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Wilsford Henge, Wilsford, Wiltshire

Radiocarbon Dating and Chronological Modelling

Bisserka Gaydarska, Alex Bayliss, Peter Marshall, Christopher Bronk Ramsey, Michael Dee, Elaine Dunbar, Irka Hajdas and Jim Leary

Scientific Dating

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Summary

Radiocarbon dating and chronological modelling of samples from Wilsford Henge, Wilsford, Wiltshire was undertaken in support of the Vale of Pewsey Project. The results estimate Wilsford henge to have been constructed in *2600–2470 cal BC (95% probability)*. After a gap of around 1,000 years, an inhumation was cut into the ditch in *1600–1585 cal BC (1% probability*) or *1545–1420 cal BC* (*94% probability*). Midden deposits were found in the top of the henge ditch, which contain finds dating to between *875–775 cal BC (95% probability)* to *795–610 cal BC (95% probability*).

These activities at Wilsford coincide with similar developments across Wessex.

Contributors

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Front Cover Image

Wilsford Henge from the air (NMR 4622/1, © Historic England Archive)

Archive Locations

Wiltshire Museum, 41 Long Street, Devizes, Wiltshire, SN10 1NS (finds)

Historic Environment Record

Wiltshire and Swindon Historic Environment Record, Wiltshire Archaeology Service, The Wiltshire and Swindon History Centre, Cocklebury Road, Chippenham, SN15 3QN

Date of investigation

2015–24

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Introduction

The Vale of Pewsey Project

The National Mapping Programme (NNP) has provided almost continuous data for the area between Stonehenge and Avebury in Wiltshire (Carpenter and Winton 2011; https://historicengland.org.uk/research/results/aerial-archaeology-mapping-explorer/), demonstrating that there are extensive and previously unrecognised archaeological landscapes in the Vale of Pewsey. The Vale is in a key position between the two geographically separated parts of the Stonehenge and Avebury World Heritage site. These newly identified sites and monuments, particularly the spatially cohesive group along the headwaters of the River Avon, formed the basis for a staged, collaborative excavation project to understand the evolution of this landscape. This will go some way towards linking the Stonehenge landscape to the south with the Avebury landscape to the north.

The fieldwork took place over three seasons (2015–17) and comprised targeted excavation and analysis of poorly understood monuments, Wilsford henge and Cat's Brain long barrow, as well as further excavation of Marden henge. The collaborative project undertaken by the University of Reading and Historic England was supported by a major research grant from the Arts and Humanities Research Council, awarded to Jim Leary and Martin Bell of the University, with Historic England also providing financial support and specialist resources.

This document is a technical archive report on the radiocarbon dating and chronological modelling of samples from Wilsford Henge, Wiltshire. Elements of this report may be combined with additional research at some point in the future to form a comprehensive publication on the chronology of Wilsford Henge and its timescape within the Stonehenge and Avebury landscape.

Wilsford Henge

Wilsford henge is situated to the south-east of the Marden barrow cemetery, on the east side of the ridge within the parish of Wilsford (Fig. 1). The site appears regularly as a cropmark and was noted as a possible henge as early as the late 1980s (Harding and Lee 1987). It was identified on aerial photographs as a broad and very irregular penannular ditch with a gap facing north-east, roughly in the direction of the River Avon. A line of external pits encircles part of the enclosure, including across the gap forming the possible entrance. Both the Wilsford and Marden henges are defined by irregular ditches, and both seem to face the river. A geophysical survey conducted in 2012–13 identified an interior circuit of pits or post-holes within the henge, together with evidence for an adjacent, previously unrecognised, Roman settlement. This appears to underlie the raised causeway that runs through the centre of the site (Linford et al. 2013).

Excavations were undertaken at Wilsford Henge in 2015–16 as part of the Vale of Pewsey Project (Leary 2015; 2016; Fig. 2). A trench measuring 40m x 15m (Trench D) was located over the terminal of the henge ditch and some of the internal area adjacent to this. The internal diameter of the henge is 42m, and the excavations demonstrated that the ditch is 3.35m deep and 13.3m wide. The initial infills of the ditch are eroded sands. Noteworthy from these fills is an assemblage of large, well-preserved animal bones, possibly aurochs (Worley pers. comm.). The central part of the henge has a flint cobbled surface, a possible level platform, that is believed to have been lain deliberately. A ring of large pits or postholes were visible on the aerial and geophysical surveys both inside and outside the henge ditch. Two of the internal pits/postholes were excavated in 2015, one of which contained the skull of a deer (Leary 2015). Two of the external pits were excavated in 2016 in Test Pits 3 and 4, each measuring 3.5m x 3.5m. The pits were substantial, over a metre deep. The pit in Test Pit 3 (2.7m by 1.52m) contained a ramp and a postpipe suggesting that it once contained a post, and the pit in Test Pit 4 (2.48m by 2.36m) contained a thick charcoal-rich fill (Leary 2016).

A grave containing the well-preserved skeleton of a 14–15-year-old possible male was found cut into the early fills of the ditch of the Wilsford henge. This skeleton was in a crouched position, lying on its right-side facing west, with its head to the north and arms crossed. A necklace made of amber spacer beads was found around the neck of this skeleton, and residual sherds of Grooved Ware and finely decorated Beaker came from the fill (4074) of the grave (Russell 2021). Sealing this burial, the overlying fills contained Late Bronze Age and Early Iron Age finds, that have been interpreted as re-deposited midden. This midden may have developed within the henge and been pushed into the ditch at a later stage.

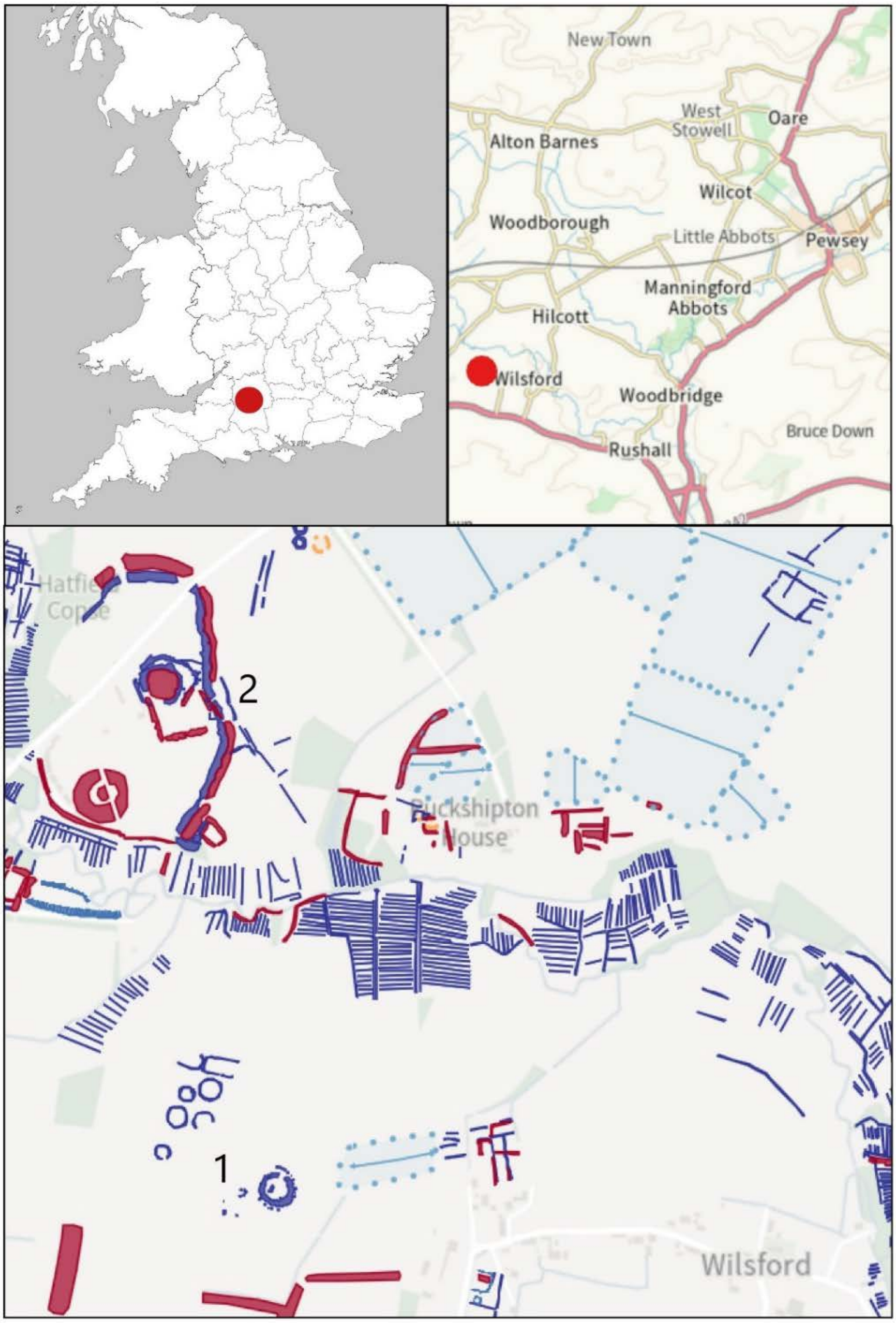

Figure 1: Maps to show the location of Wilsford Henge, the red dot. Top right 1:150000; © Crown Copyright and database right 2024. All rights reserved. Ordnance Survey Licence number 100024900. Bottom 1:5000; 1. Wilsford henge, 2. Marden henge, Aerial Archaeology Mapping Explorer © Crown Copyright and database right 2024. All rights reserved. Ordnance Survey Licence number AC0000815036

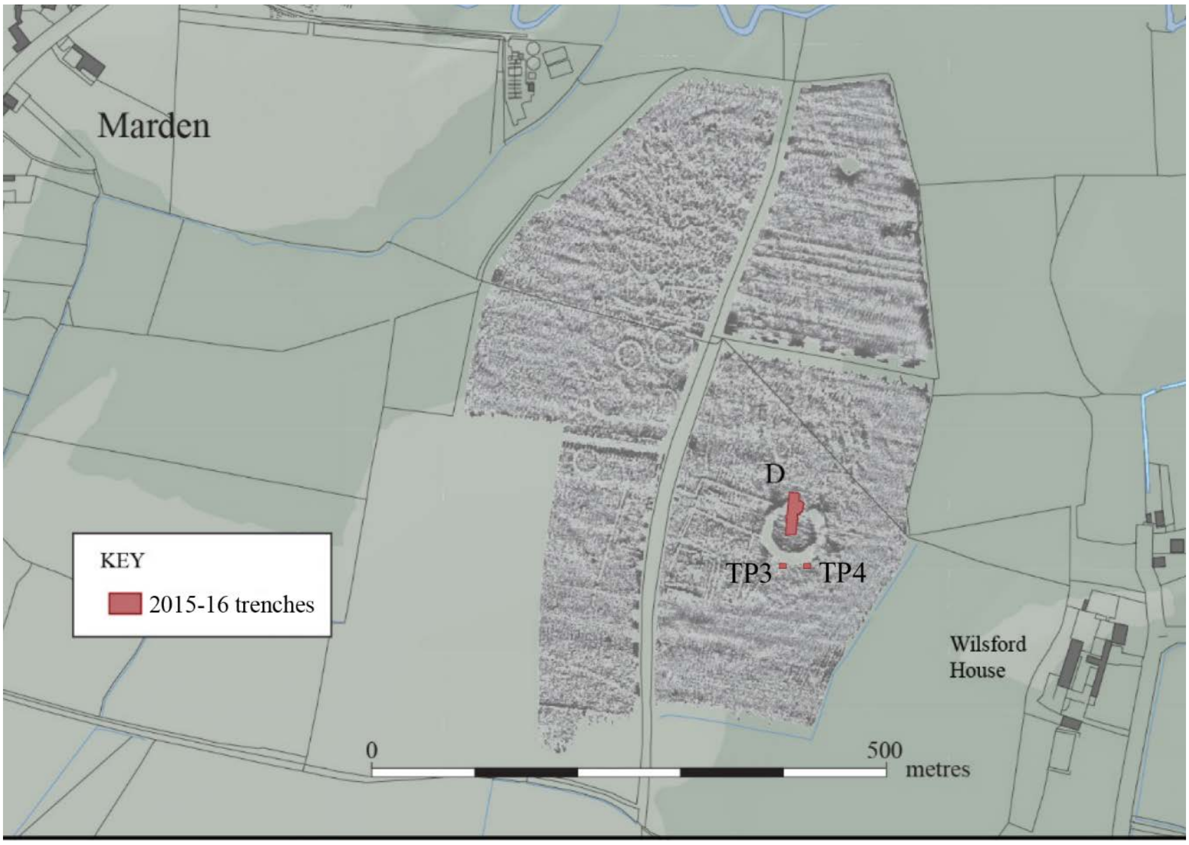

Figure 2: Plan showing the locations of the 2015–16 trenches at Wilsford Henge (after Leary 2015, fig. 2)

Radiocarbon Dating and Chronological Modelling

The new radiocarbon dating programme for Wilsford henge was conceived within the framework of Bayesian chronological modelling (Bayliss and Marshall 2022). This allows the combination of calibrated radiocarbon dates with archaeological prior information using a formal statistical methodology. The objectives of the dating programme were to provide:

- a robust chronology for the construction of the henge,
- a precise date for the furnished inhumation cut into the henge ditch,
- an understanding of the temporal relationships between the internal/external pits and the henge,
- an understanding of the chronology of the midden and the history of its deposition,
- dating for the equid bone from the midden, thus contributing to the understanding of the presence of equids in prehistoric Britain.

This will enable comparison with the nearby Marden Henge and, more broadly, will establish the place of the Vale of Pewsey archaeological landscape within the late Neolithic timescape of Wessex.

Sampling

Prior to this programme of radiocarbon dating, there were no existing radiocarbon dates from the henge.

Sample selection was undertaken using the iterative process for implementing Bayesian chronological modelling on archaeological sites outlined in Bayliss and Marshall (2022, §3). Articulating bone groups from the fills of the henge ditch were targeted for dating, as their deposition was probably close in time to when the ditch fills accumulated. Those from the initial silting of the ditch probably closely date the construction of the henge, and that from an overlying fill probably relates to an episode of later reuse. A sample of human bone was recovered from the grave cutting the early fills of the ditch. Disarticulated animal bones were selected from the two pits outside the henge, to establish their temporal relationship to the ditch circuit, and from the midden layers in the upper part of the ditch, to determine when the midden formed. Short-lived charcoal was dated from the two shallow pits located inside the henge seeking to establish the timing of these episodes of pit-digging and infilling.

Table 1 Radiocarbon and stable isotopic measurements from Wilsford Henge (replicate measurements have been tested for statistical consistency and combined by taking a weighted mean as described by Ward and Wilson (1978).

Laboratory number	**Sample reference, material and context**	**$\delta^{13}C_{IRMS}$ (‰)**	**$\delta^{13}C_{AMS}$ (‰)**	**$\delta^{15}N_{IRMS}$ (‰)**	**C/N ratio (atomic)**	**Radiocarbon age (BP)**
Henge Ditch						
ETH-122545	Sample 4081.2. Juvenile pig tibia with refitting unfused epiphysis from the primary basal fill (4081) of the henge ditch (4046)	−20.5±0.1	−24.6	6.9±0.1	3.4	4076±24
GrM-29391	Sample 4081.3. Replicate of ETH-122545	−20.7±0.15		5.5±0.3	3.1	3974±22
4018 pig	^{14}C: 4021 ±17 BP, T'=9.8; $\delta^{13}C$: T'=1.2, −20.6±0.08‰; $\delta^{15}N$: T'=19.6, T'(5%)=3.8, v=1 for all					
OxA-35175	Sample 4081. Juvenile cattle tibia (LHS) with refitting unfused proximal epiphysis from the primary basal fill (4081) of the henge ditch (4046)	−22.8±0.2		5.6±0.3	3.2	4015±33
GrM-29392	Sample 4073.1 Articulating cattle metacarpal and carpals from the basal silty sand fill 4073 of the henge ditch (4046)	−24.0±0.15		5.6±0.3	3.2	4008±24
SUERC-66997	Sample Sk1. Human bone, right femur, from crouched inhuman of a *c.* 14.5–15 year old ?male in grave (4075) cutting the early fills of the henge ditch (4046)	−20.5±0.2	−20.5±0.2	9.2±0.3	3.2	3232±31
ETH-122547	Sample 4065.1. Juvenile pig femur with refitting unfused epiphysis from a sandy silt fill (4065) of the henge ditch (4046) overlaying the top of grave cut 4075		−20.6			3676±27
Pits inside Henge						
ETH-122544	Sample 4033.2. *Corylus avellana* charcoal from a single fill 4033 of a shallow pit 4063, located inside the henge		−26.2			3956±24
GrM-29737	Sample 4033.1. Maloideae roundwood charcoal from a single fill 4033 of a shallow pit 4063, located inside the henge	−25.3±0.15				3977±26
Pits outside the Henge						

Laboratory number	Sample reference, material and context	$\delta^{13}C_{IRMS}$ (‰)	$\delta^{13}C_{AMS}$ (‰)	$\delta^{15}N_{IRMS}$ (‰)	C/N ratio (atomic)	Radiocarbon age (BP)
ETH-122550	Sample 7120.1. Roe deer (identified by ZooMs, pers. com. Samantha Presslee) left femur from sandy silt primary fill (7120) of a large pit (7121), located outside the henge	−21.8±0.1	−27.5	4.5±0.1	3.3	3956±24
GrM-29390	Sample 7109.1. Goat (identified by ZooMS, pers.com. Samantha Presslee) right metacarpal from a clay upper fill (7109) of a large pit (7125), located outside the henge	−21.6±0.15		7.0±0.3	3.1	3558±22
Midden						
ETH-122548	Sample 4039.2. Cattle left mandible from grey silt upper fill (4039) of the henge ditch (4046) believed to represent re-deposited midden	−22.4±0.1	−28.2	7.0±0.1	3.3	2539±23
GrM-29394	Sample 4039.1. Equid distal metapodial from grey silt upper fill (4039) of the henge ditch (4046) believed to represent re-deposited midden	−21.3±0.15		3.7±0.3	3.1	2599±21
ETH-122549	Sample 4053.2. Pig right mandible from grey silt upper fill (4053) of the henge ditch (4046) believed to represent re-deposited midden	−21.6±0.1	−24.7	3.3±0.1	3.3	2597±23
GrM-29396	Replicate of ETH-122549 4053.3	−20.5±0.15		3.6±0.3	3.2	2601±21
4053 pig	^{14}C: 2599 ±16 BP, T'=0.0; $\delta^{13}C$: T'=37.2; $\delta^{15}N$: T'=0.9, +3.3±0.1‰; T'(5%)=3.8, v=1 for all					
GrM-29395	Sample 4053.1. Cattle left mandible from grey silt upper fill (4053) of the henge ditch (4046) believed to represent re-deposited midden	−21.8±0.15		4.1±0.3	3.1	2525±21

Radiocarbon Dating

Fifteen radiocarbon results have been obtained from samples of human and animal bone and charcoal from the Wilsford Henge. Details of the dated samples, radiocarbon ages, and associated stable isotopic measurements are provided in Table 1. The radiocarbon results are conventional radiocarbon ages (Stuiver and Polach 1977). All have been corrected for fractionation using $\delta^{13}C$ values measured during the dating process by Accelerator Mass Spectrometry (AMS), except for SUERC-66997 which was calculated using the $\delta^{13}C$ value measured by Isotope Ratio Mass Spectrometry (IRMS). In addition, $\delta^{13}C$ values and $\delta^{15}N$ values have been obtained on sub-samples of the dated material by Isotope Ratio Mass Spectrometry, as these results more accurately reflect the natural isotopic composition of the sampled material.

Seven samples were dated at the Centre for Isotope Research, University of Groningen, the Netherlands in 2022 (GrM-), which were pretreated, combusted in an elemental analyser coupled to an IRMS for determination of $\delta^{13}C$ and $\delta^{15}N$ values, and graphitised as described by Dee et al. (2020). The graphite was then pressed into aluminium cathodes and dated by AMS (Synal et al. 2007; Salehpour et al. 2016).

Six samples were dated at the Laboratory of Ion Beam Physics, ETH Zürich, Switzerland in 2022 (ETH-). The five animal bone samples were gelatinised and ultrafiltered as described by Hajdas et al. (2007; 2009) and the charcoal sample was pretreated using the acid-base-acid protocol described by Hajdas (2008). They were then combusted in an elemental analyser and graphitised using the fully automated system described by Wacker et al. (2010a). Graphite targets were dated using a 200kV, MICADAS Accelerator Mass Spectrometer as described by Wacker et al. (2010b). Stable isotopic ratios for the bone samples were obtained on sub-samples of the pretreated material using a ThermoFischer Flash-EA 1112 elemental analyzer coupled through a Conflo IV interface to a ThermoFisher Delta V Isotope Ratio Mass Spectrometer.

The pretreatment, combustion, graphitisation, and measurement by AMS of the single bone sample dated at the Scottish Universities Environmental Research Centre (SUERC-) in 2016 followed the methods outlined in Dunbar et al. (2016). Samples for $\delta^{13}C$ and $\delta^{15}N$ measurement were prepared and analysed as described by Sayle et al. (2014). The single animal bone processed at the Oxford Radiocarbon Accelerator Unit (OxA-) in 2017 was pretreated and combusted in an elemental analyser coupled to an IRMS for determination of $\delta^{13}C$ and $\delta^{15}N$ values as described in Brock et al. (2010), graphitised (Dee and Bronk Ramsey 2000) and dated by AMS (Bronk Ramsey et al. 2004).

Data reduction in both Zürich and Groningen was undertaken as described by Wacker et al. (2010c). All four facilities maintain continual programmes of quality assurance procedures, in addition to participation in international inter-comparison exercises (Scott et al. 2017). Details of quality assurance data and error calculation at Groningen are provided by Aerts-Bijma et al. (2021), and similar details for ETH are provided in Sookdeo et al. (2020).

Replicate radiocarbon results and stable isotopic measurements by IRMS have been obtained on two animal bone samples. One pair of each type is statistically consistent at the 5% significance level and the other is inconsistent at the 1% significance level (Ward and Wilson 1978; Table 1). This is not within statistical expectation, and so the accuracy of the divergent radiocarbon measurements has been assessed during the modelling process.

Chronological Modelling

The chronological modelling presented here has been undertaken using OxCal 4.4 (Bronk Ramsey 2009), and the internationally agreed calibration curve for the northern hemisphere (IntCal20; Reimer et al. 2020). The models are defined by the OxCal keywords and brackets on the left-hand side of Figures 3 and 5, and by the CQL2 code provided in the Appendix. In the figures, calibrated radiocarbon dates are shown in outline, and the posterior density estimates produced by the chronological modelling are shown in solid black. The other distributions correspond to aspects of the model. For example, the distribution *start Wilsford Henge* (Fig. 3) is the posterior density estimate for when the henge was constructed. In the text and tables highest posterior density intervals, which describe the posterior distributions, are given in italics.

From the sequence of Neolithic deposits in the henge ditch, we have sampled the basal fills (4073) and (4081). The articulating cattle metacarpal and carpals from fill (4073) dates the initial silting of the ditch. The replicate measurements on a juvenile pig tibia with refitting unfused epiphysis (ETH-122545 and GrM-29391) from the stratigraphically later fill (4081), are statistically inconsistent at the 1% significance level (Table 1). They are both, however, statistically indistinguishable at the 5% significance level with a third measurement from this context (OxA-33175; T'=2.2 and T'=1.1, T'(5%)=3.8, v=1, respectively; Ward and Wilson 1978). Therefore, a weighted mean has been taken (4021±17 BP) for the pig tibia as it is difficult to judge which measurement is the outlier (although it is perhaps more likely that one of the errors on these replicate measurements has been slightly underestimated)[1].

[1] A variant model which includes ETH-122545, but excludes GrM-29391, has good overall agreement (Amodel: 90), although *ETH-122545* has poor individual agreement (A: 47). Another variant model which includes GrM-29391, but excludes ETH-122545, also has good overall agreement (Amodel: 138), and *GrM-29391* also has good individual agreement (A: 116).

Other measurements that may be related to the use of the henge derive from a shallow pit in its' interior and two pits located outside the monument. The two measurements on short-lived charcoal (ETH-122544, GrM-29737) from the pit [4063] inside the henge are statistically consistent at 5% significance level (T'=0.4, T'(5%)=3.8, v=1), and so probably accurately reflect the date of this activity. The two measurements from the pits [7120] and [7125] from outside the henge ditch are very different in age, with GrM-29390 from pit [7125] clearly post-dating other Neolithic activity on the site. These pits were both substantial, but quite different (Leary 2016, 29). Pit [7120] was over a metre deep, with a ramp on its northern side and had a large post-pipe indicating that it once contained a post. Pit [7125] was very different in form and fill, although of similar depth. There was no clear ramp leading into the feature although disturbance on the northern side may be responsible for this. There are two possibilities: either both pits were associated with the Neolithic henge and GrM-29390 came from the later disturbance, or pit [7125] is a much later feature. We incline to the former interpretation, excluding GrM-29390 from the model as intrusive from later activity. Our modelling approach, however, encompasses either interpretation.

Following the Neolithic use of the henge ditch, a crouched inhumation of a young man wearing a necklace of amber spacer beads, was lain in a grave [4075] inserted into the ditch (Leary 2015, 29). The grave fill contained four sherds of Grooved Ware, three sherds of Beaker vessels, and two clearly intrusive Late Bronze Age/Early Iron Age sherds (Russell 2021, 19 and table 7).

This burial was overlain by a series of successive fills, dark in colour, and containing many Late Bronze Age/Early Iron Age finds. These layers have been interpreted as redeposited midden (Leary 2015, 35). Whether in fact this midden was redeposited or not comes down to interpretation. The large Vale of Pewsey middens (e.g. East Chisenbury, Potterne etc) are large mounds of material, and the working hypothesis during excavation was that the Late Bronze Age/Early Iron Age midden at Wilsford was originally a mounded midden in the centre of the henge. A Romano-British farmstead was built nearby, and the interpretation was that the midden was pushed into the henge ditch to make way for its associated field systems.

The measurement (ETH-122547) on a juvenile pig femur with refitting unfused epiphysis from the lowest of these fills (4065), however, has poor individual agreement with its position in the sequence as later than grave [4075] (model did not run, Amodel: 0). The presence of an unfused epiphysis suggests that this sample was in its primary depositional context (Bayliss and Marshall 2022, §3.6), and so we considered the possibility that grave [4075] was actually cut through fill (4065) and was mis-recorded. Context (4065) produced 41 generally small, variously abraded, sherds of which one is probably Grooved Ware, 11 are Beaker, and 29 are sherds of Late Bronze Age/Early Iron Age form (Russell 2021, 18).

It is possible that the Late Bronze Age/Early Iron Age sherds in (4065) were intrusive as this is a mixed assemblage and such pottery in the fill of the Middle Bronze Age grave below is clearly contamination. In this case grave [4075] could indeed have cut fill (4065), which may not actually be part of the Late Bronze Age/Early Iron Age midden. This context is described as ‘mid-yellow brown sandy silt’ (Leary 2015, 29) and so does not appear to have been as dark as the typical midden layers. The refitting bone group from this deposit (ETH-112547) is probably *c.* 1000 years earlier than the midden material, and so it may actually derive for a silting layer in the henge cut that was cut by grave [4075]. Alternatively, it is possible that the pig femur with its accompanying epiphysis lay juxtaposed in the ground and were redeposited into context (4065) together when the midden was moved. If so, however, it does not appear that the dated pig femur was from the midden itself. Given these uncertainties, cautiously, we have modelled this date (ETH-122547) as a *terminus post quem* for the end of the overlying midden.

The replicate measurements on a pig right mandible (ETH-122549/GrM-29396) from fill (4053), which overlies (4065), are statistically consistent at the 5% significance level (Table 1). They are not, however, statistically consistent (T’=7.8, T’(5%)=3.8, v=1) with the third measurement from this context (GrM-29395) and therefore represent different depositional events. Although the two results from the uppermost dated fill (4039) are statistically consistent at the 5% significance level (T’=3.7, T’(5%)=3.8, v=1), the equid distal metapodial (ETH-122548) seems to be earlier than a cattle left mandible (GrM-29395) from the underlying deposit (4053) causing poor individual agreement for the this date if the stratigraphic sequence of midden layers is included in the model (A: 27; model not shown). Either the equid metapodial is residual, or the midden was reworked.

These issues may be clarified during the post-excavation programme if further animal bone groups are identified in the faunal assemblage. For the moment, we include the dates from the midden layers as a coherent phase of activity later than the Middle Bronze Age burial, but do not include the stratigraphic sequence of layers within the midden. This is a conservative approach, allowing for different interpretations of the history of the Wilsford midden.

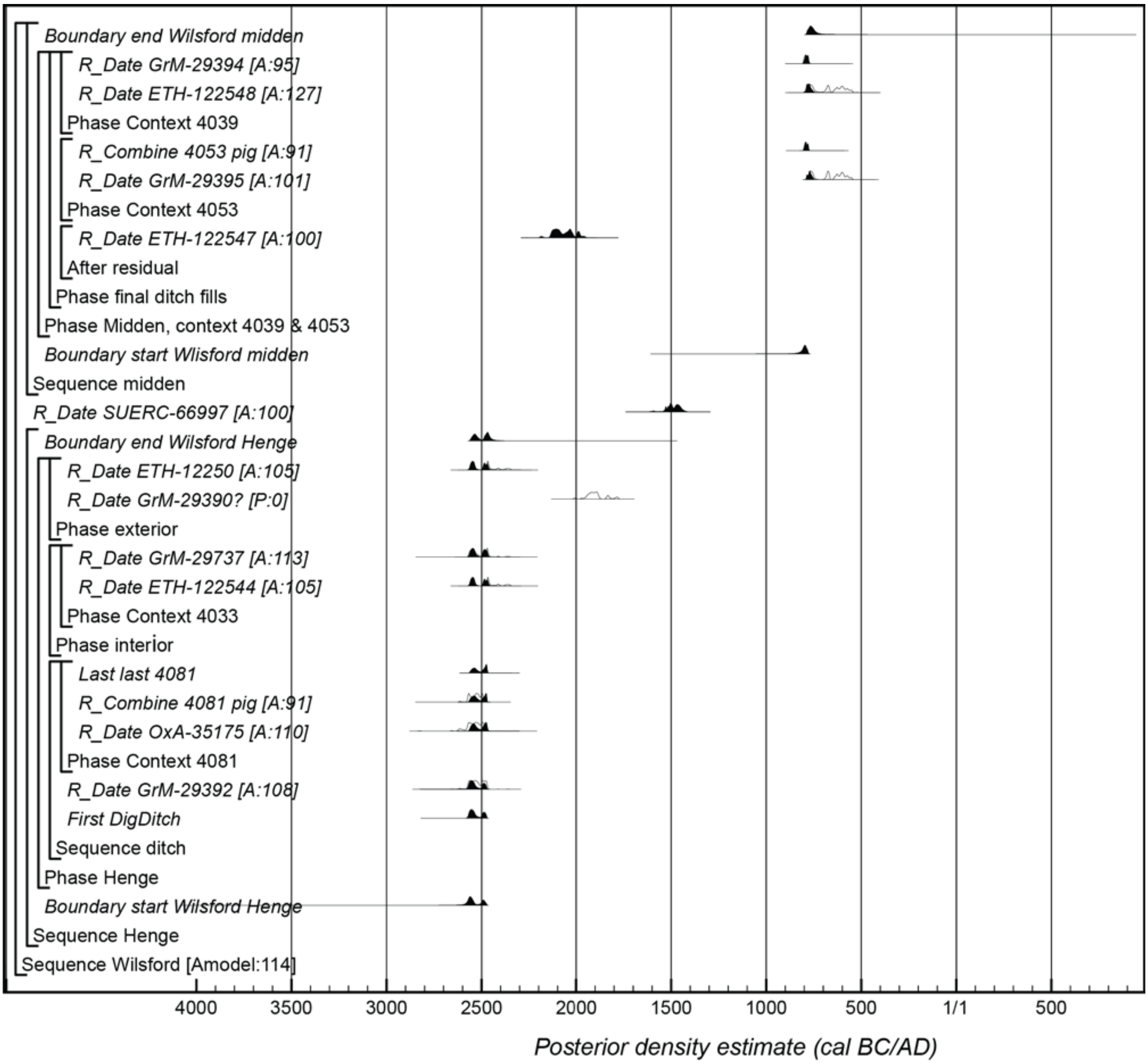

Figure 3: Probability distributions of dates from Wilsford Henge. Each distribution represents the relative probability that an event occurs at a particular time. For each of the dates two distributions have been plotted: one in outline, which is the result of simple radiocarbon calibration, and a solid one, based on the chronological model used. The result followed by '?' has been excluded from the model. The large square brackets down the left-hand side along with the OxCal keywords define the overall model exactly.

This model for Wilsford is shown in Figure 3. It has good overall agreement (Amodel: 114). and suggests that the Wilsford Henge was constructed in *2600–2470 cal BC (95% probability; start Wilsford Henge*; Fig. 3), probably in *2580–2540 cal BC (51% probability)*, or in *2500–2480 cal BC (17% probability)*. The Neolithic activity at the henge ended in *2565–2425 cal BC (95% probability; end Wilsford Henge*; Fig. 3), probably in *2555–2520 cal BC (31% probability)* or in *2490–2455 cal BC (37% probability)*. This means that the henge was in use for *1–155 years (95% probability; use Wilsford Henge*; Fig. 4), probably for *1–55 years (68% probability)*.

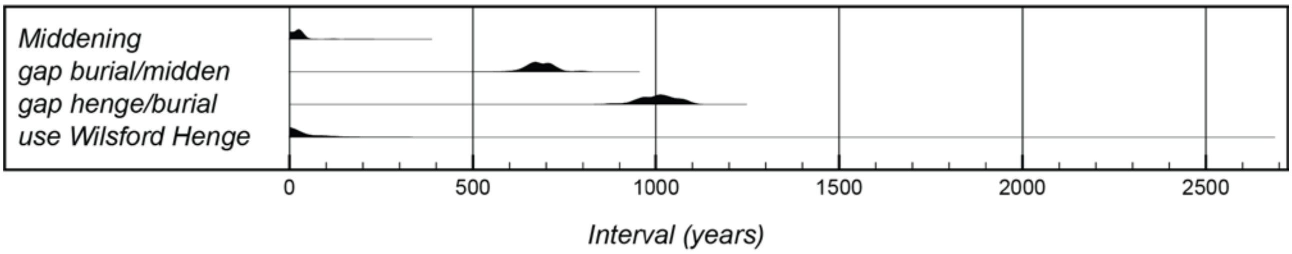

Figure 4: Durations and intervals between episodes of activity at Wilsford Henge, derived from the model defined in Figure 3.

After a gap of *900–1115 years (95% probability; gap henge/burial*; Fig. 4), probably of *950–1065 years (68% probability)*, the inhumation was cut into the henge ditch. This happened in *1600–1585 cal BC (1% probability; SUERC-66997*; Fig. 3) or *1545-1420 cal BC* (*94% probability*), probably in *1530–1525 cal BC (3% probability)* or in *1520–1490 cal BC (30% probability) or* in *1485-1445 cal BC (35% probability).* After another gap of *585–765 years (93% probability; gap burial/midden*; Fig. 4) or *770–810 years (2% probability)*, probably of *650–725 years (68% probability)*, the midden began to form. This started in *875–775 cal BC (95% probability; start Wilsford midden*; Fig. 3), probably in *815–780 cal B (68% probability)*. This episode of activity at Wilsford ended in *796–610 cal BC (95% probability; end Wilsford midden*; Fig. 3), probably in *785–740 cal BC (68% probability)*. Under this interpretation, the redeposited midden at Wilsford formed over a period of *1–65 years (93% probability; Middening*; Fig. 4) or *105–135 years (2% probability)*, probably over a period of *1–35 years (68% probability)*[2].

The equid bone from layer (4039) dates to *805–770 cal BC (95% probability: GrM-29394*; Fig. 3), probably to *795–775 cal BC (68% probability)*.

We can consider this result in relation to the reintroduction of horses into England, using the approach outlined by Buck and Bard (2007). The model illustrated in Figure 5 employs a flexible trapezium distribution (Karlsberg 2006; Lee and Bronk Ramsey 2012) for the radiocarbon dates available on later prehistoric equids from England, which allows us to assess the pace at which they were reintroduced.

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[2] An alternative model which interprets GrM-29394 as reworked, but includes the stratigraphic sequence of midden contexts in the ditch following the reading that these deposits formed in the upper part of the henge ditch and were not reworked, suggests that the midden formed between *1165–770 cal BC (95% probability*; *start Wilsford midden;* model not shown) and *790–170 cal BC (95% probability; end Wilsford midden*; model not shown), over a period of *1–65 years (58% probability; Middening*; model not shown) or *90–135 years (11% probability)* or *140–245 years (26% probability)*.

This model suggests that the first equids were reintroduced into England in *2175–1250 cal BC (95% probability; StartOfStartHorse*; Fig. 5), probably in *1750–1345 cal BC (68% probability)*, and that they were in widespread use by *1540–220 cal BC (95% probability; EndOfStartHorse*; Fig. 5), probably by *1395–725 (68% probability)*. They were reintroduced over a period of *1–1605 years (95% probability; PeriodOfStartHorse*; Fig. 6), probably over a period of *1–850 years (68% probability)*.

The Wilsford example probably dates to the time when equids were becoming more common in England (Fig. 5).

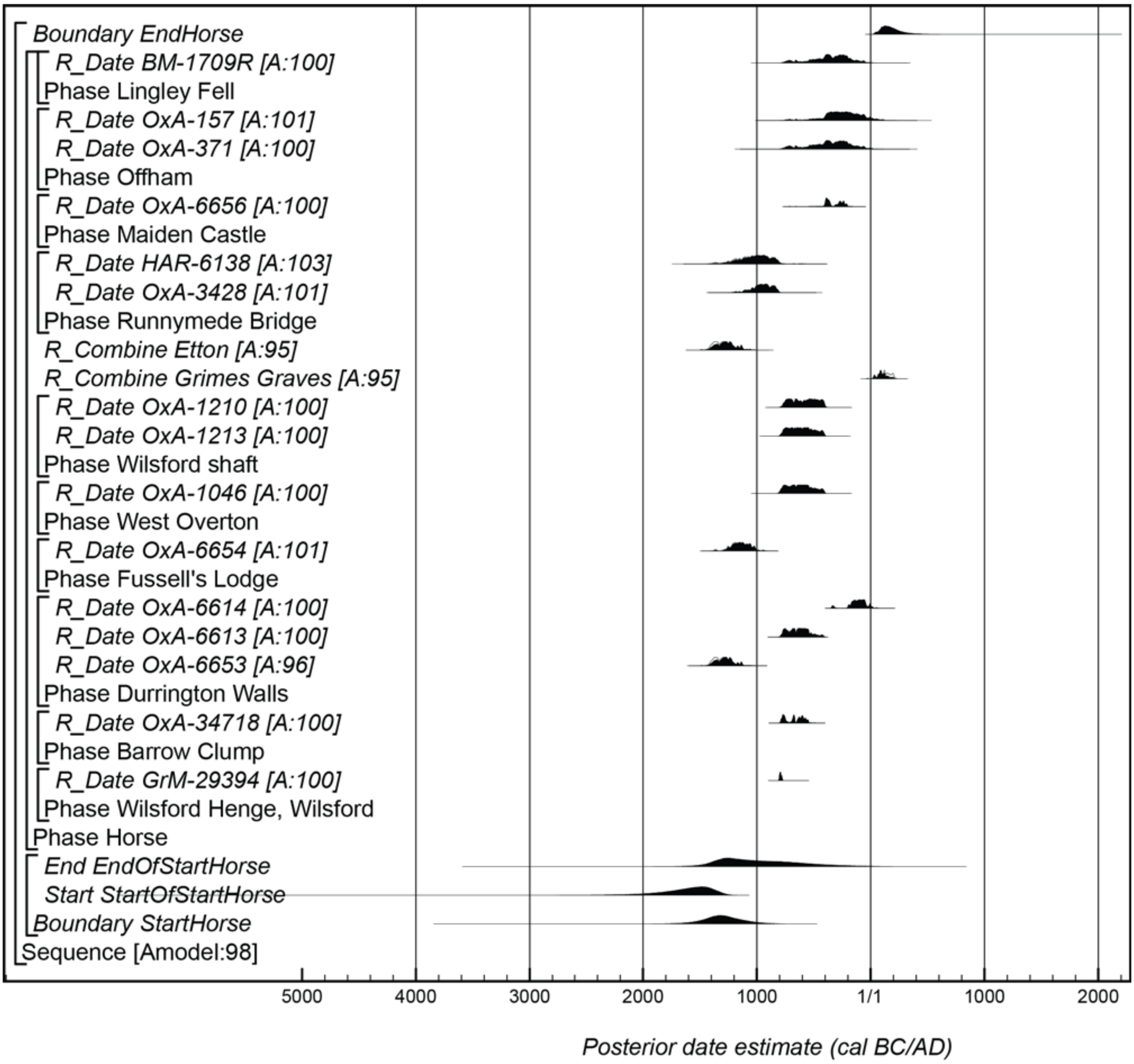

Figure 5: Probability distributions of dates for the reintroduction of the horse into England (data from Kaagan (2000, table 4.5), Healy et al. (2014, table 4), Marshall et al. (2019, table 3.1) and Waddington et al. (2019, table 1))

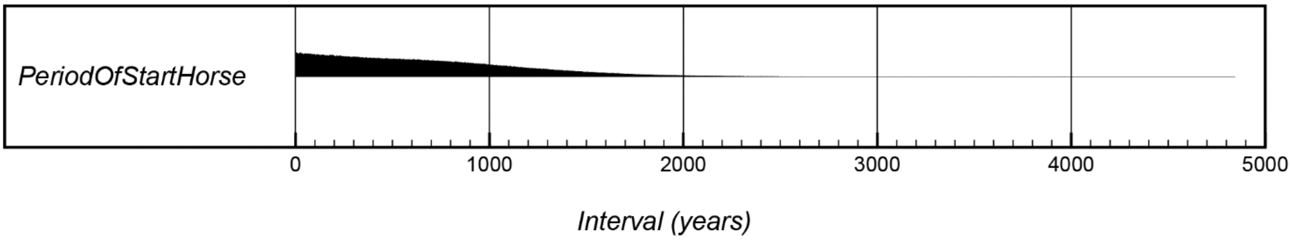

Figure 6: Probability distribution of period of horse reintroduction to England, derived from the model defined in Figure 5

Discussion

Wilsford henge is the first of the two henges to be dated as part of the Vale of Pewsey project, as chronological modelling of a new series of radiocarbon dates from the neighbouring, and much larger, Marden henge is ongoing (Wainwright et al. 1971; Marshall et al. 2024). The chronological modelling of Wilsford Henge reveals a long, if interrupted, sequence of activity starting in the late Neolithic with the construction of the henge probably sometime in the 26th century cal BC. The silhouette of the henge perhaps attracted people of the Middle Bronze Age almost a 1000 years later and they considered it to be an appropriate burial place. The site continued to serve as a focus of activity during the Late Bronze Age/Early Iron Age with evidence for middening perhaps indicating feasting and communal depositional practices.

Each of the three dated episodes of activity at Wilsford henge coincides with significant cultural developments in Southern England.

The centuries around 2500 cal BC saw a period of change materialised in the archaeological record by the appearance of two types of enclosures – earthen henges and wooden palisaded enclosures, whose similarities, differences and geographic distribution have been noted (Greaney et al. 2020). These were ceremonial centres and at a number of henges, such as Marden, Durrington Walls and Mount Pleasant, evidence for large-scale feasting has been found (Madgwick et al. 2019). The date estimate for the construction of the Wilsford henge coincides with the period when earthen henges emerged and so this site contributes to the creation of the ritual landscape of Wessex in the mid-third millennium cal BC. The scale of feasting and ritual deposition at Wilsford, evidenced by the large faunal assemblage from the lower fills of the ditch, was perhaps not as large as at Marden and the internal construction and depositional dynamics between the two neighbouring henges is still unclear. The evidence from the Vale of Pewsey, however, is broadly comparable with other developments in the region such as the multiple monuments constructed near Dorchester, Dorset (Greaney et al. 2020)

The Middle Bronze Age in Britain was a time of profound change characterised by intensification of agricultural practices and the expansion of settlement enclosures and field boundaries (Bradley 2007). The main burial practice was cremation with cremated remains being placed in ceramic urns (Caswell and Roberts 2018). In that sense, the inhumation at Wilsford henge represents a less common disposal of the body and a continuation of the Early Bronze Age tradition of individual burial. Reinforcing this link to past practices is the adornment with spacer amber beads, as artefacts of this material were typically added as grave goods during the Early Bronze Age (Woodward and Hunter 2015). Given the relative rarity of amber beads in southern England in comparison to the previous period, the deposition of such objects at the Wilsford burial suggests the continuing presence of exchange networks with continental Europe, albeit in somewhat reduced volume, or the existence of another important social practice – the curation of objects. Either way the adornment of the young male with amber beads is a clear indication of the important status of the newly deceased.

The Late Bronze Age/Early Iron Age is yet another period of significant change in British prehistory, this time marked by the shift to iron technology (Cunliffe 2005). This technological transition went hand in hand with social transformation that is archaeologically attested, among other sites, by substantial midden deposition leading to accumulation of mounds up to 3m high (Waddington et al. 2019). Such depositions were cohesive practices for the otherwise dispersed population which lived in small settlements. Although the evidence from Wilsford cannot be compared with the massive accumulations in Potterne or East Chisenbury, for example, they do confirm the importance of middening, and its attendant role in social gatherings, which perhaps took place at different scales, not only at regional and inter-regional level. The dates from Wilsford henge fit well with the currency of activity at other LBA/EIA middens in the area (Waddington et al. 2019, fig. 12).

The equid bone from the Wilsford midden deposits falls into the period when horses were becoming common in England after their reintroduction during the 2nd millennium cal BC (Fig 5).

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Appendix

Wilsford Henge (Fig. 3)

```
Options()
{
 Resolution=1;
 kIterations=20000;
};
Plot()
{
 Sequence("Wilsford")
 {
  Sequence("Henge")
  {
   Boundary("start Wilsford Henge");
   Phase("Henge")
   {
    Sequence("ditch")
    {
     First("DigDitch");
     R_Date("GrM-29392", 4008, 25);
     Phase("Context 4081")
     {
      R_Date("OxA-35175", 4015, 33);
      R_Combine("4081 pig")
      {
       R_Date("GrM-29391", 3974, 22);
       R_Date("ETH-122545", 4076, 24);
      };
      Last("last 4081");
     };
    };
    Phase("interior")
    {
     Phase("Context 4033")
     {
      R_Date("ETH-122544", 3956, 24);
      R_Date("GrM-29737", 3977, 26);
     };
    };
    Phase("exterior")
    {
     R_Date("GrM-29390", 3558, 22)
```

```
   {
    Outlier("intrusive");
   };
   R_Date("ETH-12250", 3956, 24);
  };
 };
 Boundary("end Wilsford Henge");
 Span("use Wilsford Henge");
};
Interval("gap henge/burial");
R_Date("SUERC-66997", 3232, 31);
Interval("gap burial/midden");
Sequence("midden")
{
 Boundary("start Wlisford midden");
 Phase("Midden, context 4039 & 4053")
 {
  Phase("final ditch fills")
  {
   After("residual")
   {
    R_Date("ETH-122547", 3676, 27)
    {
    };
   };
   Phase("Context 4053")
   {
    R_Date("GrM-29395", 2525, 21);
    R_Combine("4053 pig")
    {
     R_Date("ETH-122549", 2597, 23);
     R_Date("GrM-29396", 2601, 21);
    };
   };
   Phase("Context 4039")
   {
    R_Date("ETH-122548", 2539, 33);
    R_Date("GrM-29394", 2599, 21);
   };
  };
  Span("Middening");
 };
 Boundary("end Wilsford midden");
};
```

```
 };
};
```

Reintroduction of horses into England (Fig. 5)

```
Options()
{
 Resolution=1;
 kIterations=20000;
};
Plot()
{
 Sequence()
 {
  Boundary("StartHorse")
  {
   Start("StartOfStartHorse");
   Transition("PeriodOfStartHorse");
   End("EndOfStartHorse");
  };
  Phase("Horse")
  {
   Phase("Wilsford Henge, Wilsford")
   {
    R_Date("GrM-29394",2599,21);
   };
   Phase("Barrow Clump")
   {
    R_Date("OxA-34718", 2532, 33);
   };
   Phase("Durrington Walls")
   {
    R_Date("OxA-6653", 3045, 50);
    R_Date("OxA-6613", 2500, 45);
    R_Date("OxA-6614", 2090, 45);
   };
   Phase("Fussell's Lodge")
   {
    R_Date("OxA-6654", 2940, 50);
   };
   Phase("West Overton")
   {
    R_Date("OxA-1046", 2500, 70);
   };
```

```
  Phase("Wilsford shaft")
  {
   R_Date("OxA-1213", 2480, 60);
   R_Date("OxA-1210", 2450, 60);
  };
  R_Combine("Grimes Graves")
  {
   R_Date("OxA-1635", 1820, 70);
   R_Date("OxA-21193", 1930, 29);
  };
  R_Combine("Etton")
  {
   R_Date("OxA-1314", 3050, 80);
   R_Date("OxA-1313", 3040, 80);
  };
  Phase("Runnymede Bridge")
  {
   R_Date("OxA-3428", 2790, 70);
   R_Date("HAR-6138", 2830, 110);
  };
  Phase("Maiden Castle")
  {
   R_Date("OxA-6656", 2290, 45);
  };
  Phase("Offham")
  {
   R_Date("OxA-371", 2280, 120);
   R_Date("OxA-157", 2200, 120);
  };
  Phase("Lingley Fell")
  {
   R_Date("BM-1709R", 2280, 110);
  };
 };
 Boundary("EndHorse")
 {
 };
};
};
```

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