

**Channel Tunnel Rail Link
London and Continental Railways
Oxford Wessex Archaeology Joint Venture**

**The charred plant remains from Beechbrook Wood,
Hothfield, Kent (ARC BBW00)**

by John Giorgi

CTRL Specialist Report Series

2006

©London and Continental Railways

All rights including translation, reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means electronic, mechanical, photocopying, recording or otherwise without the prior written permission of London and Continental Railways

TABLE OF CONTENTS

1	INTRODUCTION	3
2	METHODS.....	3
3	RESULTS.....	3
3.1	Phase 3: Late Neolithic to early Bronze Age	4
3.2	Phase 4 to 5: Middle to late Bronze Age	5
3.3	?Phase 4 to 5: Middle to Late Bronze Age cremation	6
3.4	Phase 6: Middle Iron Age.....	7
3.5	Phase 7-8: Early Roman	8
4	DISCUSSION.....	9
5	BIBLIOGRAPHY.....	10

LIST OF TABLES

Table 1: The charred plant remains from Beechbrook Wood	11
---	----

1 INTRODUCTION

Several hundred environmental bulk soil samples were collected during excavations at Beechbrook Wood (ARC-BBW00) for the recovery of charred plant remains and charcoal. These samples were taken from a range of features including the fills of postholes, refuse pits, ditches, cremation deposits and industrial features, dating from the Mesolithic through to the early Roman period.

2 METHODS

The samples ranged in size from less than one litre (the fills of pots) to almost 50 litres with the majority being over 20 litres. The samples were processed by flotation with the flots being retained on a 0.25mm mesh. A total of 161 samples were assessed (Pelling 2003). On the basis of the assessment, it was recommended that charred plant remains from ten samples should be analysed. These were from the following features; four samples from the four fills of a late Neolithic to early Bronze Age (Beaker period) Pit [1374]; two samples from the fills [238], [1201] of two middle to late Bronze Age pits; two samples from the fills of two middle Iron Age Ditches [2182] and [2150]; and one sample from a cremation deposit [730], dated to the early Roman period. The remaining sample was from a cremation fill [1289], which has only been tentatively dated to the middle to late Bronze Age. The plant remains (sorted by staff at the Oxford Archaeological Unit) were identified, quantified, and recorded on the MoLAS ORACLE database.

3 RESULTS

The results are shown by sample in Table 1, which can be found at the end of the report. Over 2000 plant items were quantified although there was considerable variation between assemblages in the item frequency and species diversity of the charred plant remains. Thus, 65% of the quantified remains were found in the sample from the early Roman cremation deposit [730], while half of the samples contained less than ten quantified items. Preservation of the charred plant remains was variable.

The botanical remains consisted mainly of cereal grains (76% of the quantified remains) with a small amount of chaff fragments (4%) and a range of wild plants (20%). These calculations, however, do not take account of large quantities of very fragmented cereal grain (including loose embryos) in three samples, occasional oat (*Avena* spp.) awn fragments (also in three samples) and large amounts of hazel (*Corylus avellana*) nutshell and fragments of crab apple (*Malus sylvestris*) fruit in the fills of the late Neolithic to early Bronze Age Pit

[1374]. Charcoal was present in most of the samples, although mainly in small quantities with this material being analysed by another specialist. Assessment data will be used, when appropriate, in the following discussion. The results will be discussed by period.

3.1 Phase 3: Late Neolithic to early Bronze Age

All four samples from this period were from four fills [1375], [1376], [1377], [1409] of a Beaker period Pit [1374], with broadly similar charred plant assemblages being recovered from each sample.

The charred plant remains included large amounts of crab apple (particularly in fills [1376] and [1377]) and hazel nutshell. It is difficult to distinguish the remains of wild and cultivated apple although the early date of the context would suggest that the material is likely to belong to the wild species. The remains of crab apple included the seeds, very large amounts of pericarp fragments and the remains of a complete fruit (in two parts) in [1376] and possibly up to five fruits in [1377]. Some of the fruit seeds could only be identified as apple/pear (*Malus/Pyrus* spp.).

Other charred plant remains in these samples consisted of an acorn (*Quercus* sp.) cotyledon in [1377] and part of a hawthorn (*Crataegus monogyna*) fruit in [1409] with two charred cereal grains including one possibly of barley (cf. *Hordeum* sp.) in [1376]. There were moderate amounts of very fragmented charcoal in all the samples while intrusive botanical remains in these samples included rootlets and small amounts of uncharred seeds of mainly chickweeds (*Stellaria media*), bedstraw (*Galium* spp.) and goosefoots (*Chenopodium* spp.)

The botanical material in the samples from this pit include the burnt remains of consumed and unconsumed wild fruits, hazel nut and crab apple, showing the exploitation of wild food resources from the surrounding area. Both of these wild fruits are frequent archaeobotanical finds in both Neolithic and Bronze Age contexts in the British Isles (Moffet et al 1989, Robinson 2000) including a number of sites in Kent. For example, charred hazel nutshell and an apple seed were recovered from Neolithic pit fills at White Horse Stone (Giorgi 2006). The single acorn was presumably incidentally brought onto the site with the oak wood, which made up most of the charcoal from the site (Pelling 2003). Little comment may be made on cereal cultivation on the site on the basis of just two charred cereal grains, although barley has also been recorded from other sites of this period in southern England (Greig 1991).

The botanical material in the samples was probably incidentally deposited into the pit, possibly being windblown or as part of backfilling. Some of the charred material, specifically the fruit remains, found together with traces of cremated bone (between 1g and 4g) in two of the fills [1376] and [1377], may represent the residues of burnt food offerings.

3.2 Phase 4 to 5: Middle to late Bronze Age

Two samples were analysed from this phase; from middle to late Bronze Age pit fill [238] and from the fill [1201] of a late Bronze Age Pit [1220]. Almost all the charred plant remains were from pit fill [238], which produced several hundred quantified items while the other sampled fill [1201] produced very few charred plant remains. Both samples contained a moderate amount of very fragmented charcoal and also a low number of uncharred small seeds, for example, chickweeds, goosefoots, and rootlets.

Pit fill [1201]

The charred plant assemblage from the fill [1201] of a late Bronze Age Pit [1220] consisted of just a small amount of poorly preserved cereal fragments, one wheat spikelet base and oat awn fragment and a few charred weed seeds, indicative of cereal waste from activities possibly close-by, incidentally incorporated into the pit either as part of backfilling or as windblown remains.

Pit fill [238]

Ninety per cent of the quantified charred plant remains in fill [238] consisted of cereal remains, mainly grains (83%) and a little chaff (7%), mostly from hulled wheat plus a few oat awn fragments, while the other 10% was made up of seeds from a range of other plants.

The cereal grains consisted mainly of wheat (*Triticum* spp.) while there was just over half as much barley, with the well-preserved grains being identified as six-row hulled barley (*Hordeum vulgare*). Over a third of the grains, however, were not identifiable while there was also a large amount of cereal fragments, which were not quantified. Virtually all the identifiable wheat grains belonged to the hulled wheat, emmer (*Triticum dicocum*), the presence of which was confirmed by the identification of emmer glume bases. Only a few grains were identified as emmer/spelt (*T. dicocum/spelta*) while there was also a tentative identification of a spelt (*T. spelta*) glume base in the sample. Emmer and barley are the two best-represented cereals from the Bronze Age period in southern England (Greig 1991).

The other plants included two possible flax (cf. *Linum* sp.) seeds and 13 mainly small leguminous seeds, which, however, were only identified as vetch/tare/vetchling/pea (*Vicia/Lathyrus/Pisum* spp.). These plants may be from wild rather than cultivated species. The remaining seeds were from a small range of wild plants (individually poorly represented) of disturbed (including cultivated) ground and waste places, eg. *Polygonum* spp, dock (*Rumex* sp.), scentless mayweed (*Tripleurospermum inodorum*), ?cleaver (*Galium* cf. *aparine*) and grasses including brome (*Bromus* sp.). These weeds were probably accidentally harvested with the grain.

The plant assemblage from fill [238] represents an almost fully cleaned cereal crop of (de-husked) emmer and barley, possibly accidentally burnt while being prepared for milling or before storage or during the cooking of whole grains. The low density of the quantified remains suggests that the material was re-deposited, possibly as part of backfilling of the pit or as windblown remains. Some of the charred plant remains may have been deposited (as residues of a food offering) along with the very small amount of cremated bone (1g) in this pit.

3.3 ?Phase 4 to 5: Middle to Late Bronze Age cremation

One sample was analysed from the fill [1289] of a cremation burial near a field boundary ditch. This fill has not been dated, although another cremation [1294] nearby was radiocarbon dated to the middle to late Bronze Age.

This sample contained several hundred items, with most (94%) of the quantified remains consisting of seeds from a small range of wild plants which mainly grow in disturbed (including cultivated) ground and waste places. Many of these plants are likely to be cereal weeds. Over 60% (112) of the weed seeds were from corn spurrey (*Spergula arvensis*), a plant that is common in spring crops on sandy arable land, and is an indicator of acid soils (Hanf 1983). Some of the other plants in this sample, for example, knotgrass (*Polygonum aviculare*), black bindweed (*Fallopia convulvulus*), are also found in spring cereals and grow in sandy acidic soils, while scentless mayweed, a common arable weed, is found in heavy, more or less acidic, soils. There were also 17 leguminous seeds, none of which could be reduced to genus or species and may represent wild rather than cultivated pulses. The grasses included three tubers of false oat grass/onion couch (*Arrhenatherum elatius*). There was also a small amount of cereal remains with just ten grains, one possibly of wheat, which was confirmed by the presence of two hulled wheat glume bases, one of which was identified as spelt. The assemblage also contained a fairly large amount of fragmented charcoal and a small range of poorly represented uncharred weed seeds, mainly thistles (*Carduus/Cirsium* spp.), goosefoots and chickweeds.

There is not a particularly large amount of charred plant remains in this sample with the low density of remains suggesting that they may represent accidentally re-deposited or windblown cereal waste although the remains could also be the residues of weeds (from crop-processing) used as tinder together with the charcoal as fuel for the cremation. Onion couch has been found in other Bronze Age cremations from England, for example near Raunds, Northamptonshire.

3.4 Phase 6: Middle Iron Age

Two samples were analysed from this phase of the site from fill [2185] of Ditch [2182] and fill [2210] of Ditch [2150]. These two ditches were part of a middle Iron Age double enclosure. In addition to the charred remains there were small amounts of rootlets and occasional uncharred seeds, for example, oraches (*Atriplex* spp.).

Ditch fill [2185]

The sample from ditch fill [2185] produced virtually no charred plant remains with just one cereal grain, one leguminous seed, a hazelnut shell fragment and a small amount of very fragmented charcoal, with the remains probably representing background re-deposited (possibly windblown) food waste, possibly deposited at the same time as the traces (less than 1g) of cremated bone in the fill.

Ditch fill [2210]

The charred plant assemblage in ditch fill [2210] contained just over 60 quantified items with almost equal quantities of cereal grains, chaff fragments and seeds of other plants plus a very large amount of charcoal. The cereal grains were poorly preserved but included a few wheat (including emmer/spelt), six-row hulled barley and oat grains. The presence of both emmer and spelt in the sample was confirmed by the identification of a few of their diagnostic glume bases, while there was also a small number of barley rachis fragments. Both hulled wheats and barley are common cereals on Iron Age sites although it is not possible to establish whether the oats are wild or cultivated.

Over 65% of the remains of other plants were made up of leguminous seeds including 12 celtic beans/horsebeans (*Vicia faba*). The remaining seeds were from a few weeds of disturbed (including cultivated) ground and waste ground, for example, cleavers, bromes, and scentless mayweed. There was also a tentative identification of a tuber of false oat-grass/onion couch.

The charred remains in this sample consisted mainly of charcoal with only a very low item density of other charred plant remains from burnt cereals and other crop-processing waste, which were probably accidentally deposited in the ditch as part of backfilling or through natural windblown deposition. The charred plant remains may have been dumped together with the small amount of cremated bone (5g) in this ditch fill sample, a mix of the residues of food offerings (cereals, beans) and fuel (wild plants and charcoal) for the cremation. Onion couch (albeit poorly represented) is often found in association with cremations (see above).

3.5 Phase 7-8: Early Roman

One sample was analysed from this phase, from the fill [730] of a possible cremation burial at the terminus of an early Romano-British ditch. This sample produced the largest charred plant assemblage from the site with over a thousand quantified items consisting mainly of cereal grains (93% of the quantified remains) and only a few chaff fragments (1%) and seeds of other plants (6%). There was also a moderate amount of very fragmented charcoal plus some roots and a small number of uncharred weed seeds, for example, chickweeds, elder (*Sambucus nigra*).

The cereal grains consisted mainly of wheat with a smaller number of oats (and a few awn fragments) and only traces of six-row hulled barley. Preservation was variable although over a third of the grains could not be identified, while there was an exceptionally large amount of cereal fragments and loose cereal embryos, which were not counted. Almost all the identifiable wheat grains belonged to the hulled wheat, spelt, with only a very few emmer grains. Hulled wheats were also represented by a small number of chaff fragments including three spelt glume bases.

There was a moderate species range of weeds (individually represented by low numbers of seeds) of disturbed (including cultivated) ground and waste places, including a number of common arable weeds, for example, scentless mayweed, corn cockle (*Agrostemma githago*), *Polygonum* species, including *P. persicaria* (*P. persicaria/ lapathifolium*) and docks, including sheep's sorrel (*Rumex acetosella*). Many of these plants grow in (acidic) sandy loam soils rich in nutrients. Grasses were also represented in the sample and included tubers of false oat-grass/onion couch.

The charred plant remains from this sample represents a virtually fully cleaned cereal crop of (de-husked) spelt with only a little crop-processing waste. It is not possible to determine whether the oats are cultivated or wild species although the relatively large number of grains and the small quantity of other weed seeds could suggest that they were deliberately grown rather than simply being weeds of the other cereals. On the basis of a fairly high item density of charred remains and the presence of cremated bone (albeit limited to 2g) in the sample, it is possible that the grain was deliberately placed as a votive food offering, while the weeds (including onion couch) may represent the residues of material used as tinder together with the charcoal for fuelling the cremation.

4 DISCUSSION

The generally small amounts of charred plant remains in the analysed samples from Beechbrook Wood do not allow detailed comments to be made on either the agricultural economy of the site for each of the represented periods, or for comparisons in the range of plants between the different periods. The results from samples that were only assessed, but not analysed, also show low concentrations of plant remains, with occasional cereal grains in another 25 samples (including the presence of possible free-threshing wheat in the sampled fill [947] of a Bronze Age ring ditch) and a few chaff fragments in four other samples. Hazelnut shell was also present in another seven samples from pits and ditches ranging from the Bronze Age to the Iron Age while evidence of apple/pear was also found in a sample from a late Iron Age ditch fill [1479] (Pelling 2003).

The range of botanical material from the settlement does, however, reflect the general pattern for the use of wild and cultivated plant foods from sites in southern England over the periods from which samples were recovered; from the reliance on wild food resources for the early periods of the site (the late Neolithic to early Bronze Age) and the range of cereals for the later phases of the settlement, with a good representation of emmer and six-row hulled barley in the mid to late Bronze Age pit fill [238] and the predominance of spelt in the early Roman cremation fill [730]. Oats may have also been cultivated at the site in the early Roman period. There were only small amounts of weed seeds and a limited species range although these weeds suggest the cultivation of acidic sandy soils around the site.

The low quantities of charred plant remains in most of the samples probably represent re-deposited material from crop-processing activities and food preparation. In the case of the cremation deposits, however, some of the material may represent the residues of wild plants used as tinder, particularly onion couch, while fruit remains in the late Neolithic/early Bronze Age pit [1374], and the large cereal grain assemblage in the early Roman cremation deposit [730], may represent the burnt remains of food deposits.

5 BIBLIOGRAPHY

ADS, 2006 CTRL digital archive, Archaeology Data Service,
<http://ads.ahds.ac.uk/catalogue/projArch/ctrl>

Greig, J, 1991 The British Isles, in *Progress in Old World Palaeoethnobotany Balkema* (eds W Van Zeist *et al*), Rotterdam

Giorgi, J, 2006a The charred plant remains from White Horse Stone, in Giorgi, J and Stafford, E (eds) 2006b

Giorgi, J and Stafford, E (eds) 2006b Palaeoenvironmental evidence from Section 1 of the Channel Tunnel Rail Link, Kent, *CTRL scheme-wide specialist report series*, in ADS 2006

Hanf, M, 1983 The Arable Weeds of Europe, Ludwigshafen

Moffet, L, Robinson, M A, and Straker, V, 1989 Cereals, fruits and nuts: charred plant remains from Neolithic sites in England and Wales and the Neolithic economy, in *The beginnings of agriculture* (eds A Milles, D Williams and N Gardener), BAR Int Ser **496**, 243-61

Pelling, R, 2003 Appendix 1: Macroscopic plant remains and charcoal, in URS, Beechbrook Wood, Hothfield, Kent (ARC BBW00): Targeted watching brief assessment report, unpubl. report prepared by OAU for Union Railways (South) Limited, in ADS 2006

Robinson, M, 2000 Further consideration of Neolithic charred cereals, fruit and nuts, in *Plants in Neolithic Britain and Beyond* (ed A Fairbairn), Oxbow Books, 85-90

Table 1: The charred plant remains from Beechbrook Wood

	Phase	3	3	3	3	4,5	4,5	4,5	6	6	7,8
	Period	LN/EBA	LN/EBA	LN/EBA	LN/EBA	MBA/ LBA	LBA	?M- LBA	MIA	MIA	ERB
	Feature	pit 1374	pit 1374	pit 1374	pit 1374	pit	pit 1220	crem	ditch 2182	ditch 2150	crem
	Context	1375	1376	1377	1409	238	1201	1289	2185	2210	730
	sample	277	278	279	280	200	269	271	360	380	216
	vol. soil (l)	20	14	46	20	20	7	20	40	40	20
LATIN_NAME	ENGLISH										
Cereal grains											
<i>Triticum dicoccum</i> Schubl.	emmer					31					7
<i>T. cf. dicoccum</i>	?emmer					19				1	3
<i>T. spelta</i> L.	spelt										93
<i>T. cf. spelta</i>	?spelt										65
<i>Triticum dicoccum/spelta</i>	emmer/spelt					8				1	15
<i>Triticum spelta/aestivum</i>	spelt/bread/rivet wheat										9
<i>Triticum</i> sp(p).	wheat					39				1	388
cf <i>Triticum</i> sp(p).	?wheat					21		1		2	125
<i>Hordeum vulgare</i> L.	six-row hulled barley					42				2	2
cf. <i>Hordeum</i> sp(p).	?barley		1			26				1	
<i>Avena</i> spp.	oat										89
cf. <i>Avena</i> spp.	oat									2	29
Cerealialia	indet. cereal	1				96		9	1	11	473
Cerealialia	indet. cereal fragments					+++	++				++++
Cerealialia	loose cereal embryos										+++
	subtotal	1	1			282		10	1	21	1298
Cereal chaff											
<i>Triticum dicoccum</i> Schubl.	emmer glume base					9				2	
<i>T. cf. dicoccum</i>	?emmer glume base					2					
<i>T. spelta</i> L.	spelt glume base							1		3	3
<i>T. cf. spelta</i>	?spelt glume base					1					
<i>Triticum</i> spp.	wheat spikelet forks					2					
<i>Triticum</i> sp(p).	wheat spikelet base					2	1			1	4
<i>Triticum</i> sp(p).	wheat glume base					9		1		5	10
<i>Hordeum</i> spp.	barley rachis									9	
<i>Avena</i> spp.	oat awn					+	+				+
	subtotal					25	1	2		20	17
Other plants											
<i>Agrostemma githago</i> L.	corn cockle										4
<i>Stellaria media</i> sp.	chickweeds					3					
<i>Spergula arvensis</i> L.	corn spurrey							112			
<i>Atriplex</i> sp.	orache					1					
<i>Chenopodium/Atriplex</i> spp.	goosefoots/oraches										2
cf. <i>Linum</i> sp.	flax					2					
<i>Vicia faba</i> L.	?celtic bean/horsebean									4	
cf. <i>V. faba</i>	celtic bean/horsebean									8	
<i>Vicia/Lathyrus</i> spp.	vetch/tare/vetchling					4		2	1	2	2
<i>Vicia/Lathyrus/Pisum</i> spp.	vetch/tare/vetchling/pea					9		4			1
Fabaceae indet.	-							11		3	
<i>Crataegus monogyna</i> Jacq.	hawthorn				1						

	Phase	3	3	3	3	4,5	4,5	4,5	6	6	7,8
	Period	LN/EBA	LN/EBA	LN/EBA	LN/EBA	MBA/ LBA	LBA	?M- LBA	MIA	MIA	ERB
	Feature	pit 1374	pit 1374	pit 1374	pit 1374	pit	pit 1220	crem	ditch 2182	ditch 2150	crem
	Context	1375	1376	1377	1409	238	1201	1289	2185	2210	730
	sample	277	278	279	280	200	269	271	360	380	216
	vol. soil (l)	20	14	46	20	20	7	20	40	40	20
<i>Malus sylvestris</i> Miller	crab apple	2	1	33	3						
<i>M. sylvestris</i> Miller	crab apple pericarp		+++	+++							
<i>M. sylvestris</i> Miller	crab apple whole fruit		+	+							
<i>Pyrus/Malus</i> spp.	pear/apple	3	7	62	1						
<i>Polygonum aviculare</i> agg.	knotgrass							12			
<i>Persicaria lapathifolium</i> (L.) Gray	pale persicaria						1				
<i>Polygonum persicaria/lapathifolium</i>	persicaria										6
<i>Fallopia convolvulus</i> (L.) A. Love	black bindweed							7			
<i>Polygonum</i> spp.	-					3		12			4
<i>Rumex acetosella</i> agg.	sheep's sorrel										2
<i>Rumex</i> spp.	dock					1	1				7
Polygonaceae indet.	-					3	1	5			
<i>Corylus avellana</i> L.	hazelnut shell fragments	+++	+++	++++	+++						
cf. <i>C. avellana</i>	?hazelnut shell fragments								+		
<i>Quercus</i> sp.	oak acorn frags			+							
<i>Euphrasia/Odontites</i> spp.	euphrasia/red bartsia					2					2
<i>Galium aparine</i> L.	cleavers									3	
<i>G. cf. aparine</i>	?cleavers					1					
<i>Tripleurospermum inodorum</i> L.	scentless mayweed					1		1		1	11
Asteraceae indet.	-					1					17
<i>Luzula</i> sp. DC	woodrush										1
<i>Eleocharis palustris/uniglumis</i>	spike-rush										1
Cyperaceae indet.	-									1	
<i>Bromus</i> sp.	bromes					1					
cf. <i>Bromus</i> spp.	?bromes									3	
<i>Arrhenatherum elatius</i> (L.) Beauv.	false oat-grass/onion couch tubers							3			3
cf. <i>A. elatius</i>	?false oat-grass/onion couch									1	
Poaceae indet.	grasses					2		13			14
indeterminate	-	+	+	+		+	+	++	+	+	+
indeterminate	charcoal	+++	+++	+++	+++	+++	+++	+++	+++	++++	+++
	subtotal	5	8	95	5	34	3	182	1	26	77
	TOTAL	6	9	95	5	341	4	194	2	67	1392
	item density (per litre of processed soil (quantified remains only))	0.3	1.5	2	0.25	17	0.5	9.7	0.05	1.6	69.6

Key: LN/EBA = late Neolithic to early Bronze Age; MBA/LBA = middle Bronze Age to late Bronze Age; MIA = middle Iron Age; ERB = early Romano-British

+ = 1-10 items; ++ = 11-50 items; +++ = 50-100 items; ++++ = 100+ items