The Age of Stonehenge

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The date of Stonehenge's sarsen circle and trilithons has never been satisfactorily established. This detailed re-examination of the monument's stratigraphy identifies flaws in previous excavators' interpretations, leading to a revision of the stratigraphic sequence and re-dating of this important phase(Phase 3ii) to 2620-2480 BC. Implications of this include the presence of Beaker pottery in Britain before 2500 BC, the relatively late adoption of an inhumation rite after 2470 BC for the Amesbury Archer and other early Beaker burials, and the possible contemporaneity of Stonehenge Phase 3ii with nearby Durrington Walls. The paper outlines two new initiatives: the Beaker People Project (analysing mobility, migration and diet in the late third millennium BC) and the Stonehenge Riverside Project (summarizing results of new excavations at Durrington Walls).

Key words: Stonehenge, Durrington Walls, radiocarbon dating, Beakers

Introduction

The date of Stonehenge remains a matter of dispute. There is no agreement amongst archaeologists as to whether the sarsen stones were erected as early as 2600-2500 BC (Parker Pearson et al. in press), in the period after 2550 BC (Cleal et al. 1995: 167) or even towards the end of the millennium around 2300 BC or later (Pitts 2000: 144; Case 1997: 164). This is perhaps surprising, given the success of the 1994 dating programme which produced three of the four accepted radiocarbon dates from contexts associated with the erection of the sarsen circle and the trilithons (Phase 3ii; Cleal et al. 1995: 204-5; Bayliss et al. 1997: 56). Of course, the earliest phase of Stonehenge (Phase 1) is closely dated to 3015-2935 cal BC (Allen and Bayliss 1995: 531; Bayliss et al. 1997: 46-8) but other features such as the Aubrey Holes (tentatively assigned to Phase 1), the post holes, cremation burials and other human remains (assigned to Phase 2) and the first bluestone setting (Phase 3i) all remain undated.

The problem of dating the sarsen stones (Phase 3ii) is due not to an absence of satisfactory radiocarbon determinations but to the disparity between the two dates from the ramp used for one of the trilithons (OxA-4839 and BM-46), combined as 2440-2100 cal BC (Bayliss et al. 1997: 56), and the other two dates of 2620-2480 cal

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BC from Sarsen Circle Stone 1 (UB-3821) and 2850-2400 cal BC for Trilithon Stone 53/54 (OxA-4840).

The discrepancy between these two sets of dates poses a conundrum. How can the great trilithon, dated to 2440-2100 cal BC, be *later* than the sarsen circle which encloses it? Was the circle incomplete or even partially dismantled to allow builders to erect this enormous structure within the monument? Or should the earlier two dates be dismissed, since these derive from antler picks that might have been ancient when deposited? Yet the process for selecting radiocarbon samples that would date their contexts of deposition was extremely rigorous (Allen and Bayliss 1995: 512-15) so there is nothing to be gained by questioning their validity. Instead, our attention turns to reinterpretation of the excavations which were conducted half a century to a century ago.

The contexts of the radiocarbon samples

The contexts of the antlers within the pits of Stone 1 and Stone 53/54 are relatively unproblematic. The samples derive from the bottoms of these stone holes, in features which are spatially isolated and uncomplicated by earlier or later activity. The contexts of the other two samples, in contrast, reveal a different story (Figure 1). Both pieces of antler were excavated by Richard Atkinson, one in cutting 17 in 1956 and the other in cutting 52 in 1958. Neither sample can be assigned to a precise or certain location. One (OxA-4839) appears to be the antler visible near the base of a section recorded in cutting 17 (Figure 2; Cleal et al. 1995: figs 105 &137) within a deep, sloping feature (designated by two context numbers: WA 2448 in its western half and WA 3733 in its eastern and northern half; Cleal et al. 1995: fig. 100) that Atkinson identified as the erection ramp for Stone 56, the northwest stone of the great trilithon. The other was retrieved from a chalk layer which was probably above the layer in which the 1956 find was made. The 1958 find was recovered from cutting 52 (Figure 3), slightly further west than cutting 17, and has been notionally assigned to the ramp of Stone 57, part of the west trilithon (Cleal et al. 1995: 205 & 524), although Atkinson originally assigned it to the ramp of Stone 56.

Atkinson was in no doubt that the large east-sloping feature (WA 2448/3773) in which these antlers were deposited was the erection ramp for Stone 56. 'There can be no doubt that this ramp was used in the erection of Stone 56, and for this purpose a ramp would indeed be very necessary…' (Atkinson 1979: 207, cited in Cleal et al. 1995: 202). If this feature were a ramp, the stone would have had to have been erected from the side, either brought in from the northwest on its on its narrow side and stood upright, or brought in on its flat, wider side, lifted and then turned 90° to fit into its stone hole. The same applies for the erection of Stone 57, which would also have to have been carried along the northern part of this same ramp to its hole and there lifted northwards on its narrow side into position. Only a few of the other stone holes at Stonehenge have evidence for erection ramps. In each of these examples, it is evident that the stone would have been brought in flat and raised forwards into position, pivoting on its wider face. Raising a stone sideways – on its narrow face – appears to be technically more difficult but cannot be discounted.

In 1901 the geologist, William Gowland excavated around the sides of Stone 56 in order for this leaning trilithon stone to be stood upright. Its partner, Stone 55, had long ago fallen and Stone 56 was leaning perilously northwards, towards the centre of

the monument. His recording was impeccable for the time and publication was prompt (Gowland 1902). Like Atkinson, he was convinced that he had identified the direction from which Stone 56 was erected: '…we are led to the irresistible conclusion, the importance of which will be evident later, that this monolith was originally set up by raising it from the interior of the circle' (Gowland 1902: 55). This means erection from the northeast, in a completely different direction to Atkinson's identified ramp to the west, and therefore contradictory to Atkinson's interpretation. Although Atkinson recognised the high quality of Gowland's work (1979: 193), he seems not to have noticed this particular detail in Gowland's report and nowhere does he discuss the relative merits of either alternative. This is puzzling since his trench (cutting 17) exploring the ramp-like feature ended just inches away from the west end of Gowland's excavation and there was much to learn in using the records of the adjacent investigation to shed light on his own.

By combining the results of the two excavations, it is possible to reconstruct the profile of Atkinson's ramp along its long axis (Figure 4). With a maximum depth of 2.4m and a length of at least 6m, this is a very large feature, on a scale which Atkinson considered was in keeping with the enormous size of the 9m-long trilithon stone. Yet its length and gentle incline of only 15° make it of little practical use as a fulcrum for raising the trilithon stone off the ground. There was also a step in this ramp (Cleal et al. 1995: 201-2, fig. 137) that seems not to have served any practical purpose relating to stone erection. Had he looked more carefully at Gowland's report, Atkinson would have realized that the ramp he was excavating did not even lead to the stone hole for Stone 56 (Figure 5). The southern edge of this ramp was defined by solid chalk which was '…cut away to form an almost perpendicular face in a line with the middle of the long axis of the base of the monolith No. 56' (1902: 102). As a result, Stone 56 would have ended up with its base half a metre north of the actual hole within whose southwest, northwest and southeast sides it was to snugly fit (Figure 6; Gowland 1902: figs 7, 9 & 10; Cleal et al. 1995: figs 149 & 150). To achieve this position, the stone would have to have been brought in on its side from the west, raised to the vertical, then laid down flat towards the centre of the circle, moved southwards half a metre and then finally re-erected from the northeast.

It is hard to imagine why the 'ramp' might have been constructed so as to miss the stonehole. This deep, gently sloping feature does not fulfil the task of a ramp for Stone 56 and cannot be considered as an erection ramp. In contrast, Gowland's interpretation of Stone 56 as having been lifted from the northeast is far more plausible. Yet he also may have been wrong in identifying a ramp on that side, even though the stone was most probably erected from this northeast direction. On this northeast side, Gowland found that the chalk fill extended to the base of the trilithon. Digging on this side, he discovered that Bluestone 64 (part of the bluestone oval of Phase 3iv, dated to 2280-2030 cal BC) was set into the upper layers filling this deep feature. He considered that its base was the surface of the ramp, rising gently to the northeast perhaps as far as 25' (7.6m) away where a small trench of his had hit chalk rock at 0.4m depth (Gowland 1902: 81). The identification of this long, deep feature as an erection ramp raises questions about its efficacy comparable to those concerning Atkinson's ramp. Was the chalk fill north of the great trilithon deposited within a large feature which extended 9m to the west and perhaps 4m or more to the northeast?

Gowland's records of what he found, and where, are meticulous, far better than those of the excavations half a century later. He refers to the fact that the materials filling the stone hole were considerably different from one side to the other (1902: 56, 99). On the southern side, the densities of sarsen hammer stones, mauls, flint artefacts and other finds were more than five times greater than those on the northern side (Table 2). It is extremely unlikely that they indicate the homogeneous fill of a single feature. The low density of artefacts to the northeast of Stone 56 is more closely comparable to the fill of Atkinson's feature (WA 2448/3733). The evidence – the deep feature encountered by Gowland and Atkinson, and the inconsistent finds densities - may be more satisfactorily interpreted as indicating the presence of a large pit that was dug after the erection of the sarsens (Phase 3ii) but before the construction of the bluestone oval (Phase 3iv). This is reinforced by the total absence of packing stones on the northeast side of Stone 56: why are they missing here when they were used within the stone holes of the other trilithons? The simplest explanation is that they were removed when the pit was dug.

The date of Stonehenge

The difficulties of sustaining Atkinson's interpretation of WA 2448 as an erection ramp for Stone 56 are so great that we can no longer consider that its fill constitutes a reliable context for dating the erection of the great trilithon. As a result, the two associated radiocarbon determinations do *not* date the erection of the sarsens in Phase 3ii. Similar difficulties surround any interpretation of the 'ramp' as being associated with the erection of Stone 57 in the western trilithon. In this case, Atkinson recorded the edge of the pit as adjacent to Stone 57's stone hole but, on the basis of the photographs (Figure 3; Cleal et al. 1995: figs 104 & 106), there is no visible relationship between the pit's edge (identified as the edge of feature WA 3733) and the packing stones within that stone hole. In any case, Atkinson identified holes for anti-friction posts on the southeast side of Stone 57, leading him to conclude that the stone had been erected from the northwest and not from within this pit to its south (Atkinson 1979: 207).

Rejection of the two dates from WA 2448 as being stratigraphically linked to Phase 3ii leaves us with just two acceptable dates for the sarsen monument's construction, falling within the period 2620-2480 cal BC (UB-3821 and OxA-4840). This is considerably earlier than most commentators have acknowledged and has major implications, discussed below (Table 2). But first, how may the large pit be best interpreted?

Pit WA 2448/3733 can be understood as one of a multitude of features in the southwest of the monument that may be assigned to Phase 3iii (Cleal et al. 1995: 206-12; dated by our argument to 2440-2100 BC), on both stratigraphic and chronometric grounds (Figure 7). Although Phase 3iii was initially formulated as a term of convenience rather than a coherent developmental stage (Cleal et al. 1995: 207), the digging and filling of this large pit constituted a major intervention which, whilst it may not have involved stone construction, might have served as a prelude to erection of the bluestone oval in Phase 3iv. The large pit appears to be just one of a series of pits of varying sizes dug at this time into this southwestern corner of the site, some of the others being stone holes from which stones were apparently removed (WA 3268/3269, 3270, 3279, 3284-3286, 3402, 3700, 3702, 3708 and 3710).

There are few clues in the fill to inform on the purpose of the large pit. At its base there is a stepped feature (WA 2451) whose black, earthy fill is distinctly different from the chalk rubble fills and possibly constitutes an earlier feature (Cleal et al. 1995: 201-02). Finds from the pit were few. There are those from the northeast side of Gowland's trench (Table 2), together with a small assemblage of sarsen and bluestone artefacts recovered by Atkinson from WA 2448/3733. The antler fragments used for the radiocarbon dating and a chalk phallus (Montague 1995a: 407, fig. 224) were among the few other items.

So why dig a large pit as deep as the base of the largest and deepest-set stone? Not only did this pit perilously undermine the great trilithon but it also appears to have served no practical purpose. It was too deep to have served as the removal pit for a fallen stone, and its exposure of the base of Stone 56 suggests that this could have been the principal aim of the pit-diggers. Another possibility is that it was dug for removal of something such as a large, naturally buried sarsen from this location. Alternatively, it was a removal ramp to enable a wooden cradle on rollers to recover the larger bluestones up to 4.4m and 5m long (Stones 67, 68, 70 and possibly 69, and the sandstone Altar Stone 80) that may have been set as deeply as 1.6m into stone holes in front of the great trilithon in Phase 3ii, after the bluestone arc (Phase 3i) was taken down and at the same time as the sarsens were erected. Following this interpretation, there was a horseshoe arrangement of bluestones set within (and mimicking) the horseshoe of sarsen trilithons during Phase 3ii. The pit WA 2448/3773 would have provided a sufficient drop for these larger bluestones to be pivoted on their bases and laid onto a cradle or sledge which could then be pulled up the gradual incline. The problem of where at least some of the bluestones went in Phase 3ii is thus resolved.

The arrival of Beakers in Britain

The sarsen circle and trilithons (Phase 3ii) were not the first stone phase at Stonehenge. They were preceded stratigraphically by an arc of bluestones (Phase 3i) whose erection remains undated by radiocarbon methods. The clear stratigraphic relationship between the sarsen circle (Phase 3ii) and the bluestone arc (Phase 3i) is visible in the east sector of the monument where the hole of sarsen Stone 3 cuts through the fill of Bluestone Q Hole 4 (Cleal et al. 1995: 177, 192, figs 92 & 140). This places the two comb-decorated Beaker sherds from Phase 3i (found in the fill of bluestone Q Hole 5) unassailably in the period before 2480 BC (at the end of the date range for Phase 3ii), most probably around 2550 BC if they were introduced into the bluestone hole when the bluestone was pulled out, prior to the stones of Phase ii being erected.

This poses a major problem for any Beaker chronology relying entirely on dates from Beaker burials alone. Recent syntheses of English and Scottish dates for Beaker burials demonstrate that the former cannot be considered to date before 2400 BC and the latter before 2380 BC (Needham in press; Sheridan forthcoming). But might Beaker ceramic styles have been in use in Britain before the appearance of this new inhumation rite, if only by a few generations (Parker Pearson 2005: 74-5)? Radiocarbon determinations from Beaker burials thus date only the re-appearance of the rite and not necessarily the first adoption of this pottery.

There are sites other than Stonehenge that also provide evidence for the use of Beakers in Britain before 2400 BC. Outside Britain, the earliest dates are from Iberia where Beakers appear by 2700 BC (Harrison and Martín 2001; Müller and van Willigren 2001). In relation to its Continental neighbours, Britain has been considered to have been late in taking up this fashion. Yet a group of three radiocarbon dates (GU-11701 4175±45 BP; GU-11699 4150±35 BP; GU-11697 4085±35 BP) for carbonised twigs and hazelnut from a small pit containing Beaker and Grooved Ware sherds at Dunragit in southern Scotland (Thomas 2005) provide a combined date of 2780-2590 cal BC at 67.8% probability (Figures 8 & 9). This range would place Beakers in Britain probably from the 27th century onwards.

A new dating programme on the deposits within West Kennet chambered tomb (Bayliss et al. in press) includes three dates towards the end of the sequence in which this tomb's burial deposits were sealed beneath deep layers of chalk containing Peterborough Ware, Grooved Ware and Beaker pottery. In the northwest chamber, a partially articulated goat skeleton, dated to 2560-2300 cal BC at 95% probability (OxA-13202 3934±36 BP), came from a layer within and below which were sherds of All-Over-Corded and fingertip-decorated Beakers (Piggott 1962: 44-5, fig. 14: B7, B1); an almost-complete Wessex/Middle Rhine Beaker (B8) also came from the top of this layer but the stratigraphic relationship between W/MR pot and layer is less certain (Piggott 1962: 45). In the southeast chamber, two disarticulated but near-complete infant skeletons were found in layers well above that containing another sherd of the finger-tip decorated Beaker (B1). Bones of the two infants are each dated to 2870-2490 cal BC at 95% probability (OxA-13183 4103±38 BP; OxA-13181 4105±35).

Mention can also be made of the 'old chestnut' of a discovery of Beaker pottery within the mound and near the base of the ditch of the Giants' Hills I long barrow at Skendleby in Lincolnshire (Phillips 1936: 53, 67-8). Since long barrows date to the fourth millennium BC, this context has long been considered problematic, especially because there was no evidence for a pit within which the sherds might have been introduced into the mound (Phillips 1936; fig. 2). Closer examination of the ditch sections reveals, however, that the long barrow was most probably remodelled in the Beaker period when the ditches were re-cut and the mound re-built. The two radiocarbon dates of unprovenanced antlers from the site (BM-191 4410±150 BP; BM-192 4320±150 BP; Evans and Simpson 1991: 41) almost certainly derive from the preceding Neolithic activity within the original ditch or the old ground surface (Phillips 1936: 95-6). Like West Kennet, this monument appears to have been extensively modified in the Beaker period but the precise date of this intervention, whether early or not in the Beaker sequence, remains to be established.

The Amesbury Archer and the Boscombe Bowmen

Both of these extraordinary Beaker burials have been claimed as graves of those who might have had a hand in the building of Stonehenge (Fitzpatrick 2002; 2004). Yet their radiocarbon determinations at 95% probability can now be seen to fall outside the period in which the sarsens were erected. Instead, they are broadly contemporary with Phases 3iii and 3iv, when the bluestones were dismantled and re-erected within the already-standing sarsen setting.

The Amesbury Archer could be considered as the embodiment of a culture historical interpretation of the Beaker people as a migrating population from central Europe (see Clarke 1970). With his European copper daggers and the oxygen isotope values of his teeth indicating a European homeland, his discovery has revived thoughts of the Beaker people as immigrants bringing metallurgy and other innovations to Britain around 2400 BC. Yet the earlier dates for Beakers now cast his arrival in a different light. This was no architect of Stonehenge. Nor was he a pioneer bearer of Beaker pottery, despite his long-distance journey to Britain.

Much the same can be said of the multiple burial of seven individuals at Boscombe Down, Amesbury, east of Stonehenge (Fitzpatrick 2004). They lived too late for the building of the sarsens, let alone the erection of the bluestones, to be anything more than a distant oral tradition. We may even dispute whether the three adults actually came from Wales, as has been claimed (Fitzpatrick 2004). The values of oxygen and strontium isotopes in their teeth are indeed consistent with the maritime climate and igneous rocks of southwest Wales. Yet identical values can also be obtained from Brittany and coastal zones of Iberia. Their method of multiple burial cannot be paralleled in Britain and is most similar to communal burials of the type assigned to Breton chambered tombs in this period or to multiple burials in certain parts of Iberia (******). The styles of the Beaker pots in the grave are also inconsistent with a Welsh provenance, as is one of the grave goods, a bone toggle of a style which is rare in Britain but relatively common in mainland Europe (*****). In terms of travel time, Brittany may have been closer to Stonehenge than southwest Wales. Of course, such aspects do not disprove a Welsh origin but they raise the possibility that Brittany or Iberia are just as, if not more likely homelands.

With the Beaker People Project (whose team includes MPP, AC, MR, CC, JE, JM, SN and AS) now analysing isotopes from a large sample of 250 Beaker-period burials from across Britain, there will soon be the opportunity to place these exceptional burials from near Stonehenge within a broader context of human mobility and migration in the period after 2470 BC.

Durrington Walls

The relationship between Stonehenge and Durrington Walls has been speculated upon for some time (Barrett 1994: 47; Parker Pearson and Ramilisonina 1998). Durrington Walls is Britain's biggest henge monument and is located 3km to the northeast of Stonehenge, close to the bank of the River Avon (Figure 10; Wainwright with Longworth 1971). Woodhenge is a small annexe on the south side of this monument; dates from an antler pick (BM-677 3817±74 BP) and animal bone (BM-678 3755±54 BP) from its ditch place its digging in the period 2394-2039 cal BC (Pollard 1995). In contrast, the wide standard deviations on the radiocarbon dates from Wainwright's excavation of the ditch and timber circles of Durrington Walls henge have allowed it to be positioned only broadly within the middle of the third millennium BC.

In 2003 the Stonehenge Riverside Project (Parker Pearson et al. 2004; directed by MPP, JP, CR, JT, CT and KW) commenced with an investigation of Durrington Walls' relationship to the River Avon, to investigate whether it was linked to the river by an avenue. Further downstream, Stonehenge is linked to the river by an avenue which is 21.5m wide at the monument and widens to over 30m nearer the river Montague 1995b: 291-327). In 2004 trial trenches located surviving archaeological

deposits outside the east entrance of Durrington Walls and, in 2005, excavations were undertaken in this area as well as on an undisturbed part of the Southern Circle, the large timber circle inside the henge's east entrance which was excavated in 1966-1968 (Figure 11; Wainwright with Longworth 1971: 23-38). The current excavations are on-going and form part of a wider project to investigate the purpose of Stonehenge which will continue until 2010 (Parker Pearson et al. 2004).

Over two-thirds of the Southern Circle lay within the road line excavated by Wainwright, and this included the timber circle's entrance on its southeast side, aligned precisely on the midwinter sunrise. The 2005 excavation trench was located on the opposite, northwest side to establish whether there was an opposing entrance. Within the 5m-wide trench there was no trace of such an entrance nor of any of the substantial post holes that elsewhere formed the outer two of six post rings that characterise this circle's second phase (Figure 12). This discovery hints at the possibility that the back of the circle was incomplete, perhaps deliberately so. It also strengthens the likelihood that this was never a roofed building, as has been speculated (Musson 1971: 365-68).

Within the trench, posts from three rings of the 6-ring circle were investigated. All had evidence of re-cutting by pits (formerly identified as weathering cones by Wainwright) into the tops of the holes containing the decayed posts. This appears to have been a deliberate act involving the deposition of artefacts and animal bones on the bases of these re-cut pits (Richards and Thomas 1984). An antler pick from the re-cut pit in the top of posthole *** within the fourth ring (ring 2E), excavated in 2005, has recently been dated to 2580-2400 cal BC (OxA-14976 3966±33 BP). Of course, its deposition within a re-cut feature means that it may have been deposited initially within the packing fill of the posthole rather than into the pit which cuts that posthole. Radiocarbon dating of the large numbers of antler picks from the five postholes revealed within the trench should enable us to establish high-resolution chronologies for sequences within each of the post pits.

Outside the east entrance, excavations have revealed a large avenue of dimensions similar to the 21.5m width of the Stonehenge avenue where it conjoins Stonehenge. The Durrington Walls avenue is different, however, in having a bank outside its ditch (Figure 13). Its ditch is also much shallower than that of the Stonehenge avenue. Parts of the Durrington Walls avenue have been destroyed by later cultivation but sections of its 100m length are well preserved and demonstrate that it was surfaced with rammed flint to form a roadway which was heavily trampled along its central axis. Large quantities of articulated animal bones from the edge of the roadway, as well as from the gully and bank (amongst the large sherds of third millennium Grooved Ware), should provide dating material for its construction and use. The avenue is not aligned on the midwinter sunrise but, when looking in the opposite direction westwards towards the henge, is within 1½° of midsummer sunset (Clive Ruggles pers. comm.). Normally, with a flat horizon the solstice directions are diametrically opposite each other; Durrington Walls is on a steep slope so the midsummer sun sets further south than it would on the flat. The avenue also runs against the grain of the valley's contour, further suggesting that its alignment on this solsticial direction was deliberate. Together with the Southern Circle's midwinter sunrise axis, the Durrington Walls avenue provides a complementary arrangement to

that at Stonehenge where the avenue and stone circle are aligned on the midwinter sunset in one direction and the midsummer sunrise in the other.

Extensive areas of Neolithic ground surface were discovered either side of the Durrington Walls avenue and under the external bank of the henge. In most areas the ground surface was covered by deep middens of wood ash and cultural debris, both under the bank and outside it. Remains of three Grooved Ware-associated house floors were found on the north side of the avenue, all oriented westwards towards the henge. A fourth, less well-preserved house probably lies under the northern edge of the trench. Three of these houses are associated with clusters of extraction pits from which the chalk matrix for their floors and walls was presumably obtained. The dozen or so pits in each of the intercutting groups were dug and filled at different times, hinting at sequences of wall re-plastering over many years during the lifetime of each house. The houses are all small and the square trapezoidal plan of the largest, House 547, is only about 16 sq m in area. Another house, House 772, was located on the bank of the avenue. The hearths of this and House 547 were located in the south central part of the floor. The doorway of House 547, revealed by a plume of high magnetic susceptibility values leading westwards out of the house, was near the middle of the wide west side.

House 547 was different from the other houses in that the zone of its extraction pits on its south side was re-used for the digging of many circular pits into which dense and structured deposits of animal bones, pottery and lithics were deposited. These pit assemblages differed from that of an adjacent large midden north of the house in having greater amounts of pottery in larger pieces, quantities of orange hearth ash rather than grey wood ash, and no flint tools other than arrowheads. They thus appear to have been special deposits. One pit was dug into the southwest corner of House 547, presumably after its abandonment. Amongst the food waste in this pit there was an abraded human femur with two projectile injuries. Its date (OxA-14800 4101±32 BP; 2760-2560 cal BC at 71.8% probability) suggests that it was curated for some time prior to the pit's filling, dated by articulated pig bone to 2630-2470 cal BC at 93.4% probability (OxA-14801 4036±32 BP). It is only the third human bone to come from the entire site, in contrast to the large quantities of burnt and unburnt human remains from Stonehenge (Powers 1971; McKinley 1995: 451-61; Pitts 2000: 116-21).

The two radiocarbon determinations on antler and pig bone from Durrington Walls are the first high-precision dates for activity at this monument. Since Stonehenge's Phase 3ii can now be re-dated to 2620-2480 cal BC, these dates for Durrington Walls are statistically indistinguishable from those for the sarsen circle and trilithons. Of course, they do not prove contemporaneity and they are only the first of many which will allow the entire sequence of activity at Durrington Walls to be precisely dated perhaps to within two or three generations. Yet they offer the possibility that Durrington Walls was constructed and used at precisely the same time as the sarsen phase at Stonehenge. That they were designed and built as a single complex is further strengthened by their complementary differences – one in stone with predominantly Beaker pottery, cattle bones and human remains, the other in wood with predominantly Grooved Ware, pig bones and a near absence of human remains. We can also add the distinction in solstice alignments noted above. Such a dramatic dichotomy has been viewed as the product of two 'cultures' living side by side (Case

1997: 167) but other explanations of their differentiated but integrated purpose as opposed stages of a funerary process in which the dead became ancestors are perhaps more satisfactory for the time being (Parker Pearson and Ramilisonina 1998; Parker Pearson 2000; Parker Pearson et al. in press; Pitts 2000: 251-77; Pryor 2003).

Acknowledgements
We thank our Stonehenge Riverside Project colleagues, particularly Umberto Albarella, Mike Allen, Charly French, Karen Godden, Chris Knüsel, Neil Linford, Andy Payne, Clive Ruggles, the site supervisors (Bob Nunn, Dave Robinson and especially Dave Aspden and Becca Pullen), the outreach team and the many students and volunteers who have made this work such a success so far. We also thank Amanda Chadburn, Richard Osgood, Mike Pitts and Julian Richards for their advice and support. Karen Kirk and Sian Price from Time Team are thanked for their involvement in 2005, particularly for funding the new radiocarbon determinations from Durrington Walls. Other funds for the SRP were provided in 2004 and 2005 by the British Academy, English Heritage, the McDonald Institute, the Prehistoric Society (Bob Smith Prize), the Royal Archaeological Institute and the Society of Antiquaries. The Beaker People Project is funded by the Arts and Humanities Research Council.

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Figure 1 Plan of Stonehenge showing cuttings 17 and 52 (by kind permission of English Heritage).

Figure 2 Photograph of the section in cutting 17 showing the radiocarbon sample OxA-4839 (by kind permission of Salisbury Museum).

Figure 3 Photograph of cutting 52 showing the approximate location of the radiocarbon sample BM-46 (by kind permission of Salisbury Museum).

Figure 4 Reconstructed longitudinal profile of Atkinson's ramp for Stone 56, combining data from the 1901, 1956 and 1958 excavations.

Figure 5 Plan of Atkinson's ramp, incorporating the evidence from Gowland's trenches for its southern edge.

Figure 6 Reconstructed plan and transverse section of the stone hole for Stone 56 as described by Gowland.

Figure 7 Plan of the large pit and other features now assignable to Phase 3iii.

Figure 8 Plan of the Late Neolithic features at Dunragit

Figure 9 Plan and section of the pit containing Beaker pottery, showing the positions of Beaker sherds in relation to radiocarbon samples.

Figure 10 Map of Durrington Walls in relation to Stonehenge.

Figure 11 Plan of Durrington Walls, showing positions of trenches excavated in 2004 and 2005.

Figure 12 Plan of the 2005 trench into the Southern Circle.

Figure 13 Plan of Durrington Walls Trench 1 showing the avenue with adjacent houses, pits and other features.

Table 1 Stone artefacts recovered by Gowland from around Stone 56

Table 2 The revised Stonehenge chronology

Table 1
Stone artefacts recovered by Gowland from around Stone 56

	Trenches	Flint implements	Sarsen hammerstones	Sarsen mauls	Non-sarsen implement	Total	Approx. cubic metres	Artefact density per cu m
Southern side	I, II, III, VII, Q	49	14	8	1	72	8.3	8.7
Northern side	IV, V, VI, VIII	11	8	0	1	20	12.5	1.6

Table 2
The revised Stonehenge chronology

Phase 3i	Pre-2480 BC	Bluestone arc	Beakers in use	Durrington Walls?
Phase 3ii	2620-2480 BC	Sarsen circle and trilithons (bluestones set inside trilithon horseshoe?) Erection of Slaughter Stones (incl. Stonehole E)	Beakers in use	Durrington Walls Initial construction of Stonehenge Avenue
Phase 3iii	2440-2100 BC	Large pit and features in west (dismantling of bluestone setting?) Dismantling of Stonehole E	Beaker inhumation rite begins (Amesbury Archer, Boscombe Bowmen)	Woodhenge ditch Beaker-age burial in Stonehenge ditch Recutting of Stonehenge Avenue
Phase 3iv	2280-2030 BC (Bayliss et al. 1997: 56)	Bluestone oval	Beaker inhumation rite continues (Amesbury G51, Hemp Knoll, Irthlingborough) Grooved Ware ends	Recutting of Stonehenge Avenue Round barrows
Phase 3v	2270-1930 BC (Bayliss et al. 1997: 56)	Bluestone horseshoe	Food Vessel burials (Bulford)	Recutting of Stonehenge Avenue Round barrows
Phase 3vi	2030-1750 BC 1640-1520 BC (Bayliss et al. 1997: 56)	Z Holes Y Holes	End of Beaker burials	Recutting of Stonehenge Avenue Round barrows