

Contrasting the use of space in post-Roman Exeter: geoarchaeology of dark earth and medieval deposits below Exeter Cathedral

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Received: 25 September 2021; Revised: 24 November 2021; Accepted 6 November 2021

European urban dark earth investigations have aided our understanding of Late Roman and early medieval populations and their activities. Deposits from two locations below Exeter Cathedral were compared in a geoarchaeological study and contrasting uses of space were identified. This supports the need for case-by-case investigations of urban deposits.

Keywords: Britain, Exeter Cathedral, Roman, medieval, dark earth, geochemistry, soil micromorphology

Introduction

The study of European urban deposits (Nicosia *et al.* 2017), including Late Roman to early medieval dark earth, commenced with *Rescue*, an early organisation carrying out mitigation archaeology, recognising that these apparently ‘unstratified’ deposits should not simply be machined-away, but could reveal several centuries of urban history (Biddle *et al.* 1973; Carver 1987). Post-Roman dark earth *sensu stricto* did not record the complete abandonment of urban areas across Europe in the fifth century AD, after the decline of the Western Roman Empire, but more often reflected a change in use of urban space according to local circumstances (Galinié 2000; Macphail *et al.* 2003).

In England, Late Roman urban occupation deposits have been investigated from Canterbury, Leicester, Pevensey (*Anderitum*), Winchester, Worcester and, especially, London. While dark earth from the medieval castle ditch at Exeter has previously been analysed (Macphail & Courty 1985; Macphail 2014), in general, the Roman city of Exeter has received limited geoarchaeological analyses of its urban deposits. Excavations ahead of changes to the East

Cloister Walk and Chapter House of Exeter Cathedral in 2020 provided new opportunities to investigate the post-Roman and medieval levels (Figures 1 & 2).

[FIGURE 1, 13.5cm colour]

[FIGURE 2, 13.5cm colour]

Materials and methods

The two 1.50m-deep Exeter Cathedral profiles are approximately 12m apart. They were studied using 12 thin sections (Figure 2) and 22 bulk environmental samples. The methods for thin sections involved soil micromorphology, including SEM/EDS (Energy Dispersive X-ray Spectrometry), whilst bulk samples were analysed using organic matter estimates (LOI), particle size, carbonate (CO₃), magnetic susceptibility (MS) and ICP-MS elemental analyses, including phosphorus (P). Standard methods were used, following Goldberg *et al.* (2022, Chapter 17).

Results and discussion

At both locations, the latest sampled Roman levels have similar characteristics, such as lime mortars tempered with basalt, and ground raising levels composed of red-coloured burnt earth-based building materials. The latter resulted in enhanced magnetic susceptibility and high CO₃ and calcium (Ca) values. The post-Roman dark earth in the cloister profile yielded food and possible latrine waste, and coprolites from probable dog scavenging. Small bone fragments also testify to the consumption of fish, reflecting the lifestyle of local populations and access to the River Exe and the sea; the Roman port of Topsham is located 7km downstream (Figures 1 and 3a–d). Clearly, the area was not abandoned. At the Chapter House, fish bone also occurs (Figure 3e), but greater inputs of artisan activity are recorded in the form of fine iron fragments and iron slag (Figure 4a). Non-ferrous metal working (Figures 4b–d) was also demonstrated by ICP-MS data (Figure 5).

[FIGURE 3, 13.5cm colour]

[FIGURE 4, 13.5cm colour]

[FIGURE 5, 13.5cm colour]

At the Cloister site, the medieval deposits presumed to be linked to the building of the Cathedral from ca. AD 1114 onwards, are dominated by stony constructional remains, with peaks in Ca (e.g. use of limestone) and lead (Pb) (lead windows and soldering?). Medieval soils at the Chapter House (AD 1227) differ greatly, being moderately homogeneous and much more humic and phosphate- (P) rich compared to the Cloisters location (Figure 6).

Although this is consistent with historical records of the use of the area as the bishop's garden prior to the building of the Chapter House, it does not fully explain the anomalous dark staining of the soil down to the underlying dark earth. It can be suggested from studies elsewhere that the ground was used for inhumations and that decomposition has led to a 'body stain' effect (Faul & Smith 1980; Usai *et al.* 2014). The test-pit profile itself was located very near a stone-lined grave, believed to be that of Serlo, the first Dean of Exeter, who died in AD 1231. Thus, as found at across Europe, urban deposits need to be analysed and interpreted on a case-by-case basis (Galinié 2000), even when profiles are only 12m apart.

[FIGURE 6, 13.5cm colour]

Conclusions

The soil micromorphology and geochemical analysis of urban deposits below Exeter Cathedral, from closely juxtaposed locations, has shown that urban deposits record active populations that post-date the Roman city and who focused on different activities. Medieval layers contrast even more clearly, further demonstrating the need for case-by-case urban soil studies.

Acknowledgements

The authors would like to thank the Cathedral Church of Saint Peter in Exeter for supporting this research. The help of Tom Gregory (UCL), Simon Hughes (AC Archaeology), Pete Lyons (Brighton University), Chris Sampson (Exeter Cathedral Estates) and Marc Steinmetzer (Oakford Archaeology) is gratefully acknowledged.

Funding statement

The Cathedral Church of Saint Peter in Exeter funded this research.

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Figure captions

Figure 1. Location map of East Cloister Walk and Chapter House, Exeter Cathedral. The Roman sea Port of Topsham is located 6km downstream. (Figure by J. Allan)

Figure 2. a) Sondage revealing a Roman mortar floor in the East Cloister Walk, Exeter Cathedral; sampling tins M1 (2029/2034), M2 (2033/2029), M3 (M3A, M3B and M3C; 2008) and M4 (2007/2008) are visible in the section; b) Chapter House profile: sampling through Roman, dark earth (thin sections M4A-B) and medieval (Med) levels. Sample M1 is in a possible grave cut (Gr?). (Figures by R. Macphail)

Figure 3. a) Cloisters profile: photomicrograph of M3C (dark earth 2008 lower); midden waste includes heated fish bone (FB) and amorphous coprolitic material (Cop); Plane polarised light (PPL), frame height is ~4.62mm; b) as 3a, under oblique incident light (OIL); note fish bone appears to be calcined; c) photomicrograph of M3A (dark earth 2008 upper);

weathered, probable coprolitic fish bone (bone is only weakly autofluorescent under blue light; EDS = 25.6–34.2% calcium, 11.9–15.3% phosphorus; n = 5.); PPL, frame width is ~4.62mm; d) as 3c, amorphous (phosphatic) coprolite (autofluorescent under blue light), with void pattern and colours suggesting that it is probably a dog coprolite (EDS = 8.29–32.8% calcium, 4.32–9.54% phosphorus); PPL, frame height is ~2.38mm; e) Chapter House profile; photomicrograph of ECCH-4B (dark earth); dark earth includes fish bone; PPL, frame width is ~2.38mm. (Figure by R. Macphail)

Figure 4. a) Chapter House profile: photomicrograph of ECCH-4B (dark earth); artisan working—‘rusty’ iron-working fragment (EDS = max ~95% iron oxide (FeO)); oblique incident light (OIL); frame width is ~4.62mm; b) non-ferrous metal alloy fragment; plane polarised light, frame width is ~2.38 mm; c) as 4b, under OIL; d) as 4b; X-ray backscatter image of copper-(tin)-lead alloy; EDS = 1.10–18.8% copper, 1.13–2.76% tin, 10.3–50.6% lead (n = 4 areas). (Figure by R. Macphail)

Figure 5. Chapter House profile. Industrial heavy metals and elements: nickel (Ni), copper (Cu), zinc (Zn), arsenic (As), tin (Sn) and lead (Pb) (mg/Kg). Concentrations of these heavy metals suggest artisan working (e.g. tin and lead) in the dark earth, while increased lead and zinc, especially, characterise the garden and suspected inhumations soils. (Figure by C. Carey and R. Macphail)

Figure 6. Comparison of Cloisters (CL) and Chapter House (CH) profiles—LOI (organic matter) and phosphorus. Chapter House medieval soils show a particularly high organic matter and phosphorus content compared to the Cloisters profile. (Figure by C. Carey and R. Macphail)

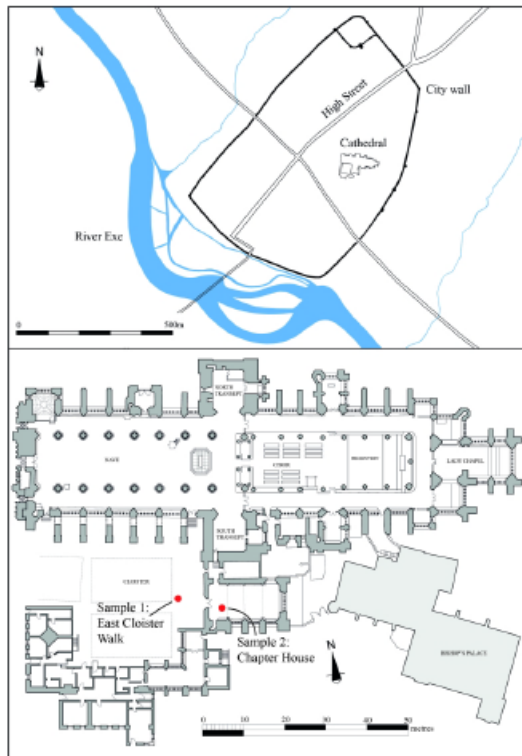


Figure 1. Location map of East Cloister Walk and Chapter House, Exeter Cathedral; the Roman sea Port of Topsham is 6 km downstream.

210x297mm (300 x 300 DPI)



Figure 2. a) East Cloister Walk, Exeter Cathedral; sondage over Roman mortar floor; sampling tins M1 (2029/2034), M2 (2033/2029), M3 (M3A, M3B and M3C; 2008) and M4 (2007/2008). b) Chapter House profile; sampling through Roman, Dark Earth (thin sections M4A-B) and medieval (Med) levels. Sample M1 is in a possible grave cut (Gr).

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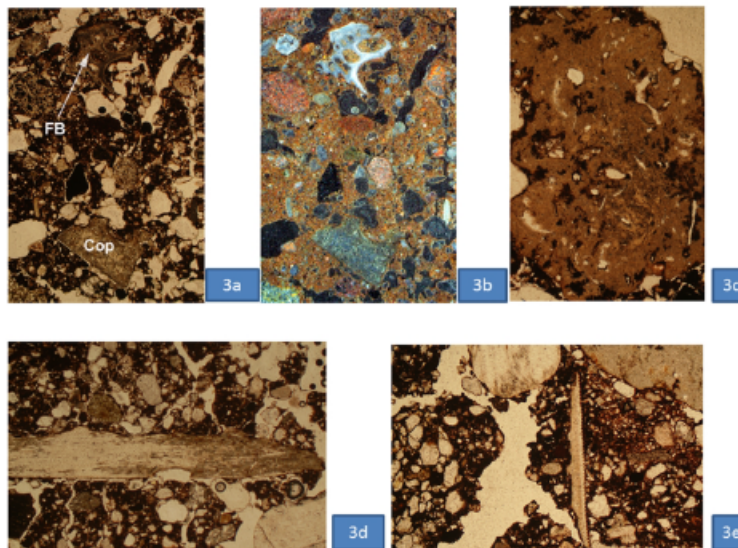


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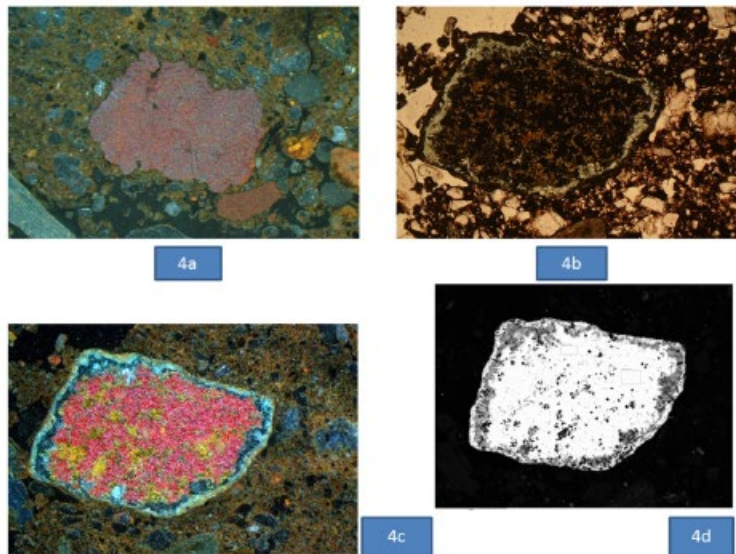


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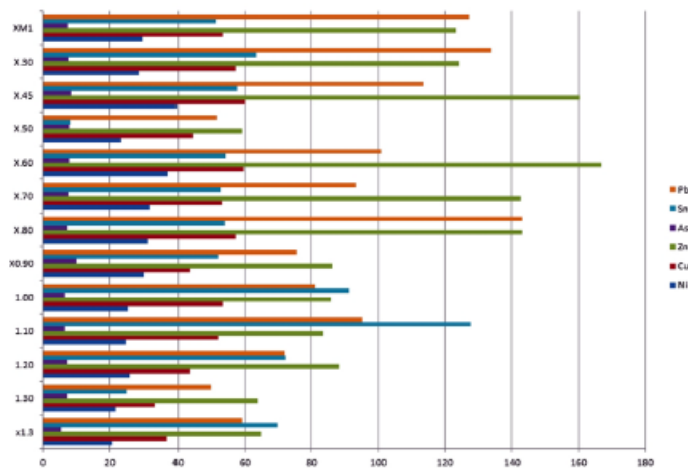


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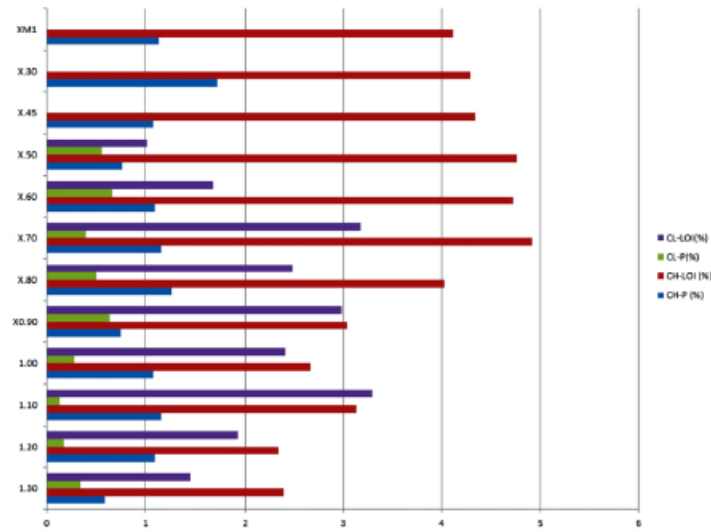


Figure 6. Comparison of Cloisters (CL) and Chapter House (CH) profiles – LOI (organic matter) and P; Chapter House medieval soils especially show a higher organic matter and P content compared to the Cloisters profile.

129x97mm (300 x 300 DPI)