies' toilet block, prior to infilling with concrete or packed infill.

The Standing Building Recording (SBR) of the 'rampart' wall was completed prior to the start of the repair works, whilst SBR of the interior of the former ladies' toilet block and cellar was completed during the repair works once access to these spaces was possible. The recording was carried out to the Basic Level as detailed by ALGAO Scotland (2013) and included a written, drawn, and photographic record of the retaining wall.

3.1.1 Results

The SBR identified ten distinct components or features on the north-east facing elevation of the 'rampart' wall between the former double access stairs at the south end of the works (opposite Jedburgh Public Hall), and the Courthouse at the north end of the works.

The face of the 'rampart' wall, C110, is constructed from undressed but well-cut, grey sandstone blocks, with masonry blocks ranging from 0.05m long to 0.55m long. The wall has been bonded with a sand-based lime mortar, but shows evidence of several areas of mortar repair, including concrete patching, and the mortar and wall face showed evidence of failure in several places, with distinct cracks and gaps visible. The wall is capped with cut, undressed, sandstone blocks, bonded in the same fashion as

Illus 5 Photograph showing failure and damage to 'rampart' wall at former double access steps (Image by Heritage and Archaeological Research Practice)

the wall, and showing similar signs of mortar loss and repair. The wall height rises from 1.57m, at the northern end, to 1.92m, at the southern end. The linear nature of the wall is interrupted to accommodate a lamppost, where the wall has been built in a curved fashion, C107, around the lamppost, but in the same architectural style as the rest of the 'rampart' wall.

Three sets of steps lead to the top of the 'rampart', with the steps in general made from the same grey sandstone as the wall facing. The southernmost set of steps (forming the southern portion of the double access steps), C101, and the central set of steps (forming the northern set of the double access steps), C102, have been partially capped with a concrete repair. The northernmost steps, C103, have been replaced by concrete steps. All sets of stairs have metal handrails, with stairs C101 and C102 showing evidence of earlier fixtures fitted to the side of the steps that have subsequently been plugged by wooden pegs, which are now flush with the face of the steps/wall.

To the north of steps C103, a former ladies' toilet block has been closed off with its former entrance now blocked with cut grey sandstone blocks and concrete mortar, C106. The toilet block had seven visible clay air vents, C108, and the wall capping here was partially covered by a tarmac seal on top of the former toilet block. At the north end of the toilet block, the wall capping steps up by 0.17m, and the rear of the wall capping was abutted by concrete edging all the way north to the former gents' toilet block (not subject to recording).

To the south of the gents' toilet block a store room or cellar was accessed by an arched entrance framed by cut sandstone blocks, that had been blocked with a wooden door, C104, and capped by a flattened arch constructed from cut sandstone blocks. The wall steps up a further 0.45m at the southern end of the gents' toilet block, before stepping back down 0.38m at its northern end. The former gents' toilet block entrance is framed by cut and dressed sandstone blocks, C105, but the entrance has been sealed shut and gated. Three metal air vents, C109, are visible beneath the wall capping at the gents' toilet block. The retaining wall continues for 3.65m to the north of the gents' toilet block where it joins the corner of the Sheriff Courthouse.

During the watching brief, access was provided to the former ladies' toilet block, and cellar. No significant features were identified in either structure. Stalls, toilets and cisterns, and sinks were all still present within the former ladies' toilet block, however, all were of modern design and style with the toilet block in general in a poor state of repair.

3.2 Watching brief

An archaeological watching brief was required to monitor the excavation of four trenches to the west of the retaining wall to record the 'rampart' wall structure and to identify, excavate, and record any other archaeological features uncovered during ground breaking works. The trenches were excavated in order to access, assess, and consolidate the rear of the 'rampart' wall to prevent the structural failure that was occurring. Significant remains that were deemed to be too complex or sensitive were left in situ (where possible) until a revision of plans was agreed between HES, CARS, and SBC.

The four trenches were located to the rear of the 'rampart' wall, with the trenches located in Sections 1, 3, 4, and 6 of the phased works plans. Each trench was excavated to the required depth, and width to complete the repair and rebuild works of the 'rampart' wall in a safe manner. In Sections 2a and 2b of the phased works, small amounts of topsoil were required to be removed behind the retaining wall to provide adequate working space to rebuild the 'rampart' backing wall.

Following the discovery of intact human skeletal remains in Section 1 (see Section 3.2.1), a revision to the design plans was made by SBC, CARS, and HES, resulting in a change of the location of the double access stairs being replaced (SMC Case ID 300046433). The double stairs from Section 1 were subsequently moved into the space occupied by the former ladies' toilet block in Section 5 in order to minimise the impact on further intact human remains. As a result of this, the single set of stairs in Section 4 was removed but not replaced, with the double set of stairs inserted into Section 5 forming the only replacement set of stairs from street level to the top of the 'rampart' during the repair works.

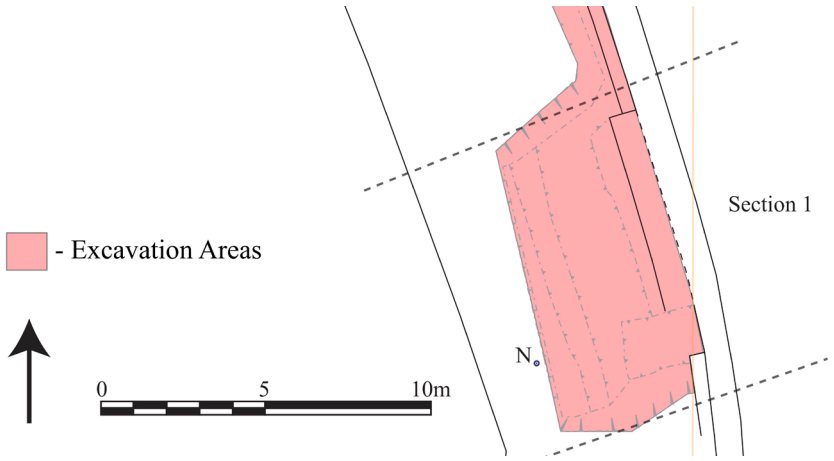
The results of each section are outlined in turn below, with an initial discussion of the 'rampart' wall, followed by a discussion of deposits and remains uncovered during excavation works to the rear of the 'rampart' wall in each section.

3.2.1 Section 1

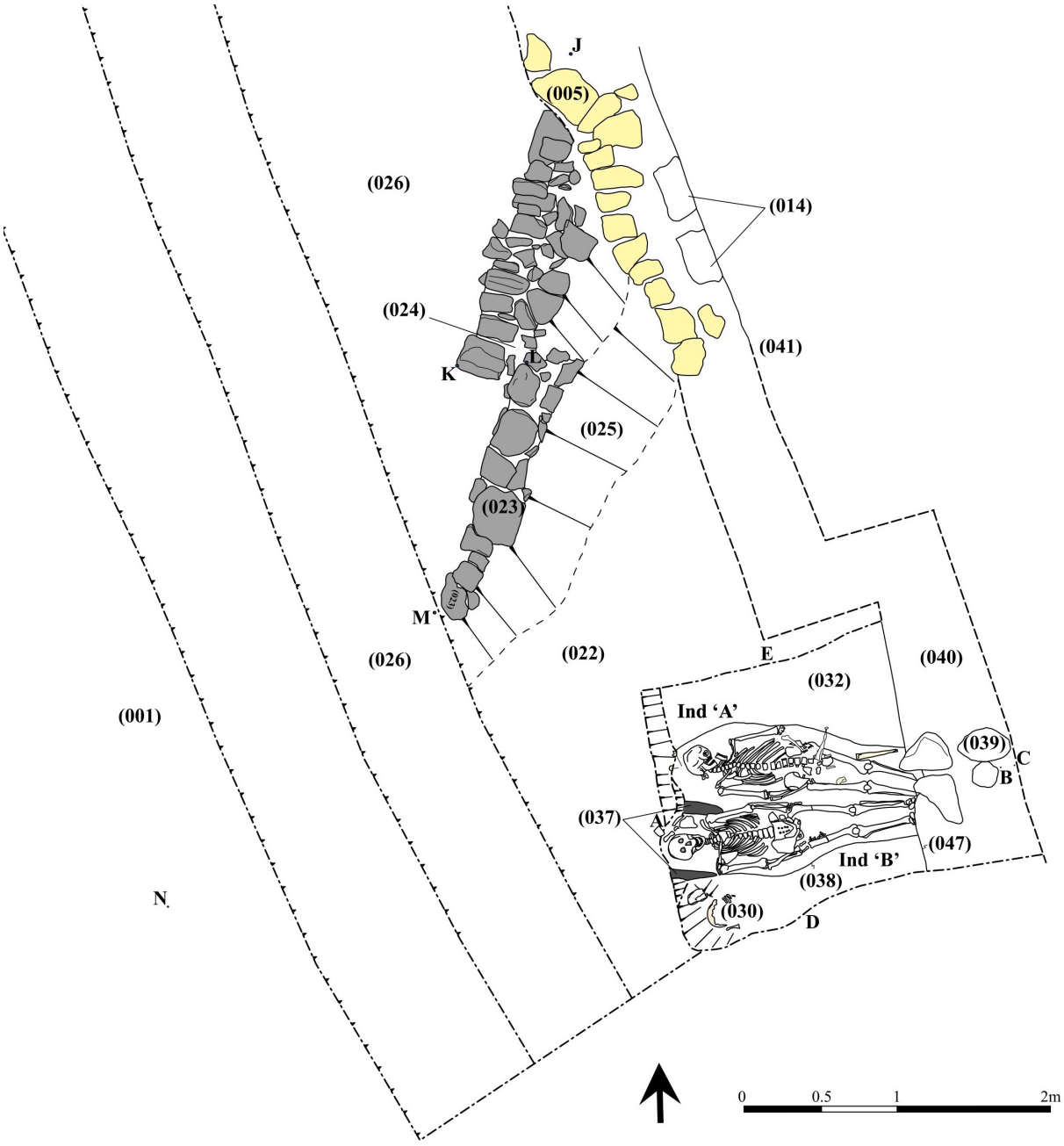
Section 1 consisted of the removal and replacement of the former double set of steps at the southern end of the works (Illus 6). Following the removal of the facing wall and steps, a trench was excavated to the rear of the steps in order to provide adequate working space to build a new double set of steps and backing wall. The trench measured 5m wide by 8m long, and was orientated approximately NNW to SSE. The trench was stepped from the western side at approximately 1m intervals to ensure safe excavation and reduce the risk of section collapse. The trench was excavated to a maximum depth of 2.2m from the top of the 'rampart'.

The upper deposit/topsoil layer in this section consisted of a mixed hard-core/gravel, C001, which continued across the whole top of the 'rampart'. The hard-core and gravel continued to a depth of up to 0.25m, where it was found to overlie a mixed, orange-brown silty loam, C027, that contained fragments of disarticulated animal bone, and represented an infill/topsoil layer that continued to a depth of up to 0.1m. On removal of C027, a mixed, orange silty clay with large stone inclusions, C022, was revealed in the southern three quarters of the trench. This mixed deposit was poorly sorted, and contained large dumps of stones, midden material, and a high concentration of broken, disarticulated bones (both human and animal). The deposit continued to the eastern extent of the trench (behind the 'rampart' wall/steps), and continued to both the south and west beyond the limits of excavation. The deposit was not fully removed at the western extent of the trench as the trench was subject to stepping for safety. Towards the eastern half and northern end of the trench the deposit was removed entirely to reveal the top of a drystone wall, C023, running on a north-east to south-west orientation, at a depth of 0.6m from the top of the 'rampart'. The wall was constructed from rough stones and cobbles and had no formal bonding material. The wall measured 3.4m long, continued to the south-west beyond the limits of excavation, and was cut by the 'rampart' wall C014/005 at its eastern end (Illus 7). It survived to a visible depth of two courses and 0.25m, with no visible evidence of wall foundations or a foundation cut.

On removal of C022 to both the east and west of wall C023 a rich, soft, grey-brown sandy silt deposit was identified, with the upper level of this deposit sloping away significantly to the east of wall C023. The nature of the deposit, and the natural slope identified to the east, coupled with the construction technique of wall C023 suggests that the wall was built around the break of a natural slope and possibly formed a small terrace, or boundary wall. An accumulation of slopewash, C026, had built up behind (to the west of) wall C023 and continued beyond the trench extents both to the west and the



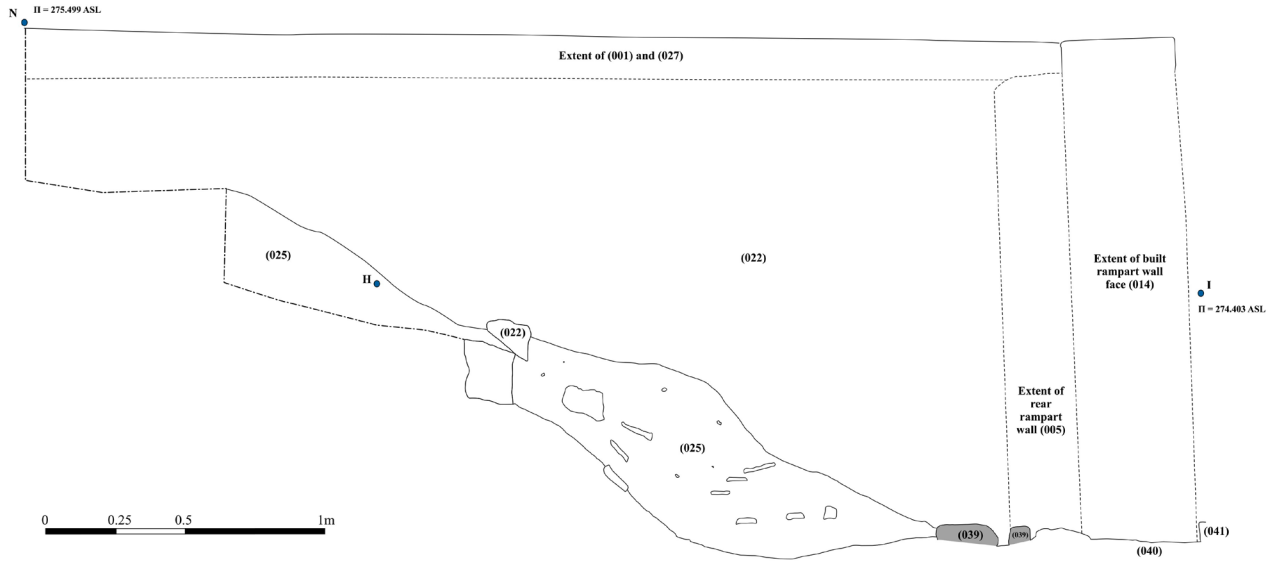
Illus 6 Section 1 location and Excavation Areas (Image by Heritage and Archaeological Research Practice)



Illus 7 Plan of excavated remains in Section 1 (Image by Heritage and Archaeological Research Practice)

north. This slopewash was only partially excavated due to the appropriate step depth for the trench having been achieved at this location, but the limited excavation revealed that C026 was a very soft, finely sorted sandy silt that contained a very high proportion of disarticulated animal bone fragments and midden material, suggesting a midden deposit or dumping ground behind the wall.

Excavation of the trench continued to the east of wall C023 through deposit C025, which continued to a depth of up to 0.65m and sloped significantly to the east (Illus 8). The deposit was found to be very similar in nature to C026, and consisted of a rich, soft, grey sandy silt, with occasional inclusions of small fragments of yellow sandstone and fragments of disarticulated animal bone and human bone.



Illus 8 Cross section of original ground surface and deposit (025) in Section 1 (Image by Heritage and Archaeological Research Practice)

Excavation at this location was affected by very bad weather, with a lot of surface water and runoff through the soft silty deposits, with C025 in particular acting as a conduit for water runoff. As C025 was removed, the articulated remains of two intact human burials, C028 and C029, were revealed at a depth of approximately 1.95m from ground level at the top of the 'rampart' (Illus 7 and 9). The discovery of the skeletal remains required a redesign of the works outlined above.

Both skeletons were positioned on their backs, lying east-west with heads to the west and hands positioned beneath the hips. The two bodies were lying adjacent to each other with C028 (Individual 'A') located to the north, and C029 (Individual 'B') located to the south. No distinct grave goods were found buried with either individual, however three small fragments of a horseshoe key (SF10) were found clasped in the left hand of Individual 'B'. The position and close proximity of the remains suggest that both individuals were interred at the same time, and it was only possible to identify evidence of one grave cut, C038, that surrounded both individuals. The grave cut was only clearly distinguishable in deposit C032, an unexcavated, orange-brown sandy silt revealed below C025. The base of grave cut C038 had very shallow sloping sides and a concave base, with the limits of the grave cut extending just beyond the extent of the

Illus 9 Photograph showing Individuals 'A' and 'B' (Image by Heritage and Archaeological Research Practice)

two individuals and measuring a minimum of 1.7m long and 0.9m wide. The two individuals were surrounded by soft, orange-brown sandy silts, C033 and C034, however, whilst separate contexts were ascribed for artefact and bone retrieval, it is likely that these contexts represent the same deposit of grave fill surrounding both individuals. The grave fills were very similar to, and very difficult to distinguish from, deposit C025, with no visible grave cut identifiable in C025, suggesting that the grave was excavated and filled back in with the same material shortly after. The nature of the deposit, and the extent of water runoff through the deposit, may also have impacted the visibility of grave cuts, with water action potentially obscuring the grave cut in C025. At the western end of the grave, and beneath the head and shoulders of Individual 'B', the partial remains of three, yellow, cut sandstone blocks, C037, were identified, forming the eastern end of a stone-lined feature that continued beyond the grave cut (and limits of excavation) to the west. The stones were aligned ESE to WNW, with a returning stone identified beneath Individual 'B' at the eastern end of the east-west aligned stones. The stones did not align with Individual 'B', however the skull of Individual 'B' was placed between two of the sandstone blocks, with the left shoulder partially resting on the northern of the blocks.

Two extra tibiae were found within the grave fill, with one positioned to the north of the left tibia of Individual 'A', and one located between the right tibia of Individual 'A' and the left tibia of Individual 'B'; at the western end of grave cut C038 above the head of Individual 'A', the distal ends of two femora C031 were identified, along with three displaced foot bones, suggesting that grave C038 cut through and disturbed an earlier grave. The displaced foot bones, and extra tibiae were retrieved from the grave, however, the identified femora were left in situ, with the remainder of the disturbed grave likely intact, and extending to the west beneath the existing 'rampart' structure. These remains were classified as C031 (Individual 'D').

The eastern end of grave C038, along with the lower legs and feet of both individuals 'A' and 'B', had been subsequently damaged and cut through during the construction of the 'rampart' wall and steps (Illus 10). The visible, linear foundation cut

Illus 10 Damage to lower limbs from 'rampart' construction (Image by Heritage and Archaeological Research Practice)

for the 'rampart' wall, C047, was found to have cut through the distal ends of the tibiae of Individual 'A', with the lower portion removed along with their feet. The feet of Individual 'B' had also been disturbed and partially crushed/covered over by 'rampart' wall foundation stones, C039, and matrix, C040. The wall foundation cut and foundation stones were traced for 3.6m in this area of the repair works, with the foundation cut extending to up to 0.65m wide, and bounded on the east by modern tarmac/pavement. The depth of the foundation cut was not revealed as the rounded boulders forming the foundation stones of the 'rampart' walls were left in situ to provide a solid base for the new 'rampart' wall to be built on.

Adjacent to the south of grave C038, at its western end, the disarticulated remains of a potential third individual, C030 (Individual 'C'), were identified, in a mixed orange-brown sandy clay, C035, forming the fill of a potential grave cut, C048. As with C038, cut C048 was ephemeral and only partially distinguishable in deposit C032, with no visible cut in the overlying C025. Whilst initially identified as Individual 'C', the bones were a mix of both infant and sub-adult, suggesting a collection of re-deposited bones.

3.2.2 Section 2A

Section 2a ran from the northern end of the former double access steps in Section 1, to the recessed lamppost at Section 3. In Section 2a only the copestones and upper courses of the 'rampart' retaining wall, C014, and associated backing wall, C005, were removed, to a depth of 0.8m from the ground level at the top of the 'rampart'. The removal of the facing stones revealed the backing wall to be constructed from rough, drystone cobbles and boulders with no formal bonding material but occasional patches of a friable, pink and orange sand and gravel mortar, C018. This mortar material was sporadically spread throughout Section 2a, and likely formed a rough bonding agent for the smaller, upper layers of backing wall prior to the construction of the mortared wall face.

A series of kerbstones, C006, used as borders for shrub beds were identified along the length of Section 2a. The shrub beds contained a mixed, mid-brown silty loam topsoil, C021. The kerbstones were set into a mixed grey concrete, C020, that survived to a depth of up to 0.3m.

3.2.3 Section 2B

Section 2b ran from the northern edge of the recessed lamppost at Section 3, to approximately 5m south of the south end of the former access steps in Section 4. As with Section 2a, only the copestones and upper courses of the 'rampart' retaining wall and associated backing wall were removed, to a depth of 0.8m from the ground level at the top of the 'rampart'. The removal of the facing stones revealed the construction and preservation of backing wall to be consistent with that revealed in Section 2a, with sporadic patches of mortar, C018. As with Section 2a, kerbstones continued along the entirety of this section and bounded the heavily root disturbed topsoil infill, C021, which was partially removed to provide a suitable working space for the new backing wall and wall repair works.

3.2.4 Section 3

Section 3 was located between Section 2a and Section 2b, with the 'rampart' wall curving inwards in a semi-circular fashion in order to accommodate a lamppost. The 'rampart' wall face was removed in its entirety in this section to reveal a drystone backing wall, C005, constructed from much larger boulders than in other sections. The nature of the boulders and the lack of bonding material meant that on removal of the wall face, the backing wall was not stable enough to remain standing, and thus slumped or fell away. Prior to wall slumping or collapse, the same profile of deposits in sections 2a and 2b were identified. After the removal of the backing wall down to ground level, a small trench was hand excavated into the recess, following the existing curvature of the 'rampart' wall, to provide a safe working space to rebuild the backing wall and wall face of the 'rampart' walls. This process removed all remnants of the backing wall and revealed a soil profile consisting of 0.15m of shrubbery topsoil, C021, overlying two distinct deposits, with remains of a mixed, orange clay silt with stone inclusions, C003/022, that represented the same dumping deposit identified in Section 1. This deposit continued to a depth of 0.5m and

both overlay and abutted a dark brown clay silt identified as C013, which continued to a depth of 0.8m and contained small fragments of animal bone. Deposit C013 was found to overlie a well-sorted, homogenous, grey-brown clay silt, C004, which appears to represent a natural accumulation of soil, possibly a hill or slope wash. The base of this deposit was not reached during the excavation works, and the deposit continued beyond the limits of excavation.

3.2.5 Section 4

Section 4 ran from the south side of the former single set of access steps, to the south edge of the former ladies' toilet block. As with Section 3, the 'rampart'/retaining wall (including the backing wall) was removed to ground level at this location, with the access steps also removed. On removal of the concrete steps and gravel/hard-core, C001, a thin layer of yellow sandstone capping C044 was found to seal the top of the backing material for the steps, continuing the length of the staircase, and consisting of one course, 0.05m thick. This overlay a mixed concrete and mortar material, C046, with occasional rough pieces of sandstone poking through. This mixed mortar deposit was up to 0.3m thick and overlay a more distinct layer of rough-cut stone coursing forming the backing wall material behind the steps. This backing material had however been bonded by rough grey concrete, C043, that was evident throughout the remainder of the backing wall behind the staircase. The nature of these deposits and bonding material, along with the concrete steps, suggests that this staircase had been a more recent addition to the 'rampart' and did not represent an original feature.

To the north of the former staircase the removal of facing wall revealed a similar nature to backing wall C005, as had been seen in Section 2a and 2b with patches of a pink and orange sand and gravel mortar, C042, sporadically bonding the backing wall material, in a similar fashion to C018.

On removal of the backing wall material the soil profile was found to be the same as that uncovered in Section 3, with up to 0.18m of hard-core and gravel overlying a mixed, dark brown clay silt with stone inclusions, C013, which also contained a corroded metal fitting, and small fragments of disarticulated animal and human bone. The deposit represented a dumping episode up to 0.95m thick, and overlay a grey-brown homogenous silt, C004, with very occasional stone inclusions, up to 0.65m thick. The bottom of this deposit was not reached during excavation works, and continued west, beyond the limits of excavation, into the 'rampart'.

3.2.6 Section 5

Section 5 consisted of the former ladies' toilet blocks, which had been sealed up with sandstone blockwork after closure. Once the entrance had been cut through and became accessible, it was evident that there were no remnants of backing wall C005 in Section 5. The toilet block was a brick-built structure abutting the rear of facing wall C014, with a complete removal of all backing wall, 'rampart' soils (and earlier soils) at the time of the construction of the toilets. There was no visible evidence for the facing wall having been dismantled and rebuilt along the length of the front of the toilet block suggesting that space required for the toilet block had been excavated out from behind the 'rampart' facing wall prior to construction of the brick building. The brickwork for the toilet block in contact with the 'rampart' soils was not removed, however, and so it was not possible to confirm this.

3.2.7 Section 6

Section 6 was located between the north end of the former ladies' toilet block, and the south end of the former gents' toilet block, and incorporated the small cellar to the south of the former gents' toilet block. The wall face and backing wall were to be removed entirely to ground level through Section 6, with a small trench excavated to the rear of the backing wall in order to provide adequate working space to rebuild the wall.

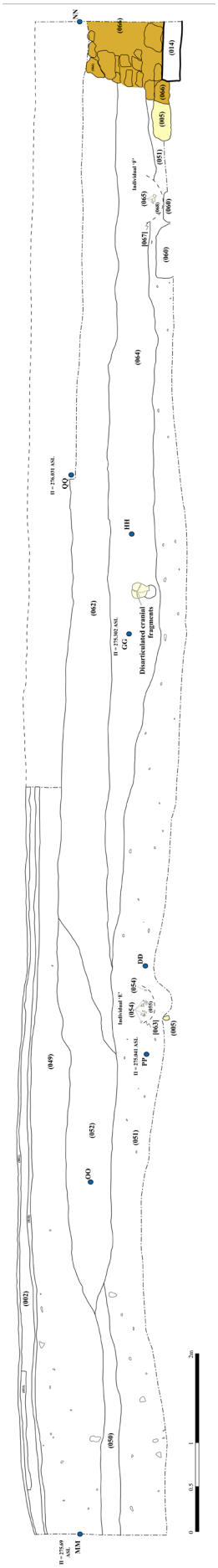
The removal of wall face C014 revealed the backing wall, C005, to be similarly constructed to that found in Sections 2 and 4, with sporadic patches of a pinkish sandy gravel mortar, C056, bonding portions of the backing wall. On the removal of the backing wall the soil profile behind showed similarities to the soil profile identified in Section 3 and Section 4, with modern deposits of hard-core and gravel overlying occasional patches of

tarmac. Beneath these deposits a mid-greyish brown clay with stone and gravel inclusions, C049, was found to continue along the length of Section 6, with a thickness of up to 0.75m. The deposit was similar in nature to C013 identified in Sections 3 and 4, and contained 19th century debris including fragments of glass and clay pipe stems.

C049 probably represents a dumping or infilling episode, and contains fragments of disarticulated human and animal bone, as well as fragments of bottle glass, pottery sherds, and clay pipe stems. The deposit overlay a wedge of orange sand, C052, that extended for a length of 4m, with a thickness of up to 0.5m. C052 displayed a southerly facing tip line, suggesting the material had been dumped, and overlay a mixed orange-brown sandy silt with gravel and stone inclusions, C062, which continued for a length of 11m north to the southern edge of the cellar, and was up to 0.5m thick. The poorly sorted nature of C062 suggests that this was also a dumped deposit.

On the removal of the backing wall to reveal these deposits it was apparent that the soil behind the retaining wall was very soft and wet, and at risk of slump or collapse. As such, once recorded, the upper deposits identified as dumped layers were partially battered and sloped backwards to the top of the 'rampart' in all areas where potential slumping was identified prior to further removal of the lower portion of the backing wall.

The removal of the lower half of backing wall revealed a soft, greyish-brown sandy silt underlying all of the dumped deposits described above. The deposit did not cover the entire length of Section 6, but was partially split by dump C052. As such, two separate context numbers were ascribed, with C050 underlying and located to the south of C052, measuring 3m long and up to 0.25m thick. To the north of, and beneath both C052 and C062, the greyish brown silt was recorded as C064 and continued for the remaining length of 10m to the south side of the cellar, and surviving to a thickness of up to 0.45m. Whilst recorded as different contexts, the similar nature suggests that they were likely the same event, with a very well sorted sandy silt suggesting a natural accumulation of hill wash or slope wash; the nature of the deposit was very similar to C025 identified in Section 1, being very soft in nature and showing evidence of



Illus 11 North-east facing section showing remains uncovered in Section 6 (Image by Heritage and Archaeological Research Practice)

being affected by water retention and runoff. The deposit however was not completely undisturbed, with occasional fragments of disarticulated human skeletal material, and evidence of root disturbance.

This deposit of likely hill wash overlay an orange-brown gravelly clay with stone inclusions, C051, which was identified along the entirety of Section 6 up to the southern edge of the cellar. The base of this deposit was not identified, continuing beyond the depth of the required excavation for the repair works, with a thickness of up to 0.65m identified. Approximately 6m from the south end of Section 6, the removal of the lower half of backing wall uncovered the heavily disturbed remains of a formerly intact human burial, C054 (Individual 'E'). Due to the softer nature of soil deposits, it was apparent that the weight of the backing wall material had partially crushed the remains in the abdominal region, however it was also apparent that the lower half of the skeleton had also been previously removed, with no remains below the pelvis in situ. As in Section 1, the original construction of the 'rampart' wall had clearly cut through part of an intact burial. The soil surrounding the skeletal remains, C054, was an orange-brown silty clay, with occasional stone inclusions, C055, and very similar in nature to the surrounding C051. An ephemeral cut for the grave, C063, was identified in the section below the identified remains, but had likely been disturbed by the weight of the backing wall material. On discovery of the skeletal remains, following consultation with HES, the disturbed portions of the remains were retrieved, whilst the intact remains (approximately from the shoulder up) identified as continuing west into the undisturbed section of the 'rampart', were left in situ.

The foundation stones, C060, of the 'rampart', and surrounding mortar bonding, C061, were revealed in Section 6, and were similar in style and construction to C039 and C040 revealed in Section 1. The nature of disturbance to skeletal remains C054 and the height of these remains above the foundation level for the wall indicates that the deposits and ground slope prior to 'rampart' construction were at a higher level at this section in comparison to Section 1 where only the foundation trench appeared to cut through existing soils before 'rampart' construction. In Section 6 it appears that a larger amount of soil was cut away to construct the 'rampart', with more 'original', or pre-existing soil retained behind the newly constructed wall, resulting in less dumped material directly behind the 'rampart' wall than in Section 1. The profile of the backing wall material showed the rear side to not be vertical, but displayed a slight lean to the west towards the top, which would also be consistent with cutting and removing a greater amount of material, and maintaining stability prior to the construction of the wall as a more vertical cut through existing soils may have resulted in collapse or slump. The 'rampart' wall cut, C059, in Section 6 was linear on an approximate north-south orientation, and was found to have cut through deposits C050, C051, and C064 to a minimum depth of 0.65m. The full depth of the 'rampart' wall cut was, however, not revealed, as the uncovered foundation stones were not removed to reveal the bottom of the foundation trench.

Located 1.5m to the south of the southern side of the cellar, further skeletal remains were identified on removal of backing wall C005. The disturbed, distal ends of two tibiae and a fibula, C065 (Individual 'F'), were identified in the soil profile, approximately 0.1m above the top of the foundation stones of the 'rampart' wall. No in situ feet bones were identified, and as was evident with Individual 'A' and Individual 'B' in Section 1, and Individual 'E' in Section 6, the original construction of the 'rampart' wall had cut through an intact human burial. The soil, C068, surrounding Individual 'F' was very similar in nature to the overlying C064. A shallow, concave grave cut, C067, was identifiable as having cut into C051, however, the grave cut could not be traced into the above deposit, C064, which showed very similar characteristics to the nature of C025 and C038 for Individuals 'A' and 'B', and the lack of a visible grave cut for Individual 'D' in Section 1. As with C025 in Section 1, water action through C064 may have affected the visibility of the grave cut, potentially obscuring it. The remains of Individual 'F' were left in situ.

On discovery of the human skeletal remains in Section 6, and following discussion with HES, an on-site revision to wall removal was sought in order to minimise the potential disturbance of further intact skeletal material behind the 'rampart' backing wall. Where solid foundations of the original 'rampart' wall were revealed they were not removed; rather

they were kept in situ to provide a solid working base for the wall rebuild. Further, adjacent to the south of the cellar, portions of the lower backing wall were retained to limit disturbance to the soil deposits behind the wall. The backing wall to the north of the cellar was also not removed, with only the facing stones removed to be rebuilt and strengthened.

3.3 Discussion

3.3.1 Standing building recording

Results of the SBR indicated that both sets of recessed steps appear to be later additions to the 'rampart' walls, in particular the single access steps, C103, showed evidence (concrete mortar bonding and concrete steps) of being later than the double staircase, C101 and C102.

There is no evidence in the 'rampart' wall to suggest that the construction of the former ladies' toilet block included the removal of a large portion of the 'rampart' wall face (other than to create an entrance), suggesting that the former ladies' toilet block was built into a space excavated behind the existing 'rampart' wall face at the time. Whilst this would have resulted in the removal of a large amount of soil from behind the wall, the current works found no evidence for this material having been re-deposited on the 'rampart', suggesting that the material may have been removed and dumped off site. Once the toilets fell out of use, the entrance was subsequently blocked by grey sandstone block work, C106, similar in style and form to the 'rampart' wall face. The interior of the former ladies' toilet block contained no significant features, with all fixtures and fittings identified dating to the 20th century; this appears to tie into the mapping evidence indicating that the ladies' toilet block was a modern feature and was not constructed until after 1964. The space for the former ladies' toilet block has now been used to house the double access steps to the top of the 'rampart' (see Sections 3.3.2 and 3.3.6 below).

The cellar also contained no significant features, but consisted of a small, square room with a rendered, likely barrel-vaulted ceiling. A date for construction of the cellar could not be identified, however, the cellar is to be retained and has not been affected by the repair works.

3.3.2 Watching brief Section 1

Section 1 was subject to the largest area of excavation works due to the space required to replace and rebuild the double access steps located there. Removal of modern overburden deposits from the 'rampart' behind the double access steps revealed a series of clearly disturbed deposits, including C022, which was very poorly sorted and contained a large amount of fragmentary and disarticulated human and animal skeletal material. The nature of C022 suggests that it had been excavated from elsewhere (potentially from ground to the east of the 'rampart') and deposited on top of existing soils and deposits during the construction of the 'rampart'. On its removal a number of intact archaeological deposits were identified, including the remains of a small drystone wall with a rich hill wash or slope wash deposit behind it, containing a large proportion of disarticulated animal bones, suggestive of midden material. Wall C023 followed the existing contours of the deposits, with the ground clearly sloping away to the south and east, suggesting that prior to the dumping of C022 and the construction of the 'rampart', the ground surface had sloped away from the abbey to the south and east. Wall C023 potentially represents a small terrace or boundary wall, built along the natural contours of the pre-existing landscape. This wall was subsequently cut through and covered over during construction of the 'rampart'.

Located to the east of C023, C025 was a homogenous, fine-grained sandy silt with occasional stone inclusions, suggesting a natural accumulation of hill wash or slope wash. On its removal the intact remains of two skeletons were revealed, with their grave cut only visible in the lower deposit, C032. The two burials were positioned on their backs in a west to east orientation, with excavation indicating that they were interred at the same time, with body positioning (particularly shoulder position) suggesting that they were likely shrouded at burial. The act of grave cutting for these two bodies disturbed the earlier grave of C031 (Individual 'D'), cutting through this earlier burial at the knees. The resting position of Individual 'D' was found to be at a slightly higher level than Individual 'A' (approximately 0.2m to 0.3m higher) with the exposed femoral ends of Individual 'D' sitting

above and to the rear of the skull of Individual 'A'. The disturbed tibiae of Individual 'D' were likely reburied with Individuals 'A' and 'B' as two extra tibiae were discovered adjacent to the lower legs of these individuals during excavation. On investigation of grave cut C038 and the surrounding deposit, C025, it was not possible to distinguish a grave cut through deposit C025 for Individual 'D', with water action and disturbance through deposit C025 potentially obscuring any grave cuts.

During excavation of Individual 'B', the skull and shoulders were found to be partially positioned within the bounds of an earlier stone-lined feature, with cut yellow sandstone blocks, C037, found below the shoulders and neck of the body. These stones did not appear to encase the head as they were on a slightly different alignment, but may represent an earlier, stone-lined feature that was incorporated into the grave cut for Individuals 'A' and 'B', possibly representing the eastern end of an earlier cist grave, however, there was not enough of the feature uncovered to prove conclusive.

The eastern end of grave C038, and as a result, the lower limbs and feet of both Individual 'A' and Individual 'B' were found to have been disturbed and cut through by the foundation cut for the construction of the 'rampart' wall, with both tibiae of Individual 'A' being cut through completely, and the feet of the individual removed. Whilst the tibiae of Individual 'B' were not cut through, the feet were disturbed by the construction of the wall foundations, and not fully intact.

Adjacent to the south of grave C038 further human remains identified as Individual 'C' were revealed. Initially thought to be an infant burial, it was discovered to be a mixture of disarticulated infant and non-adult remains that were likely re-deposited, and potentially disturbed during the grave cutting for grave C038. The sequence of events and nature of the soils therefore suggest a natural accumulation of hill wash deposits forming the soils for the abbey graveyard, that were subsequently cut into on numerous occasions, with each act of grave cutting having the potential to disturb earlier graves. The homogenous nature of C025, and lack of visible grave cuts within this hill wash deposit also suggests that each grave was filled in shortly after interment, using the same soil that had been excavated to create the grave. The presence of fragments of small amounts of disarticulated human and animal remains within this hill wash, or graveyard soil, also highlights the potential continuous disturbed nature of the deposit. This hill wash deposit appears to have formed the natural slope of the landscape, which was terraced or bounded by wall C023 in an attempt to either create a boundary or limit erosion of the slope wash deposits. The construction of wall C023 also appears to have created a suitable area for midden material to be dumped or accumulate behind.

At the time of the construction of the 'rampart', this natural sloping landscape (that had potentially been eroding to the east of wall C023) was partially cut through to create a foundation trench for the 'rampart' wall, prior to the dumping of excavated material to raise the ground level. The construction of the 'rampart' wall retained this dumped material and created a formalised, elevated walkway to the east of the abbey and its graveyard.

3.3.3 Watching brief Section 2a and Section 2b

Section 2a and Section 2b had the least intrusive works carried out, with only the upper courses of the 'rampart' retaining walls removed to be repaired. The backing wall was found to have been of the same construction as had been identified in the earlier test-pitting works, with a rubble drystone construction, however, it was now found to also contain sporadic patches of rough mortar bonding material. The soil profile behind the exposed backing wall in both Section 2a and Section 2b had been part of more modern shrub bedding, with heavily root disturbed topsoil identified. As such the nature of 'rampart' construction, and the soil profile behind the 'rampart' retaining wall was not revealed in these sections of works, with little to be added to the narrative of the 'rampart' in these sections.

3.3.4 Watching brief Section 3

Section 3 was subject to a full wall removal of both the facing wall and backing wall material. The nature of construction of the backing wall was revealed to consist of larger boulders, again of drystone construction, that had little to no structural integrity once the facing wall had been removed. Due to the removal of the facing wall and backing

wall in their entirety at Section 3 a full soil profile of the 'rampart' was revealed, indicating a similar formation of contexts as had been identified in Section 1, with an upper layer of dumped or in-filled soils overlying a homogenous, naturally accumulated hill wash. These deposits were the same as had been identified during the test-pitting phase, and C003 was very similar in form and nature to C022 in Section 1, suggesting that they were likely part of the same activity or event. Whilst no artefactual remains were retrieved in Section 3 the revealed soil profile indicates that a natural accumulation of soils was likely cut through prior to the dumping of mixed soils and the construction of walls C005/014 to retain them. The lack of structural integrity to backing wall C005 suggests that the construction of both walls may have occurred simultaneously, not as separate phases as previously postulated, with the drystone backing wall built and pressed into the soil profile to a certain height before the construction of the wall face to the same height, before the process was started again until the desired wall height was reached.

3.3.5 Watching brief Section 4

As with Section 3, a large part of Section 4 was subject to full removal of both the facing wall and backing wall, as well as the removal of a former single set of access steps located to the south of the former ladies' toilet block. On removal of the steps the construction makeup behind indicated a large amount of concrete mortar surrounding rough cut sandstone blocks, and capped by a layer of thin, small, flat yellow sandstone slabs, with no evidence of the drystone backing wall, C005. The lack of drystone backing wall, the concrete mortar bonding of the sandstone backing material, and the concrete steps at the face of the staircase suggests that this single set of stairs was either a later addition into the 'rampart' (although it is mapped on the OS Town Plan of 1858), or had been subject to later repair works after initial construction.

The full removal to ground level of both the facing wall and backing wall material in Section 4 corroborated the soil profile identified in Section 3, with evidence of dumped soil underlying modern overburden, and overlying hill wash deposit. This soil profile continued north to the south side of the former ladies' toilet block in Section 5, and it is possible to assume that the soil profile would likely continue to the south (behind the remaining 'rampart' wall in Section 2b) to meet Section 3.

3.3.6 Watching brief Section 5

Section 5 contained the former ladies' toilet block, and once access had been achieved it was discovered that there was no evidence of the drystone backing wall left in situ at this location, with the brick-built walls of the toilet block abutting the western face of the 'rampart' facing wall. The wall face did not display any evidence of being cut into in order to build the toilet block, and it is likely therefore that the space behind the wall face was excavated out from above, with the toilet block built into the space. The only breaking through of the wall face will have occurred with the construction/insertion of the entranceway C106 into the toilet block, and the insertion of air vents, C108, into the upper courses of the 'rampart' wall face. The fixtures and fittings, and mapping evidence, all indicate that the former ladies' toilet block was a modern addition to the 'rampart', inserted some time after 1964.

3.3.7 Watching brief Section 6

As with Section 3 and Section 4, Section 6 required a complete removal of both its facing wall and backing wall. This section of 'rampart' wall displayed signs of significant failure, with visible cracks to the wall mortar, and possible bowing to the wall face. On removal of the wall face and upper backing wall, it became apparent that the nature of the deposits was at risk of slumping without the retaining wall in place. The deposits were evidently softer than those further south, and were also retaining more water (however this may be a result of the works being carried out in November and December in Section 6, compared to August and September in Sections 1 through 4). With the removal of the upper half of the wall face and backing wall, a similar soil profile to Section 3 and Section 4 was revealed, with modern overburden deposits overlying a mixed dumped deposit, which contained evidence of 19th century debris including fragments of glass bottles and clay pipe stems. A two-penny piece dating to between 1642 and 1650 was also found, indicating

that the accumulation of this material did not occur before that time. The evidence suggests therefore that C049 was a dumped deposit, and was found to overlay two further dumped deposits, with tip lines of all of these deposits indicating that they had been dumped, or cast, from the north or north-east. The dumping of these deposits likely ties into the construction phase of the 'rampart' and the building of the 'rampart' wall, and along with C022 in Section 1 and C013 in Section 3 and Section 4, represent the dumped deposits to raise the ground level during construction of the 'rampart'.

The removal of the backing wall to ground level revealed a series of intact deposits in the soil profile below 'rampart' construction material. C050 and C064 represent a similar hill wash to C025 in Section 1. These hill wash accumulations appear to represent the original graveyard soils that were subsequently repeatedly cut into. No grave cuts were clearly visible through this deposit, which displayed a homogenous, fine-grained form indicative of a natural accumulation of soils over an extended period of time, and likely heavily affected by water action. Beneath these soils the discovery of two disturbed graves indicates that, as in Section 1, the original construction of the 'rampart' has cut through and disturbed intact remains likely associated with the earlier abbey graveyard. Individual 'E' was discovered in the removal of backing wall material that had, over time, crushed the abdominal area of the body, with the 'rampart' construction and wall cut having cut through and removed the lower half of the skeleton. The remains of a further body, Individual 'F', were identified to the south of the cellar, with only the distal ends of two tibiae and a fibula visible in the soil profile where the 'rampart' wall cut had cut through the ankles of this individual. The grave cuts for these two individuals were cut into deposit C051, which appears similar in nature to C032 in Section 1, and may represent the same iron rich deposit that the graveyard soils overlay. Both individuals were found between 275.2m and 275.1m ASL (compared to 273.65m and 273.55m ASL for Individual 'D', and Individuals 'A' and 'B' respectively) indicating that the original ground levels prior to the construction of the 'rampart' also sloped away to the south-east, as is still the case today.

On removal of the backing wall material, it was also evident that the western face of backing wall C005 displayed a lean to the west towards its upper courses; this suggests that the cut for the wall through existing soils was fairly consistent, and on a relatively steep angle, with the backing wall material, C005, built up against the exposed face of the cut deposits before being built up against or pressed into the sloping face of the dumped deposits used to raise the ground level and construct the 'rampart'. This construction technique is also corroborated by the collapse and slumping of some portions of the backing wall following removal of wall face C014, as the backing wall material alone was not structurally sound enough to retain the 'rampart', indicating that the wall face was not a formalisation of an existing retaining or boundary wall, but that walls C005 and C014 were part of the same phase of construction works.

Whilst the removal of the wall face surrounding the cellar revealed portions of its southern wall, and suggested a barrel-vaulted ceiling, there was no direct evidence to indicate when the cellar had been constructed. The fact that the wall backing material continued up to the southern wall of the cellar with no clear evidence of having been cut through, coupled with no evidence of a visible cut through the 'rampart' construction soil, C049, to the south side of the cellar, suggests that the cellar may have been part of the original construction phase of the 'rampart'.

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

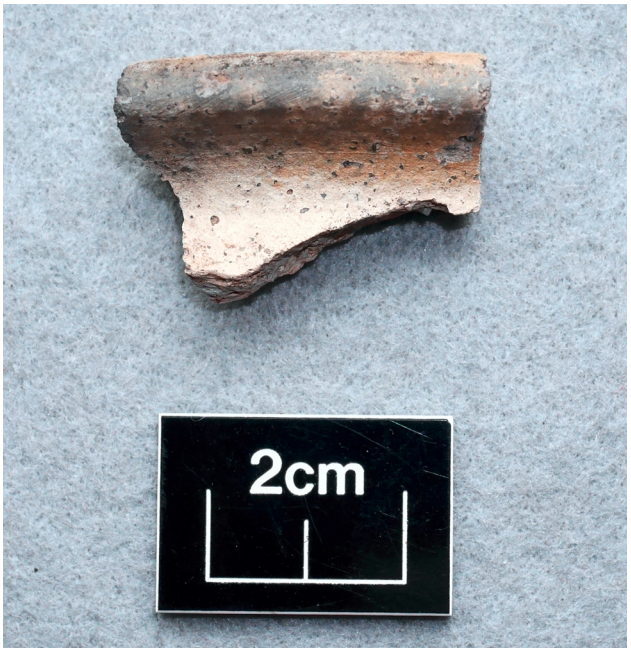
The excavations at Jedburgh Abbey 'rampart' produced a small assemblage of ceramics (12 pieces) ranging in date from the 12th to 19th/20th centuries. The assemblage includes sherds found during the earlier test pitting works. Four of the five sherds of medieval pottery from C026, C033, and C034 in Section 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

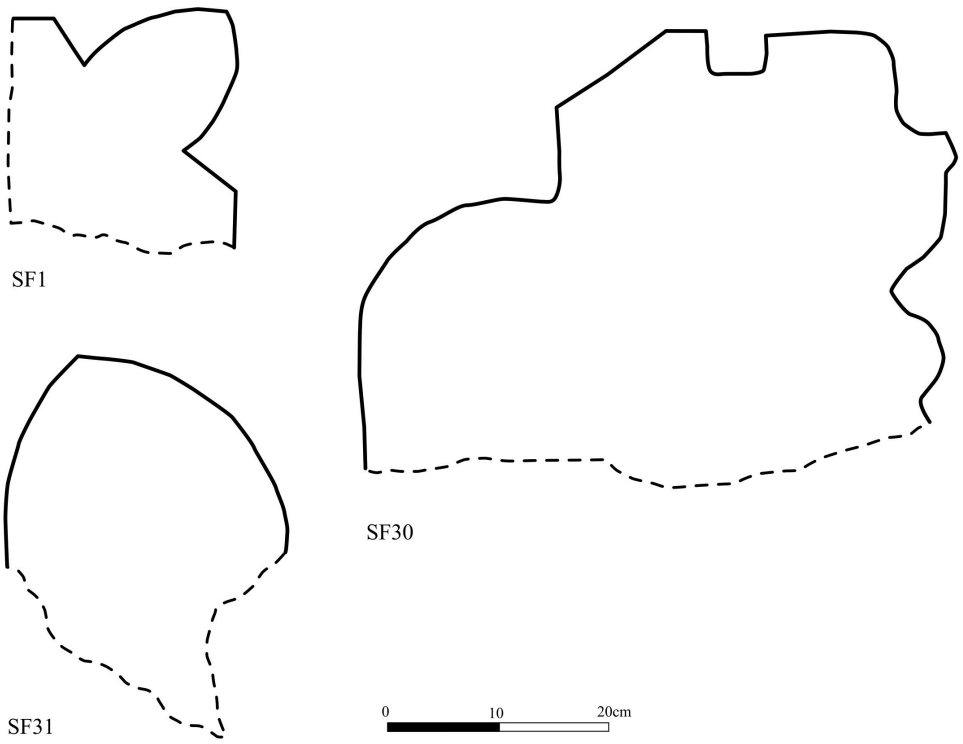
There are three clay pipe stems from C049, SF17 and SF27, in Section 6, and two from C013 in Test Pit 3 that are likely to be of 19th century date.

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.

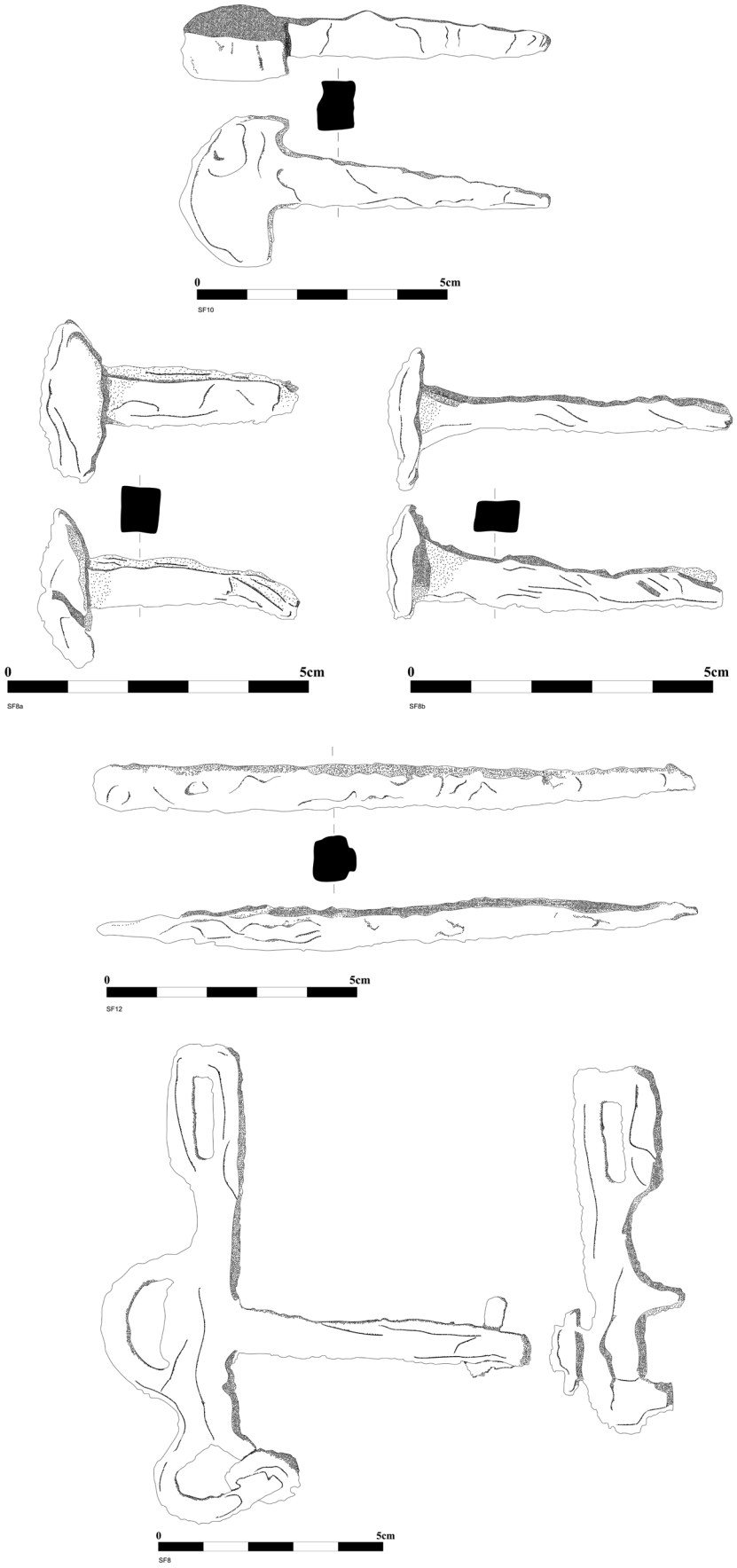
4.3 Metal assemblage

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.

5. ENVIRONMENTAL ANALYSIS

Ian Hill

Environmental analysis was focussed on the human and animal remains retrieved during the excavation works. Radiocarbon dates were retrieved from three separate samples of human remains (Individuals 'A', 'B', and 'E'), with the dates derived from samples of their ribs. A further radiocarbon date was retrieved from a sheep radius found in midden deposit C026. Stable isotope analysis (to assess diet) was also completed for samples from Individuals 'A', 'B', and 'E', with analysis of a tooth, rib bone, and femur of Individuals 'A' and 'B', and tooth and humerus for Individual 'E'. During excavation of Individuals 'A' and 'B' soil samples were taken from the anterior aspect of the sacrum for palaeoparasitological analysis, and a bone and tooth sample from Individuals 'A' and 'B' were submitted for aDNA analysis at the Francis Crick Institute to form part of the 1,000 Ancient British Genomes project.

5.1 Radiocarbon dates

Samples were retrieved from rib bones of Individuals 'A', 'B', and 'E' and submitted for radiocarbon dating. A further sample (sheep radius) was retrieved from midden material C026 and submitted for radiocarbon dating. The samples were processed by SUERC and were calibrated to the calendar timescale using the Oxford Radiocarbon Accelerator Unit calibration program OxCal 4 (Bronk Ramsey 2009). The provided date ranges were calibrated using the IntCal20 atmospheric calibration curve (Reimer et al 2020). The radiocarbon dating results are provided in Table 2.

Radiocarbon dates for Individuals 'A' and 'B' (C028 & C029) display a very similar date range, which supports the theory that the two individuals were buried at the same time, and evinced in the archaeological results. These two individuals were probably interred around the mid-15th century, and earlier than Individual 'E' (C054) located in Section 6 to the north. The date range for Individual 'E' is less precise than Individuals 'A' and 'B', with a possible interment ranging from the early-16th to the mid-17th century. This may indicate a progression of burial plots expanding to the north from the 15th century onwards, however, it must be borne in mind that the remains of Individual 'E' were heavily disturbed by the construction of the 'rampart', which may have impacted the date ranges retrieved. Dating for the sheep radius from C026 provides a date range in the first half of the 15th century, and likely prior to the interment of Individuals 'A' and 'B'. This also suggests that the midden material and wall C023 pre-dated these burials.

Table 2 Radiocarbon dates from osteological samples retrieved in Section 1 and Section 6

Sample Number	Context Number	Individual	Laboratory Code	Uncalibrated Date BP	Calibrated Date (AD) at 95.4% Probability	Percentage Likelihood (95.4% probability)
3	028	A	SUERC–100093 (GU58635)	416 +/-29	1429–1513	85.5%
					1591–1620	10.0%
5	029	B	SUERC100094 (GU58637)	428 +/-29	1425–1500	91.6%
					1600–1615	3.9%
7	054	E	SUERC100095 (GU58639)	278 +/-29	1508–1594	52.5%
					1617–1666	40.0%
					1784–1795	3.0%
21	026	N/A	SUERC–100906 (GU59012)	513 +/-24	1400–1443	95.4%

5.2 Stable isotope analysis

Stable isotope analysis was conducted on samples retrieved from Individuals 'A', 'B', and 'E'. The analysis included $\delta^{13}C$, $\delta^{15}N$, and $\delta^{34}S$. A sample of femur or humerus fragments (to assess long term diet) and rib fragments (to assess later life diet) were submitted for Individuals 'A', 'B', and 'E'. Tooth samples (to assess early life diet) were submitted for Individuals 'A' and 'B'. The analysis was completed by SUERC, and the results are provided in Table 3.

Stable isotope analyses have been used extensively to infer ancient diet, with often simplistic analysis of the data used to suggest marine based or terrestrial diets (Makerewicz & Sealy 2015); a higher $\delta^{15}N$ ratio coupled with a less negative $\delta^{13}C$ ratio suggesting a marine based diet, and a lower $\delta^{15}N$ ratio coupled with a more negative $\delta^{13}C$ ratio suggesting a terrestrial, plant-based diet with varying diets plotted in between these extremes. On this basis alone, the data for Individuals 'A', 'B', and 'E' would suggest a terrestrial based diet, with Individuals 'A' and 'B' displaying a more meat rich diet than Individual 'E'. More detailed factors should be considered in isotope analyses, as local environmental factors and cultivation practices (such as manuring) can affect levels of $\delta^{15}N$, resulting in a higher ratio than 'baseline' levels would suggest (ibid: 148–9). In comparison to the isotope levels returned for the sheep radius from C026 however, it appears that at a (presumed) local level an herbivorous diet would return a significantly lower $\delta^{15}N$ ratio, and a more negative $\delta^{13}C$ ratio than displayed in Individuals 'A', 'B', and 'E'. Analyses from 24 contemporary burials in Portmahomack (dating from the 12th to 16th centuries) displayed a higher average $\delta^{15}N$ ratio ranging from 12.7‰ to 16.6‰, and less negative $\delta^{13}C$ ratio ranging from -20.4‰ to -17.1‰ indicating a mixed terrestrial and marine diet (Curtis-Summers 2016: D31).

Whilst the isotope analysis of the samples from Jedburgh Abbey Rampart seems to indicate a terrestrial diet, it is far too small a sample size to make broader generalisations regarding diet in the area in the 15th and 16th centuries from these analyses alone. Excavations in the 1980s at Jedburgh Abbey uncovered 41 burials (both lay people and monastic burials), however, stable isotope analyses have not been carried out on those remains to provide a more nuanced understanding of late medieval diet in Jedburgh (Lewis & Ewart 1995). Direct comparisons between the individuals indicate that both Individuals 'A' and 'B' likely had a very similar diet, whilst Individual 'E' probably had a less

Table 3 Stable isotope analysis results

Sample Number	Context Number	Sample Type	d13C ‰	d15N ‰	C/N Molar ‰	d34S ‰	C/S Molar	N/S Molar
1	028	Human right maxillary second incisor	-20.7	10.5	3.4	17.6	494	147
2	028	Human right femur fragment	-20.5	10.5	3.4	16.4	488	145
3	028	Human right rib fragment	-20.5	10.8	3.3	15.2	484	146
4	029	Human left maxillary canine	-20.4	10.5	3.4	16.6	447	131
5	029	Human right rib fragment	-20.3	11.1	3.5	15.6	527	150
6	029	Human left femur fragment	-20.6	10.7	3.4	15.7	489	144
7	054	Human rib fragment	-20.4	10.5	3.4	14.6	521	154
8	054	Human left humerus fragment	-20.6	9.5	3.4	14.3	490	145
21	026	Sheep radius	-21.8	5.8	3.2	–	–	–

meat-rich diet, although still well within the ranges of an omnivorous one. The $\delta^{13}C$ ratios remained consistent for all three individuals into later life, with very marginal fluctuation; slight increases in later life are noted in the $\delta^{15}N$ ratios, particularly Individuals 'B' and 'E', which may indicate an increase in meat consumption in later life.

The $\delta^{34}S$ (sulphur) analysis compares the ratio of 34S:32S in a sample against the equivalent ratio in a known reference standard known as the Vienna-Canyon Diablo Troilite (VCDT). We can then compare this ratio to a map of the available Sulphur δ34S‰ (VCDT) from plants in the UK biosphere. The small sample size also restricts the analysis of the $\delta^{34}S$ results, with all three individuals displaying ratios that fall within the parameters of any UK coastal zone on the British Geological Society Biosphere Isotope Domains. What these results do show however, is that the $\delta^{34}S$ ratios for all three individuals decreased in later life. This may suggest a move inland, but it must be noted that there is no inland sulphur data for the Scottish Borders, or indeed inland Scotland, (BGS 2022) so it is possible that their ratio could also be similar to the local area as well.

5.3 Palaeoparasitology

Analysis of soil samples from the pelvic regions of Individuals 'A' and 'B' was completed by the Ancient Parasites Laboratory of the Department of Archaeology, University of Cambridge to determine if intestinal parasites could be identified in these two individuals. No intestinal parasite eggs were identified within the samples, however, this does not mean that the individuals were not affected by parasites, merely that none were identified within the retrieved samples. Given the small sample size, intestinal parasites cannot be ruled out from the wider community.

5.4 aDNA analysis

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A tooth and an auditory ossicle from both Individuals 'A' and 'B' were sent to the Ancient Genomics Institute at the Francis Crick Institute for DNA analysis. The auditory ossicles were sampled because they preserve human DNA exceptionally well and can be sampled directly without any additional impact to the skeleton (Sirak et al 2020). A tooth from each individual was sampled additionally to assess for the presence of DNA from ancient pathogens. Teeth preserve DNA reasonably well and have a direct blood supply via the pulp cavity which is likely to act as a reservoir of infectious pathogens (Margaryan et al 2018).

The bones and teeth were sampled and processed in the clean room facility of the ancient genomics laboratory at the Francis Crick Institute. The teeth were sampled by drilling 50–100 milligrams of powder from the tooth root with an EV410-230 EMAX Evolution Dentistry drill. The tooth powders and whole ossicles were then lysed with 300ul (<10mg of powder) or 1000ul (>10mg of powder) of lysis buffer (0.5 EDTA pH 8.0, 0.05% Tween-20, 0.25mg/ml Proteinase K) and incubated overnight at 37°C. Lysates were centrifuged for two minutes at maximum speed (13,200 rpm) in a table centrifuge and 140ul of the lysate was transferred into FluidX tubes for automated extraction on an Agilent Bravo Workstation (Dabney et al 2013; Rohland et al 2018). Extracts were turned into single-stranded double-indexed Next Generation Sequencing DNA libraries automatically on an Agilent Bravo Workstation with no treatment to remove uracils (Gansauge et al 2020). The two DNA libraries derived from the auditory ossicles were subject to shallow Next Generation shotgun sequencing on an Illumina HiSeq instrument to assess DNA preservation. Both showed excellent DNA preservation as defined by the endogenous content (proportion of reads aligning with the human genome – see Table 4). DNA sequences in both libraries showed patterns of damage consistent with authentic ancient DNA (genuinely ancient DNA would be expected to show damage rates of around 10% or above). These two libraries were subject to deeper whole genome shotgun sequencing on an Illumina NovaSeq Instrument to produce higher coverage (higher quality) whole genomes.

Both the shallow and deeper sequencing data indicate that Individual 'A' was genetically female (two X-chromosomes) and Individual 'B' was genetically male (one Y-chromosome), in agreement with the osteological assessments of biological sex (Skoglund et al 2013). We were able to use the higher

coverage whole genome data to call the paternal (Y-chromosome haplogroup) and maternal lineage (mitochondrial haplogroup) of Individual 'B' and the maternal lineage of Individual 'A' using Y-Leaf and HaploGrep (Weissensteiner et al 2016; Ralf et al 2018). The two burials had different maternal lineages, suggesting they were not directly related on their maternal line of descent. Two methods of estimating genetic relatedness were applied to the shallow screening data: the pairwise mismatch rate (PMR) (Kennett et al 2017) and TKGWV2 (Fernandes et al 2021). The results from both analyses suggested that the two Jedburgh individuals were unlikely to have been close relatives (third degree or closer - PMR = 0.0332±0.006 with a baseline of 0.04; TGWV2, Halved Relatedness Coefficient (HRC) = -0.0566 when Unrelated < 0.0625, 2nd Degree between 0.0625 and 0.1875, 1st Degree > 0.1875). The number of Single Nucleotide Polymorphisms (SNPs) that could be included in both analyses was low (783 SNPs for PMR, 1697 for TKGWV2), however, and so this result is tentative until further analyses can be performed on the whole genome data. It is not possible to assess whether they were non-biological kin, for example spouses.

Individual 'B''s paternal lineage is within the sub-clade R1b-L21. R1b-L21 lineages were introduced to Britain by migrations from continental Europe around 2500 BC associated with the development of the Beaker phenomenon and are almost ubiquitous amongst men who lived in Britain through the Bronze Age (Olalde et al 2018; Patterson et al 2022). While frequencies of this subclade have decreased as a result of post-Bronze Age migrations, R1b-L21 is still in high frequency amongst present-day populations from Britain, particularly western Britain and Scotland, as well as in Ireland and Brittany (Patterson et al 2022). Maternal lineage sub-clades represented in both Individual 'B' (J1c1) and Individual 'A' (X2b) have been in Britain since the Neolithic and are still relatively common in present-day north-western Europe (Olalde et al 2018; Brace et al 2019). Uniparental markers are single loci which represent a small proportion of an individual's genetic ancestry and may not be representative. Therefore, any conclusions about an individual's ancestry based only on these loci will be tentative. However, with this in mind, the paternal and maternal lineages of

Table 4 Preliminary results from shallow screening and deep sequencing of DNA libraries from Jedburgh Individuals A and B

Individual	Element	Lab No.	Run	% Endogenous Human DNA	C-T DNA Damage	Nuclear Coverage	Genetic (Karyotypic) Sex	Y-Chromosome Haplogroup	Mitochondrial Haplogroup
A	R. Malleus	C11178	Screening	86	22.77	0.01x	XX	–	–
A	R. Malleus	C11178	Deep Sequencing	41	19.26	2.4x	XX	–	X2b
B	R. Malleus	C11180	Screening	58	19.63	0.008x	XY	–	–
B	R. Malleus	C11180	Deep Sequencing	27	15.88	1.3x	XY	R1b1a1b1a1a2c1a5b1a1a	J1c1

both Individuals 'A' and 'B' are consistent with what we would typically expect from the local ancestry of medieval people from Scotland.

We plan to undertake further analyses on the whole genome data from Individuals 'A' and 'B' to provide a firmer account of their ancestry and genetic relatedness. The DNA libraries produced from powder taken from their teeth have not yet been sequenced and analysed but may give indications as to whether either individual was suffering from a specific systemic infection at the time of their death.

6. DISCUSSION

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These excavations provided insight into the construction of the 'rampart', as soil deposits containing disturbed and broken, commingled human remains and fragments of animal bone were identified, with the remains of at least fourteen human individuals present. The mixed soil deposits were found to have been dumped, and were lying on top of an old ground surface that sloped down and away from the abbey to the east, with the remains of a drystone wall, possibly a terrace wall, identified following the contour of the old ground surface. This wall may be an indication of spatial division, with clear midden material dating to the 15th century deposited behind and to the north-west of it, whilst the articulated, in situ human burials were found to the south-east of the wall. Unfortunately, the excavations into the midden material were very limited, and the ground to the north-west of the 'rampart' (and its previous use) was not possible to investigate archaeologically. Above the old ground surface, and probable boundary wall, the mixed soil with commingled human and animal remains had been dumped during the construction of the 'rampart', and effectively used to raise the ground level and create its flat surface still evident today. The discovery of the old ground surface, and associated drystone walls, suggested that land to the east of the abbey used to slope away, down toward the Jed Water located around 100m to the east.

Whilst the name of the structure and former military activity in the area have led to suggestions that the 'rampart' may date back to the 1500s, constructed by French troops, the archaeological evidence suggests that construction dates from a later period in history. The nature of the 'rampart' indicates that its construction occurred during one phase, with a rubble-backing wall immediately faced with the dressed stone face. This is a far more elaborate construction than would likely take place during a defensive military operation and suggests that the 'rampart' as we know it today is not the remains of defensive earthworks. The discovery of a 2d coin (SF28) dating to the latter part of Charles I's reign (1642–1650) within the dumped soils and material used to construct the 'rampart' further corroborates this and suggests that it was constructed sometime after the mid-17th century, whilst the radiocarbon dates from Individual 'E' provide a *terminus post quem* for 'rampart' construction ranging from the early 16th to the mid-17th century. The 'rampart' was likely completed prior to the end of the 18th century, when the Low Kirkyard was no longer depicted on town plans of Jedburgh. The abbey had fallen out of use by this time, and architectural fragments from the abbey had clearly been used in the construction of the 'rampart' backing wall. It is not infeasible however, that such a large-scale construction project could have removed evidence of earlier earthworks associated with 16th century military activity, but no traces of this were uncovered in the archaeological remains investigated.

6.1 Changing burial practices and treatment of the dead

Excavation through the old ground surface, and the sealed soft sandy silts below, at the southern end of the works revealed the articulated remains of two intact human burials, one male and one female, at a depth of almost two metres below the top level of the 'rampart'. Body positioning of both skeletons (particularly orientation of the shoulder bones) suggest that they were likely shrouded at burial, and radiocarbon dating and the close proximity of the remains indicate that both individuals were interred at the same time. The only grave good retrieved was a small, unused fiddle-key horseshoe nail found clasped in the left hand of the male individual (Individual 'B'), which was likely some sort of amulet. At the western end of the grave, beneath and adjacent to the head and shoulders of Individual 'B', the partial remains of three, yellow, cut sandstone blocks were identified, forming the eastern end of a stone-lined feature that continued beyond the grave cut (and limits of excavation) to the west. These stones did not align with the burial, however, the head was placed between two of the sandstone blocks, and the left shoulder was found partially resting on their northern edge. The style and orientation of the blocks suggests that the interment of these two individuals had disturbed the eastern end of an earlier cist grave. The disturbance of earlier graves was further emphasised by the identification of the distal ends of two femora and

three foot bones in the grave cut above the head of Individual 'A', suggesting that another earlier burial (Individual 'D') had been cut through during the interment of the two individuals observed here.

This earlier burial must have been cut through at the knees, and intriguingly, two extra tibiae (lower leg bones) were found within the grave fill of Individuals 'A' and 'B'. It is suspected that these tibiae belonged to Individual 'D'. If this is the case, the reburial of the tibiae alongside the lower legs of the male and female individuals shows some level of care and respect for earlier burials by the grave diggers; the same cannot be said however, of the people responsible for the construction of the 'rampart'. It is clear that the feet of both Individuals 'A' and 'B' were, at least partially, damaged or destroyed during 'rampart' construction. The feet of the male individual were partially crushed and obscured by the large foundation stones of the 'rampart', whilst the female individual lost both feet, and her lower legs were completely cut through above the ankles. This is a pattern of disturbance that was observed as the 'rampart' repair works progressed to the north. It became very apparent that the construction of the 'rampart' had disturbed several other graves, with two further burials identified as having been cut through during the primary construction of the 'rampart': One burial cut through in the abdominal region, and one burial cut through at the ankles. The primary construction of the 'rampart' likely cut through a portion of the earlier, 'Low Kirkyard', ultimately disturbing several burials, with the disturbed remains cast upwards with the dumped soils and used to raise the ground level and build the 'rampart' walkway.

Analysis of pottery fragments retrieved from the grave fill of Individuals 'A' and 'B' suggests that they came from vessels that likely date to the 12th century. Whilst we know that the two primary burials date to the mid-1400s, the pottery fragments potentially relate to earlier burials or activity in the area, and could have been disturbed during grave cutting; it is not possible to say that the pottery definitely came from the disturbed burial that was likely responsible for the extra tibiae, however, it may highlight the repeated use of the site for burials dating back to the 12th century and the founding of Jedburgh Abbey. It is also clear that the burials identified all happened prior to the construction of the 'rampart'.

This practice of disturbing earlier burials is common across England and Scotland in the later medieval period and often seems to have occurred even in monastic settings (McCarthy 1990). Graves were often intercut and the remains of the earlier burials were either re-interred with the new burial or became part of the commingled assemblage within the grave fills. When burials are disturbed, particularly in an Anglo-Christian setting, and not disturbed deliberately, it likely indicates that there was no visible grave marker present to denote a burial. The disturbance of the earlier burials by later interments at Jedburgh Abbey Rampart is a fairly typical representation of later medieval burial practices. What is unusual is the evidence for it being a double burial, as this is not a normal practice for this time period (Hindmarch & Melikian 2006). To gain insight into the lives of the two primary individuals excavated during these works, we must try to place them in their 15th century context.

6.2 Biocultural context for the Jedburgh Abbey Rampart skeletons

Radiocarbon dating of the two primary burials discussed here indicates that they were interred in the mid-1400s, long before the abbey fell out of use. Their burial location, quite near to the abbey itself, suggests that they may have been people of some prominence in the community; though they were not interred within the abbey and thus unlikely to be nobility or from the monastic order. Unfortunately, there have not been a large number of studies done on skeletal material from medieval Scotland, however, there was some analysis of the 41 burials excavated at Jedburgh Abbey in the 1980s which can provide some comparison for our 'rampart' individuals (Grove 1995: 117–30). The majority of the burials excavated from areas considered monastic (the Chapter House, outside the Chapter House, within the Cloister Alley, and within the Church) were likely male and the only pathologies detailed were dental or degenerative (ibid: 117–28). These make up the majority of the burials described in the publication. Fifteen other burials were considered post-monastic and contained males, females, and children, displaying a wider range of pathological lesions, including possible evidence of anaemia, though still primarily dental and degenerative

pathologies (ibid: 128–30). The two individuals from the 'rampart' are therefore notable for two reasons (in comparison to the those excavated in the 1980s); firstly, they fall into the monastic time period and include a female inhumation; and secondly, while they seem to follow the pattern of dental and degenerative pathologies observed, the male individual ('B') in particular, displays more extensive pathological changes which could be related to inherited traits (that is the bifurcated spinous processes of the cervical vertebrae and the transitional vertebra resulting in Bertolotti's Syndrome).

If we look further to other bioarchaeological studies of medieval populations in Scotland, Jennings's PhD thesis provides a good comparison group (Jennings 2010). Her comparison of eight cemetery populations from across the English–Scottish border from the 7th through to the 17th centuries reflects on the physiological stresses faced by populations which are within conflict zones (evinced along the English–Scottish border, particularly during the Rough Wooing of the 15th and 16th centuries (Jennings 2010: 53–64)). Within her results it is evident that there are a wide-range of pathologies present across the local medieval populations, that there are increased rates for non-specific indicators of stress amongst all demographic groups, infections were higher, and malnutrition directly affected children in the conflict zone populations more than in surrounding populations (ibid: 244). She did not examine degenerative changes so this cannot be commented on, but this perspective allows us to place our individuals from the 'rampart' into their cultural context: in 15th century Jedburgh, violence and stress were a regular part of life as the Border Wars raged on. Perhaps this helps to explain the periosteal reactions observed on the female individual's remains, or the healed fracture to the male individual's nose. While the specific details of the origins of these pathologies on these individuals is impossible to determine, their skeletons have provided an insight into the lives and lifeways of those being buried at Jedburgh Abbey.

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