The Alluvial Geoarchaeology of the Upper River Kennet in the Avebury Landscape: a Monumental Transformation of a Stable Landscape

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This document presents the detailed descriptions of the different alluvial sediment units observed within the investigation of the River Kennet in the Avebury World Heritage landscape. The descriptions of the borehole transects, test pits/trenches, and micromorphological thin sections provide the stratigraphic overviews and the detailed descriptions of the sediment units. The aim is to give readers the detailed quantitative analysis of the data used in the main paper, allowing a clearer presentation of the macro- and micro-stratigraphic trends and their interpretations.

APPENDIX S1: THE ALLUVIAL ZONES

Five landscape zones were identified in the geoarchaeological survey of the upper Kennet valley from Windmill Hill to West Overton, and used for the presentation and description of results in this study, as follows:

Zone A is to the north and north-west of the Avebury henge. To the north-west, the ground rises on to the chalk downland towards Windmill Hill, broken only by the slight valley formed by the Kennet western Y-fork of the Kennet (the Oslip stream), ostensibly an old spring line. As well as the causewayed enclosure at Windmill Hill (Smith 1965; Whittle *et al*. 1999), there are numerous long barrows and round barrows recorded in its environs, alongside a smaller number of sites known on the plateau around Winterborne Monkton, including the site of the now destroyed Millbarrow.

Zone B includes the Avebury henge that is located on a slight knoll of chalk with clay-with-flints, which is almost a natural amphitheatre when viewed from the north-west/north/north-east. To the west/south-west/south, the River Kennet floodplain affords a low view of the western bank of the henge, now much obscured by the village and trees. To the east of Avebury henge there is a shallow, stepped valley proceeding alongside and just to the north-east of the West Kennet Avenue towards the modern A4 and the River Kennet.

Zone C is to the south and south-east of the Avebury henge, which contains the massive bulk of Waden Hill and the gigantic Silbury Hill, sat on the floodplain bottom. To the south/south-east, Waden Hill totally obscures the henge, except from its northern end. It is also noteworthy that a sizable Romano-British settlement has now been mapped immediately adjacent to Silbury Hill on the lower valley side (Leary *et al*. 2013). To the south/south-west, the Kennet floodplain appears to be almost blocked and certainly constrained by the presence of Silbury Hill. It is in this zone that the River Kennet turns sharply eastwards through *c*. 90° at Swallowhead Springs with a more constricted floodplain downstream to the east.

Zone D is the floodplain from Silbury Hill eastwards towards The Sanctuary. Contained within this zone are the rising chalk downland either side of the river, again containing a wealth of long and round barrows including the West and East Kennett long barrows, The Sanctuary and Overton barrow groups on the valley sides, alongside the West Kennet palisade enclosures situated directly on the floodplain (Whittle 1997).

Zone E is the floodplain eastwards from The Sanctuary to North Farm, West Overton. The valley traverses the boundary of the World Heritage site and passes close to North Farm, where it slowly meanders eastwards past East Kennett village on the southern side of the A4 towards Marlborough. Again, numerous round barrows are recorded along the valley sides in this zone.

To cross-correlate between the stratigraphic units present in the boreholes in the transects in each zone, similar macro-stratigraphic units were identified, described, and used throughout the profile descriptions (Table S1).

APPENDIX S2: METHODS OF SAMPLING AND ANALYSIS

Laboratory sampling and homogenisation

Within the laboratory all the alluvial profile samples were cleaned, photographed and relogged. Each sample was then sub-sampled using a clean scalpel on a 1 cm interval, removing *c*. 10 g of sediment per sub-sample, placed in a polyethylene bag. Sub-samples were oven dried at 40° C for one week, before homogenisation using a pestle and mortar and fractionation on a 2 mm stainless steel sieve.

Particle size analysis

The <2 mm sediment fraction was analysed to determine sediment composition using a Malvern Mastersizer 2000 laser analyser. Each sub-sample was disaggregated through adding 5 ml of sodium hexametaphosphate to a heaped spatula of sediment (about 1 g), which was agitated on a platform rotary shaker at 175 rpm for a minimum of 1 hour. Each sub-sample was analysed using Basic Ultrasonic Method, making three measurements, with a mean value calculated. All data were exported from the Malvern Mastersizer using the Wentworth scale, a Phi classification of sediment sizes range, and this nomenclature is used throughout.

Organic and carbonate contents

Ceramic crucibles were oven-dried at 100°C for 24 hours before weighing, to remove any water. A spatula of sub-sample was added to each crucible before drying for a further 24 hours at 100°C. The crucibles were then removed from the oven and placed in a desiccator before reweighing and were then fired at 450°C for 4 hours, before being placed in a desiccator and reweighed. Samples were then fired for a further hour at 850°C. The 450°C burn was used to calculate the organic content with the 850°C burn used to calculate the carbonate content.

Magnetic susceptibility

The magnetic susceptibility of each sub-sample (<2 mm) was measured using a Bartington MS2B magnetic susceptibility metre with the reading calibrated to the mass of the sample, using 10 ml pots. The sample sequence required a blank zero measurement, before the sample was added to the metre and the magnetic susceptibility measured for five seconds, before removal and a further blank zero measurement, to calibrate for drift. The sample measurement was mass specific.

Data analysis and presentation

With the analyses completed the data were entered into an Excel spreadsheet, before exporting to SPSS (statistics software) for the drawing of line graphs of the sediment fractions. Graphs drawn in SPSS were exported in Adobe Illustrator, and added to the sample logging sheet, with the context boundaries drawn over the graphs. Each context was then described and the data from the soil micromorphology, OSL dates, and borehole stratigraphic records were integrated.

Micromorphological thin section analyses

Intact soil block samples were taken for micromorphological characterisation analysis from the valley fill sequences by French in the McBurney Laboratory, University of Cambridge (after Courty *et al*. 1989). The thin section slides were produced following the methods of Murphy (1986) as adapted by French and Rajkovača (2015), and described using the accepted terminology of Bullock *et al.* (1985) and Stoops (2003). Brief thin section descriptions are given in Appendix S5 (below) with accompanying photomicrographs (Figs S10–S12), and a summary of descriptions and interpretations is given in Table 4.

Molluscan and palaeo-environment proxies

The analysis of the palaeo-environment data from this research forms a second paper for this project (French *et al*. in prep.). However, it is worth noting here that molluscan samples were taken from Zone A Test Pit 3, Zone B Trenches 2 and 5 in Butler's Field, Zone C calcitic palaeo-channel fill deposits in BH 223 to the south of Silbury Hill, and Test Pits 1 and 2 in Zone E at North Farm, West Overton, for the assessment of preservation and comparison with the previous sequences analysed by J.G. Evans from Windmill Hill, Butler's Farm, under the Avebury henge bank, at West Kennett and South Street long barrows, and at North Farm (Evans 1972; Evans *et al*. 1985; 1993). Unfortunately, the assessment and preliminary analysis of the land snails shows an almost total loss of preserved shells from locations and deposits almost identical to those sampled previously by Evans in Butler's Field and North Farm.

In addition, several sets of sub-samples were also taken from the palaeo-channel fills and buried soils for pollen preservation assessment by Scaife (in the Department of Geography, University of Southampton). These include: the palaeosol in BH 528 to the south-east of Avebury henge; the palaeo-channel in Trench 5, Butler's Field and between Silbury Hill and Swallowhead Springs in BH 223 and BH 379; the springhead at BH 419 at the southern base of Waden Hill; the palaeosol in BH 524 to the north of East Kennett long barrow; and the buried soil and palaeo-channel at North Farm Test Pits 1 and 2, respectively. Pollen preservation was extremely poor throughout. However, in the last month of the project, sink-hole deposits beneath two Roman wells were discovered in Zone A on the floodplain margin of Spring Field to the north-west of Avebury henge with good pollen preservation stretching throughout an 11 m deep sequence in Trench 4, but unfortunately only relating to the late Iron Age and Roman periods.

APPENDIX S3: OSL SAMPLING AND METHODS

Optically stimulated luminescence sampling and dating (or OSL) were conducted by Wood and Toms at the University of Gloucestershire's Luminescence Dating Laboratory on four profiles in the River Kennet floodplain (Toms 2018; Toms & Wood 2020). These are: the palaeo-channel sequences exposed in Trenches 2 and 5 in Butler's Field; the buried soil/colluvial/alluvial sequence in Test Pit 1; and the palaeo-channel fill sequence exposed in Test Pit 2, both at North Farm, West Overton (Tables 3 & S2).

Sixteen sediment samples were collected within opaque tubing and submitted for Optical dating (Tables 3 & S2). To preclude optical erosion of the datable signal prior to measurement, all samples were opened and prepared under controlled laboratory illumination provided by Encapsulite RB-10 (red) filters. To isolate that material potentially exposed to daylight during sampling, sediment located within 20 mm of each tube-end was removed. The remaining sample was dried and then sieved. The fine silt fraction was segregated and subjected to acid and alkaline digestion (10% HCl, 15% H_2O_2) to attain removal of carbonate and organic components respectively. Fine silt sized quartz, along with other mineral grains of varying density and size, was extracted by sample sedimentation in acetone (<15 μm in 2 minutes 20 seconds, >5 μm in 21 minutes at 20°C). Feldspars and amorphous silica were then removed from this fraction through acid digestion (35% H_2SiF_6 for 2 weeks) (Jackson *et al*. 1976; Berger *et al*. 1980). Following addition of 10% HCl to remove acid soluble fluorides, grains degraded to <5 μm as a result of acid treatment were removed by acetone sedimentation. Twelve multi-grain aliquots (*c*. 1.5 mg) were then mounted on aluminium discs for D_e evaluation. All drying was conducted at 40°C to prevent thermal erosion of the signal. All acids and alkalis were Analar grade. All dilutions (removing toxic-corrosive and non-minerogenic luminescence-bearing substances) were conducted with distilled water to prevent signal contamination by extraneous particles.

APPENDIX S4: GEOARCHAEOLOGICAL SURVEY RESULTS

Zone A

TRANSECTS

Transect 44 covers the down slope from Windmill Hill to the Kennet floodplain north-west of Avebury henge, and is complemented by the Test Pit profiles excavated in Spring Field (Figs 2, 3, & S1). Transect 44 shows a present day, thin rendzina soil, *c*. <0.25 m thick, from the top of Windmill Hill to the floodplain margin. However, at certain points on the downslope there is a thin finger of hillwash derived colluvium underneath this rendzina topsoil, as recorded in boreholes BH 335–338. This hillwash is generally thin (<0.25 m), although a deeper pocket is recorded in BH 366 between 0.28–0.92 m and 0.15–0.45 m in BH 335. Overall the transect records very limited upslope storage of colluvial derived hillwash on the valley edges, with small localised pockets collecting on breaks of slope. The Kennet floodplain contains a relatively thin alluvial sequence in boreholes BH 331–350, which is grouped as macro-stratigraphic unit 3 (Table S1), a pale greyish brown silty clay loam with frequent chalk fragments, a hillwash derived alluvium. The deepest expression is recorded in BH 331 between 0.18–1.06 m and BH 332 between 0.2–0.51 m, with this alluvial sequence currently undated.

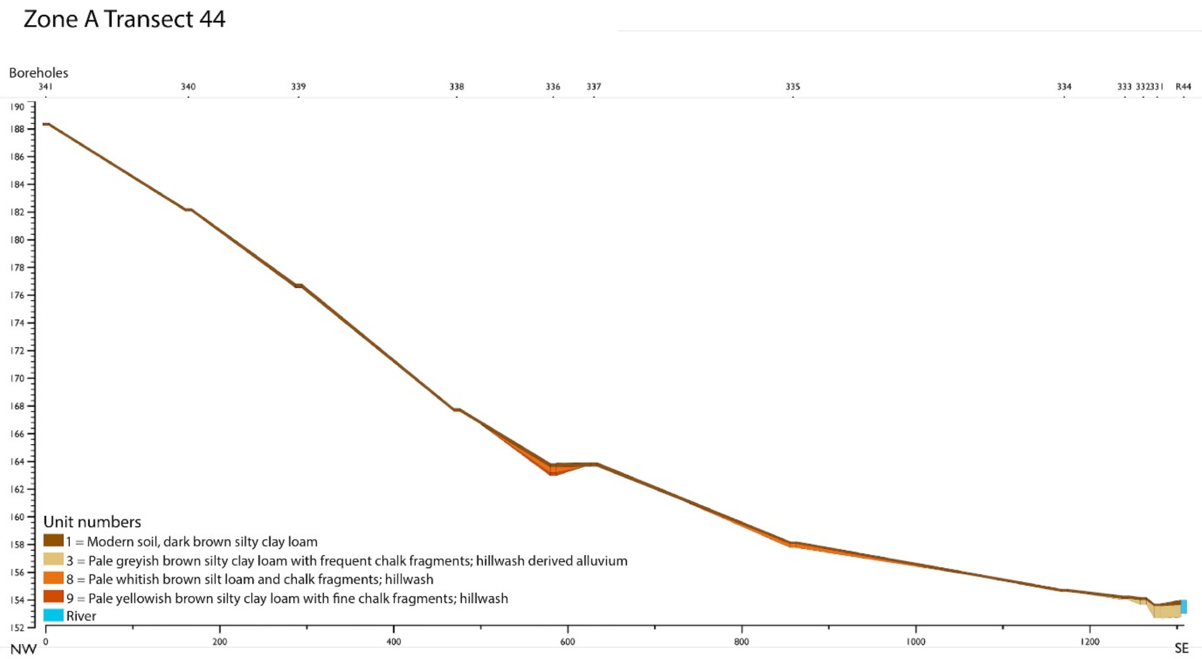

FIG. S1

Zone A: Transect 44 covers the down slope from Windmill Hill to the Kennet floodplain north-west of Avebury henge (C. Carey/N. Crabb)

TEST PITS

The alluvial sequences within Zone A were further investigated and sampled through test pits TP1, TP3 and TP4 (Figs 2 & 3). In TP3 there is a thin (*c*. 0.1 m thick) buried soil horizon surviving beneath *c*. 0.33 m of modern floodplain grassland soil. This palaeosol was a brown, very fine sandy/silty clay loam exhibiting an irregular small blocky ped structure with few to common chalk and flint gravel pebbles. The well oriented dusty clay coatings integral with the groundmass in this soil (Figs S10b & c; Table 4) are indicative of the lower B horizon (or Bwt) of a former argillic brown earth (Fedoroff 1968; Bullock & Murphy 1979; Kuhn *et al*. 2010). Nonetheless, the absence of more than a few limpid (or pure) clay coatings suggests that this soil was not particularly well developed and therefore probably not indicative of a stable, long-lived woodland soil (cf. Bullock & Murphy 1979; Fedoroff 1968). However, the abundance of dusty (silty or impure) clay, both oriented and undifferentiated, throughout the groundmass suggests that this soil has undergone repeated episodes of physical disturbance, followed by relative stability for some time in the past (Slager & van de Wetering 1977; Macphail 1992; Lewis

2012). The absence of illuvial dusty clay in the voids/channels suggests that there is minimal effect of more recent alluviation on this buried soil, although the former A horizon is unrecognisable and has become incorporated and transformed by alluvial deposition and the formation of the present day A/B silty clay alluvium and turf soil profile. Nonetheless, there is some depletion of fines (silt and clay) evident in the upper part of the B horizon of the buried soil in TP3 (Fig. S10a). There is variable influence of alkaline groundwater and the dissolution of the chalk substrate leading to the secondary formation and incorporation of micro-sparite (silt-sized calcium carbonate) and amorphous calcium carbonate in the groundmass towards the base of the buried B horizon (Fig. S10d) (cf. Durand *et al*. 2010). The few sesquioxide (iron oxide) nodules and greater/lesser formation of amorphous sesquioxides (Fig. S10d) are also indicative of the rise and fall of the local groundwater table (Lindbo *et al*. 2010), and are probably associated with the effects of more recent seasonal flooding and alluvial deposition.

In Test Pit 4 there is a similarly thin (*c*. 0.1 m thick) buried soil horizon sealed beneath *c*. 0.5 m of blocky structured silty clay alluvium and turf with a marked fine gravel stone-line at its base (Table 4). This buried soil exhibits a similar fabric to the buried Bwt horizon observed in Test Pit 3 (above), but with a more well developed small blocky/columnar blocky ped structure, a dusty clay dominated groundmass (Fig. S10c) and a greater influence of secondary micro-sparite calcium carbonate and some amorphous sesquioxide formation in the lower 2–3 cm of the sample. There are also some illuvial dusty clay coatings of the voids (Fig. S10c). This is a similar soil type and Bwt horizon to that observed in TP3. Similarly, the former A horizon of this soil has been transformed by the subsequent deposition of silty clay alluvium, with only the stone-line as an indicator of its former presence. This soil was also affected by some alternating gleying/oxidation conditions, and more recent illuviation associated with more recent alluviation leading to dusty clay channel infills.

Zone B

TRANSECTS

Transects 1000, 30, and 1 provide the stratigraphic overview of Zone B, the landscape immediately surrounding the Avebury Henge (Figs 2 & S2; Table S1). Transect 1 records the sediment sequences between Avebury Henge, eastwards crossing the dry valley to Avebury Down. Similar to transect 44, transect 1 records a generally thin topsoil profile representing the modern day rendzina soil, up to *c*. 0.35 m thick at its maximum extent. In the valley bottom on the east side, a thin colluvial sequence is recorded of pale yellowish brown silty clay loam with fine chalk fragments (unit 9) between 0.2–0.6 m in BH 109. The lower shelf on the west side of the dry valley contains a deeper extant soil profile, with unit 11 underlying the current topsoil, an orangey brown very fine sandy/coarse silt loam, with few fine flint pebbles. It represents the silt and clay enriched B horizon of a loessic derived palaeosol, demonstrating that an argillic brown earth soil had formed in the past at this location.

Transect 1000 traverses the floodplain to the south-west of Avebury henge (Table S1). Some differentiation is recorded on the two opposing sides of the floodplain, intersected by the modern course of the River Kennet. On the west side of the transect the floodplain sediments record unit 4, an alluvium of pale grey silt loam with few fine chalk and shell fragments (BH 288, 0.6–1.3 m), underlying unit 8 a pale greyish white calcitic silt loam, which is interpreted as colluvially derived (BH 288, 0.4–0.6 m). Above this are unit 2, the blocky structured, greyish brown silty clay loam, defined as the upper alluvium (BH 288, 0.26–0.4 m) and the modern topsoil (0–0.26 m). On the east side of the floodplain, the alluvial sediment sequences contain basal unit 10, a greyish brown silt loam with few fine charcoal, chalk and flint fragments, representing a buried soil (BH 252, 0.85–1.2 m), overlain by unit 12, a very dark brown silt loam with common chalk fragments (BH 252, 0.55–0.85 m). Unit 12 is a localised and complex deposit, containing a mix of the 'medieval soil' first defined by Evans *et al*. (1993) and minerogenic alluvium. Above this is unit 2, the upper alluvium (BH 252, 0.15–0.55 m) and unit 1 the modern topsoil. Transect 1000 records on the east side of the floodplain a basal palaeosol (unit 10), overlain by a further alluvial soil complex (unit 12), probably of medieval age. On the west side of the floodplain, the alluvial sequences recorded in transect 1000 define an earlier phase of alluviation in unit 4, underlying colluvially derived alluvium (unit 9) and later alluviation of unit 2, the *Arion clay*.

Transect 30 is a further cross section of the alluvial sequences on the east side of the floodplain (Table S1). The transects define a thickening of the alluvial sequences in this part of the floodplain, with its deepest point in borehole BH 242. BH 242 records a basal unit 4, a pale grey/yellowish brown very fine sandy silt alluvium with fine shell fragments, overlain by unit 3, a pale grey silty clay grading into calcareous silt alluvium. Above this is unit 2, the grey silty clay upper alluvium *Arion clay* and the modern topsoil unit 1.

This sequence of units 4–1 (Table S1) is the same general deposit sequence that is visible downstream of this locale in the floodplain adjacent to the West Kennet palisade enclosures (Zone D) and at North Farm (Zone E). The sequence contains unit 4, the earliest phase of alluviation in this zone, an alluvium that is silt carbonate dominated, of generally pale grey colour. Above this are two further phases of alluvium, defined as units 3 and 2. These units become progressively more minerogenic over time, defining increasing amounts of eroded soil material being deposited within the floodplain, with a concomitant lowering of energy in the depositional environment of the floodplain.

Given the proximity of the alluvial sequences on the Kennet floodplain immediately adjacent to the Avebury henge, alongside its potential to contain substantial prehistoric archaeological remains, archaeological excavations were undertaken to investigate this alluvial archaeological record in Butler's Field. Trenching, test pitting and gouge coring within Butler's Field revealed several low point depressions within the floodplain (Fig. S3), one of which was investigated by Trench 5. Trenches 2 and 3 investigated the more 'usual' alluvial sequences in the floodplain, although these alluvial sequences contained the medieval soil complex and were located above an earlier basal floodplain palaeosol. The excavations in Butler's Field allowed for the detailed sampling, analysis and OSL dating of the alluvial sediment sequences in Trenches 2 and 5.

TEST PIT 1

In zone B in the floodplain between the A4361 and Silbury Hill, a further buried soil was present in Test Pit 1 (Figs 3 & S10; Table 4), which was buried by *c*. 1.4 m of irregular blocky, humic silty clay alluvial material. The buried soil is a calcitic silty clay mixed with fine chalk/flint gravel and exhibiting considerable oxidation mottling (Fig. S10d). Micro-sparitic (or silt-size) calcium carbonate predominates in the groundmass, with few other pedogenic features of note present other than irregular zones of amorphous sesquioxide staining. This very calcitic and occasionally gleyed B horizon (or Bgk) of a palaeosol thus appears to have undergone little pedogenesis prior to alluvial deposition. But it has undergone severe transformation through wetting and drying processes (Lindbo *et al*. 2010), and the solution/dissolution of calcium carbonate (Ahnert 1996, 152–4; Durand *et al*. 2010), most probably derived from the underlying geology and available groundwater in this part of the Kennet floodplain.

TRENCH 5

Trench 5 excavated a deep alluvial sequence within a low point depression in the floodplain in the southern part of Butler's Field, reaching a depth of 2.48 m below ground surface (Figs 2, 4–9, S3, & S11; Tables 3, 4, S2, & S3). As such it constituted a somewhat atypical alluvial sequence within the floodplain, with seven distinct alluvial units recorded. The detailed sediment descriptions are described below from the base of the sequence to the present day ground surface as follows:

501: This is a whitish grey silt, with flint and chalk clasts. The clay content is very high (24%), with very fine silt (13%) and fine silt (10%) all decreasing. Conversely, medium silt (10%), coarse silt (17%) and very fine sand (14%) all slightly increase. There is considerable fluctuation in the fine sand (5%),

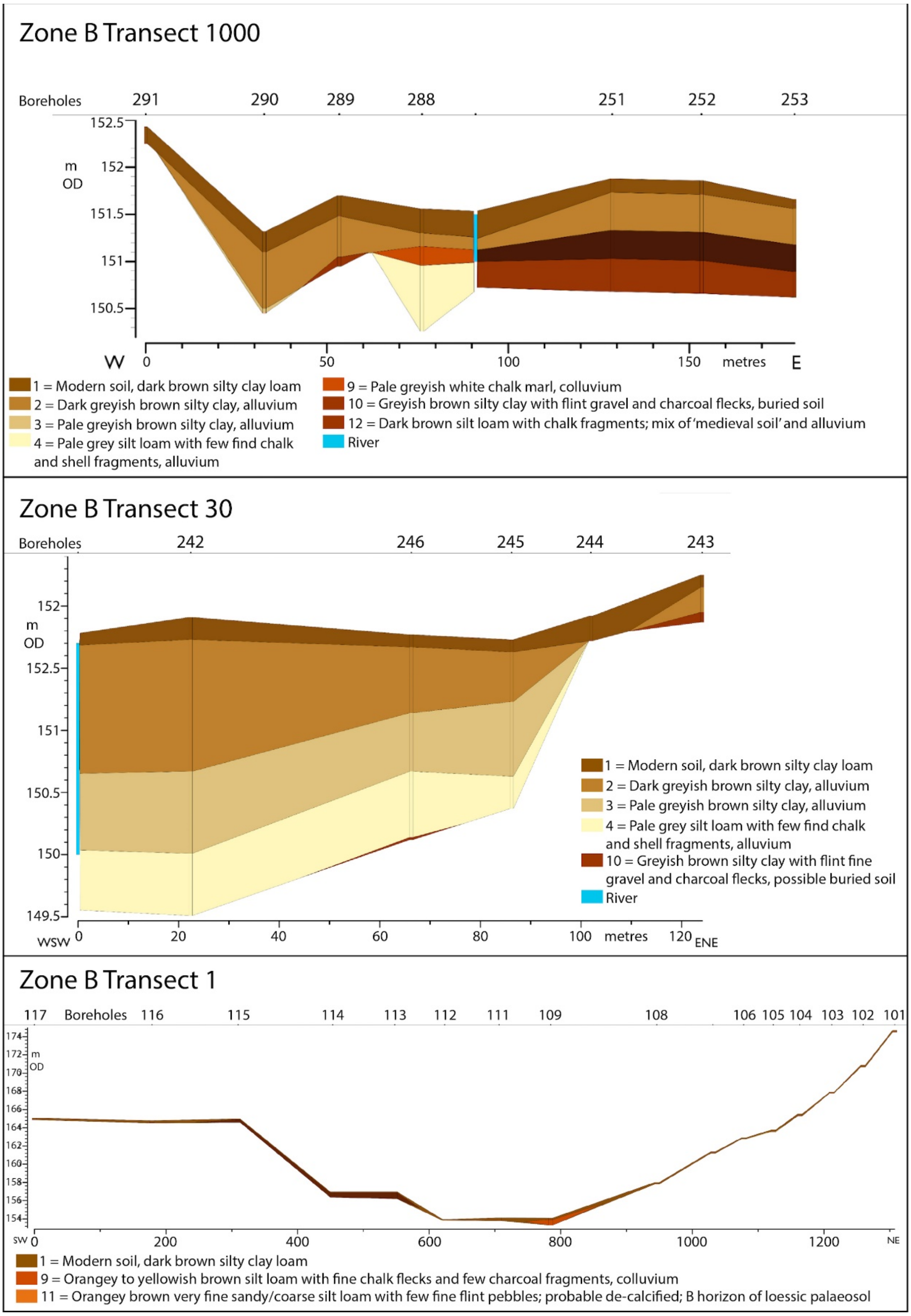

Fig. S2.
Zone B: Transects 1000, 30, and 1 provide the stratigraphic overview of Zone B in the landscape immediately surrounding the Avebury henge (N. Crabb/C. Carey)

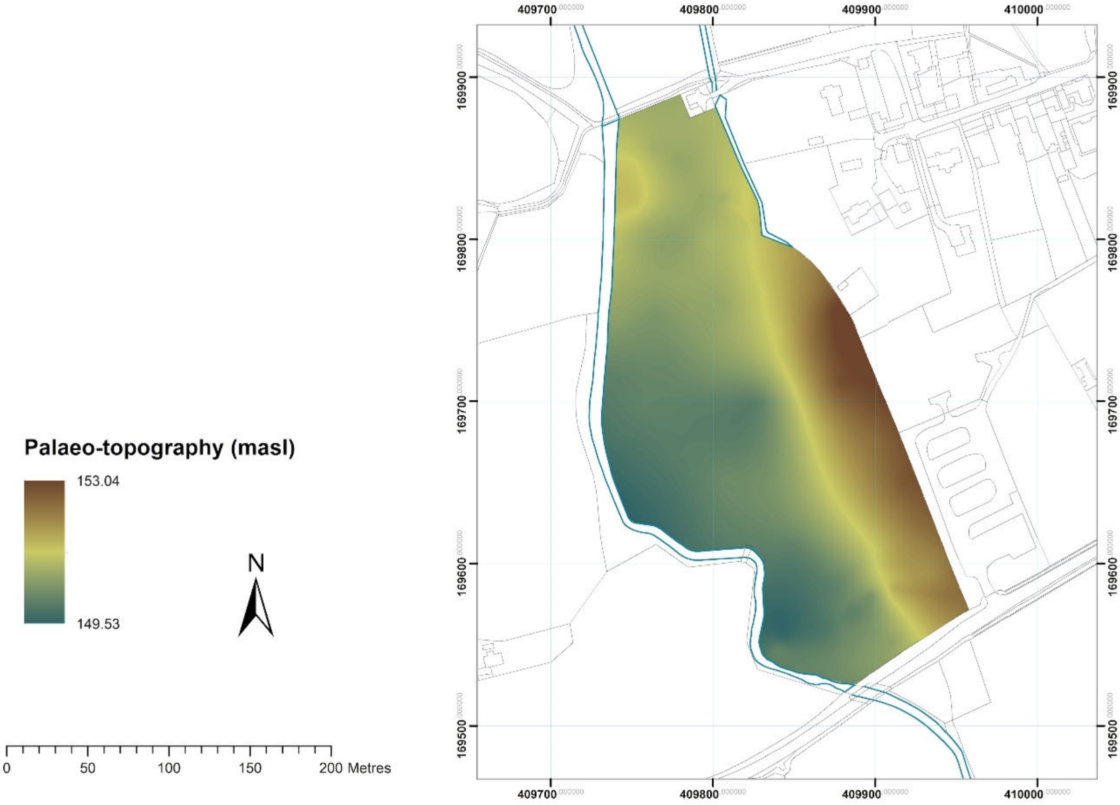

Fig. S3
Sub-terrain DEM contour map of Butler's Field with the alluvial cover removed (M. Gillings)

medium sand (3%) and coarse sand (3%) fractions, although these values are high in comparison to the rest of the sequence. The organic content (1%) is very low, whilst the carbonate content (34%) is very high. The OSL date of 14,270–11,730 BC (GL18001) (Tables 3 & S2) demonstrates a Late Pleistocene age for this sediment unit.

502: This is a greyish blue silt, with a trace of sand and flint gravel. This material is similar to the preceding unit 501, although the decreasing sand fractions represent a decreasing energy in the depositional environment. Again, the clay fraction (22%) is highest, although it has reduced slightly from unit 501 and continues to decline across unit 502. Very fine silt (11%), fine silt (11%), medium silt (12%) and coarse silt (14%) all increase, with a converse decrease in the very fine sand to coarse sand components. The carbonate content (31%) remains high, with the organic content (2%) showing a slight sustained elevation, whilst the magnetic susceptibility has two pronounced spikes. The OSL dates in this unit place the bottom of unit 502 as Mesolithic (8080–6610 BC; GL18073), whilst the top of unit 502 has a Late Mesolithic to Early Neolithic date (4550–3550 BC; GL18074) (Tables 3 & S2).

503: This a brownish grey silt with a trace of clay and sand, Fe mottling and a small chalk clasts. Clay (14%) significantly decreases, whilst fine silt (15%), medium silt (18%), coarse silt (20%) and very fine sand (11%) all increase. The carbonate content (29%) remains high but has slightly decreased from the preceding unit 502. Fine sand (3%), medium sand (3%) and coarse sand (4%) remain relatively high and demonstrate an elevation at the top of (503). Both the magnetic susceptibility and organic content (2%) rise slightly at the base of the unit. Thin section Samples 1 (2.0–2.05 m) and 2 (1.8–1.85 m) are both a pale greyish brown calcitic silt exhibiting minor staining with amorphous sesquioxides, and a fine dust of included micro-charcoal (Figs 11b–d) and a high carbonate content (Fig. S11e). Upon drying, the apparently dense, apedal fabric then became a small columnar blocky structure defined by very fine channels which shrink/swell depending on their moisture content (Fig. S11a). The Early Neolithic date

(4420–3460 BC; GL18002) (Tables 3 & S2) is virtually indistinguishable from the preceding date and confirms a date of the formation of this context that covers the Neolithic period.

504: This a brownish grey silt, with a trace of sand and comminuted snail shells. The trends in the minerogenic composition of the alluvium apparent in context (503), continue and increase in (504). Clay (13%) and very fine silt (11%) remain low, whilst fine silt (19%), medium silt (26%) and coarse silt (22%) all are high, with medium silt now the modal sediment fraction. Very fine sand (7%) decreases, whilst fine sand (1%), medium sand (1%) and coarse sand (1%) are now all minor components of the alluvium. The carbonate content (28%) initially slowly decreases, before decreasing more substantially from *c*. 1.25 m. Both the magnetic susceptibility and the organic content (2%) show a slight rise across this context. Thin section Sample 3 (1.5–1.55 m) is a pale brown calcitic very fine sandy silt with occasional dusty clay coatings lining the voids. It has a massive, homogeneous, apedal aspect. The date of this alluvial sediment unit is in the Early–Mid-Iron Age (820–410 BC; GL18075) (Tables 3 & S2).

505: This is a light brown grey clayey silt. Clay (18%), very fine silt (20%) and fine silt (23%) all increase. Conversely, medium silt (22%), coarse silt (14%) and very fine sand (3%) decrease. The fine-coarse sand fractions are negligible, whilst the carbonate content (9%) continues to decrease. The organic content (4%) and magnetic susceptibility both show increases throughout this sediment unit. Thin section Sample 4 (0.75–0.8 m) exhibits a similar fabric to Sample 3 but displays hints of fine horizontal laminations (Fig. S11f). It also contains a dust of micro-charcoal, and common irregular patches of black magnetite iron staining.

TRENCH 2

The other trenches excavated in Butler's Field revealed archaeology interspersed within thinner alluvial deposit sequences that is more characteristic of the wider valley, such as in Trench 2. It contained a more characteristic alluvial sequence with a total alluvial sediment depth of *c*. 1.3 m overlying a palaeosol (Figs 4, 5, 8, 9, & S5; Tables 3, S2, & S4). A matrix supported gravel was evident at the base of the sequence (unit 640) that was not sampled and is confidently interpreted as a Pleistocene deposit. The detailed descriptions of this alluvial sequence are given below from the base to the present-day ground surface.

639: This unit was only partially sampled, due to abundant clasts in the lower part of this unit and is described as a dark greyish brown silt with flint flakes and charcoal. There are decreasing clay (17%) and very fine silt (14%) components, whilst fine silt (17%), medium silt (22%), coarse silt (21%) and very fine sand (7%) all rise. The carbonate content (13%) is low, but increases, whilst the organic content (4%) is high but decreases towards the top of the unit. The fine sand to coarse sand components are generally low, although they demonstrate occasional spikes. The OSL date for this deposit is 690–310 BC (GL18003) (Tables 3 & S2). This unit is a weakly preserved palaeosol that was evident across multiple locales in the floodplain at the base of alluvial sequence and was interpreted by Evans *et al*. (1993) as the 'Avebury soil'.

638: This is a light brown clayey silt. Clay (13%) and very fine silt (11%) remain constant at relatively low levels, whilst fine silt (16%), medium silt (25%), coarse silt (25%) and very fine sand (9%) demonstrate a slight increase. Fine sand (0.7%), medium sand (0.3%) and coarse sand (0.4%) initially reduce, although they increase slightly towards the boundary with (311a). The carbonate content (26%) is high, although it does decrease toward the interface with (311a), with organic content (3%) and magnetic susceptibility slowly rising. The OSL date provides a date range of 20 BC–AD 150 (GL18004) (Tables 3 & S2), although this date is caveated, due to significant U-disequilibrium in the measurement process. The unit is clearly a carbonate rich alluvium, a correlative deposit to unit 504 in Trench 5.

311a: This unit is sub-division of unit 311 and is essentially a continuation of the alluvial deposit unit 638. It is a mid-grey, dark grey brown silt, with no inclusions. Clay (15%), very fine silt (12%) and fine silt (16%) show a slight increase from unit 638, whilst medium silt (23%) and coarse silt (23%) show a slight decrease and very fine sand (9%) remains constant. Fine sand (1%), medium sand (0.51%) and coarse sand (0.6%) are very low and remain constant. The carbonate content (22%) continues to decrease, whilst both organic content (4%) and magnetic susceptibility both rise.

311: This unit is a mid- to dark grey brown silt with abundant inclusions and is a 'medieval soil complex.' Clay (16%), very fine silt (14%) and fine silt (17%) rise, whilst medium silt (22%), coarse silt (20%) and very fine sand (8%) reduce. Carbonate contents (20%) continue to fall throughout this unit. Both the organic content (5%) and magnetic susceptibility show large increases in this unit. Fine sand (2%), medium sand (0.68%) and coarse sand (0.4%) fractions also rise, most notably in the fine sand fraction.

641: This unit is a dark brown clay silt. Clay (23%), very fine silt (21%) and fine silt (21%) continue to rise, with the corresponding decrease in the medium silt (17%), coarse silt (11%) and very fine sand (4%) fractions. The carbonate content (11%) continues to fall, as does the magnetic susceptibility values, whilst organic contents (6%) are high. The fine sand, medium sand and coarse sand fractions decrease to very low levels. This is a correlative unit of 505 in Trench 5. The dating of this unit is late post-medieval, by comparison to other locations with the floodplain.

Zone C

TRANSECTS

Zone C covers the floodplain north and south of Silbury Hill and the dry valley east of Waden Hill, up to the change in the direction of the River Kennet to a more easterly course downstream (Fig. 2). Transects 50, 65, 47 and 7 provide the stratigraphic overviews of this part of the floodplain (Figs S4 & S5; Table S1).

Transect 50 (Fig. S6; Table S1) traverses downslope from the top of Waden Hill, south-west to north-east. The transect describes a generally thin rendzina soil on the top of Waden Hill. Downslope in boreholes BH 384–386, the soil profile slightly thickens with an underlying unit 11, an orange brown/reddish brown colluvial deposit, probably a B horizon of a loessic palaeosol, to a maximum depth of 1.06–0.28 m in BH 386. Transect 7 traverses the valley on the east side of Waden Hill, on a broadly NNW-SSW alignment. Transect 7 records no alluvial deposits within the valley floor, although a thin sequence of colluvial deposits is visible beneath the current topsoil. In BH 150 there is a basal unit 15, a colluvial reddish brown silty clay with flint gravel between 0.73–0.25 m, beneath the modern soil and this same sequence continues in BH 151 with unit 15 between 0.55–0.5 m beneath the modern soil. From BH 152 southwards there is a thin deposit of colluvial unit 21, a medium brown silt loam with chalk fragments, with its deepest expression in BH 154 between 0.65–0.3 m beneath the modern soil.

Transect 47 (Fig. S7; Table S1) traverses the floodplain to the north-east of Silbury Hill, south-west to north-east. On the south-west side of the floodplain adjacent to Silbury Hill, the transect reveals a slight knoll in the floodplain with a small amount of colluvium (unit 3) recorded beneath the modern soil profile to a maximum depth of 0.12 m in BH 369. On the east side of the river, a colluvial deposit is recorded beneath an upper alluvium, reaching its deepest sequence in BH 372. This borehole records an intermittent chalk pea grit beneath a very pale greyish brown, calcitic, silt loam interpreted as colluvium (unit 9) at 1.78–1.4 m. Above this between 1.4–0.85 m is unit 8 a pale greyish brown, calcitic, silt loam, colluvium. Above this between 0.85–0.2 m is unit 2, a dark greyish brown silty clay loam alluvium. Finally, there is a modern topsoil (unit 1) between 0.2–0 m. The colluvium is undated, but clearly predates the formation of the upper clay silt rich alluvium, which is late medieval–post-medieval (see North Farm, Zone E).

Transect 65 (Fig. S5; Table S1) traverses the floodplain to the east of Silbury Hill, on an east/west alignment. The west side records a low flinty knoll, providing a high point on the floodplain next to Silbury Hill, with a thin brown silty clay loam (unit 6) underneath the modern soil in boreholes BH 373 and 374. From boreholes BH 375 eastward, a deeper alluvial deposit sequence is visible, with the deepest expression in BH 375. Borehole BH 375 has a basal unit 14, periglacial chalk dominated deposit 1.15–1.0 m (similar to unit 501, Trench 5, Butler's Field), overlain by unit 13, a pale grey calcitic loam with chalk clasts, interpreted as hillwash deposit 1.0–0.84 m. Above this is unit 22, a dark brown silty clay loam with few micro-charcoal and pottery, an alluvium with soil stabilisation horizon at 0.84–0.76 m. This is overlain by alluvial unit 3, a greyish brown silty clay loam with chalk gravel 0.76–0.38 m and alluvial unit 2, a greyish brown silty clay loam with chalk gravel at its base 0.38–0.3 m, and the modern soil 0.3–0 m. Eastward from BH 375, boreholes BH 376 records the same deposit sequence of units 13, 3, 2, and 1, with the sequence at BH 376 extending to 1.44 m BGL, above chalk bedrock.

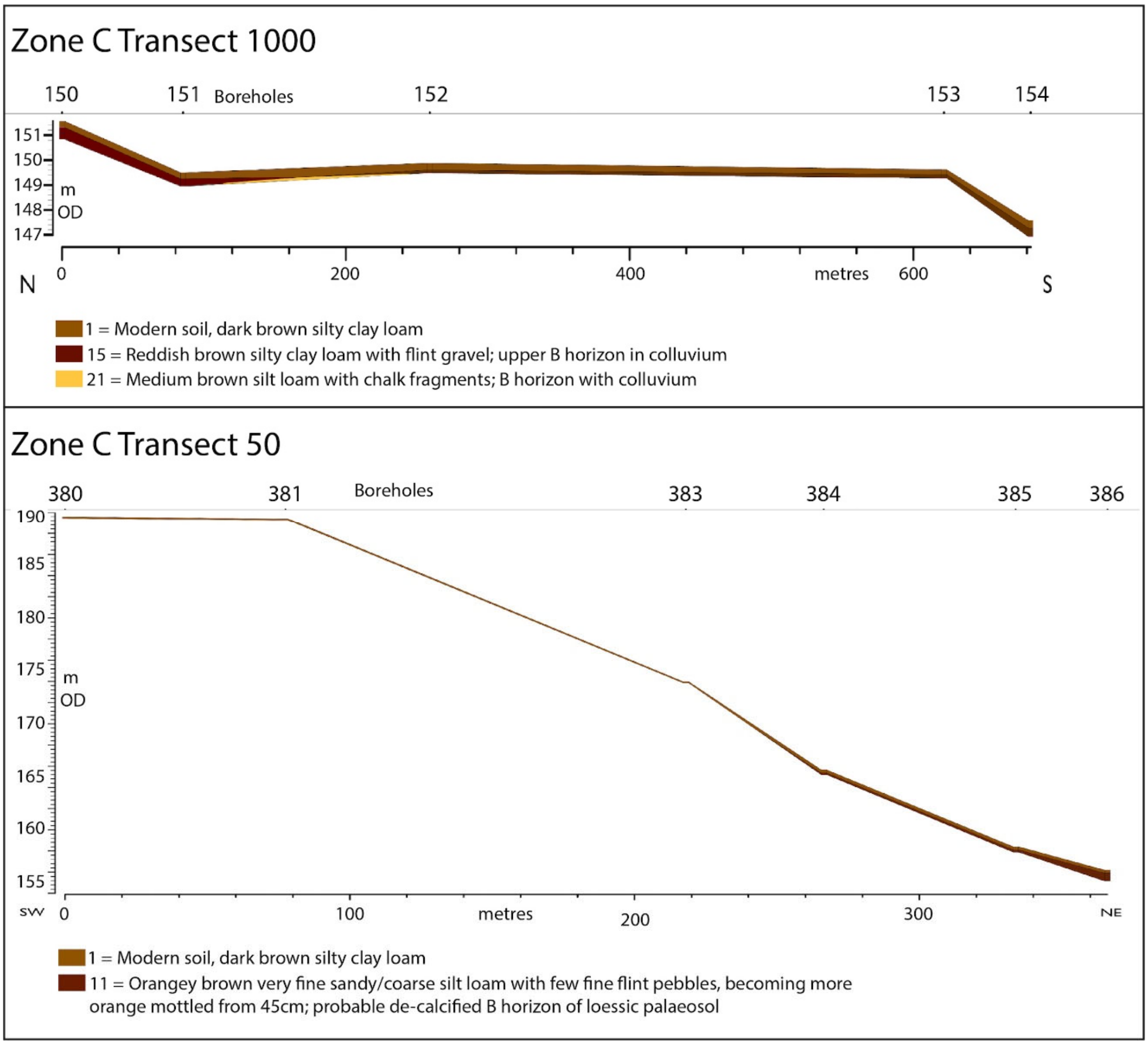

Fig. S4.
Zone C: Transect 50 traverses downslope from the top of Waden Hill, south-west to north-east (N. Crabb/C. Carey)

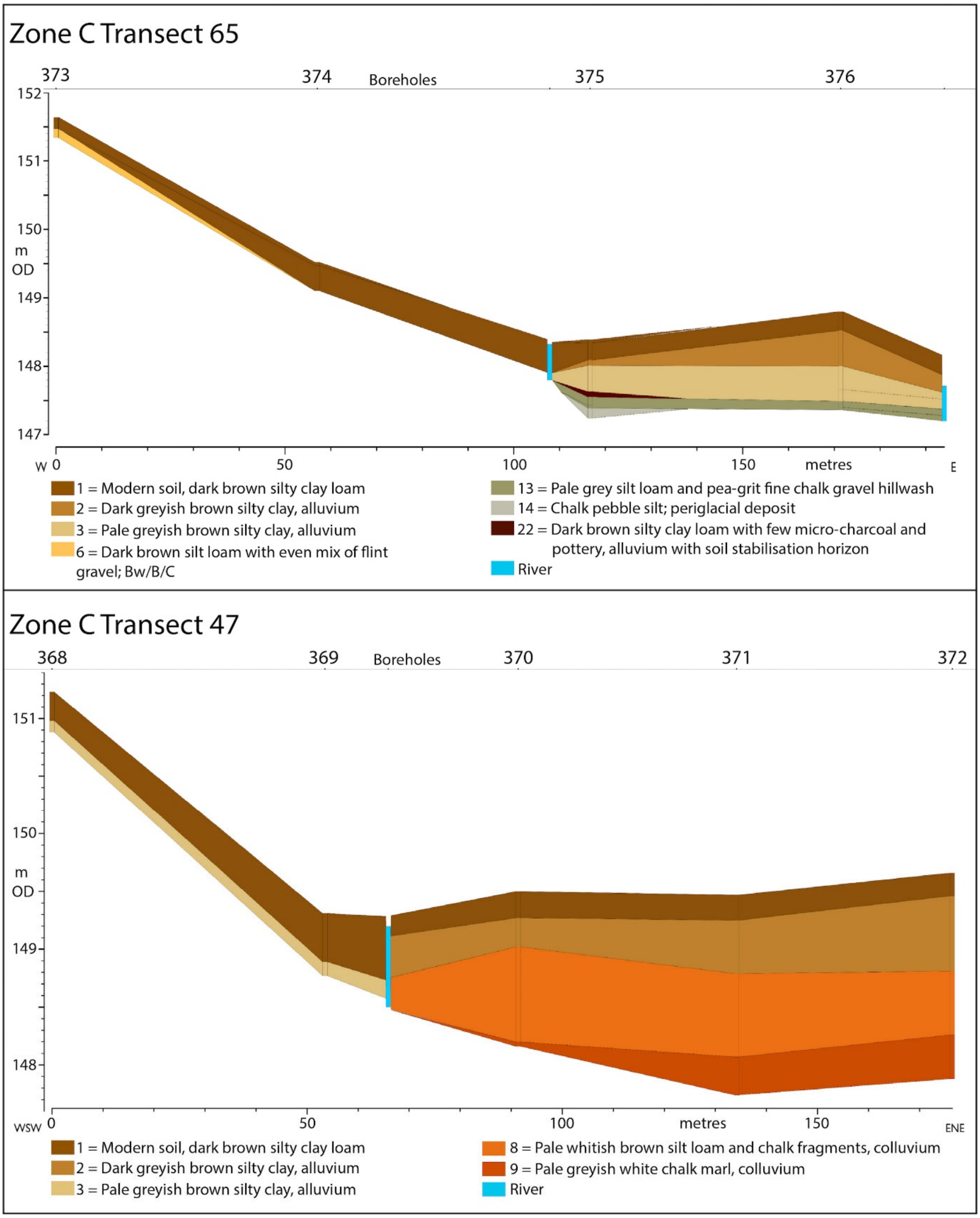

Fig. S5.

Zone C: Transect 47 traverses the floodplain to the north-east of Silbury Hill, south-west to north-east and Transect 65 traverses the floodplain to the east of Silbury Hill, on an east–west alignment (N. Crabb/C. Carey)

Zone D

TRANSECTS

Once east of the sharp bend in the River Kennet immediately south of Silbury Hill, the modern river takes on a gently meandering course with a sequence of relatively narrow ‘pinch-points, such as at the southern end of Waden Hill and between the southern slope of Overton Hill and East Kennett village

(Fig. 2). The alluvial sequences in this floodplain zone bear a remarkable similarity to those recorded and analysed in Zone B, with the same general deposition of major alluvial units and a general lack of colluvium observable on the valley sides and breaks of slope. The stratigraphic overview for Zone D is provided from transects 54, 59 and 15 (Fig. S6; Table S1). In addition, a single gouge core profile was sampled and analysed from transect 15 at borehole PEC5a (Fig. 2).

Transect 54 heads downslope on the south side of the Kennet valley, traversing from south to north, stopping just before the floodplain, through the western edge of the West Kennet palisade enclosures area (Fig. S6; Table S1). The transect records a generally thin soil sequence downslope, although two areas of colluvial deposition are visible. The first at BH 11 records unit 6 between 0.43–0.3 m, a dark brown silt loam with even mix of flint gravel, before the modern soil profile recorded as unit 1 from 0.33–0 m. The second area of colluvium is on a break of slope towards the floodplain edge, recorded in BH 406. This borehole has a basal unit 5 between 0.81–0.62 m, a weathered chalk C horizon, overlain by unit 7, a thin brown calcitic silt between 0.62–0.59 m. Above this is unit 6 between 0.59–0.25 m, a brown silt loam with increasing fine chalk fragments, with the modern soil profile unit 1 at the top between 0.25–0 m. In similarity with the other transects in the area, the upslope storage of colluvial deposits recorded in the transect beneath the current soil profile is minimal and localised.

Transect 59 traverses south-west to north-east on the southern side of the Kennet floodplain, just upstream and to the north-west of the location of the West Kennet palisaded enclosures (Fig. S6; Table S1). The transect records a layer of basal pale greyish white calcitic silt, a channel deposit unit 4, overlain by unit 2, a dark greyish brown silty clay alluvium, beneath the modern topsoil (unit 1). The alluvial deposit sequence is deepest on the southern edge of the floodplain and gets thinner as the basal topography increases in elevation towards the current river channel. The deepest sequence is recorded in borehole BH 438 at a depth of 1.27 m, which has unit 4 between 1.47–1.1 m, unit 2 at 1.1–0.05 m and unit 1 at 0.05–0 m.

Similar to transect 59, transect 15 traverses the Kennet floodplain on the southern side between West Kennett Farm and East Kennett village, traversing south-west to north-east (Fig. S6; Table S1). The alluvial sequence thickens towards the river moving northward and reaches a maximum depth of 1.33 m in BH 183. The deposit sequence has a thin intermittent basal unit 8, a dark grey brown clay silt with a trace of sand, abundant small organic material and small crushed shells. This is overlain by unit 3, a greyish brown calcareous silt with few very fine chalk fragments, a hillwash derived calcareous alluvium. This is the thickest unit in the transect and becomes darker upward in the unit. The late medieval–post-medieval dark silty clay alluvium (unit 2) was not extensively visible in this transect, although it is represented in the BH 429 and also in the laboratory analysis of core PEC5a (below). In general, the depth of the alluvial sediment sequence at this location varied between 0.75–1.33 m BGL, demonstrating the same pattern of alluviation visible in zones B and C, outside of the localised deep deposit sequences such as in Trench 5, Butler's Field.

CORE PEC5a

Core PEC5a (Figs S7 & S8; Table S5) provides a detailed analysis of a gouge core sample from Zone D, located in the floodplain between West Kennett Farm and East Kennett village. Due to access, it was unfortunately not possible to excavate a test pit at this locality to provide an OSL chronology for the deposit sequence, alongside the sediment analyses. Therefore, after sediment characterisation of this deposit sequence, chronostratigraphic correlations were made between core PEC5a, with the dated exposures in Zone B (Butler's Field) and Zone E (North Farm) (see below; Tables 3 & S2).

PE6: This basal unit is described as a greyish brown silt. Clay (12%), very fine silt (12%) and fine silt (22%) decrease, whilst medium silt (30%), coarse silt (20%) and very fine sand (4%) increase. The carbonate content (23%) is high but increases upward. The organic content is low (2%), whilst magnetic susceptibly shows a slight rise. The fine sand (0.57%), medium sand (0.8%) and coarse sand (0.54%) fractions are low, but show some evidence of sorting, with the highest values at the base of the unit.

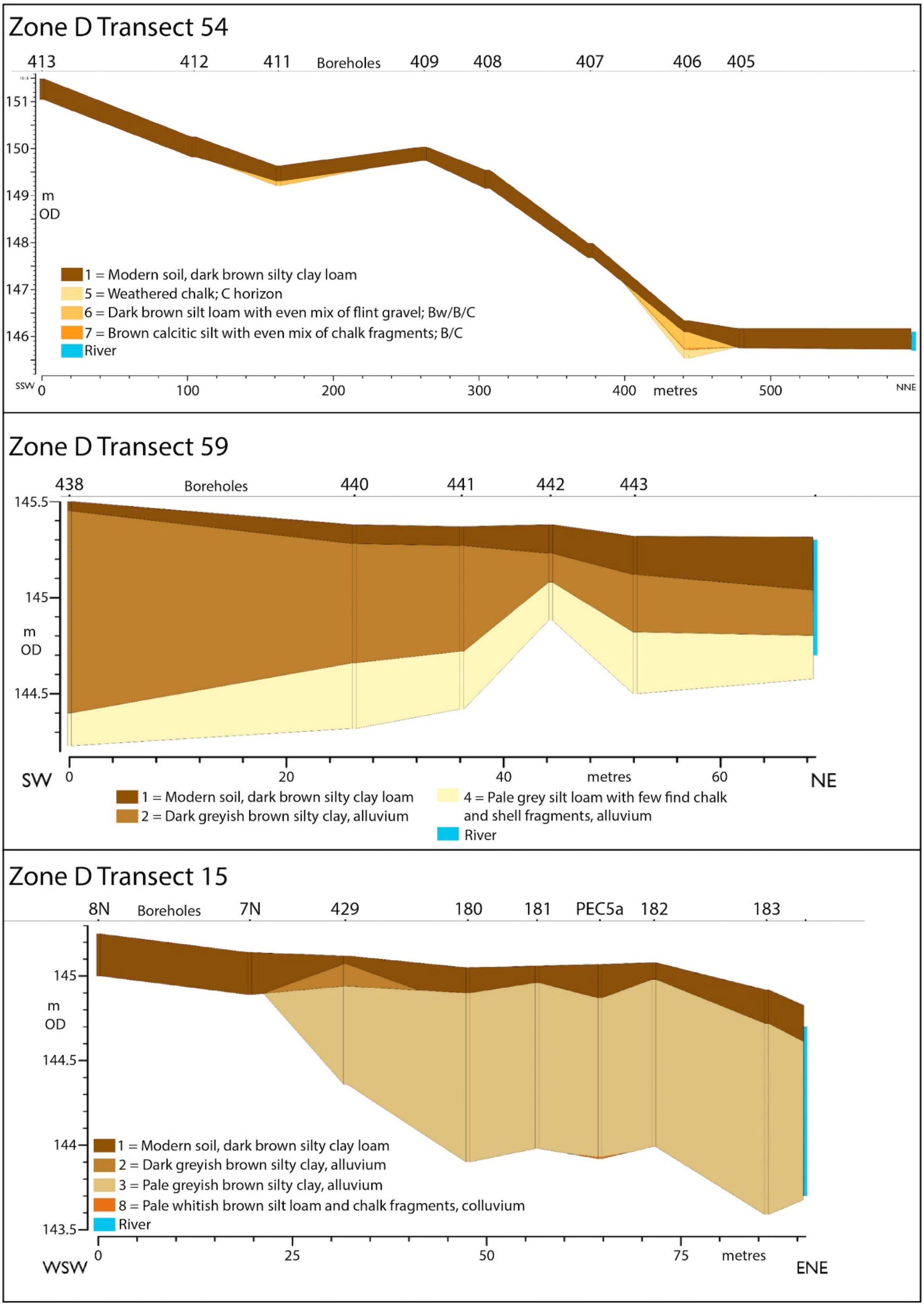

Fig. S6.
Zone D: Transects 54, 59 and 15 traverses south to north from the West Kennet palisade enclosures across the floodplain towards West Kennett farm (N. Crabb/C. Carey)

This is a weakly preserved palaeosol land surface at the base of the alluvial sediment stack, a correlative of unit 639 in Trench 2 in Zone B (the 'Avebury soil'), suggesting a date for this unit of between the Late Bronze Age to Early Iron Age.

Medium silt is the dominant sediment fraction, but there are significant components of both coarse silt and fine silt, indicating a loessic component to the basal unit. The sorting of the sand does indicate evidence of pedogenic processes, although the organic content is low. The increase in carbonate content towards the top of this unit is indicative of carbonate rich alluvial additions to this thin soil profile. By correlation with unit 639 in Trench 2 of Zone B, a date of burial by the overlying alluvium is suggested between the Late Bronze Age and Early Iron Age.

PE5: This unit is a white to grey silt with occasional charcoal. Clay (11%), very fine silt (11%) and fine silt (20%) slightly increase, with medium silt (29%), coarse silt (22%) and very fine sand (6%) also slightly increasing. The carbonate content (27%) is high, whilst organic content (2%) is low, but shows a slight rise and magnetic susceptibility shows a sustained increase. The fine sand (0.75%), medium sand (0.68%) and coarse sand (0.36%) fractions remain low.

The alluvial sediment unit PE5 has high carbonate levels, but these are below the values witnessed in the Late Pleistocene and early Holocene alluvium (pre-4000 BC) (>30%) in Trench 5, Zone B. The modal sediment fraction is medium silt, with fine and coarse silt also high, defining eroded soil loessic material being deposited as alluvium. The high carbonate content indicates a floodplain that is not yet significantly constrained, with chalk dissolution depositing calcite rich alluvium via a wide channel with probable areas of braid plain. The sediment distribution of carbonate rich alluvium with high medium and coarse silt components at the base of the alluvial sediment stack is very similar to unit 638 in Trench 2 of Zone B, which has a Late Iron Age to Romano-British date. The same date is proposed for unit PE5.

PE4: This unit is a light grey white silt with occasional charcoal. Clay (15%), very fine silt (14%) and fine silt (21%) increase, whilst medium silt (26%), coarse silt (19%) and very fine sand (5%) decrease. Fine sand (0.38%), medium sand (0.29%) and coarse sand (0.07%) all decrease to a very low level. The carbonate content (24%) remains high, but has slightly decreased from unit PE5, whilst organic content (2%) slightly rises and the magnetic susceptibility levels remains generally constant, although with occasional very low values.

In the upper part of unit PE4, medium silt remains the modal fraction, but there is a reduction in coarse silt and all the sand fractions, with a corresponding increase in the finer fractions (clays, very fine and fine silts). This particle size distribution indicates a fluvial regime of decreasing energy, caused through some deposition of alluvium on the valley floor, although dissolution of the chalk (carbonates) is still high defining a relatively wide channel with some possible areas of braiding. It is possible that the slight increase in clay and very fine silt relates to disturbance of the clay with flints capping the valley high points. This unit is interpreted as of Roman date.

PE3: This unit is a light grey brown silt. Clay (16%), very fine silt (18%) and fine silt (23%) continue to increase, whilst medium silt (24%), coarse silt (16%) and very fine sand (3%) continue to decrease. The carbonate content (23%) decreases throughout (PE3), whilst organic content (3%) and magnetic susceptibility rise. The fine sand, medium sand and coarse sand fractions remain low.

Unit PE3 is a continuation of the trends observed in PE4, with the valley floor continuing to infill with alluvium and the depositional energy of the river system further decreasing. Medium silt is still dominant, but there is a clear increase in the fine silt, very fine silt and clay fractions, demonstrating a smaller overall particle size. The reduction in carbonate content describes the floodplain starting to become restricted, with a reduction in overall channel width, providing less surface area for the dissolution of chalk, possibly becoming a single thread channel. The date for the reduction in carbonate contents in Zone B in Trenches 2 and 5 are post-Iron Age and in Test Pit 2 North Farm are Roman to post-Roman (see below), and the same date is postulated here, namely late Roman to medieval.

PE2: This unit is a dark brown grey clay silt with calcite balls. Clay (26%), very fine silt (25%) and fine silt (24%) continue to rise, with a corresponding decrease in medium silt (15%), coarse silt (8%) and very fine sand (2%). Fine-coarse sand fractions remain very low. The carbonate content (12%) continues to decrease although there are a few calcite aggregates, whilst the organic content (4%) continues to rise, possibly caused by magnetite in fluctuating water levels (Brown *et al*. 2009).

The high levels of clay and very fine silt define this unit as the late medieval/post-medieval alluvial unit. The low carbonate levels coupled with the continued decrease in the overall particle size, defines a floodplain that has substantially filled up with alluvium and is now a constrained single channel river.

PE1: This unit is a dark brown clay silt, the modern soil. Clay (16%), very fine silt (19%) and fine silt (22%) decrease, whilst medium silt (18%), coarse silt (13%) and very fine sand (7%) increase. Fine sand (3%), medium sand (2%) and coarse sand (1%) all substantively increase. Carbonate contents (3%) are now very low, whilst the organic content (15%) is very high, with the magnetic susceptibility showing a steep reduction, except in the A horizon at the top of the unit.

This is the modern soil, dating from the post-medieval period to the present day. It describes a sandy/silty clay loam soil that has been bioturbated and affected by modern agriculture, causing a loss of some of the finest sediment fractions, with a corresponding increase in the medium silt, coarse silt and very fine sand fractions. The organic contents are very high.

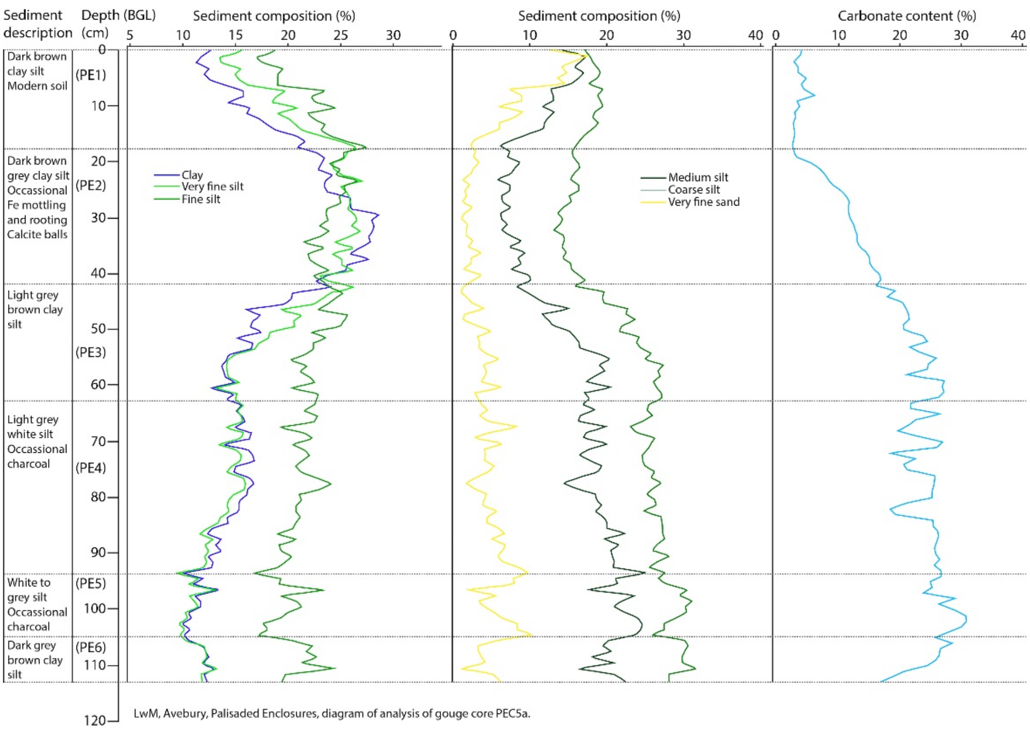

Fig. S7.
Zone D PEC5a gouge core sediment data 1. Also refer to Table S3 (C. Carey/N. Crabb)

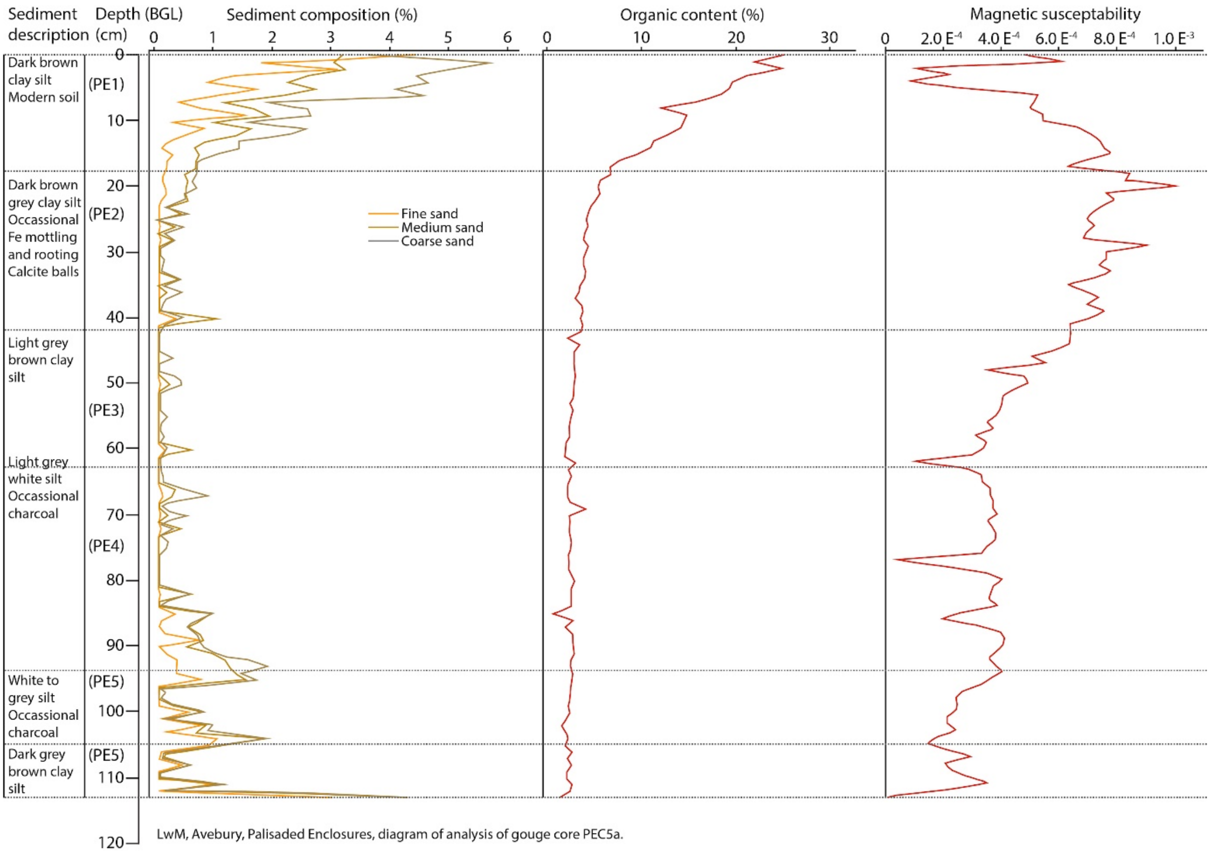

Fig. S8.
Zone D PEC5a gouge core sediment data 2. Also refer to Table S3 (C. Carey/N. Crabb)

Zone E

TRANSECTS

Zone E is the section of floodplain heading eastwards along the River Kennet towards West Overton and Fyfield (Fig. 2). The site of the sanctuary, the terminus of the West Kennet Avenue, overlooks the floodplain on the north side, alongside the Overton barrow cemetery. The stratigraphic overviews for this zone are provided by transects 63 and 62 (Fig. S9), with detailed analyses occurring at Test Pits 1 and 2, North Farm, West Overton (Fig. 11).

Transect 63 traverses the floodplain from south to north at North Farm (Fig. S9; Table S1). The northern part of the transect ends somewhat abruptly with an extant river cliff defining the edge of the floodplain at this location. Transect 63 does not capture the full extent of the alluvial sequences on the southern part of the floodplain, due to accessibility constraints. On the southern section of the transect towards the river, the alluvial deposits become shallower, with a general sequence that is very similar to those recorded upstream (Zones B-D). At core BH 472, there is a basal unit 4, beneath 1.46 m, a mix of greyish white calcitic silt and very abundant fine chalk fragments (<1 cm), a channel deposit. Above this is unit 3 between 0.55–1.24 m, a pale greyish white brown calcitic silt with pebbles, grading into a pale greyish whitish brown silty clay loam with few fine chalk pebbles. This is overlain by unit 2 between 0.19–0.55 m, a greyish brown silty clay loam, with the modern soil unit 1 above this. This same general sequence is observed on the north side of the river in cores BH 450 and 454, albeit the overall depth of the alluvial sequences has decreased, to 0.68 m in BH 454. Further north on the transect units 4 and 3 are no longer observable, with just units 2 and 1 present in cores BH 451, 453 and 452. BH 453 records a basal unit 5 of chalk and flint gravel beneath 0.4 m, overlain by unit 2 between 0.4–0.28 m BGL, a dark greyish brown silty clay alluvium, with the modern soil unit 1 above this.

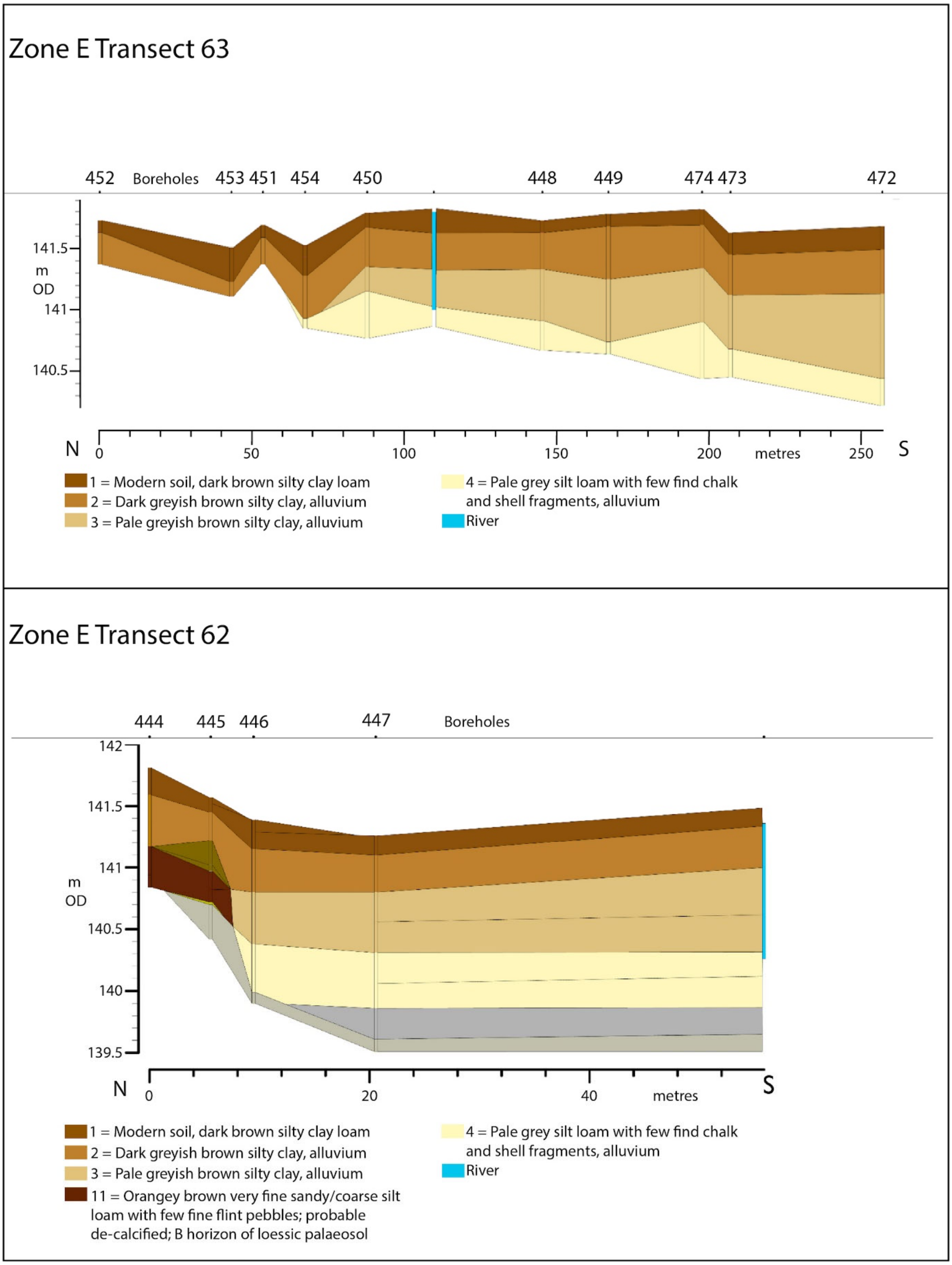

Fig. S9.

Zone E: Stratigraphic overviews for this zone are provided by transects 63 and 62 with detailed analyses occurring at Test Pits 1 and 2, North Farm (N. Crabb/C. Carey)

Transect 62 is slightly further east, but still located on North Farm, recording the alluvial stratigraphy on the north side of the floodplain, traversing north to south (Fig. S9; Table S1). Associated with transect 62 are two test pits. Within transect 62 is North Farm Test Pit 1 and further to the south end of transect 62 is Test Pit 2. Transect 62 records the same general deposit sequence recorded across the valley floodplain of alluvial units 4–1, which thicken southward towards the river. The deepest expression of this sequence is in BH 447 which has a basal unit 14, a Pleistocene light brown to greyish white mix of rounded fine flint/chalk gravel (<2 cm) and calcitic sand/silt between 1.75–1.65 m. Above this is unit 16, light greyish white calcitic silt with very abundant pea-grit and very abundant fine chalk fragments (<1 cm), between 1.65–1.4 m. This is overlain by unit 4 very pale brown calcitic silt with abundant very fine chalk pebbles between 1.4–0.95 m, which is in turn overlain by unit 3 a pale yellowish to greyish brown calcitic very fine sandy/silty loam between 0.95–0.46 m. This is underneath unit 2, a greyish brown silty clay loam alluvium with few fine chalk/flint pebbles between 0.46–0.16 m, beneath the modern soil.

To the north end of transect 62 in boreholes BH 445 and BH 444, the lower part of the alluvial sequence is replaced by a colluvially derived deposit sequence, entering the floodplain from the north, above the river cliff at North Farm (Table S1). This deposit sequence is most clearly observed in BH 445, where there is chalk bedrock, overlain by unit 14, a Pleistocene yellowish brown calcitic silt with even mix of pea-grit and fine chalk and flint gravel (<3 cm) between 1.15–0.87 m. Above this is unit 20, a compacted flint gravel between 0.87–0.85 m, which is overlain by unit 11, an orange to yellow brown silty clay loam with a preserved palaeosol, between 0.85–0.6 m. Above this is colluvial unit 19, a greyish brown silty clay loam with chalk and flint pebbles between 0.6–0.35 m, before burial by alluvial unit 2 a dark greyish brown silty clay between 0.35–0.12 m, beneath the modern topsoil (0.12–0 m).

Both North Farm Test Pits 1 and 2 allowed the detailed analyses of the sediment deposit sequences combined with OSL dating (Tables 3 & S2). The descriptions begin with Test Pit 2, which describes an alluvial sequence with direct parallels to the alluvial sequences already described in Zones B and D, before Test Pit 1, which describes the colluvially dominated sequence towards the north end of the transect on the northern side of the floodplain.

TEST PIT 2

Test Pit 2 from North Farm provides the detailed analysis of the alluvial sediments for Zone E (Figs 2, 11–13, & S12e–g; Tables 3, S2, & S6). In this sequence, seven distinct sediments were identified in the field. This sequence contains a relatively deep exposure of 1.6 m, greater than Trench 2 in Zone B and core PEC5a in Zone D, but not as deep as Zone B in Trench 5. Test Pit 2 also appears to represent a Pleistocene low point depression in the floodplain, of moderate depth. The sediment units are described as follows:

107: This basal unit is a light grey calcitic silt, with abundant fine chalk pebbles **(**Figs S12e & g**)**. None of the sediment fractions display a clear trend across the unit, with fluctuating values for each fraction. Clay (29%) is high, with very fine silt (17%), fine silt (16%), medium silt (16%) and coarse silt (14%) present in very similar quantities, but at relatively low levels compared to later alluvium. Very fine sand (7%) is relatively high but constant, whilst fine sand (1%), medium sand (0.2%) and coarse sand (0.26%) are low. The carbonate content (36%) is very high and shows a slight increase, whilst the organic content (1%) and magnetic susceptibility values are low. Thin section Sample 2/5 (1.5–1.6 m) down-profile was predominantly a pale greyish white, dense calcitic silt with an increasing frequency of fine flint and chalk gravel with depth. The fine gravelly basal zone contained occasional dusty clay striae, silty clay crust and irregular zones of amorphous sesquioxide staining, and hints of a micro-laminated structure. This unit was not absolutely dated, although the OSL date in unit 105 above provides a *terminus pre quem* of 4090–3180 BC (GL19049) (Tables 3 & S2). However, given the calcitic nature and chalk clasts of this unit, plus the high clay values, a late Pleistocene date is postulated. This would provide an analogous unit to unit 501 in Trench 5, Butler's Field (Zone B) that had also had a high clay and carbonate content.

106: This is a very pale brown calcitic silt, with fine chalk clasts. Clay (27%) starts to decrease in this unit although it is still the modal fraction, with a corresponding small increase in very fine silt (17%), fine silt (18%), medium silt (17%) and coarse silt (14%). Fine sand (6%) slightly decreases, whilst fine sand (1%), medium sand (0.45%) and coarse sand (0.32%) remain low but fluctuate (0.1%). The carbonate content (36%) remain very high, whilst the organic content slightly increases and magnetic susceptibility remains low. Thin section Sample 2/4 (1.26–1.32 m) down-profile was predominantly a pale greyish white, dense calcitic silt with an increasing frequency of fine flint and chalk gravel with depth. A Neolithic date is provided for unit 105 above unit 106, thus providing a high degree of confidence that unit 106 is an Early Holocene (or Mesolithic) alluvial sediment.

105: This is a pale brown calcitic silt with few chalk pebbles. Clay (19%) continues to decrease, whilst very fine silt (15%), fine silt (19%), and medium silt (21%) rise. Both coarse silt (16%) and very fine sand (7%) increase slightly overall, although they both decrease at the top of the unit. Fine sand (2%), medium sand (1%) and coarse sand (0.46%) remain low but increase slightly from (106) and continue to fluctuate. The carbonate content (34%) remains high, with the organic content (2%) and magnetic susceptibility remaining steady. The OSL date of 4090–3180 BC (GL19049) provides an Early–Mid-Neolithic date for this unit (Tables 3 & S2). Thin section Sample 2/3 (1.06–1.12 m) down-profile was similar to thin section Sample 2/4 below (1.26–1.32 m) (see below).

104: This is a pale yellowish brown calcite, with fine sandy silt. Clay (15%) continues to decrease, with very fine silt (14%) remaining constant. Fine silt (21%), medium silt (25%) and coarse silt (18%) all rise, whilst very fine sand (5%) reduces. Fine sand (0.59%), medium sand (0.48%) and coarse sand (0.48%) remain low but continue to fluctuate. The carbonate content (28%) drops throughout this unit, whilst organic content (2%) remains low, but increases slightly, with a general slight rise in magnetic susceptibility. At the top of (104) there is a moderate magnetic susceptibility spike. The OSL date of 130 BC–AD 170 (GL19050) provides a Late Iron Age to early–mid-Roman date towards the top of this unit (Tables 3 & S2). Thin section Sample 2/2 (0.9–0.97 m) became more golden brown and sand-rich with much more dusty clay throughout the groundmass, and less calcitic with few to common fine sand-sized amorphous sesquioxide nodules (Fig. S12f).

103: This is a greyish brown silty clay, with a few flint and chalk clasts (<3 cm). Clay (15%) and very fine silt (14%) start to increase, although fine silt (20%) reduces slightly. Medium silt (24%), coarse silt (19%) and very fine sand (6%) all decrease over the unit. The fine sand (0.59%), medium sand (0.59%) and coarse sand (0.79%) remain low, but increase slightly overall, although they continue to fluctuate throughout. The carbonate content (23%) continues to drop, with the organic matter (4%) and magnetic susceptibility values rising. The magnetic susceptibility shows a large spike towards the top of this unit. The OSL date of AD 400–620 (GL19051) provides a late Roman to post-Roman to earlier medieval date for this unit (Tables 3 & S2).

102: This is a brown silty clay, with irregular blocky structure. Clay (20 %), very fine silt (19%) and fine silt (21%) all increase, with a corresponding decrease in medium silt (19%), coarse silt (13%) and very fine sand (5%). The carbonate content (14%) has now reduced to a low level. Fine sand (1%), medium sand (0.90%) and coarse sand (1%) remain very low but continue to fluctuate. The organic content (6%) and magnetic susceptibility values continue to increase. The OSL date of AD 1300–1390 (GL19055) defines a late medieval to post-medieval age for this alluvial deposit (Tables 3 & S2). Thin section Sample 2/1 (0.35–0.43 m) was a pale greyish brown, dense calcitic silt with a few irregular voids and almost no gravel, a minor very fine sand content and some dusty clay (Fig. S12e).

101: This is the modern soil with a turf root mat Ah. Clay (13%), very fine silt (14%), fine silt (16%) and medium silt (17%) decrease, whilst coarse silt (17%), very fine sand (11%), fine sand (5%), medium sand

(3%) and coarse sand (3%) increase. The carbonate content (12%) is now very low, the organic content (11%) is very high and the magnetic susceptibility values rise.

TEST PIT 1

North Farm Test Pit 1 presents a thinner sediment sequence than in Test Pit 2, with Test Pit 1 being closer to the northern edge of the floodplain near the river cliff (Figs 2 & 11). The sequence is composed of three sediment units described below (Figs 14, 15, & S12a–d; Tables 2, 3, S2, & S7), as follows:

112: This basal unit is an orange brown to brown silty clay, with occasional stones, being a buried soil with alluvial additions. Clay (13%), very fine silt (11%), fine silt (16%) and medium silt (24%) are initially higher but reduce, whilst coarse silt (24%) and very fine sand (10%) are initially lower and increase. The carbonate content (8%) is highest in this unit and remains constant, whilst the organic content (4%) is relatively high and increases slightly. Fine sand (0.90%), medium sand (0.58%) and coarse sand (0.76%) are initially low, but demonstrate a fluctuating increase. The magnetic susceptibly is low, but increases toward the top. Both thin section Samples 1/4 and 1/5 (0.73–0.85 m) showed a similar golden brown, very fine sandy/silty clay loam soil with a distinctive well developed columnar blocky ped structure. This fabric exhibited a much more speckled, striated and weakly reticulate striated groundmass with abundant dusty clay (Figs S12c & d). This soil is developed on a calcitic, rubbly gravel of flint and chalk, or the weathered B/C horizon. This is the so called 'Avebury soil' which was originally thought to date to the Neolithic (Evans *et al*. 1993) but can now be clearly defined as a brown earth palaeosol which was being buried in the Iron Age–early Roman period from 550–220 BC (GL19053) to 200 BC–AD 60 (GL19054) (Tables 3 & S2).

111: This is a brown silt clay with frequent chalk pebbles, becoming fine chalk gravel. Clay (15%), very fine silt (14%), fine silt (19%) and medium silt (24%) rise slightly, whilst coarse silt (21%) and very fine sand (6%) reduce slightly. Fine sand (0.39%), medium sand (0.35%) and coarse sand (0.32%) are all low and decrease, although there is again fluctuation. The carbonate content (6%) is initially relatively high then reduces sharply in this unit, whilst the organic content (5%) increases upward. Magnetic susceptibility shows a slight overall rise, although there are episodic spikes in the data.

Thin section Sample 1/3 (Fig. S12a) (0.54–0.67 m) exhibited a very fine sandy/silty clay loam soil fabric, with the upper part of the slide containing a few flint and chalk gravel and stones of various sizes and orientation, indicating hillwash additions. Towards the top of the unit, the steep reduction in carbonate content is likely the product of alluvial additions to the soil unit in the medieval period.

Although thin section Sample 1/2 (0.43–0.53 m) was an even mixture of chalk and flint gravel pebbles in all orientations and very fine sandy/silty clay loam, in the lower two-thirds of the slide, the same soil fabric exhibited a larger blocky ped structure with substantial irregular void spaces inbetween. In addition, the dusty clay component was often present as common short striae and coatings of the voids, and there were common zones of amorphous sesquioxide impregnation (as in Fig. S12b), all indicative of some soil mixing, wetting and drying, and the slaking and intercalation of fines (Macpahil 1992; Kuhn *et al*. 2010; Lindbo *et al*. 2010). This mixture and superimposition of components strongly suggests both colluvial coarse and fine additions mixed with alluvially derived, eroded fine soil material.

The dating for unit 111 is provided by units 112 below and 110 above, and it can be seen clearly at this location that it occurred from the Iron Age/Roman period onwards. Unit 110 has an OSL date of AD 1300–1390 (GL19055) (Tables 3 & S2).

110: This uppermost unit is a brown silty clay, with occasional flint pebbles, and irregular block peds. Clay (14%), very fine silt (16%), fine silt (20%), medium silt (24%), coarse silt (19%) and very fine sand (6%) remain broadly constant with the upper part of unit 111. Fine sand (0.68%), medium sand (0.36%) and coarse sand (0.12%) show some evidence of sorting, being elevated toward the base of the unit and the top of the unit, although they remain low overall. The carbonate content (3%) remains low, whilst the organic content (7%) is high, with magnetic susceptibility remaining low.

The modern soil material (thin section Sample 1/1: 0.14–0.25 m) was a brown, very fine sandy/silty clay loam dominated by dusty (or silty) clay throughout its groundmass with an irregular aggregated to small blocky structure, intermixed with a few chalk/flint pebbles. The groundmass is brown, suggesting the influence of humified organic material from the established turf above. There are also abundant short striae of dusty clay throughout the groundmass (Fig. S12a), indicative of additions of silty clay alluvial material, wetting and drying, and soil mixing and profile disturbance (Macphail 1992; Kuhn *et al*. 2010; Lindbo *et al*. 2010).

APPENDIX S5: MICROMORPHOLOGICAL DESCRIPTIONS

Winterborne North/Spring Field (Zone A)

In Test Pit 3 there is a *c*. 0.1 m thick buried soil horizon located below *c*. 0.33 m of modern grassland and alluvial soil which is a golden brown, very fine sandy/silty clay loam exhibiting an irregular small blocky ped structure with few to common chalk and flint gravel pebbles (Figs 2, 3 & S10a). The whole groundmass is a dusty (or silty) clay with moderate to strong birefringence (Fig. S10b). The fabric becomes more calcareous with depth, with both the groundmass and voids containing greater amounts of silt-sized or micritic calcium carbonate. There are minor fine charcoal fragments and organic punctuations throughout, and few to occasional sand-size sesquioxide nodules.

This well-structured soil with well oriented dusty clay coatings integral with the groundmass is indicative of the lower B horizon (or Bwt) of a former argillic brown earth (Bullock & Murphy 1979; Fedoroff 1968; Kuhn *et al*. 2010). Nonetheless, the absence of more than a few pure or limpid clay coatings suggests that this soil was not particularly well developed and therefore probably not indicative of a stable, long-lived woodland soil (Fedoroff 1968; Bullock & Murphy 1979). However, the abundance of dusty clay, both oriented and undifferentiated, throughout the groundmass suggests that this soil has undergone repeated episodes of physical disturbance, followed by relative stability for some time in the past (Slager & van de Wetering 1977; Macphail 1992; Lewis 2012). But the absence of illuvial dusty clay in the voids/channels suggests that there is minimal effect of more recent alluviation on this buried soil, although the former A horizon is unrecognisable and has undoubtedly become incorporated and transformed by alluvial deposition and the formation of the present-day A/B silty clay and turf soil profile.

There is some influence of alkaline groundwater and the dissolution of the chalk substrate leading to the secondary formation and incorporation of micro-sparite (silt-sized) and amorphous calcium carbonate in the groundmass towards the base of the buried B horizon (cf. Durand *et al*. 2010). The few sesquioxide nodules are also indicative of the rise and fall of the local groundwater table (Lindbo *et al*. 2010) and are probably associated with the effects of more recent alluvial deposition.

In Test Pit 4 there is a thin (*c*. 0.1 m thick) buried soil horizon present sealed beneath *c*. 0.5 m of blocky structured silty clay alluvium and turf with a marked fine gravel stone-line at its base (Figs 2 & 3). This buried soil exhibits a similar fabric to the buried Bwt horizon observed in Test Pit 3 (above), but with a more well developed small blocky/columnar blocky ped structure, a dusty clay groundmass (Fig. S10c) and a greater influence of secondary micro-sparite calcium carbonate and some amorphous sesquioxide formation in the lower few centimetres of the sample. There are also some illuvial dusty clay coatings of the voids (Fig. S10c). There are few to common fine charcoal fragments and very fine organic punctuations throughout.

This is a similar soil type and buried Bwt horizon to that observed in TP3. Similarly, the former A horizon of this soil has been transformed by the subsequent deposition of silty clay alluvium, with only the stone-line as an indicator of its former presence. This soil was also affected by some alternating gleying/oxidation conditions, and more recent illuviation associated with more recent alluviation leading to dusty clay channel infills.

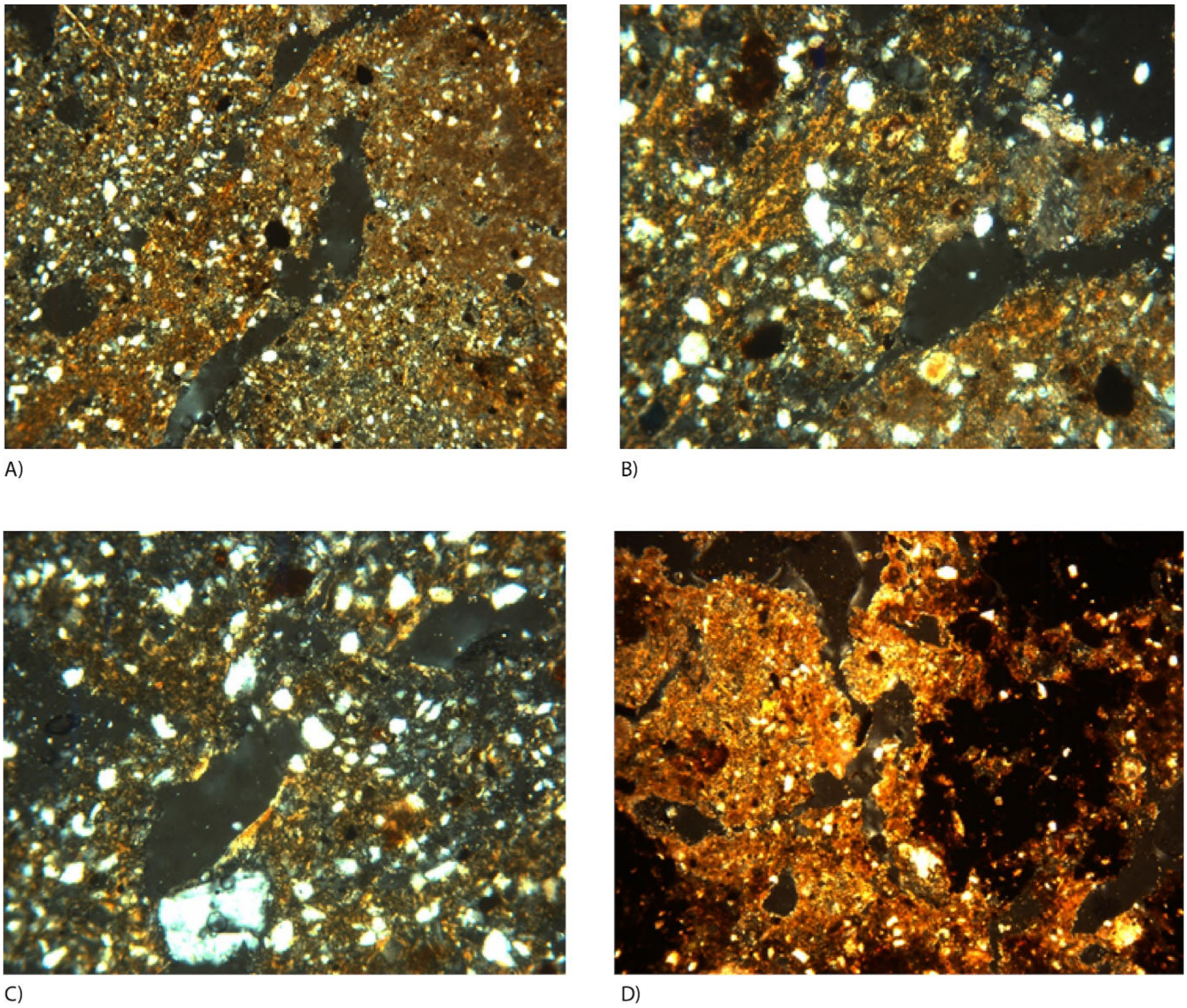

Fig. S10.
Winterborne North/Spring Field Test Pits 3 and 4 (Zone A) and Winterborne South Test Pit 1 (Zone B) thin section photomicrographs: A) Photomicrograph of the partly depleted, very fine sandy/silty clay loam fabric, TP3, sample 2 (frame width = 4.5 mm; cross polarized light); B) Photomicrograph of the striated, birefringent dusty clays in the groundmass, TP3, sample 2 (frame width = 2.25 mm; cross polarized light); C) Photomicrograph of the striated, birefringent dusty clays in the groundmass and as a void coating, TP4, sample 1 (frame width = 2.25 mm; cross polarized light); D) Photomicrograph of the micritic silty clays with strong to weak sesquioxide staining, TP1, sample 1 (frame width = 4.5 mm; cross polarized light) (C. French)

Winterborne South (Zone B)
The buried soil present in Test Pit 1 about 1 km downstream in the Kennet floodplain between the A4361 and Silbury Hill was buried by *c*. 1.4 m of irregular blocky, humic silty clay alluvial material (Figs 2 & 3). It is a calcitic silty clay mixed with fine chalk/flint gravel and exhibiting considerable oxidation mottling (Fig. S10d). Micro-sparitic calcium carbonate predominates in the groundmass, with few other pedogenic features of note present other than irregular zones of amorphous sesquioxide staining. This very calcitic and occasionally gleyed B horizon (or Bca) of a palaeosol thus appears to have undergone little pedogenesis prior to alluvial deposition. It has undergone severe transformation through wetting and drying processes (Lindbo *et al*. 2010), and the solution/dissolution of calcium carbonate (Durand *et al*. 2010), most probably derived from the underlying geology and available groundwater in this part of the upper Kennet floodplain.

Butler's Field (Zone B)

TRENCH 1

Sample 1 (0.60-0.72 m) from the upcast bank material is a weakly blocky structured, pale brown, calcitic silty clay with common coarse gravel size chalk, flint and limestone, and a few included alluvial fine soil aggregates (Figs 5 & S11a).

The two contiguous samples (2 & 3) taken through the *c*. 0.24–0.26 m thick buried soil below revealed a well-structured, pale greyish brown to brown, calcitic very fine sandy/silty clay loam. Undifferentiated dusty clay with common micro-sparitic calcium carbonate dominates the groundmass, but there some illuvial dusty clay coatings evident in the groundmass and around the margins of the voids, common sesquioxide (or iron oxide) nodules and staining, common calcitic infills in the voids, and a fine 'dust' of very fine fragments of organic matter and charcoal throughout (Figs S11b–d).

These features suggest that this former weathered Bw horizon of a buried soil had suffered considerable disturbance prior to burial and the addition of very fine, comminuted anthropogenic debris. This 'dirty,' well mixed aspect to this soil was possibly associated with organic additions and bioturbation, as well as physical disturbance, possibly even ploughing (Macphail *et al*. 1987; Macphail 1992; Lewis 2012). The common silt-sized calcium carbonate is a secondary feature (Durand *et al.* 2010), probably associated with the seasonal rise and fall of the groundwater table and overbank floodwaters.

TRENCHES 2 and 3

Both Trenches exhibited similar stratigraphy, with only Trench 2 being spot sampled for micromorphological analysis (Figs 5 & S11). Sample 2 from the base of the pale grey alluvium is a calcitic very fine sand/silt with a well-developed columnar blocky ped structure. Its groundmass is completely dominated by silt-sized calcium carbonate.

Sample 1 from the old land surface/buried soil below is a pale greyish brown, calcitic very fine sandy silt with a quite well developed blocky ped structure defined by fine channels (Fig. S11e). It exhibits a minor dusty clay component, minor plant tissue remains and very fine dust of charcoal, which suggests that it had been a very poorly developed, very fine sandy loam Bw horizon of a brown earth soil. Subsequently this soil has been affected by the common secondary formation of silt-sized calcium carbonate from the influence of base-rich groundwater and the drying out of overbank, standing flood waters above (Durand *et al*. 2010).

TRENCH 5

Four spot samples were taken through the stratigraphy exposed in Trench 5 to characterise the main alluvial fabric types (Figs 5 & S11). Samples 1 (at 2.0–2.05 m) and 2 (at 1.8–1.85 m) are both a pale greyish brown calcitic silt exhibiting minor staining with amorphous sesquioxides and a fine dust of included micro-charcoal. Upon drying, the apparently dense, apedal fabric then became a small columnar blocky structure defined by very fine channels which shrink/swell depending on the moisture content.

Sample 3 (at 1.5–1.55 m) is a pale brown calcitic very fine sandy silt with occasional dusty clay coatings lining the voids. It has a massive, homogeneous, apedal aspect. Sample 4 (at 0.75–0.8 m) exhibits a similar fabric to Sample 3 but displays hints of fine horizontal laminations perhaps indicative of episodic deposition (Fig. S11f). It also contains a dust of micro-charcoal, and common irregular patches of black magnetite iron staining.

TEST PIT 8

Both block samples taken through the *c*. 0.2 m thick buried soil are a calcitic fine sand with an increasing mix of fine flint gravel with depth. There is little sign of any ped structure, but there is some illuviation of fines with dusty clay striae and linking grains and fabric (Figs S11g & h), and there are minor plant tissue remains, rare fine charcoal and a few sesquioxide nodules. This appears to be a very immature brown earth soil which has been completely transformed by subsequent alluvial deposition and secondary calcium carbonate formation.

BOREHOLE BH 375

This sample taken at 0.76–0.8 m is a pale greyish brown calcitic very fine sandy silt with common fine chalk gravel and some amorphous iron mottling. It is a similar fabric to that observed in the lowermost alluvial unit in Trench 5 in Butler's Field and appears to overlie a pale grey silt/chalky pea-grit deposit, which in turn is developed on the periglacial weathered chalk substrate.

INTERPRETATION

There are four main phases of alluviation which occur consistently across the Kennet valley occupied by Butler's Field. The uppermost alluvium occurs over the widest lateral extent across the whole valley bottom area to about the 152 m contour. It is a very dark brown silty clay loam with a very well developed columnar blocky ped structure. This is very humic and probably topsoil derived from the catchment upstream and upslope and is associated with seasonal overbank flooding of long-term pasture. It most probably developed hand-in-hand with the post-late 16th century AD construction of the embanked water catchment ponds system (McOmish *et al*. 2005) and is reflecting topsoil soil erosion associated with wide-scale arable agriculture in the immediate catchment.

The previous phase of alluvial material is a grey to greyish brown, very fine sand/silty clay with a well-developed columnar blocky ped structure below with a variable silt-sized calcium carbonate content is indicative of a different source and environment of deposition. This equates with the 'Arion clay' described by John Evans in his 1980s fieldwork (Evans *et al*. 1993). First it requires the exposure and erosion of the chalk-rich base of dryland soil profiles from the catchment. Immediately this implies disturbance of soil profiles on the chalk slopes of the hinterland and must therefore be associated with intensive plough agriculture and extensive areas of bare soils exposed to autumn and winter rains. This calcitic silt-sized material from bare exposed subsoils would be easily entrained in rain/soil water moving as a fine overland flow into the winterbournes and eventually into the Kennet valley itself. From the auger survey, this material is particularly prevalent in the *c*. 3 km long reach of the valley between the winterbourne/river fork just west of the National Trust offices to the sharp eastwards bend in the river valley just south of Silbury Hill and then eastwards to West Kennett Farm. This phase of sediment capture could be coincident with a major re-organisation of settlement and the riverside, possibly associated with canalisation of the winterbourne around the 11th century AD (see Pollard *et al.* 2019).

The preceding unit of pale grey calcitic silt does not appear to exhibit a great lateral/spatial extent and is only observed in the deepest depressions in the floodplain, particularly in Butler's Field (Trench 5) (Figs 5 & S3) but also at North Farm (Test Pit 2) (Fig. 11). It may also be derived from the exposure and erosion of chalk substrates upslope/upstream but is more probably confined from erosion of the Pleistocene Coombe chalk within the riverbed itself, rather than being locally derived slope hillwash material redeposited as alluvium in this part of the upper Kennet valley. At present, this sediment unit is regarded as Iron Age through OSL dating to 690–310 BC (GL18003) at a depth of 1.25 m (Toms 2018) and earlier (Tables 3 & S2). Nonetheless, it does suggest the relative absence of soil erosion and alluvial aggradation in earlier prehistoric times, at least being captured in this reach of the river. There is only about 0.5 m of accumulation evident in Trench 5 from the early Neolithic at 4420–3460 BC (GL18002) at a depth of 1.74 m to the Iron Age at 690–310 BC (GL18003) at a depth of 1.25 m through OSL dating (Tables 3 & S2). This goes against accepted wisdom for considerable earlier prehistoric clearance activities from previous work in this same area by Evans *et al*. (1993), as well as the clear evidence of soil disturbance on the floodplain margins (as below).

The basal whitish grey calcitic silt observed below about 1.75 m in Trench 5 exhibits a similar fabric to the Neolithic and later prehistoric calcitic silt material deposited above. Nonetheless, the OSL

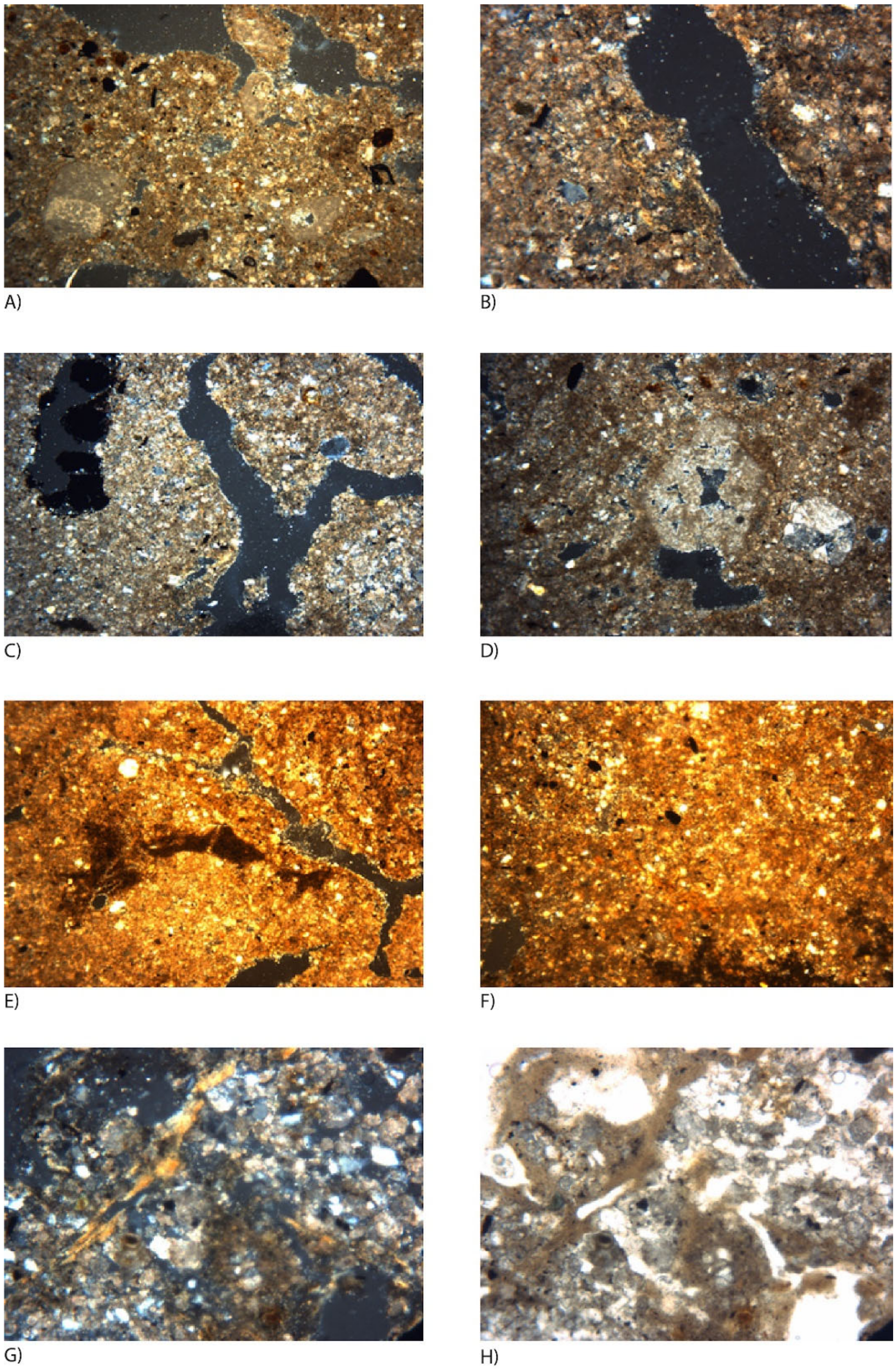

Fig. S11.

Photomicrographs of Butler's Field test trenches and test pits in Zone B: A) Photomicrograph of groundmass is dominated by silt-sized calcium carbonate and unoriented dusty clay, Trench 1, sample 1 (4.5 mm = frame width; cross polarized light); B) Photomicrograph of illuvial dusty clay coatings evident in the groundmass and around the margins of the voids, Trench 1, sample 3 (4.5 mm = frame width; cross polarized light); C) Photomicrograph of a fine dust of very fine fragments of organic matter and charcoal, Trench 1, sample 3 (4.5mm = frame width; cross polarized light); D) Photomicrograph of calcitic infill of a void, Trench 1, sample 3 (4.5 mm = frame width; cross polarized light); E) Photomicrograph of calcitic very fine sandy silt, Trench 3, sample 4 (4.5 mm = frame width; cross polarized light); F) Photomicrograph of fine horizontal laminations, Trench 5, sample 4 (4.5 mm = frame width; cross polarized light); G) Photomicrograph of dusty clay striae, Test Pit 8, sample 1 (2.25 mm = frame width; cross polarized light); H) Photomicrograph of dusty clay linking grains and fabric, Test Pit 8, sample 1 (2.25 mm = frame width; plane polarized light) (C. French)

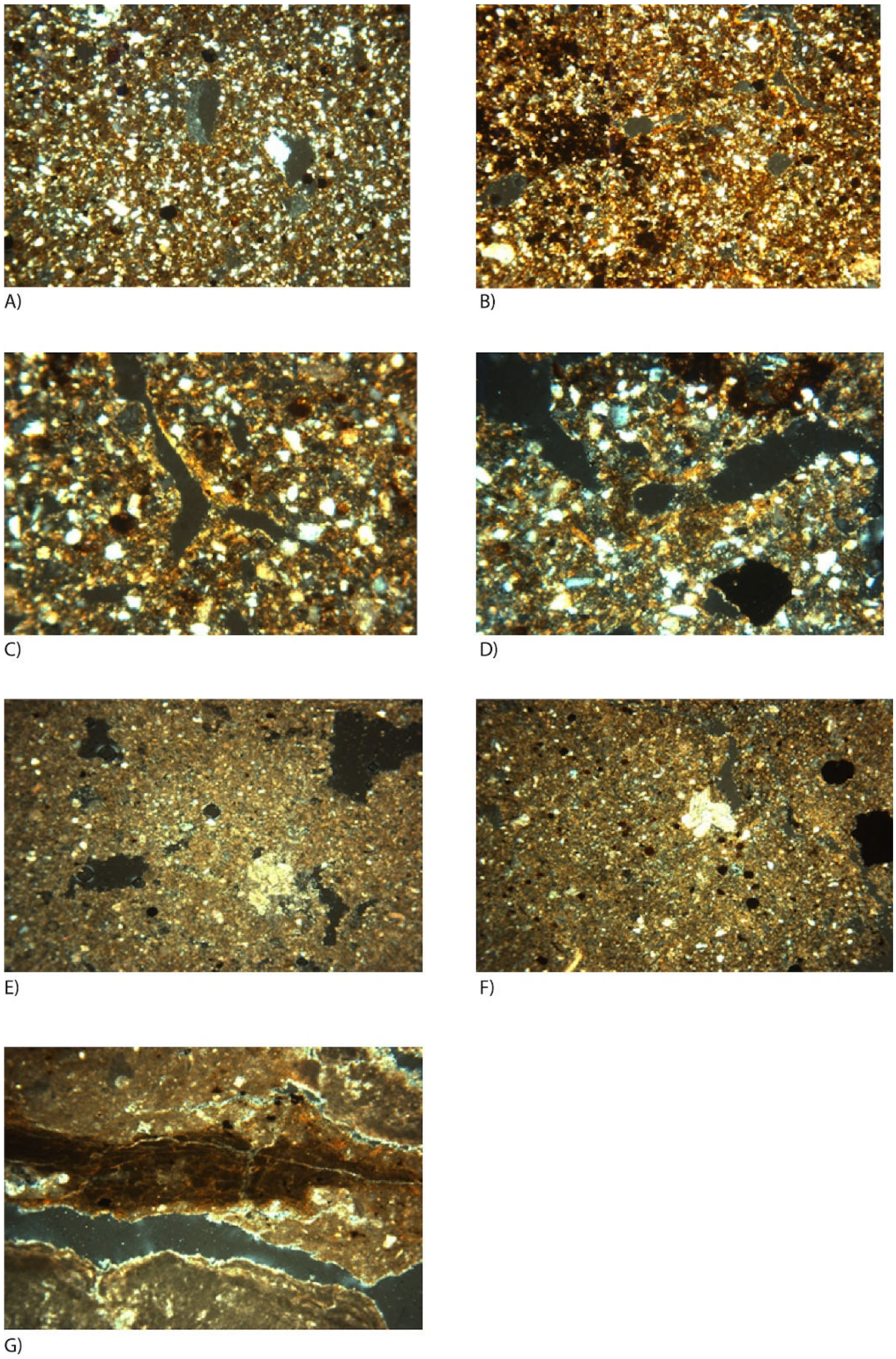

Fig. S12.

Photomicrographs from Zone E North Farm Test Pits 1 and 2: A) Photomicrograph of abundant short striae and speckled dusty clay in the very fine sandy/silty clay groundmass, Test Pit 1, sample 1/1 (4.5mm = frame width; cross polarized light); B) Photomicrograph of very fine sandy/silty clay loam soil fabric with common, irregular zones of amorphous sesquioxide impregnation, Test pit 1, sample 1/3 (4.5mm = frame width; cross polarized light); C) Photomicrograph of very fine sandy/silty clay loam soil with a well developed columnar blocky ped structure with speckled and striated groundmass, Test Pit 1, sample 1/4 (4.5mm = frame width; cross polarized light); D) Photomicrograph of the weakly reticulate striated groundmass with abundant dusty clay, Test Pit 1, sample 1/5 (2.25mm = frame width; cross polarized light); E) Photomicrograph of calcitic silt, Test Pit 2, sample 2/1 (4.5mm = frame width; cross polarized light); F) Photomicrograph of very fine sandy/silty clay loam, Test Pit 2, sample 2/2 (4.5mm = frame width; cross polarized light); G) Photomicrograph of dense calcitic silt with the occasional dusty clay striae and silty clay crust with hints of a micro-laminated structure, Test Pit 2, sample 2/5 (4.5mm = frame width; cross polarized light) (C. French) dates of 14,270–11,730 BC (GL18001) at a depth of 2.38 m and 4420–3460 BC (GL18002) at a depth of 1.74 m (Tables 3 & S2) suggest that there was highly alkaline groundwater collecting and drying out in this low depression in the south of Butler's Field throughout the first half of the Holocene. It is suggested that the lower two-thirds of the Trench 5 sequence between about 1.2 and 2.45 m BGL needs to be seen not as calcitic hillwash material captured as alluvial deposition in a former cut-off channel, but as ponded bedload in a highly base-rich water capture area, seasonally accumulating in the late winter and then rapidly drying out. This new evidence now complements the sub-terrain DEM contour map of Butler's Field based on the borehole survey which illustrates a number of shallow, interconnected basins in this reach of the Kennet river valley on the south-western side of Avebury henge (Fig. S3).

This alluvial sequence suggests that the earlier-mid-Holocene riverine flow energy was only sufficient to transport this fine bedload material to the upper zones (A & B) of the river valley and not to such a great extent much farther downstream past Silbury Hill itself. Indeed, Silbury Hill itself as a massive mound feature on a natural chalk promontory and the abrupt left (eastwards) turn in the river (determined by the chalk downland geology and topography) may have acted together to considerably interrupt and slow river flow and the associated eroded bedload deposition beyond the Swallowhead Springs area downstream to the east.

The buried soils that survive on the margins of this floodplain are consistently brown earths with a few surviving hints of their initial development as weakly developed argillic brown earths (cf. Avery 1990) found beneath silty clay alluvial deposits of Roman and later times. These buried soils all survive as weathered B (or Bw) to weakly developed argillic Bt horizons of a brown earth, with the former organic A horizons incorporated into the alluvial material aggraded above through soil faunal mixing processes (Kooistra & Pulleman 2010). The argillic aspect is characterised by clay striae in the groundmass in the base of the profile, but there are rarely any pure and well organised illuvial clays indicative of stable, well drained, long-term woodland cover (Bullock & Murphy 1979). Rather each soil profile is dominated by dusty clays in the groundmass and in the voids and channels, a feature indicative of disturbance and soil mixing processes as well as the addition and incorporation of alluvial fines (silt and clay) (Slager & van de Wetering 1977; Fisher 1982; Macphail 1992; Kuhn *et al*. 2010). The groundmass of every sample is also very dirty, with common included comminuted, very fine sand- to silt-sized charred and organic matter, which is typical of soils that are disturbed and physically mixed, but not necessarily ploughed (Macphail *et al*. 1987; Macphail 1992; Lewis 2012).

North Farm (Zone E)

TEST PIT 1

Five block samples were taken from the Pest Pit 1 profile: one from the modern/upper soil profile, one from the upper alluvial horizon, one from the colluvial horizon, and two samples from the buried soil (Fig. 11).

The modern soil material (sample 1/1: 0.14–0.25 m) was a brown, very fine sandy/silty clay loam dominated by dusty (or silty) clay throughout its groundmass with an irregular aggregated to small blocky structure, intermixed with a few chalk/flint pebbles. The groundmass is brown, suggesting the influence of humified organic material from the established turf above. There are also abundant short striae of dusty clay in the groundmass (Fig. S12a).

Sample 1/2 (0.43–0.53 m) was an even mixture of chalk and flint gravel pebbles in all orientations and very fine sandy/silty clay loam (as above). Sample 1/3 (0.54–0.67 m) exhibited essentially the same very fine sandy/silty clay loam soil fabric as both horizons above (ie, in sample 1/1). The upper part of the slide contained a few flint and chalk gravel and stones of various sizes and orientations, similar to sample 1/2 above. In the lower two-thirds of the slide, the same soil fabric exhibited a larger blocky ped structure with substantial irregular void spaces in between. In addition, the dusty clay component was often present as common short striae and coatings of the voids, and there were common zones of amorphous sesquioxide impregnation (Fig. S12b). These features are all indicative of some soil mixing, wetting and drying, and the slaking and intercalation of fines (Slager & van de Wetering 1977; Macphail 1992; Kuhn *et al*. 2010; Lindbo *et al*. 2010).

The *c.* 0.22 m thick buried soil in samples 1/4 (0.68–0.8 m) and 1/5 (0.73–0.85 m) was a similar golden brown, very fine sandy/silty clay loam soil with a distinctive well developed columnar blocky ped structure, but with a much more speckled, striated and weakly reticulate striated groundmass with abundant dusty clay (Figs S12c & d). This soil is developed on a calcitic, rubbly gravel of flint and chalk, or the weathered B/C horizon.

TEST PIT 2

The main stratigraphic horizons present in Test Pit 2 through the palaeo-channel deposits were spot sampled for micromorphological analysis in five samples (Fig. 11).

Sample 2/1 (0.35–0.43 m) was a pale greyish brown, dense calcitic silt with a few irregular voids and almost no gravel, a minor very fine sand content and some dusty clay (Fig. S12e). Sample 2/2 (0.9–0.97 m) was a golden brown and sand-rich with much more dusty clay throughout the groundmass, and less calcitic with few to common fine sand-sized amorphous sesquioxide nodules (Fig. S12f). Samples 2/3 (1.06–1.12 m), 2/4 (1.26–1.32 m), and 2/5 (1.5–1.6 m) down-profile were predominantly a pale greyish white, dense calcitic silt with an increasing frequency of fine flint and chalk gravel with depth. The fine gravelly basal zone contained the occasional dusty clay striae, silty clay crust and irregular zones of amorphous sesquioxide staining, and hints of a micro-laminated structure (Fig. S12g).

INTERPRETATION

The well-preserved buried soil present in Test Pit 1 on the northern edge of the Kennet floodplain is a well-structured, very fine sandy/silty clay loam dominated by dusty clays throughout consequent on soil disturbance, rainsplash and slaking down-profile (Kuhn *et al*. 2010). This implies initial disturbance, bare soils and mixing, and then the influences of soil faunal mixing and long-term stability to create the well-formed columnar ped structure. Thus, even though there is strong evidence of human occupation and use in the immediate vicinity for most of the 3rd millennium BC (Evans *et al*. 1993), the soil evidence strongly suggests an open and stable brown earth soil, most probably associated with long-term pasture, rather than woodland soils on the river's northern margin. This all occurred prior to later deposition and accumulation of first chalky colluvial soil, which through OSL sediment dating is indicated to have occurred after about 200 BC to AD 60 (GL19054), and then subsequent silty clay alluvial deposition above from *c*. AD 390–1300 (GL19055) (Toms & Wood 2020, table 1) (Tables 3 & S2).

The lower half of the fill of the palaeo-channel observed in Test Pit 2 (*c*. 0.95–1.75+ m) is dominated by pale greyish white, calcitic silt with fine chalky gravel, which lessens up-profile. Again, this is seen as accumulation of calcitic silt bedload erosion in a low point depression as observed in Trench 5 in Butler's Field. This is succeeded by a *c*. 0.3 m thick horizon of pale brown calcitic, very fine sandy/silt loam, which has begun to aggrade at some point after about 4090–3180 BC (GL19049) and continues to build-up into the Roman period at about AD 130–170 (GL19050) (Toms & Wood 2020, table 1) (Tables 3 & S2). It is remarkably similar to the palaeosol material observed in Test Pit 1 on the dryland margin adjacent, mixed with a calcitic silt material most probably derived from calcitic bedload erosion and accumulation associated with the strongly alkaline groundwater and river water, combined with an eroded soil hillwash component from the river's edge and possibly even surrounding downland slopes. Overlying this is the final fill horizon of *c*. 0.7 m of a greyish brown, very fine silty clay with an irregular blocky ped structure above, which is indicative of overbank alluvium. This alluvial material has begun to aggrade from before *c*. AD 400–620 (GL19051) and continues to develop from beyond *c*. AD 1320–1410 (GL19052) (Toms & Wood 2020, table 1; Tables 3 & S2).

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SUPPLEMENTARY TABLES

TABLE S1: MACRO-STRATIGRAPHIC UNITS KEY FOR THE CROSS-CORRELATING THE BOREHOLE PROFILES

Units	*Description*
1	Modern turf/topsoil
2	Blocky structured, dark greyish brown silty clay loam; alluvium ('Arion clay')
3	Pale dark greyish brown silty clay loam with frequent chalk frags; hillwash derived alluvium
4	Pale grey sandy/silt loam with few fine chalk and shell frags; alluvium
5	Weathered chalk substrate; C
6	Dark brown silt loam with even mix of flint gravel; buried soil of Bw/B/C
7	Brown calcitic silt with even mix of chalk frags; B/C
8	Pale whitish brown calcitic silt loam & chalk frags; hillwash
9	Pale yellowish brown silty clay loam with fine chalk frags; hillwash
10	Greyish brown silt loam with few fine charcoal, chalk & flint frags; buried soil of Bw
11	Orangey brown, v. fine sandy/coarse silt loam with few fine flint pebbles, becoming orange mottled with depth; probably decalcified Bw/t horizon
12	Very dark brown silt loam with common chalk frags; mix of 'medieval soil' of Evans (1985) & alluvium
13	Mix of pale grey silt loam & pea-grit fine chalk gravel; hillwash on channel bed
14	Chalk pebble silt; periglacial deposit
15	Reddish brown silty clay loam with flint gravel; upper B horizon in colluvium
16	Pale greyish white calcitic silt with v. abundant pea-grit & v. abundant fine chalk frags (<1 cm); thin/ discontinuous slightly humic lens at 1.54–1.55 m; periglacial B/C
17	Orangey brown silt loam with few fine chalk pebbles (<1 cm); hillwash
18	Greyish brown silty clay loam with common fine chalk pebbles (<1 cm); hillwash
19	Compacted flint gravel (<5 cm)
20	Medium brown silt loam with chalk frags; B horizon with hillwash
21	Dark brown silty clay loam with few micro-charcoal & pottery frags; alluvium with soil stabilisation horizon

TABLE S2: DOSE RATE (D_r), EQUIVALENT DOSE (D_e) AND AGE DATA OF OSL SAMPLES

Trench	*Field code*	*Lab. code*	*Over-burden (m)*	*Grain size (μm)*	*Moisture content (%)*	*NaI γ-spectrometry* **(in situ)** *γ D_r (Gy.ka^{-1})*	*Ge γ-spectrometry* (ex situ)			□ *D_r* (Gy.ka^{-1})	*β D_r* (Gy.ka^{-1})	*^{226}Ra/^{238}U*	*Cosmic D_r (Gy.ka^{-1})*	Preheat (°C for 10s)	Low dose repeat ratio	High dose repeat ratio	Post-IR OSL ratio
							K (%)	**Th (ppm)**	**U (ppm)**								
Butler's	ABRY08	GL18004	1.06	5–15	25±6	0.28±0.03	0.49±0.05	3.83±0.37	0.73±0.10	0.13±0.02	0.42±0.06	2.13±0.67	0.18±0.02	260	0.97±0.09	1.01±0.05	0.95±0.09
Field Tr 2	ABRY07	GL18003	1.25	5–15	23±6	0.49±0.05	0.73±0.06	6.79±0.47	1.37±0.13	0.25±0.03	0.69±0.08	1.50±0.25	0.17±0.02	240	1.03±0.06	0.99±0.04	1.01±0.06
Butler's	ABRY06	GL18075	1.56	5–15	23±6	0.22±0.03	0.30±0.05	3.22±0.33	0.67±0.11	0.12±0.02	0.30±0.04	1.02±0.32	0.17±0.02	220	1.01±0.03	0.98±0.02	0.97±0.03
Field Tr 5	ABRY05	GL18002	1.74	5–15	23±6	0.19±0.02	0.6±0.05	2.82±0.32	0.53±0.09	0.10±0.02	0.27±0.04	1.40±0.32	0.16±0.02	260	1.00±0.05	0.96±0.03	1.00±0.05
	ABRY04	GL18074	1.91	5–15	23±6	023±0.03	0.40±0.05	2.75±0.35	0.68±0.11	0.11±0.02	0.36±0.05	1.50±0.45	0.16±0.01	220	0.98±0.02	0.99±0.01	0.98±0.02
	ABRY02	GL18073	2.22	5–15	22±6	0.20±0.02	0.32±0.05	2.23±0.32	0.69±0.09	0.10±0.02	0.31±0.04	1.16±0.38	0.15±0.01	220	0.99±0.02	1.01±0.02	0.98±0.02
	ABRY01	GL18001	2.36	5–15	22±5	0.15±0.02	0.23±0.04	1.61±0.32	0.51±0.09	0.07±0.01	0.22±0.04	1.16±0.31	0.14±0.01	280	0.95±0.05	0.99±0.04	0.96±0.05
North	ABRY18	GL19052	0.40	5–15	19±5	0.55±0.05	0.78±0.07	7.51±0.49	1.23±0.12	0.27±0.03	0.78±0.08	1.00±0.16	0.20±0.02	220	1.01±0.08	0.99±0.05	0.99±0.08
Farm Test	ABRY16	GL19051	0.62	5–15	19±5	0.30±0.03	0.49±0.05	3.96±0.37	0.64±0.11	0.14±0.02	0.45±0.05	1.25±0.25	0.19±0.02	220	0.98±0.05	0.99±0.04	0.98±0.05
Pit 2	ABRY15	GL19050	0.78	5–15	21±5	0.31±0.03	0.42±0.05	4.66±0.38	0.68±0.09	0.16±0.02	0.42±0.05	1.39±0.27	0.19±0.02	240	0.99±0.06	1.01±0.04	1.02±0.06
	ABRY10	GL19049	1.18	5–15	23±6	0.17±0.02	0.24±0.04	2.33±0.32	0.47±0.10	0.08±0.01	0.23±0.04	1.12±0.32	0.18±0.02	220	0.97±0.04	1.01±0.04	0.97±0.04
North	ABRY22	GL19055	0.32	5–15	17±4	0.75±0.06	0.98±0.08	9.88±0.59	1.91±0.14	0.39±0.04	1.04±0.10	1.20±0.14	0.20±0.02	240	1.02±0.06	0.98±0.04	1.00±0.06
Farm Test	ABRY20	GL19054	0.65	5–15	16±4	0.74±0.06	0.97±0.08	9.39±0.57	1.94±0.14	0.38±0.04	1.04±0.10	1.32±0.17	0.19±0.02	220	0.99±0.04	1.01±0.03	0.98±0.04
Pit 1	ABRY19	GL19053	0.80	5–15	20±5	0.70±0.06	0.99±0.08	9.00±0.57	1.95±0.14	0.36±0.04	1.00±0.10	1.48±0.22	0.19±0.02	240	1.00±0.04	1.00±0.04	0.99±0.04
	ABRY13	GL21113	0.95	5–15	16±4	0.26±0.03	0.28±0.06	4.02±0.36	0.57±0.10	0.14±0.02	0.33±0.05	2.18±0.74	0.18±0.02	240	1.02±0.03	1.01±0.03	1.02±0.04

D_r values are based on Gamma Spectrometry (*in situ* NaI and *ex situ* Ge), dose rate conversion factors (Adamiec & Aitken 1998), grain size (Mejdahl 1979), burial moisture content (Zimmerman 1971; assumed synonymous with present moisture content), depth, site surface altitude, and a geomagnetic latitude of 51°N (Prescott & Hutton 1991). D_e values are based on conventional multi-grain, single-aliquot regenerative-dose (SAR) OSL measurements of fine silt quartz (Berger *et al*. 1980; Murray & Wintle 2000; 2003). Age estimates are based on the Central Age Model (Galbraith *et al*. 1999) and expressed relative to year of sampling (2018). Uncertainties in age are quoted at 1σ confidence, are based on analytical errors and reflect combined systematic and experimental variability and (in parenthesis) experimental variability alone. The dates in black indicate samples with accepted age estimates; the date in italics indicates an age estimate with analytical caveats (GL18004: significant U disequilibrium; Olley *et al*. 1996)

TABLE S3: SEDIMENT CHARACTERISATION DATA FROM BUTLER'S FIELD TRENCH 5, ZONE B

Context		*Clay (%)*	*Very fine silt (%)*	*Fine silt (%)*	*Medium silt (%)*	*Coarse silt (%)*	*Very fine sand (%)*	*Fine sand (%)*	*Medium sand (%)*	*Coarse sand (%)*	*Organic content (%)*	*Carbonate content (%)*	*Magnetic susceptibility*
501	Mean	24.26	12.69	9.87	10.19	16.8	14.01	4.67	3.44	3.33	1.17	33.63	0.000000028055
	Min	18.99	8.81	7.99	7.55	12.28	8.56	1.57	0.18	0.00	0.82	24.44	0.0000000087
	Max	32.95	18.57	12.95	12.81	19.59	18.76	9.04	8.62	9.94	1.73	36.61	0.000000118
502	Mean	22.32	10.90	10.93	11.58	13.56	11.10	5.57	6.28	6.34	1.74	31.08	0.000000031207143
	Min	15.85	7.94	7.95	8.23	10.13	6.65	2.84	1.32	0.13	1.28	24.14	0.0000000176
	Max	30.07	14.49	15.33	15.19	19.70	16.38	8.76	12.95	14.07	2.12	34.67	0.0000000931
503	Mean	14.08	11.21	14.89	18.34	19.51	11.14	3.09	2.95	3.45	1.74	28.99	0.000000044935
	Min	8.79	7.76	10.97	14.92	14.77	7.86	1.01	0.20	0.73	1.49	23.14	0.0000000307
	Max	21.10	14.21	16.35	22.70	24.07	17.51	6.05	5.21	8.96	2.097	31.76	0.0000000538
504	Mean	12.63	11.923	18.69	25.61	21.71	7.09	0.64	0.69	0.76	1.98	28.13	0.000000042031148
	Min	9.00	8.08	11.97	16.25	17.83	2.05	0	0	0	1.30	21.02	0.0000000262
	Max	14.60	14.55	22.38	29.47	24.53	14.31	4.88	4.43	6.84	2.86	32.45	0.0000000947
505	Mean	18.02	19.52	22.76	21.61	14.15	3.47	0.14	0.13	0.14	4.08	9.25	0.000000092912676
	Min	12.52	12.01	17.52	16.90	9.30	1.23	0	0	0	2.17	1.43	0.000000035600000
	Max	23.22	22.93	26.07	27.35	22.57	8.02	2.84	3.78	2.70	5.91	23.25	0.000000156000000

TABLE S4: SEDIMENT CHARACTERISATION DATA FROM BUTLER'S FIELD TRENCH 2, ZONE B

Context		*Clay (%)*	*Very fine silt (%)*	*Fine silt (%)*	*Medium silt (%)*	*Coarse silt (%)*	*Very fine sand (%)*	*Fine sand (%)*	*Medium sand (%)*	*Coarse sand (%)*	*Organic content (%)*	*Carbonate content (%)*	*Magnetic susceptibility*
641	Mean	23.27	21.07	20.93	17.15	11.33	4.05	1.00	0.567	0.47	6.00	10.72	0.00000037028
	Min	20.21	18.17	19.72	15.40	8.72	2.48	0.56	0.19	0	5.32	6.59	0.0000001974
	Max	25.61	23.87	24.00	18.88	13.99	5.71	1.51	1.07	1.25	6.88	15.87	0.0000006833
311	Mean	16.13	13.91	17.31	21.57	20.22	8.25	1.46	0.68	0.40	4.80	19.83	0.000000432315789
	Min	14.17	11.36	15.24	18.92	14.53	5.14	0.25	0	0	3.91	17.12	0.0000002911
	Max	20.90	18.38	21.40	23.14	24.13	10.43	3.02	1.71	1.38	5.47	22.76	0.0000007606
311a	Mean	14.73	12.30	16.35	23.12	22.62	8.77	1.10	0.51	0.36	3.86	21.91	0.000000181283333
	Min	14.11	11.93	15.73	22.39	21.79	7.56	0.78	0.04	0	3.53	18.69	0.0000001635
	Max	15.20	13.11	17.40	23.90	23.49	9.98	1.43	1.44	1.29	4.53	23.06	0.0000002171
638	Mean	12.60	10.73	16.36	25.36	24.57	8.93	0.68	0.30	0.35	2.64	25.49	0.0000000856975
	Min	10.95	9.31	14.61	23.17	21.64	4.05	0	0	0	1.80	20.25	0.0000000515
	Max	16.11	12.99	19.03	29.72	28.16	10.61	1.59	1.48	1.68	3.53	28.92	0.0000001716
639	Mean	17.34	14.19	16.69	22.14	20.66	7.20	0.60	0.41	0.38	3.51	12.65	0.000000104088889
	Min	12.48	10.43	14.96	19.37	18.29	5.01	0.04	0	0	2.44	5.19	0.0000000666
	Max	21.99	17.12	18.14	24.46	23.38	10.04	1.58	1.66	1.82	4.19	23.37	0.0000001619

TABLE S5: SEDIMENT CHARACTERISATION DATA FROM CORE PEC5A, ZONE D

Context		*Clay %*	*Very fine silt (%)*	*Fine silt %*	*Medium silt (%)*	*Coarse silt %*	*Very fine sand %*	*Fine sand %*	*Medium sand %*	*Coarse sand %*	*Organic content (%)*	*Carbonate content (%)*	*Magnetic susceptibility*
(PE1)	Mean	16.05	19.16	21.91	18.06	12.79	6.58	2.67	1.62	0.98	15.02	3.41	0.000537052631579
	Min	11.24	13.48	17.01	15.52	6.08	1.61	0.63	0.42	0.03	6.59	2.48	0.000072
	Max	22.74	26.48	27.57	19.54	17.41	12.17	5.71	3.18	4.33	25.12	6.13	0.00085
(PE2)	Mean	25.57	25.40	23.84	15.13	7.66	1.94	0.24	0.20	0.03	4.09	11.54	0.000749434782609
	Min	22.62	22.83	21.39	13.05	5.72	1.06	0	0	0	2.86	3.05	0.000627
	Max	28.70	27.41	26.68	17.23	10.16	3.32	0.79	1.06	0.31	5.53	16.83	0.00102
(PE3)	Mean	16.36	18.05	22.96	23.71	15.51	3.27	0.10	0.04	0.01	2.59	22.55	0.000430095238095
	Min	12.53	13.00	20.19	15.81	8.23	1.04	0	0	0	1.76	16.09	0.000089
	Max	24.13	26.44	25.69	27.43	20.68	5.91	0.55	0.60	0.11	3.57	27.14	0.000643
(PE4)	Mean	14.74	14.04	20.96	25.93	18.91	4.68	0.38	0.29	0.07	2.39	23.69	0.000339870967742
	Min	9.84	9.31	16.61	22.99	14.30	1.67	0	0	0	0.54	18.08	0.000025
	Max	16.84	15.97	24.18	28.21	25.28	8.02	1.82	1.19	0.73	3.99	26.89	0.000412
(PE5)	Mean	11.13	10.75	19.68	28.84	22.17	5.53	0.75	0.68	0.36	2.19	27.42	0.000257916666667
	Min	9.95	9.64	17.21	25.85	17.42	1.79	0	0	0	1.45	23.69	0.000144
	Max	13.44	13.23	23.62	31.14	24.57	8.67	1.72	1.92	1.01	2.64	30.77	0.000405
(PE6)	Mean	12.00	12.18	21.71	29.74	19.75	3.96	0.57	0.80	0.54	2.17	23.42	0.000229125
	Min	10.26	11.73	19.52	28.08	16.16	1.01	0	0	0	1.23	16.64	0.000026
	Max	13.11	13.35	24.68	31.69	22.13	6.87	2.80	4.24	2.92	2.58	28.40	0.000359

TABLE S6: SEDIMENT CHARACTERISATION DATA FROM TEST PIT 2, ZONE E

Context		*Clay (%)*	*Very fine silt (%)*	*Fine silt (%)*	*Medium silt (%)*	*Coarse silt (%)*	*Very fine sand (%)*	*Fine sand (%)*	*Medium sand (%)*	*Coarse sand (%)*	*Organic content (%)*	*Carbonate content (%)*	*Magnetic susceptibility*
101	Mean	13.34	13.58	16.07	17.18	16.88	10.82	4.93	3.43	2.86	10.99	11.65	0.000000143811111
	Min	10.91	11.61	14.46	15.66	15.78	8.87	2.54	1.48	0.86	7.21	10.77	0.000000119700000
	Max	17.41	16.16	17.52	18.36	17.59	12.37	6.43	5.34	4.98	15.40	12.89	0.000000165600000
102	Mean	19.49	19.38	21.05	19.04	13.16	4.51	1.01	0.90	1.00	5.54	13.91	0.000000118983871
	Min	16.43	14.47	16.97	16.96	10.23	1.69	0	0	0	4.05	12.43	0.000000087700000
	Max	21.99	22.92	24.87	22.12	19.07	9.22	3.58	2.64	4.79	7.03	17.26	0.000000180500000
103	Mean	15.14	14.41	19.55	24.24	18.90	5.46	0.59	0.59	0.79	3.51	22.67	0.000000086072000
	Min	12.04	11.00	15.80	20.32	11.12	1.53	0	0	0	2.81	17.84	0.000000030100000
	Max	20.74	22.33	24.85	28.65	23.10	9.32	3.17	3.56	2.95	4.34	25.83	0.000000367100000
104	Mean	14.54	14.10	21.09	25.30	18.23	5.00	0.59	0.48	0.48	2.34	28.41	0.000000058100000
	Min	11.85	9.76	15.31	21.22	7.97	0.27	0	0		1.75	25.54	0.000000032100000
	Max	19.20	19.93	28.69	28.84	25.85	11.02	2.95	3.30	3.78	3.15	31.99	0.000000188200000
105	Mean	19.17	14.35	18.85	21.28	16.27	6.54	1.68	1.03	0.46	1.72	33.62	0.000000031630769
	Min	15.46	10.51	12.33	14.62	10.09	1.12	0	0	0	1.42	31.34	0.000000017900000
	Max	23.75	19.32	25.44	26.83	21.11	15.06	4.81	3.630	2.65	2.10	34.38	0.000000099100000
106	Mean	26.53	16.91	17.77	17.41	13.57	5.78	1.17	0.45	0.32	1.74	35.45	0.000000024780000
	Min	19.17	13.86	13.39	13.30	8.93	0.62	0	0	0	1.48	33.74	0.000000014500000
	Max	31.16	19.38	23.40	21.41	19.73	11.59	4.51	2.00	3.01	2.40	37.90	0.000000041000000
107	Mean	28.55	17.30	16.12	15.65	14.082	6.55	1.15	0.20	0.26	1.50	35.56	0.000000019368421
	Min	18.38	13.26	12.24	12.26	5.11	1.11	0	0	0	1.20	33.91	0.000000011300000
	Max	36.13	25.20	20.12	22.92	19.35	13.48	3.86	1.43	3.82	1.83	37.19	0.000000032700000

TABLE S7: SEDIMENT CHARACTERISATION DATA FROM TEST PIT 1, ZONE E

Context		*Clay (%)*	*Very fine silt (%)*	*Fine silt (%)*	*Medium Silt (%)*	*Coarse silt (%)*	*Very fine sand (%)*	*Fine sand (%)*	*Medium sand (%)*	*Coarse sand (%)*	*Organic content (%)*	*Carbonate content (%)*	*Magnetic susceptibility*
110	Mean	14.12	15.56	19.97	23.52	19.25	6.35	0.68	0.36	0.12	6.86	2.52	0.000000279357
	Min	12.90	13.52	15.66	18.09	17.04	3.80	0	0	0	6.102	1.901	0.0000002280
	Max	15.62	16.81	21.80	26.17	21.93	9.46	4.02	3.54	1.07	8.80	3.34	0.0000004057
111	Mean	15.16	13.82	18.47	24.19	20.77	6.42	0.39	0.35	0.32	5.01	5.81	0.000000341419
	Min	13.77	10.85	14.91	21.34	14.52	2.69	.01	0	0	3.86	1.97	0.0000002236
	Max	16.70	17.94	23.29	26.23	24.24	9.21	1.50	1.66	1.80	6.51	9.33	0.0000012070
112	Mean	13.24	11.14	15.76	23.79	24.10	9.52	0.90	0.58	0.76	4.23	7.54	0.000000195427
	Min	9.44	8.79	12.19	18.78	18.59	2.99	0	0	0	3.64	5.54	0.0000001151
	Max	15.95	14.09	20.48	27.99	28.22	15.28	2.35	2.57	3.80	5.01	9.54	0.0000003828

TABLE S8: A CHRONOSTRATIGRAPHIC MODEL FOR THE UPPER KENNET VALLEY, WITH ASSOCIATED DATE RANGES, INTERPRETATIONS OF THE DRIVERS OF ALLUVIATION AND THE FLOODPLAIN ENVIRONMENT (GREEN DEFINES NATURAL ALLUVIATION IN TOPOGRAPHIC LOW POINTS WITHIN THE FLOODPLAIN; YELLOW DEFINES NATURAL ALLUVIATION IN TOPOGRAPHIC LOW POINTS WITHIN THE FLOODPLAIN (DOMINANT) BUT WITH A MINOR COMPONENT OF HUMAN INDUCED ALLUVIATION VISIBLE THROUGH CHANGING SEDIMENT FRACTIONS; BEIGE DEFINES ANTHROPOGENICALLY DRIVEN ALLUVIATION)

Phase/ period of alluviation	*Alluvial sediment*	*Sequence*	*Alluvial Zone*	*OSL date*	*Key supporting data*	*Interpretation of sediment aggradation (human vs natural)*	*Interpretation of wider floodplain environment*
1) Late Pleistocene	(501)	Trench 5	Zone B	ABRY01 2.38 m BGL 15.0±1.3 14,270–11,730 BC	High calcitic carbonate content of sediments (>30%); high clay content; low fine-coarse silt components; frequent chalk/flint pebbles/clasts	Natural climatic aggradation from within channel deposition; forms in Pleistocene low point depressions within floodplain; reprecipitation of calcite from solution alongside channel bedload; rate of alluvial deposition low & localised to floodplain low points	Open floodplain, with wide-spread exposure of chalk bed-rock on valley floor; channel form is wide & shallow, with probable areas of braid plain, alongside some single channel locations in areas of deeper topography
	(107)	North Farm Test Pit 2	Zone E	Interpreted date			
1) Early Holocene (pre-Neolithic)	(502)	Trench 5	Zone B	ABRY02 2.22 m BGL 9.4±0.7 8080–6610 BC	High calcitic carbonate content (>30%), although reduced slightly from Late Pleistocene values; decrease in clay content, coupled with slight rise in silt fractions; reduction in size/abundance of chalk clasts	Natural climatic aggradation from within channel deposition; forms in Pleistocene topographic low points in floodplain; high carbonate content through reprecipitation of calcite in low flow periods, chalk clasts derived from channel bedload; rate of alluvial deposition low & localised to floodplain low points	Floodplain containing wide, shallow channel system with areas of braid plain, flowing over exposed chalk bedrock in places; presumably some vegetation growth & soil development along floodplain fringes & in areas of high floodplain topography
	(106)	North Farm Test Pit 2	Zone E	Interpreted date			
2) Neolithic – Middle Bronze Age	(503)	Trench 5	Zone B	ABRY05 1.74 m BGL 6.0±0.5 4420–3460 BC ABRY04 1.90 m BGL 6.0±0.5 4550–3550 BC	Continued reduction in clay content, with slight but definable rise in fine silt-coarse silt fraction; carbonate content remains high	Naturally driven calcitic within channel alluviation (dominant), but with anthropogenic minerogenic alluviation signal present (minor) but increasing; deposited within localised topographic low points in floodplain; minor, but distinct human induced alluviation signal with rising fine-coarse silt fractions, caused by soil disturbance &	Floodplain still open, with continuation of wide shallow channel, with presumable areas of braid plain, alongside single thread channel across topo-graphic low points; evidence for some deposition of alluvial sediments with valley low points, linked to silt erosion

	(105)	North Farm Test Pit 2	Zone E	ABRY10 1.18 m BGL 5.7±0.5 4090–3180 BC		inwashing of soil derived loessic silt fractions; this landscape disturbance signal small scale & likely reflects localised disturbance; rate of alluvial deposition low, but has increased from pre-Neolithic	derived from soil erosion; is potentially linked to localised phases of monument building adjacent to floodplain (eg, Avebury henge)
3) Late Bronze Age, Iron Age–early Roman	(504) (lower part of unit)	Trench 5	Zone B	ABRY06 1.54 m BGL 2.6±0.2 820–410 BC	Alluvial unit, continued increasing in fine-coarse silt fraction; medium silt dominant; carbonate content decreases throughout	Anthropogenically driven alluviation is now dominant, defining increased & widespread land surface disturbance on valley sides; soil erosion through ploughing providing silt rich loessic derived soil material to wash into floodplain; previous land surface palaeosols (PE6), (639), & (112) located on slightly higher points within floodplain are buried by alluvial sediments between LBA & very early Roman period	Rate of carbonate deposition starts to slightly decrease & minerogenic silt dominated alluvium is deposited in increasing amounts on valley floor; channel form is still wide, with presumably some areas of braid plain extant; however, infilling of valley floor with minerogenic silt rich alluvium starts to constrain channel system
	(639)	Trench 2	Zone B	ABRY07 1.25 m 2.5±0.2 690–310 BC	Palaeosol land surface extant until burial by alluvium		
	(PE6)	PEC5a	Zone D	Interpreted date	Palaeosol land surface extant until burial by alluvium		
	(PE5)	PEC5a	Zone D	Interpreted date	Alluvial unit burying palaeo-sol. High carbonate levels, yet modal sediment fraction is medium silt (29%), coarse silt & fine silt also high		
	(104)	North Farm Test Pit 2	Zone E	ABRY15 0.78 m 2.0±0.1 130 BC–AD 170	Alluvial unit, continued increase in fine-coarse silt fraction; medium silt dominant; carbonate content decreases throughout		
	(112)	North Farm Test Pit 1	Zone E	ABRY20 0.65 m 2.1±0.1 200 BC–AD 60 ABRY19 0.80 m 2.4±0.2 550–220 BC	Palaeosol land surface extant until burial by alluvium		

4) Roman – medieval	(504) Upper	Trench 5	Zone B	After ARBY06	Alluvial unit, continued deposition of minerogenic alluvium dominated by fine-medium silt, with medium silt modal; corresponding continued reduction in carbonate content	Anthropogenically driven alluviation with clear deposition of eroded soil material. Extensive evidence for medieval activity on & adjacent to floodplain at Butlers field (Zone B), causing anthropogenic additions to medieval soil complex	Decrease in overall particle size defines a fluvial regime of decreasing energy; this has been caused through deposition of alluvium on valley floor, which has started to infill valley bottom, constraining channel; this process ongoing from EIA (above); reduction of channel width & constraining of channel has led to reduction in chalk dissolution with corresponding decrease in carbonate calcite re-precipitation within alluvial sediment stack
	(638)	Trench 2	Zone B	ABRY08 1.0 m BGL 2.0±0.2 210 BC–AD 150 (date accepted with caveat)	Alluvial unit, continued deposition of minerogenic alluvium dominated by fine-medium silt, with medium silt & coarse silt both very high; corresponding continued reduction in carbonate content		
	(311)	Trench 2	Zone B	Date provided by excavated remains in Butlers Field	Palaeosol medieval soil complex		
	(PE4)	PEC5a	Zone D	Interpreted date: post-Roman–early medieval	Alluvial unit, with medium silt modal fraction, reduction in coarse silt with corresponding increase in clay, very fine & fine silts		
	(PE3)	PEC5a	Zone D	Interpreted date: early to late medieval	Alluvial unit, with medium silt modal fraction, reduction in coarse silt with corresponding increase in clay, very fine & fine silts		
	(103)	North Farm Test Pit 2	Zone E	ABRY16 0.62 m 1.5±0.1 AD 400–620	Alluvial unit, with medium silt modal fraction, reduction in coarse silt with a corresponding increase in clay & very fine silt		

	(111)	North Farm Test Pit 1	Zone E	After ARBY20, before ARBY22	Colluvial unit with later alluvial additions, defining on onset of colluviation at a floodplain edge location; abundant small clasts, alongside modal medium silt, & high fine & coarse silt components	Anthropogenically driven colluvial sediment, with alluvial additions higher in unit	
5) Late medieval–post-medieval	(505) (641)	Trench 5 Trench 2	Zone B Zone B	Interpreted date Post-dates medieval soil complex (311)	Particle size reduces with clay & very fine silt increase-ing, clay/very fine silt often modal; corresponding reduction in coarse silt, medium silt & very fine sand fractions; low carbonate content; few to no calcite aggregates; defined by Evans *et al*. (1993) as the *Arion clay*	Anthropogenically driven alluviation with clear deposition of eroded soil material	Valley floor has been increase-ingly infilled with anthropo-genically derived minerogenic alluvium, constraining river to single thread, relatively deep & narrow channel; this channel form has deposited alluvium through overbank deposition with reduction in overall particle size, defining reduction in fluvial energy; little disso-lution of chalk & associated re-precipitation of calcite
	(PE2)	PEC5a	Zone D	Interpreted date			
	(102)	North Farm Test Pit 2	Zone E	ABRY18 0.40 m 0.66±0.05 AD 1320–1410			
	(110)	North Farm Test Pit 1	Zone E	ABRY22 0.32 m BGL 0.68±0.04 AD 1300–1390			