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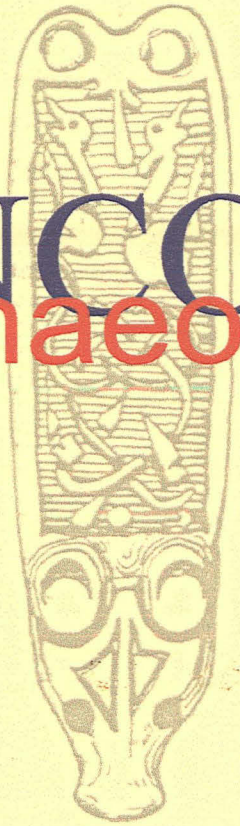
A Report to Greetwell Developments

April, 2001



LINCOLN archaeology

Bunkers Hill, Lincoln

Archaeological Evaluation - Updated Environmental Archaeology Assessment

By J Rackham

Report No.: 457

LINCOLN archaeology

BUNKERS HILL, LINCOLN

ARCHAEOLOGICAL EVALUATION - UPDATED ENVIRONMENTAL ARCHAEOLOGY ASSESSMENT

SUMMARY

This report updates an Environmental Archaeology Assessment originally included in an evaluation report by the City of Lincoln Archaeology Unit (Trimble 2000, Appendix G). It has been revised to take into account the results of further analysis of column samples taken from the fills of ditches comprising a prehistoric triple-ditched boundary (previously assessed through the processing and analysis of a limited number of samples from each column), and the results of radiocarbon dating on fragments of charcoal from a ditch recut or later pit.

The updated report draws attention to a relative abundance of molluscan evidence in one of the three columns (Column 1) and suggests that further analysis of the Column 1 assemblages could facilitate increased understanding of the sequence of change in landscape use in the immediate area. However, a securely dated stratigraphic sequence would be a prerequisite for this work. This might, according to the author of the report, be achieved through the dating of ceramic material found during sample processing. Alternatively, the results of further fieldwork (see below) may assist in the development of a chronology for the site.

The calibrated radiocarbon date (see report for full details) for the sample of charcoal (context 131) from a recut or pit cutting along the line of the easternmost ditch of the ditched boundary is broadly consistent with a possible late Bronze Age/early Iron Age date assigned to a small quantity of associated pottery (Trimble 2000, Appendix C). It is of note that the date more or less concurs with radiocarbon dates of late Bronze Age to middle/late Iron Age for the primary fills of two linear boundary ditches at Rectory Farm, West Deeping (Bountwood 1998, 39). The presence of some slag and hammerscale was also noted in samples from context 131. This constitutes potentially early and important evidence for iron smithing in the immediate vicinity. (pers. comm. J Cowgill; see Trimble 2000, Appendix G).

It is anticipated that the results of further investigations, to be carried out in 2001, along the line of the triple-ditched boundary, will both elucidate and expand upon the findings of the present study.

R Trimble (CLAU Project Officer)

24 April 2001

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Bunkers Hill, Greetwell – GBH99
Updated Environmental Archaeology Assessment

Introduction

This report incorporates elements from an earlier evaluation report (Rackham 2000) but does not entirely supercede that report. This report should therefore be used in conjunction with the earlier report.

Evaluation excavations conducted by the City of Lincoln Archaeology Unit at the site of a proposed housing estate at Bunkers Hill concentrated upon the excavation of a triple ditch system revealed by crop marks. During the course of the evaluation four samples were taken from the fills of the ditches and a pit uncovered in Trench 1. A series of three column samples, primarily for mollusc analysis, were taken through the fills and subsequent colluvial slopewash of three ditches in Trench 8 excavated in the valley adjacent to the modern stream. The samples are listed in Table 1. All except three of the column samples have been washed and assessed. Owing to the low productivity of the samples from Column 3, the basal three samples have not been processed.

In addition to the samples taken shells and animal bone were collected during hand excavation.

Methods

The soil samples were processed in the following manner. Sample volume and weight was measured prior to processing. The samples were washed in a 'Siraf' tank (Williams 1973) using a flotation sieve with a 0.5mm mesh and an internal wet-sieve of 1mm mesh for the residue. Both residue and float were dried, and the residues subsequently re-floated to ensure the efficient recovery of charred material and mollusc shells. The dry volume of the flots was measured, and the volume and weight of the residue recorded.

The residue was sorted by eye, and environmental and archaeological finds picked out, noted on the assessment sheet and bagged independently. A magnet was run through each residue in order to recover magnetised material such as hammerscale and prill. The residue was then discarded. The float of each sample was studied under a low power binocular microscope. The presence of environmental finds (ie snails, charcoal, carbonised seeds, bones etc) was noted and their abundance and species diversity recorded on the assessment sheet. The float was then bagged. The float and finds from the sorted residue constitute the material archive of the samples.

The individual components of the samples were then preliminarily identified and the results are summarised below in Tables 2 and 3.

Results

A few uncharred seeds, recent rootlets and occasional worn egg capsules were recorded in a number of the samples indicating low levels of contamination. Some uncharred straw and chaff blowing across the site during sampling has also been incorporated into the samples. Some of the samples produced several to many shells of the burrowing blind

snail, *Cecilioides acicula* (see Table 3). This taxon is believed to have been introduced (Evans 1972; Kerney and Cameron 1979) and since it is known to burrow to depths of 2 metres (Evans 1972) it must be viewed as a probable contaminant in the sampled contexts.

Table 1: Bunkers Hill, Greetwell. Samples taken during the evaluation

sample no./depth	trench	context	sample vol. l.	sample wt kg	feature type	Date
1	1	046	17	21	primary fill western ditch	
2	1	003	17	21	ditch fill	IA
3	1	006	18	21.5	primary fill eastern ditch	
4	1	131	16	20	fill of pit cutting E ditch	LBA/EIA?
140-150	8	106	6	6	col. 1 – colluvium	
130-140	8	106	7	7	col. 1 – colluvium	
120-130	8	106	10	9	col. 1 – colluvium	
110-120	8	106	9	8	col. 1 – colluvium	Roman/ post Rom.
100-110	8	106/112	8	9	col. 1 – colluvium	
90-100	8	112	9	9	col. 1 – colluvium/ditch fill	
80-90	8	112	8	7.5	col. 1 – colluvium/ditch fill	
70-80	8	112	9	8	col. 1 – colluvium/ditch fill	
60-70	8	112	7.5	7	col. 1 – colluvium/ditch fill	
50-60	8	088	7	7	col. 1 – ditch fill	Prehist?
40-50	8	088	7	6.5	col. 1 – ditch fill	
30-40	8	088	7	7	col. 1 – ditch fill	
20-30	8	088	9	7	col. 1 – ditch fill	
10-20	8	088	6	6	col. 1 – ditch fill	
0-10	8	088	5	5	col. 1 – ditch fill	
90-100	8	105	8	8	col. 2 – colluvium	
80-90	8	105	7	7	col. 2 – colluvium	Prehist
70-80	8	098	5	6.5	col. 2 – colluvium	
60-70	8	098	6	7	col. 2 – colluvium	
50-60	8	097	6	6	col. 2 – ditch fill	
40-50	8	096	5.5	6	col. 2 – ditch fill	
30-40	8	095	6	6	col. 2 – ditch fill	
20-30	8	095	5	6	col. 2 – ditch fill	
10-20	8	093	8	8	col. 2 – ditch fill	
0-10	8	093	5	5	col. 2 – ditch fill	
70-80	8	106	7	7.5	col. 3 – colluvium	Roman
60-70	8	106	6.5	7	col. 3 – colluvium	Roman
50-60	8	106	6	6.5	col. 3 – colluvium	Roman
40-50	8	107	5	5	col. 3 – colluvium	Roman
30-40	8	111	5	6	col. 3 – ditch fill	Roman
20-30	8	111			col. 3 – ditch fill	Roman
10-20	8	111			col. 3 – ditch fill	Roman
0-10	8	111			col. 3 – ditch fill	Roman

Measurements for the column samples are taken from the base of the column

Archaeological finds are sparse in the samples that have been assessed (Table 2). Only context 131 produced a range of finds including flake and spheroidal hammerscale, badly leached probable iron smithing slag (pers comm. J.Cowgill), pottery, abundant charcoal and fragments of burnt bone and mussel shell. The other samples yielded only a little charcoal, one or two flakes of hammerscale, and occasional charred cereal grains (Table 3). Apart from context 131 the four samples taken from Trench 1 do not suggest any local

occupation. Context 131 indicates the local smithing of iron and the occurrence of pottery tentatively assigned to a possible late Bronze Age/early Iron Age tradition makes this a potentially early iron smithing record of some importance. The charcoal surviving in the sample has been submitted for radiocarbon analysis and the result is indicated below.

Table 2: Archaeological and Environmental finds from the assessed samples

samp.no. /depth	col	cont.	samp. vol. l.	res. vol. lt	flot vol. ml	pot £/#	ham'er scale no.	slag wt g	char-coal *	grain *	snail */$	other
1		046	17	5	60		1		1	1	5/3	
2		003	17	12	4				1		5/3	tiny frag. brick/tile
3		006	18	10	25		2		2		5/3	one piece burnt flint
4		131	16	9	120	6/1	++	10	4		5/3	mussel shell and burnt bone fragments
140-150	1	106	6	0.05	<1	1/6				1	2/1	brick/tile?
130-140	1	106	7	0.03	1	2/4			1		1/1	fired earth/pot?
120-130	1	106	10	0.1	1	1/1	1				2/2	fired earth, burnt bone
110-120	1	106	9	0.15	<1	1/5			1		2/1	charred hazelnut shell
100-110	1	106/112	8	0.1	1				1	1	2/2	fired earth
90-100	1	112	9	0.2	1						2/2	brick/tile, vole tooth
80-90	1	112	8	0.05	1	2/1			1		2/2	brick/tile
70-80	1	112	9	0.15	3				1	?	5/3	tiny piece of coal
60-70	1	112	7.5	0.3	4				1		5/3	
50-60	1	088	7	0.15	5		1		1		5/3	mouse?
40-50	1	088	7	0.15	4						5/3	
30-40	1	088	7	0.2	2						3/3	
20-30	1	088	9	0.75	2				2		4/3	
10-20	1	088	6	0.3	1						2/2	
0-10	1	088	5	0.2	1				1		2/2	
90-100	2	105	8	0.15	<1				1	1	2/1	
80-90	2	105	7	0.1	<1	20/18			1		2/2	coal in flot
70-80	2	098	5	0.2	1				1		2/2	fired earth
60-70	2	098	6	0.3	1	1/1			1		2/2	fired earth/brick?, bank vole
50-60	2	097	6	0.3	1				1		2/3	burnt bone fragment
40-50	2	096	5.5	0.3	1				1		2/2	burnt bone
30-40	2	095	6	0.9	<1						2/2	
20-30	2	095	5	0.6	<1						2/2	vole, mouse?
10-20	2	093	8	0.75	1				2		3/3	ostracod
0-10	2	093	5	0.25	1						2/2	fired earth
70-80	3	106	7	0.55	1	4/1			1		1/1	burnt bone
60-70	3	106	6.5	0.05	<1	3/1					1/2	burnt bone
50-60	3	106	6	0.08	1		1		1		1/2	fired earth, burnt bone
40-50	3	107	5	0.08	1						3/2	fired earth, bone
30-40	3	111	5	0.12	<1	1/3					2/2	fired earth, burnt bone
20-30	3	111										
10-20	3	111										
0-10	3	111										

£/# - no sherds/weight in g.
* frequency – 1=1-10; 2=11-50; 3=51=150; 4=151-250; 5=>250 items
$ diversity – 1=1-3; 2=4-10; 3=11-25; 4=26-50 taxa
++ - >25 but not counted

The processing produced a few finds (Table 2) including a 2nd-3rd century abraded grey ware sherd from 110-120 in column 1, and a shell tempered probable Iron Age sherd from 80-90cm in column 2 (pers comm. B.Precious and M.Darling). Small quantities of charcoal were present in all the column samples and a fragment of burnt bone (50-60, column 2) and charred hazelnut shell (110-120, column 1) were also recorded. The dating from the more recently recovered pottery was not available for this report.

Snails

The ditch and pit samples from Trench 1 are very rich in snail shells (Table 2) and have been discussed in the earlier report (Rackham 2000).

The three column samples were primarily sampled for molluscan evidence. The objective of the sampling was to establish whether there was any change in the local environmental conditions during the infilling of the ditches and the subsequent deposition of over one metre of colluvial sediments above. All the samples have been assessed barring the basal three in Column 3. The molluscan assemblages from Column 3 were generally poor. The taxa recorded are dominated by shells of *Vallonia excentrica*, *Trichia hispida*, *Cecilioides acicula*, with occasional shells of *Lymnaea truncatula*, *Lymnaea* sp., *Aplexa hypnorum*, *Carychium* sp. and *Succinea* sp. These latter indicate the wet and damp ditch environment at the base of the column. The upper fills are more characteristic of open country/grassland habitats.

In Column 2 a similar assemblage was recorded. The grassland element included *Vallonia excentrica*, *Vertigo pygmaea* and *Pupilla muscorum*. With increasing depth snails preferring damper habitats are found such as *Lymnaea truncatula*, *Carychium* sp., *Valvata cristata*, although the proportion of semi or truely aquatic taxa is lower than in Column 3.

In neither of these columns is the abundance of molluscs sufficient to warrant a detailed analysis, although a general guide is indicated. Shells increase in abundance with depth, and the proportion of damp ground taxa, tends to increase. This is likely to reflect the change from a ditch environment to the higher colluvial sedimentary sequence and is not particularly useful for understanding local changes in the landscape.

Preliminary identification of the molluscan taxa present in the samples has been made and entered onto the assessment sheets, but the data from Column 1 is presented in Table 3. Data from samples from Column 2 and those from the archaeological features can be found in the previous report (Rackham 2000).

Without quantification the data from Column 1 (Table 3) cannot be interpreted in detail, but some general conclusions can be drawn. The base of the sequence reflects a grassland habitat with shells of *Vallonia costata* and *Pupilla muscorum* present, while the ditch environment is indicated by shells of *Carychium* sp., *Succinea* sp., *Lymnaea truncatula* and *Planorbis leucostoma*. This latter is typical of ditches and ponds that tend to dry up (Macan 1977).

Table 3: Molluscan taxa recorded from the Column 1 samples

Sample	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-110	110-120	120-130	130-140	140-150
Context	88	88	88	88	88	88	112	112	112	112		106	106	106	106
Shell abundance	2	2	4	3	5	5	5	4	2	2	2	2	2	1	2
Cecilioides acicula	+			+		+	+	+	+	+	+	+	+	+	+
Helicella sp.			+					+			+		+		
Open country/grassland															
Helicella itala															
Vertigo pygmaea				+				+	+						
Vertigo sp.			+	+	+	+	+	+							
Pupilla muscorum	+	+				+	+	+		+	+				
Vallonia costata	+	+	+	+				+				+			
Vallonia excentrica		+	+	+		+	+	+	+	+	+	+	+	+	+
Vallonia sp.					+			+							
Truncatellina cylindrica			+												
Catholic															
Trichia hispida	+		+	+	+	+	+	+	+	+	+		+	+	+
Cochlicopa sp.		+					+								
Helix sp.	+	+	+			+		+				+			
Shade loving/woodland															
Nesovitrea hammonis					+										
Oxychilus sp.				+											
Vitrea crystallina				+											
Acanthinula aculeata					+										
Punctum pygmaeum							+								
Carychium sp.	+		+	+	+	+	+	+	+						
Clausilidae	+														
Marsh															
Vertigo antivertigo			+		+		+	+							
Succinea sp.	+	+	+	+		+	+	+	+	+					
Lymnaea truncatula	+	+	+	+	+	+	+	+	+	+	+		+		
Aquatic															
Lymnaea palustris				?	?	+	?								
Planorbis leucostoma	+	+	+	+	+++	+++	+++	+++		+	+				
Valvata cristata					+	+	+	+	+		+				
Pisidium sp.						+	+	+	+						

+ - present; +++ - abundant

habitat groupings broadly taken from Evans, 1972; Macan 1977; Ellis 1969; Kerney and and Redfern 1979

Over the next 40-50 centimetres the assemblages are dominated by *P.leucostoma*, with other aquatic species, indicating that for a potentially considerable period of time this stream side area at the foot of the slope was prone to flood and possibly marshy in character. The grassland taxa are still present, but one or two shells of species more typical of shaded or woodland habitats have appeared.

As this aquatic and semi-aquatic component disappears up the sequence the grassland elements become more abundant again, until the snail numbers fall, due to poor preservation in the upper colluvium and the recent ploughing.

This sequence appears to reflect two changes in the local conditions. A period of increasing wetness, after the original ditch has largely filled, followed by a return to slightly dryer grassy conditions although not as dry as the beginning of the sequence since *Vallonia costata* has not returned. It also suggests on the basis of the density of the

shells in the deposits that the 30-90 centimetre part of the sequence may have built up more slowly, perhaps reflecting a period of very little local change or disturbance other than flood events and seasonally wet conditions. The build up of these sediments may included an alluvial as well as colluvial element.

The additional processed samples have added bank vole and a few fragments of burnt and unburnt bone to the assemblage of finds from the samples (Table 2).

Radiocarbon result

A single sample of charcoal was submitted to Beta Analytic Inc, Florida, for C14 dating. This was extracted from the soil sample that had been taken from fill 131 of a pit, which contained evidence for iron smithing in the form of slag and hammerscale.

The following result was obtained.

Context	Lab No.	Measured Age	Intercept	2 Sigma	1 Sigma
131	Beta 150256	2450±70 BP	BC 520	Cal BC 790-390	Cal BC 770-410

This is a relatively early and important date for iron smithing evidence in this country. The calibration curve is attached.

Discussion

The primary aim of the environmental sampling was to assess the value of the molluscan evidence surviving in the deposits and its potential for studying local changes in the environment at the site. Despite the abundance of snails in the samples from Column 1, those from Columns 2 and 3 are rather poor and do not warrant detailed analysis, although they do yield some information suggestive of local changes. The main features of the Column 1 assemblages relate to changes in the wetness of the immediate environment of the excavation area and a possible indication of episodes of locally stable or consistent conditions. If the ceramics from this sequence can be dated then some chronology for the build-up of the sediment might be possible. In these circumstances the molluscan sequence has some potential for relating the changes which are clearly visible in the faunas to changes in landscape use, but in the absence of such dating the interpretation of the sequence would be conjectural. Neither of the other column sequences produced evidence for the superabundance of the aquatic elements so clearly visible in Column 1, and it may be that these features are not contemporary with the deposits in Column 1. A possible 1st millennium BC date for the wet episode seems possible given that the ditch sampled in Column 3 is dated to the Roman period. This would also imply that colluviation had commenced in the Iron Age but that over 1 metre of colluvial sediments were deposited in the Roman and post-Roman periods. Without dating of the ceramics from the additional samples processed further discussion of this sequence is not warranted.

Acknowledgments

I should like to thank Alison Foster and Jeremy Dubber for the sample processing.

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: est. C13/C12=-25:lab. mult=1)

Laboratory number: **Beta-150256**

Conventional radiocarbon age[1]: **2450±70 BP**

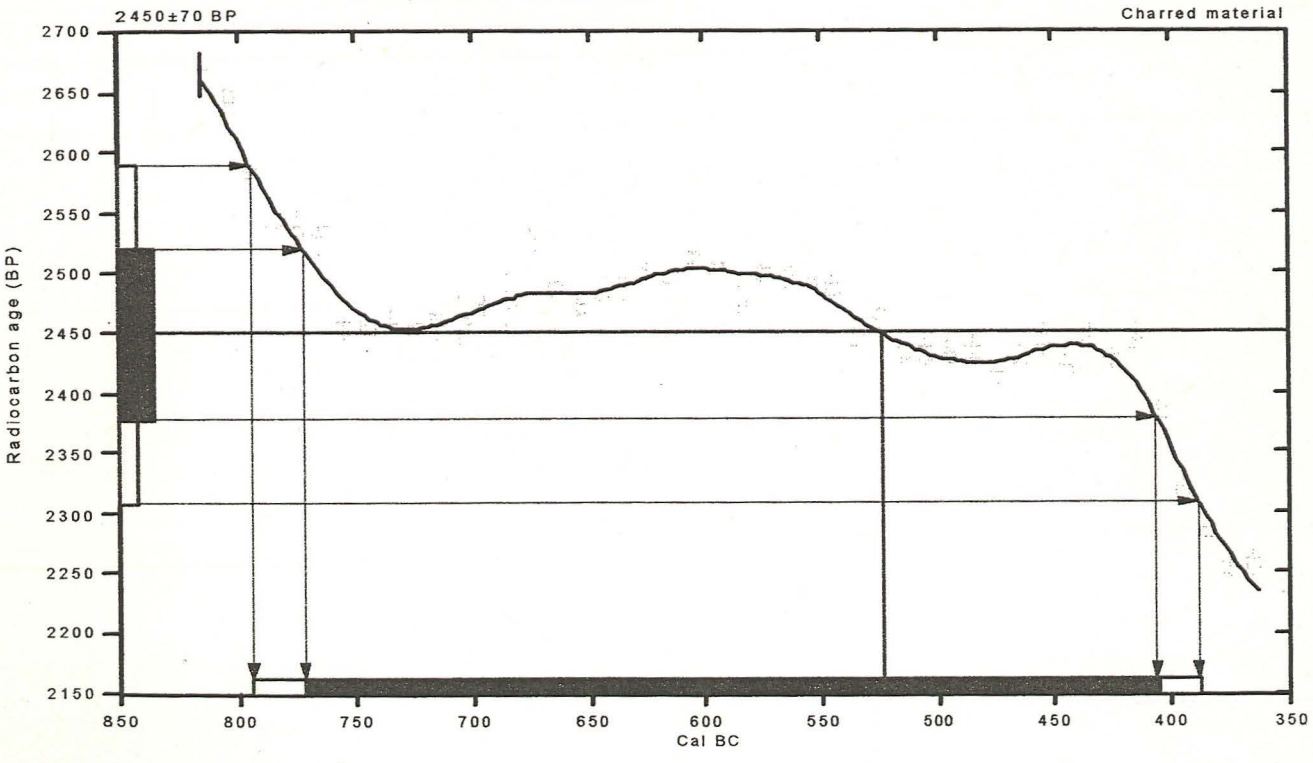
2 Sigma calibrated result: (95% probability) **Cal BC 790 to 390 (Cal BP 2740 to 2340)**

[1] C13/C12 ratio estimated

Intercept data

Intercept of radiocarbon age with calibration curve: Cal BC 520 (Cal BP 2470)

1 Sigma calibrated result: (68% probability) Cal BC 770 to 410 (Cal BP 2720 to 2360)



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Database used

Calibration Database

Editorial Comment

Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii

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Mathematics

A Simplified Approach to Calibrating C14 Dates

Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

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