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**Assessment of plant remains (mainly charcoal) from excavations at  
Cawthorn Camps, North Yorkshire, 2000 (site code CAS645)**

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**Summary**

*This report presents the results of an assessment of the quantity and quality of plant remains, primarily wood charcoal, in samples collected during excavations at Cawthorn Camps, North Yorkshire, in 2000.*

*Samples subjected to bulk-sieving mostly produced small or very small quantities of charcoal and sometimes other charred plant remains, but in a few cases there were modest-sized assemblages of charcoal, sometimes with small amounts of charred cereal grain and hazel nutshell.*

*Samples of charcoal collected for radiometric dating were also assessed and the likelihood with which they will yield a date, from the point of view of the quantity and type of charcoal, is judged.*

**Keywords:** CAWTHORN CAMPS; NORTH YORKSHIRE; PREHISTORIC; ROMAN; POST-ROMAN; CHARCOAL; CHARRED PLANT REMAINS

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## Assessment of plant remains (mainly charcoal) from excavations at Cawthorn Camps, North Yorkshire, 2000 (site code CAS645)

### Material examined and methodology

Plant remains have been examined from two kinds of samples taken during excavations at Cawthorn Camps, near Pickering, N. Yorkshire, under the direction of Peter Wilson, Centre for Archaeology, English Heritage, in October/November 2000:

(i) 'bulk-sieved' samples of 5-40 litres in volume, processed at Ryedale Folk Museum by staff from the Centre for Archaeology, using 250 µm or 500 µm meshes to collect the 'flot' or 'washover' (for the most part, only this fraction was submitted for examination, but all material sorted from the >4 mm fraction of the residue by Centre for Archaeology staff was also submitted and examined).

Washovers from a total of 62 samples representing 60 contexts were submitted for assessment. Nearly all consisted of modern roots (often the greater part of the fraction) with a variable content of charcoal and sometimes a little sand or gravel. The results of assessment of these samples are presented in Table 1, in which comments on material sorted from the >4mm fraction of the residue are incorporated. In most cases only a few specimens of charcoal were examined for the purposes of identification (usually about five specimens per sample).

(ii) samples of charcoal collected for dating by radiocarbon assay, if suitable.

These samples were examined and their content of charcoal noted, identifications and some assessment of the size of the timber from which the charcoal came being made. Charcoal fragments were isolated as far as possible from any remaining sediment matrix (but, except in one case, without re-washing the samples) and the weight of charcoal measured using a digital balance capable of recording at the level of

milligrammes. The results of examining these samples are presented in Table 2.

### Comments on the plant material from Cawthorn Camps 2000

#### *Pre-Roman material (Phases 1-2)*

Plant remains from the samples from pre-Roman levels were extremely sparse and mostly confined to very small amounts of charcoal (usually as rather small fragments). There were a very few charred grass caryopses and cereal grains (the latter not identified beyond *Triticum*, wheat, at this stage, and a few fragments of charred hazel (*Corylus avellana* L.) nutshell. It is possible that some of the charcoal samples collected from these levels for dating may be large enough to yield a date by Accelerator Mass Spectrometry.

#### *Early Roman (Phase 3)*

A number of the samples from this phase yielded quite large assemblages of charcoal, and several (e.g. from the fills of ?hearths 1232 and 1241 and the fill in hearth/pit 149/2301) might be worth examining in more detail to investigate the kinds of fuel being burnt in these hearths (it is clear from the analyses to date that several kinds of wood provided fuel). Small amounts of charred cereal grains (including both wheat and barley, *Hordeum*), were also present, as well as a few weed seeds and a little hazel nutshell, but probably none of the assemblages is large enough to be worth recording in detail. The same is true of the samples from oven fills of Phase 3b, where charcoal concentrations were only rather modest. Certainly no remains of chaff were observed in any of the samples, so we seem likely to be dealing with waste from food storage or preparation, rather than either burnt straw (e.g. from litter, fuel or

roofing) or crop processing waste.

Several of the samples for dating from this phase appear likely to be suitable, especially the material which was apparently from roundwood rather than large stems (though there was no twig material in any sample).

#### *Late Roman (Phase 4)*

Amongst the traces of charcoal in the samples from the single context dated unequivocally to Phase 4 were some charred heather (*Calluna vulgaris* (L.) Hull) root fragments which presumably relate to some period of burning, perhaps in relatively recent times; the presence of traces of modern uncharred heather flowers and beetle remains in one of the samples perhaps suggests all these remains are intrusive (the deposits were presumably shallow).

#### **Recommendations for further work**

It is suggested that it may be useful to make a survey of the types of tree represented by charcoal in a selection of the samples from the Phase 3 deposits and to check the identifications, as far as possible, of the few charred cereals in the samples from this phase, as a proper record for the archive. For the latter, it will be useful to check the <4 mm fractions of the residues of perhaps five samples.

It is anticipated that this work would require a total investment of no more than five days to complete an archive report and a brief summary for publication.

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Table 1. Bulk-sieved samples from Cawthorn Camps 2000: results of examination of washovers. Phases: 1—Pre-Roman; 2—Pre-Roman; 3—Early Roman (c AD 80-120+); 4—Roman period decay/destruction (AD 120+); 6—Destruction, decay and exploitation (post early-medieval occupation includes pre-1920's forestry). '+' in charcoal volume column indicate quantities of a few cm<sup>3</sup> or less; '-' in charcoal id column indicates no identification of material was attempted but does not preclude that material may be identified if necessary. A single small find sample (from Context 1189) is also included.

Phase	Context type	Context	Sample	Vol. (L)	Mesh (µm)	Charcoal vol. (cm <sup>3</sup> )	Charcoal ids/size	Other charred remains (including max dimension for nutshell fragments)
1	fill in pit 1170	1171	1940	10	250	+	- (5)	-
	layer sealing 2208	1189	sf2047	-	-	-	-	spot find of charred hazel nutshell (10)
	fill in pit 1252	1253	1917	20	500	+	- (10)	-
	fill in pit 1360	1361	1968	40	250	-	-	-
		1362	1969	40	250/500	+	- (10)	-
	layer	1454	1971	20	250/500	+	- (5)	-
	layer	1455	1972	10	500	+	- (10)	-
	layer	1456	1973	10	500	-	-	-
1b	fill in pit 1350	1355	1942	5	250	+	- (5)	-
	fill in pit 1351	1356	1943	5	250	+	- (5)	-

Phase	Context type	Context	Sample	Vol. (L)	Mesh (µm)	Charcoal vol. (cm <sup>3</sup> )	Charcoal ids/size	Other charred remains (including max dimension for nutshell fragments)
	fill in pit 1357	1357	1944	10	250	+	- (5)	-
	fill in pit 1353	1358	1945	10	250	+	- (5)	-
	fill in pit 1354	1359	1946	10	500	+	- (10)	-
1?	fill in pit 1066	1067	1908	8	250	+	- (10)	single grain of <i>Bromus</i> and a few <i>Triticum</i>
	fill in pit 1068	1069	1907	10	250	+	incl. <i>Salix/Populus</i> (15)	
1/3	fill in pit 1250	1251	1916	30	500	+	- (5)	-
	fill in pit 1255	1257	1930	10	250	+	- (10)	-
	fill in pit 1263	1266	1941	5	250	+	- (10)	-
	fill in pit 1277	1278	1961	8	250	+	- (2)	-
2	layer	1061	1913	40	250	+	- (5)	a single <i>Bromus</i> caryopsis
	buried turf	1139	1939	10	250	+	- (5)	-
	buried turf = 1176	1175	1934	40	250	+	- (10)	-
	buried turf = 1175	1176	1922	40	250	+	- (10)	-
	layer	1511	1954	40	500	+	incl. <i>Quercus</i> (10)	<i>Corylus</i> nutshell (5); some fragments recovered from the residue as 'seeds?' included further hazel nutshell and some modern root bark

Phase	Context type	Context	Sample	Vol. (L)	Mesh (µm)	Charcoal vol. (cm <sup>3</sup> )	Charcoal ids/size	Other charred remains (including max dimension for nutshell fragments)
2-3	fill in pit 1256	1258	1931	10	250	+	- (5)	-
	layer	1320	1903	40	500	+	incl. <i>Fraxinus</i> (10)	material recovered from residue as ‘?nut shell’ was modern root bark
3	fill in ?hearth 1232	1225	1904	30	500	~120	incl. <i>Alnus</i> and <i>Fraxinus</i> (10)	a few fragments of <i>Corylus</i> nutshell (5) recovered from residue
			1951	10	250/500	~300	incl. <i>Fraxinus</i> (15), ? <i>Betula</i> (10)	traces of well-preserved <i>Hordeum</i> grain, <i>Rumex</i> nutlets, charred bark (20)
		1233	1952	10	250	~200	incl. <i>Fraxinus</i> (25), <i>Quercus</i> (15), ? <i>Betula</i> (10), ? <i>Corylus</i> (15)	-
	fill in ?hearth 1241	1240	1906	20	500	~900	incl. <i>Alnus</i> (30), <i>Fraxinus</i> (15), <i>Quercus</i> (25)	‘wood (twigs)’ recovered from residue were modern woody roots
			1953	20	250	~200	incl. <i>Fraxinus</i> (10),	traces of <i>Triticum</i> , <i>Hordeum</i> (incl. <i>H. vulgare</i> ), and ? <i>Avena</i> , showing varied preservation; one small (<5mm) charred leguminous cotyledon;
	layer	1249	1915	40	250	+	- (5)	-
	layer	2303	1977	10	500	~200	incl. <i>Fraxinus</i> (20), ? <i>Corylus</i> (15)	traces of <i>Hordeum</i> , tentatively identified <i>Triticum</i> and <i>Secale</i> , and <i>Corylus</i> nutshell (10)
	hearth (= 152)	2304	1979	10	500	~25	- (15)	a single charred <i>Hordeum</i> ; the residue yielded traces of <i>Corylus</i> nutshell (10), and ?burnt bone fragments (30) as well as some ?burnt soil and ?iron pan in concreted lumps (30)

Phase	Context type	Context	Sample	Vol. (L)	Mesh (µm)	Charcoal vol. (cm <sup>3</sup> )	Charcoal ids/size	Other charred remains (including max dimension for nutshell fragments)
	fill in hearth/pit 149/2301 (= 148)	2305	1978	10	250	~160	incl. some <i>Quercus</i> (30), and traces of <i>Salix/Populus</i> (15)	trace of <i>Corylus</i> nutshell; material from residue comprised reddened concreted sediment containing a little charcoal, perhaps burnt soil
	fill in hearth/pit 149/2301	2306	1980	10	500	+	incl. <i>Quercus</i> (10)	traces of <i>Corylus</i> nutshell
3a	layer in rampart of Camp C	1114	1935	30	250	+	- (5)	one <i>Triticum</i> grain
	turf developed on berm between ditch upcasts	1123	1923	40	250	+	- (5)	-
	upcast forming counterscarp to inner ditch, Fort D	1125	1924	40	250	+	- (5)	-
	fill in ditch 1191	1162	1932	5	250	+	- (2)	-
	part of rampart 1184, Fort D	1168	1938	40	250	+	incl. <i>Quercus</i> (10), ? <i>Calluna</i> root (5)	-
	buried turf	1173	1921	30	250	+	incl. <i>Quercus</i> (15)	-
	layer	1339	1967	40	250/500	+	incl. <i>Fraxinus</i> (20)	-

Phase	Context type	Context	Sample	Vol. (L)	Mesh ( $\mu\text{m}$ )	Charcoal vol. ( $\text{cm}^3$ )	Charcoal ids/size	Other charred remains (including max dimension for nutshell fragments)
	layer	1344	1950	40	500	+	- (15)	-
	fill in gully 1577	1569	1974	40	500	+	incl. <i>Fraxinus</i> (30)	-
		1570	1975	10	250	~85	incl. <i>Fraxinus</i> (25), ? <i>Corylus</i> (30)	-
3b	rampart 1167, Fort D, 2nd phase	1137	1936	40	500	+	incl. ? <i>Calluna</i> root (5)	-
		1138	1937	40	500	+	incl. <i>Quercus</i> (10), ? <i>Calluna</i> (5) root	-
	fill in oven 1429	1431	1956	5	250	~50	incl. <i>Alnus</i> (10), <i>Corylus</i> (10)	traces of <i>Corylus</i> nutshell (10)
		1432	1957	5	250	+	incl. <i>Alnus</i> (5)	-
		1433	1958	10	250	+	incl. <i>Alnus</i> (15)	a single <i>Galium aparine</i> fruit
		1434	1959	5	500	+	incl. <i>Alnus</i> (20)	traces of <i>Corylus</i> nutshell (5) from residue
	fill in oven 1436	1437	1960	8	500	+	incl. <i>Alnus</i> (20)	-
	fill in oven 1533	1535	1962	10	500	~80	incl. <i>Corylus</i> and <i>Fraxinus</i> (10) and <i>Quercus</i> (20)	-
		1536	1963	10	250	~60	incl. <i>Salix/Populus</i> , ? <i>Pomoideae</i> and ? <i>Betula</i> (all 10)	a single <i>Hordeum</i> grain
		1537	1964	10	250	~85	incl. <i>Fraxinus</i> (15)	two ? <i>Hordeum</i> grains
1538		1976	10	250	~50	incl. <i>Quercus</i> (15)	-	



Phase	Context type	Context	Sample	Vol. (L)	Mesh (µm)	Charcoal vol. (cm <sup>3</sup> )	Charcoal ids/size	Other charred remains (including max dimension for nutshell fragments)
3-4	layer	1223	1919	40	500	+	- (2)	-
	turf wall 1206	1226	1918	40	500	-	-	-
	layer	1323	1920	40	500	+	- (10)	-
4	fill in depression 1220	1221	1901	40	500	+	? <i>Calluna</i> root (10)	modern <i>Calluna</i> flowers and beetles noted
		1224	1902	40	500	+	? <i>Calluna</i> root (5)	-
4/6	layer	1414	1955	20	500	+	- (10)	-

Table 2. Samples from Cawthorn Camps for dating by radiocarbon assay. In some cases (marked \*) the presence of more than a trace of matrix sediment present may be giving an unrealistically large weight. Unless otherwise stated, the material is charcoal. Where the prospect for dating by AMS is qualified with †, the material is less suitable (because of the species or size—and therefore age—of member from which it is thought to have come than in other cases).

Phase	Context type	Context	Sample	Weight of datable material (g)	Nature of material (including maximum dimension of largest fragments, in mm)	Prospect of dating by AMS	Prospect of dating by conventional radiometry
1	layer	1454	1988	12.17*	<i>Quercus</i>	good†	satisfactory
1?	fill in pit 1068	1069	1984	3.17*	<i>Quercus</i> (15), ? <i>Pomoideae</i> (10), not twig/roundwood	good†	borderline
36950	fill in pit 1263	1266	1985	0.99*	two fragments of <i>Quercus</i> (5)	borderline†	too small
36951	layer	1320	1970	-	lumps of sediment with a little very crumbly and/or distorted oak charcoal; probably not worth attempting to procure a date	poor†	too small
3	fill in ?hearth 1232	1225	1986	8.01	<i>Fraxinus</i> (15), ? <i>Betula</i> (30)	good	satisfactory
			1989	5.54	<i>Fraxinus</i> (25), probably all roundwood	good	satisfactory
		1233	1905	10.31	<i>Fraxinus</i> (15)	good	satisfactory

Phase	Context type	Context	Sample	Weight of datable material (g)	Nature of material (including maximum dimension of largest fragments, in mm)	Prospect of dating by AMS	Prospect of dating by conventional radiometry
	fill in ?hearth 1241	1240	1981	7.78	mostly <i>Fraxinus</i> (15), some ? <i>Betula</i> (15)	good	satisfactory
		1240	1987	4.55	rather crumbly; <i>Alnus</i> and <i>Fraxinus</i> (both 15)	good	satisfactory
	layer	1249	1914	-	a single piece of what appears to be peat (or at least humic material with some mineral sediment and modern roots)	probably not worth dating (if there is a possibility it is reworked?)	too small
	layer	2303	1982	2.46	five fragments of charcoal, probably all <i>Corylus</i> (2), from roundwood up to about 10 y/old	very good	borderline
	fill in hearth pit 149/2301	2306	1983	-	mineral sediment with modern rootlets and a very little charcoal, probably <i>Quercus</i> (a matter of a few mg, but may be difficult to extract easily as coherent fragments)	poor†	too small
3a	fill in stake-hole 1329	1333	1909	-	a single fragment of ?peaty sediment, certainly not charcoal	probably not worth dating	too small
	daub	1340	1911	1.89*	one fragment of ? <i>Corylus</i> (15)	good	too small

Phase	Context type	Context	Sample	Weight of datable material (g)	Nature of material (including maximum dimension of largest fragments, in mm)	Prospect of dating by AMS	Prospect of dating by conventional radiometry
		1340	1912	-	one fragment of unidentified charcoal (10) in a matrix of ?humic sediment	probably not enough to date	too small
3b	fill in oven 1533	1535	1965	9.41	<i>Corylus</i> (20), <i>Fraxinus</i> (15) and <i>Quercus</i> (35)	good (esp. if enough <i>Corylus</i> can be selected)	satisfactory
		1536	1966	3.08*	single fragments of ?Pomoideae (10) and ? <i>Prunus</i>	good	borderline
3a-4	layer	1316	1910	1.26*	a single fragment of ?diffuse-porous charcoal (15), very strongly fused except for one patch where vessels visible	good	too small