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Contrasting use of space in post Roman Exeter, UK; geoarchaeology of Dark Earth and Medieval deposits below Exeter Cathedral

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Abstract:	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; contrasting uses of space were identified. This supports the need for case-by-case investigations of urban deposits.

Abstract

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; contrasting uses of space were identified. This supports the need for case-by-case investigations of urban deposits.

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Introduction

The study of European urban deposits (Nicosia *et al*. 2017), including Late Roman-Early medieval Dark Earth, commenced with *Rescue* recognising that these apparently 'unstratified' deposits should not simply be machined-away, but could reveal several hundreds of years' worth of urban history (Biddle *et al*. 1973; Carver 1987). Post-Roman Dark Earth *sensu stricto* did not record the total abandonment of urban areas across Europe in the 5th 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; Dark Earth from the medieval castle ditch at Exeter was also analysed (Macphail 2014; Macphail & Courty 1985), but 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).

Materials and methods

The two 1.50 m deep Exeter Cathedral profiles are approximately 12m apart. They were studied using 12 thin sections (Figure 2) and 22 bulk samples, employing soil micromorphology, including SEM/EDS (Energy Dispersive X-ray Spectrometry), organic matter estimates (LOI), particle size, carbonate (CO_3), magnetic susceptibility (MS), and ICP-MS elemental analyses, including phosphorus (P). Standard methods were used (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, resulting in an enhanced magnetic susceptibility, and high CO_3 and Ca. The post Roman Dark Earth in the cloister profile includes food and possible human waste, and coprolites from probable dog scavenging. Fine bone fragments also testify to the consumption of fish, reflecting the lifestyle of local populations and access to the River Exe and sea; the Roman port of Topsham is 6 km downstream (Figures 1 and 3a-3d). 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).

At the Cloister site, the medieval deposits presumed to be linked to the building of the Cathedral from AD 1050, are dominated by stony constructional remains, with peaks in Ca (e.g. use of limestone) and 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 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 their 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 (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.

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 post-dating the Roman city who focused on different activities. Medieval layers contrast even more, further demonstrating the need for case-by-case urban soil studies.

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Funding statement

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Captions

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

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).

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 BL; EDS= 25.6-34.2% Ca, 11.9-15.3% P – *n*=5.). PPL, frame width is ~4.62mm. d) as Fig 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% Ca, 4.32-9.54% P), PPL, frame height is ~2.38mm. Chapter House profile; photomicrograph of ECCH-4B (Dark Earth); dark earth includes fish bone. PPL, frame width is ~2.38mm.

Figure 4. a) Chapter House profile; photomicrograph of ECCH-4B (Dark Earth); artisan working – 'rusty' iron-working fragment (EDS=max ~95% FeO); OIL, Frame width is ~4.62mm. b) non-ferrous metal alloy fragment; PPL, frame width is ~2.38 mm. c) As Fig 4b, under OIL. d) as Fig 4b; X-ray backscatter image of copper-(tin)-lead alloy; EDS= 1.10-18.8% Cu, 1.13-2.76% Sn, 10.3-50.6% Pb (*n*=4 areas).

Figure 5. Chapter House profile; industrial heavy metals and elements (Ni, Cu, Zn, As, Sn and 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 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.

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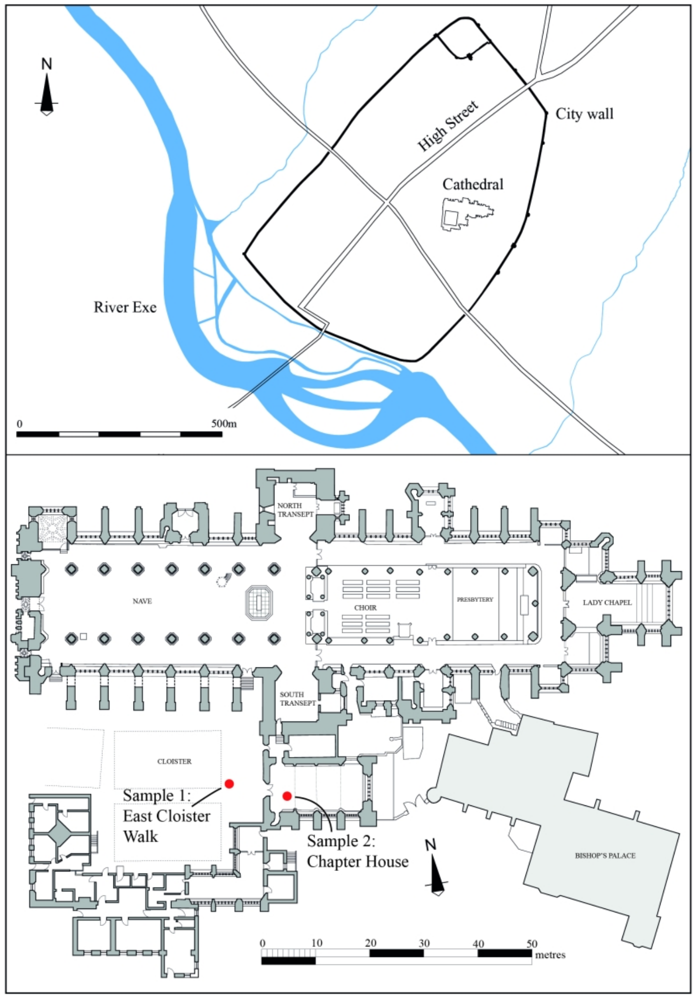

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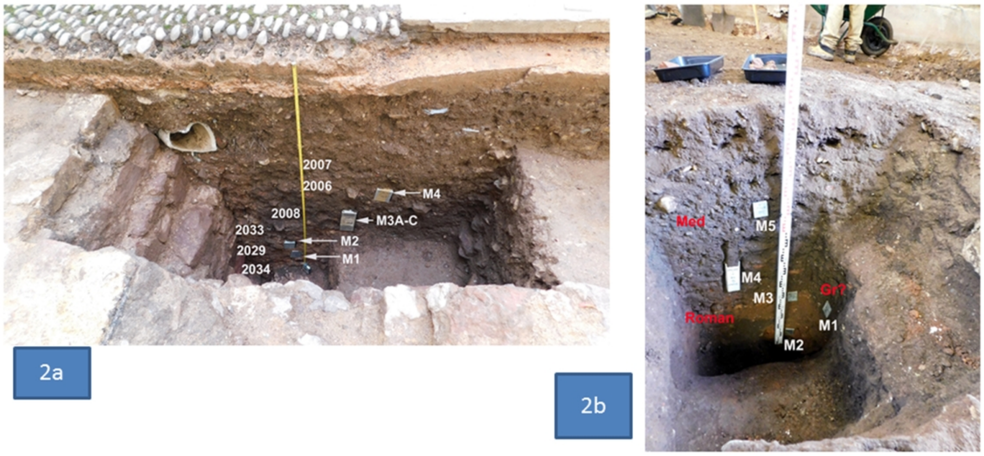

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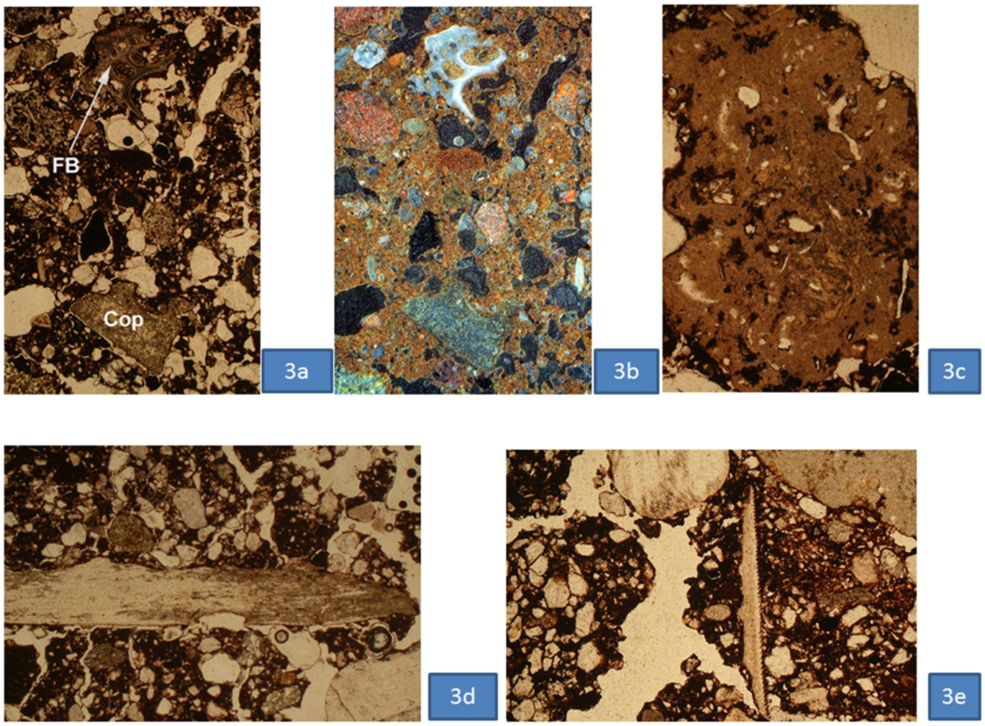

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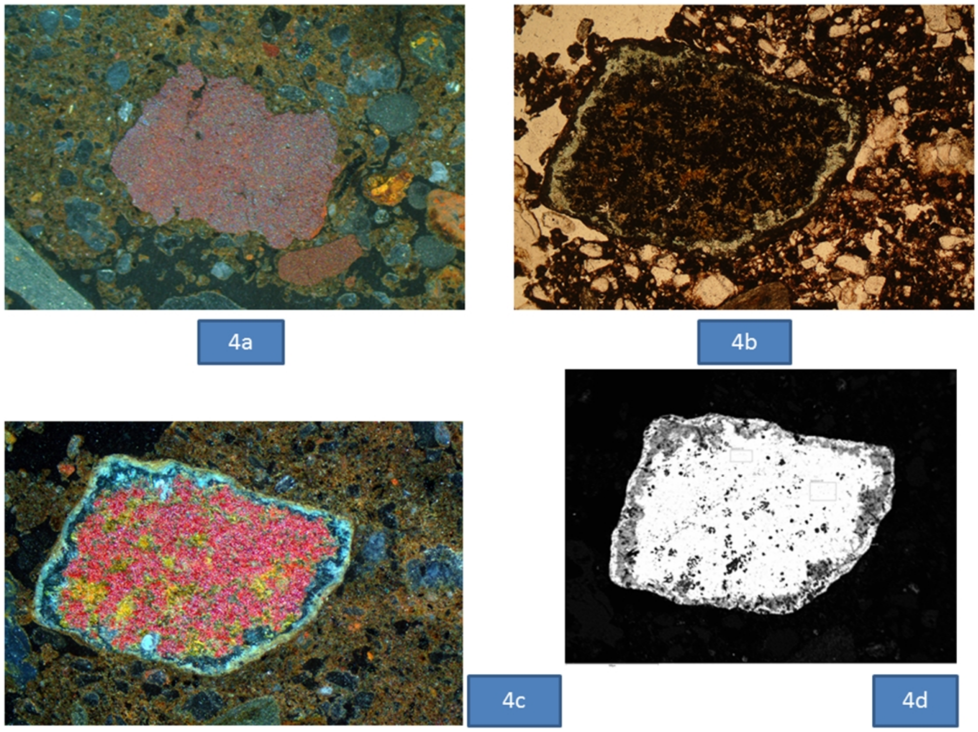

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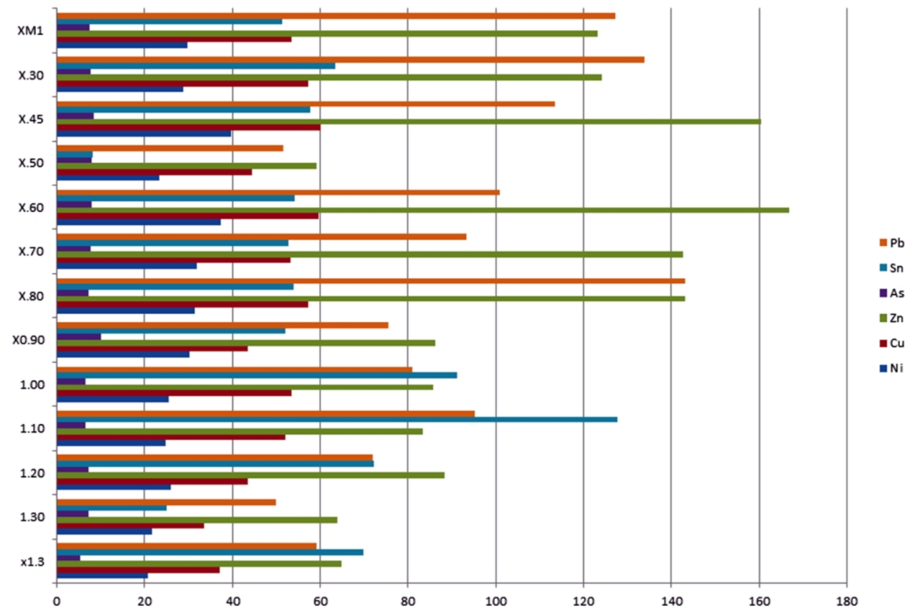

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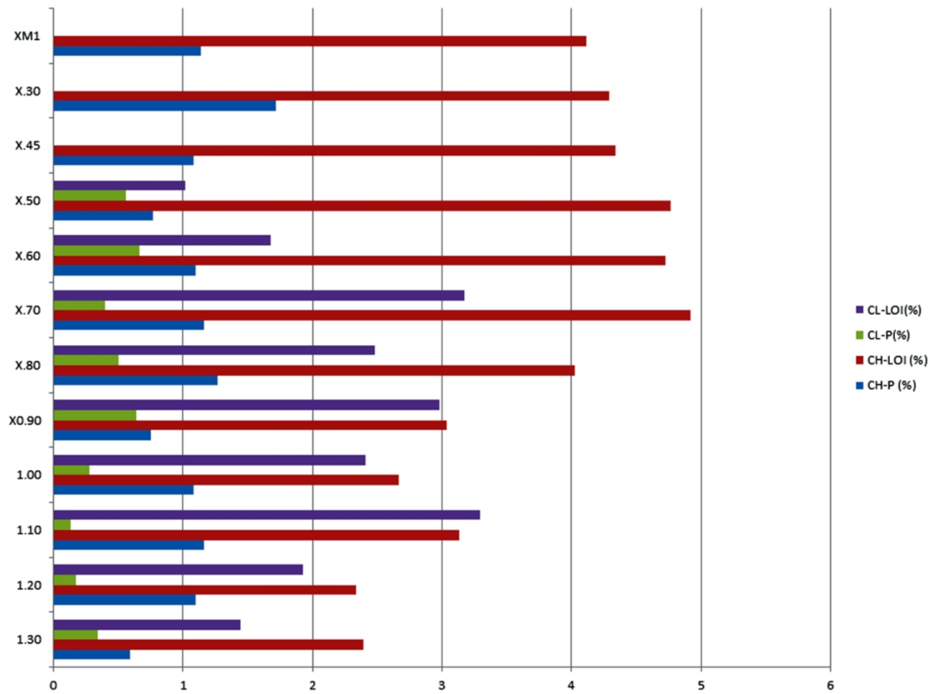

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