

**Channel Tunnel Rail Link
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**The radiocarbon dates from Beechbrook Wood,
Hothfield, Kent**

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1 INTRODUCTION

The aim of the radiocarbon programme was to provide the chronological relationship between a number of funerary monuments and non-funerary events and to define whether burial activity was contemporary with activity associated with Beaker pit 1374. Were the ring ditch monuments contemporary with each other and were the cremation burials contemporary with each other, thus defining two chronologically distinct funerary events? Strict selection and scrutiny of material was made in an attempt to ensure that all items dated specific events (cf. Allen and Bayliss 1995; Allen *et al.* 2004) and were not just datable items.

A series of 13 radiocarbon results was obtained and are presented in Table 1 and Figure 4; all have been calibrated with the atmospheric data presented by Stuiver *et al.* (1998) and performed on OxCal ver 3.9 (Bronk Ramsey 1995; 2001) and are expressed at the 95% confidence level with the end points rounded outwards to 10 years following the form recommended by Mook (1986).

2 MESOLITHIC ACTIVITY

Young roundwood charcoal fragments of *Alnus/Corylus* were selected from what the excavator considered to be a dump within the lower secondary fill (context 944) of ring ditch 1021 to date the activity associated with, if not the construction of, this barrow. The result of 7072±35 BP (NZA-20049) clearly falls nearly three millennia earlier (6020-5840 cal BC) than the construction of this type of monument. The δC^{13} of -24.05 falls within the expected range for charcoal, thus we conclude that the charcoal, despite the excavators' interpretation, was residual from some earlier activity. This does, however, indicate the presence of Mesolithic activity prior to all other recorded and excavated activity on the site. It may provide some argument for the choice of location for the early Bronze Age and Beaker barrows (see Allen 1997; Allen & Gardiner 2002).

3 BEAKER PITS

Pit 1374 contained the largest assemblage of earlier prehistoric pottery in a single depositional context along the CTRL route (and is considered unusual at a national scale). The Beaker material consists of fragments of several vessels of different styles in a secure context. Within the pit was a discrete dump of charred and ashy material (context 1377) with Beaker pottery. Charred material was selected from this dump to determine if this non-funerary activity was

contemporary with the ring ditches (1021 and 851), and to define if this event and its associated pottery belongs in the early (2600-2300 BC), middle (2300-2000 BC) or late (2000-1700 BC) Beaker period. Three results were obtained from this feature.

Charred hazelnuts, roundwood hazel (*Corylus*) charcoal, and charred crab apple were selected from the dump of charred material in the primary fill (context 944). All three results (Table 1; Figure 1), fall within the Beaker period (2450-1950 cal BC). One result (3864±35 BP, NZA-21170), however, is early within that period (early-middle Beaker), and is considered unexpectedly early (2470-2200 cal BC) given some of the Beaker styles represented (Alistair Barclay pers. comm.).

The two other results (NZA-22738, 3747±35 BP and NZA-22739, 3762±35 BP) are statistically indistinguishable at the 95% confidence limit (Ward and Wilson 1979) and fall with a range of 2290-2030 cal BC falling comfortably into the middle Beaker range. There is no reason to believe that the dump contained mixed older material and although there is no laboratory and other scientific reason to discount result NZA-21170, we consider the later two contemporary results, to be more likely to date the deposition event which is associated with the Beaker pottery. The date of this activity can be compared with that from the ring ditches, see below.

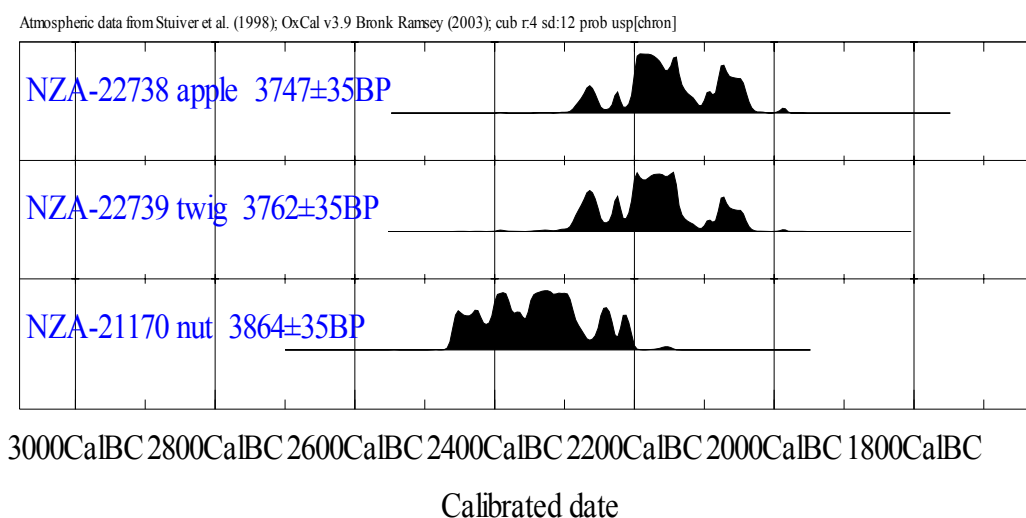


Figure 1. Distribution of the results from Beaker Pit 1374

4 EARLY BRONZE AGE/BEAKER BARROWS (RING DITCHES 1021 AND 851)

Two ring ditches 1021 and 851 were dated, but as we have seen that from 1021 was obviously residual Mesolithic charcoal, see above. Nevertheless the lower secondary fill (899) of ring ditch 851 contained charred remains and hazelnuts thought to be a dump in the ditch. A result

of 3774 ± 40 BP gives an Early Bronze Age date of 2310-2030 cal BC that is statistically indistinguishable at the 95% confidence level (Ward and Wilson 1978) from Beaker pit 1374, indicating that this ring ditch is contemporary with the dated Beaker non-funerary activity.

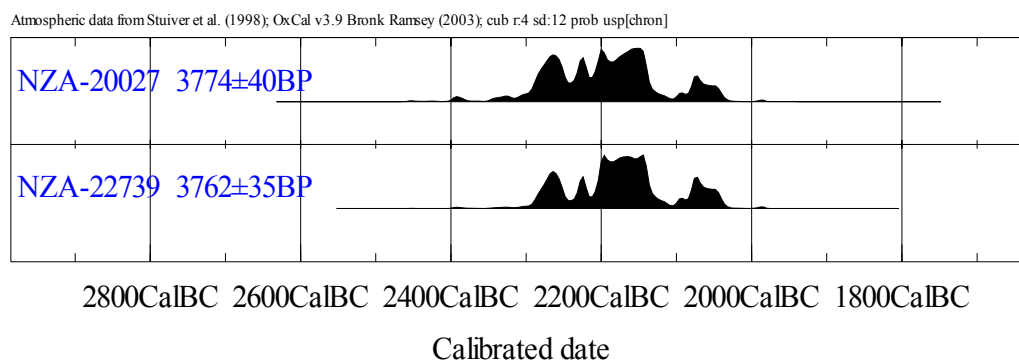


Figure 2. Radiocarbon distributions of ring ditch 851 (NZA-20027) and Beaker pit 1374 (NZA-22739).

5 MIDDLE BRONZE AGE SETTLEMENT ACTIVITY

Middle to later Bronze Age is evidenced on site associated with diagnostic pottery forms. Two samples were submitted to relate this settlement event to the Early Bronze Age and Beaker activity, but also to elucidate a phase of transition between the Middle and Late Bronze Age pottery recognised at a number of sites including Tutt Hill, and provide chronological parameters for Late Bronze Age activity that is dominated by largely plain ceramics generally classified as post Deverel-Rimbury. The transitional period is considered to be 1200-1050 cal BC and the Late Bronze Age post Deverel-Rimbury phase equates with Needham's period *c.* 1150-950 cal BC (Needham 1996, 134). Results were obtained on sooting from carefully selected and diagnostic pottery sherds.

Pit 245: diagnostic transitional middle to late Bronze Age pottery (PRN 1017, fabric 3) from the basal fill of the pit and associated with 62 other sherds totalling 1533g was selected. The sherd was relatively small (9g) but has clean, sharp old breaks and indicating that had not been lying around for long before being discarded into the pit. This, and other large sherds, lay flat on the base of the pit.

Pit 1220: the fills and pottery essentially seem to represent a single dumping event in this shallow pit. Only two fills are distinguished and both contain sherds from a single vessel (fabric F8, form R6, illustration 10). Sherds of a different fabric (F10) were also recovered and one of these with sooting and burnt residue (PRN1053) was selected. The sherd displays sharp old breaks indicating low residuality.

Despite the expected differing dates of these ceramic forms (i.e. transitional middle to late Bronze Age 1200-1050 cal BC, and straight-sided jar, form R6, 1150-900 cal BC), both sherds gave similar results; PRN 1017, 3081±30 BP and PRN 1053, 3112±30 BP (Table 1). These calibrate to 1410-1260 and 1430-1260 cal BC respectively and are statistically indistinguishable at the 95% confidence level. The significance of this in ceramic terms is discussed elsewhere, but here indicates that both pits and vessels forms belong to a distinct Middle Bronze Age phase. The sooting and residue on the Middle to Late Bronze Age transitional form (R6) is clearly Middle Bronze. This activity is clearly about eight centuries later than the dated ring ditch and Beaker pit 1374.

6 LATE BRONZE AGE AND LATE ROMAN CREMATION BURIALS

A series of undated cremation burials was dated in an attempt to see if these cremation events were contemporaneous and thus the cremation rite belonged to a single phase. This would determine if they were contemporary with the Late Bronze Age or Iron Age and Romano-British settlement phases. In each case charred material thought to be tinder (onion couch grass) or roundwood twigs from the pyre were selected.

Cremation burial 1290: onion couch grass tuber was selected from this feature sited close to cremation burial 1294. The sample also contained spelt wheat.

Cremation burial 1294: parenchyma and roundwood bark was selected from this feature which was positioned along a field boundary assumed to be Late Bronze Age. Its date is assumed to indicate a period of use of the fields.

Cremation burial 1344: round wood twiggy *Alnus/Corylus* charcoal was selected from this feature adjacent to a field boundary thought to be Late Iron Age.

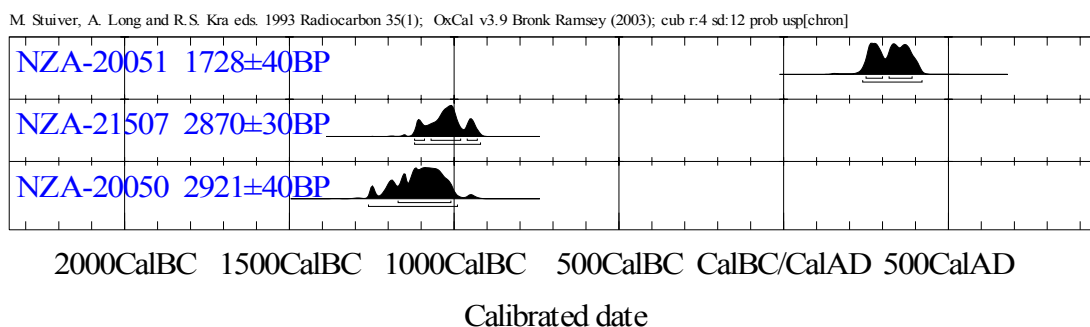


Figure 3. Radiocarbon distributions from dated cremation burials

The three results from these burials define two episodes of cremation burial (Figure 3). The first is Late Bronze Age and includes burials 1290 and 1294. They gave results of 2870±30 BP and 2921±40 BP which calibrate to 1190-920 and 1270-990 cal BC respectively. Both overlap (Figure 4), and are Late Bronze Age, and burial 1290 is the later of the two. These two burials are 1100 years later than the Early Bronze Age funerary events, and fall about 300 years later than pits 245 and 1220. If it can be assumed that the burials lay along existing and extant field boundaries, then they indicate that the fields were established by, and in use during, the Late Bronze Age. The date of 1190-920 cal BC from burial 1290 indicates the cultivation of spelt wheat at this time.

The third dated cremation burial (1344) produced a Late Romano-British date (1728±40, cal AD 220-420), demonstrating the cremation burial was practised after the Late Bronze Age, and suggesting this field boundary was in use and extant at this time. This is the latest dated event on this site.

7 IRON AGE AND ROMANO-BRITISH ENCLOSURES AND SETTLEMENT

The final set of dates attempted to determine if the enclosed settlements were contemporary with the cremation burials, and determine if the industrial activity in pit 504 was contemporary with, or a part of, the same phase as the enclosure 1022.

Short-lived and roundwood charcoal was selected from enclosures 3072 and 1022 from contexts interpreted as dumps in the main ditch fills. These were holly (*Ilex*) twigs from enclosure 3072 (context 2346) and Betulaceae (birch) from enclosure 1022 (context 505). Within pit 504 roundwood *Quercus* (oak) charcoal was selected from ash and charcoal of a hearth on the base of the pit representing some industrial activity.

All three results provide dates from the Middle Iron Age to Early Romano-British periods with the dated events spanning 500 years (Figure 4).

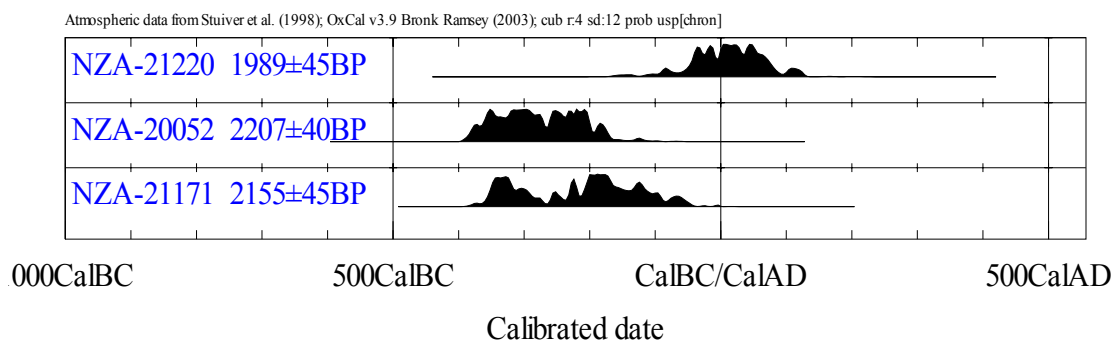


Figure 4. Radiocarbon distributions for enclosure ditches 3072 (NZA-20052) and 1022 (NZA-21220), and pit 504 (NZA-21171).

It is clear that the industrial activity associated with pit 504 and enclosure 3072 are Middle Iron Age and are contemporaneous (360-50 and 390-170 cal BC respectively), while the activity dated in enclosure 1022 is slightly later (100 cal BC- cal AD 130) being Late Iron Age to early Romano-British. This dated event is over a century earlier than cremation burial 1344 (cal AD 220-420).

8 THE DATED SITE EVENTS

The suite of 13 dates clearly indicate three main phases of dated activity (Figure 6). A phase of clearly chronologically distinct Beaker and Early Bronze Age activity (ring ditch 851 and pit 1374) occurs about 800 years earlier than any other dated activity. The second phase of dated activity includes the pits and two of the cremation burials (see Figure 5). The dated pits (1220 and 245) are contemporaneous and Middle Bronze Age (c. 1450-1250 cal BC) and the cremation burials (1290 and 1294) are also contemporaneous and Late Bronze Age (1250-950 cal BC). As a group they span about 500 years being clearly 800 years later than the Early Bronze age activity and about 650 years earlier than the Iron Age-Romano-British activity.

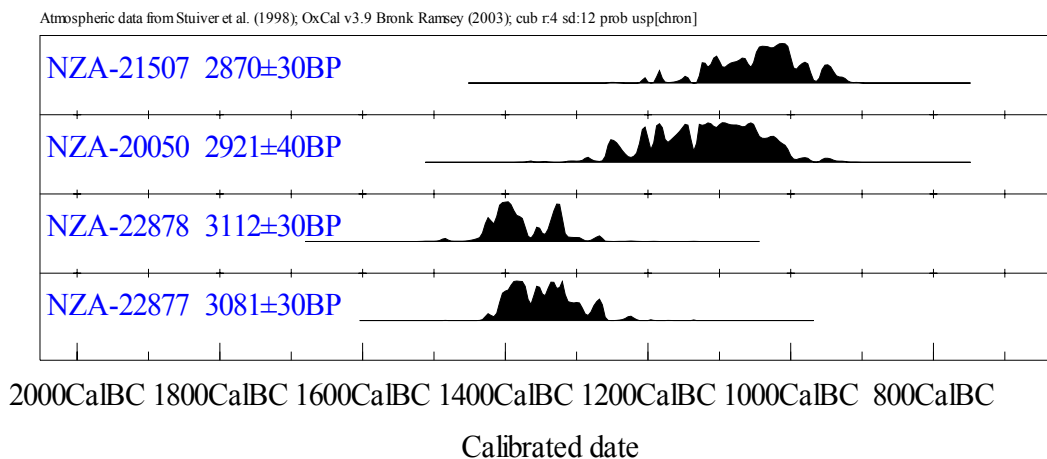


Figure 5. Radiocarbon distributions of pits 1220 and 245 (NZA-212877, NZA-22787), and cremation burials 1290 and 1294 (NZA-20050, NZA-21507)

The last group of dated events includes the Middle Iron Age to Early Romano-British enclosures (1022 and 3072) and pits (504) with the last dated event being the Late Romano-British cremation 1344.

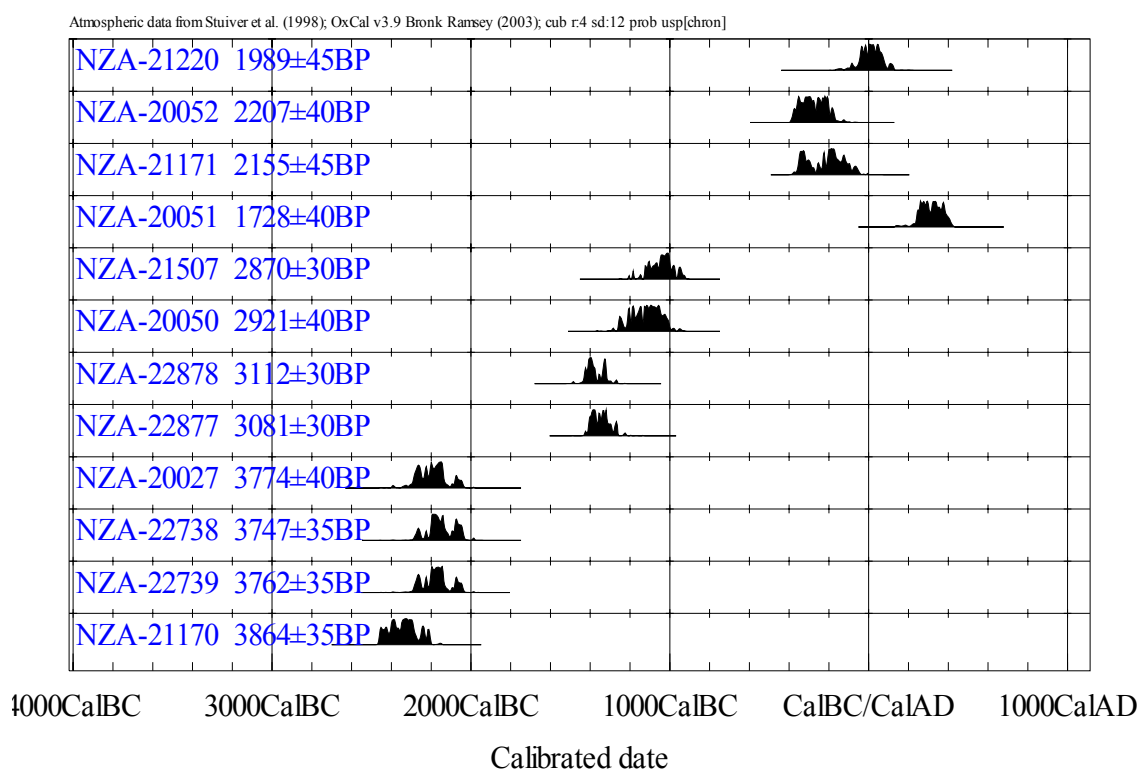


Figure 6. Radiocarbon distributions of the dated funerary and settlement activity, excluding the Mesolithic determination from ring ditch 1021 (see Table 1)

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<i>Feature</i>	<i>context</i>	<i>sample</i>	<i>context details</i>	<i>material</i>	<i>result no.</i>	δC^{13}	<i>result BP</i>	<i>cal BC (unless otherwise stated)</i>
pit 1374	1377	279	dump of nuts	Hazelnut shells	NZA-21170	-22.22	3864±35	2470-2200
pit 1374	1377	279	dump of hazelnuts and charred material	charcoal Corylus	NZA-22739	-20.5	3762±35	2290-2030
pit 1374	1377	279	dump of hazelnuts and charred material	charred crab apple	NZA-22738	-26.2	3747±35	2280-2030
ring ditch 1021	944	243	lower secondary fill	charcoal Alnus/Corylus	NZA-20049	-24.05	7072±35	6020-5840
ring ditch 851	899	229	dump in ditch	Hazelnut shells	NZA-20027	-23.9	3774±40	2310-2030
[LP] pit 245	244		Primary pit fill of pit	PRN 1017, fabric 3	NZA-22877	-29.5	3081±30	1410-1260
[LP] pit 1220	1201		last pit fill, dump	PRN 1053, fabric 10	NZA-22878	-27.8	3112±30	1430-1260
cremation burial 1294	1293	272	cremation debris	Parenchyma+ roundwood bark	NZA-20050	-26.48	2921±40	1270-990
cremation burial 1290	1289	271	cremation debris	onion couch grass	NZA-21507	-25.64	2870±30	1190-920
cremation burial 1344	1345	276	cremation debris	charcoal Alnus/Corylus	NZA-20051	-25.15	1728±40	AD 220-420
pit 504	525	218	deliberate dump	charcoal Quercus rw	NZA-21171	-24.85	2155±45	360-50
enclosure ditch 3072	2346	384	ditch fill	charcoal Ilex	NZA-20052	-24.77	2207±40	390-170
enclosure ditch 1022	505	208	charcoal dump in ditch	charcoal Betulaceae (cf Betula pendula/ pubescens)	NZA-21220	-25.37	1989±45	100BC-AD130

Table 1: Radiocarbon results from Beechwood Brook