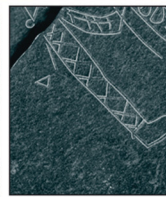
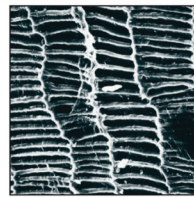


CYDW11



ST MARY'S CHURCH, DEVIZES

Archaeological evaluation

for Parochial Church Council of St Mary's Church, Devizes

January 2012



HEADLAND
ARCHAEOLOGY (UK) Ltd

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Archaeological evaluation

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January 2012

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Approved by:	Andy Boucher – Project Manager

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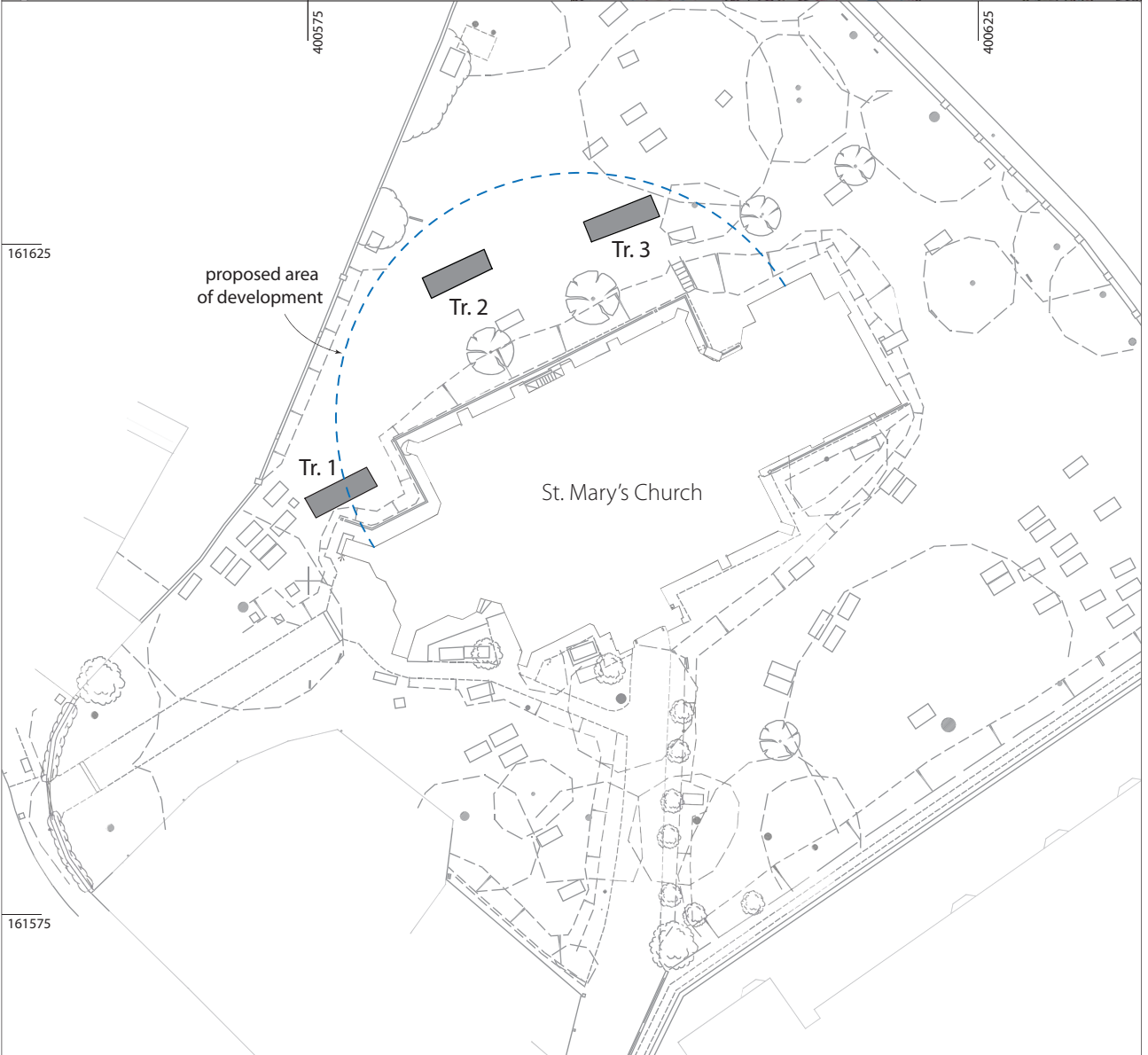
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St Mary's Church
New Park Street
Devizes
Wiltshire



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Illus 1
Site location

ST MARY'S CHURCH, DEVIZES

Archaeological evaluation

Headland Archaeology excavated three trial trenches within the churchyard of St Mary's Church, Devizes, to evaluate the archaeological impact of a proposed extension to the northwest side of the church. Articulated human remains dating to the 19th – early 20th century were encountered as well as a quantity of disarticulated human and animal remains; no other archaeological deposits were uncovered.

1 INTRODUCTION

Headland Archaeology (UK) Ltd. was commissioned by the client, the PCC (Parochial Church Council) of the Parish of St John with St Mary, to undertake an archaeological evaluation within the grounds of St Mary's Church.

The Chancellor of the Diocese of Salisbury gave permission for the archaeological work to be carried out under extended minor works provisions (July 2011). A written scheme of investigation was produced by Michael Heaton Heritage Consultants (August 2011).

The results of the archaeological evaluation are to be submitted in support of an application for planning permission for a semi-circular (c.456m²) extension to the northwest side of the church. The report will also support an application for Diocesan Faculty.

1.1 Location

The site comprised three trenches within the north and northwest areas of the churchyard (SU 00591 61620). The ground surface in the west of the site stood at 133.13 mOD with a gradual incline in ground level to 133.94mOD in the east. The underlying geology is Upper Greensand bedrock supporting natural green sand.

1.2 Archaeological background

The town of Devizes was founded in the 11th century within the baileys of a Norman Castle built

around c. AD1080 (Wiltshire County Council, 2004). St Mary's Church was built in the 12th century and lies outside the defensive ditches of the town, close to the market place, where development commenced and progressed in the late medieval period from the 12th–14th century (ibid). The site of St Mary's Church therefore potentially comprises c. 700 years of interments within its grounds. The presence of four other Church of England parish churches within Devizes, including those dedicated to St John (est. 1130), St James (15th century foundation) and St Peter (1860s), may have resulted in a reduced level of burial at St Mary's. Furthermore a Quaker burial ground was established in 1665 in Devizes and further religious institutions were founded in the 19th century (Crittall, 1975).

During the post-medieval period the population of Devizes gradually increased; rising from 485 families in the mid 17th century, 3,121 in the mid 18th century to 3,547 by the census of 1801 (ibid). It nearly doubled again by the early to mid 19th century (6,500) and was 9,755 by 1971 (ibid). Many individuals living in Devizes from the 16th century onwards would have been involved in textile production; from the late 18th century the woolen cottage industry changed to factory production e.g. 300 looms within John Anste's Mill. In the early 18th century Devizes had the largest corn market in the West Country. Further industry in Devizes consisted of early 19th century Canal and railway building works, a brewery and a foundry with a workhouse being established in 1836 (Wiltshire County Archeological Service, 2004).

2 METHOD

The objectives of the archaeological programme were to determine the presence or absence of archaeological remains that would be impacted upon by the proposed works, and more specifically, to establish the likely number of articulated skeletons that might be affected by these future works.

Three evaluation trenches measuring 5m x 1.6m were excavated within the footprint of the proposed development. Trenches were machine excavated to the level of articulated burials after which excavation proceeded by hand. Only burials entirely within the confines of the trenches were excavated and lifted, burials continuing beyond the edges of the trenches were left *in situ*. Excavation continued to the level of natural green sand. Burials cutting natural deposits were left *in situ*.

All recording followed IfA Standards and Guidance. Recording was undertaken on Headland Archaeology pro forma trench and skeleton record sheets. Digital, 35mm colour transparencies and black-and-white print photographs were taken.

All articulated skeletons and grave assemblages were recorded *in situ* in accordance with the Guidance for best practice for treatment of human remains excavated from Christian burial grounds in England (CoE and English Heritage 2005) and IfA Technical paper No. 13 (McKinley and Roberts 1993).

Each articulated skeleton was assessed by an osteoarchaeologist. Skeletons were lifted and bagged where this was necessary to enable further excavation below them. Those that could be left *in situ* without affecting the objectives of the evaluation were assessed and left *in situ*. In accordance with the WSI (written scheme of investigations) demographic data and the presence/absence of pathology were recorded for articulated burials. Articulated and disarticulated skeletal material was assessed to produce a count of the minimum number of individuals present. Reporting on such data will provide an indication of the potential for further study of skeletal remains were a larger group to be excavated. All skeletal material was re-interred during backfilling in a stratigraphic sequence as close as possible to its original place of interment.

3 RESULTS

Articulated and disarticulated skeletal material was found within all three trenches, however no further archaeological features were encountered.

Beneath the topsoil, all trenches contained 'cemetery soils' created by repeated burial, which consisted of mixed soils containing disarticulated bone. A small quantity of disarticulated animal remains was also dispersed within each trench.

All burials were supine in an extended position and aligned roughly east-west, with the head situated at the west of the grave, in the typical Christian manner. The majority of individuals had their arms placed straight by their sides (7 burials, including all non-adults) although a few had their right arm (2 burials) or both arms bent across the lower spine/pelvic area (2 burials). The majority of burials were stacked 2-3 coffin deep within one grave plot.

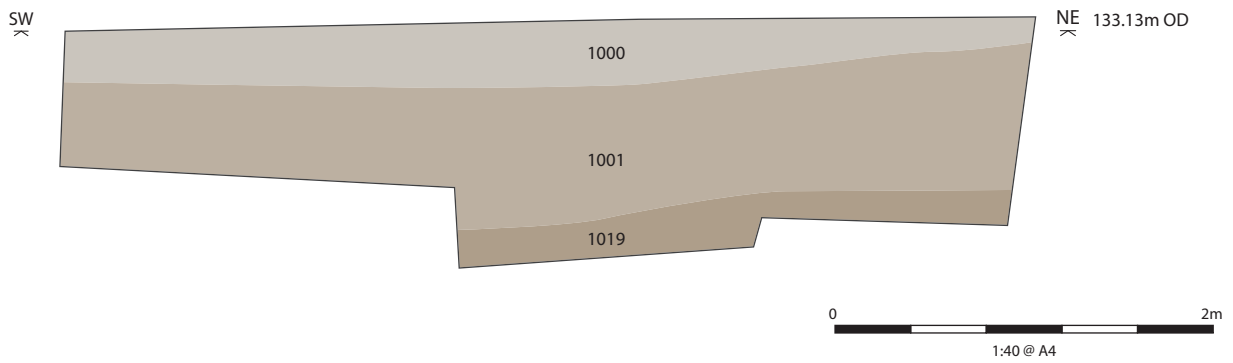
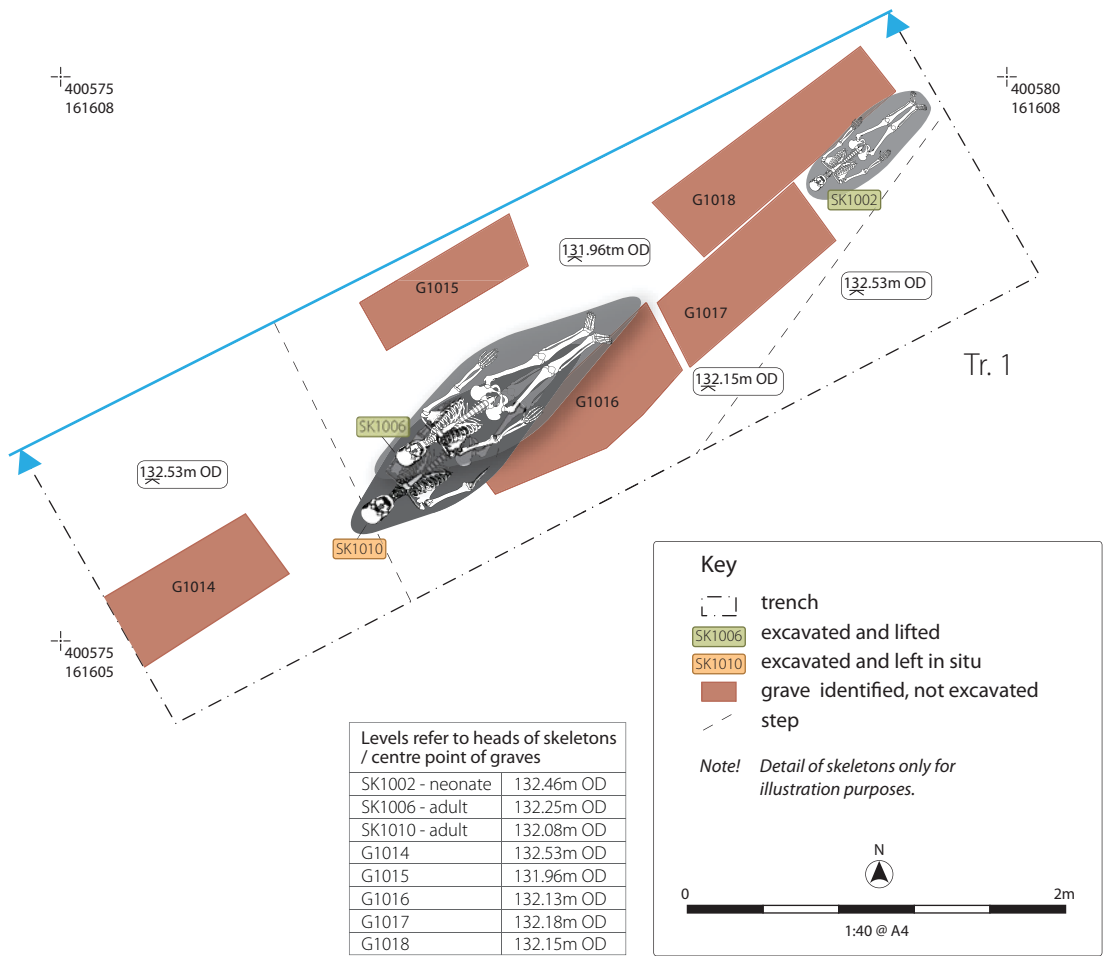
In Trench 1 articulated burials were encountered at a depth of 132.53mOD. In total two articulated skeletons were assessed and excavated, one skeleton was assessed and left *in situ* and five further grave cuts were identified but not excavated.

The uppermost articulated skeletons in Trench 2 were located at a depth of 132.45mOD. Three skeletons were assessed and excavated, one skeleton was assessed and left *in situ*, and eight further graves were identified but not excavated. One brick lined tomb was present in the northeast corner of the trench. This was recorded but not excavated.

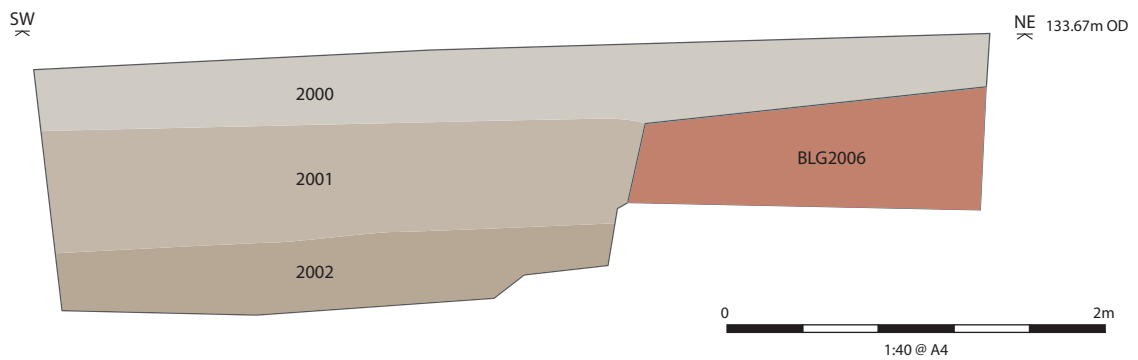
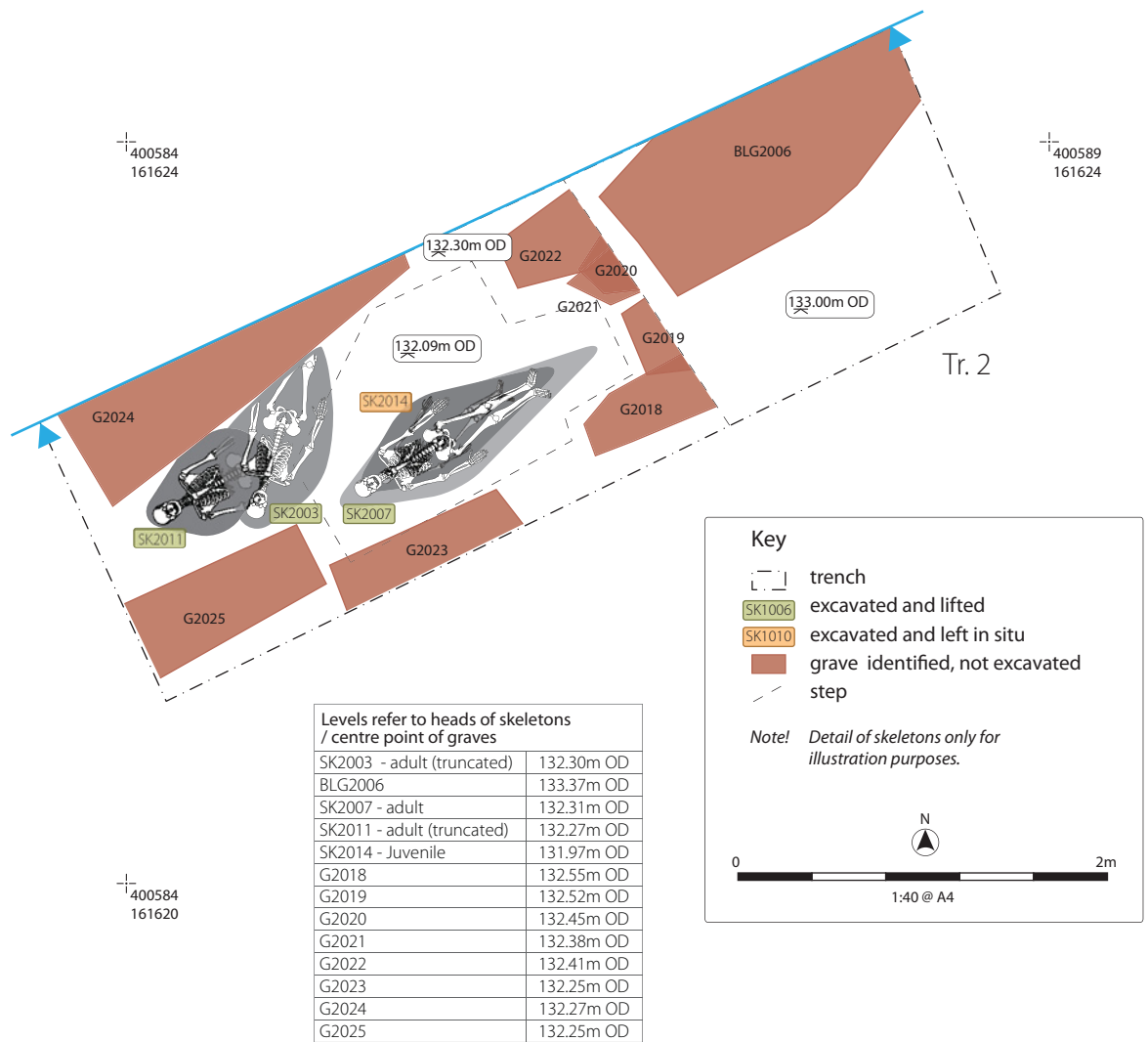
Burials in Trench 3 were revealed at a depth of 132.98mOD. Six skeletons were assessed and excavated, two skeletons were assessed and left *in situ* and seven further grave cuts were identified but not excavated. A brick lined tomb was present within this trench located in its north-east corner, with only a small section of the tomb (its south-west corner) observable.

4 DISCUSSION

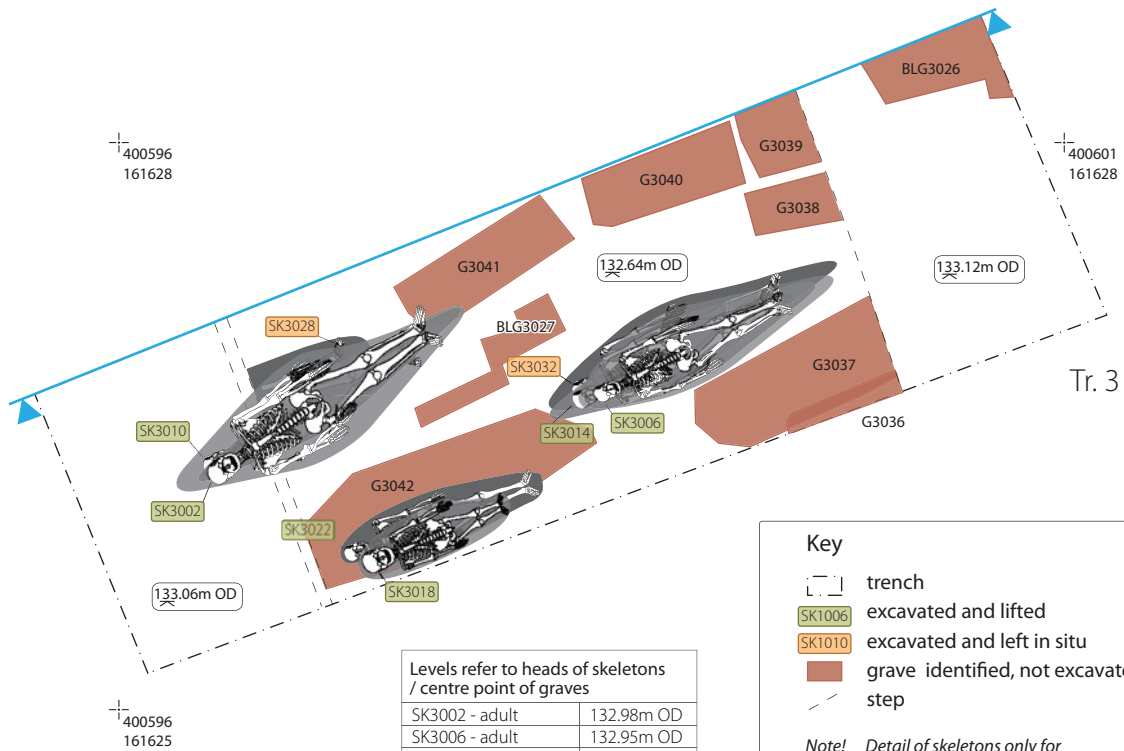
The articulated burials revealed during the evaluation are likely to be of a late date and therefore undisturbed by subsequent burial. Interment in the graveyard is believed to have ceased in 1936 (late burial register 1855-1936), with burials during the latter part of the nineteenth and early twentieth centuries being sporadic. The coffin furniture associated with the skeletal assemblage



Illus 2
Trench 1 - Plan and section



Illus 3
Trench 2 - Plan and section



Levels refer to heads of skeletons / centre point of graves	
SK3002 - adult	132.98m OD
SK3006 - adult	132.95m OD
SK3010 - adult	132.92m OD
SK3014 - adult	132.68m OD
SK3018 - neonate	132.96m OD
SK3022 - Juvenile	132.88m OD
BLG3026	133.51m OD
BLG3027	133.13m OD
SK3028 - adult	132.70m OD
SK3032 - adult	132.43m OD
G3036	132.96m OD
G3037	132.74m OD
G3038	132.77m OD
G3039	132.79m OD
G3040	132.64m OD
G3041	132.59m OD
G3042	132.64m OD

Key

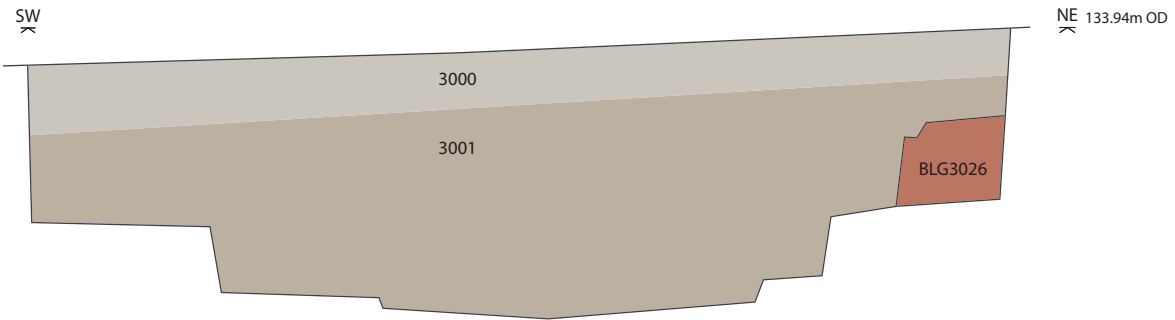
- trench
- excavated and lifted
- excavated and left in situ
- grave identified, not excavated
- step

Note! Detail of skeletons only for illustration purposes.

N

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Illus 4
Trench 3 - Plan and section

was typical of the 19th century (Hancox 2006). In all cases wood from the coffins only survived as a dark stain, or not at all. Coffin handles (up to 8 per burial) were attached to decorated plates (grip plates), all made of iron, and nearly all of them were too corroded to identify either shape or decoration. Coffin lid plates (depositum plates) were present in the form of shields on some individuals, the use of which dates from the early 19th century through to the beginning of the 20th century. Other individuals had an ‘urn and flowers’ design which appears from the 1830s at various sites across the country and lasts until the 1860s (ibid).

One individual, SK 2007, had a surviving inscription (incomplete) on a shield-shaped depositum plate. It consisted of yellow writing on a black painted background which read:

Thomas Buckley

Died 1866

?

The Devizes census of 1861 revealed that Thomas Buckley was a hairdresser living in the town and would have been 56 years old when he died (Ancestry 2011).

Small, four-holed white plastic buttons were found at the neck area of two adult skeletons, both within the same grave cut, indicating some form of funerary attire and indicating a date of burial in the very late nineteenth or early twentieth century.

4.1 Summary of osteological results

Skeletal preservation was excellent, meaning that a range of pathological conditions could be observed, and the certainty with which age and sex could be determined was high. The assemblage of skeletons assessed from the evaluation trenches, although small, shows some interesting features; notably a relatively high degree of trauma and short female stature in comparison to other assemblages of this time period. The presence of gout and DISH indicates some people were eating to excess. Individuals in Devizes suffered low levels of childhood stress, infectious disease and rickets compared to skeletal assemblages of contemporary larger cities, perhaps reflecting lower levels of pollution and reasonable housing and living conditions. Limited evidence suggests individuals may have been involved in activities that utilized their arms predominantly. The low prevalence of

Schmorl’s nodes and joint disease is interesting given the older age of adults at St Mary’s and may indicate a more sedentary lifestyle.

A full osteological assessment is included as appendix 1.

4.2 Estimate of the total number of articulated burials

An attempt was made to estimate the likely number of articulated burials present within the development area (456m²). A figure of 848 articulated burials is suggested by;

- determining the area of each trench excavated to the level of natural deposits;
- identifying the number of burials and partial burials present within this area;
- determining the number of burials per square metre in each trench;
- taking an average value to determine the number of burials per square metre, across the development area;
- factoring this value into the development area.

	Trench 1	Trench 2	Trench 3
Area reduced to natural deposits (m²)	4.9	5.28	4.48
Number of burials / part burials	7	9.4	10.6
Burials per m²	1.43	1.78	2.37
Average burials per m²	1.86		
Projected number of burials within development area	(1.86 x 456) = 848		

Table 1

Estimated number of burials within development area

The minimum number estimate is based on the evidence from the evaluation but should be treated with caution. It is not clear if the density of burial encountered in the three evaluation trenches is representative of the site as a whole. For the purpose of estimating minimum numbers, grave cuts identified but not excavated have been assumed to contain a single burial, this may not be the case in reality.



Illus 5

SK 2007, Thomas Buckley breast plate



Illus 6

SK 3010, Plastic buttons

The number of burials disturbed by any future development will of course be determined in part by the depth of excavation. The estimated number of burials within the development area does not necessarily equate to the number disturbed by future development.

5 CONCLUSION

All the burials from the three evaluation trenches at St Mary's Church dated to the 19th – early 20th centuries based on the evidence of coffin furniture and evidence for funeral attire (Hancox 2006). The overall minimum number of individuals was 37, of which only 15 were articulated. The quantity of disarticulated material cannot be explained by the truncation of articulated burials, consisting of only four of fifteen individuals, and is therefore likely to relate to the disturbance of earlier burials by subsequent interments within the area, creating 'cemetery soils' (Brickley and McKinley 2004).

All individuals were buried in coffins which exhibited a variety of decorative elements. The coffin furniture was poorly preserved, due to corrosion, with only one incomplete inscription surviving on the depositum plates present.

It is estimated that 848 articulated burials are present within the proposed development area and the skeletal assessment of the articulated burials from the trial trenches indicates that the majority of skeletal material in the churchyard may be very well preserved. The assessment also highlighted potential research aims if further work is to be undertaken, and particularly interesting is the high degree of trauma present in the skeletons from just a small portion of the graveyard excavated.

No archaeological deposits pre-dating the use of the site as a burial ground were revealed during the course of the evaluation.

6 ARCHIVE

The archive will be offered to Devizes museum within one year of the completion of fieldwork.

7 REFERENCES

- Abrahams, P.H., Marks Jr, S.C. and Hutchings, R.T. 2003. *McMinn's Color Atlas of Human Anatomy*. Elsevier Science Limited. China.
- Ancestry, 2011, *Devizes census returns, 1861*, [online], [http://search.ancestry.co.uk/Browse/print_u.aspx?dbid=8767&id=WILR_1291_1293-08928.pid=17496567], accessed December 2011.
- Barnes, E. 1994. *Developmental Defects of the Axial Skeleton in Palaeopathology*. University Press of Colorado. Niwot, Colorado, United States.
- Brickley, M. and Ives, R. forthcoming. *The human bone from Zion Chapel burial ground*.
- Brickley, M and McKinley, J.I. 2004. 'Guidelines to the Standard for Recording Human Remains' *BABAO and IFA paper No. 7*.
- Brickley, M., Berry, H. and Western, G. 2006. 'The people: physical anthropology' in M. Brickley, S. Buteux, J. Adams and R. Cherrington (eds) '*St. Martin's Uncovered: Investigations in the churchyard of St.Martin's-in-the-Bull Ring, Birmingham, 2001*'. Oxbow Books, Oxford, pp 90-151.
- Brickley, M. and Miles, A. 1999. *The Cross Bones burial ground, Redcross Way Southwark London*. Archaeological excavations (1991-1998) for the London Underground Limited Jubilee Line Extension Project. MoLAS Monograph 3.
- Brothwell, D. R. 1981. *Digging up Bones*. Cornell University Press, New York.
- Capassp, L. Kennedy, A.R. and Wilczak, C.A. 1999. 'Atlas of Occupational Markers on Human Remains'. *Journal of Paleontology – Monographic Publication 3*. Edigrafital S.P.A Teramo – Italy.
- Cockburn, A., Duncan, H. And Riddle, J.M. 1979. 'Arthritis, ancient and modern: guidelines for field workers', *Henry Ford Medical Journal* 27 (1): 74-49
- Corbett, M. E. and Moore, W. J. 1976. 'Distribution of caries in ancient British populations IV: The 19th century' in *Caries Research* 10: 401-414
- Crittall, E. (editor), A. P. Baggs, D. A. Crowley, R.B. Pugh, J.H. Stevenson and M. Tomlinson. 1975. 'The borough of Devizes: Town, castle and estates', *A History of the County of Wiltshire: Volume 10* (1975), pp. 225-252. URL: <http://www.british-history.ac.uk/report.aspx?compid=102796>
- Daly, T. forthcoming. *Excavation at land adjacent to All Saints Way, West Bromwich, Sandwell, West*

- Midlands, Volume2: The Osteological Analysis.* Headland Archaeology Ltd.
- English Heritage. 2004. *Human Bones from Archaeological Sites: Guidelines for producing assessment documents and analytical reports.* English Heritage (in association with The Biological Association of Biological Anthropology and Osteoarchaeology, BABAO).
- English Heritage and Church of England, 2005. *Guidance for best practice for treatment of human remains excavated from Christian burial grounds in England.* English Heritage (compiled by S. Mays).
- Fazekas, I. Gy. and Kosa, F. 1978. *Forensic Foetal Osteology.* Akademiai Kiado, Budapest.
- Maresh, M. M. 1970. Measurements from roentgenograms. In R. W. McCammon (ed) *Human Growth and Development.* Springfield, Illinois, pp157-200.
- Hancox, E. 2006 'The Impedimenta of Death: Specialist Reports' in M. Brickley, S. Buteux, J. Adams and R. Cherrington (eds) *'St. Martin's Uncovered: Investigations in the churchyard of St.Martin's-in-the-Bull Ring, Birmingham, 2001'*, (Oxford): 152-160.
- Hawkey, D.E. and Merbs, C.F. 1995. 'Activity-induced musculoskeletal stress markers (MSM) and subsistence strategy changes among ancient Hudson Bay Eskimos.' *International Journal of Osteoarchaeology* 5: 324-338.
- Jurmain, R. 1999. *Stories from the Skeleton: Behavioural Reconstruction in Human Osteology.* Taylor and Francis, London and New York.
- Kennedy, K. (1989). 'Skeletal Markers of Occupational Stress' in *Reconstruction of Life From the Skeleton.* İşcan, M., Kennedy, K. (Eds.) New York, Wiley-Liss: 129-160.
- Lewis, M. E. 2007. *The Bioarchaeology of Children: perspectives from biological and forensic anthropology.* Cambridge University Press, Cambridge.
- Litten, J. 1991. *The English way of Life: The common funeral since 1450.* London, Robert Hale.
- Lovejoy, C. O., Meindl, R. S., Pryzbeck, T. R. and Mensforth, R. P. 1985. 'Chronological metamorphosis of the auricular surface of the ilium: a new method for the determination of adult skeletal age at death' *American Journal of Physical Anthropology* 68:15-28.
- Mata S., Fortin P.R., Fitzcharles M.A., Starr M.R., Joseph L., Watts C.S., Gore B., Rosenberg E., Chem R.K., Esdaile J.M. 1997. 'A controlled study of diffuse idiopathic skeletal hyperostosis. Clinical features and functional status.' *Medicine (Baltimore)* 76: 104-117.
- Mays, S. and Cox, M. 2000. *Human Osteology in Archaeology and Forensic Science.* Cambridge University Press. New York.
- Mays, S., Brickley, M. and Ives, R. 2009. 'Growth and Vitamin D Deficiency in a Population from 19th century Birmingham, England' in *International Journal of Osteoarchaeology* 19: 406-415
- McKinley J.I. and Roberts C. 1993, 'Excavation and post-excavation treatment of cremated and inhumed human remains' *IfA Technical paper No. 13*
- McKinley, J.I. 2004. 'Compiling a skeletal inventory: disarticulated and co-mingled remains' in 'Guidelines to the Standard for Recording Human Remains' *BABAO and IFA paper No. 7.*
- Miles A, Powers N, Wroe-Brown R with Walker D. 2008. *St Marylebone Church and Burial Ground: Excavations at St Marylebone Church of England School, 2005.* MOLAS monographs.
- MOLAS, 2011, *Centre for Human Bioarchaeology*, [online], [<http://www.museumoflondon.org.uk/Collections-Research/LAARC/Centre-for-Human-Bioarchaeology/Database/Post-medieval+cemeteries/>] accessed December 2011.
- Ortner, D. J. 2003. *Identification of Pathological Conditions in Human Skeletal Remains.* Elsevier, Amsterdam.
- Resnick, D. and Niwayama, G. 1995. 'Soft Tissues' in D Resnick (ed.) *Diagnosis of bone and joint disorders.* 3rd edition, Saunders, Philadelphia, pp. 4333-4352.
- Roberts, J. 2000. 'The palaeopathology of joint disease' in Cox, M. And Mays, S. *Human Osteology in Archaeology and Forensic Science'.* Cambridge University Press, New York. pp163-182.

- Roberts, C. and Cox, M. 2003. *Health and Disease in Britain: from prehistory to the present day*. Sutton Publishing Limited, Stroud.
- Roberts, C. and Manchester, K. 1995. *The Archaeology of Disease*. Sutton Publishing Limited, Stroud.
- Roberts, C.R., Lucy, D. and Manchester, K. 1994. 'Inflammatory lesions of the ribs: An analysis of the Terry Collection' in *American Journal of Physical Anthropology* 95: 2 : 169-182
- Scheuer, L. and Black, S. 2004. *The Juvenile Skeleton*. Elsevier, Great Britain.
- Schaefer, M., Black, S. and Scheuer, L. 2009. *Juvenile Osteology: a laboratory and field manual*. Elsevier, USA.
- Steckel, R.H. 1995. 'Stature and the Standard of Living' in *Journal of Economic Literature* 33: 1903-40
- Stuart-Macadam, P. 1992. 'Anemia in past populations' in P. Stuart Macadam and S. Kent (eds) *Diet, demography and Disease: changing perspectives on anaemia*. New York, pp 151-170.
- Suchey, J. M. and Brooks, S.T. 1990. 'Skeletal age distribution based on the Os pubis: a comparison of the Acsadi-Nemeskeri and Suchey-Brooks Methods. *Human Evolution* 5: 227-238.
- Swinson, D., Snaith, J., Buckberry, J. and Brickley, M. 2010. 'High Performance Liquid Chromatography (HPLC) in the investigations of gout in palaeopathology' in *International Journal of Osteoarchaeology* 20: 135-143.
- Ubelaker, D. H. 1989. *Human Skeletal Remains: Excavation, Analysis, Interpretation*. Washington DC.
- Waldron, T. 2009. *Palaeopathology*. Cambridge University Press. United States.
- Waldron, T. and Rogers, J. 2001. 'DISH and the monastic way of life' in *International Journal of Osteoarchaeology* 11: 5: 357-365.
- Walker, P. L., Bathurst, P.R., Richman, R., Gjerdum, T. And Andrushko, V. A. 2009. 'The causes of porotic hyperostosis and cribra orbitalia: a reappraisal of the iron-deficiency-anemia hypothesis' *American Journal of Physical Anthropology* 139:109-125.
- Whittaker 1993. *The Spitalfields Project. Vol 2. The Anthropology: The Middling Sort*, CBA Research Report 86 (York).
- Wiltshire County Council, 2004. *The Archaeology of Wiltshire's Towns. An extensive urban Survey: Devizes*. Wiltshire Council.

8 APPENDICES

8.1 Appendix 1 – Osteological assessment

Three trial trenches were excavated in the northwest part of St Mary's Churchyard, Devizes. A total of 15 articulated skeletons, dated to the 19th to early 20th century, were assessed.

Methodology

Of the 15 skeletons, four were assessed *in situ* with the remaining eleven being assessed and lifted by the osteologist. The removal of the latter individuals allowed the joint surfaces and elements of the posterior skeleton, for example the spinal facets, to be observed. The skeletons were cleaned quickly with a toothbrush and the use of a dental tool to try to examine as much of the surface of the bones and teeth as possible. Due to the unwashed state of the bone the prevalence of pathology reported should be taken as a minimum of the amount of pathology and trauma that may have affected the individuals during life.

Osteological recording was in accordance with the standards recommended by the British Association for Biological Anthropology and Osteoarchaeology (BABAO) in conjunction with the Institute of Field Archaeologists (Brickley and McKinley, 2004) as well as English Heritage (2004).

Aims and objectives

The aim of the skeletal assessment was to determine the age, sex and stature of the skeletons, and also to record and diagnose any pathology present. The minimum number of individuals within the area of the three trial trenches is to be estimated.

Table 2 lists the comparative sites referred to in the subsequent text. It includes mainly large assemblages from major industrial cities or areas of the period, with the exception of the Zion chapel skeletons, which were included as Hereford and Devizes in the 19th century lacked the scale of industry seen in places like Birmingham and London.

Site	Date	Type	No. of skeletons	Reference
St Martin's Church, Birmingham	19 th century	Urban Industrial – Working & middle class	839	Brickley <i>et al.</i> 2006
St Marylebone, London	18 th -19 th centuries	Urban Industrial – Wealthy population	301	Miles <i>et al.</i> 2008
St Brides Lower, London	Late 18 th -19 th centuries	Urban industrial – Low status	544	MOLAS centre for Human Bioarchaeology
Cross Bones, Redcross Way, London	19 th century	Urban industrial – Paupers' cemetery	147	Brickley and Miles 1999
Christchurch, Spitalfields Crypt, London	18 th -19 th centuries	Urban industrial – Wealthy population	968	Molleson and Cox 1993
Zion Chapel, Hereford	19 th century	Urban – Baptist	27	Brickley and Ives, forthcoming
All Saints, West Bromwich	18 th -19 th centuries	Urban industrial – working & middle class	40	Daly, forthcoming

Table 2
Comparative sites

Preservation

Surface preservation was recorded using the grading system of McKinley (2004) where 0 indicates no modification to bone and 5+ exhibits extensive penetrating erosion resulting in modification of the bone profile. The degree of fragmentation was recorded using the categories ‘low’, ‘moderate’ or ‘high’ and completeness was expressed as a percentage.

Five burials were 60% complete or less; of these, four had been truncated by further episodes of burial and one was only 40% excavated as it was found to cut into natural green sand. The rest of the burials, constituting two-thirds of the skeletal assemblage, were undisturbed and over 75% complete. The low percentage (27%) of skeletons that were truncated within the three trenches indicates that a substantial amount of complete articulated burials are present within the study area.

Completeness	30%	40%	60%	75%	85%	90%	95%
Number	1	2	2	1	2	2	5
%	6.7%	13.4%	13.4%	6.7%	13.4%	13.4%	33.3%

Table 3
Completeness of skeletons

Surface preservation was generally extremely good with skeletons observed at only grade 1 or 2; the former was exhibited by 53% of skeletons and the latter by 47%. The majority of skeletons had very low fragmentation (73%) and the rest were moderately fragmented (27%). The surrounding sandy soils seem to have preserved the skeletons extremely well; the presence of root action, especially in trench three, caused drying out of the soils possibly assisting such high levels of skeletal preservation. The corroded metal coffin lid plates, however, did cause some softening and disintegration of the bones of the spine and ribs in some individuals.

Minimum Number of Individuals

In order to establish how many individuals are represented on site, a count of the ‘minimum number of individuals’ (MNI) is undertaken. The MNI is calculated by counting and siding all the articulated and disarticulated bone elements (without taking archaeologically defined graves into account) and the most common element represents the MNI. The MNI is a minimum number and in reality will be lower than the actual number of skeletons present.

The most common bone part in the adult population was the left distal femoral epiphysis (joint surface) and for non-adults was the right distal femoral metaphysis (shaft adjacent to the epiphyseal plate). The MNI for adults is 20 individuals and for non-adults is 17. This gives a total minimum number of individuals buried within the area of the three trial trenches to be 37.

On site the number of articulated burials was 15 and a further 20 grave cuts and 2 brick-lined graves were unexcavated but presumably contained articulated burials.

	Disarticulated	Articulated	Total
Adult	14	6	20
Non-adults	12	5	17

Table 4
MNI by most common bone element

Demography

The presence and preservation of the pelvis is vital for the estimation of adult age allowing different stages of bone morphology and degeneration to be identified at the pubic symphysis (Suchey-Brooks 1990) and/or the

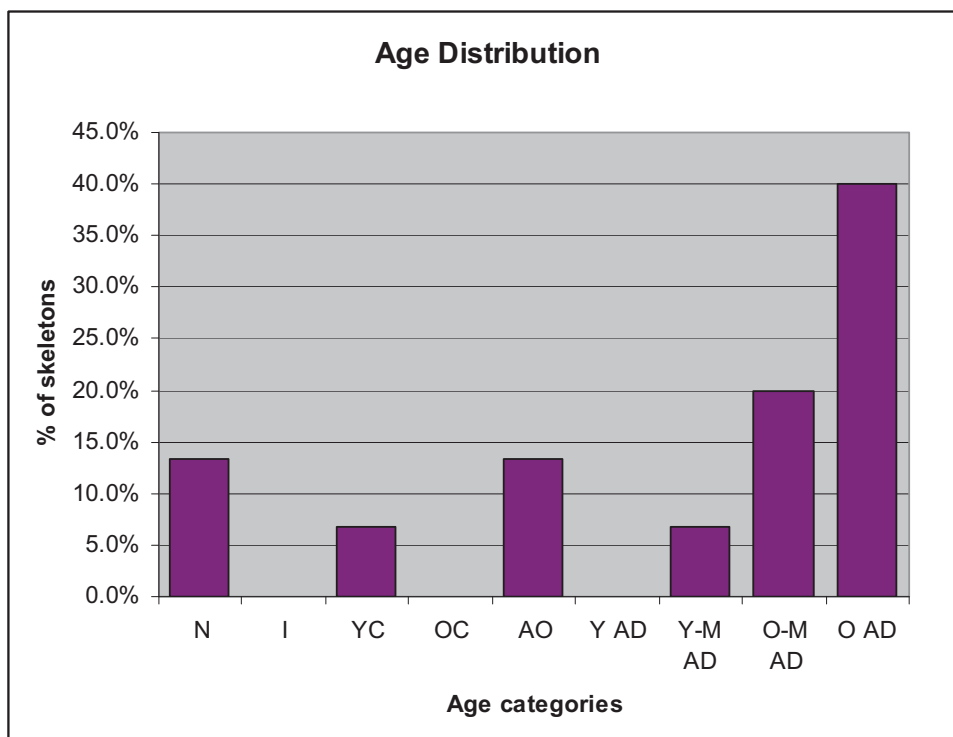
auricular surface (Lovejoy *et al* 1985). Estimation of age is based on as many criteria as possible; sternal rib morphology (Iscan, 1984/5) and dental attrition were also considered (Brothwell, 1981). The latter technique was not used as a sole criterion for estimating the age of an individual due to the unreliability of the technique, especially in post-medieval assemblages probably as a result of changes in the diet compared to earlier periods (Walker *et al* 1991, Brickley *et al* 2006), and it exhibited a tendency to underage within this assemblage. In non-adults consideration of primary and secondary ossification centers (Scheuer and Black, 2000a, 2000b), dental formation and eruption timings (Ubelaker, 1989) as well as long bone length (Fazekas and Kosa 1987, Maresh 1970) are used to calculate age.

Age at death is divided into a number of categories with non-adult categories including foetus (up to 40 weeks *in utero*), Neonate (around the time of birth), Infant (birth-1 year), Younger child (1-6 years), Older child (7-12 years) and Adolescent (13-17 years). Adult categories are split into Younger adults (18-25 years), Younger-middle adults (25-35 years), Older-middle adults (35-45 years), Older adults (45+ years) and Adult (whose age could not be accurately determined but is over seventeen years).

The skeletons assessed consisted of 5 non-adult and 10 adult individuals. With a sample size as small as 15 statistical comparison is dubious, it is interesting to note however, that whilst the proportion of non-adults (33%) is below that which might be expected from documentary evidence (the London Bills of Mortality suggest around 50% of the population died before the age of 20 years between the early eighteen and mid nineteenth centuries, Roberts and Cox, 2003, 304), the percentage at St Mary’s is comparable to the majority of other contemporaneous sites, such as at St Martin’s Church, Birmingham where non-adults consisted of 30% of those excavated.

Of the 5 non-adult individuals, 2 were neonates, 1 a younger child and 2 were adolescents. In the adult population a relatively modern cemetery population pattern arises; increasing number of individuals with increased age and a large amount of older adult individuals. Older adults represent 6 out of the adult population of 10.

Due to the small number of individuals assessed and the small extent of the burial ground excavated it is likely that this sample is not going to be an accurate representation of the buried population.



Graph 1
Age distribution

Sex was determined using standard osteological techniques; morphological differences in the skull and pelvis (Mays and Cox 2000). Sex was not determined for non-adults as it can only be ascertained once secondary sexual characteristics have developed during late puberty and early adulthood.

All adults could be sexed and four females and six males were present, which is in line with other sites of this period. Only one younger-middle adult was present and this individual was female.

Age category*	M – %	F – %
Y AD	0	0
Y-M AD	0	1 – 25%
O-M AD	2 – 33.3%	1 – 25%
O AD	4 – 66.7%	2 – 50%
Total	6	4

* Y AD =Younger adult; Y-M AD =Younger-middle adult; O-M AD =Older-middle adult; O AD =Older adult

Table 5
Adult Age and Sex Distribution

Stature

Stature could be estimated for nine of the ten adults; the majority of individuals had both a complete femur and tibia to measure and Trotter’s regression formulae (1970) was used.

Sex	Number		Mean	Range	
	(n)	(%)		Min	Max
Male	6	100%	168.56	161.31	181.0
Female	3	75%	150.25	147.13	156.5

Table 6
Adult statures (cm)

The mean male stature at St Mary’s of 168.56 cm falls within, albeit at the lower extent, of the range of means given for post-medieval sites (168–174cm) by Roberts and Cox (2003, 308). The female mean stature of 150.25 cm however is not within the range of means for females which is 156–164 cm (*ibid*). This short stature may be a reflection of nutritional factors as well as genetics and other secular trends (Roberts and Cox 2003, Steckel 1995). The females from St Mary’s Church were closest in height to, but still shorter than, females buried at Spitalfields crypt.

Paleopathology

The skeleton can be affected by a variety of pathological conditions which can be identified by characteristic lesions and the distribution of these lesions across the skeleton. Understanding the expression of such changes and the clinical impact that they had on the individual is of vital importance in understanding morbidity and life histories in past societies. It must be remembered that this is a small sample size, excavated from evaluation trenches only, however some prevalences are given to indicate possible patterns of disease and trauma within the population buried at St Mary’s Church. All pathological manifestations were described in detail (Ortner, 2003) and where possible a differential diagnosis was stated.

Trauma

Nine of fifteen individuals assessed from St Mary's Church were affected by some form of trauma. Both fractures and muscle trauma were observed on the skeletons; the latter can be seen in the form of traumatic myostitis ossificans, an exuberant ossification in muscle tissue at the site of attachment, which is more likely to occur in response to trauma in younger individuals (Resnick and Niwayama 1995).

Seven individuals suffered from a fracture in one or more of their bones during life and in all cases were well healed by the time of death. The total crude prevalence rate for fractures is 47% and males were affected to a greater extent; five males, one female and one adolescent exhibited fractures. All of the comparative sites have a lower fracture prevalence rate; the highest prevalence is present in individuals from West Bromwich (22%, 9/41) and St Martin's (21.39%, 108/505). The numbers at St Mary's however may be inflated due to the small sample size present and limited area of the churchyard excavated.

One individual exhibited a possible nasal fracture which was well-healed and only identifiable from the irregular shape of the nasal bones. SK 3010, an older-middle adult male, exhibited an irregular flattening of the inferior central area of the right and left nasal bones (plate 1), with attached nasal cartilage which has ossified (turned to bone). Such fractures are often the result of interpersonal violence or, for example, sporting accidents (Ortner 2003).

SK 3002 was the only non-adult with trauma, in the form of a depression in the right frontal bone just above the lateral margin of the orbit. A defined oval indentation (7.78 x 10.95 mm) with smooth margins and base, approximately 3.5 mm deep, indicates possibly healed blunt trauma.

Vertebral and rib fractures are also present but the poorer preservation of some skeletons in the torso regions, due to the degrading coffin plates, prevented the potential observation of this pathology; thirteen individuals had vertebrae and ribs present to observe. Three individuals suffered from vertebral compression fractures. All fractures were mild in form, with approximately 25% of vertebral body height lost, and wedged on the left side of the vertebrae. One female (O-M AD) was affected at the T12 position (1/78 thoracic bodies) and two males, both older adults, were affected in the lumbar region of the spine, at L2 and L5 (2/35 lumbar bodies).

Two male individuals exhibited single rib fractures both at the left 8th rib position (0.8% of ribs). One of these individuals had associated muscle trauma to the intercostal muscle attachment at the site of the fracture, projecting inferio-laterally. The same individual exhibited further intercostal muscle trauma at the sternal end of his 10th rib.

One individual had a well-healed fracture to his left clavicle which can be seen as a sharp angulation in the mid-shaft area of the bone (plate 9) which was pronounced in comparison to his right clavicle. Muscle trauma, which is possibly associated with this fracture, was present at the medial end of the clavicle around the trapezius attachment, projecting medially around the joint surface (plate 9).

Apart from the two individuals described above, another two individuals suffered from severe muscle trauma. The latter two exhibited such trauma to their legs; one had a large bony projection on the left distal femur at the fibular collateral ligament attachment and the other on the left distal fibula at the anterior talofibular ligament insertion.

Overall, the individuals assessed from St Mary's had a high prevalence of bone fractures, all located in the upper body. Severe muscle trauma was located on both the upper body (likely associated with adjacent fractures) and on the lower limbs around the knee and ankle areas.

Activity related change

Soft tissue trauma can also be seen in the skeleton as bony formation (enthesophytes) and bone excavations (destruction) at the site of muscle or ligament attachments. These can be produced as a result of repetitive activity or strain and bioarchaeologists have used such markers to infer activities associated with occupations in living and prehistoric populations (Kennedy 1989, Hawkey and Merbs 1995). Interpretation however must be viewed with speculatively given their multifactorial aetiology (Jurmain 1999), for example, enthesophytes may accompany some diseases such as Diffuse Idiopathic Skeletal Hyperostosis (DISH). In this assemblage, one



Illus 7

SK 3010, possible healed nasal fracture



Illus 8

SK3002, healed trauma to the frontal bone



Illus 9

SK1010, healed fracture and muscle trauma to left clavicle

individual SK 3014 had profuse enthesophytes across his skeleton which are likely associated with an early stage of DISH (see below).

The majority of consistent micro-trauma was observed on the arms, particularly the humeri. Four individuals, three males and one female, exhibited enthesophytes or bone destruction at the insertion of the pectoralis major, which is involved in the movement of the upper arm. One female individual had enthesophytes present at the brachialis insertion on the ulna, which flexes the elbow joint (Abrahams et al. 2003). A further female exhibited cortical bone defects on her clavicles at the costoclavicular ligament insertion, which limits excessive movement of the medial end of the clavicle (*ibid*).

Evidence of strain to the legs was limited to two male individuals. One had enthesophytes present at the patellar ligament attachment of the tibia, which is involved with extension of the knee (*ibid*). The second individual exhibited enthesophytes at his ischial tuberosities where the insertion for the adductor magnus muscle, a powerful adductor of the thigh, is located (*ibid*).

Infectious Disease

Two individuals showed signs of infection; SK 1006 and SK 3006, both older adults. SK 3006 was a female individual exhibiting healed periostitis on both the medial surfaces of the distal tibial shafts. The tibia is a common area affected by such infection as it lies close to the skin and so can be subject to minor injury more frequently (Roberts and Manchester 1993). SK 1006 was male and exhibited active woven bone formation at the sternal ends of the visceral (inner) surfaces of his left ribs 8 through to 11. These rib lesions are linked to infection of the pleural lining and may be related to poor air quality and conditions such as tuberculosis (Roberts *et al* 1994).

Overall prevalence rates for infectious conditions are lower in comparison to contemporary urban sites e.g. 23% at St Martin's, Birmingham. Devizes was smaller in size and industry and therefore had less crowding and polluted conditions. The level of prevalence at St Mary's is most comparable to monastic sites of this period, including the post-medieval assemblages from Ennis Friary, Co. Clare, Ireland (14%, Roberts and Cox 2003) and St George's Church, Canterbury (12%, *ibid*).

Metabolic Disease

SK 3014, an older-middle adult male had large osteophytes (bony formation) down the right side of his spine from vertebrae T7 to T12. They had a 'candle-wax' appearance but had not yet fused together (Ortner 2003). The presence of such osteophytes, along with the pronounced enthesophytes present across this individuals' skeleton may indicate an early stage in the development of Diffuse Idiopathic Skeletal Hyperostosis (DISH). DISH has been associated with a number of metabolic anomalies and is therefore considered a 'multisystem hormonal disorder' (Waldron and Roberts 2001, 360). It has a greater prevalence in skeletons from monastic sites and this has been interpreted as a result of a diet rich in protein and fat and adult onset diabetes (Waldron and Roberts 2001). DISH was observed in all the comparative assemblages with the exception of Cross Bones burial ground (London). Individuals suffering from DISH often have no symptoms apart from possible stiffness and reduced movement in the neck and trunk (Mata *et al.*, 1997) however serious symptoms can occur, usually as the result of compression of the spinal cord or other structures (Waldron and Roberts 2001).

This individual also exhibited a circular lytic lesion (4.73 mm diameter) on the medial para-articular area of the distal end of his left first metatarsal (big toe). Characteristic over-hanging edges indicate that this individual suffered from gout. This is a chronic inflammation due to a build up of urate crystals within various body tissues, and dietary causes include a strong association with the consumption of alcohol and obesity, although genetic factors and kidney disease may also be causative factors (Swinson *et al.* 2010). The swelling at the joint can cause acute pain and severe tenderness. Two individuals at St Marylebone, London and six at St Brides, London suffered from gout, and a 'gout boot' was present on an individual from Christchurch Spitalfields (Molleson and Cox 1993).

The same individual had lateral bowing of his proximal tibial shafts and this may represent residual bending deformities associated with childhood rickets (Mays *et al.* 2009).



Illus 10

SK1006, healed fracture and infection to ribs



Illus 11

SK 3014, gout

Two female individuals of 11 with orbit/s had pitting on their orbital roofs consistent with cribra orbitalia. This is an indicator of general stress in childhood and has been linked to iron deficiency anemia (Stuart-Macadam, 1992), a diet deficient in vitamin B₁₂ (found in animal products) and/or folic acid but it may also be caused by chronic infection and scurvy (Walker et al. 2009).

Joint Disease

Degenerative disc disease of the vertebral bodies is characterised by osteophyte development around the margins of, or on, the body surfaces, as well as porosity of the body surfaces (Rogers 2000).

In the adult skeletons from St Mary's Church three individuals of those with one or more vertebrae preserved were affected by degenerative disc disease. This included one older male (SK 1006) with his lumbar and thoracic spine affected, another male of older-middle adult age with only the thoracic region affected, and one older female with cervical degenerative disc disease. In total 6.5% (10/155) of vertebrae were affected; 4.8% (2/42) of cervical vertebrae, 6.4% (5/78) of thoracic and 8.6% (3/35) of lumbar.

Schmorl's nodes are associated with degeneration of the intervertebral discs as discs may rupture due to trauma, such as frequent lifting or carrying heavy loads, or other pathological processes may weaken them. The subsequent pressure of the herniated vertebral discs manifest as indentations in the vertebral body surfaces termed Schmorl's nodes (Aufderheide and Rodrigues-Martin 1998). Four individuals, 2 males and 2 females, had Schmorl's nodes present; the six vertebrae affected were all mild in form, consisting of small shallow depressions, and only one individual had more than one vertebra affected (SK 1006). The majority were located in the thoracic vertebrae, with the exception of one individual with their L4 affected.

Osteoarthritis (OA) was present in the spine and extra-spinal joints of some individuals. The clearest diagnostic feature of OA is eburnation; when a polished surface is created from bone-to-bone contact once deterioration of the joint cartilage has taken place. Further features of OA include osteophytes on or around the joint margin, porosity on the surfaces, and subchondral cysts. OA is characterised by the presence of at least two of these latter features, or eburnation even if it occurs alone (Rogers 2000). Studies have shown no correlation between severity of pain experience by the individual and the expression of OA (Cockburn *et al.* 1979).

Two adults out of the seven with one or more vertebral facets observable, were affected by OA; these individuals also had degenerative disc disease (see above). SK 3006 had L4-5 facets affected and SK 3014 had T4-6 facets involved.

One individual, SK 3014, had extra-spinal OA. This involved both sternoclavicular joints (2/15), both acromioclavicular joints (2/15) and both hip joints (2/18).

The size of the assemblage is too small to attempt to discern any pattern of OA in differing areas of the spine or rest of the body, by age or sex. Overall, 30% (3/10) of adults suffered from OA at St Mary's which is lower than the majority of skeletal assemblages of comparable date with the exception of the wealthy individuals at St Marylebone burial ground with a 24.6% prevalence (49/199).

Three individuals suffered from hallux valgus, the common term being a bunion, located at the first metatarsal-phalangeal joint (big toe); this can be due to ill-fitting footwear (Waldron 2009).

Congenital abnormalities

Two individuals had transitional vertebrae in which the T12 vertebrae had a fully characteristic lumbar form. One individual had spina bifida occulta with the posterior arches of the sacral segments 3 to 5 remaining unfused. These are developmental anomalies (Barnes 1994), but the individual would have suffered no adverse effects (Ortner 2003).

Dental Pathology

The general poor state of dental health from this time period is widely known (e.g. see Whittaker 1993). The number of individuals present was too small to investigate the effects of age and sex on prevalence. The FDI (Fédération Dentaire Internationale) system was used to record teeth on-site and the severity of calculus and periodontal disease were recorded following Brothwell (1981).

Table 7 below shows the prevalence of dental disease in the skeletons from St Mary's Church.

	N of teeth affected	% of total Teeth*	N individuals affected	% of total Individuals*
Calculus	48	0.6	5	50
Caries	4	2.2	4	40
Abscess	1	0.4	1	10
Periodontitis	21	11.8	5	50
AMTL	76	27.9	7	70
Congenital absence	2	1.1	1	10
DEH	34	19.0	5	50

*Abscess and AMTL prevalence calculated by % of total tooth positions present, Periodontitis by % of teeth present and in occlusion. Total individuals = with dentition.

Table 7
Incidence of dental pathology

Calculus is a build up of mineralised plaque and is associated with carbohydrate consumption and a lack of oral hygiene (Roberts and Manchester 1995). All deposits consisted of slight patches on the enamel surfaces of the teeth, even in older adults, and affected 60% (6/10) of those individuals with teeth; only adults were affected. This is within the range for post-medieval sites of 5.23% to 69.97% (Roberts and Cox, 2003), and similar to that at St Martin's Church (63%, 3684/5893).

Only one male individual suffered an abscess at the root of the right maxillary first incisor, likely due to a carious lesion allowing bacteria to infect the pulp cavity. Abscesses are extremely painful and sometimes debilitating.

A low caries (tooth decay) prevalence was also present with just 2.1% (4/192) of teeth affected compared to a 7.5% at West Bromwich; this is less than the mean percentage of a range of post-medieval sites at 11.22% (Roberts and Cox 2003). Three adult males and one female exhibited a carious lesion on only a single tooth; the majority of lesions were on the posterior teeth, likely to be due to the fact that they are the hardest teeth to clean. Caries are multi-factorial in origin; however the main cause is the presence of sucrose and fermented carbohydrates in the diet. Sugar was widely available during this period and the drop in price just before 1850 led to a massive increase in the prevalence of dental caries in British populations (Corbett and Moore 1976).

The severity of periodontal disease (occurring when inflammation of the gums, gingivitis, leads to loss of bone in the jaws), increased with age, as expected, and 50% of individuals with at least one tooth present within a socket were affected. Of the total teeth present (in sockets) 12% (21/178) exhibited periodontal disease which is greatly below that of the lowest comparative prevalence of 42% at Zion Chapel, Hereford. This is likely due to the lack of calculus accumulations in individuals from St Mary's which is a major predisposing factor in the development of periodontal disease (Hillson 1996).

Ante-mortem tooth loss (AMTL) increased with age and the St Mary's skeletons exhibited a comparable, but slightly greater, AMTL (28%) than other post-medieval sites (Roberts and Cox 2003), likely due to the high amount of older adults present. AMTL can be the result of a variety of factors including dental caries, abscess, heavy wear exposing the tooth pulp, periodontal disease and trauma (Hillson 1996).

Dental enamel hypoplasias (DEH) are important indicators of general health during childhood in a population as they represent a disruption in development of the enamel, resulting from stress such as malnutrition or disease (Hillson 1996). Fifty percent of the individuals were affected (5/10) and 18% (34/192) of total teeth; the

prevalence of teeth affected was low in comparison with other contemporary sites, with St Brides having the lowest prevalence with 29% of individuals affected (152/529).

SK 1010 was the only individual to have congenitally absent (or possibly impacted) teeth; this consisted of both his mandibular third molars, and only SK 3014 exhibited overcrowding in his anterior mandibular dentition.

Overall a low severity of calculus deposits, a low prevalence of abscesses, caries, periodontal disease and DEH was present. The high rate of AMTL could have contributed to this lower prevalence, but may also indicate that people in towns had a lower intake of refined sugars and carbohydrates and practiced better oral hygiene compared to city dwellers at this time. The slightly higher degree of AMTL is likely due to the high number of older adults at St Mary's.

Conclusion

Skeletal preservation was excellent, meaning that a range of pathological conditions could be observed, and the certainty with which age and sex could be determined was high. The assemblage of skeletons assessed from the evaluation trenches, although small, shows some interesting features; notably a relatively high degree of trauma and short female stature in comparison to other assemblages of this time period. The presence of gout and DISH indicates some people were eating to excess. Individuals in Devizes suffered low levels of childhood stress, infectious disease and rickets compared to skeletal assemblages of contemporary larger cities, perhaps reflecting lower levels of pollution and reasonable housing and living conditions. Limited evidence suggests individuals may have been involved in activities that utilized their arms predominantly. The low prevalence of Schmorl's nodes and joint disease is interesting given the older age of adults at St Mary's and may indicate a more sedentary lifestyle.

8.2 Appendix 2 – Skeleton summary

SK	%	SF	FRAG	AGE	STATURE	ARMS	COFFIN	SEX	SK PATHOLOGY	DENTAL PATHOLOGY
1002	60%,	G2	Mod	B-1.5mths	-	L Straight	2 nails		None	No dentition
1006	90%	G2	Low	45-49ys	170.41cm (R fem+tib)	R+L bent	10 nails	M	Well Healed fracture of anterior (14cm from sternal end) left 8th rib. Left 8-11th ribs active infection – thin woven bone plaque at sternal visceral area. L5 mild compression fracture with left wedge. SBO S3-5. DJD- mild ops + po T10-11, mild ops + mod po L3-5. Schmorl's nodes T10-12 inferior. Pronounced enthesophytes Pect. Major bilateral. Bifid Xiphoid.	11 teeth (all in sockets), 29 tooth positions, 9 AMTL, 9 Pm, tooth 11 1x large caries origins obscured. Single linear DEH 3 teeth - 44,34,33. SL Periodontal 46 + 47. SL calculus distal crown 18 + 37. Abscess tooth 11.
1010 (In situ)	95%	G1	Low	45-49ys	163.0 cm (R fem+tib)	R - bent L - straight	2 nails	M	Healed mid-shaft fracture to left clavicle and associated (?) muscle trauma to medial clavicle extending over JS.	25 teeth (all in sockets), 27 tooth positions, 2 CA – bilateral mandibular M3s, SL calculus (4 teeth) buccal surfaces of 11,21,42,32. Linear DEH (16 teeth) all incisors, canines and Pre-molars present.
2003	60%	G2	Mod	45-49ys	181.0 cm (L hum)	L - bent	None	M	L2 mild compression fracture left wedge. Enthesophytes –ischial tuberosities (weavers bottom), stress lesion L pect. Major.	No dentition
2007	95%	G2	Low	45-56ys	163.78 cm (L fem+Tib)	R - bent L - straight	Shield shaped breast plate 'Thomas Buckley Died 1866' further writing obscured by rust, head plate and shin plate, 6 coffin handles and decorated end plates	M	L distal lateral femur spur - muscle trauma (broken post-mortem- full extent ?). Coccyx sacralisation first segmnt only. Enthesophytes mod bilateral pect. Major.	1 tooth (in socket), 27 tooth positions, 26 AMTL, Severe periodontal + slight calculus at buccal surface the only tooth present - tooth 42.

SK	%	SF	FRAG	AGE	STATURE	ARMS	COFFIN	SEX	SK PATHOLOGY	DENTAL PATHOLOGY
2011	30%	G2	Mod	35-45ys	No complete long bones	L - straight	None	F	T12 mild compression fracture mild left wedge, Schmorl's node T4 inferior, Pronounced stress lesion bilateral costoclav att. Maxillary torus pronounced bilateral. Faint enthesophytes- L ulnar tuberosity.	24 teeth (all in sockets), 28 tooth positions, 2 AMTL, 2 Pm. Severe wear (stage 8) on all the anterior teeth sloping in an anterior direction.
2014 (In situ)	95%	G1	Low	12-15ys	-	R+L straight	4 x coffin handle plates	?	None	8 teeth (all in sockets), 8 tooth positions, single linear DEH (6 teeth) 41 + 31 to 35.
3002	85%	G2	Low	c. 15ys	-	R+L straight	Shield design breast plate, 8 handle plates with rusted design, 15 nails.	M?	Defined oval (7.78x10.95mm) lytic lesion on R frontal bone above lateral supraorbital margin – smooth margins and inner surface at a depth of c.3.5mm – healed trauma, blunt impact. T12 transitional vertebrae.	28 teeth (27 in sockets), 29 tooth positions, 1 Pm, Single linear DEH (4 teeth) bilateral upper and lower canines.
3006	85%	G1	Low	45-49ys	156.5 cm (L fem+tib)	R+L straight	Head, Breast and shin plates – shape of breast plate is oval with a florid tapered detail.	F	Healed infection (periostitis) bilateral medial tibiae distal shafts. Cribra orbitalia- bilateral moderate porosity. Hallux valgus R MT1. Schmorl's nodes T9 inferior. DJD- C6-7 mod po + mild ops. OA – EB on L4+5 L facets, 5x R rib heads (2-6)+ 4 x L ribs (1-4).	14 teeth (all in sockets), 32 tooth positions, 17 AMTL, 1 Pm. SL calculus (10 teeth) teeth 41 to 45 + 31 to 35. Periodontal moderate 3 teeth- 48,45,35. Incisors and canines present -severe wear (Grade 8) in comparison to other teeth + anterior sloping.
3010	75%	G1	Low	40-44ys	171.84 cm (L fem+tib)	R+L Straight	8 coffin handle plates, head, breast and shin plates- some writing on breast plate but illegible as corroded, Nails	M	Well-healed nasal fracture (?) – central-inferior R+L nasal bones flattened + nasal cartilage ossified. Muscle trauma to distal anterior fibula (spur extends 8.99mm). Bilateral Hallux valgus. Schmorl's nodes L4 inferior and superior. Tibial tuberosities pronounced enthesophytes.	10 teeth (all in sockets), 29 tooth positions, 17 AMTL (endentalous maxilla), 2 Pm. Small caries tooth 45 distal. Linear DEH (5 teeth) 43,44,45,34,35. Moderate periodontal 10 mandibular teeth.

SK	%	SF	FRAG	AGE	STATURE	ARMS	COFFIN	SEX	SK PATHOLOGY	DENTAL PATHOLOGY
3014	95%	G1	Low	35-44ys	161.31 cm (L fem+tib)	R+L Straight	6 coffin handle plates of a florid outline, head, breast and shin plates present – shin plate in a 'Fleur de Lys' design. Nails	M	'Early DISH' T7-12 + enthesophytes. Gout – L MT1 distal circular lytic lesion (4.73mm diameter) para-auricular with over-hanging edges. Bilateral Hallux valgus. T8 mild healed fracture. Muscle trauma spur inferior rib angle (22.72mm inferio-lat) + T10 sternal end inferior (11.72mm). Tibiae lateral bowing prox-mid shafts- rickets retention. T12 transitional vertebrae. DJD- T1-3 mod ops +severe po. OA- T4-6 facets mod ops+po, bilateral Clav-manub + R Clav-acrom severe po + mild ops, L Clav-acrom EB, bilateral acetab mild ops + po.	28 teeth (all in sockets), 31 tooth positions, 3 AMTL. Tooth 36 large caries origins obscured. Overcrowding of anterior mandibular teeth (42 pushed linguallly behind 41), SL calculus (28 teeth) buccal and lingual surfaces, SL periodontal 26 and moderate on 27,28,17,18.
3018	90%	G1	Low	Birth-2mths	-	R+L straight Legs flexed	Nails. 5 handles. Sides appear to be lined with a non-fe metal – tin?lead?- interior or exterior? As no wood remains. Reamins of the lid are of a mid-torso 'G' made of silver?	-	None	No dentition
3022	40%	G2	Low	2-3yrs	-	NP	12 Nails, 1 handle	-	None	No dentition
3028 (In situ)	40%	G1	Low	38-48yrs	147.13 cm (L fem+Tib)	R+L Straight	2 handle plates	F	None	No dentition observable

SK	%	SF	FRAG	AGE	STATURE	ARMS	COFFIN	SEX	SK PATHOLOGY	DENTAL PATHOLOGY
3032 (In situ)	95%	G1	Low	27-29yrs	147.13 cm (L fem+Tib)	R+L Straight	2 nails and 1 handle	F?	Ossified nasal cartilage with right deviation. Cribrra orbitalia – mild bilateral. Bilateral femoral plaque. Pronounced enthesopytes bilateral Pect. Major.	30 teeth (all in sockets), 32 tooth positions, 2 AMTL. Small caries tooth 26 mesial. slight calculus buccal surface all mandibular incisors (4 teeth).

8.3 Appendix 3 – Site registers

Trench register

Trench	Length (m)	Width (m)	Max. depth (m)	Level (top)
1	5	1.6	1.17	133.13 (mOD)
2	5	1.6	1.58	133.67 (mOD)
3	5	1.6	1.30	133.94 (mOD)

3.2 Context register

Trench	Context	Description
1	1000	Topsoil - dark brown / black sandy loam
1	1001	Subsoil – mixed mid-brown graveyard soil
1	1002	Neonate Skeleton
1	1003	Coffin for SK 1002
1	1004	Cut for SK 1002
1	1005	Fill of cut 1004
1	1006	Adult Skeleton
1	1007	Coffin for SK 1006
1	1008	Cut for SK 1006
1	1009	Fill of 1008
1	1010	Adult Skeleton
1	1011	Coffin for SK 1010
1	1012	Cut for SK 1010
1	1013	Fill of 1012
1	1014	Unexcavated grave cut
1	1015	Unexcavated grave cut
1	1016	Unexcavated grave cut
1	1017	Unexcavated grave cut
1	1018	Unexcavated grave cut
1	1019	Green sand - Natural
2	2000	Topsoil - black sandy loam
2	2001	Subsoil – dark green/brown subsoil
2	2002	Subsoil – light green/brown subsoil

Trench	Context	Description
2	2003	Adult Skeleton – truncated
2	2004	Cut for SK 2003
2	2005	Fill of 2004
2	2006	Brick lined grave
2	2007	Adult Skeleton – Thomas Buckley d.1866
2	2008	Coffin for SK 2007
2	2009	Cut for SK 2007
2	2010	Fill of 2009
2	2011	Adult Skeleton - truncated
2	2012	Cut for 2011
2	2013	Fill of 2012
2	2014	Juvenile Skeleton
2	2015	Coffin for SK 2014
2	2016	Cut for SK 2014
2	2017	Fill of 2016
2	2018	Unexcavated grave cut
2	2019	Unexcavated grave cut
2	2020	Unexcavated grave cut
2	2021	Unexcavated grave cut
2	2022	Unexcavated grave cut
2	2023	Unexcavated grave cut
2	2024	Unexcavated grave cut
2	2025	Unexcavated grave cut
2	2026	Yellow / brown sand – Natural
2	2027	Green sand - Natural
3	3000	Topsoil – dark brown / black sandy loam
3	3001	Subsoil – mid brown silty sand
3	3002	Adult Skeleton
3	3003	Coffin for SK 3002
3	3004	Cut for SK 3002
3	3005	Fill of 3004

Trench	Context	Description
3	3006	Adult Skeleton
3	3007	Coffin for SK 3006
3	3008	Cut for SK 3006
3	3009	Fill of 3008
3	3010	Adult Skeleton
3	3011	Coffin for SK 3010
3	3012	Cut for SK 3010
3	3013	Fill of 3012
3	3014	Adult Skeleton
3	3015	Coffin for SK 3014
3	3016	Cut for SK 3014
3	3017	Fill of 3016
3	3018	Neonate Skeleton
3	3019	Coffin for SK 3018
3	3020	Cut for SK 3018
3	3021	Fill of 3020
3	3022	Juvenile Skeleton
3	3023	Coffin for SK 3022
3	3024	Cut for SK 3022
3	3025	Fill of 3024
3	3026	Brick lined grave
3	3027	Brick lined grave
3	3028	Adult Skeleton – excavated but left in situ
3	3029	Coffin for SK 3028
3	3030	Cut for SK 3028
3	3031	Fill of 3030
3	3032	Adult Skeleton
3	3033	Coffin for SK 3032
3	3034	Cut for SK 3032
3	3035	Fill of 3034
3	3036	Unexcavated grave cut

Trench	Context	Description
3	3037	Unexcavated grave cut
3	3038	Unexcavated grave cut
3	3039	Unexcavated grave cut
3	3040	Unexcavated grave cut
3	3041	Unexcavated grave cut
3	3042	Unexcavated grave cut
3	3043	Brown sand - Natural
3	3044	Green sand - Natural