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Pit digging and lifeways in Neolithic Wiltshire

by David Roberts[1] *and Peter Marshall*[2]

Neolithic pit digging has received considerable attention in recent decades, primarily because of the surge in data provided by developer-funded archaeological excavations. This study provides the first synthesis for Neolithic pit digging in Wiltshire. Analysis of the pottery, struck flint, faunal and archaeobotanical assemblages, together with discussions of burning and structured deposition, allows for a consideration of the place of pit digging in Neolithic lifeways. A programme of radiocarbon dating and chronological modelling has allowed the currency of Neolithic ceramics in pits to be explored. Alongside an accompanying open access Historic England Research Report, we hope to stimulate further research into Neolithic pit digging in Wiltshire.

Discourses of pitting

Considerable attention has been paid in recent decades to Neolithic pits in Britain, particularly in southern and eastern England (Richards and Thomas 1984; Thomas 1991; 1999; Pollard 2001; Garrow 2006; 2007; 2010; see also Harding 2006; Edwards 2009; Carver 2012 for northern England and papers in Anderson-Whymark and Thomas (eds) 2011 for wider regional coverage). Archaeological discussion has encompassed the pits themselves, the assemblages they contain, and their relationships to contemporary features, landscapes and communities (Edwards 2009), as well as providing fertile material for engagement with archaeological theory and reflection on archaeological practice. The regionality visible in Neolithic Britain has considerably shaped the discourse around Neolithic pits, as it has regarding larger monuments and broader debates (cf. Thomas 2004; Sheridan 2007; Jones 2011). For example, the key divisions in recent debate regarding the relative importance of cereals and wild resources to Neolithic communities (e.g. Stevens and Fuller 2012; 2015; Bishop 2015) derive at least in part from the influence of the particular regional archaeological contexts within which scholars primarily work.

One aspect of regionality on which it appears most people agree is the disproportionate influence of Wessex, particularly the Stonehenge and Avebury landscapes of Wiltshire, in interpreting Neolithic life in southern Britain (Thomas 1999; Jones 2011). It is certainly the case that the conjunction of the unique monumentality of Stonehenge along with other Wessex monuments such as Avebury, Silbury Hill and Durrington Walls, the presence in Wessex of influential early archaeologists, its location in a privileged and wealthy region of southern England, and its significance in the early development of British techniques of field archaeology, all contributed to the region exerting a strong influence on interpretations of Neolithic archaeology. As well as this stimulus, the considerable early archaeological focus on the area has led to imbalances in the available data, meaning that even attempts to consider all British data usually contain more sites from Wessex than other regions (e.g. Piggott 1954; Thomas 1999). The advent of PPG16 and ensuing modern system of developer-funded archaeology has led to a redressing of these imbalances, providing a huge quantity of data on all periods from more

[1] Historic England, 37 Tanner Row, York, YO1 6WP; [2] Historic England, Cannon Bridge House, 25 Dowgate Hill, London, EC4R 2YA

widely across Britain (Bradley 2007; Garrow 2011; Blinkhorn 2012; Smith *et al.* 2016).

The twin themes of understanding pit digging—often through narratives of 'structured deposition'—and broadening the regional scope of Neolithic studies have been balanced in Wiltshire, the heart of Neolithic Wessex, by a continuing focus on monuments. Large-scale research projects focussing on Neolithic archaeology are still undertaken in significant numbers in Wiltshire's core zones, but the focus has remained either directly on the major monuments of the area (Whittle *et al.* 1999; Gillings *et al.* 2008; Leary *et al.* 2012; Parker Pearson 2012; Field *et al.* 2015), or on attempting to place these sites in their landscape contexts through wider field investigation (e.g. Richards 1990; Exon *et al.* 2000; Gaffney *et al.* 2012; Gillings *et al.* 2014; Bowden *et al.* 2015). Certain areas of Wiltshire beyond the Stonehenge and Avebury World Heritage Site (WHS) have seen considerable development and accompanying commercial archaeological work, particularly the fringes of Swindon (Brett and McSloy 2011; Cass *et al.* 2015) and the northwest Wiltshire towns of Chippenham, Melksham and Trowbridge (Barber *et al.* 2013), as well as large-scale work around Amesbury (Powell and Barclay 2019; Harding and Stoodley 2017) and Old Sarum (Powell *et al.* 2005). Unlike in other regions (e.g. Garrow 2006; Jackson and Ray 2011) the evidence from developer-funded work in Wiltshire for pit digging and deposition in the Neolithic period has not been synthesised – this is the aim of this article.

Reviewing pit digging in Wiltshire

This study cannot claim to have studied every Neolithic pit excavated in Wiltshire, but can reasonably assert to have included all those recorded in the Historic Environment Record (HER) up to December 2016. The dataset was collected through an HER search by Wiltshire Archaeology Service staff for the following conditions:

- All monument records where Monument Type = Pit and Period = Neolithic
- All archaeological events where Feature Type included 'Pit' and Period included 'Neolithic'
- All monument records where Monument Type = Pit and Period = Undated

This combination of searches has allowed assessments of all pits recorded in the HER as being Neolithic in date, all sites where both pits and features of Neolithic date were present, and all undated pits. The majority of records in the HER are drawn from 'grey literature' reports submitted to the HER as part of the planning process. The HER also records data from publications; whilst coverage of these may not be complete, most monographs and all publications in the county journal are included, and a wide-ranging search of available literature has revealed further examples.

Each of the three sets of search results were reviewed and all associated grey literature and publications read. Dating evidence was reviewed, and in a considerable number of cases judged as falling short of definite. In particular, pits dated as 'Neolithic to Bronze Age' or similar based on worked flint were not included as Neolithic pits in this study. Dating was accepted as definite on the basis of calibrated radiocarbon dates from *in situ* material, Neolithic pottery (earlier Neolithic, Peterborough Ware and Grooved Ware) and worked flint of certain Neolithic date. Also accepted are dates assigned to flint assemblages by professional specialists. A small number of pits were putatively dated by their association with well-dated pits, but only when clearly paired/grouped and of similar morphology and/or similar assemblages existed.

Using these criteria large numbers of pits previously accepted as Neolithic were rejected for this study. In a significant number of recent excavations only assessment reports were available, rather than full reports or publications. Sometimes this was due to the project being part of continuing work, in other cases no work beyond assessment had been undertaken despite post-excavation assessments recommending additional analytical work and publication. Whilst every effort has been made to interrogate the reports submitted to the HER for data from these sites, and some additional data has kindly been supplied by Alistair Barclay, formerly of Wessex Archaeology, it has not been possible to visit all archaeological contractors premises and assess any additional material culture, although samples have kindly been provided by Wessex Archaeology, Salisbury Museum and Historic England for additional scientific dating. Furthermore, this dataset does not include pits that are part of major monuments such as henges. Pits at henges fulfil a range of functional and non-functional roles, just as elsewhere, but this study aims to understand pits away from major monuments. Whilst it is clear that pits are present at some monumental sites prior to

the main monumental phases (e.g. Coneybury Henge (Richards 1990, 149)), these are also omitted here.

Data were gathered on the morphology, chronology and assemblages of pits in considerable detail, and the full dataset is made available as an Historic England Research Report (Roberts and Marshall 2019). It is hoped that readers will find these data useful for comparative purposes. Whilst detailed data were collected on as many aspects of artefactual and ecofactual assemblages as possible, synthesising each of these categories in any detail is beyond the scope of this paper. Instead we present key data patterns, outline scientific dating and chronological modelling results shedding light on the deposition of pottery and grain in Neolithic pits, and conclude with an interpretation of Neolithic lifeways based on pit data, and areas for future research. We look forward to the reuse, critiquing and development of our data and interpretations; every effort has been made to maintain consistency and clarity, and all mistakes and omissions in the dataset are the responsibility of the primary author.

The dataset

In total 169 pits from 63 sites were included based on the parameters above (Figure 1). These included 29 Early Neolithic pits (Figure 2), 73 Middle Neolithic pits (Figure 3), five Mid–Late Neolithic pits, 50 Late Neolithic pits (Figure 4) and 12 pits that were only broadly dated to the Neolithic period. Whilst most pits were dated by pottery, a few were dated solely by radiocarbon dates, worked flint or through the very clear association with other pits dated by pottery.

The chronology of Neolithic pit digging across Wiltshire

Thirty-five new radiocarbon measurements (Roberts and Marshall 2019, table 3) were obtained from pits across Wiltshire in order to better understand the chronology of this activity and the currency

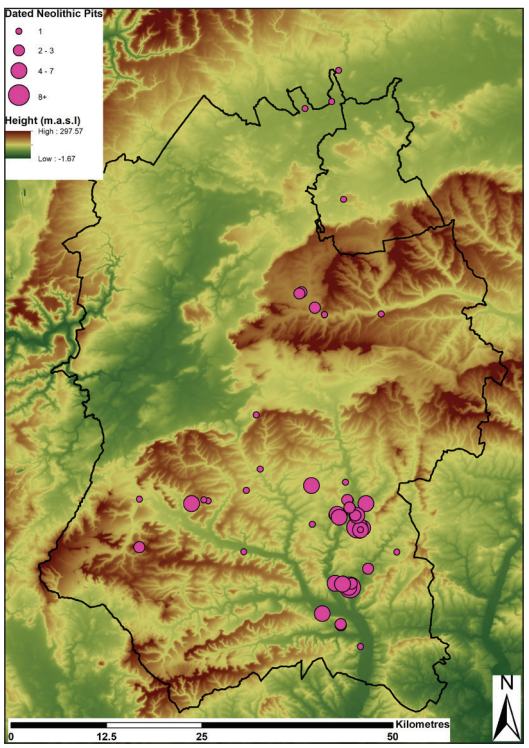

Fig. 1 Distribution of Neolithic pits from non-monumental sites in Wiltshire

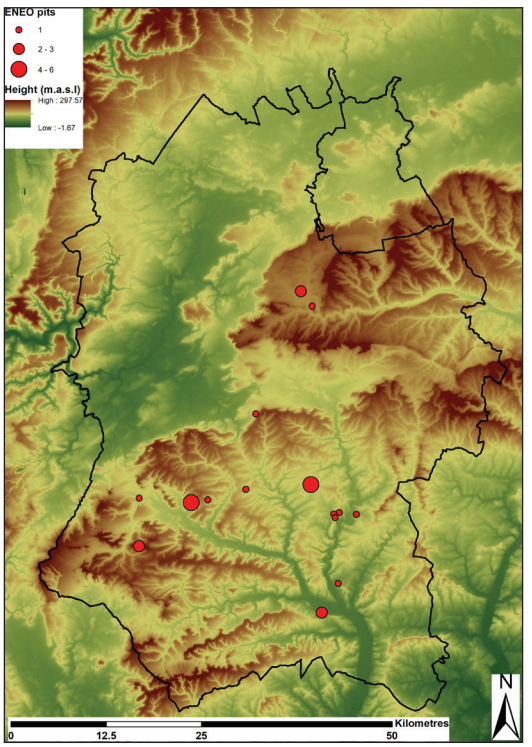

Fig. 2 Distribution of Early Neolithic pits from non-monumental sites in Wiltshire

of ceramic types deposited in pits, particularly Peterborough Ware and the first use of Grooved Ware. Furthermore, the opportunity to directly date cereals from Middle Neolithic pits presented an opportunity to contribute to the current debate (Stevens and Fuller 2012; 2015; Bishop 2015) surrounding the suggestion that 'agriculture was temporarily abandoned for several centuries throughout much of mainland Britain after 3,600 BC' (Stevens and Fuller 2015, 856) (see Archaeobotanical Remains below).

These dates have been included in a review of the chronology of Neolithic pit digging across Wiltshire that is based on 100 radiocarbon measurements from 16 sites (Table 1).

The model shown in Figure 5, that includes the available Neolithic radiocarbon dates on samples from Neolithic pits excavated in Wiltshire (Table 1), has good overall agreement (Amodel=111; Figure 5) and key parameters are given in Table 2. We have constructed site-based model components for each site that has three or more radiocarbon dates from two or more features (see Roberts and Marshall 2019). These sites are thus represented by two parameters – the start and end of activity at the site. This prevents our model being biased by the overwhelming number of measurements from just two sites (Amesbury Down and West Amesbury Farm).

Pit morphology varied significantly, but there was no clear pattern of chronological change in morphology beyond an increase in the proportion of sub-circular pits over time, and a significant reduction in the proportion of bowl-shaped pits in the Middle Neolithic (Tables 3–4; Figure 6).

Pottery

This study found that in Wiltshire 28 pits contained Early Neolithic pottery,[1] 71 pits contained

1 The earliest pottery used in Wessex is plain, and then decorated bowls, often with carinated rims, dating to the 40th or 39th centuries cal BC (Barclay *et al.* 2018) , and includes styles known as Carinated Bowls, thin-walled fineware Carinated Bowls, and Southwestern style pottery (Cleal 2004, Sheridan 2010). These styles are succeeded

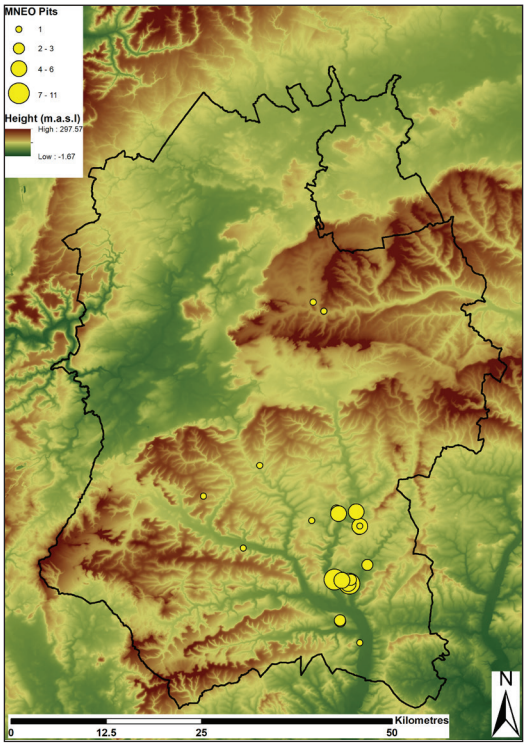

Fig. 3 Distribution of Middle Neolithic pits from non-monumental sites in Wiltshire

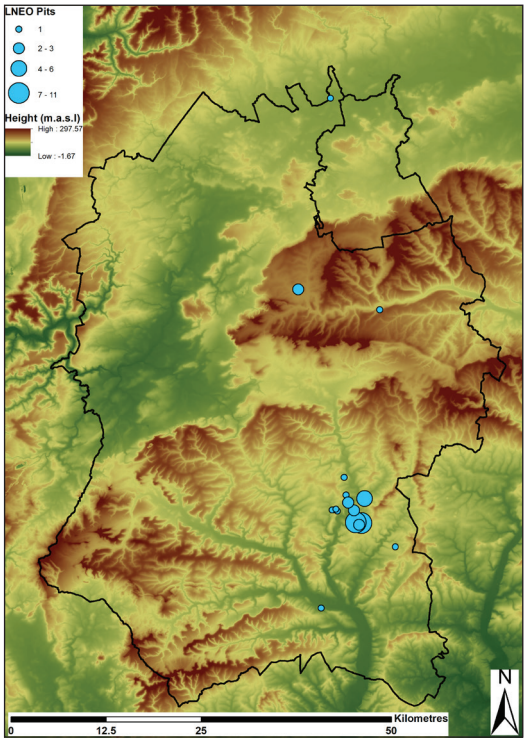

Fig. 4 Distribution of Late Neolithic pits from non-monumental sites in Wiltshire

Table 1: Summary of scientific dating evidence considered in the review of Neolithic pits in Wiltshire

Site	**No. of ^{14}C results**	**No. of ^{14}C results (excluded)**	**No. of ^{14}C results (*TPQ*)**	**References**
Tilshead Nursery School	1			Amadio 2010; Roberts and Marshall 2019 table 3
Pits outside Robin Hood's Ball	2		2	Richards 1990; Whittle *et al*. 2011, table 4.13
Chalk Plaque pit, Amesbury	2		2	Cleal *et al.* 1994, Roberts and Marshall 2019 table 3
Coneybury Anomaly	12		2	Barclay *et al.* 2018, table 2
King Barrow Ridge & Countess East	7		1	Richards 1990; Darvill 1995; Wessex Archaeology 2003; Roberts and Marshall 2019 table 3
West Amesbury Farm	21	6		Roberts *et al.* submitted table 3
Old Sarum Water Pipeline	12	3		Powell *et al.* 2005; Roberts and Marshall 2019 table 3
W431 Durrington Pipeline	1			Wessex Archaeology 1992; Roberts and Marshall 2019 table 3
'C' Crossing, Salisbury Plain Training Area	3			Wessex Archaeology 2001; Roberts and Marshall 2019 table 3
Greentrees School	3			Wessex Archaeology 2015c; Roberts and Marshall 2019 table 3
Amesbury Down	22	1		Powell and Barclay 2019; Roberts and Marshall 2019 table 3
Old Dairy, Amesbury	5	2		Harding and Stoodley 2017; Roberts and Marshall 2019 table 3
Bulford South	4			Wessex Archaeology 2015b, 2015c; Roberts and Marshall 2019 table 3
Harnham Road water supply	2			Context One Archaeological Services 2008, appendix 4; Roberts and Marshall 2019 table 3
West Kennet Avenue	1			Allen and Davis 2009, table 1; Roberts and Marshall 2019 table 3
Porton Down Car Park	2			Garner et al 2009, table 7; Roberts and Marshall 2019 table 3

Table 2: Key parameters for Neolithic pit digging in Wiltshire (derived from the model described in Figure 5)

Parameter name	**Parameter description (OxCal v4.2 commands in bold)**	***Highest Posterior Density interval (95% probability unless otherwise stated) cal BC***
start_wiltshire_neolithic_pits	**Boundary** parameter estimating the start of Neolithic pit digging in Wiltshire	*3905–3705*
first_earlier_neolithic	**First** parameter estimating the first dated pit with earlier Neolithic ceramics	*3795–3700*
last_earlier_neolithic	**Last** parameter estimating the first dated with earlier Neolithic ceramics	*3625–3595(4%) or 3580–3485 (30%) or 3475–3370 (61%)*
first_PW	**First** parameter estimating the first dated Neolithic pit with Peterborough Ware ceramics	*3630–3255*
last_PW	**Last** parameter estimating the first dated Neolithic pit with Peterborough Ware ceramics	*3085–2655*
first_GW	**First** parameter estimating the first dated Neolithic pit with Grooved Ware ceramics	*3545–2930*
last_GW	**Last** parameter estimating the first dated Neolithic pit with Grooved Ware ceramics	*2460–2290*
end_wiltshire_neolithic_pits	**Boundary** parameter estimating the end of Neolithic pit-digging in Wiltshire	*2450–2205*

Peterborough Ware and 47 contained Grooved Ware. One pit contained pottery dated only as 'probably Neolithic' and at least two pits from different sites apparently contained non-Grooved Ware Late Neolithic pottery, although no further details were given. One pit contained Early Neolithic pottery, Peterborough Ware, and Grooved Ware, and four further pits contained both Peterborough Ware and Grooved Ware. All five of these pits were from the King Barrow Ridge W59 excavations by the

by Peterborough Ware in the Middle Neolithic (*c*.3,400–2,900 cal BC; Ard and Darvill 2015, 1, Sheridan *et al*. 2008) and in turn the Grooved Ware traditions of the Late Neolithic (*c*.2,900–2,500 cal BC).

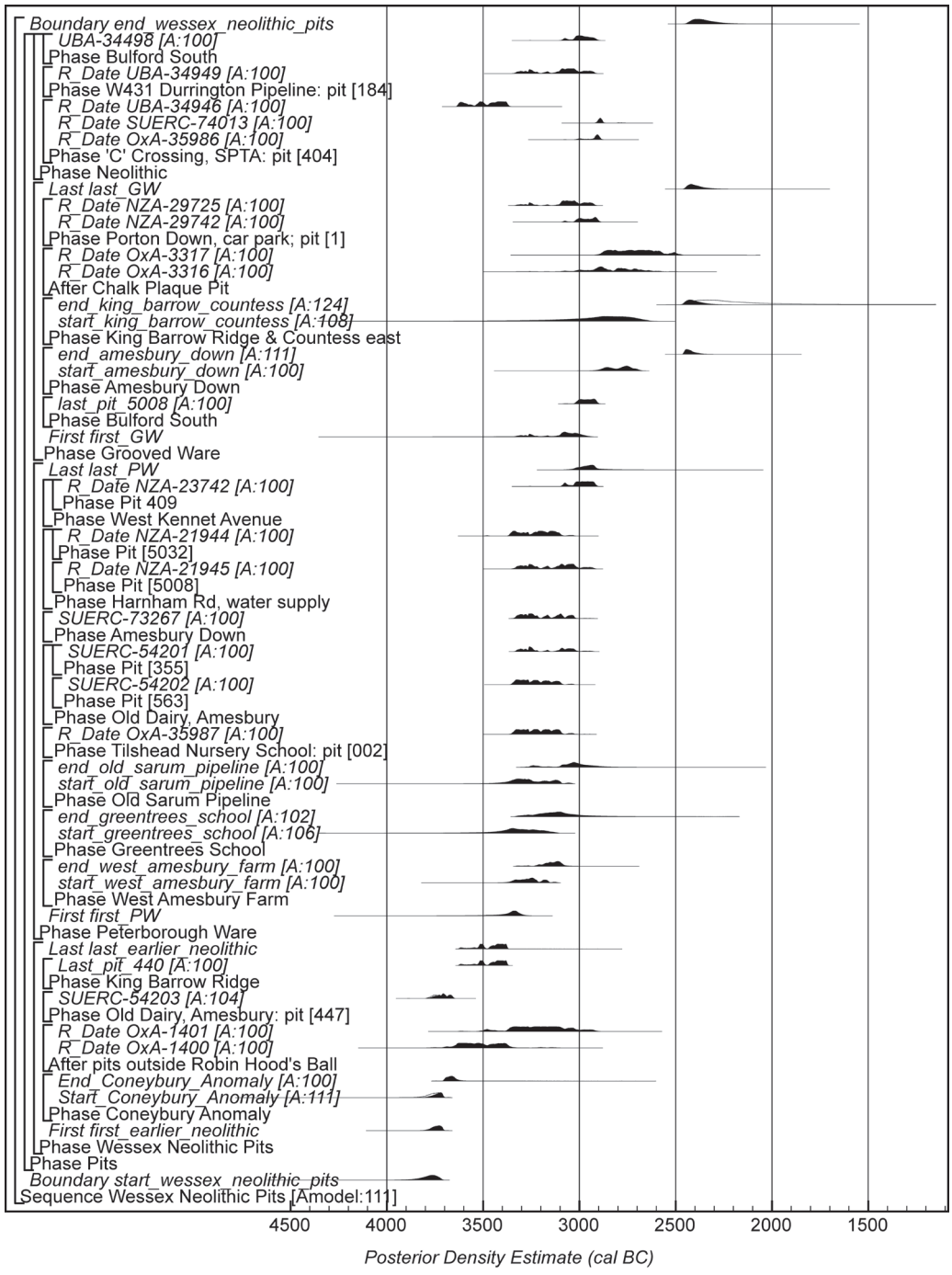

Fig. 5 Probability distributions of dates from Neolithic pits in Wiltshire. Each distribution represents the relative probability that an event occurs at a particular time. For each of the dates two distributions have been plotted: one in outline, which is the result of simple radiocarbon calibration, and a solid one, based on the chronological model used. Distributions other than those relating to particular samples correspond to aspects of the model. For example, the distribution 'start_wiltshire_neolithic_pits' *is the estimated date when Neolithic pits started to be dug in Wiltshire. The large square brackets down the left-hand side of the figure along with the OxCal keywords define the model exactly*

Table 3: Morphological descriptions of pits in plan by period (figures in brackets are percentages of total for period). Only the major period divisions are shown as the other divisions have small sample sizes

Period	Circular	Sub-circular	Oval	Sub-oval	Irregular	Sub-rectangular	Sub-square	Not given	Total Pits
ENEO	6 (20.7)	6 (20.7)	2 (6.9)	3 (10.3)	2 (6.9)	1 (3.4)	0 (0.0)	9 (31.0)	29
MNEO	19 (26.0)	25 (34.2)	4 (5.5)	9 (12.3)	4 (2.7)	3 (4.1)	0 (0.0)	11 (15.1)	73
LNEO	8 (16.0)	18 (36.7)	7 (14.3)	4 (8.2)	0 (0.0)	1 (2.0)	1 (2.0)	11 (22.4)	50

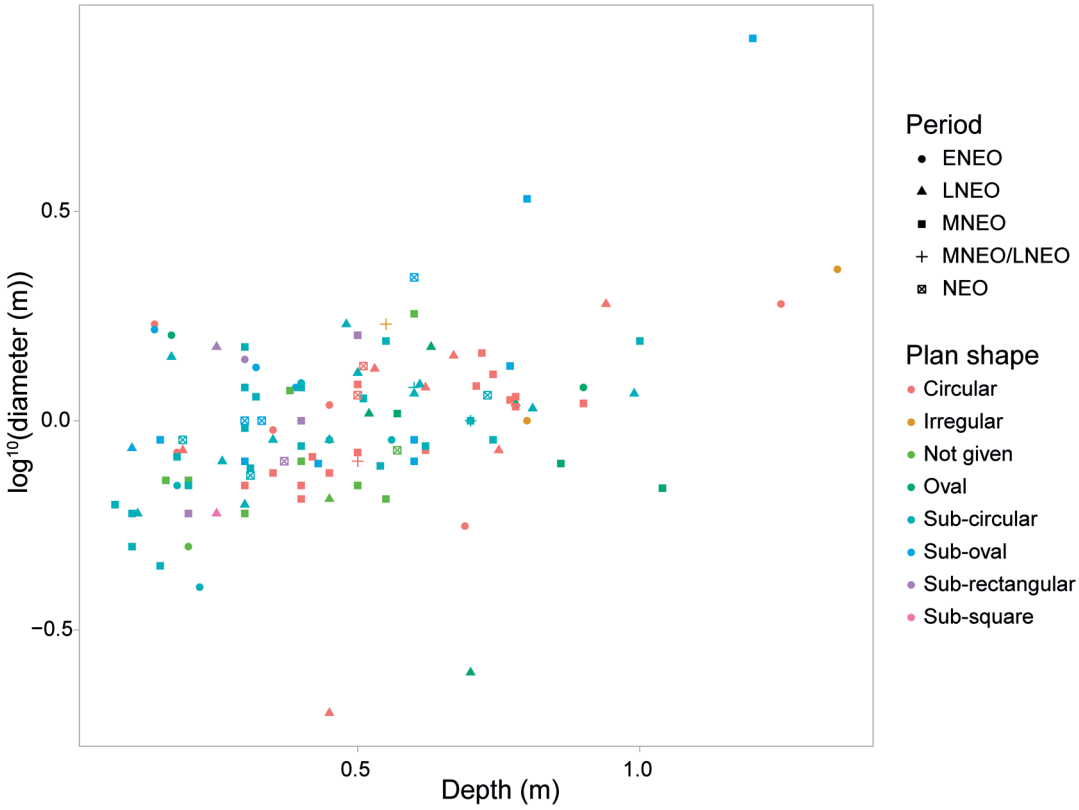

Fig. 6 Pit Morphology

Stonehenge Environs project (Richards 1990, 109–23), and each individual pit tended to contain mostly a particular ceramic style, rather than assemblages of similar sizes. Nonetheless, they represent the only examples in the dataset where more than one of the main pottery types were present. Mean sherd counts per pit are broadly similar in the Early and Middle Neolithic, but increase by *c*.50 per cent in the Late Neolithic, although the mean weight of sherds decreases with time (Table 5). Minimum numbers of vessels (MNVs) were rarely given, but were slightly higher in the Middle Neolithic than the Early or Late Neolithic. It should be noted that these figures exclude the enormous assemblage of 1,659 sherds of Early Neolithic pottery from the Coneybury 'Anomaly', which, if included, raises the Early Neolithic mean sherd count to 123.2 and so greatly alters the overall picture; it is truly anomalous.

Table 4: Morphological descriptions of pits in section by period (figures in brackets are percentages of total for period)

Period	Bowl shaped	Near-vertical	Over-hang	Steep-sided	Not given	Total Pits
ENEO	7 (24.1)	1 (3.4)	1 (3.4)	8 (27.6)	12 (41.4)	29
MNEO	3 (4.1)	13 (17.8)	6 (8.2)	23 (31.5)	28 (38.4)	73
LNEO	13 (26.5)	7 (14.3)	3 (6.1)	12 (24)	15 (30.6)	50

Figure 7 is a schematic diagram summarising the estimated dates when pit digging occurred in fourth

Table 5: Summary pottery assemblage metrics for Neolithic pits in Wiltshire by period

	Mean sherd count per pit	Mean sherd weight (kg)	Mean MNV per pit
Early Neolithic pottery (excl. Coneybury 'Anomaly')	20.80	0.0089	2.12
Peterborough Ware	18.83	0.0075	2.45
Grooved Ware	31.08	0.0061	2.13

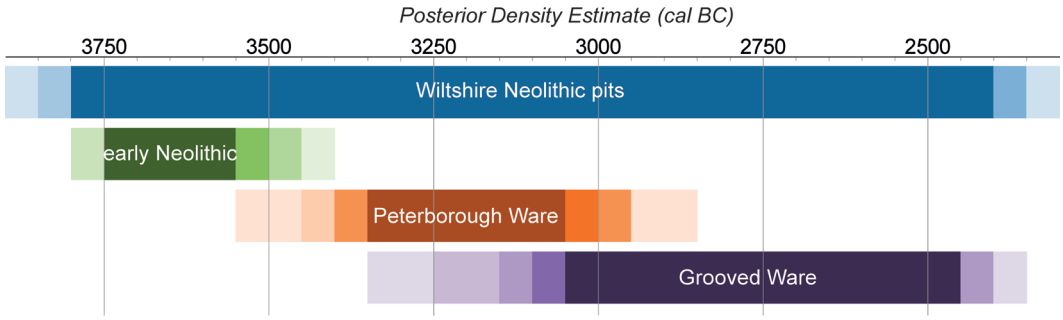

Fig. 7 Schematic diagram showing the period of use of dated Neolithic pits in Wiltshire of the fourth and third millennia cal BC, together with the periods of use of ceramics in them (early Neolithic, Peterborough Ware and Grooved Ware). The horizontal bars represent the probability that Neolithic pit digging or deposition of a particular ceramic took place in a particular 50-year period (light shading is less probable, darker shading more probable)

Table 6: Pits containing pottery from different ceramic traditions

	Early Neolithic pottery	Peterborough Ware	Grooved Ware
East Anglia	710	59	256
Wiltshire	28	72	49

and third millennium cal BC Wiltshire, together with the currency of ceramic types deposited in pits. The horizontal bars represent the probability that Neolithic pit digging or deposition of a particular ceramic took place in a particular 50-year period (light shading is less probable, darker shading more probable).

There is evidence to support the contemporaneity in the deposition of Grooved Ware and Peterborough Ware in pits in the centuries around 3,000 cal BC, although there may have been a gap between the deposition of earlier Neolithic ceramics and Peterborough Ware in pits. It is notable that the proportions of pits containing these three ceramic styles differ markedly from those obtained by Garrow's review of Neolithic pits in East Anglia (Table 6), although this may be a product of the unusual nature of Peterborough Ware distribution in that region (Garrow 2006, 14–5).

Lithics

The majority of pits contained assemblages of struck flint, although the proportion of pits containing struck flint decreased through the Neolithic (Table 7). Where recorded, mean counts per pit of struck flint, debitage/flakes, and—perhaps surprisingly—blades peak in the Middle Neolithic, despite the Early Neolithic or even the Mesolithic to Neolithic transition traditionally being seen as the zenith of blade-based industries. These peaks are to a considerable extent explained by the inclusion of the five pits from West Amesbury Farm in the dataset, which contained unusual quantities of struck flint and had a very thorough retrieval of lithics, which particularly increases the proportions

Table 7: Summary struck flint assemblage metrics for Neolithic pits in Wiltshire by period (figures in brackets are percentages of total pits datable to the period)

	Pits with struck flint	Pits with burnt flint	Mean struck flint count per pit when recorded	Mean debitage/ flake count per pit when recorded	Mean retouched implement count per pit containing struck flint	Mean blade count per pit containing struck flint
ENEO	27 (90)	8 (26.7)	242.95	251.05	5.85	9.33
MNEO	61 (84.7)	13 (18.1)	297.60	699.90	9.30	58.50
LNEO	39 (78)	23 (46.0)	264.84	294.68	12.81	23.33

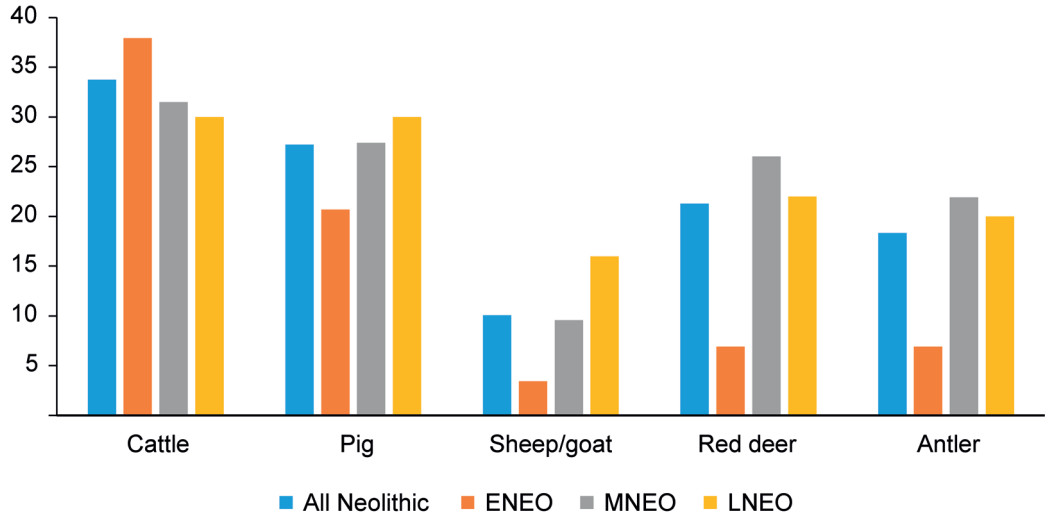

Fig. 8 Species presence/absence normalised by pit count by period; visualises percentages presented in Table 8

Table 8: Counts of pits where key species are reported present by period (figures in brackets are percentages of total pits datable to the period)

Species/ Antler	All Neolithic	ENEO	MNEO	LNEO
Cattle	57 (33.7)	11 (37.9)	23 (31.5)	15 (30.0)
Pig	46 (27.2)	6 (23.7)	20 (27.4)	15 (30.0)
Sheep/goat	17 (10.1)	1 (3.4)	7 (9.6)	8 (16.0)
Red deer	36 (21.3)	2 (6.9)	19 (26.0)	11 (22.0)
Antler	31 (18.3)	2 (6.9)	16 (21.0)	10 (20.0)

of microdebitage relative to hand collection (Roberts *et al.* submitted; Bishop *et al*. accepted). Mean counts of retouched implements in the Late Neolithic are more than double those from the Early Neolithic. Perhaps this reflects the increasing formality of deposition in this period (Pollard 2001)?

Animal bone

The faunal dataset is relatively small from Neolithic pits—although see Worley *et al.* (2019) for a holistic review of diet and farming in the Middle Neolithic in this region—with even the most commonly present species, cattle, appearing in only around a third of pits in any period (Table 8; Figure 8). These are underestimates of the actual presence of animal bone, however, because several sites have only overall summaries of the presence/absence of animal bone and species present, rather than data for each pit.

The presence and absence of species through the Neolithic shows clear, if gentle, trends of decreasing presence of cattle and increasing presence of pig and sheep/goat. Red deer is mainly reflected in the faunal record from pits as antler, predominantly shed, and peaks in the Middle Neolithic. A small number of other species are recorded very infrequently, including aurochs, beaver, bird, dog, fish, fox, frog/toad, mouse, roe deer, pine-marten, shrew, wildcat, wild pig and vole. Of these, only aurochs, beaver, bird, dog, roe deer and vole are present on more than a single pit site. Despite the relatively small sample sizes, mean numbers of identified species (NISPs) per pit where species are present and NISPs are recorded by period—where NISPs have been recorded—have been calculated (Table 9; Figure 9). As with other assemblages, the Coneybury 'Anomaly' contained an extraordinary quantity of faunal remains in comparison to other pits, so means have been calculated both including and excluding this site. NISPs show the mean quantities of each species per pit where that species is present, so show different trends to the presence/absence data above. For example, although cattle are present in fewer pits as the Neolithic goes on, where they are present the mean quantity present significantly increases. Pig, which is present in more pits over the course of the period, appears in pits in the Middle Neolithic in significantly greater quantity than in the Late Neolithic, whereas mean NISPs for antler and red deer follow the presence/absence trend, peaking in the Middle Neolithic.

Archaeobotanical remains

Due to the early dates of excavation of a significant proportion of pits, and variable reporting of many

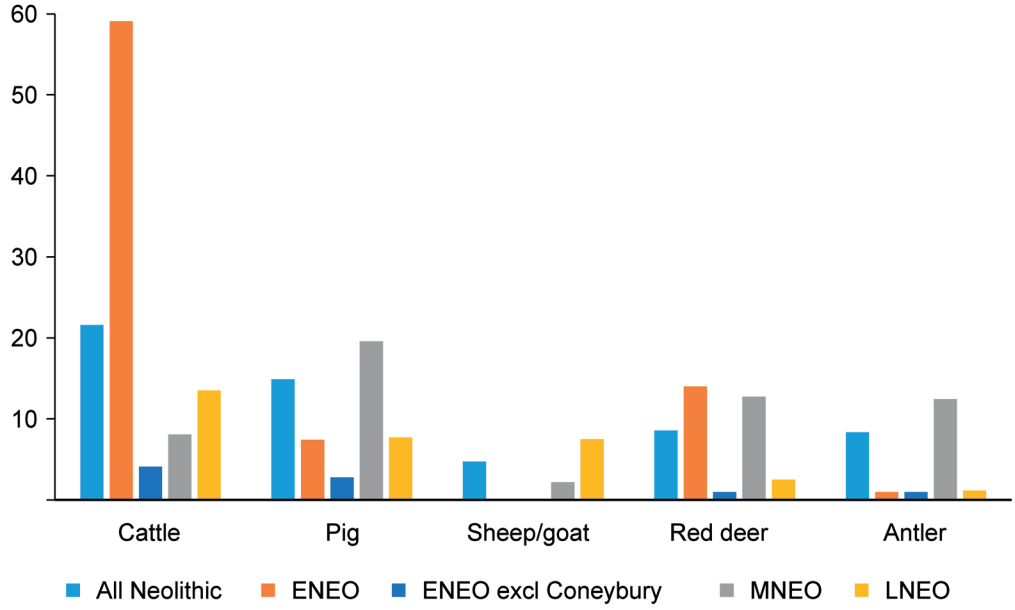

Fig. 9 Mean NISP per pit by period where NISPs recorded

Table 9: Mean NISP per pit by period where NISPs recorded

Species	All Neolithic	ENEO	ENEO Excl. Coneybury	MNEO	LNEO
Cattle	21.6	59.1	4.1	8.1	13.5
Pig	14.9	7.4	2.8	19.6	7.7
Sheep/goat	4.8	0.0	0.0	2.2	7.5
Red deer	8.6	14.0	1.0	12.8	2.5
Antler	8.4	1.0	1.0	12.4	1.2

others, the application of sampling techniques—usually flotation—to retrieve archaeobotanical remains and finds is both unclear and inconsistent across the dataset. Of 169 pits, 88 have been subject to some form of sampling, almost always flotation, although some coarse sieving has also been undertaken. The mean sample volume where this information was given was 32 litres, reflecting the current best practice of taking 40 litre samples. It should be noted, however, that in many cases only 10 litres of the samples were processed and assessed for environmental remains. This widespread practice does not provide a representative sample of the sample's contents and is discouraged by the Association for Environmental Archaeology (pers. comm. G. Campbell).

Where samples were taken, the most common archaeobotanical material present was hazelnut shell, in 54 pits (61.4 per cent of those sampled; Table 10). There is a strong chronological pattern in the deposition of hazelnut, which is only present in 25 per cent of sampled pits in the Early Neolithic, and rises to 72.1 per cent and 64 per cent respectively in the Middle and Late Neolithic. The frequent presence of burnt hazelnut shells, often in significant numbers, suggests that it was quite consistently used as part of everyday life in these periods, being present only slightly less often than struck flint.

Table 10: Counts of pits by period where hazelnut and grain are present when samples have been taken (figures in brackets are percentages of total pits datable to the period where samples have been taken)

Archaeobotanical material	ENEO	MNEO	LNEO	Neolithic
Hazelnut	3 (25)	31 (72.1)	16 (64.0)	54 (61.4)
Cereal grain	5 (41.7)	12 (27.9)	16 (64.0)	32 (36.4)

Cereal grains or grain fragments were present in 33 pits (37.5 per cent), although only five pits contained more than 10 grains or grain fragments. Of these pits, two contained 11 and >10 grain fragments, and were Middle and Late Neolithic respectively; as has been discussed by Worley *et al.* (2019) and Pelling *et al.* (2015) small amounts of grain in pits of these dates are likely to be intrusive, and indeed one of the grains from the former has been directly dated and proven to be intrusive (Worley *et al.* 2019). The Coneybury 'Anomaly' contains a moderately-sized assemblage of cereal remains,

although these have not been directly dated. The two pits in the dataset with large assemblages of several hundred grain fragments each are both Early Neolithic, and from the environs of Windmill Hill. The excavators suggest that the large burnt grain deposits contained in these pits are unlikely to be accidental and may represent the ceremonial destruction of large quantities of different cereal crops (Whittle *et al.* 2000, 176).

We undertook further direct dating of 13 cereal grains, from six sites (West Amesbury Farm, The Portway, Old Dairy, Bulford South, Boscombe Down Sports Ground and Kings Gate). Of these, only a single grain from Bulford South Pit 5008 proved to be prehistoric in date and contemporary with the infilling of the pit (Table 11). The clear demonstration that the vast majority of directly dated cereals in Middle Neolithic pits from Wiltshire are intrusive adds further support to the hypothesis that there was some kind of decline of cereal agriculture in the Middle Neolithic (Worley *et al*. 2019).

The unexpected result from Bulford aside, this pattern demonstrates that events resulting in burnt cereal grain being deposited almost never happened in Wiltshire in the Middle and Late Neolithic. Whilst cereals may still have been processed and burnt, their depositional pathways did not lead to them entering the archaeological record. Continuing to argue that cereal crop processing on a significant scale was undertaken in the region in the Middle and Late Neolithic, when processing in every other period provably caused burnt cereals to enter the archaeological record, is persisting in an interpretation for which there is no evidence. As Worley *et al.* (2019) outline, cereals may have been imported to the region and consumed, as is hinted at from evidence from dental calculus from a Middle Neolithic individual found at West Amesbury Farm (Mays *et al.* 2018, 705), or cultivation may have been undertaken on such a small or occasional basis as to be archaeologically invisible.

Burning and 'ashy' pits

The process of burning nonetheless appears vital to understanding deposition in Middle and Late Neolithic pits. Throughout the literature, across different periods of excavation, locations and types of project, a notable subset of pits are reported to have contained 'ashy' layers (Stone and Young 1948; Richards 1990, 114; Wessex Archaeology 1996; 2015a; 2015b; Context One Archaeological Services 2008; Roberts *et al*. submitted). Ten of these pits are Middle Neolithic, six Late Neolithic, and one contains both Peterborough Ware and Grooved Ware and is considered Mid–Late Neolithic. Perhaps significantly, no similar layers are reported from Early Neolithic pits. These pits tend to be large, between 0.8m and 1.5m in diameter and between 0.3m and 1m deep, and all have steep, near vertical or overhanging sides. These numbers are likely slightly under-representing the presence of these distinctive fills, as the characterisation of the layers as 'ashy' is quite subjective, and runs against the grain of modern archaeological reporting styles (*contra* Hodder 1999). Pit 5008 from Bulford, included here as containing a distinctively ashy fill, is for instance described as having a lower fill that was 'dark brownish grey silt loam with a very fine texture' (Wessex Archaeology 2015a).

'Ashy' fills tend to contain significantly large finds assemblages, particularly of lithics, although this may be biased due to the high recovery rates at West Amesbury discussed above. They also tend to be the primary anthropogenic fills in pits, sometimes being preceded by eroded material from the pits' sides or edges. If the 'ashy' layers were created by burning, it did not occur *in situ*; in no case were the sides of pits with these layers noted as burnt or heat-discoloured, although sometimes a minor proportion of struck flint or animal bone within the ashy fill was burnt. An attempt at identifying ash pseudomorphs in loose fill sampled from a pit at West Amesbury Farm failed, although a micromorphological sample from an *in situ* pit fill would make a positive result more likely (Roberts *et al*. submitted; pers. comm. M. Canti). The process leading to the particular formation of these fills is unknown, and further geoarchaeological and chemical analysis should be targeted at resolving this question.

Structured Deposition

The 'ashy' layers discussed above certainly represent a particular type of deposition, albeit one which we do not understand. Structured deposition *sensu* Pollard (2001) is harder to identify in this dataset until the Late Neolithic, although is certainly present. As discussed above, ritualised destruction of grain may be an Early Neolithic manifestation of structured deposition near Windmill Hill, and a possibly similar activity may be represented by the extraordinary deposit of *c*.10,300 burnt hazelnut shells in a Middle Neolithic pit at the Portway, near Old Sarum (Powell *et al.* 2005, 258). Indeed, the very large assemblage of faunal remains from the Early Neolithic Coneybury 'Anomaly' might

Table 11: Radiocarbon dates on cereals recovered from Neolithic pits

Laboratory number	Material & context	$\delta^{13}C$ (‰)	Radiocarbon Age (BP)	Calibrated Date (2σ)
Old Sarum Pipeline (The Portway) (Powell *et al*. 2005)				
UBA-34506	Single carbonised grain, *Triticum* sp. (indet) (Inés L. López-Dóriga, Wessex Archaeology) from the primary fill (6101) of pit [6100]. Placed on the base of the pit where 48 Peterborough ware sherds from a minimum of two different Ebbsfleet and one Mortlake bowl, two of which fitted with sherds in pit [6093] and four pieces of sarsen (weighing 2.6–12kg).	−23.4±0.22	595±27	cal AD 1290–1420
SUERC-73424	Single carbonised grain, *Triticum* sp. (indet) (Inés L. López-Dóriga, Wessex Archaeology), from the primary fill (6058) of pit [6056]. Placed on the base where fragments of sarsen stone 16 and 1.6kg), a large jagged flint nodule (7kg) and large sherd (0.552kg) of a Mortlake bowl.	−22.6±0.2	145±32	cal AD 1660–1955
OxA-35716	Single carbonised grain, *Triticum* sp. (indet) (Inés L. López-Dóriga, Wessex Archaeology), from the primary natural silting (6142) at the base of pit [6061].	−22.9±0.2	957±27	cal AD 1020–1160
Bulford South (Wessex Archaeology 2015a)				
UBA-34499	Single carbonised grain, *Hordeum vulgare* (Inés L. López-Dóriga, Wessex Archaeology), from the fill (5018) of pit [5008]. Pit 5008 measured 1.2m in diameter and 0.62m in depth, with regular sides and a flat base. The pit contained 39 sherds (154g) from two shell tempered Grooved ware (Woodland type) vessels	−25.2±0.22	4505±41	3370–3020 cal BC
Boscombe Down Sports Ground (Wessex Archaeology 1996)				
UBA-34497	Single carbonised grain, *Hordeum vulgare* (Inés L. López-Dóriga, Wessex Archaeology), from the fill (221) of pit [222]. Pit 222 measured 0.63m in diameter and 0.3m in depth, with near vertical sides and an irregular base. The pit was entirely filled by an 'ashy' layer (221) that contained a Late Neolithic flint assemblage.	−21.9±0.22	1108±26	cal AD 880–1000
OxA-35719	Single carbonised grain, *Triticum* sp. (indet) (Inés L. López-Dóriga, Wessex Archaeology), from the fill (197) of pit [160]. Pit 160 measured 0.9m in diameter and 0.45m in depth, with near vertical sides and a flat base. The primary fill is an 'ashy' layer (197) that contained a Late Neolithic ceramic assemblage.	−23.1±0.2	963±27	cal AD 1010–1160
Kings Gate (Powell and Barclay 2019)				
UBA-34503	Single carbonised grain, *Triticum* sp. free threshing (Inés L. López-Dóriga, Wessex Archaeology), from the fill (61746) of pit [61745]. Pit 61745 measured 0.86m in diameter and 0.1m in depth, and was sub-oval in shape. Pit 61745 contained a single large Grooved Ware sherd (contained a single large rim sherd from a calcareous vessel (probably of the Durrington Walls style) decorated with six moulded horizontal lines between which were alternating diagonal and horizontal lines. Below this zone was an area of diagonal tooling. A single post-firing perforation had been drilled through from the exterior) and an antler fragment as well as a relatively large quantity of worked flint, including large primary flakes and at least one core, much of it in the southern half of the pit	−20.3±0.22	406±31	cal AD 1430–1620
Old Dairy, Amesbury (Harding and Stoodley, 2017)				
UBA-34505	Single carbonised grain, *Hordeum vulgare* (Sarah F. Wyles, Wessex Archaeology) from the fill (564) of pit [563]. Pit 563 measured 1.13m in diameter and 0.51m in depth, with convex sides and a shallow concave base. The filling comprised a deposit of deliberate back-fill containing dark grey-brown ashy material (564) and refuse which included sherds of Middle Neolithic pottery, animal bone, worked flints and charcoal.	−24.3±0.22	557±25	cal AD 1310–1430
SUERC-73268	Single carbonised grain, *Triticum* sp. (indet) (Sarah F. Wyles, Wessex Archaeology) from the same context as UBA-34504	−22.5±0.2	654±28	cal AD 1280–1400
West Amesbury Farm (Worley *et al*. 2019)				
SUERC-74012	Single carbonised grain, *Triticum* sp. (free-threshing) (Ruth Pelling, Historic England), from fill (93227) of pit [93206]	−25.0 (assumed)	401±30	cal AD 1430–1620
OxA-35988	Single carbonised grain, *Triticum* sp. (free-threshing) (Ruth Pelling, Historic England), from fill (93230) of pit [93208]	−22.9±0.2	824±24	cal AD 1165–1265
UBA-31616	Single carbonised grain, *Hordeum vulgare*, (Ruth Pelling, Historic England) from fill (93230) of pit [93208]	−22.5±0.22	825±39	cal AD 1150–1280
UBA-31617	Single carbonised grain, *Hordeum vulgare* (Ruth Pelling, Historic England), from fill (93231) of pit [93206]	−24.9±0.22	184±60	cal AD 1530–1955

be interpreted in such a light, and Reynolds (2011) has explored possible links of this deposit to animist belief systems. The Portway site also provides an example of more complex Middle Neolithic structured deposition, where sarsens, pottery, a pig scapula and other materials were arranged in a formal manner, with an apparent significant chronological gap demonstrated by a natural accumulation layer between two episodes of deposition. It should be noted, however, that two radiocarbon dates from the two structured deposits within the pit, NZA-18417 (4,477±40 BP) and NZA-18339 (4,428±45 BP, Powell *et al*. 2005, table 3) are statistically consistent at the five per cent significance level (T'=0.7; T'5 per cent=3.8; ν=1; Ward and Wilson 1978) and could therefore be of the same actual date. This demonstrates that the pit and the initial deposition retained importance sufficient to be returned to. Memories of pits, and repeated returns to pit sites, are also demonstrated by the sequence of pit-grave-pit excavated at West Amesbury Farm, where effort was also made to mark a pit with a post after its initial filling (Roberts *et al*. submitted). Many pits may also have been marked by accompanying piles of chalk upcast from their digging; few pit fills have a major chalky component.

The materials selected for deposition are revealing. The combination of large quantities of hazelnuts and pig bones might imply that pigs were being grazed in hazel-rich woodland in a period when pastoralism is assumed to have been the dominant lifeway. Sarsen is also regularly found in Middle and Late Neolithic pits in Wiltshire. At this time sarsens would occur fairly regularly on the chalk downland, and Powell *et al.* (2005) suggest that they might have been used as anvils for the processing of hazelnuts. Molluscan evidence from the Portway pits suggests a rapidly changing local environment including woodland and downland—ideal for pannage and hazelnut gathering—and this taskscape (Ingold 1995) may be reflected in the materials deposited. At West Amesbury Farm, by contrast, lithics and pottery are very strongly represented, and the faunal and archaeobotanical assemblages indicate activity in late autumn/early winter, suggesting a different type of place and taskscape (Roberts *et al*. submitted).

Landscape

The distribution and landscape context of pits is also key to understanding the dataset and the communities who undertook pit digging in the Neolithic. Given the considerable quantity of developer-funded archaeological work across Wiltshire and previous antiquarian focus on particular areas around Stonehenge and Avebury, it would be expected that if pits were widespread across the county, their distribution would be similar in each of these zones. Instead, the distribution of pits is strikingly concentrated, and increasingly so through the Neolithic period (Figures 2–3). In the Early Neolithic pits were dug on the edges of chalk downland around the headwaters of the Wylye, Kennet and Avon, and in the environs of Windmill Hill and Robin Hood's Ball causewayed enclosures. In the Middle Neolithic there appears to be a dramatic contraction in the overall distribution of activity to foci around the middle and lower Avon valley and surrounding downland, with occasional isolated pits around the headwater zones. The Late Neolithic sees an even more dramatic contraction of activity to the middle Avon valley and its downland, with a few pits also present south of Windmill Hill, and one from the Thames valley providing the only well-dated pit north of Marlborough Downs.

There are considerable biases in the data. Many more research excavations focusing on Neolithic landscapes have taken place in the Stonehenge and Avebury WHS than elsewhere in Wiltshire. Secondly, the distribution of developer-funded fieldwork is highly concentrated around Salisbury, Amesbury, Swindon, the Thames valley, and the northwest Wiltshire towns of Chippenham, Melksham and Trowbridge. These biases are reflected in the concentrations of pits around Amesbury, the Stonehenge WHS, Old Sarum (north of Salisbury) and Avebury. However, it is also very interesting to note the lack of activity in northwest Wiltshire. Only two possible Neolithic pits are known: one, near Chippenham, dated as possibly early Neolithic on the basis of a small flint assemblage (Anon. 1991), and a second, found near Trowbridge, on the basis of a single sherd of Peterborough Ware (Last *et al.* 2016, 24–5). Neither met the criteria for establishing chronology to be considered as Neolithic in this study.

Most pits in the dataset are on chalk geologies, and of the exceptions four are on either Clay-with-flints capping deposits on chalk ridges (Shrewton (Richards 1988), Monkton Deverill (Rawlings 1990)), or river valley head deposits overlying chalk (Wylye (Cotswold Archaeology 2013), Downton (Davies 1985)). The only pits truly off the chalk are found in the valleys of the River Thames (Stone 1974; Roberts 1993; Cass *et al.* 2015) and its tributary,

the River Ray (Passmore 1913). There is relatively little other Neolithic activity in these areas, except for Lanhills long barrow. Neither are pits known from the Vale of Pewsey, despite having Marden Henge, Britain's largest henge, at its centre, and Wilsford Henge just over the Avon; there appears to be relatively little activity in the Vale base beyond the henges in what may have been seasonally marshy terrain in the period. Whilst these areas are clearly important to communities in the Neolithic period given the presence of major monuments, it seems that whatever other activity was taking place in the valleys did not require the digging of pits.

Although almost all pits occur on chalk, their topographic contexts vary considerably. Particularly in the south of Wiltshire around Old Sarum and the lower Avon valley, many pits are at the very base of the chalk, where it meets the alluvial plain of the river, similar to pit locations in the Thames valley in north Wiltshire. Contrastingly, most pits in the middle Avon valley are located a little higher up on chalk downland slopes around 10–30m above the river. Wiltshire's greatest henges such as Avebury, Marden and Durrington Walls, tend to be located very close to rivers, and sometimes incorporate them into their designs (Richards 1996). The locations typical of pits in this region are a sort of halfway house between the locations of the valley henges and those of earlier upland monuments such as causewayed enclosures and long barrows, but are rarely located very far from rivers.

Landscapes are not just topography. Changes in lifeways, particularly the shift away from cereal cultivation and towards pastoralism, took place alongside changes in the environment. Molluscan evidence suggests an increasingly open landscape on the chalk and in river valleys through the Neolithic period (Allen and Gardiner 2009; Hazell and Allen 2013) and this is borne out by the evidence for pits (Table 12). The sparse evidence for pit digging from areas beyond the chalk may indicate that the heavier clays of far southwest Wiltshire and parts of northwest Wiltshire were wooded at this time. Clearance for cereal cultivation, monument construction or other community needs, took place in the Early Neolithic and continued when the first of these factors had ceased in the mid-4th millennium cal BC. In all probability, the maintenance of domestic animals is the main reason for continuing clearance following the apparent cessation of cereal cultivation in the area. The role of cattle and other domesticates in woodland clearance in the Neolithic has been discussed by Noble (2017), as has the diversity and complexity of animal-human-ecology interactions by Oswald (forthcoming), and it is clear that these animals would have transformed the ecology of the Early Neolithic open woodlands of the chalk, although they may have had less of an impact on the denser wooldand elsewhere in Wiltshire, depending on patterns of transhumance over time.

Lifeways

We can thus reconstruct a picture of the role pits may have had in life in the Neolithic. In the Early Neolithic, pits were dug in relatively small numbers above the headwaters of river valleys and near causewayed enclosures. Whilst exceptional deposits were very occasionally made (e.g. the Coneybury 'Anomaly' and the pits containing burnt cereals near Windmill Hill) in general relatively small amounts of material culture were deposited, and not in a formal way. This contrasts notably with behaviour at causewayed enclosures, where rich assemblages of pottery, lithics and animal bones were deposited, and have been interpreted as being highly meaningful in both their location and selection of assemblages (Andersen 2015).

After the mid-4th millennium cal BC, it appears that communities moved away from cereal cultivation, and may have adopted a more pastoral lifestyle. Sheep/goat remains begin to appear in pits, and the proportion of pigs and red deer increase, with much larger quantities than previously of pig being deposited, if these are present. Lithic assemblages increase slightly in size, and there is a very significant increase in evidence for blade manufacturing. At

Table 12: Molluscan evidence from Neolithic pits

Period	Pits where molluscs analysed	Woodland / open broad leafed woodland	Shaded preference	Localised clearance	Mixed	Open grassland with trees	Open downland
ENEO	2	1		1			
MNEO	34	5	7	7	1	7	5
LNEO	14				7		7

sites such as West Amesbury Farm, and perhaps Old Sarum Airfield (Wessex Archaeology 2015b), lithic technologies incorporate those from earlier periods, such as burin manufacture, and also develop new forms of some tools, such as transverse arrowheads (especially petit-tranchet types; Bishop *et al*. accepted). Occasional structured deposits continue to be made of foodstuffs, although they are now of hazelnuts rather than cereals. This change is also very strongly mirrored in the archaeobotanical assemblages from pits, with hazelnuts appearing in most pit assemblages and the apparent absence of grain contemporary with the use of pits.

By the Late Neolithic pig remains are deposited in pits as often as cattle remains; the frequency of sheep/goat has increased further, and cattle and red deer decreased slightly. Where cattle are present they form the bulk of assemblages. The deposition of struck flint blades reduces significantly, and more retouched tools are deposited in pits. Hazelnuts remain important, and cereal remains are almost never present as *in situ* material; although they are frequently found as intrusive items.

The hazelnuts from the Portway pits, and grain from pits on the fringes of Windmill Hill, are both apparently deliberate acts of large-scale destruction of food resources. The Windmill Hill pits have relatively few animal bones associated with them. While there are only small quantities of animal bone at Old Sarum and the Portway, there is some element selection by sides, and a focus on pigs. This change in formalised food resource use may hint at the eventual development of highly selective and large-scale ritual consumption of pigs at monuments such as Durrington Walls (Madgwick *et al*. 2019). Roberts *et al.* (submitted) argue that at West Amesbury Farm the deposition of young animals, perhaps as part of culling of herds at the beginning of winter, may prefigure the later feasting practices visible in the Stonehenge landscape.

Future research directions

This review, and other work associated with Historic England's Stonehenge Southern WHS Project, has provided an opportunity to think about how lifeways associated with the digging of Neolithic pits in Wiltshire changed over time. The dataset remains limited, and much analytical work remains to be undertaken at both site and landscape resolutions. In particular, links between pits and monuments, hinted at by early pits at sites such as Coneybury (Richards 1990) and Stonehenge (Pitts 2012), need to be further explored. Did pit digging, as part of a cycle of transhumance, lead to more elaborate Late Neolithic expressions of monumentality at some places? Why did pit digging take place in increasingly selective locations through the Neolithic period, culminating in the concentrations of Late Neolithic pits in the Durrington/Amesbury area? If we are to be able to answer such questions, a more consistent programme of environmental sampling—and processing and analysing the full samples—is vital to provide environmental, artefactual and scientific dating evidence. Attention must also be paid to attempting to disprove—and therefore improve—the interpretation outlined here by determining whether pits in the west and northwest of Wiltshire in contexts away from the chalk were dug in the Neolithic.

Wiltshire's outstanding monuments and prominent role in early studies of the Neolithic gave it unique influence in building early narratives of this key period of British prehistory, and research into these special sites continues to occupy public and academic discourse today. It is by elaborating and enriching these narratives through understanding Neolithic activity beyond monuments that we can properly contextualise the complex changes that occurred in lifeways at this time, and it is hoped that this article may provide the basis for some of that work to be done.

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