Nottingham Castle Middle Bailey
Excavation of an Adult Individual

Prepared for Nottingham City Council

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1. Summary

- During 2016 Nottingham City Council commissioned Trent and Peak Archaeology to excavate the remaining portion of an adult human burial that had been discovered during excavations at Nottingham Castle during 1978. At this time only the skull and upper torso were uncovered and excavated, leaving the remainder in the grave. It was suggested at the time that the burial was from the English Civil War.

- During the excavation the remaining bones were uncovered, recorded and lifted in accordance with the approved Written Scheme of Investigation. While it was hoped that the remains could be displayed in the Castle Museum at a future date it was found that the legs of the individual had been truncated by a 19th Century pipe trench, leaving only the torso and arms *in situ.* The remains were fragile and were slightly clipped during machining, further limiting their display potential.

- The remains were reunited with those lifted during 1978 and were assessed by an osteoarchaeologist. The individual was found to be an adult male approximately 40-50 years age at death, with poor-moderate dental hygiene and degenerative joint disease on the left clavicle. The individual had a gracile build, indicating that an occupation involving manual labour was unlikely.

- Accelerator Mass Spectrometry radiocarbon dating was undertaken on a fragment of mandible, which indicated a date range of 1520 to 1637 calAD, with a 54.2% likelihood that the individual died between 1520 and 1601 calAD. This indicates that the individual was probably not buried at the time of the English Civil War, but was buried during the 16th Century and may have been associated with the Great Chapel that stood on the Green during the Medieval period. Pottery finds from within the grave fill add credence to this assessment.

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1. Introduction

1.1. The historical site of Nottingham Castle currently consists of a walled area containing landscaped grounds and the "Ducal Palace", arguably the finest Palladian mansion of its type in the country. It is situated above a network of caves on the site of a medieval castle.

1.2. The document, "*Nottingham Castle: Development options scoping study (July 2012): Archaeological Impact Assessment*" (Kinsley 2012a), established the baseline archaeological potential which may be impacted on by proposed redevelopment works to the castle, including the construction of a Visitor's Centre.

1.3. Excavations were undertaken during the late 1970s and early 1980s by Trent and Peak Archaeology (TPA) throughout the castle grounds. During the excavations of the south-western corner of the Green (Area VI), the highest part of the lawn, the upper half of a burial of a young adult of unknown sex was uncovered within a shallow grave (Drage 1989, 78). It was postulated that the burial was from the Civil War period, although no evidence is given for this dating. No signs of violence were present to indicate that the individual was a casualty of war (*ibid.*, 135). The individual was partially excavated, leaving the lower torso and legs within the section (*ibid.*).

1.4. Nottingham City Council wished to identify the location of this grave in order to recover the remaining bones (the lower half of the skeleton), with the aim of undertaking a thorough analysis. The remains excavated during Drage's project are currently held at Brewhouse Yard Museum under the accession number NCM 1986: 1233. As the area of the Middle Bailey will be impacted on both by the redevelopment works and by continued use of the Middle Bailey Green for events by Nottingham City Council, it was proposed to complete the excavation of these remains through a research excavation funded by NCC Museums and Galleries Service.

1.5. "*Nottingham City Council Museums and Galleries Service Strategic Plan 2014–2018*" establishes the context within which this work would be situated (36):

> *The development of visitor infrastructure included within this Strategic Plan, especially the major project for Nottingham Castle, means that the City is ideally placed to achieve the same benefits as other towns and cities with a rich historical heritage. The benefits of such investment in the historic environment are identified in the English Heritage report* The Impact of Historic Environment Regeneration.
>
> *The Castle redevelopment will also achieve wider social benefits in line with the case studies included in the* Social Impacts Heritage Led Regeneration Report *published by the Architectural Heritage Fund and partners [Victoria Baths Manchester and Wilton's Music Hall, London]. These illustrate the benefits of an audited track record of supporting community involvement, engaging with hard to reach groups, building local pride and creating volunteering and job opportunities. These projects are both located in inner city locations and offer transferable learning opportunities for Nottingham and the Nottingham Castle project in particular.*

1.6. In the context of the Nottingham City Council Museums and Galleries Service Strategic Plan, this project has been established as part of an initiative to better understand the Nottingham Castle Scheduled Monument and to enhance its role as a focus for Cultural Heritage within the City and the "Greater Nottingham" area.

2. Background

2.1. The original earthwork castle was constructed in 1067–8 under the instruction of William the Conqueror. The earth and timber defences may have covered the entire extent of the later stone replacements, but this is uncertain (Drage 1989, 36, 43). The earth and timber defences of the Upper Bailey were replaced by a stone curtain wall in 1171–3. A stone keep was in existence by 1188 and a gate tower was constructed in 1373–7. The Middle Bailey earthwork defences were replaced by a stone curtain wall in 1171–89. A great hall and chapel are recorded from the 1230's, and major rebuilding (Richards Tower and the State Apartments) occurred in 1476–80. The Outer Bailey was captured during a siege in 1194. A barbican may have been constructed at the Outer Gatehouse in 1212–13 (Drage 1989, 43) and from 1251 the Outer Gatehouse was rebuilt in stone. A stone curtain wall then replaced the Outer Bailey earthwork and palisade and interval towers possibly during the 1270's (Kinsley 2012a, Appendix B, 2.1).

2.2. The strategic position of the Castle Rock combined with its location (which played a central part in controlling movement to and from the North) resulted in Nottingham Castle gaining prestige, eventually growing to become one of the most important royal castles outside of London by the 13th Century.

2.3. The castle was the scene of many historically important events throughout the Medieval period. The castle was the site of a battle between Prince John and Richard I following the King's return from the Third Crusade in 1194, in which King Richard put down the rebellion of Prince John (Drage 1990, 42).

2.4. In 1330 Queen Isabella, the wife of Edward II and at that time regent for her son Edward III, and her lover Roger de Mortimer were captured at the castle and their reign overthrown (ibid, 51).

2.5. Furthermore, the castle was the official seat of government for most of the reign of Richard III who set out from the castle with his army of 12,000 troops to challenge Henry Tudor and ultimately meet his death on Bosworth battlefield in 1485 (ibid, 90).

2.6. In 1642, King Charles I raised his standard at Nottingham Castle as he sought to exert supreme authority of the Crown over Parliament, effectively starting the English Civil War. The Castle was then held successfully throughout the war by a parliamentarian garrison under the command of Colonel Hutchinson (ibid, 70).

2.7. Following the downfall of the monarchy and the execution of King Charles I in 1649, the Castle was still considered to be a formidable threat. Its potential seizure by a hostile force proved so problematic that a meeting was held at the castle in 1651 which sealed its fate; it was decreed that the castle should be completely destroyed (ibid, 73).

2.8. Following the Restoration of the monarchy In 1661 the site was sold to William Cavendish, 1st Duke of Newcastle, an exiled Royal Commander. Cavendish remodelled the site, demolishing the majority of the remaining Medieval castle in order to begin the building of his palace. Sadly for the Duke, he did not survive to see its completion in 1679 and his subsequent heirs left the site empty for much of its remaining history (ibid, 74).

2.9. In 1831, the 4th Duke of Newcastle opposed the cries for parliamentary reform that were popular at the time. Following the Duke's reported opposition to the Reform Act in the House of Lords, the castle was burned down by radicals during a night of riots. The first Great Reform Act came into being the following year, with the events at Nottingham being pivotal in persuading Parliament and the House of Lords of the strength of popular opinion (www.nottinghamcastle.org.uk).

2.10. The building lay in a neglected and ruinous state until the 1870's when the Director of Nottingham Art School, along with Henry Cole (the evangelical first Director of the Victoria & Albert Museum), supported the Corporation of Nottingham in their aim to restore the palace as a public museum. On the 3rd of July 1878, the museum was formally opened by the Prince and Princess of Wales as the first municipal art gallery and museum outside London (www.nottinghamcastle.org.uk).

3. Topography and Geology

3.1. Nottingham Castle and the Castle Mound sit on a bed of Nottingham Castle Sandstone. It is this geological formation that provided the opportunity for the excavation of the intricate network of caves under the castle and across the city (BGS 2016).

4. Previous Archaeological Work

4.1. The Outer Bailey of Nottingham Castle has most recently been subject to two phases of community training excavation led by Trent and Peak Archaeology, under the banner of Archaeology Live! This was undertaken during July and August 2015, and July and August 2016. The project was centred around the excavation of a small 15 x 5m trench within the castle grounds, to the east of the Ducal Palace. The excavation was primarily for training purposes and did not extend to a depth sufficient enough to expose significant archaeological features; however, evidence of 19th century allotments was found, along with the possible remains of 17th to 18th century ornamental gardens (Parker 2015).

4.2. Prior to the "Archaeology Live!" excavations, a programme of geophysical survey was undertaken by Trent & Peak Archaeology. An extensive survey of the south-eastern part of the Outer bailey was undertaken in April 2014 and combined geo-magnetic, earth-resistance, and ground-penetrating radar survey to produce an image of buried archaeological features and provide some information about the location and depth of the interface between superficial deposits and the bedrock (Johnson & Richley 2014). Prior to the geophysical survey of 2014, some restricted areas within the Outer Bailey were investigated through Archaeological Watching Briefs on the installation of services and as part of Archaeological mitigation works relating to the development of disabled toilet facilities adjacent to the gatehouse entrance to the Castle (Gilbert 2001, Kinsley 2012).

4.3. In addition to these specific interventions within the Outer bailey, an impact assessment detailing the known heritage assets and interventions within the bounds of the castle was undertaken as part of the City Council bid for a Heritage Lottery funded redevelopment of the site (Kinsley 2012a).

4.4. A programme of Archaeological Excavation was undertaken by Trent and Peak Archaeology between 1976 and 1984. Christopher Drage, who conducted the excavations, subsequently published the results (along with a detailed history of the castle) in conjunction with the Thoroton Society. It was during these investigations that the partial inhumation was discovered.

4.5. The remains were discovered within Area VI of the excavation, which was located at the south-western corner of the Green. The skull and upper torso were uncovered in a shallow grave at the same level as several features of Medieval date, although it was postulated that the remains may be from the Civil War (Drage 1990, 78).

5. Objectives

5.1. The archaeological objectives of this stage of the project were to:

- Locate the aforementioned partially-excavated grave within the castle grounds.
- Undertake a targeted excavation of the grave in order to fully record and exhume the remains in line with approved guidelines.
- Reunite the excavated remains with those as yet unexcavated, in order to compile a full analysis of the individual's age, sex, stature, pathology, diet and date of death where possible.
- Engage local interest in the archaeology of Nottingham Castle, to build relationships between the people of Nottingham and their cultural heritage.
- To provide information in order to better understand the Nottingham Castle Scheduled Monument and to enhance its role as a focus for Cultural Heritage within the City and the "Greater Nottingham" area.

6. Methodology

6.1. All works were undertaken in accordance with the methodology defined in this Project Design/WSI and to standards defined by CIfA guidelines for recording of archaeological sites (2008a, 2008b).

6.2. The position of the trench was agreed with the City Archaeologist and Historic England Regional Inspector on the basis of the WSI (Smart 2016) and published/archival plans from Drage's 1978 excavation (See Figure 1). The trench was located within the Ordnance Survey grid to a precision of 0.1m in the field by GPS/Total Station prior to excavation and their final positioning taking into account of surface topography, services/safety requirements and all existing site features (fences, walls, etc). It was proposed to retain some flexibility in the specific layout in order to respond to changing circumstances/conditions on the ground.

6.3. A mechanical excavator was used to remove the turf and topsoil under continuous archaeological supervision. The previous excavation of the skeleton quoted a depth of around 0.4 to 0.6m deep; therefore, this depth was not surpassed by the mechanical excavator unless the on-site archaeologist deemed that the ground level had been built-up since the original excavations took place.

6.4. The locations of any artefacts recovered in the topsoil/subsoil were recorded three-dimensionally or by context/spit if appropriate.

6.5. Once the topsoil/made ground was removed and the first archaeological horizon was visible, the on-site archaeologist cleaned the trench using hand tools in order to identify the grave cut and any other features.

6.6. Archaeological features were hand-cleaned and planned. Following scanning by a metal detector, all features present were excavated sufficiently to determine their plan and form, their nature, their degree of survival, and to recover any datable artefacts. All features thus investigated were recorded stratigraphically using a single-context system in plan and section, and all finds recovered were retained for analysis.

6.7. The grave cut was carefully excavated by hand in spits of no more than 0.1m. All spoil was sieved over a bucket with the aim of recovering any small finds or fragmentary bone.

6.8. The human remains were excavated using wooden or plastic tools and a natural bristled brush, working from the centre outwards. Once the remains were fully exposed and cleaned, they were recorded by the on-site archaeologist using pro-forma recording sheets, drawings and photography.

6.9. Once the remains were lifted and all recording had been completed, the trench was backfilled by mechanical excavator.

Post-Excavation Methodology

6.10. All post-excavation methodology followed the guidelines recommended in *First Aid For Finds* (Watkinson and Neal 2001).

6.11. Those remains of sufficient stability were gently cleaned using clean water and a soft brush. Due care was taken to avoid further fragmentation of the bones, and the bones were not submerged in water. Once washed, the remains were left to dry naturally overnight.

7. Results

7.1. A trench of approximately 70m^2 was excavated on the 1st and 3rd of June 2016 by machine, under the supervision of TPA Project Officer and Osteoarchaeolologist Kate Smart. The trench (see Figure 2; Plate 2) re-exposed those trenches excavated by Drage in 1978, a service trench excavated by Trent and Peak Archaeological Unit in 1998/1999 (Walker and Kinsley 2003), and identified the location both of the skeleton and of several features noted from previous excavations. The trench was positioned with reference to the site plans drawn by Drage, but the excavation revealed that these drawings were out by several metres. The trench, therefore, had to be carefully extended until the burial was found. The edge of the burial was clipped by the machine, resulting in several bones being displaced, but these were recovered from the spoil.

7.2. A full context register detailing composition and depth can be found in Appendix I.

7.3. The trench was sealed by (0001), a compact, dark greyish-brown topsoil deposit consisting of clayey sand. The depth varied slightly over the trench, with the maximum depth being 0.3m. The horizon between the base of the topsoil and the subsoil (0002) was indistinct, so the exact depth is unknown.

7.4. The subsoil (0002) consisted of firm, mid greyish-brown clayey sand, very similar in consistency and composition to the topsoil. It had a maximum depth of 0.2m. It is highly likely that both the topsoil (0001) and subsoil (0002) are layers of made ground deposited during landscaping works in the late 19th and 20th centuries. The first archaeological horizon was reached at the base of the subsoil at a height of between 57.78 and 57.62m A.O.D., with various archaeological features cut into a layer of redeposited sand (0003) that was mid brownish-yellow mottled with mid brown in colour. While this deposit was not excavated during this excavation, several fragments of bone were found within the upper few centimetres during cleaning. Although these fragments could have been pressed into the surface from the deposits above, this suggests that, like the deposits above, it is made ground, albeit of a much older date.

7.5. Cut into the surface of (0003) were several features ranging from Medieval to modern in date. The oldest of these features appears to be the burial identified during the 1978 excavation ([0013]), which was found in the north-western corner of the trench at a height of 57.66 A.O.D. The burial cut was unclear as it had been backfilled with material very similar to the deposit surrounding it. It appeared to be ovoid in shape with a flat base and had been truncated to the west by Drage's trench, to the east by [0007] (see section 7.7) and also in depth by later landscaping. The maximum remaining depth of the cut was no more than 0.2m.

7.6. The burial cut was filled by (0014), a loose-moderately loose mid-dark greyish-brown silty sand similar to the sandy deposit around it (0003). The fill contained the burial (SK101), which is discussed in Section 8 below. A culvert was identified at the southern edge of the trench, extending into the trench edge. The culvert (0008)

was brick-lined and stone-capped, and appeared to be post-Medieval in date. It was constructed within [0009], a rectangular linear cut backfilled by (0010), a loose, mid brownish-yellow silty sand which appeared to be a redeposition of (0003).

7.7. A late post-Medieval or early modern pipe trench [0007] extended north-south across the trench, measuring approximately 30cm wide and 0.04m deep. The trench contained a lead water pipe which appeared disused, and was backfilled by (0006), a dark greyish-brown clayey sand virtually identical to the surrounding subsoil. As the trench extends northwards from the Ducal Palace, it is likely that the pipe comprised part of the water supply to the Palace during the Victorian or early 20th Century period. Unfortunately the trench has truncated the burial [0013], removing the leg and foot bones and disturbing the pelvic area.

7.8. Drage's 1978 trench [0005] can be seen in the north-western corner of the trench, filled by (0004), a loose dark greyish-brown clayey sand which is almost certainly backfilled spoil heap from the excavation.

7.9. Of possible note is an area of clean, bright orange sand (0015) at the south-west corner of the trench which may indicate landscaping activities.

8. The Finds

8.1. A total of 167 finds were recovered from the excavation of an adult individual in the Middle Bailey at Nottingham Castle. A quantification of these finds can be seen in Table 1 below.

Material	Quantity
Animal bone	19
CBM	15
Clay tobacco pipe	15
Coal	1
Glass	5
Flint	1
Metal	22
Mortar	5
Pot - medieval	66
Pot - Post-medieval	6
Stone/slate	12

Table 1: Quantification of finds

8.2. The Pottery

Alison Wilson and Lee Elliott

8.2.1 A total of 72 fragments of pottery weighing 232g were recovered from the excavation, ranging in date from the 11th - 19th century. The assemblage was quantified by two measures: number of sherds and weight, and the resulting archive was entered into an excel spreadsheet. The pottery is stored in one archive box which is at present stored at the Trent & Peak Archaeology stores, Chilwell, Nottingham.

Burial Fill (0014)

8.2.2 The burial fill contained 30 sherds of almost exclusively medieval material. The exception was a rim sherd which could be an early form of Yellow Ware and is likely to be residual. The earliest forms consisted of a body sherd of post-Conquest Stamford Ware and a Shelly Ware rim which was in production

between the 11th and 13th centuries. The bulk of the assemblage consisted of Green Glazed and Sandy Splashed Ware dating to the 12th and 13th century, with a rim of medieval Reduced Ware, bringing the date forward to between 1400 - 1550.

Recovered from spoil (0016)

8.2.3 The 29 pottery sherds recovered from the spoil were exclusively medieval, with the exception of two sherds of post-medieval pottery in the form of an earthenware rim, probably part of a flanged bowl with light brown internal glaze, and a body sherd of Midland Yellow Ware, both dating to the early 16th - 17th century. The medieval assemblage consisted of Shelly Ware dating to between the 11th and 14th century and Green Glazed and Sandy Splashed Ware all dating to the 12th and 13th century.

Pipe Backfill (0006)

8.2.4 There were 8 pottery sherds recovered from the pipe backfill. The earliest was a sherd of Stamford Ware while 6 sherds of Sandy Splashed Ware made up the bulk of the assemblage, with a small fragment of 17th century tin glazed pottery taking it into the post-medieval period.

Recovered during cleaning above grave

8.2.5 Two sherds of medieval Reduced Ware were recovered during cleaning above the grave, dating to between 1400 and 1550.

Subsoil (0002)

8.2.6 The subsoil contained 3 pottery sherds of mixed date. There was one fragment of White Bodied Glazed Ware dating to the 13th - 14th century alongside a body sherd of 19th century coarse earthenware and a fragment of soft paste porcelain also dating to the 19th century.

Discussion

8.2.7 The pottery assemblage from the excavation of an adult individual in the Middle Bailey of Nottingham Castle is almost entirely comprised of pottery of a medieval date, although the fragments were for the most part small fragments and largely undiagnostic in form. All the sherds of post-medieval pottery appear to be residual.

8.2.8 The earliest pottery fragments from the site are body sherds from Stamford Ware vessels produced between c. 1150-1200, with the rest of the assemblage being dominated by Green Glazed and Sandy Splashed Wares typical of the 12th and 13th century.

8.2.9 The Midland Yellow Ware is transitional late medieval to early post-medieval, with the remaining post-medieval assemblage being of 19th century production.

8.2.10 The pottery assemblage as a whole is representative of a site of medieval origin with later post-medieval development.

8.3. The Animal Bone

Kristopher Poole

8.3.1 18 fragments of animal bone were recovered from a cleaning layer of the site. These consisted of 11 unidentifiable fragments (one of which was burnt), 2 fragments of large mammal long bone, a pig lower incisor, a fragment of pig maxilla, a chicken furcula (wishbone), scapula and another bird coracoid, probably from a woodcock. Given the very small size of this assemblage, nothing can be

said of animal husbandry or dietary preferences, although the relatively high number of birds does fit with a pattern observed in bones from other areas of Nottingham Castle during evaluation works (NCA9).

8.4. The Stone

Alison Wilson

8.4.1 A total of 12 fragments of stone were recovered during the excavation. Of these 2 fragments were slate, probably roofing slate, and 10 fragments were sandstone or similar. No diagnostic architectural fragments were recovered.

8.5. The Clay Tobacco Pipe

Alison Wilson

8.5.1 15 fragments of clay tobacco pipe were collected during the excavation. All the fragments found were lengths of stem. In the absence of any identifying features such as makers stamps or decoration, the stems have been dated using bore hole diameter (early clay pipes have a bore diameter of 3mm, decreasing over time until stems by the middle of the 18th century had a bore of less than 2mm). All fragments recovered were of a 17th - 19th century date.

Recovered from spoil (0016)

8.5.2 8 fragments of pipe stem were recovered from the spoil. 6 of these had a 2mm bore diameter and were manufactured in the 18th and 19th century. Of the remaining 2 stems, one was of 17th century origin and the other, which had a 1.5mm bore diameter, dated to the 19th century.

Subsoil (0002)

8.5.3 The subsoil contained 5 fragments of pipe stem. One of these had a 1.5mm bore diameter, placing the date of manufacture to the 19th century, while the remaining 4 stems had a bore 3mm diameter suggesting a 17th century date.

Cleaning above grave.

8.5.4 Two 19th century fragments of pipe stem were recovered during cleaning above the grave.

8.6. The Building Material

Alison Wilson

8.6.1 15 fragments of building material were recovered from the excavation. The bulk of the material was un-diagnostic and could only be assigned to a general period of medieval to modern, with the exception of several pieces of decorated medieval tile.

Burial fill (0014)

8.6.2 Two fragments of tile, one part of a roofing tile nib, uncertain date.

Recovered from spoil (0016)

8.6.3 4 fragments of ceramic brick or tile, too small for identification. 1 fragment of modern earthenware white glazed tile and a fragments of plaster/mortar, probably modern.

Pipe backfill (0006).

8.6.4 One individual piece was a small tile fragment containing a large number of iron inclusions typical of medieval tile manufactured in Nottingham. The remaining 5 fragments were part of a decorated medieval floor tile, probably a King's head, dating to the 13th or 14th century *(Lee Elliott, pers. comm)*.

Subsoil (0002)

8.6.5 1 small unidentifiable fragment of brick or tile was recovered.

8.7. The Metalwork

Alison Wilson

8.7.1 A total of 22 metal items were recovered from the excavation. 2 were made of lead alloy, while the remaining 20 were made of iron.

Burial fill (0014)

8.7.2 The finds from the burial fill consisted entirely of iron nails of uncertain date.

Recovered from spoil (0016)

8.7.3 6 iron nails of uncertain date and 2 lead alloy off-cuts.

Subsoil (0002)

8.7.4 1 iron nail fragment of uncertain date

Recovered during cleaning above grave

8.7.5 6 iron nails of uncertain date.

Discussion

8.7.6 The metal finds from the excavation are all building related and of uncertain date. As such, given the context, they can be assumed to be of medieval to post-medieval date.

8.8. The Glass

Alison Wilson

8.8.1 A total of 5 fragments of glass were recovered from the excavation, 2 in the spoil and 3 in the subsoil. These were all post-medieval bottle glass, all dark green with the exception of 1 pale green fragment.

9. Osteoarchaeological Report

Kate Smart BA, MSc.

9.1. During excavations of the Nottingham Castle Green in 1978 the head and shoulders of an adult individual were discovered within trench, with the remainder of the body left unexcavated outside the trench. The head and upper torso was removed from the burial and deposited in due course with the rest of the site archive at Brewhouse Yard Museum, Nottingham (Accession Code NCM 1986: 1233). During 2016 it was proposed that the remaining bones should be excavated in order to reunite them with the excavated portion, and so that a more detailed assessment of the individual's age, sex and health could be undertaken, along with (if possible) radiocarbon dating. The subsequent excavations took place in June 2016, with the assessment of the remains following in October 2016.

9.2. The articulated remains of a single individual were identified. The remains were approximately 55% complete, with the legs having been truncated by a late post-

medieval or modern pipe trench. The skeletal material was analysed with the aim of determining the sex, age, stature and presence of pathology where possible. A full catalogue of the skeletal material is contained within the archive.

Methods

9.3. The remains excavated during 1978 were removed from the museum archive and the bones from both excavations were reunited. The remains were laid out in anatomical order and each bone was carefully examined and identified (where possible) in order to confirm that the remains were from a single individual. None of the bones from the assemblage were duplicated, therefore it can be confidently assumed that the bones were all from a single individual.

9.4. The methods used in the analysis of the remains are based on the recommendations of Brickley and McKinley (2004) and Buikstra and Ubelaker (1994). Age estimation was based on epiphyseal fusion (Buikstra and Ubelaker 1994), dental development and attrition (Brothwell 1981), degeneration of the pubic symphysis (Brooks and Suchey 1990) and degeneration of the auricular surface (Lovejoy *et al.* 1985). Sex estimation of the remains was undertaken using the sexually dimorphic traits of the skull and *os coxae* (pelvis) (Buikstra and Ubelaker 1994). The stature of the individual was not assessed due to the absence of any complete long bones.

Age at Death

9.5. Epiphyseal fusion of the femoral head, clavicle and S2-S3 vertebrae of the sacrum indicated that the individual was older than 17 years of age at death. This method is not very accurate once an individual becomes an adult, so these results only tell us that the remains are from an adult rather than a juvenile.

9.6. Dental development similarly is not accurate above roughly 21 years of age, and as the individual's wisdom teeth were unerupted this method could only say that the remains were from an individual over 15 years of age at death. Dental attrition is different, however, and is relatively accurate up to middle age, although it must be noted that the degree of attrition depends largely on the quality of the diet, i.e. if a person eats a lot of hard food such as coarse bread containing grit from millstones, then their teeth will be far more worn than an individual who subsists on softer food such as meat and fresh vegetables. The dental attrition of this individual suggested that they were between the ages of approximately 25 and 35 years of age at death.

9.7. Assessment of the degeneration of the auricular surface and public symphyses of the pelvis is a far more accurate method of age estimation than dental attrition or the development of bones and teeth. In this case degeneration of the auricular surface suggested an age of approximately 39-50 years of age at death, while the Todd and Suchey-Brooks methods of assessment of the pubic symphyses suggested an age of 40-49 and 23-59 respectively.

9.8. Taking all of the above methods into account, it seems likely that the individual was between the ages of approximately 40 and 50 years at death.

Sex

9.9. The sex of an individual is usually assessed through the sexually dimorphic traits of the skull and pelvis. In this case the poor condition of the skull and pelvis prevented many of these traits being assessed.

9.10. Of the skull, only the nuchal crest and anterior mandible were complete enough to be examined. Both of these areas suggested that the individual was a male.

9.11. On the pelvis the sciatic notch, preauricular sulcus and sacrum morphology indicated a male, while the shape of the auricular surface was indeterminate. All

other traits were either not present or were too fragmentary to be accurately assessed.

9.12. Metrical data of the femoral head was within the indeterminate range but slightly closer to the male average than the female. This indicates a small, gracile body type but does not discount a male.

Dental Pathology

9.13. Dental pathology, along with degenerative joint disease, is one of the most common pathologies present on human skeletal remains. In this case the maxilla was absent, although three teeth from it were present, while the mandible was present but damaged.

9.14. A single carious lesion was present on the right lower 1st molar, at the cemento-enamel junction on the mesial surface. No abscesses were visible and calculus was mild to moderate throughout. No periodontal disease was discernible. Although the presence of calculus indicates fairly poor dental hygiene, the incidence of caries is surprisingly low.

9.15. Dental enamel hypoplasia (DEH) was present in the form of lines on 9 of the remaining 14 teeth. DEH is formed during the development of the teeth, as the enamel is being laid down, and is very common in archaeological remains. If the body is stressed (for example by disease or dietary deficiencies) during the period that the tooth is being formed, DEH can be left in the form of lines, grooves or pits which represent a temporary halt, slowing or disruption of the formation of enamel.

Skeletal Pathology

9.16. As the remains were so fragmentary it is impossible to be sure that all pathology was recorded. However, several lesions were noted.

9.17. The left clavicle shows a moderate amount of degeneration on the scapular end, resulting in a porous surface. The medial end shows a pitted lesion 9.7mm x 5.5mm in size and the costal impression is enlarged and porous. Porosity and degeneration at muscle attachment sites are often the result of degenerative changes related to over-use of a ligament or tendon (enthesophytes), and the location of some of these changes on the costal impression (the tuberosity that anchors the costoclavicular ligament) may suggest that this is the case in this instance.

9.18. Degenerative spinal disease can be seen in the presence of slight lipping on a single unidentified transverse process, in Schmorl's Nodes present on the T6, T7, T8, L2 and L3 vertebrae (Schmorl's Nodes are small depressions in the vertebral joint surfaces indicative of degenerative changes in the cartilage, or 'discs', between the vertebrae, often referred to as a slipped or prolapsed disc), and in the flared vertebral end of a single right rib. Spinal joint disease is very common within archaeological populations and may indicate nothing more than that the individual was middle-aged.

9.19. A ragged hole is present on the medial surface of the right ilium (pelvis) measuring 9.6mm x 12.9mm in size. This is likely to be post-mortem damage but as there is no colour differentiation between the damaged and undamaged bone a peri-mortem injury cannot be discounted. Likewise, damage is present on the left humeral head in the form of a linear indentation 9mm in length which is likely to be post-mortem.

Discussion

9.20. The individual recovered from the Castle Green excavations appeared to be an adult male in middle age. His body appeared fairly gracile with no obviously large muscle attachment sites, possibly indicating that he was not occupied in heavy manual labour during his life. Stature could not be assessed. His diet appeared to be

of good quality as the teeth were not excessively worn, and nutritionally adequate as no metabolic deficiencies were observed (i.e. anaemia, osteoporosis, vitamin C or D deficiency).

9.21. Dental hygiene was fairly poor, although this is not by any means unusual in remains of this time period. It should be noted that although calculus was widespread, the presence of carious lesions was not. Caries are most often the result of the fermentation of food sugars, particularly sucrose, in the diet, while calculus forms fastest when there is a high protein and/or carbohydrate diet (Roberts and Manchester 2005, 65-71). Therefore, the presence of calculus without a large number of carious lesions may mean that the individual was eating a diet low in sugar but high in protein and carbohydrates (i.e. meat, dairy, pulses, beans and grains). This is unsurprising as, while processed sugar was available in Medieval Europe, it was extremely expensive, and most sweetness in the diet at this time would likely have been derived from fruits and honey. However, it should be noted that a diet high in protein is considered to have been indicative of a higher status individual due to the fact that meat and fish were expensive products (Larsen 1997, 76-77).

9.22. The presence of degeneration on the left clavicle may be indicative of the over use of the left arm through a particular occupation, although it must be noted that the determination of occupation through enthesophytes has not been well researched and, therefore, the specific occupation cannot be determined. Along with this, the right clavicle was not present within the assemblage so the two cannot be compared.

Recommendations

9.23. The remains, while interesting, are in poor condition and, therefore, display in a museum may not be worthwhile. No further work to examine age, sex, stature or pathology is recommended; however, should the opportunity arise it may be possible to undertake further scientific testing in order to determine the individual's diet and where the individual was born (stable isotope analysis). If this is required a sampling specialist should be consulted in order to determine the best samples to be used (likely teeth).

10. Scientific Dating

10.1. Prior to the excavation of the remaining portion of the skeleton, a sample of bone from the individual's mandible excavated in 1978 was submitted to the Oxford Radiocarbon Accelerator Unit (ORAU) for Accelerator Mass Spectrometry (AMS) radiocarbon dating. The dating aimed to discover the age of the burial, to determine whether or not it was from the time of the English Civil War (Lomax 2016, 4).

10.2. The result of the dating indicated that the individual died between 1445 and 1630 calAD (95.4% probability), with a 66.8% probability that the individual died between 1445 and 1523. However, the individual was found to have elevated nitrogen isotope levels, indicating a large amount of marine or freshwater fish in the diet (Lomax 2016, 16). Elevated nitrogen isotope levels can affect the results of radiocarbon dating, so the calculations were repeated, taking these levels into account (Fig. -). The revised calculation indicated that the individual died between 1483 and 1647 calAD, with a 54.2% probability that they died between 1520 and 1601 (*ibid.*).

10.3. The results indicate that the burial is probably of 16th Century date, which is prior to the English Civil War (1642-1651), although an early 17th Century date cannot be ruled out. While it is possible that the burial is the result of the castle being used to isolate those suffering from the plague between January and April 1610, it is more

likely that the burial is earlier and related to the Great Chapel that was present in the area of the Green during the Medieval period (*ibid.*).

11. Discussion

11.1. The excavations on the Castle Green were able to identify the location of Drage's Area VI Trench from the 1978 excavations, and locate the remainder of the burial partially exposed and excavated during those works.

11.2. A simple stratigraphic sequence was identified across the trench, with layers of post-Medieval/modern topsoil and subsoil overlying the archaeological horizon. This seems to confirm Drage's suspicion that the area of the Green was reduced in level during the post-Medieval period, truncating the Medieval layers.

11.3. The location of the burial was identified, however the legs were missing from the skeleton. The excavation of the late post-Medieval/early modern pipe trench is likely to have impacted upon the leg bones at around the level of the knee, and rather than cutting through or breaking the bones it appears that the construction workers simply pulled them from the section, leaving the pelvis and feet disturbed. Several small displaced foot bones were recovered from the material around the pipe trench, lending weight to this interpretation. It is unknown what happened to the bones that were removed, but they were probably thrown onto a spoil heap and backfilled or spread elsewhere in the castle grounds as part of the landscaping works.

11.4. The individual appears to be an adult male in middle age. His gracile build and probable good quality diet possibly indicate an individual of higher status. This would not necessarily mean nobility, but could mean someone in a favoured position, such as a scribe, steward or attendant.

11.5. The pottery found within the grave fill was of Medieval date, with the Medieval reduced ware suggesting a date of between 1400 and 1550. The scientific dating of the bones suggested a date of between 1520 and 1601, which correlates with this date. Taking both methods into consideration, it seems likely that the individual died in the early-mid 16th Century and was not a Civil War casualty. The proximity of the grave to the location of the Great Chapel makes it likely that this interment was a formal burial within the chapel grounds. This adds further weight to the theory that the individual was of a higher status.

12. Bibliography

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Appendix 1: Plates and Figures

Plate 1: SK01 *in situ*

Plate 2: Looking north west, showing SK01 location and pipe trench

Plate 3: SK01 *in situ* showing truncation

Plate 4: View of the trench looking west

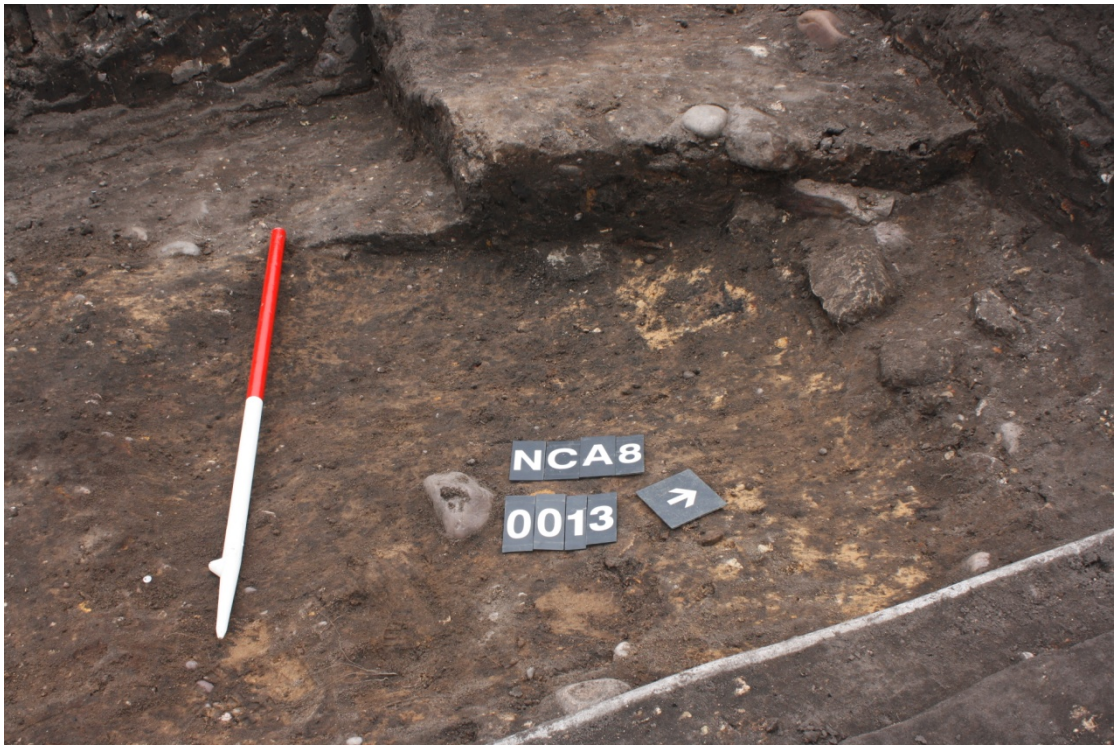
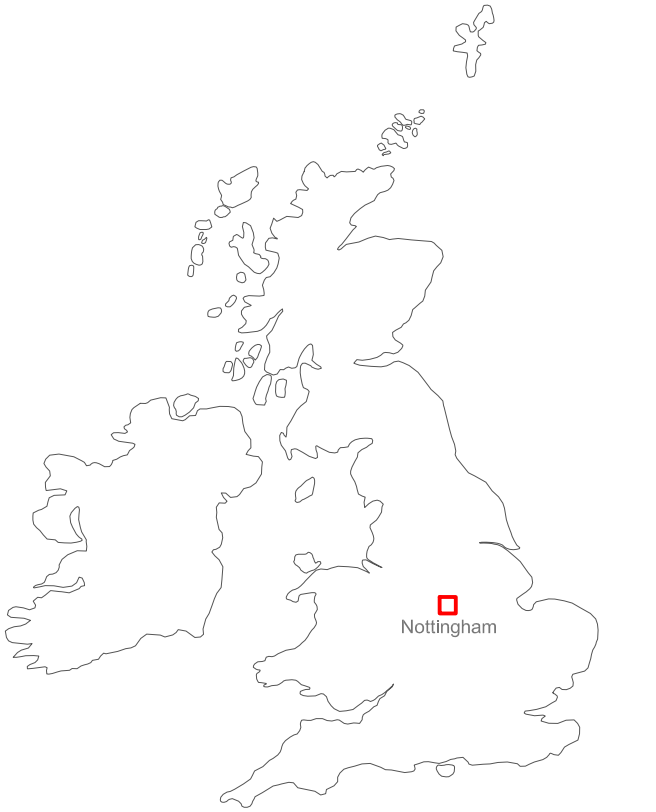
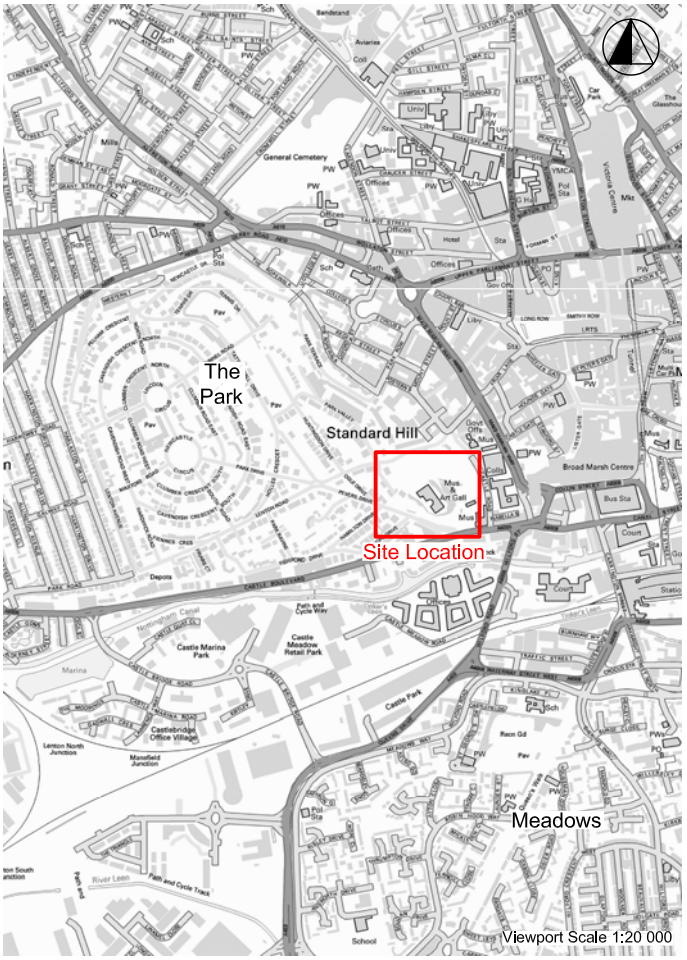


Plate 5: Grave cut [0013] post-excavtion

Plate 6: The trench showing the grave in the background and the location of the stone-capped culvert in the foreground



Not to Scale



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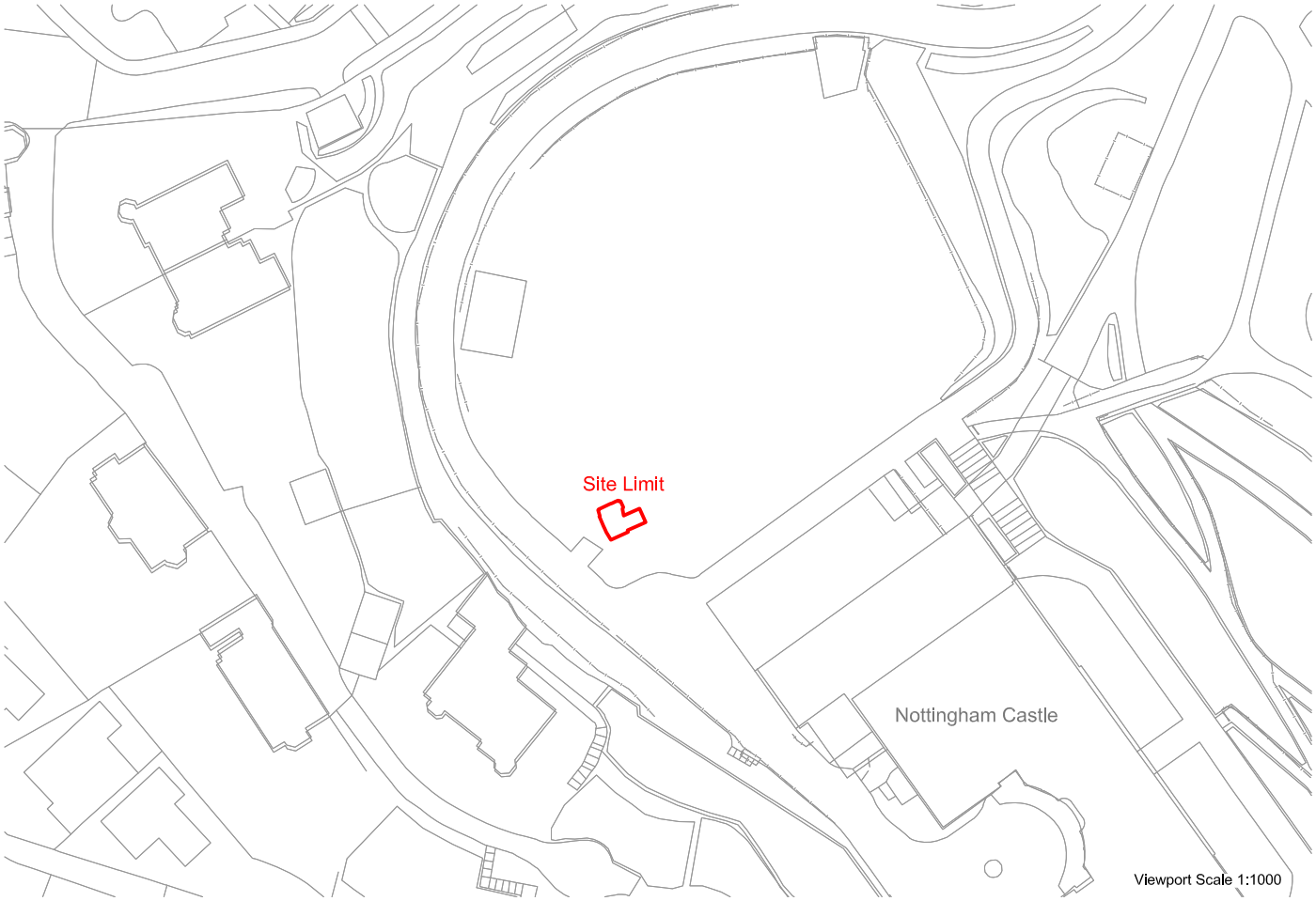


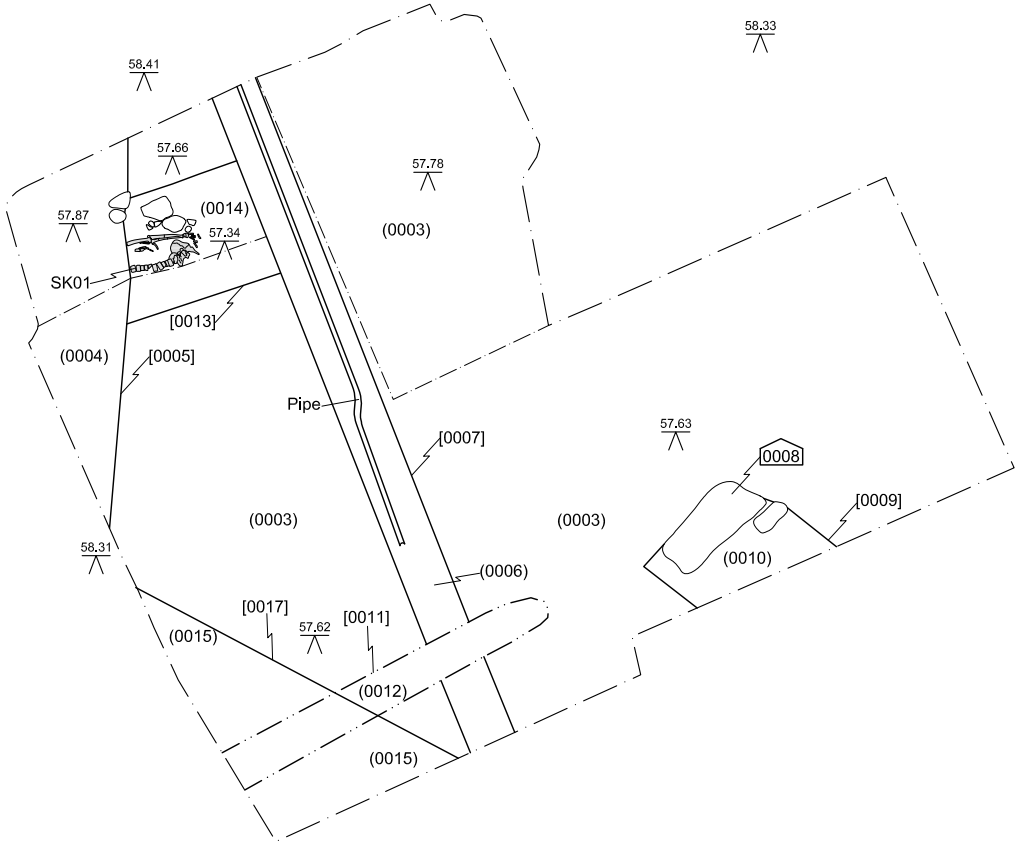
Viewport Scale 1:1000

Trent & Peak ARCHAEOLOGY

NCA8
Figure 1
Scale at A4-varies

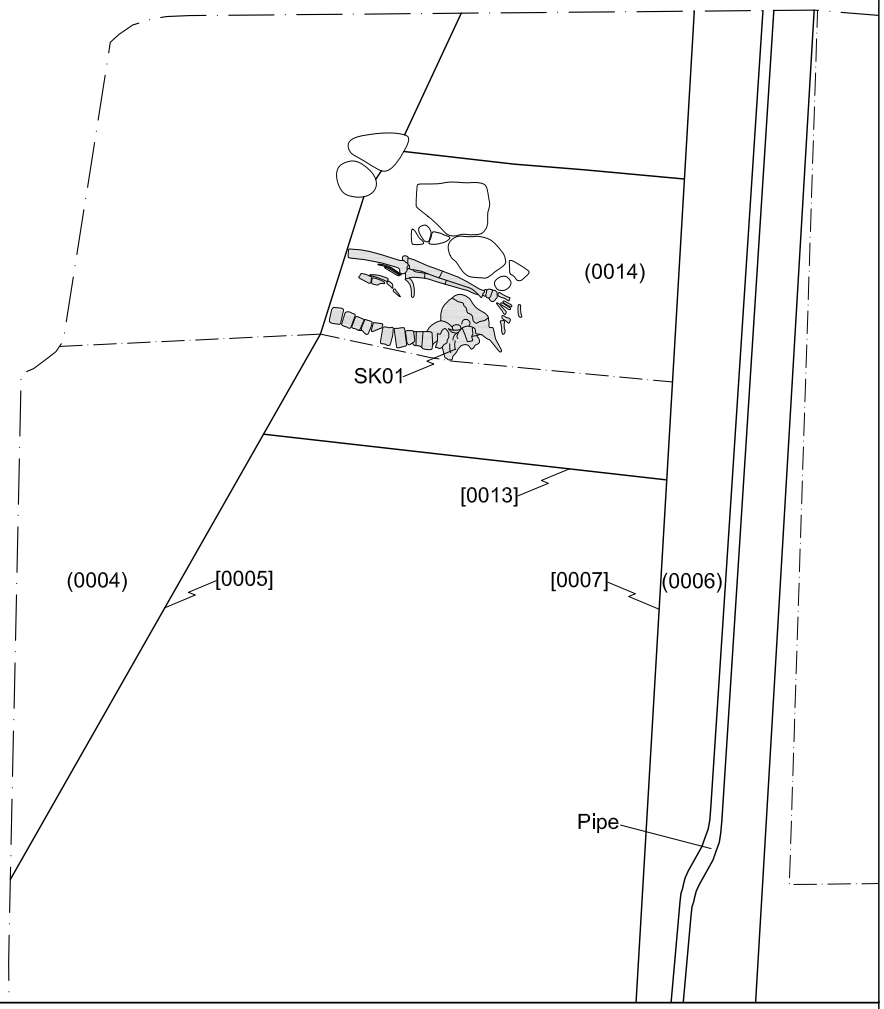
Nottingham Castle: Exhumation of an Individual
Location Map
13.01.17

Scale at A4-1:1000
0m 50m



Trent & Peak ARCHAEOLOGY	NCA8	Nottingham Castle: Exhumation of an Individual
	Figure 2	Site Plan
	Scale at A4-1:50	06.02.17

0m 5m



Trent & Peak ARCHAEOLOGY

NCA8
Figure 3
Scale at A4-1:20

Nottingham Castle: Exhumation of an Individual
Structure From Motion Photogrammetry and Detailed Plan of SK01
13.01.17

0m 2m

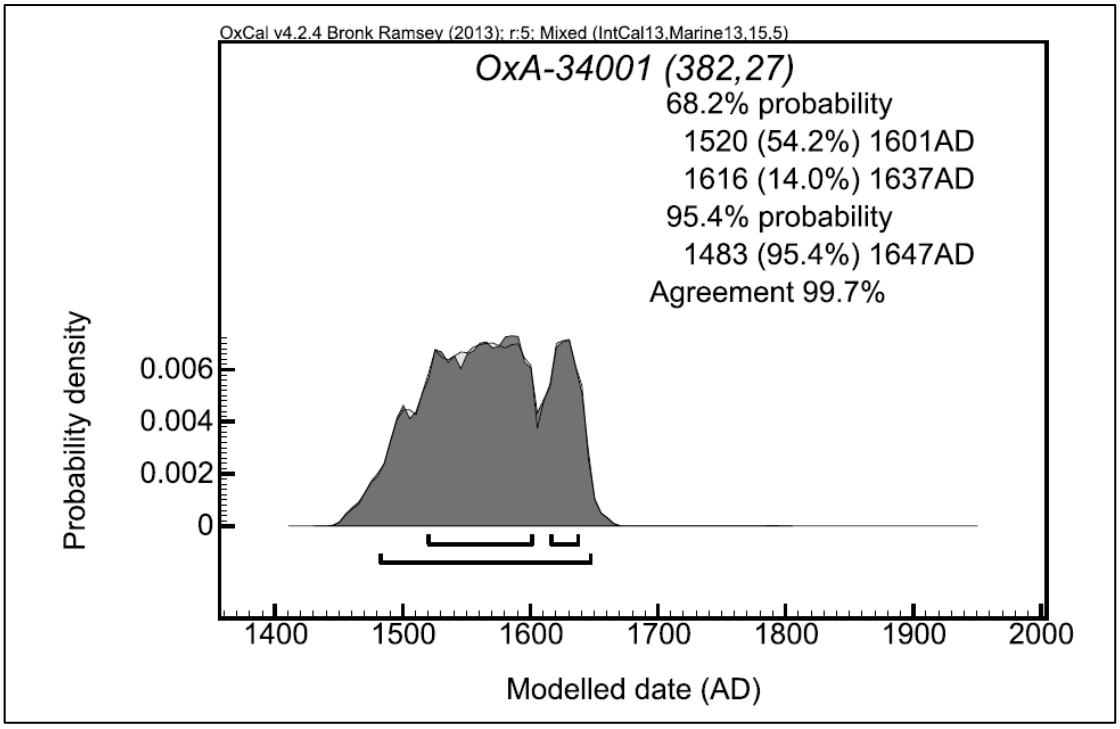


Figure 4: The second radiocarbon dating calibration chart for the sample submitted in May 2016 (Lomax 2016, 16)

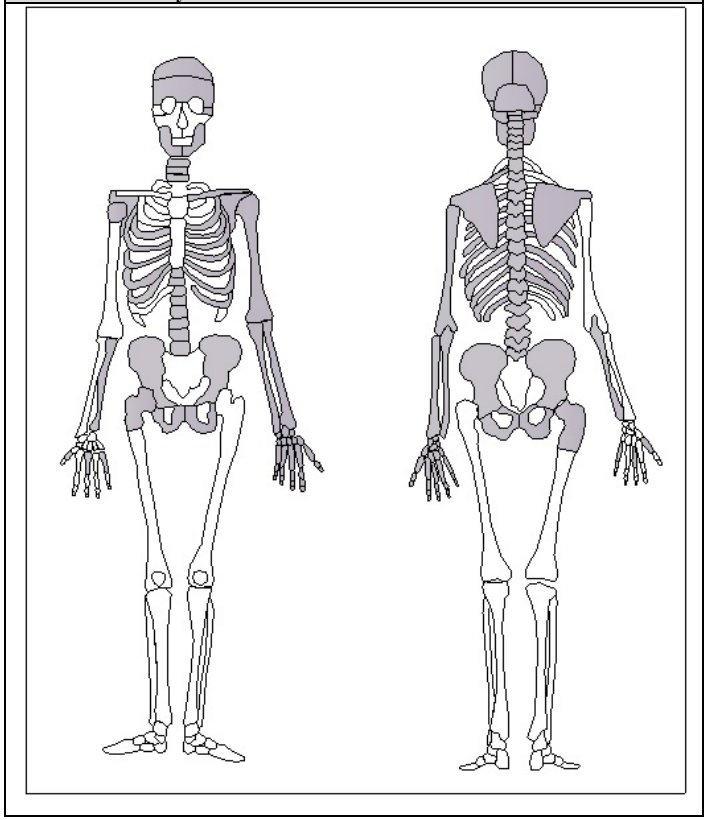
Appendix 2: Context Register

Context	Depth	Category	Description
0001	0.3m	Deposit	Topsoil; compact, dark grey-brown clayey-sand; occasional small stones <5%; horizon between (0001) and (0002) poorly defined
0002	0.2m	Deposit	Subsoil; firm, greyish-brown clayey-sand; frequent small stones with patches of orangey-pink clay and pottery & CBM; Horizon unclear
0003	Unknown	Deposit	Mixed redeposited sandstone; loose, brownish-yellow and mottled silty sand; infrequent small stones <5%; clear interface
0004	0.5m observed	Deposit	Backfill of Drage's trench (1978); loose, greyish-brown clayey-sand; moderate inclusions of small stones and pottery fragments; clear interface
0005	0.5m	Cut	Cut of Drage's trench; vertical; flat; though not fully excavated, records show a square-shaped trench
0006	Unknown	Deposit	Backfill of pipe trench [0007]; loose, greyish-brown clayey-sand; frequent stones <.05m and fragments of pottery & CMB
0007	Unknown	Cut	Cut of (0006); vertical sides; flat base; truncates lower remains of SK01
0008	n/a	Structure	Stone culvert; stone-built drain/culvert, visible at the base of the trench; not excavated but appeared to be post-medieval
0009	n/a	Cut	Cut of culvert (0008); utility cut for drain/culvert; rectangular
0010	Unknown	Deposit	Fill of [0009]; loose, brownish-yellow silty sand; occasional small stones <.05m; clear interface
0011	Unknown	Cut	Cut of service trench archaeologically excavated in 1998/1999; linear trench for archaeological work; linear shape; vertical sides; minimum depth 0.4m
0012	Unknown	Deposit	Fill of [0011]; loose, pinkish-yellow silty sand; frequent stones & CBM; clear interface
0013	Truncated; max width approx 1m	Cut	Grave cut; burial; rectangular/ovoid; uncertain sides; flat base
0014	Unknown	Deposit	Fill of [0013]; loose, dark-greyish brown silty-sand, occasional small stones, pottery fragments and bone fragments; larger stones present around edge of grave – possibly intentional
0015	Unknown	Deposit	Bright orange sand; firm pinkish-orange sand; occasional small stones; sharp interface
0016	n/a	Spoil	Sieving of upper stratification for finds from burial or subsoil
0017	Unknown	Cut	Cut of (0015); not excavated
SK01	n/a	Human Remains	*In situ* human remains; supine; good condition; East-West orientation; 0.55m below ground surface; see Appendix II

Appendix 3: Bone Inventory

Site Code	NCA8	Orientation	E-W
Skeleton No.	SK0001	Disturbance	Moderate
Area/Context Number	(0014)	Associated finds	N/A
Condition	Moderate-good	Sex	Male
Completeness	55%	Age	40-50
Body Position	Supine	Stature average (cm)	N/A

Skeletal Inventory



Adult Age	
Epiphyseal fusion	>19
Dental eruption and development	>15
Dental attrition	25-35
Pubic symphyses	40-49/23-59
Cranial suture closure	N/A
Ilium auricular surface	39-50

Juvenile Age	
Epiphyseal fusion	
Dental development	
Post-cranial measurements: Humerus length Radius length Ulna length Femur length Tibia length Fibula length Ilium width	

Dental Inventory																	
Dental hypoplasia						L					L, G	L			L		P=Pit, L=Line, G=Groove
Periodontal Disease																	S=Slight, M=Medium, C=Considerable, X=Jaw not present
Calculus																	O=Occlusal, B=Labial, L=Lingual, M=Mesial, D=Distal, A=All/S=Slight, X=Medium, C=Considerable
Abscesses																	B=Buccal, L=Lingual
Caries																	O=Occlusal, M=Mesial, D=Distal, B=Labial, L=Lingual
Maxillary teeth	~~8~~	~~7~~	~~6~~	~~5~~	~~4~~	3 J	~~2~~	~~1~~	~~1~~	~~2~~	3 J	4 J	~~5~~	~~6~~	7 J	~~8~~	~~1~~=Lost ante-mortem, 1=lost post-mortem, B=Broken, V=Unerupted, O=Erupting, NP=Undeveloped J=Jaw not present
Mandibular teeth	8 NP/	7	6	5	4	3	2	1	~~1~~	~~2~~	~~3~~	4 J	5 B	6	7	8 NP/V	~~1~~=Lost ante-mortem, 1=lost post-mortem, B=Broken, V=Unerupted, O=Erupting, NP=Undeveloped J=Jaw not present
Caries			M														O=Occlusal, M=Mesial, D=Distal, B=Labial, L=Lingual
Abscesses							B			B							B=Buccal, L=Lingual
Calculus				M/S	B/	M,B/X	B/	M/S				D/S	B/X	B,L/	B,L,D/		O=Occlusal, B=Labial, L=Lingual, M=Mesial, D=Distal, A=All/S=Slight, X=Medium, C=Considerable
Periodontal Disease																	S=Slight, M=Medium, C=Considerable, X=Jaw not present
Dental Hypoplasia				L	G	L	L						L				P=Pit, L=Line, G=Groove
	Right								Left								

Sex (F = Female, M = Male, I = Indeterminate)			
Skull:		**Pelvis:**	
Supraorbital ridges	N/A	Sciatic notch	M
Mastoid processes	N/A	Subpubic angle	N/A
Posterior zygomatic arch	N/A	Subpubic concavity	N/A
Nuchal crest	M	Ischio-pubic ramus	N/A
Anterior mandible	M	Ventral arch	N/A
Orbital rims	N/A	Preauricular sulcus	M
Metrical data:		Obturator foramen	N/A
Femoral head diameter	M?	Pelvic brim	N/A
Femoral bicondylar width	N/A	Acetabulum	N/A
Humeral head diameter	N/A	Segment morphology of the sacrum	M
Radial head diameter	N/A		
Scapula glenoid cavity width	N/A		
Clavicle maximum length	N/A		

Appendix 4: OASIS Form

OASIS DATA COLLECTION FORM: England

Printable version

OASIS ID: trentpea1-271260

Project details

Project name	Nottingham Castle Middle Bailey: Exhumation of an individual
Short description of the project	Excavation was undertaken in the Middle Bailey (or Castle Green) of Nottingham Castle in order to exhume the partial remains of an individual. The head and upper torso were excavated during archaeological works undertaken in the 1980s, with the remainder being left within the section. The recent works aimed to excavate and reunit the remaining bones with those excavatied previously and stored at the Museum of Nottingham Life, Brewhouse Yard.
Project dates	Start: 31-05-2016 End: 01-06-2016
Previous/future work	Yes / Yes
Any associated project reference codes	NCA8 - Sitecode
Any associated project reference codes	1006382 - SM No.
Type of project	Field evaluation
Site status	Scheduled Monument (SM)
Current Land use	Other 14 - Recreational usage
Monument type	CASTLE Medieval
Monument type	MANSION Post Medieval
Significant Finds	HUMAN SKELETON Post Medieval
Significant Finds	POTTERY Medieval
Methods & techniques	"Targeted Trenches"
Development type	Large/ medium scale extensions to existing structures (e.g. church, school, hospitals, law courts, etc.)
Prompt	Scheduled Monument Consent
Position in the planning process	Pre-application

Project location

Country	England

Site location	NOTTINGHAMSHIRE NOTTINGHAM NOTTINGHAM Nottingham Castle
Postcode	NG1 6EL
Study area	100 Square metres
Site coordinates	SK 56854 39483 52.949398138188 -1.153727450138 52 56 57 N 001 09 13 W Point

Project creators

Name of Organisation	Trent and Peak Archaeology
Project brief originator	English Heritage
Project design originator	Dr. Paul S. Johnson
Project director/manager	Dr. Paul S. Johnson
Project supervisor	Kate Smart
Type of sponsor/funding body	City Council
Name of sponsor/funding body	Nottingham City Council

Project archives

Physical Archive recipient	Brewhouse Yard
Physical Archive ID	NCM 1986:1233
Physical Contents	"Ceramics","Glass","Human Bones","Metal"
Digital Archive recipient	Brewhouse Yard
Digital Archive ID	NCM 1986:1233
Digital Contents	"none"
Digital Media available	"Images raster / digital photography","Spreadsheets","Text"
Paper Archive recipient	Brewhouse Yard
Paper Archive ID	NCM 1986:1233
Paper Contents	"none"
Paper Media available	"Context sheet","Drawing","Photograph","Plan","Report","Section","Unpublished Text"

Entered by	Kate Smart (ksmart@yorkat.co.uk)
Entered on	14 December 2016

OASIS:

Please e-mail Historic England for OASIS help and advice