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ARO9: Anatomy of a Burial

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ARO9: Anatomy of a Burial

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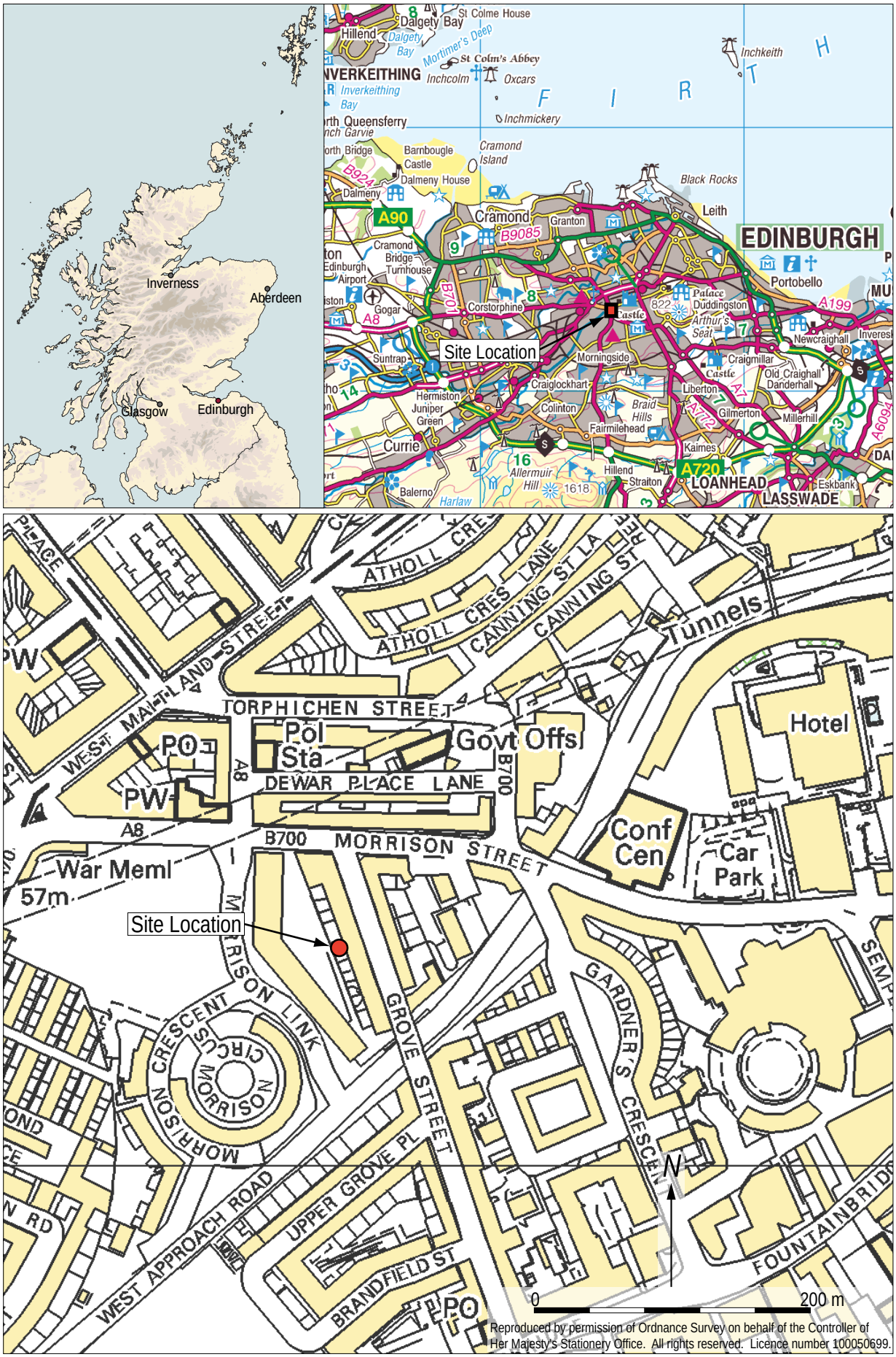

Figure 1: Site location.

Abstract

In September 2012 the partial and disarticulated remains of at least five individuals were unexpectedly discovered by workmen in the rear garden of a house in Grove Street, Edinburgh. GUARD Archaeology Ltd were commissioned to undertake archaeological investigation of the rear garden, followed by the post-excavation analysis of the human bone, under Historic Scotland's Human Remains Call-Off Contract (HRCC). Although no obvious structural remains were found human bones were. Skeletal analysis revealed evidence of them having been used in anatomical display or for teaching purposes. Radiocarbon dates were subsequently obtained from two right mandibles and provided a date of death of the eighteenth and nineteenth centuries AD. Following historical research of the house owners and residents, it was concluded that the remains were most likely part of an anatomical teaching collection which had been deliberately buried at the site, possibly as a means of disposing of unwanted specimens.

Introduction

On 22 September 2012 workmen unexpectedly uncovered fragments of disarticulated human bone when landscaping the rear garden of a house at 12 Grove Street, Edinburgh (Plate 1). Following its discovery, the bone was recorded and collected by Lothian and Borders Police Force and assessed by the Virtual Anthropology Laboratory at Dundee University, where it was deemed to be historical and not modern in date. Historic Scotland commissioned GUARD Archaeology Ltd to investigate the site under the terms of the Human Remains Call-Off Contract. This paper outlines the results of the work which includes the archaeological field assessment of the find site, post-excavation analysis of the bone and the subsequent historical research which it generated. The field assessment was undertaken between the 27 and 28 September 2012 (Kilpatrick 2012).

The house at 12 Grove Street (NGR: NT 24342 73158), which has B-Listed Historic Building status (HB No. 44037 and NMRS NT27SW.3849), is part of a small terraced development constructed in 1822 in the Haymarket area of the city (Figure 1). Cartographic sources revealed that prior to this date the area had been enclosed fields and gardens, with no buildings recorded, although several maps such as Ainslie (1804) and Kirkwood (1817) show settlement along the main roadways to its immediate north (http://www.nls.uk). Following the construction of the house, the area soon became surrounded with new roads and buildings as the city expanded westwards in the nineteenth century.

Plate 1: Terraced housing at Grove Street.

The Archaeological Assessment

The site of bone deposition was within the rear garden of a house, which had recently been bought after having lain empty for a number of years, and was currently undergoing renovation (Plate 2). The work also included the landscaping of the rear garden, which was overgrown and contained rubbish including household waste. The garden measures 7.7 by 8.7 m, and has a high stone boundary wall on three sides, except where the house is located. Access to it is gained via the house from the basement level, with stairs leading up to it. The level of the garden corresponds to that of the height of the ground floor (Figure 2).

Plate 2: Pre-excavation of site.

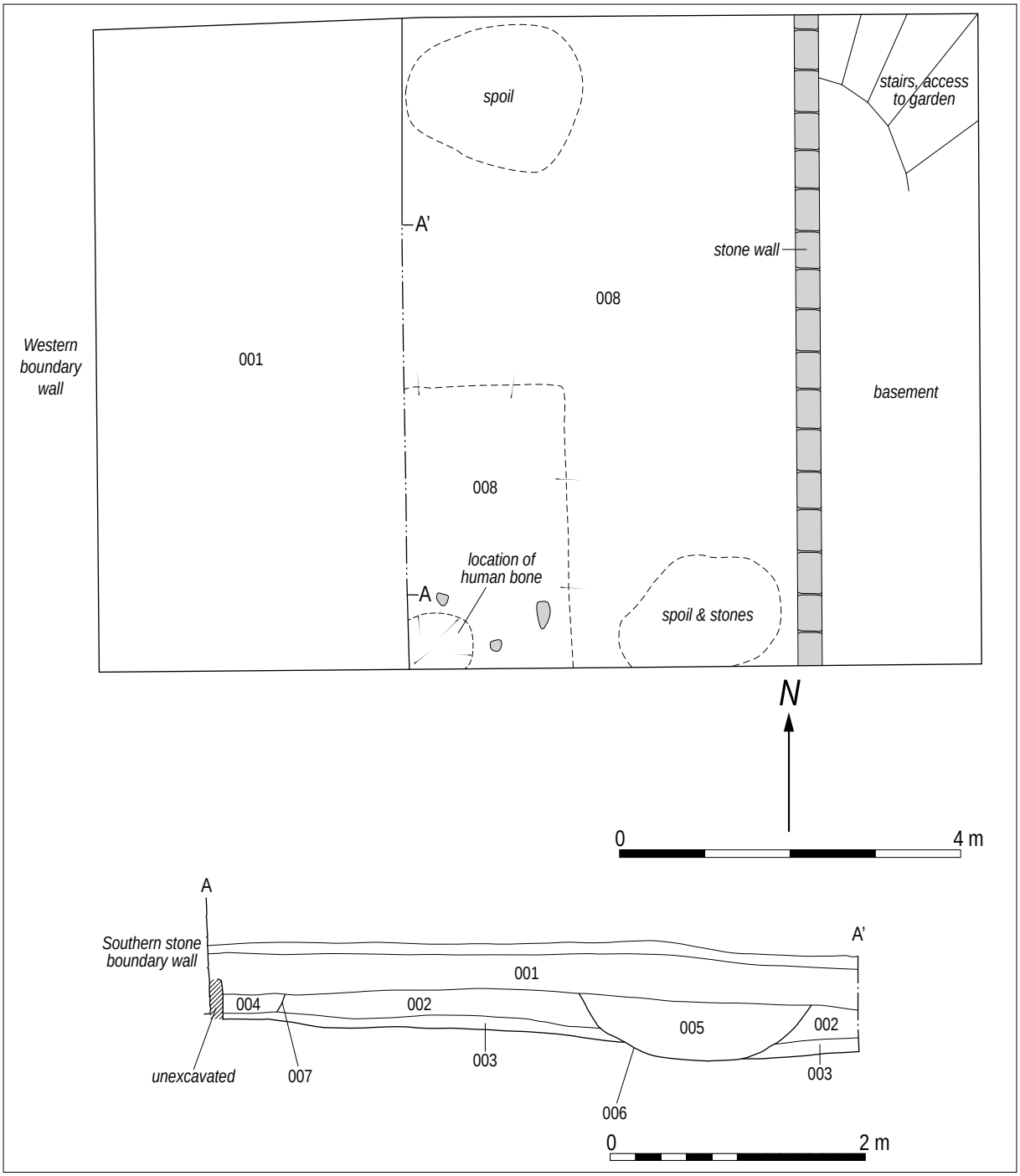

Figure 2: Plan of garden and east-facing section of garden deposits.

The Garden Deposits

Prior to the archaeological assessment commencing, landscaping work had reduced the eastern half of the garden to the level of the pink/grey boulder clay subsoil (008). However, the sequence of deposits present in the unexcavated western half consisted of three layers (Figure 2). The lowest, was pale brown silt (003), 120 mm in depth. It appeared underlie the southern boundary wall suggesting that it may have been an earlier agricultural soil. Above this was a mixed dark-grey clayey/silt that contained charcoal flecks and coal fragments (002), 220 mm in depth. It is consistent with an earlier garden soil probably associated with the initial garden phase. Uppermost, was modern topsoil (001), which capped the garden soil (002) to a depth of 400 mm.

Two pits (007 and 006) were observed in section cut through the earlier garden soil (002). The smaller pit (007) was located at the southern boundary wall and measured 400 mm in width

with a depth of 150 mm. Its fill consisted of redeposited subsoil (004). Two fragments of pottery were found within this fill, which included the base sherd of a nineteenth century white earthenware vessel and a fragment of fourteenth - fifteenth century Scottish medieval red ware (SF 11) (see Will below).

The Bone Deposition Site

The human bone was found adjacent to the southern boundary wall roughly half way up the garden (Plate 2, Figure 2). The area that had contained the bone was covered with overspill from the overburden removal from which several small fragments of bone, including a human patella and vertebrae (SF 1-4) were recovered (see catalogue in the site archive). Beneath the overcast soil was the subsoil surface (008), with a slight depression, which measured 0.6 by 0.8 m. According to the workmen this is where the bones were found. They also stated that the skull had originally been positioned above the unattached mandible (lower jaw) fragments and that the remains appeared to be contained within a clay deposit, which may correspond with the fill of the small pit (007), which they lay next to. No further bone was recovered from the fill of this pit during the assessment although two fragments of pottery were found (SF 11). No formal burial structure was observed and it is presumed that the remains derived from pit 007, which was disturbed during the landscaping works.

Specialist Reports

The disarticulated bone

by Maureen C. Kipatrick

Macroscopic analysis was carried out on the human remains using methods outlined by Buikstra and Ubelaker (1994) and Brickley and McKinley (2004) and the data was recorded on pro-forma skeletal recording sheets and a Microsoft Excel spreadsheet. Sixty bones including bone fragments were recovered from the same burial locus, although 17 fragments were recovered from the surrounding disturbed spoil.

The bones represented the very incomplete and disarticulated remains of at least five individuals. This was based on the presence of four right-sided adult mandibles and a sub-adult right hand 3rd metacarpal. Most commonly represented were the small bones of the foot and hands which accounted for 29.9 % of the total assemblage (Table 1). This was followed by skull fragments which accounted for 21.6%. The larger bones of the arms and legs were mostly absent and no pelvic fragments were present (see catalogue in the site archive).

Sex determination was difficult due to the fragmentary and incomplete state of most of the bones and the complete absence of pelvic fragments, which along with the skull, are the most sexually dimorphic bones in the skeleton. Despite this, it was concluded that on the evidence of one mandible (L&B 36) that at least one male individual was present within the assemblage.

Little weathering was observed on the bone surfaces with most graded 0-1 as per McKinley in Brickley and McKinley (2004) although the majority had post-mortem breakage on their edges. This was probably a culmination of both pre- and post-burial conditions, which included their recent disturbance during discovery. Several of the bones had very polished and smooth surfaces suggesting that they may have been repeatedly handled prior to their final deposition.

Body Part	No. of Fragments	% of Assemblage
Skull	13	21.6
Vertebrae	8	13.3
Sternum/Chest	5	8.3
Pelvis	0	0
Arm	2	3.3
Leg	5	8.3
Hand	8	13.3
Foot	10	16.6
Unidentified small fragments	9	15

Table 1: Number and percentage of bone fragments per body part.

Most bones which were complete were fully fused, apart from a 3rd hand metacarpal which was only partially fused. This suggests that it derived from a slightly younger individual, possibly in their middle to late teenage years at death (Scheuer and Black 2004, and Baker and Dupres et al 2010). However, dental evidence suggests that most of the individuals within the assemblage had probably reached adulthood prior to death. This was based on: the presence of the 3rd molar (wisdom tooth) which appeared

to have erupted in several jaws, the relative size of the jaws, and the condition of the teeth, which in some instances were quite worn. At least one older individual was present, as the skull fragment (L&B 39) has complete fusion and near obliteration of its cranial sutures.

Unfortunately, height could not be calculated for any of the individuals due to the disarticulated condition and incomplete state of most of the surviving long bones, with only a left ulna (lower arm bone) surviving intact. Studies have shown that measurements obtained from upper limbs can underestimate height by as much as 100 mm and as a result it was not calculated (Molleson and Cox 1993). Interestingly, the bones which did survive did not appear to be particularly robust as no prominent muscle attachments were evident. Prominent muscle attachments are often used as evidence of a physically active lifestyle although their absence does not necessarily negate that the individual did not lead an active life.

Pathological conditions present on the skeletal remains included dental disease and osteoarthritis which are two of the most commons pathological manifestations found in skeletal remains. Due to the fragmentary state of the bone assemblage, only 19 teeth with one loose tooth were present within the total collection. Of these 12 were molars, 5 were premolars and 2 were canines. No incisors were present which may be due to the fact that they contain only one root making them more likely to fall out post-mortem. Dental wear, was the most commonly noted, with 12 out of a total of 19 teeth affected (63.1%; see Table 2). Most wear was found on the occlusal (biting) surfaces and ranged from slight to moderate in severity. Two molars had caries formation (10.5%) on their medial surfaces, which had resulted in the formation of a large cavity (L&B 3 and 34). This must have resulted in some discomfort for the individuals affected. Four teeth, all molars, had also been lost ante-mortem probably as a result of periodontal (gum) disease, which can be caused by several factors including poor oral hygiene, inadequate dental treatment and the consumption of a soft cariogenic diet, which was typical for this time (Cox and Roberts 2003). Radiocarbon dating of two of the bones (Table 3) provided dates within the eighteenth and nineteenth centuries. Five teeth, from two jaws, also had evidence of dental enamel hypoplasia (DEH). This is an enamel defect often attributed to systemic stress usually during childhood (Roberts and Manchester 1999) although its actual cause can be difficult to diagnose with accuracy (Waldron 2009, 244).

L&B No.	Teeth No.	Dental wear	Dental caries	DEH
2	1	1		
3	1		1	
27	1			
33	4	2		
34	5	4	1	2
35	2	1		
36	5	4		3
Total No.	19	12	2	5
*CPR %		63.1	10.5	26.3

**CPR – Crude Prevalence Rate*

Table 2: Total number of teeth within the assemblage.

Three right-sided foot metatarsals 3rd, 4th and 5th (L&B 12, 13, and 14) and one right hand 2nd metacarpal (L&B 17) had slight patches of eburnation (polishing) on their joint surfaces suggesting the presence of osteoarthritis. This is a condition associated with the breakdown of the articular cartilage of a joint, which can lead to pain, swelling and stiffness of the affected joint, although its symptoms can vary between individuals. Its cause is multifactorial and can include genetic predisposition, age, sex, history of trauma and obesity (Waldron 2009, 28). In modern populations the hand is a common site for osteoarthritis although in the feet it tends to more commonly affect the 1st metatarsophalangeal (big toe) joint (Waldron 2009,38).

Nineteen of the bones revealed evidence of their use as anatomical exhibits/specimens (see catalogue in the site archive). This was particularly the case with many of the foot and hand bones which contained small holes most commonly on their articular (joint) surfaces, although several also on their shafts. These holes, which measured between 1.77 and 2.3 mm in diameter, were used as a means of re-articulating the bones with wire once the soft tissue had been removed (Plates 3 and 4). Two of the bones, a talus (ankle bone) and calcaneum (heel bone) had multiple and in some instances over-lapping holes suggesting that they had either been repaired or that an in-experienced individual had tried to articulate them (L&B 25 and 26). Several of the bones also contained very smooth, polished surfaces such

as a proximal hand phalange (L&B 5) and femoral fragments (L&B 30 and 31) suggesting that they may have been repeatedly handled, resulting in surface wear prior to their final burial at 12 Grove Street. Although devoid of re-articulation 'holes', this wear could suggest that they too had been used as teaching specimens. A calcaneum (heel bone) (L&B 24) also contained dark red paint on its articular surface as well as smooth, worn surfaces, again suggestive of handling and the possibility that anatomical landmarks had been highlighted through the application of paint (Plate 3).

Plate 3: Close up of re-wiring holes.

Plate 4: Anatomical bone.

Faunal bones

Six fragments of animal bone, including one skull, were recovered by the Police at Grove Street. One of the bones was from a young animal (based on lack of bone fusion) and another bone was found with cut marks to its surface.

Charcoal analysis

by Susan Ramsay

Charcoal samples were obtained from all excavated contexts and examined using a binocular microscope at variable magnifications. Reference was made to Schweingruber (1990) and Cappers *et al* (2006) to aid identifications. The detail of the carbonised results is to be found in the site archive.

Most of the samples examined contained cinder that had been derived from coal rather than wood. The samples also contained modern seeds, particularly nettles (*Urtica dioica*) and fat-hen (*Chenopodium album*), suggesting that significant amounts of mixing may have occurred. Only the topsoil (001) deposit produced any charcoal. This charcoal was identified as oak, but it appeared that it may have flaked off a plank or similar. It looked very 'fresh' in appearance and so may be relatively modern. No further archaeobotanical interpretation can be made from these samples.

Pottery report

by Bob Will

A small assemblage of pottery consisting of 28 sherds (weight 263.2 g) was recovered. Most of the sherds would date to the nineteenth century although there were three sherds of late medieval or post-medieval date. The largest group consisted of 14 sherds of red earthenware from flower pots.

Radiocarbon dates

Two samples of human bone obtained from two different right mandibles were submitted to the Scottish Universities Environmental Research Centre (SUERC) for AMS radiocarbon dating (Table 3). The dates revealed that both mandibles were of probable eighteenth/nineteenth century date, with an overlap in the late eighteenth/early nineteenth centuries.

Sample	Material	Context	Depositional Context	Uncal	Calibrated 1-sigma	Calibrated 2-sigma	$\delta^{13}C$ relative to VPDB
SUERC-44682 (GU29694)	Human Bone: Right Mandible	Unstratified	Secondary	223+/-29	1647-1670 AD (31.5% probability)	1736-1805 AD (43.0% probability)	-19.6‰
SUERC-44683 (GU29695)	Human Bone: Right Mandible	Unstratified	Secondary	134+/-29	1833-1880 AD (22.9% probability)	1799-1892 AD (40.5% probability)	-20.4‰

Table 3: Radiocarbon dates.

History of 12 Grove Street *(Plate 1)*

by Morag Cross

The house at 12 Grove Street had been erected by August 1822, when John Bonar (d. 1825) of Grove House, the earliest owner yet identified (whose father published the *Encyclopedia Britannica*), used it as security for loan (Anderson 1878, 689; *Sas Abr* 1822, no 2087). The property specifically included 'the back ground and cellars belonging thereto'. In the 1820s, it formed part of various financial transactions between local builders and lawyers, and around 1828, it was leased to a hide and leather merchant, John Scoular (*Sas Abr* 1824-36; *Edin Dir* 1828, 161).

Scoular died there in 1847, and Robert Peddie was renting it by 1848 (*Scotsman* 27 Mar 1847, 3; *Edin Dir* 1848, 179). Peddie was a lawyer from Stirling, who had married Maria Denoon Young in 1845 (*Dundee Adv* 22 April 1845, 3). Her three brothers were all involved in various made-to-order and manufacturing hardware businesses (*England Census 1841-1911; Scotland Census,* 1841-1901; *Edin Dir* 1840, 1870). Although Peddie only rented the house for one year, the street was evidently to his liking, as he moved to no 6 Grove Street for four years (Peddie, *Census* 1851; *Ed Dir* 1850, 133; 1853, 147). In 1858, he returned to no 12 again (*ibid.* 1858, 186, 272).

It appears that the owner from around 1851 was Thomas Scott, an upholsterer and undertaker, of the upmarket cabinetmaking firm of J & T Scott, in George Street, Edinburgh (*Edin Dir* 1851, 153, 215; *Scotsman* 14 Mar 1863, 6; 6 Jun 1863, 6). However, as was common at the time, owners of property frequently rented them out for long periods, rather than reside there themselves, and this is what happened at 12 Grove Street. The Scotts would seem unlikely candidates for having buried the bones in the back garden, precisely because they were professional undertakers, and had no need for the 'irregular' disposal of bones. They had multiple, legal opportunities to deposit remains in open graves and within sanctioned burial grounds, while conducting contemporary funerals. The tenant during this time was a Perthshire landowner, Alexander Monteath of the Broich and Duchally (1798-1880); (*Edin Dir* 1852, 225; 1857, 260; *Ryeland Tree*; *Grave Res*).

The co-incidence of wireworkers, medical practitioners and clergymen associated with the house and garden, occurs in the late 1840s and in the late 1850s with the intermarried Peddie, Young and Thomson families. This is significant as some of the bones had once been attached by wires, probably for anatomical teaching purposes, and others had been much-handled, as if by medical students. The Youngs produced various grades of fine and woven wire products, their sister edited a Christian family magazine, and their father was a retired minister, so respectful disposal may have been a conscious concern.

Robert Peddie had gone into partnership with his wife's brother, William Denoon Young, around 1850, as 'Young, Peddie & Co, Manufacturing Ironmongers', 54 Hanover Street (*Edin Dir* 1850-1, 133, 176). In the early 1840s, two other brothers, James and Charles Denoon Young, had formerly been in partnership with William as 'wire cloth manufacturers' at 128 High Street (*ibid.* 1840, 134; 1842, 135). By 1850, Charles was running 'Charles D Young & Co, Manufacturing Ironmongers', at North Bridge, Edinburgh (*ibid.* 1850, 176). James Denoon Young, meanwhile, was trading as a 'wire merchant' in Glasgow, with a manufactory at the Old Powder Magazine, Cambridge Street in the late 1840s (*Glas Dir* 1849, 297).

A fifth sibling, Jessie Denoon Young, married David Purdie Thomson (1821-64), a newly-qualified doctor, in 1844 (*Stirling Obs,* 8 Aug

1844, 4). Thomson, son of a high-class Edinburgh confectioner, graduated from Edinburgh University in 1843, and became a Licentiate of the Royal College of Surgeons of Edinburgh (LRCSE), a major additional qualification, in the same year (*Med Reg* 1863, 388; NA, MH/12/5970/156, f.286r). Thomson and his wife moved to Liverpool, and their eldest daughter Jane E Thomson was born in 1845 (*England Birth Index*).

Thomson had another brother, William Thomson who also trained as a doctor at Edinburgh, becoming LRCSE in 1847 (*Med Reg* 1883, 856). Like his brother, William practised in England from the date of his qualification, but only William was licensed by the Royal College of Physicians of Edinburgh, in 1860 (*ibid.*). The census of 1861 shows that Robert and Maria Peddie (nee Denoon Young), and their niece Jane E Thomson, were living at 12 Grove Street (Peddie, *Census* 1861). The partnership of Young, Peddie & Co was dissolved in that same year, with each partner forming his own company (*Edinburgh Gaz* 25 Jan 1861, 133). Robert Peddie & Company operated from nearby 5-6 Fountainbridge until c. 1865, and then from Tynecastle Iron Works (*Edin Dir* 1861, 244; 1865, 153).

The wire-holes in several bones were side-by-side, as if they had been drilled more than once, to renovate or re-articulate somewhat 'worn' skeletal fragments (M Kilpatrick, pers. comm.). The Peddie and Young companies produced fine-gauge wire-netting for aviaries, wire staples, mesh screens for riddles, and rolls of fencing wire (e.g. *Stirling Obs* 19 Apr 1855, 2; *Glasgow Her* 17 Jun 1857, 1; *Caled Merc* 7 Feb 1861, 1). Quite possibly, Drs William or David Thomson had teaching specimens, which were damaged or required 'renovation', and asked their extended family if they could attempt the repairs. Two bones showed multiple holes (M Kilpatrick, pers. comm.) as if they had been 'test' or 'practice' pieces, while the exact technique for manipulating an unfamiliar medium was being worked out.

Another scenario is that one of the wire companies wanted to enter the scientific market, and was examining the methods of joining bones together with wire. The concept was well-established in popular culture by the late 1850s. Scientific museums employed specialist 'articulators', the profession of 'Mr Venus' in Charles Dickens's *Our Mutual Friend* (1864-5) (Allingham 2010), who were often taxidermists as well (Plate 5). In 1858, the Professor of Natural History at Edinburgh University recommended a whale skeleton discovered at Stirling 'should be united by a qualified articulator and preserved in a museum' (*Caled Merc* 22 May 1858, 2). A wooden skeleton was constructed by the 'anatomical articulator to the Royal College of Surgeons in London' for a Burmese prince in 1858, to circumvent his religious taboos on handling bones (*Caled Merc* 22 Jan 1859, 3).

Plate 5: "You're casting your eye round the shop, Mr. Wegg. Let me show you a light." (p. 44). James Mahoney's eighth illustration for Dickens's Our Mutual Friend, Household Edition, 1875. Wood engraving by the Dalziels, 9.4 cm high x 13.4 cm wide.

Scanned image by Philip V. Allingham. This image may be used without prior permission for any scholarly or educational purpose. http://www.victorianweb.org/victorian/art/illustration/mahoney/21.html.

The case for this family's involvement with the garden burial site is surely strengthened when their strong religious convictions are considered. Their third sister, Mrs Catherine Ponsonby, nee Young, was an early female magazine proprietor, editing *The Christian Family Advocate,* latterly from Rutland Square, where her brother William Denoon Young had also stayed (*Edinburgh Gaz* 11 Sept 1857, 825; *Edin Dir* 1850, 243; 1856, 270). Their father, Rev James Young, and brother-in-law, David P Thomson MD, both wrote numerous articles for the journal.

The *Advocate* published an illustrated series on human anatomy, 'The Science of the Bible' (Mitchell 1854). One chapter discusses the function of the spine, and the need for dissection to discover the circulation of the blood (*ibid.*

107-8). Although authored by a minister, Rev W Mitchell, the article on the workings of the heart includes two labelled medical diagrams, and demonstrates the belief that there is no contradiction between modern science, and the divine design of the human body (*ibid.* 145-6).

The Rev James Young, who died in 1854, was a Free Church minister (*Dundee Advertiser*, 22 Apr 1845, 3; Young, *Census* 1851; NRS, Young, OPR 1854) a sect which broke away from the Established Church of Scotland in 1843. They therefore had to fund a swathe of entirely-new urban ecclesiastical buildings, almost none of which had graveyards in which the bones could have been interred (Raeburn, 2011). Young's religious beliefs strongly influenced Maria Denoon Peddie, who had authored reflections on prayer, and advertised the Spanish Evangelization Society from 12 Grove Street (Young 1839; *Caled Merc* 7 June 1862, 1). This suggests that a reverential, and considered compromise, may have been to bury the remains in the garden, rather than burn them or consign them to the rubbish heap.

Dr David P Thomson is the strongest candidate for ownership of the remains; his daughter boarded with her aunt at 12 Grove Street in 1861 (Peddie, *Census* 1861). He was Medical Officer for the Poor Law Board in Liverpool 1853-6 and sometime secretary of the local branch of the British Association for the Advancement of Science (NA, MH/12/5970/156). As Secretary of the Liverpool Philosophical Society, he edited their journal, and delivered public lectures on meteorology, and Ancient Egypt (*Proc Lit Phil Soc Liverpool* 6 (1849-51), 153; 7 (1851-3), 3, 141; 11 (1856-7), 17; *Thomson 1851a, 1851b*). He also applied for several university professorships, with testimonials from a previous Liverpool Philosophical Society secretary, Dr Thomas Stuart Traill, who had written the standard book on Scottish post-mortem procedure (White 2004; NA, MH/12/5970/156, f.290v, 291r).

Thomson had even provided museum exhibits to the University of Edinburgh, where Traill was now Regius Professor of Medical Jurisprudence. As Traill told him in 1848, 'The noble specimen of the zebu for which our museum is much indebted to your care and attention, is the great object and attraction to the many visitors since it was got up' (NA, MH/12/5970/156, f.290v, 291r). Dr Thomson was later appointed as coroner to the sugar-producing colony of British Guyana, where he died in 1864 (NRS, SC70/1/149/657-8, 660; *Med Times* 1863, pt II, 184; 1865 pt I, 26; Collingwood 1865, 79).

From 1877 until 1993, the house was owned by absentee landlords, the Gilroy farming family, of whom George K Gilroy and his RAF colleagues shot down the first German plane after Britain entered World War II (RoS, SS6897, SS25988; BoB Memorial Trust; *Times* Obituary 1995). Tenants included a greengrocer and a potter, the house eventually being subdivided into bedsits for cleaners, laundry workers and waitresses (*Val Rolls* 1895-1957; *Edin Dir* 1890-1927; Scotland *Census* 1871-1911). During the Second World War, it housed munitions workers and miners, all the while going steadily downhill in status (*Val Rolls* 1895-1957). None of the later occupants traced so far has been linked with the medical profession.

The years 1848, and 1858-63 display the co-incidence of a doctor who became a coroner, with teaching, antiquarian and museum associations, his daughter (Jane E Thomson) boarding in the house, and up to three separate family wireworking companies. In addition, there are testimonials from a pioneer in pathology (Prof Traill), and the publication of illustrated anatomical articles in a religious journal. This seems a likely context for the burial being seen as the respectful, rather than dismissive, disposal of teaching specimens that were too damaged, or no longer required, as Dr Thomson was now working in British Guiana.

Discussion

Despite its small size and post-medieval date the bones recovered from Grove Street represent an interesting assemblage due to their complicated pre-depositional history. The on-site archaeological assessment revealed no obvious burial structure which suggests that the bones were not in their primary burial context. This was confirmed by skeletal analysis when it was revealed that the bones had probably been used as anatomical display specimens and/or teaching aids. Radiocarbon dating of two of the bones provided a date of death within the eighteenth and nineteenth centuries AD which equates to a period within Edinburgh's history when it was a renowned centre for medical teaching and research.

The medical school of Edinburgh University was founded in 1726 (Porter 1999, 121) and became a very popular teaching establishment that by 1780 it was attracting 200 students a year and double that by 1820 (Porter 1999, 291). However, the University was not the only establishment to provide medical studies, as private anatomy schools were also established particularly around what became known as Surgeons' Square. These "extra-mural" classes could attract hundreds of students and provided hands on dissection experience. In 1825 the anatomist Robert Knox was attracting 150 students to lectures at his school in 10 Surgeons' Square (Dingwall 2010), this rose to 335 between 1826 and 1834 (Bates 2010, 61).

However, anatomical study was not without its controversies despite its long history, indeed the first recorded public dissection of a human cadaver is from Bologna in 1315 by Mondino de' Luzzi an Italian physician (Porter 2003, 54-55). The controversy surrounded the procurement and use of human bodies was due to public misgivings and the Christian belief in the sanctity of the body. In Scotland royal patronage was provided in 1506 when James IV of Scotland granted the Edinburgh Guild of Surgeons and Barbers the bodies of certain executed criminals (Richardson 2000). This was extended in 1752 with the Murder Act which granted the use of all criminals executed for murder to be used for dissection as a means of additional punishment (Porter 1999; Bates 2010). This was again followed by the 1832 Anatomy Act which further extended the legal number of corpses available for dissection by using unclaimed bodies from workhouses and hospitals, revoking the need for executed criminals (Porter 1999, 318).

The problem that this ever-growing popularity in teaching led to, and it was not confined solely to Edinburgh but throughout Britain and abroad, a demand for bodies that far outstripped the numbers available for dissection. The only legal means pre-1832 were the aforementioned executed criminals and also privately donated bodies, although the latter was not a common occurrence as relatives of those that died in hospital more often than not refused permission (Risse 1986, 261-262). This shortage was overcome by the illegal trade in grave robbing by individuals that became known as 'resurrection men'. These individuals exhumed the bodies from recently dug graves and sold the fresh bodies to medical establishments for profit (Porter 1999, 2003; Bates 2010). Bodies were not only plundered from the graves of urban centres, but also rural areas and transported by various means to the receiving anatomists' rooms. In 1720 Alexander Munro *primus* chair of anatomy at Edinburgh University was accused of obtaining corpses illegally from Greyfriars Kirk for his anatomy lectures then held at Surgeons Hall (Dingwall 2010, 307). However, by the early nineteenth century the general populace were becoming increasingly uneasy with the practice of body snatching. The West Port Murders in Edinburgh by Williams' Burke and Hare in 1828 caused a national outcry when they were accused of murdering 16 people whose bodies they sold for dissection to the anatomist Robert Knox. Only Burke was executed and his body dissected due to Hare turning King's evidence. However, it took further murders in London before the Anatomy Act of 1832 was brought in to regulate the use of bodies for dissection (Porter 2003; Bates 2010).

The eighteenth/nineteenth century date for the human remains at Grove Street fits into the above period when Edinburgh was an important and renowned centre for anatomical research and study. The re-articulation of the bones and the smoothness of many of the surfaces would suggest that they had been used as anatomical teaching specimens, although there was no obvious evidence of post-mortem dissection though this could be due to the bones partial and fragmentary state. Where the remains originated from is obviously unknown and the fact that they number several individuals could suggest that they had been obtained from several sources prior to their incorporation into the assemblage. Although grave-robbing was probably common during the period that some, or all, of the bones were initially acquired does not necessarily mean that this was what befell these individuals following death, their bodies could have been donated privately or were unclaimed through work houses following the 1832 Anatomy Act. Equally it is unknown where this assemblage was stored, or used, prior to its final deposition at Grove Street, although Cross (above) makes an interesting case in that they could have been 'owned' by a Dr David Thomson who, although practiced in Liverpool, trained in Edinburgh and

whose daughter resided at 12 Grove Street with relatives involved with wire-working companies.

The above is not the only instance where human remains have been found in Edinburgh with evidence of anatomical use. Six inhumations and a number of disarticulated bones were found at 13 Infirmary Street in 1993 with evidence of post-mortem dissection and are thought to be the remains of patients who had died during their stay at the Edinburgh Royal Infirmary in the late eighteenth century AD (Henderson and Collard et al 1996). Human and animal bone were also found at Surgeons' Square in 1988 and are thought to be the remains originating from an anatomy school which previously occupied the area. These bones, although disarticulated, also had evidence of post-mortem dissection although, unlike the Infirmary bones, were not formally buried (Henderson and Collard et al 1996, 940).

The six faunal bones which were found alongside the human bone from Grove Street may also be anatomical in origin and used as comparative study specimens although equally they could represent domestic waste. Much of the deposits (001 and 002) surrounding the burial were very mixed and contained much domestic rubbish, particularly fragments of broken pottery of differing dates (see Will above).

Conclusion

The analysis of the small bone assemblage from 12 Grove Street has revealed that the remains were probably part of an anatomical teaching or reference collection. As a university city with a medical school and private anatomy schools, Edinburgh was a centre of excellence for anatomical study during the eighteenth and early nineteenth centuries. This fuelled the need for cadavers for dissection purposes and due to the legal shortage bodies were often procured using illegal means including grave robbing and murder. Although viewed with distaste by much of the populace, the actions of the 'resurrection men' inadvertently aided medical research and training, and helped medical staff such as surgeons, practise their skills on the dead before treating the living. Although the skeletal remains from 12 Grove Street cannot unequivocally be associated with resurrectionist activity; indeed they could have been acquired through entirely legal means; it can also not be completely discounted either. However, the reason for their final burial at 12 Grove Street remains unknown, although it could relate to previous occupants with known ties to physicians and wire working companies.

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