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

# Dating prehistoric to early medieval activity in Kent; a review of the radiocarbon dating

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## CTRL Schemewide Specialist Report Series 2006

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#### ABSTRACT

As a result of numerous excavations along the line of the Channel Tunnel Rail Link radiocarbon dating was undertaken on 16 sites and 149 radiocarbon results were acquired. These range from the Late Glacial to medieval periods. A specific set of research questions was set, and largely answered, by these results, but when combined as a single dataset they provide the opportunity to review both the absolute dating evidence for various episodes and types of activity along the CTRL route, and the internal chronology of those activities and associated assemblages.

For the Late Glacial period, radiocarbon dating of charcoal from a soil preserved in periglacial chalk deposits has provided further evidence for the occurrence of 'Allerød' soils under suitable preservational conditions in the SE of England. Mesolithic dates have been obtained, some unexpectedly, from several sites but are two few and widely spread (chronologically and spatially) to add much to our understanding of the chronology or location of Mesolithic sites in Kent.

The Neolithic suite falls clearly into two blocks, the earlier Neolithic (*c*.3950-3500 cal BC) encompassing an early Neolithic long house at White Horse Stone, and the later Neolithic, predominately Grooved Ware features, again at White Horse Stone. The Early Neolithic house is clearly dated to 3900-3750 cal BC and other dates from pits at Saltwood Tunnel indicate activity there at only a slightly later date. A clear gap exists in the data between the Plain Bowl Early Neolithic phases (3950-3370) and the dated Grooved Ware events at White Horse Stone and Eyhorne Street (2900-2400 cal BC).

A consistent series of dates for the Late Neolithic-Early Bronze Age confirms the use of several sites for inhumation burials associated with Beakers over a period spanning about 500 years around the turn of the 3rd millennium. Only sporadic, individual dates were obtained for the Early Bronze Age while dates from Bronze Age barrows on the route seem to indicate a chronological gap between burials at Saltwood Tunnel, Beechbrook Wood and Tutt Hill 156 in the first quarter of the 3<sup>rd</sup> millennium BC, and those from Whitehill Road Barrow and Tutt Hill 89 in the later part of the 2<sup>nd</sup> millennium BC.

Most dates obtained for the Middle to Late Bronze Age were from settlement features and include several on pottery residues or closely associated with pottery assemblages. These results provide the earliest date in Kent for grog-and flint-tempered vessels with fingertip decoration on the rim and will aid in the review of Middle Bronze Age pottery now required in Kent. Several of the Middle Bronze Age settlements have proved to be contemporaneous (within 100 years), with a clear gap in the radiocarbon chronology from *c*. 1250 to 1050 cal BC. Later pits at Tollgate, Cobham Golf Course, Saltwood Tunnel, Hurst Wood, and White Horse Stone are, again broadly contemporary (*c*. 1100-800 cal BC) in the Late (or later) Bronze Age. Cremation burials provide an essentially continuous series of dated activities with the majority falling in the Middle to Late Bronze Age time frame but extending into the Romano-British period.

Earlier Iron Age settlement activity occurred at White Horse Stone, Northumberland Bottom and Tollgate and can be differentiated from Middle and Late Iron Age settlement activity at Eyhorne Street, Cuxton and Beechbrook Wood. All dated Iron Age inhumation burials fall into the Early and Middle Iron Age and into the earlier group of settlements.

The Romano-British to Saxon activities are largely restricted to funerary activity on the two sites of Pepper Hill and Saltwood Tunnel and have enabled us to determine broad chronological trends in burial rites in the Romano-British cemeteries and for the development of the Saxon cemetery at Saltwood Tunnel.

#### Acknowledgements

The detail of this review was compiled from the 16 site based radiocarbon reports many of which were co-authored by the relevant project officers and other specialists, and I thank them all for their help and input. In particular I thank Elaine Morris and Grace Jones for information on the later prehistoric pottery, Julie Gardiner for advice and comment, and Karen Walker who copy-edited this report.

#### **1** INTRODUCTION

The CTRL assessment and post-excavation programme launched the largest radiocarbon programme of radiocarbon dating so far undertaken in Kent, encompassing 16 sites and 149 determinations from 158 submissions (Table 1). This review highlights some of the main chronological trends that are apparent when examining the radiocarbon suite as a whole; further themes regarding the dating of ceramic types are only touched upon here but are dealt with in more detail by E. Morris (in Booth 2006). This does not provide a complete chronological review, nor a review of all of the radiocarbon results, but highlights some of the important results and revisions to phasing and archaeological materials required as a consequence of this dating programme. This review will touch briefly on several themes dealt with in more detail elsewhere, but will dwell on the chronological information relating to earliest, latest, duration and contemporaneity of events, as derived from the radiocarbon results.

#### 1.1 Selection and Methods

As the 16 detailed site reports record, not all of the determinations received were useful, but the majority (i.e. over 140) were. The selection criteria for the post-excavation (see Allen & Bayliss 1995; Allen *et al.* 2004) were made after the assessment and were strict and time consuming, requiring detailed examination of taphonomy, context, material and individual item identification. Despite this rigour, it must be admitted that some results indicated that even this scrutiny was not strict enough. Archaeological interpretation of field events and context deposition were not as focused in all instances as they might have been, and interpretations of archaeological deposits vacillated, unfortunately sometimes being modified because of the resultant determination when, in fact, the contextual parameters should be the fixed framework into which the determinations are placed.

Despite this, by far the majority of the determinations were successful and met their original objectives as set out in the individual site reports, enabling us to make some significant, and profound, statements about the chronology of archaeology in Kent. This whole programme will, however, soon be augmented by another dating programme associated with sites based around the Thames (CTRL 2), and associated research programmes.

#### **1.2** The radiocarbon dating programme

A total of 149 results were obtained from 16 different sites (Fig. 1). Most sites received six or fewer determinations but four (White Horse Stone, Saltwood Tunnel, Pepper Hill and Beechbrook Wood), because of their complexity or the detailed chronological resolution required, had between 13 and 54 results, comprising 75% of the radiocarbon programme (Fig. 1).





Figure 2: Error margins of determinations comparing assessment phase and post-excavation results



#### 1.3 Radiocarbon Results

Not only was the archaeological selection and scrutiny of the material significantly more rigorous than for many other previous projects in Kent and south-east England, but the precision and accuracy of measurements within the radiocarbon laboratories is now also greater than previously. Where error ranges of  $\pm 50$  to 60 years were common and the norm less than 10 years ago, the majority (116; 78%) of the results from this project, largely submitted in 2004-5 have error ranges  $\leq 40$  years, and many (58%) are < 40 years. Even during the life of this project measurements precision increased; all 14 radiocarbon assessment results submitted between 1998-2002 had error margins greater than  $\pm 40$ years, averaging  $\geq \pm 55$ , while during the post-excavation phase (2004-5) the majority were  $\pm 30$  or less and averaging  $\pm 35$  (Fig. 2). This level of precision has facilitated more specific questions and distinction between phases throughout the project.

The suite of 149 radiocarbon results (Table 1, Appendix 1) is heavily biased against periods and episodes with well-dated artefacts making radiocarbon chronology redundant, and against periods where the nature of the events do not require detailed radiocarbon chronology. For instance, Mesolithic events are sparse and often only require placing into a broad chronological framework, while a sequence of evolving Bronze Age events and activities can be better articulated via a series of radiocarbon determinations than through often vague and poorly dated artefact chronologies. This review, by its nature, will therefore, retain these inherent biases. Nevertheless, the programme of dating not only amplified chronological resolution of a number of activities but, in several circumstances, identified episodes of activity not recorded in the artefactual record. This is also true of two late glacial episodes.

#### 2 LATE GLACIAL WINDERMERE INTERSTADIAL (ALLERØD)

Kent is well known for its late glacial 'Allerød' (Upper Dryas Phase 2/Windermere Interstadial) soils which have been reported in periglacial chalk deposits (e.g. Upper Halling Holborough, Kerney 1963; 1965: Brook, Kerney *et al.* 1964; and Holywell Combe, Kerney *et al.* 1980; Preece & Bridgland 1998; etc). Many of these soils have been studied in quarry sections or limited exposures by palaeo-geographers (e.g. Holborough), and have been dated using contained fragments of charcoal. A review of these in Kent (Preece 1994; Preece & Bridgland 1998) provides a series of over 15 determinations from four sites and indicates the regular, if not common, occurrence of microscopic charcoal from a whole array of sites. Indeed such is also true of late glacial Windermere interstadial soils outside Kent such as at Pitstone/ Marsworth, Buckinghamshire (Green *et al.* 1984), Westhampnett, West Sussex (Allen & Powell forthcoming) and Watcombe Bottom, Isle of Wight (Preece *et al.* 1995). This presence of charcoal, albeit in low and microscopic occurrences, may indicate the presence of human activity.

It is perhaps surprising that the Allerød soil excavated under controlled archaeological conditions at White Horse Stone produced very little charcoal, especially considering the much larger volume of material than that examined in all other Kent sites except perhaps Holywell Coombe (Preece & Bridgland 1998). This lack of charcoal makes the White Horse Stone 'Allerød' soil an exception in Kent. Yet fragments of charred uniseriate dicotyledenous material were recorded and dated providing a result of 11,130±48 BP (11500-10900 cal BC) within the range of other dated sites in Kent. Perhaps more surprising and significant was the indication of late glacial burning discovered incidentally by the radiocarbon programme, and from a site off the chalk. At Pepper Hill charred parenchyma from a cremation burial produced a result of 12,111±56 BP (13400-11700 cal BC), indicating the wider extent of this evidence that had not previously been identified. However, what this means in palaeo-environmental, palaeo-geographical or archaeological terms is unknown, but its presence may well be significant.

While the result from White Horse Stone falls comfortably within the typical range of other dated soils in southern England (i.e. 11,900-10,800 cal BC, see Table 2, Fig. 3), that from Pepper Hill falls earlier, and into an episode that is, on the Continent, considered to be the 'Bølling' Interstadial (Iversen 1954). But two decades of research of organic sequences in upland Britain have generally failed to distinguish or separate the 'Bølling' (*c*. 12,000-13,500 cal BC) from the 'Allerød' (*c*. 11,000-12,000 cal BC) Interstadials using pollen analysis.

	Material	Laboratory	<b>Result BP</b>	Cal BC	Range
Site		number			
Westhampnett, W. Sx	Pinus + Betula	OxA-4167	10,840±100	11200-10650	550
Westhampnett, W. Sx	Betula + Rosacea	AA-11679	10,870±80	11190-10690	500
Westhampnett, W. Sx	cf. Betula	OxA-4166	10,880±110	11250-10650	600
Upper Halling, Kent	cf. Betula	OxA-3236	10,900±120	11250-10650	600
Pitstone, Bucks	charcoal	OxA-415	10,900±130	11250-10650	600
Dover Hill, Kent	Betula	OxA-3239	11,100±100	11500-10700	800
White Horse Stone, Kent	uniseriate	NZA-22046	11,130±48	11500-10900	600
	dicotyledenousmaterial				
Brook borehole III, Kent	charcoal	AA-10706	11,170±70	11500-10900	600
Dover Hill, Kent	Betula	OxA-3238	11,220±110	11850-10950	900
Upper Halling, Kent	cf. Betula	OxA-3237	11,240±110	11850-10950	900
Holywell Coombe, Kent	charcoal	OxA-2089	11,370±150	11900-11000	900
Holywell Coombe, Kent	Arianta snail shell	OxA-2159	11,430±100	11900-11050	850

Table 2: Radiocarbon determinations for Allerød buried soils (data from Evans 1986; Kerney 1963; Preece 1991; 1994; Preece & Bridgland 1998; Preece et al. 1995; Allen & Powell forthcoming)

	Material	Laboratory	<b>Result BP</b>	Cal BC	Range
Site		number			
Holywell Coombe, Kent	Arianta snail shell	OxA-2158	11,430±110	11900-11050	850
Holywell Coombe, Kent	'reduced carbon'	OxA-2353	11,520±90	11900-11200	700
Holywell Coombe, Kent	Carex/Scirpus fruits	OxA-2345	11,530±160	12100-11000	1100
Dover Hill, Kent	charcoal	Q-463	11,550±135	12100-11050	1050
Brook (Pit A), Bucks	Betula	AA-10708	11,575±75	12000-11200	800
Holywell Coombe, Kent	charcoal	OxA-2242	11,580±100	12050-11200	850
Holywell Coombe, Kent	humic acids	OxA-2352	11,600±100	12100-11200	900
Watcombe Bottom, IoW	charcoal	OxA-3235	11,690±120	13200-11200	2000
Holywell Coombe, Kent	Arianta snail shell	OxA-2479	11,810±120	13300-11400	1900
Pepper Hill, Kent	charred parachyma	KIA-23923	12,111±56	13400-11700	1700
Holborough, Kent	charcoal	Q-473	13,180±230	14600-12600	2000

#### **3** LATE GLACIAL/POSTGLACIAL TRANSITION

One other determination provided evidence of burning, and therefore possibly human activity, in the Late Glacial/Postglacial transition; a period typically dominated by long blade industries. This was again from Pepper Hill where a charred tuber from a cremation burial produced a result of 10,302±46 BP (10,750-9800 cal BC), but for which there is no complementary artefactual evidence. This single result is, however, particularly significant for Kent, as apart from the recently discovered long blade industries and important palaeo-environmental evidence from Underdown Lane, Herne Bay (Wessex Archaeology 2003), the county is largely devoid of evidence for this period. Sites at Springhead West and Ickham have flint industries of comparable date, but other examples are single diagnostic flints such as the bruised blade from the River Beult at Linton. The result highlights the potential of these large radiocarbon dating programmes for the incidental identification of events and activities not otherwise represented by artefacts or deposits.

	Atmospheric data from Stuiver et al. (1998); OxCal v3.9 Bro	nk Ramsey (2003); cub r:4 sd:12 prob	usp[chron]	
Westhampnett	OxA-4167 10840±100BP			
Westhampnett	AA-11679 10870±80BP			
Westhampnett	OxA-4166 10880±110BP			
Upper Halling	OxA-3236 10900±120BP			
Pitstone	OxA-415 10900±130BP			
Dover Hill	OxA-3239 11100±100BP			
White Horse Stone	NZA-22046 11130=48BP			
Dover Hill	AA-10706 11170±70BP			
Unner Halling	OxA-3238 11220±110BP			
Holywell Coombe	OxA-3237 11240±110BP			
Holywell Coombo	OxA-2089 11370±150BP			
Holywell Coombe	OxA-2159 11430±100BP			
Holywell Coombe	OxA-2158 11430±110BP			
Holywell Coombe	OxA-2353 11520±90BP	i		
Holywell Coombe	OxA-2345 11530±160BP			
Dover Hill	Q-463 11550±135BP	i		·
Brook (pit A)	AA-10708 11575±75BP	i		
Holywell Coombe	OxA-2242 11580±100BP			
Holywell Coombe	OxA-2352 11600±100BP			
Watcombe Bottom	OxA-3235 11690±120BP			
Holywell Coombe	OxA-2479 11810±120BP			
Pepper Hill	KIA-23923 12111±56BP			
<u>Holborough</u>	Q-473 13180±230BP			
180	000CalBC 16000CalBC	14000CalBC	12000CalBC	10000CalBC
		Calibrated date	•	

Figure 3: Radiocarbon distributions of dated Allerød events in south-east England (sites in Kent underlined)

#### 4 MESOLITHIC

As with the unexpected find of burning in the Late Glacial/Postglacial transition, one anomalous result from the Beechbrook Wood ring ditch indicated burning of alder/hazel charcoal in the later Mesolithic 6020-5840 cal BC (7072±35 BP). The radiocarbon dated Mesolithic activity (Fig. 4), however, clearly spans the entire Mesolithic period, showing no clustering or contemporaneity between sites (Fig. 4).

#### Figure 4: Mesolithic determinations from the project



The two dated pine charcoal fragments, residual within the postholes of the early Neolithic long house at White Horse Stone, are typically earlier Mesolithic (Table 3), and compare well with the few other dates on the chalk. The presence of pine has been argued to confirm that the typical post glacial vegetation success continued over the chalk, but that thicker brown earths at least must have prevailed then, as pine will not survive well on thin rendzina soils (Allen 1988; 1995a). There seems to be no relationship between site location and date (Table 3).

Table 3. Dated pine on the chalklands of southern England (sources Allen 1992; 1995b; Allen and Bayliss 1995; Bell 1983; Mercer and Healy forthcoming)

Location	Material	Lab ref	Radiocarbon	Calibrated date range
			age (BC)	(2δ) cal BC
Stonehenge carpark, Wi	ilts			
Postpit B	Pinus charcoal	HAR-456	8090±140	7500 - 6650
Postpit 9580, tertiary	Pinus charcoal	OxA-4920	8400±100	7600 - 7170
Postpit 9850, secondary	Pinus charcoal	OxA-4919	8520±80	7750 - 7350
Postpit 9580, secondary	Pinus charcoal	GU-5109	8880±120	8300 - 7600
Postpit A	Pinus charcoal	HAR-455	9130±180	8800 - 7700
Hambledon Hill, Dorset	<b>,</b>			
post-hole F279	Pinus sylvestris charcoal	OxA-7845	8400±60	7580 - 7350

Location	Material	Lab ref	Radiocarbon	Calibrated date range
			age (BC)	(2δ) cal BC
post-hole F279	Pinus sylvestris charcoal	OxA-7846	8480±55	7800 - 7370
post-hole WOWK82	Pinus sylvestris charcoal	OxA-7816	8725±55	8200 - 7600
Itford Bottom, East Su	issex			
Treehollow	Pinus charcoal	BM-1544	8770±85	8250 - 7600
White Horse Stone, Ke	ent			
posthole 4834	Pinus charcoal	NZA-21381	8516±35	7600 - 7520
posthole 5113	Pinus charcoal	NZA-21349	9182±40	8530 - 8280
Strawberry Hill, Wilts				
Ditch 15	Pinus charcoal	OxA-3040	9350±120	9150 - 8250

#### **5** NEOLITHIC

A suite of 32 determinations can be ascribed to the Neolithic period (*c* 2400-4000 cal BC), and a further 13 to the late Neolithic-early Bronze Age (*c* 2400-1800 cal BC). The Neolithic suite falls clearly into two blocks, the earlier Neolithic (*c* 3950-3500 cal BC) encompassing the early Neolithic long house at White Horse Stone, and the later Neolithic, predominantly Grooved Ware features, at White Horse Stone (Fig. 5).

The early Neolithic long house and two hearths within it are clearly dated to 3900-3750 cal BC (Allen *et al* 2006). Only one other determination is broadly contemporary with that activity. Charred residue on a transitional middle to late Bronze Age pottery sherd (PRN 1139) from Tutt Hill gave a date of 3790-3640 cal BC (4936±40 BP), but as we cannot be sure precisely what the residue contains we must consider that older carbon has been included and have discounted this result. Two pits from Saltwood tunnel, however, produced consistent results only slightly later than the White Horse Stone long house. Pits 136 (4775±30 BP) and 175 (4742±30 BP) date to 3650-3370 cal BC. Apart from one determination from Peterborough Ware pit 2507 at Little Stock Farm (3350-3050 cal BC, 4482±35 BP), there are no other dated Peterborough Ware phase contexts, and a clear gap exists in the data between the Plain Bowl early Neolithic phases (3950-3370) and the dated Grooved Ware events (2900-2400 cal BC), see Figure 5.

A clear phase of 'Grooved Ware'-dated events can be seen which includes a number of pits at White Horse Stone, and the only dated event outside this site is posthole 19 from structure 66 at Eyhorne Street.

Figure 5: Radiocarbon	distributions	of the main	dated N	eolithic	events
(GW = Grooved Ware; FV	V = Food vesse	el; LH = Long	g House)		

Eyhorne Street	posthole 19 4044±35BP	
White Horse Stone	GW pit 904 4046±35BP	
White Horse Stone	GW pit 4994 4080±35BP	
White Horse Stone	GW pit 911 4097±30BP	
White Horse Stone	GW pit 958 4113±35BP	
Eyhorne Street	posthole 19 4113±40BP	
White Horse Stone	GW pit 958 4120±35BP	
White Horse Stone	posthole 5008 4137±30BP	
White Horse Stone	GW pit 913 4153±40BP	
White Horse Stone	GW pit 4943 4155#30BP	
White Horse Stone	pit/hollow 5072 4161±30BP	
White Horse Stone	FV pit 5125 4189±30BP	
White Horse Stone	pit/treehole 861 4193±25BP	
White Horse Stone	pit/hollow 5072 4195±35BP	
White Horse Stone	GW pit 5256 4196#60BP	
White Horse Stone	pit 952 4228±35BP	
White Horse Stone	pit 4956 4230±35BP	
White Horse Stone	pit 5094 4238±35BP	
White Horse Stone	pit/hollow 5072 4271±35BP	<u> </u>
Little Stock Farm	pit 2507 4482±35BP	<del></del>
Saltwood Tunnel	pit SG175 4742±30BP	
Saltwood Tunnel	pit SG136 4775±30BP	
White Horse Stone	LH p/h 4817c 4911±60BP	
Tutt Hill	pit 14 4926±40BP	
White Horse Stone	LH p/h 4820 b 4949±30BP	
White Horse Stone	LH p/h 4817ch 4974±60BP	
White Horse Stone	LH p/h 5280 5007#75BP	
White Horse Stone	LH p/h 4902 5028#30BP	
White Horse Stone	hearth 4874 5039±25BP	
White Horse Stone	LH p/h 4817b 5067±30BP	
White Horse Stone	LH p/h 4820c 5123±30BP	
White Horse Stone	hearth 4830 5165±31BP	

Atmospheric data from Stuiver et al. (1998); OxCal v3.9 Bronk Ramsey (2003); cub r.4 sd:12 prob usp[chron]

5000CalBC 4500CalBC 4000CalBC 3500CalBC 3000CalBC 2500CalBC 2000CalBC Calibrated date

#### 6 LATE NEOLITHIC-EARLY BRONZE AGE (c 2300-1900 CAL BC)

The late Neolithic–early Bronze Age or Beaker period (c 2300-1900 cal BC) is represented by a consistent and coherent groups of ten determinations (Fig. 6) from five different sites. Barrows 156 (Tutt Hill) and 851 (Beechbrook Wood) can be seen as contemporary. Also belonging to this phase are inhumation burials at Northumberland Bottom, grave 4507 at Saltwood Tunnel, and pit 1374 (Beechbrook Wood), pit 23 (Eyhorne Street), and posthole 70 (Eyhorne Street). Grave C4619 at Saltwood Tunnel is slightly later than the rest of this suite. The dated elements of this phase span a period of about 2450 to 1950 cal BC (Fig. 6), with the majority being statistically indistinguishable at the 95% confidence limit (Ward & Wilson 1978). Only the 'rogue' result from pit 1374 at Beechbrook Wood, and grave 4676 at Saltwood Tunnel fall outside this main range of c 2300 to 2075 cal BC.

#### 7 EARLY BRONZE AGE (1900-1500 CAL BC)

Unlike the discrete phase of 'Beaker' events (*c* 2300-1900 cal BC) seen on a several sites, there is no such consistency with the early Bronze Age group (Fig. 7). The dated events span the period of about 2150 to 1500 cal BC with few events being contemporary, and most being single isolated dated events at single localities.

There is little evidence from the radiocarbon dated events of activity occurring contemporaneously on sites, rather the evidence indicates a succession of events at different locations including burial, funerary monuments, and more domestic or occupation related activity. The majority of the dated events were, however, funerary-related, see below..

Dated barrows, therefore, occur in the 'Beaker' phase (Tutt Hill and Beechbrook Wood) and the early Bronze Age phase (Tutt Hill). Other barrows were dated by artefactual evidence (e.g. Saltwood Tunnel) and belong to these phases.

#### 7.1 Bronze Age Barrows

A selection of barrows across the scheme were radiocarbon dated. Many were not radiocarbon dated as the dating evidence within them, or the resolution of the chronological questions posed, did not require absolute dates. Nevertheless five barrows from four sites were dated, and those selected for dating fall into two clear chronological groups. Those at Saltwood Tunnel, Beechbrook Wood and Tutt Hill 156 all fall in the first quarter of the third millennium BC, while the two dated from Whitehill Road Barrow and Tutt Hill 89 fall at least 300 years later in the later part of the second millennium BC (Fig. 8). Whether this chronological gap is real or not is difficult to define from this small sample, but it does indicate the potential of examining chronological development, 'phases' of activity and inactivity in monument building from well-dated monuments within a region.



Figure 6: Radiocarbon distributions of 'Beaker' events









#### 8 MIDDLE TO LATE BRONZE AGE EVENTS

A series of ten results fall into the Middle Bronze Age (Fig. 9) encompassing a number of sites and events. In broad terms these range from c 1550 to 1250 cal BC, and apart from a cremation burial from Beechbrook Wood (see below) with no dated events falling into the later middle Bronze Age time frame. The events ranged from ditches, domestic pits structures and cremation burials, indicating a number of activities probably within a 250 year time span. Cremation burial 98 from Tutt Hill (3094±40 BP, 1440-1210 cal BC), is the earliest dated cremation event on the project.

More significant within this time frame is that four results are on pottery residues, and two others were associated with diagnostic pottery assemblages; typically globular urns, urn/jars and cooking jars, typically in flint-tempered fabrics. These results provide the earliest date in Kent for grog-and flint-tempered vessels with fingertip decoration on the rim (E. Morris in Booth 2006), and will aid in the review of Middle Bronze Age pottery now required in Kent (E. Morris in Booth 2006). The middle to late Bronze Age transitional phase (c 1200-900 cal BC) defined in the pottery assemblages could not be confirmed by radiocarbon dating because of the lack of suitable associated material with which to date these ceramic events. The difficulty in defining these pottery associations was shown when a number of vessels thought to belong to this phase were demonstrated to fall chronologically outside this range. These included a transitional vessel (thought to be 1050-900 cal BC) and a straight-sided jar (thought to be 1150-900 cal BC) from Beechwood Brook which dated to c 1400-1250 cal BC, and a straight-sided jar from Cobham Golf Course (thought to be 1100-900 cal BC) which dated to 980-820 cal BC. Similarly shouldered jars at Saltwood Tunnel dated to both middle (1520-1310 cal BC) and late Bronze Age (1130-900 cal BC) periods. Thus the radiocarbon dates have helped in defining this chronology, but further review is required (E. Morris in Booth 2006).

In terms of middle and late Bronze Age settlement, the radiocarbon dates enable us to indicate that pits representing settlement activity at White Horse Stone, Beechbrook Wood, Saltwood Tunnel and Cobham Golf Course are all contemporary within 100 years and span about 1525-1250 cal BC, firmly in the middle Bronze Age. There is a clear gap in the radiocarbon distributions and thus in the dated events from c 1250 to 1050 cal BC (Fig. 10). Later pits at Tollgate, Cobham, Saltwood Tunnel, Hurst Wood, and White Horse Stone are all broadly contemporary (c 1100-800 cal BC) in the late (or later) Bronze Age.



Figure 9: Middle Bronze Age radiocarbon distributions



Tollgate pit 374 2624±35BP			
Cobham pit 137 2741±30BP			
Hurst Wood pit 226 2742±45BP			
Saltwood pit 3910 2746±30BP			
Saltwood pit 6658 2769±30BP			
White Horse pit 5421 2804±40BP			
Saltwood pit W207 2847±35BP			
White Horse pit 5415 3064±50BP			
Beechbrook pit 241 3081±30BP			
Beechbrook pit 1201 3112±30BP	-		
Saltwood pit 5366 3146±35BP	-		
Cobham ditch 197 31 <u>91±40BP</u>	-		
2000CalBC 1500CalBC 100	0CalBC	500Call	BC
Calibrated date			

#### 8.1 Cremation burials

One tradition that spans both the later Bronze Age and the Iron Age is cremation. A number of cremation burials were dated and, excluding those at the cemetery at Pepper Hill, most were isolated or associated with small local settlement side cemeteries. The earliest dated cremation burials in the project are middle Bronze Age (Tutt Hill 3094±40 BP, 1440-1220 cal BC and Saltwood Tunnel 3063±30BP, 1410-1210 cal BC). The distribution of dated cremation burials (Fig. 11), however, indicates a tradition continuing from the middle Bronze Age through to the Romano-British period. The dated events provide an essentially continuous series of dated activities (Fig. 11), with the majority falling in the middle to late Bronze Age time frame and including those at White Horse Stone, Beechbrook Wood, Saltwood Tunnel and Tutt Hill. From this biased evidence at least, there is no indication of this tradition belonging to any specific time frame other than later prehistory and Romano-British periods (Fig. 11).

#### 9 IRON AGE ACTIVITY

A series of radiocarbon results was obtained in an attempt to define chronological relationships and contemporaniety within sites, particularly at White Horse Stone. Although the features selected by the archaeologists at the latter were all clearly thought to fall later than the radiocarbon plateau (*c* 800/750-400 cal BC), this was not the case. Most of the 14 determinations from White Horse Stone for the Iron Age settlement and industrial activity fell within the radiocarbon plateau, making it impossible to attempt to chronologically separate different activities in the various areas of the site. Nevertheless, 17 results from six sites show that earlier Iron Age settlement activity occurred at White Horse Stone, Northumberland Bottom and Tollgate and can be differentiated from middle and late Iron Age settlement activity at Eyhorne Street, Cuxton and Beechbrook Wood (Fig. 12). There are, for instance, no late Iron Age non-funerary radiocarbon results from any of those sites with results also falling on the radiocarbon plateau (i.e. White Horse Stone, Northumberland Bottom and Tollgate, see Fig. 12).

Five Iron Age inhumation burials or densities of unburnt human remains were dated from three sites (Fig. 13). All of the dated remains fall into the early and middle Iron Age and into the earlier group of settlement evidence (see Fig. 12), rather than the later Iron Age settlement phase.



Atmospheric data from Stuiver et al. (1998); OxCal v3.9 Bronk Ramsey (2003); cub r:4 sd:12 prob usp[chron]		
Beechbrook 1344 1728±40BP		1 1
Northumberland 2163 1968±40BP		I I
White Horse 6130 $2279\pm60$ BP		I I
Saltwood 1699 2402±30BP		1 1
Saltwood 1746 2499±30BP		1 1
White Horse 948 2791±35BP		1 1
White Horse 654 2868±35BP		I I
Beechbrook 1294 2870±30 <u>BP</u>	+	I I
Beechbrook 1290 2921±40BP		1 1
Saltwood 3602 3063±30BP		I I
Tutt Hill 98 3094±40BP	+	1 1

2500CalBC 2000CalBC 1500CalBC 1000CalBC 500CalBC/CalAD500CalAD

Calibrated date

Figure 12: Radiocarbon distributions of Iron Age settlement activity

500CalBC	1000CalBC	500CalBC	CalBC/CalAl	D 500CalAl
White Horse pi	t 8037 2527±40			
White Horse pi	t 2130 _2507±50			
N'umberland pi	t 156 2506±35B			
White Horse pi	t 4561 2469 <u>±40</u> B			
White Horse pi	t 4067 2429±55B			
White Horse st	r 4391 2409 <u>±40B</u>			
White Horse pi	t 2119 2397 <u>±50B</u>			
Tollgate pit 387	2384±35BP			
White Horse pi	t 2155 2377±45BP			
White Horse pi	t 2130 2367± <u>40BP</u>			
White Horse st	r 4503 2349±40BE		<u> </u>	
White Horse pi	t 2155 2337± <u>40BP</u>		<u> </u>	
Eyhorne pit 226	5 2295±30BP			
Cuxton pit 343	2267±30BP			
Beechbrook en	cl 3072 2207±40B			
Beechbrook pit	504 2155±45BP			
+ + + +				

Calibrated date





#### 10 ROMAN AND SAXON ACTIVITY

The Roman to Saxon activities are largely restricted to funerary activity on the two sites of Pepper Hill and Saltwood Tunnel, and are discussed in detail in reports of those sites. There is little need to comment in detail any further here, except in summary.

At Pepper Hill it is clear that most of the Romano-British funerary practices are a sequential progression or development. While inhumation and cremation burial were common and present prior to and throughout the Romano-British period from c 300 cal BC to cal AD 400, other practices were more chronologically distinct. Busta were specific to the Romano-British period and were dated from about cal AD 50 to cal AD 300. From the radiocarbon results we can ascribe the following broad radiocarbon dated phases to the various burial rite.

bustum	<i>c</i> cal AD 50 to <i>c</i> . cal AD 300
pyre sites	<i>c</i> 50 cal BC to cal AD 125
inhumation	c 300 cal BC to cal AD 450
cremation	<i>c</i> 900 cal BC to cal AD 325

The Saxon results were largely to elucidate phases within the cemetery at Saltwood Tunnel rather than to provide anything more explicit. The three main cemeteries were chronologically defined, showing that the Eastern cemetery was probably the first and had very early Saxon origins, at it is probable that this was followed, on the basis of the dated burials, by the western cemetery and then the central cemetery. The radiocarbon and artefactual evidence allow us to propose the following phases for the main cemeteries.

Saxon Central cemetery inhumation burial	AD 540-780
Saxon Western cemetery inhumation burial	AD 420-660
Saxon Eastern cemetery inhumation burial	AD 340-700

#### **11 GUIDE TO ARCHIVE**

The schemewide radiocarbon report has been prepared and published as part of the Channel Tunnel Rail Link Section 1 Post-excavation Project. This Specialist Report is one of six publication specialist schemewide reports available to download from the Archaeology Data Service website: http://ads.ahds.ac.uk/catalogue/projArch/ctrl/. These provide synthetic overviews of the specialist data from CTRL Section 1 in its regional context. The ADS site also includes 20 Site Integrated Site Reports, which present synthesised data from key site sequences at an interpretative scale that can be assimilated into complementary studies. Underpinning the site reports and overviews, is a comprehensive archive of individual specialist reports and databases, which are also available to download. The CTRL reports and data can be accessed through the 'Project Archives' section of the ADS website.

Hard copy publication of the CTRL Section 1 results comprises a single volume synthetic overview of the excavated results in their regional context, which includes a complete site gazetteer and guide to the archive (Booth et al 2007).

Table 4 below details all available digital data for radiocarbon dating. All reports and accompanying figures are presented as downloadable, print-ready Adobe Acrobat files (.pdf). ADS also maintain archivally stable versions of report image pages (.tiff), sometimes available at higher resolution than the pdf versions. Report texts and databases are also available as text files (.csv).

Principal site name	Filename root	Principal authors and organisation
Schemewide specialist report		
Dating Schemewide Report	DAT_SSR	Allen MJ (OWA JV)
Santalist managed and set		
Specialist research reports	DATE NU	
02 Pepper Hill	DAT_PHL	Allen M (OWA JV)
03 Whitehill Road Barrow	DAT_WHR	Allen MJ (OWA JV) and Barclay A (OWA
		JV)
04 Northumberland Bottom	DAT WNB	Allen MJ (OWA JV), Askew P (MoLAS)
	_	and Jones GP (OWA JV)
05 Tollgate	DAT TLG	Allen MJ (OWA JV)
06 Cobham Golf Course	DAT CGC	Allen MJ (OWA JV) and Davis S
		(MoLAS)
07 Cuxton	DAT CXT	Allen MJ (OWA JV), Morris EL
		(Southampton) and Mackinder T (MoLAS)
09 White Horse Stone	DAT WHS	Allen MJ (OWA JV). Havden C (OWA
		JV), Barclay A (OWA JV) and Bayliss A
		(English Heritage)
12 Thurnham Villa	DAT THM	Allen MJ (OWA JV) and Lawrence S
		(OWA JV)
14 Evhorne Street	DAT EYH	Allen MJ (OWA JV), Havden C (OWA
		JV) and Brady K (OWA JV)
16 Sandway Road	DAT SWR	Allen MJ (OWA JV), Trevarthen M (OWA
5	_	JV). Stevens CJ, Macphail RI (UCL), and
		Crockett AD (OWA JV)
18 Leda Cottages	DAT LED HWD	Allen MJ (OWA JV)
19 Tutt Hill	DAT TUT	Allen MI (OWA IV) and Brady K (OWA
17 1 44 1111		IV)

#### Table 4: Digital archives

Principal site name	Filename root	Principal authors and organisation
20 Parsonage Farm	DAT_PFM	Allen MJ (OWA JV)
21 Beechbrook Wood	DAT_BBW	Allen MJ (OWA JV) and Brady K (OWA
		JV)
23 Boys Hall Balancing Pond	HUM_BHB	Marquez-Grant N (OWA JV)
27 Little Stock Farm	DAT_LSF	Allen MJ (OWA JV) and Ritchie K (OWA
		JV)
28 Church Lane	DAT_CHL_STR	Allen MJ (OWA JV) and Hayden C (OWA
		JV)
30 Saltwood Tunnel	DAT_SLT	Allen MJ (OWA JV), Riddler I (Freelance),
		Trevarthen M (OWA JV) and Diack M
		(CAT)
Specialist research datasets		
Schemewide C14 results	DAT_SCW_C14results	Allen M J

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Table 1: Radiocarbon results ordered chronologically

Site	Site Code	Feature type and no	Material	Result no	Result BP	Cal
Pepper Hill	NBR 98	cremation 11053	Hordeum sp. + rhizome	KIA 23926	140±27	AD 1670-1960
Pepper Hill	NBR 98	Grave 11731	lower limb	KIA 23948	899±51	AD1020-1250
Cobham Golf Cse	CGC 98	ring ditch 61	Corylus/Alnus	NZA-20963	914±30	AD 1030-1210
Tutt Hill	430/99 83+900	Pit 35	Maloideae r/w	NZA-21142	960±35	AD 1000-1170
Thurnham	THM 98	waterhole 10288	Red deer metatarsal	AA-39808;	1010±40	AD 900-160
				GU-9083		
Hurst Wood	HWD 98	Pit 104	Clematis vitalba	NZA-12274	1076±60	AD 780-1160
Boarley Farm	BFW 98	animal burial 1021	horse tibia	GU-9086	1130±50	AD 700-1000
West						
White Horse Stn	PIL 98	Inhumation in ditch 9011	human bone, femur	GU-9013	1190±60	AD 680-980
Boarley Farm	BFW 98	animal burial in pit 1060	horse radius	GU-9087	1210±50	AD 680-900
West						
Saltwood Tunnel	SLT 98C	Horse burial grave 1244	horse r humerus	NZA-19887	1336±35	AD 640-780
Saltwood Tunnel	SFB 99	Saxon Grave 1216	long bone	NZA-19638	1352±35	AD 620-780
Saltwood Tunnel	SFB 99	Saxon Grave 1491	Human femur frags + pelvis frags	NZA-20446	1395±35	AD 560-700
Saltwood Tunnel	SLT 98C	Saxon Grave 6421	Foot frags	NZA-19719	1415±35	AD 560-680
Saltwood Tunnel	SLT 99	Saxon Grave 4614	r femur + 1 radius	NZA-19885	1435±40	AD 540-670
Saltwood Tunnel	SLT 98C	Saxon Grave 6635	lower limb	NZA-19639	1446±35	AD 540-660
Saltwood Tunnel	SFB 99	Non-Saxon Grave 1391	Human bone frags inc mandible	NZA-20448	1455±35	AD 540-660
Saltwood Tunnel	SLT 99	Saxon Grave (rich) 3885	Human femur and other bone	NZA-20445	1474±40	AD 430-660
Saltwood Tunnel	SLT 99	Saxon Grave 6321	femur/pelvis frag	NZA-19640	1560±35	AD 420-600

Site	Site Code	Feature type and no	Material	Result no	Result BP	Cal
Saltwood Tunnel	SFB 99	Saxon Grave 1577	Human long bone frags	NZA-20447	1596±45	AD 340-600
Thurnham	THM 98	Well 11010	Coppiced Hazel stake. Corylus avellana.	GU-9077	1640±50	AD 250-540
Saltwood Tunnel	SLT 98C	Saxon Grave 1048	gaming counters	NZA-21511	1701±30	AD 250-420
Beechbrook Wood	BBW 00	cremation event 1344	charcoal Alnus/Corylus	NZA-20051	1728±40	AD 220-420
Pepper Hill	NBR 98	Bustum 10603	grain T. spelta/dicoccum	KIA 23931	1759±28	AD 170-390
Pepper Hill	NBR 98	Grave 11589	Human bone frags	NZA-20650	1764±25	AD 170-390
Pepper Hill	PHL 98	cremation 142	charcoal Maloideae, Alnus/Corylus	KIA 23933	1806±26	AD 130-320
Little Stock Farm	LSF 99	cremation burial 2408	monocot stem, hawthorn thorns	NZA-19917	1828±40	AD 80-330
Pepper Hill	NBR 98	cremation 10999	charcoal Maloideae	KIA 23930	1908±31	AD 20-220
Pepper Hill	NBR 98	Bustum 11702	A. elatius/oak sapwood	KIA 23925	1927±27	AD 20-140
Pepper Hill	NBR 98	Pyre site 11009	oak sapwood	KIA 23924	1933±28	AD 1-140
Pepper Hill	PHL 97	Grave 837	L femur frags	KIA 23947	1946±28	AD 20-120
N'umberland Btm	WNB 98	Cremation burial 2163	charred Clematis vitalba	NZA-20596	1968±30	50BC-130AD
Pepper Hill	NBR 98	Grave 10961	L femur frags	NZA-20649	1971±30	50BC-AD120
Pepper Hill	NBR 98	prye site 11502	Maloideae	KIA 24213	1972±22	40BC- AD90
Pepper Hill	NBR 98	Grave 11386	L femur and skull frags	KIA 24643	1974±28	50B-AD120
Pepper Hill	NBR 98	Pyre site 11708	charcoal Maloideae roundwood	KIA 23929	1978±33	50 BC-AD 120
Beechbrook Wood	BBW 00	enclosure ditch 1022	charcoal Betulaceae (cf Betula pendula/	NZA-21220	1989±45	100BC-AD130
			pubescens)			
Pepper Hill	NBR 98	Grave 10404	L femur frags	KIA 23946	2012±32	350-40 BC
Pepper Hill	NBR 98	Grave 10863	teeth	KIA 23944	2016±30	60 BC- AD 80
Pepper Hill	NBR 98	Pyre site 10857	charcoal Fraxinus roundwood	KIA 23934	2027±29	120BC-AD60
Pepper Hill	NBR 98	cremation 11272	charcoal Maloideae	KIA 23927	2119±29	350-40 BC

Site	Site Code	Feature type and no	Material	Result no	Result BP	Cal
Pepper Hill	NBR 98	Grave 10961	R femur frags	KIA 23945	2120±28	350-50 BC
Beechbrook Wood	BBW 00	pit 504	charcoal Quercus roundwood	NZA-21171	2155±45	360-50
Saltwood Tunnel	SLT 98	grave 24	Human bone	NZA-22734	2185±35	370-110
Little Stock Farm	LSF 99	grave 2031	L radius	NZA-19987	2203±35	380-170
Beechbrook Wood	BBW 00	enclosure ditch 3072	charcoal <i>Ilex</i>	NZA-20052	2207±40	390-170
N'umberland Btm	330 98	Pit 147	red deer tibia	NZA-22748	2222±30	370-190
Cuxton		Pit 343	Pomioidea charcoal <15 yrs	NZA-22593	2267±30	400-200
White Horse Stn	WHS 98	inhumation in ditch 2184	Human femur	GU-9089	2250±70	410-90
		nr Pilgrims Way				
White Horse Stn	WHS 98	cremation burial pit 6132	Charred grain (2)	GU-9088	2270±60	460-160
Eyhorne St	ARC 420 99	Pit 226	Hordeum vulgare	NZA-22594	2295±30	400-260
	68+200				2227.40	
White Horse Stn	WHS 98	IA pit 226, area 9	Hordeum vulgare	NZA-22039	$233/\pm40$	800-200
White Horse Stn	WHS 98	4-post str 4503, phole	Hordeum vulgare	NZA-22036	2349±40	800-200
		4350				
White Horse Stn	WHS 98	IA pit 2130, area 9	Hordeum vulgare	NZA-22041	2367±40	760-370
White Horse Stn	WHS 98	IA pit 2155, area 9	pig mandible	NZA-22038	2377±45	760-370
Tollgate	ARC330 98	Pit 387	PRN 1264	NZA-22886	2384±35	760-380
White Horse Stn	WHS 98	metalworking pit 7009	Prunus spinosa	NZA-21958	2394±25	760-390
White Horse Stn	WHS 98	IA pit 2119, area 9	Human fibula	NZA-22042	2397±50	770-380
Saltwood Tunnel	SFB 99	Unurned cremation burial	32 grass bases	NZA-20597	2402±30	760-390
		1699				

Site	Site Code	Feature type and no	Material	Result no	Result BP	Cal
White Horse Stn	WHS 98	4-post str 4391, phole	Triticum cf diococcum	NZA-22037	2409±40	770-390
		4353				
White Horse Stn	WHS 98	IA pit 4067/fowl, area 18	Fowl femur	NZA-22045	2429±55	770-390
White Horse Stn	WHS 98	metalworking pit 7011	Prunus spinosa	NZA-21841	2438±30	770-400
Little Stock Farm	LSF 99	grave 2031	L radius	NZA-19915	2447±35	770-400
White Horse Stn	WHS 98	IA pit 4561, area 14	Cattle humerus	NZA-22044	2469±40	770-400
Saltwood Tunnel	SFB 99	cremation burial 1726	onion couch grass tubers	NZA-20598	2499±30	790-450
White Horse Stn	WHS 98	IA pit 2130, area 9	Human fibula	NZA-22040	2507±50	800-410
N'umberland Btm	ARC330 98	Pit 156	charcoal Prunus + Maloideae	NZA-22728	2509±35	800-420
Little Stock Farm	LSF 99	Pit 2441	skull frag	NZA-19916	2522±35	800-510
White Horse Stn	WHS 98	IA pit 8037, area 21	Sheep/goat foot (articulated)	NZA-22043	2527±40	800-510
Tollgate	ARC330 98	pit 374	PRN 1186	NZA-22880	2624±35	850-760
Pepper Hill	NBR 98	cremation 10314	Vicia/Lathyrus + charcoal Maloideae,	KIA 23932	2712±28	920-800
			Alnus/Corylus			
Cobham Golf Cse	CGC 98	Pit 137	PRN 1022	NZA-21143	2741±30	980-820
Hurst Wood	HWD 98	Pit 140	Maloidea	NZA-12284	2742±45	1000-800
Saltwood Tunnel	SLT 99	Pit 3910	emmer/spelt grain	NZA-22595	2746±30	980-820
Saltwood Tunnel	SFB 01	Pit 6658	emmer/spelt grain	NZA-22727	2769±30	990-820
White Horse Stn	PIL 98	cremation burial 948	onion couch grass	NZA-21492	2791±35	1010-830
White Horse Stn	WHS 98	LBA pit 5421	pottery residue	NZA-22006	2804±40	1130-890
Saltwood Tunnel	SFB 99	BA pit W207	charred Vicia faba	NZA-19637	2847±35	1130-900
White Horse Stn	PIL 98	cremation burial 852	onion couch grass	NZA-21505	2868±35	1190-920
Beechbrook Wood	BBW 00	cremation burial 1290	onion couch grass	NZA-21507	2870±30	1190-920

Site	Site Code	Feature type and no	Material	Result no	Result BP	Cal
Beechbrook Wood	BBW 00	cremation event 1294	Parenchyma+roundwood bark	NZA-20050	2921±40	1270-990
Saltwood Tunnel	SFB 99	Unurned cremation burial	Maloideae charcoal <50 yrs	NZA-20655	3063±30	1410-1210
		3602				
White Horse Stn	WHS 98	Decorated bowl posthole	charred hulled Hordeum	NZA-21490	3064±50	1440-1130
		5415				
White Horse Stn	PIL 98	Pil Str - p/hole 571	Hordeum vulgare	NZA-21840	3079±30	1430-1260
Beechbrook Wood	BBW 00	Pit 245	PRN 1017	NZA-22877	3081±30	1410-1260
Tutt Hill	430/84+440/98	cremation burial 98	Aluns/Corylus	NZA-20102	3094±40	1440-1210
Beechbrook Wood	BBW 00	Pit 1220	PRN 1053	NZA-22878	3112±30	1430-1260
White Horse Stn	WHS 98	pit/treehole 5454	Sheep/goat tibia	NZA-22035	3140±40	1520-1310
Saltwood Tunnel	SFB 99	Pit 5366	PRN 2474	NZA-22879	3146±35	1520-1310
White Horse Stn	WHS 98	Ditch 4025	Horse humerus	NZA-21326	3151±35	1520-1310
Cobham Golf Cse	CGC 98	Ditch 197	PRN 1094	NZA-23006	3191±40	1530-1390
White Hill Road	WHR 99	Grave	human bone frags	NZA-22740	3273±30	1620-1440
Barrow						
Tutt Hill	430/84+300/99	ring ditch 89	Prunus	NZA-21140	3383±30	1750-1530
White Horse Stn	WHS 98	Decorated bowl feature	Prunus charcoal	NZA-21281	3415±30	1870-1620
		5415				
Sandway Road	SWR 99	Mesolithic hollow 558	grain cf. <i>Triticum</i> sp <u>.</u>	NZA-11936	3523±45	1960-1690
		(72)				
N'umberland Btm	WNB	Grave	R femur human	NZA-22735	3601±40	2120-1780
Eyhorne St	420/68+100	Pit 60	hazelnut	NZA-20420	3648±35	2140-1910
Saltwood Tunnel	SFB 99	BA Grave C4619	lower limb	NZA-19641	3683±35	2200-1940

Site	Site Code	Feature type and no	Material	Result no	Result BP	Cal
Saltwood Tunnel	SLT 99	BA Grave C4507	r femur	NZA-19886	3722±45	2290-1970
Eyhorne St	420/68+100	Pit 23	hazelnut	NZA-20419	3742±40	2290-2020
N'umberland Btm	WNB	Grave	R femur human	NZA-22736	3743±40	2280-1980
Beechbrook Wood	BBW 00	Pit 1374	charred crab apple	NZA-22738	3747±35	2280-2030
Beechbrook Wood	BBW 00	Pit 1374	Corylus charcoal	NZA-22739	3762±35	2290-2030
Eyhorne St	EHY	Posthole 70	Charred plant	NZA-12233	3773±60	2410-1980
Beechbrook Wood	BBW 00	ring ditch 851	hazelnut shells	NZA-20027	3774±40	2310-2030
Tutt Hill	430/99 84+300	ring ditch 156	Fraxinus excelsior	NZA-21141	3789±35	2340-2040
Beechbrook Wood	BBW 00	Pit 1374	hazelnut shells	NZA-21170	3864±35	2470-2200
Eyhorne St	420/68+100	Posthole 19	charred crab apple (Malus sylvestris)	NZA-20417	4044±35	2840-2460
White Horse Stn	PIL 98	GW pit 904	Pig radius (left)	NZA-21324	4046±35	2840-2460
Saltwood Tunnel	SLT 98C	Saxon Grave 6653	unident mineralised roundwood wood from	NZA-21688	4054±55	2870-2460
			spearhead			
White Horse Stn	WHS 98	GW pit 4994	Cattle scapula	NZA-21325	4080±35	2860-2490
White Horse Stn	PIL 98	GW pit 911	Pig mandible	NZA-21282	4097±30	2870-2490
White Horse Stn	PIL 98	GW pit 958	cattle phalanx	NZA-21589	4113±35	2870-2500
Eyhorne St	420/68+100	Posthole 19	residue on pot	NZA-20418	4113±40	2880-2500
White Horse Stn	PIL 98	GW pit 958	Aurochs vertebra	NZA-21327	4120±35	2880-2570
White Horse Stn	WHS 98	Longhouse posthole 5008	Maloideae charcoal	NZA-21280	4137±30	2880-2580
White Horse Stn	PIL 98	GW pit 913	cattle phalanx	NZA-21508	4153±40	2880-2590
White Horse Stn	WHS 98	GW pit 4943	charred hazelnuts	NZA-21493	4155±30	2880-2620
White Horse Stn	WHS 98	Pit/hollow 5072	pig scapula	NZA-22749	4161±30	2880-2610
White Horse Stn	WHS 98	FV deposit/pit 5125	cattle radius	NZA-21831	4189±30	2890-2630

Site	Site Code	Feature type and no	Material	Result no	Result BP	Cal
White Horse Stn	PIL 98	pit/treehole 861	cattle tibia	NZA-21959	4193±25	2890-2660
White Horse Stn	WHS 98	Pit/hollow 5072	cow calcaneum	NZA-22751	4195±35	2890-2620
White Horse Stn	WHS 98	GW pit 5256	charred hazelnuts	NZA-21491	4196±60	2910-2580
White Horse Stn	PIL 98	undat pit 952	Aurochs tibia	NZA-21328	4228±35	2910-2670
White Horse Stn	WHS 99	Pit 4956	Cow calcaneum	NZA-22737	4230±35	2920-2660
White Horse Stn	WHS 99	Pit 5094	Red deer antler	NZA-22813	4238±35	2920-2690
White Horse Stn	WHS 98	Pit/hollow 5072	cow skull	NZA-22750	4271±35	2930-2690
Little Stock Farm	LSF 99	pit 2507	hazelnuts	NZA-19918	4482±35	3350-3030
Saltwood Tunnel	SFB 99	Neolithic pit SG 175	hazelnuts	NZA-20600	4742±30	3640-3370
Saltwood Tunnel	SFB 99	Neolithic pit SG 136	hazelnuts	NZA-20599	4775±30	3650-3380
White Horse Stn	WHS 98	Longhouse posthole 4817	Charred cereal	NZA-11463	4911±60	3920-3530
Tutt Hill	ARC 430/99	Pit 14	PRN 1139	NZA-23008	4926±40	3790-3640
White Horse Stn	WHS 98	Longhouse posthole 4820	Calcined animal bone	NZA-21769	4949±30	3790-3650
White Horse Stn	WHS 98	Longhouse posthole 4817	Alnus/Corylus charcoal	NZA-11464	4974±60	3950-3640
White Horse Stn	WHS 98	Longhouse posthole 5280	charred Triticum sp	NZA-21504	5007±75	3960-3660
White Horse Stn	WHS 98	Longhouse posthole 4902	cow molar	NZA-21278	5028±30	3950-3710
White Horse Stn	WHS 98	Hearth in longhouse 4874	charred cereal grain	NZA-21506	5039±25	3950-3760
White Horse Stn	WHS 98	Longhouse posthole 4817	Calcined animal bone	NZA-21770	5067±30	3960-3790
White Horse Stn	WHS 98	Longhouse posthole 4820	Maloideae charcoal	NZA-21279	5123±30	3980-3800
White Horse Stn	WHS 98	Hearth in longhouse 4830	Maloideae charcoal	KIA-25383	5165±31	4050-3810
Tutt Hill	ARC 430/98	Pit 5	PRN 1063	NZA-23007	5996±45	4990-4780
Sandway Road	SWR 99	Mesolithic hollow 558	grain Triticum/Hordeum sp	NZA-11935	6920±45	5900-5710
		(72)				

Site	Site Code	Feature type and no	Material	Result no	Result BP	Cal
Beechbrook Wood	BBW 00	ring ditch 1021	charcoal Alnus/Corylus	NZA-20049	7072±35	6020-5840
E Station Rd	STR 99	Palaeochannel	oak branch (sapwood)	NZA-12234	7968±60	7060-6680
White Horse Stn	WHS 98	Longhouse posthole 4834	Pinus charcoal	NZA-21381	8516±35	7600-7520
White Horse Stn	WHS 98	Longhouse posthole 5113	Pinus charcoal	NZA-21349	9182±40	8530-8280
Sandway Road	SWR 99	Mesolithic hollow 558	hazelnuts	NZA-11934	9318±50	8740-8330
		(72)				
Pepper Hill	NBR 98	cremation 11271	tuber	KIA 23928	10302±46	10750-9800
White Horse Stn	WHS 98	Allerod soil	uniseriate dicotyledenous material	NZA-22046	11130±48	11500-10900
Pepper Hill	NBR 98	cremation 11091	charred parenchyma	KIA 23923	12111±56	13400-11700