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Palaeoenvironmental Report

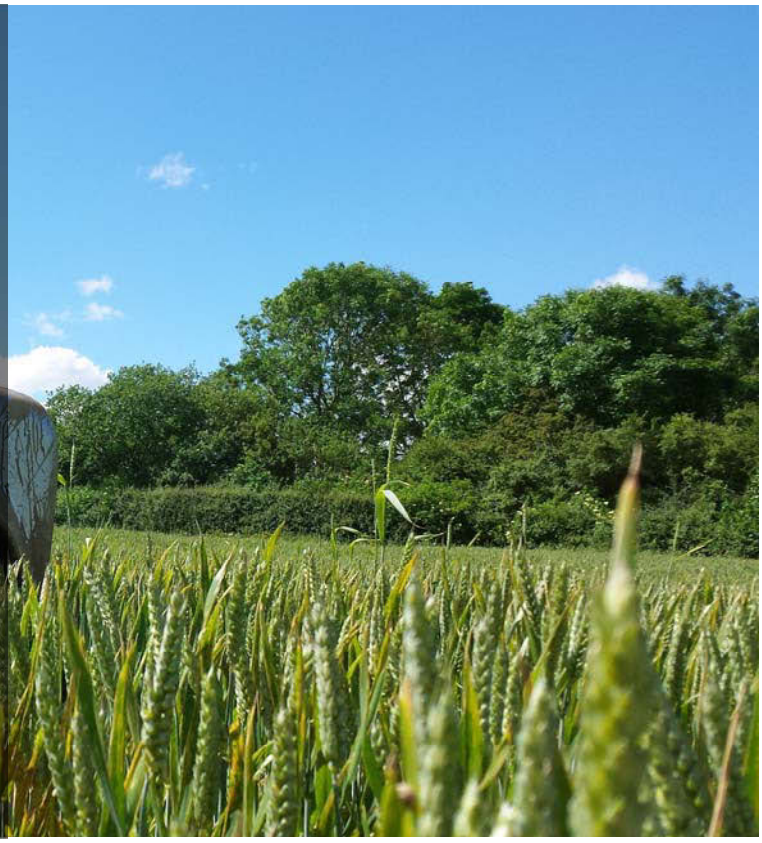
Concerning flotation analysis and archaeobotanical identification

Grahame & Rebecca Dudley

3 Well Street, Exeter

Archaeological Evaluation

May 2015



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1 Executive Summary

This Report has been prepared by the Palaeoenvironmental Department at Border Archaeology Ltd (BA) to facilitate and elucidate the palaeoeconomic interpretations of a small evaluation (BA1212WSE) conducted at 3 Well Street, Exeter, in search of the holy well of St. Sidwell and in advance of redevelopment of the site, which had formerly been a garage.

Two samples were recovered, one from each of the two substantial features on the site, these being namely the probable original medieval holy well, which was constructed in an octagonal form of well-dressed heavitree blocks, and a later brick-lined well located next to the medieval structure and likely constructed following decommissioning of the original and servicing nearby newly constructed housing. The samples were processed through flotation and the resultant archaeological and archaeobotanical material sorted and identified. The results were disappointing in their almost complete absence of archaeobotanical material. However, the artefactual material retrieved from the sampling can be used to augment and verify the archaeological interpretations of the site. It is probable that the absence of archaeobotanical material is not due to taphonomic biases and, therefore, it can be reasonably conclusively stated that, during the probable partially deliberate backfilling of the wells, the immediate area was not in any way domestically occupied and that nearby domestic activity was entirely constrained in the houses and their plots.

A variance from the pattern whereby the palaeoenvironmental sampling has only been able to support the archaeological interpretation is in the presence of slag. However, the labelling of the current structure as a garage is reasonably long established and it may be that, during this iteration as a garage or immediately prior to it, it functioned, at least partly, as a smithy. This is terminology that may previously have been interchangeable due to the practices undertaken.

2 Introduction

This report details the results derived from 40ℓ of soil, 20ℓ from each sample, retrieved from the upper fills of two wells sunk into land now known as 3 Well Street, Exeter. This land was, at the time of excavation, occupied by a former garage building and due for redevelopment by Grahame and Rebecca Dudley of Culmvale, Stoke Canon, Exeter. Although the wells were by no means fully excavated within the remit of archaeological evaluation by BA, they were subsequently investigated by boring conducted by ARCA of the Department of Archaeology in the University of Winchester. The boring determined that the well structure itself was likely comparatively shallow but was sunk into marshy peaty ground before the bore encountered bedrock at 3.3m, the strata of which likely being the issuing source of the well. For this reason, it is likely that the well was of the naturally brimming variety. In addition, the boring confirms that the sampling of the upper fills, usually an activity not recommended for optimum palaeoenvironmental retrieval, was entirely appropriate.

The site due for redevelopment was suspected to enclose land believed to be the location of the holy well of St. Sidwell. While local folklore suggested the well only sprang up when St. Sidwell was killed on the site, it is clear that it was always an important water source and, as the city grew, was sunk and piped. However, the discovery of the substantial and well-constructed octagonal structure was somewhat surprising, its sheer size likely contributing to its survival during subsequent land use changes and the decommissioning of the water source as an important supply for the city of Exeter. The octagonal well could have supported some form of roofing and was surrounded by a gully of cobbling that respected the octagonal shape, a fine example of medieval civic architecture; this is without consideration of the probable boundary walling formed from the same heavitree stone that would have formalised and delineated the holy well. Later changes to the well construction included an arched brick conduit that was likely the starting point of the piped water supply that the well was adapted to service.

A later brick well, which had presumably followed decommissioning of the original, had been cut through the medieval cobbling. The dating of the brick well insertion is coupled with the construction of nearby housing and is likely an informal recognition of the area as a valuable water source. The enclosing of the land as a garage was formalised in the latter half of the 20th century. However, with the support of the archaeometallurgical evidence retrieved from the palaeoenvironmental sampling, it seems likely that this type of industrial activity was already practised on the site in an informal manner.

The two samples, taken in 10ℓ sample buckets, derived from two distinct contexts, from each of which 20ℓ was taken. Although comprising the uppermost fills of the two wells, they were the only uncontaminated contexts available. The accepted desire to sample the basal fills of features relates to garnering a palaeoeconomic reconstruction from the time that the feature was initially cut and therefore when its construction for purpose was relevant; however, the sampling of these upper fills in this instance relates directly to the probable deliberate backfilling of the features following total abandonment from original purpose. The samples were processed by means of flotation and the archaeobotanical remains from both the floating element and the heavier residue were sorted and visually identified.

The elevation of the site, occupying a steep slope, is being utilised in the redevelopment design. However, it seems likely that the front of the development where the wells were located was always comparatively level and this may be due to naturally issuing water creating a marshy area, as suggested by the geoarchaeological investigation.

As the site is contained within an urban area, it is classified as unsurveyed by The Soil Survey of England and Wales. However, the surrounding geology of mudstones, siltstones, shales and, especially, non-calcareous

pelosols with brown earths of loamy silty and permeable clays would exhibit no negative taphonomic effect on the preservation of archaeobotanical remains; indeed, the largely waterlogged soils would aid the preservation of uncharred material and it seems plausible that the waterlogging was almost continual, and, consequently, the denuding of the soils of organic remains through a fluctuating water table can be discounted. The absence of difficult clays within the fills allowed rapid flotation processing with limited agitation, further preserving any potential palaeoenvironmental remains. The absence of archaeobotanical material besides charcoal solely relates to the depositional processes and is a very accurate reflection of the palaeoeconomic circumstances on the site.

3 Methodology

3.1 Objectives of analysis

The purpose of the palaeoenvironmental sampling strategy implemented during archaeological evaluations is the retrieval of non-specific palaeoenvironmental remains and the further characterisation of features that cannot be fully investigated due to the confines of the evaluation parameters.

3.2 Sampling methodology

Sampling methodology followed the BA Palaeoenvironmental Department Manual for environmental sampling and processing. The samples from 3 Well Street were not subject to sub-sampling and their entirety was processed by means of flotation. Flotation was undertaken in Siraf-style tanks with a 1mm retent mesh and 250µm flot sieve. No refloating was required for the samples from Exeter. Retents were initially scanned by magnet to retrieve archaeometallurgical debris and a sieve bank was used to facilitate visual sorting with the smaller fractions sorted by means of magnifying lamp and/or illuminated stereo zoom microscopy. The flots were sorted entirely by means of illuminated stereo zoom microscopy. The retents were not of substantial enough size to require part sorting and the flots were by no means rich enough to require rifle box sorting; this allowed 100% analysis. The results of this analysis are reported with the flot and retent data recombined; this is due to limited to no variance in the species being reported.

3.3 Processing log

No.	Job no.	Site code	Sample no.	Sample part	Context no.	Floated
1245	BA1212WSE	WSE12	1	2/2	1007	09-10-14
1247	BA1212WSE	WSE12	2	2/2	1009	13-10-14
1248	BA1212WSE	WSE12	1	1/2	1007	13-10-14
1250	BA1212WSE	WSE12	2	1/2	1009	13-10-14

4 Personnel

Floatation and primary analysis was undertaken by Robin Putland BSc MSc, Janice McLeish MA, David Stockwell BA, Matthew Gutteridge BSc and David Elgar BSc MSc within BA's Palaeoenvironmental department. This work was assisted by BA's field staff as part of a programme of Continuing Professional Development (CPD). Further

analysis and identification was undertaken by Robin Putland BSc MSc and Amy Bunce BSc MA. No external specialism was required for this report.

5 Description of results

5.1 Description and implications of materials recovered

Detailed below are the general implications of the discovery of certain materials within the palaeoenvironmental samples. Of relevance to the material from 3 Well Street is the conspicuous total absence of charred and uncharred archaeobotanical material of palaeodietary origin. As this is by no means due to taphonomic biases, it accurately reflects the total absence of domestic activity on the site during deposition of the upper fills of the wells. The presence of significant quantities of pottery, Ceramic Building Material (CBM), slate, coal/coke and clinker/tar is coupled with instances of glass and other artefacts such as a Fe nail, Clay Tobacco Pipe (CTP) fragment and a Cu pin. This strongly suggests nearby occupation but also points to the likelihood of the charcoal inclusion relating solely to industrial practices. Of some note is the absence of snail shells, in this instance it is likely due to a combination of soil conditions not favouring their preservation and the depositional processes not being attractive to any terrestrial mollusca.

5.1.1 Finds

Archaeological finds within palaeoenvironmental samples are fairly common and help confirm that the sampling of the material was not biased in any manner. In the case of 3 Well Street, they also highlight the absence of archaeobotanical material. Occupation was clearly located nearby, but domestic activity was not practised on the site, with any such activities being well confined to the houses and their plots.

The archaeological finds retrieved from the 3 Well Street samples all derived from the retents and consisted of pottery, CBM, glass, slate, coal/coke, clinker/tar and a Fe nail, CTP and Cu pin.

The pottery was predominantly in smaller fragments and was glazed, being predominantly of a medieval to post medieval date with some examples of early modern ceramics. Decoration was present on many of the pieces, although the fragment size precluded identification through means of pattern recognition. The presence of pottery at a well is, in many respects, to be expected and it is not present due to standard domestic refuse practices, which would have resulted in other midden materials becoming incorporated in the fills.

CBM was predominantly of larger brick fragments, although the presence of locally tempered daub cannot be discounted. The brick fragments are presumed to date from the phase of construction that included the sinking of the brick lined well.

Slate was common throughout the samples and was clearly of broken roofing slates; coupled with the brick fragments, this illustrates the local building materials during the nearby housing construction.

Coal/coke and clinker/tar were recovered from the samples. This may elucidate the lack of charcoal but strongly suggests an industrial fuelling. This appears consistent with the archaeometallurgical evidence and suggests use of the site in a related fashion prior to its formalisation as a garage. This smithy type occupation of the site would date to the late 19th century and/or the early 20th century.

Small fragments of glass were also retrieved. Like the pottery, this may be expected at a well site without the usual accompaniment of domestic midden material. In addition, a Fe nail, CTP stem fragment and Cu pin were discovered. These personal items would likely have been lost on site and not imported onto the site.

5.1.2 Slag

Archaeometallurgical debris was present in the form of unspecific slag fragments and occasional inclusion of spheroidical hammerscale. Slag was retrieved from both the flots and retents; this apparent contradiction, in that slag would normally be too heavy to float, is in fact due to vesicles containing air in spheroidical hammerscale and the smaller fragments of slag. Droplets of slag become spheroidical when they cool while travelling through the air having been propelled during iron working. This iron working may be standard hot smithying but may also be the primary smithying of a bloom. Considering the date of the site, bloomery furnaces were far superseded by blast furnace technology and a standard blacksmith's activities are the much more plausible explanation of these slag spheres. Spheroidical hammerscale is almost always deposited within a few metres of the anvil and, barring mass importation of soils onto the site (which is highly unlikely), it is therefore conclusive proof of the use of the site as a blacksmith's at some point prior to its establishment as a garage. This connection between the activities is common with many smithies becoming garages in the mid-20th century. However, it should be noted that the fairly limited quantity of slag and the lack of slag amongst the other material discovered during archaeological excavation (likely due to slag fragmentation) suggests that this activity was not long lived on this site. The presence of coal/coke and clinker/tar suggests a fuelling that did not use wood or charcoal, which is entirely consistent with industrial activity such as smithying which requires much higher temperatures than domestic activity.

5.1.3 Bone

Burnt bone within palaeoenvironmental samples is reasonably conclusively of anthropogenic origin, since it derives predominantly from domestic activities, although it is also present in industrial and funerary practices; by contrast, unburnt bone may have become incorporated due to animal death in the vicinity of the context while it was forming. Such incidences of unburnt bone, especially of small mammals and reptiles, can highlight the environmental conditions during the formation of the context as the animals will occupy specific ecological niches.

The bone inclusions from 3 Well Street are very occasional and exceptionally fragmented. They are likely present due to consumption on site with finished food substances brought onto the site, hence the lack of charred plant remains that predominantly result from preparation and cooking accidents. Food waste is, however, frequently disposed of within fires and the white colour of the bone, which is traditionally categorised as cremated bone due to the high temperatures (>800°C) obtained to achieve this colouration, strongly supports disposal in a fire such as a blacksmith's hearth.

The unburnt large mammal bones were highly fragmentary and cremated bone is inherently fragmentary precluding species identification. The very occasional incidence of unburnt small mammal bone was inconclusive in that the species were undeterminable due to a lack of identifying elements on the fragments present.

5.1.4 Uncharred archaeobotanical material

No modern root fibres were present due to the urban nature of the site, but some modern moss material came through in the flots. No uncharred organic materials were present in any form. This, in itself, further points to the enclosed and industrial nature of the site.

5.1.5 Charcoal

Charcoal is ubiquitous in palaeoenvironmental samples, as it is used in domestic, funerary and industrial settings, or may be present as a result of accidental firings. Identification of the wood species making up the charcoal assemblage can add valuable data as to wood selection for the varying purposes. While often relied upon for dating, in particular C14, charcoal is not the best material to use. Charcoal is subject to the 'Old Wood problem', whereby charcoal is known to be frequently redeposited and reused. In addition, wood grows over many years and it is not possible to know precisely where within the tree a charcoal fragment has derived.

The charcoal from 3 Well Street was retrieved solely from the retents, but was in comparatively very limited quantities. It is likely that all charcoal inclusions are entirely incidental. Very little can therefore be determined from the charcoal and there were no fragments recovered of a suitable size for wood identification. In no instance could charcoal be assigned to a specific fire occurrence; therefore, wood identification would only have added to the generalised data for wood selection in the period and area concerned. The charcoal was equally unsuitable for recommendation for C14 dating due to fragment size.

5.1.6 Charred archaeobotanical material

Charred archaeobotanical material is generally the most illustrative palaeoeconomic remnant. While often the sole reason for its preservation, charring is also accepted as being almost solely anthropogenic and the material can therefore be used to directly reconstruct the past agricultural economy and diet.

The total lack of charred archaeobotanical material is suggestive of the respect that the site may have been held in, since it was a holy well and was in no way domestically occupied. The lack of food substances beyond bone is suggestive of the intense heat that food debris was likely disposed of in. As such, cereal grains cannot be expected to survive, although the lack of fruit seeds and nut shells is illuminating as to just how un-domestic the site was. No palaeodietary reconstructions can be garnered from 3 Well Street.

5.2 Description of significant palaeoenvironmental contexts

As the sampling from 3 Well Street was of just two contexts, they are both considered in detail below. Further results can be observed in the table below.

5.2.1 (1007)

The only encountered fill of the later brick lined well [1006] was probably a partly deliberate backfill towards the top of the well. Archaeologically, it was recognised to contain 19th century finds such as pottery, CBM and slate. The palaeoenvironmental evidence added glass, coal/coke, clinker/tar, a Fe nail and CTP stem to the archaeologically discovered finds. Slag fragments and spheroidical hammerscale was also present. Unburnt bone and burnt bone was present to some extent, as well as charcoal. As with (1009), this fill appears to add to the general picture of probable partially deliberate backfilling of the wells.

5.2.2 (1009)

The encountered fill of the earlier octagonal holy well [1002] once modern rubble had been removed. However, it was still likely to be a 19th century partly deliberate backfill, as it had also filled the post-medieval arched brick conduit [1010]. Archaeologically, it was recognised to contain CBM. The palaeoenvironmental evidence added

glass, coal/coke and the Cu pin to the archaeologically discovered finds. Smaller quantities of slag, spheroidical hammerscale and charcoal were also present. Only burnt bone was included with (1009), although, at the quantities observed, little can be concluded from this. As with (1007), this fill appears to add to the general picture of probable partially deliberate backfilling of the wells.

6 Tables of results

The following table details the results of both the archaeobotanical material and the archaeological finds. The flot and retent data has been recombined due to the lack of variation between the material represented.

6.1 Table of archaeobotanical and non-archaeobotanical remains

		Context no.	1007		1009	
		Sample no.	1		2	
		Sample part	1/2	2/2	1/2	2/2
		Bucket no.	1248	1245	1250	1247
		Sample vol. (mℓ)	2100	1800	3000	2800
		% sample analysed	100	100	100	100
		Waterlogged?	N	N	N	N
		Refloated?	N	N	N	N
Latin name	Common name	Plant part				
Charcoal						
Undetermined	Undetermined	fragments	+	++	+	
Artefactual						
Ceramic/pottery	-	-	+	++	+	+
CBM	-	-	++	+++	+++	++
Glass	-	-	+	+	+	
Worked stone - slate	-	-	++	++++	+++	++
Coal / coke	-	-	++	++	++	++
Clinker / tar	-	-		+++		
Fe nail	-	-	+			
Clay Tobacco Pipe	-	-		+		
Cu pin	-	-			+	
Archaeometallurgical						
Spheroidical hammerscale	-	-		+	+	
Slag	-	-	++	++	+	
Faunal						
Mammal (unburnt)	Indeterminate	-	++	+		
Mammal (burnt)	Indeterminate	-		+	+	+

7 Conclusions

The intention of the non-specific palaeoenvironmental sampling at 3 Well Street was ideally for the retrieval of archaeobotanical remains. However, the augmentation of the archaeological evidence with the addition of a suggested short period of blacksmithying on the site prior to the establishment as a garage appears to be the legacy of the 40ℓ of sample recovered. The palaeoenvironmental sampling adds nothing to the known construction of the wells and refers only to the later infilling, likely as a partially deliberate activity.

The palaeoenvironmental conclusions in no way effect the redevelopment of the site and, as no plans are in place to fully excavate the wells, no palaeoenvironmental considerations are needed in any mitigation plan.

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