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Early Neolithic Trackways in the Thames Floodplain at Belmarsh, London Borough of Greenwich

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with contributions by

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Excavations in 2008 on the site of a proposed new prison at Belmarsh West, London Borough of Greenwich, found the heavily decayed remains of two superimposed Early Neolithic trackways. These structures, which are radiocarbon dated to the first quarter of the 4th millennium cal BC *comprise some of the earliest structures yet encountered in the London Basin. The trackways were found towards the base of a peat sequence, immediately above the underlying Devensian gravels. The associated palaeoenvironmental record suggests that they were constructed in response to rising base levels, within a local floodplain environment dominated by alder carr, in order to maintain mobility across an expanding wetland landscape. The archaeological and geomorphological background to the excavations and a description of the results of the excavations are presented, with a particular emphasis on the Neolithic structures. The significance and wider context of the structures are examined through a consideration of their construction, wider palaeoenvironmental context, and the ways in which the structures can shed light on the nature of Early Neolithic subsistence strategies and land-use within the Thames floodplain.*

Keywords: Early Neolithic, wooden trackway, River Thames, radiocarbon dating, palaeoenvironmental record

An archaeological excavation undertaken in 2008 by Archaeology South-East (UCL Institute of Archaeology) on the site of a proposed new prison at Belmarsh West in the London Borough of Greenwich (Fig. 1) revealed significant evidence for Early Neolithic timber trackways. A preliminary borehole survey had successfully modelled the peat deposits known to exist on the site and had demonstrated the potential for the recovery of palaeoenvironmental remains from the sealed peat deposits. Moreover, the borehole survey identified a major north–south aligned palaeochannel cutting through the peat deposits that may have formed a focus for past human activity. The subsequent archaeological excavation therefore comprised two excavation areas (Trenches 1 and 2; Figs 1 & 2) positioned so as to examine both the palaeochannel itself and the peat deposits through which it ran.

The following paper summarises the results of this excavation, with particular emphasis on the Neolithic timber structures revealed and their palaeoenvironmental context. In particular, the palynological and phytolithic sections refer specifically to analysis of a column sample (Column 11) taken through peat associated with the earlier of the two timber structures (Structure 1). A full report on the geoarchaeological

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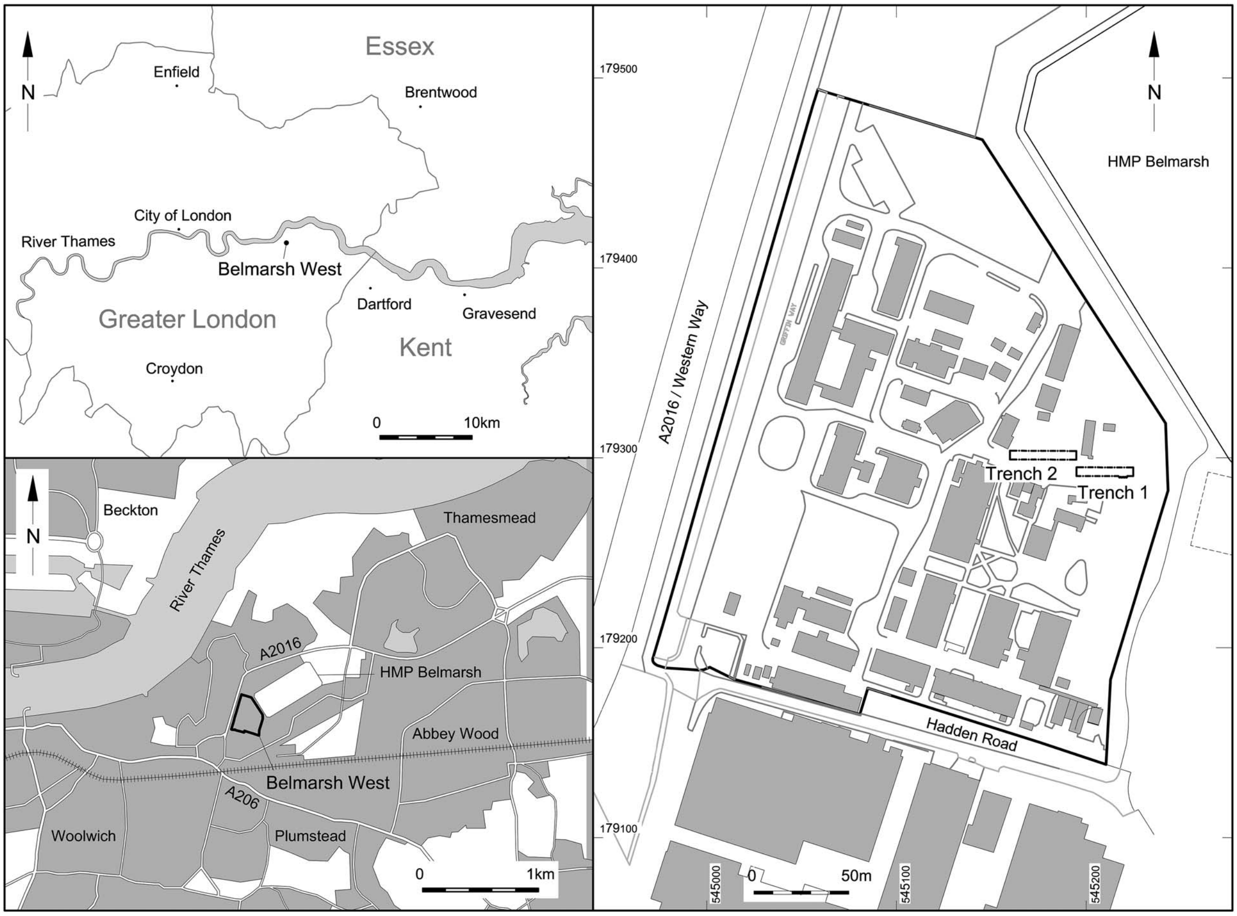

Fig. 1.
Site Location

and palaeoenvironmental sequence of the site will be presented as a separate paper (Bates *et al.* forthcoming).

ARCHAEOLOGICAL BACKGROUND

A number of prehistoric timber structures are now known in the London region, though most date to the Bronze Age or later (Fig. 3). Indeed, the available evidence alludes to a period of intensive and extensive exploitation of wetland resources during the Middle and Late Bronze Age, with a series of timber trackways located along the boundary between the river terrace gravels and Thames floodplain in what has become known as the north-east London wetlands (Meddens 1996; Stafford *et al.* 2012). In contrast, evidence for exploitation of wetland habitats during the preceding Neolithic period is striking in its scarcity. Prior to the recent Belmarsh excavation, Neolithic timber structures in the Thames floodplain were limited to a single example; the possible trackway uncovered towards the base of peat deposits at Fort Street, Silvertown, dated to 3350–2900 cal BC (4410 ± 60 BP, GU-4407; Crockett *et al.* 2002, 191). This trackway is also notable in its location, within the floodplain, whereas the majority of Neolithic activity along the river corridor tends to be clustered on its margins.

Settlement evidence for the period is rare but includes the exceptional site of Runnymede to the west (Needham 1991), Brookway, Rainham to the east (Lewis 2000), Waterloo, and Park Street, Southwark (Sidell & Wilkinson 2004). Elsewhere, the majority of evidence for Neolithic activity comprises little more than scatters of struck or burnt flint and pottery on the surface of weathered sands and gravels, or as a residual component within later features. This includes a scatter of Neolithic struck flint found in close

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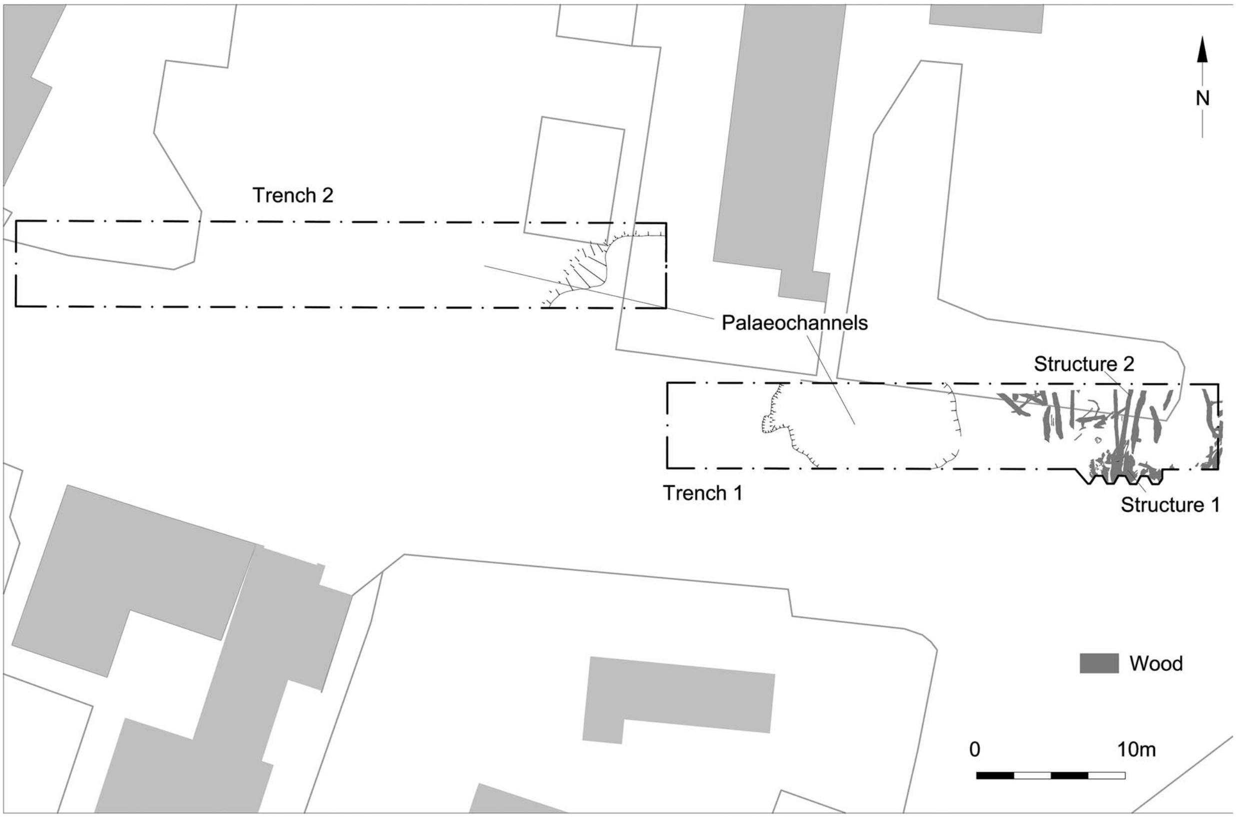

Fig. 2.
Site plan, showing location of the timber structures and palaeochannels

proximity to the Brookway site, Rainham during work associated with Section 2 of the High Speed 1 railway (Stafford, pers. comm.), small assemblages of struck flint and pottery from Movers Lane, Woolwich Manor Way, and Prince Regents Lane during work in advance of the A13 DFBO road scheme (Stafford *et al.* 2012) and at Royal Docks Community School, also on Prince Regents Lane (Holder 1998).The Woolwich Manor Way material is of particular significance as it appears to comprise largely *in situ* assemblages of flint and pottery associated with a possible occupation horizon (*ibid.*). To the south of the river similar scatters of Neolithic material, found on the surface of the underlying gravels, have been found at the B&Q site and the Courage Brewery site in Southwark (Sidell *et al.* 2002; Sidell & Wilkinson 2004), at Bronze Age Way, Erith (Bennell 1998), and most recently at Belmarsh East (Riccoboni *et al.* 2008).

Other notable finds of Neolithic date in the region include the exceptional Early Neolithic burial and associated occupation evidence at Yablsey Street, Blackwall, radiocarbon dated to 4230–3980 cal BC (5252 ± 28 BP, KIA-20157; Coles *et al.* 2008) and the famous Dagenham Idol, radiocarbon dated to 2470–2030 cal BC (3800 ± 70 BP, OxA-1721; Coles 1990). Further upstream to the west, finds include a human femur recovered from Chelsea Harbour, radiocarbon dated to 2910–2770 cal BC (4243 ± 30 BP, OxA-20589) and a wooden 'beater' or club, recovered from the Thames foreshore at Chelsea and radiocarbon dated to 3630–3350 cal BC (4660 ± 50 BP, Beta-117088, Lewis 2000). The recovery of significant quantities of Neolithic axes from the Thames and its tributaries (Lewis 2000) further underlines the significance of the river during the Neolithic.

GEOMORPHOLOGY
(Martin Bates)

The site lies on the Thames floodplain approximately 0.75 km from the active channel of the Thames and approximately 0.5 km north of the southern boundary

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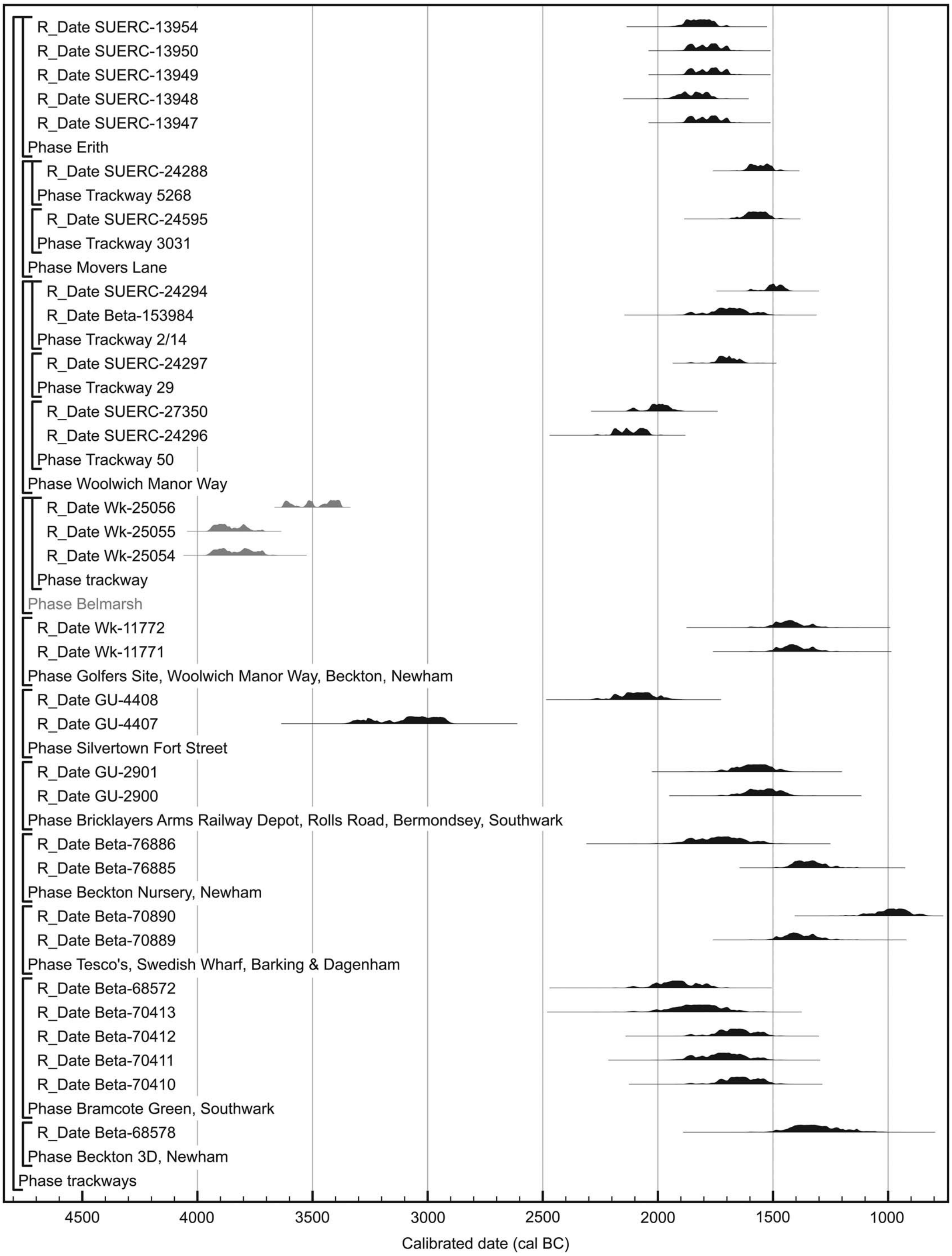

Fig. 3.
Probability distributions of dates from trackways and platforms/structures in Greater London; each distribution represents the relative probability that an event occurred at a particular time. These distributions are the result of simple radiocarbon calibration (Stuiver & Reimer 1993)

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of the floodplain (Fig. 1). The lithological sequences present within the study areas to the east and west of Belmarsh Prison (Fig. 4) consist of a tripartite sequence of sediments that are recognisable throughout the lower Thames region: basal flint rich gravels, peats with variable wood and reed content and inorganic silts.

The basal flint gravels consist of poorly sorted, subangular flint gravels that exhibit localised bedding in places. These gravels were rarely examined in the excavations due to their unconsolidated nature and the excessive water associated with them. The gravels are typical of the main sequence of coarse gravels beneath Holocene sediments throughout the floodplain and are the equivalent of the late Devensian Shepperton Gravel (*sensu* Gibbard 1985). These sediments are likely to have been deposited under braided channel conditions by the late Devensian Thames flowing in multiple channels across the floodplain.

A considerable hiatus exists between the final deposition of the gravels and the initiation of peat formation at the site. Unlike other parts of the floodplain where the gravel is present at lower elevations, and a more complex lithological sequence of interbedded peats and clay-silts exist above gravels (Devoy 1979; Sidell 2003; Batchelor 2009), at Belmarsh a long interval of time passed in which a stable floodplain surface existed at the site. Similar situations have been reported at Slade Green (Bates & Williamson 1995) and Erith (Bennell 1998). Little is known of the nature of the environmental changes occurring during this interval of time at the site due to the absence of sediments and associated palaeoenvironmental material. However, it is likely that conditions at the site are reflected in the known regional conditions in the lower Thames (Devoy 1979; Sidell 2003; Batchelor 2009).

Deposition of sediments on the site recommenced with peat growth initiated probably as a result of rising ground water tables associated with relative sea level rise and impeding of drainage through the gravels. This pattern is seen across the Thames and indeed is a feature of many major river valleys in south-east England (Long *et al.* 2000). This peat is identical to peats at many locations in the lower Thames. Formation of the peat under alder carr, and perhaps reedswamp upwards, is attested to by the nature of the peat (see below).

Finally the sequence is capped by a series of sub-horizontal minerogenic sediments (predominantly clay-silts) associated with localised channel-like features perhaps indicative of minor erosion events. These minerogenic sediments appear to represent tidally dominated sequences of saltmarsh or tidal mudflat environments. The small channels present within this upper sequence are difficult to correlate and consequently it is difficult to ascertain if they belong to a single phase of channelling or multi-channelling phases. Channelling on top of, or through, peats is common throughout the lower Thames area.

OVERVIEW OF THE EXCAVATED SEQUENCE

(Martin Bates, Diccon Hart, & Peter Marshall)

The two excavation trenches measured 30 × 5 m (Trench 1) and 35 × 5 m (Trench 2) and were fully sheet-piled prior to excavation. Following machine removal of overburden and alluvial deposits, the peat sequence itself was hand-excavated in arbitrary 100 mm spits. A continuous baulk was retained along the entire southern section of both trenches in order to facilitate both sediment sampling and stratigraphic interpretation and a series of column and associated bulk environmental samples was taken from the baulks that spanned the entire sequence. An additional column sample (Column C11) was taken through the older of the two Neolithic timber trackways (Structure 1) for detailed analysis of the palaeoenvironmental conditions at the time the trackway was built (see below).

In addition, ten radiocarbon age determinations were obtained from waterlogged wood and peat samples associated with the Neolithic sequence (Table 1; Fig. 10, below). A Bayesian approach has been adopted for the interpretation of the chronology from the site (see for instance Buck *et al.* 1996; Bayliss *et al.* 2007). The technique used is a form of Markov Chain Monte Carlo sampling, and has been applied using the program OxCal v4.1.7 (http://c14.arch.ox.ac.uk/). Details of the algorithms employed by this program are available from the on-line manual or in Bronk Ramsey (1995; 1998; 2001; 2009) and the algorithm used in the model can be derived from the structure shown in Figure 10 (see site archive for full details). The model shown in Figure 10 is derived from the stratigraphic relationships between structures and environmental sequences in Trench 1 and shows good agreement (Amodel = 90%). It should be emphasised, however, that the posterior density estimates produced by this modelling are not absolute. They are interpretative estimates, which can and will change as further data become available and as other researchers choose to model the existing data from different perspectives.

TABLE 1: RADIOCARBON RESULTS

Lab. no	*Sample code*	*Column*	*Sample type*	*Sample ident.*	*Context description*	*$\delta^{13}C$ (%)*	*Radio-carbon age (BP)*	*Weighted mean*	*Calibrated date (95% confidence) cal BC*	*Posterior Density Estimate (95% prob.) cal BC*
Trench 1										
Structure 1										
SUERC-29298	BWQ08C11_11 (15–16 cm)	C11	Peat	Humic acid	Immediately above Group 3 timbers	–27.4	4900 ± 40	4918 ± 29 (T' = 0.4; ν = 1; T'(5%) = 3.8)	3770–3640	*3760–3640*
SUERC-29299	BWQ08C11_11 (15–16 cm)	C11	Peat	Humin	As SUERC-29298	–27.7	4935 ± 40			
Wk-25054	BWQ08 T142		Wood	*Corylus*/*Alnus* cf. *Alnus*	Part of poss. N–S aligned trackway	–27.7	5023 ± 44		3960–3700	*3930–3705*
Wk-25055	BWQ08 T146		Wood	*Alnus* sp.	Part of poss. N–S aligned trackway	–26.4	5039 ± 30		3960–3710	*3940–3755 (92%) or 3740–3710 (3%)*
SUERC-29300	BWQ08C11_11 (27–28 cm)	C11	Wood	Humic acid	3–4 cm below Group 3 timbers	–28.0	5075 ± 40	5075 ± 29 (T' = 0.0; ν = 1; T'(5%) = 3.8)	3970–3780	*3965–3815*
SUERC-29301	BWQ08C11_11 (27–28 cm)	C11	Peat	Humin	As SUERC-29300	–27.7	5075 ± 40			
Wk-25056	BWQ08 T149		Wood	*Alnus* sp.	Poss. retaining post assoc. with Group 3 trackway	–28.9	4709 ± 30		3640–3370	*3635–3490 (66%) or 3470–3375 (29%)*
Structure 2										
Wk-25051	BWQ08 T121		Wood	*Alnus* sp.	Part of E–W aligned timber structure/ platform	–26.7	4982 ± 30		3910–3670	*3930–3875 (8%) or 3805–3660 (87%)*
Wk-25052	BWQ08 T122		Wood	*Alnus* sp.	Part of E–W aligned timber structure/ platform	–27.8	5011 ± 45		3960–3690	*3950–3700*
Wk-25053	BWQ08 T123		Wood	*Alnus* sp.	Part of E–W aligned timber structure/ platform		5075 ± 44		3970–3760	*3970–3770*
Peat										
SUERC-22126	BWQ08C6.4_6	C6.4	Peat	Humic acid	49–50 cm from top of C6.4	–28.7	5295 ± 30	5291 ± 23 BP (T' = 0.0; ν = 1; T'(5%) = 3.8)	4235–4000	*4220–4200 (2%) or 4175–4035 (81%) or 4020–3990 (12%)*
SUERC-22403	BWQ08C6.4_6	C6.4	Peat	Humin	As SUERC-22126	–28.2	5285 ± 35			
Trench 2										
Wk-25057	BWQ08 T135		Timber	*Quercus* sp. sapwood	Basal peat layers		5427 ± 45		4360–4170	*4360–4225 (88%) or 4205–4165 (5%) or 4130–4115 (1%) or 4095–40745 (1)*

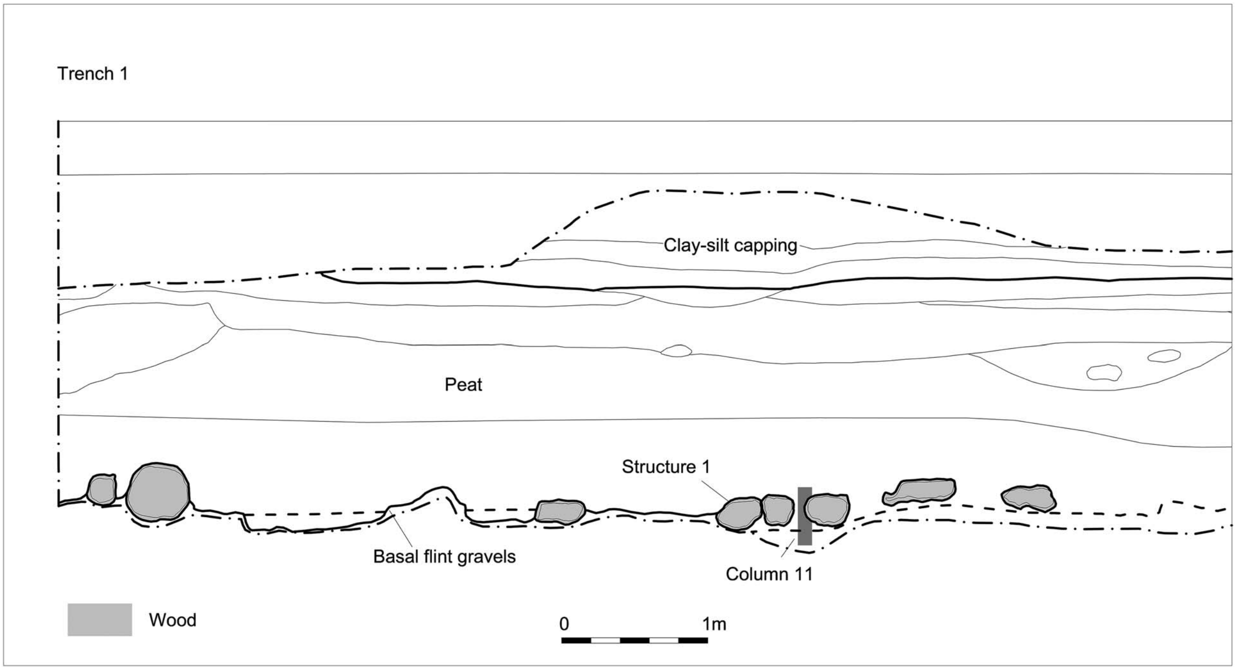

Fig. 4.
Sample Section of trench 1, showing the location of the Neolithic trackways in the site sequence

The peat sequence
The underlying late Devensian gravels were generally encountered between –2.33 m and –2.7 m OD, though later scouring by fluvial action had reduced the level of this deposit to –3.3 m OD at the far western end of Trench 2.

The earliest peat unit (Fig. 4), representing the onset of peat formation on the site, comprised 100 mm of peat accumulation to around –2.21 m OD. The model shown in Figure 10 provides an estimate for the onset of peat inception on the site of *4175–4035 cal* BC (*80% probability*; *BWQ08C6_4_6*). It is on the surface of this initial peat unit that the Early Neolithic trackways were constructed. Palynological analysis shows that the local environment at the time of the onset of peat formation comprised alder carr but that oak (*Quercus*) and lime (*Tilia*) were also present.

The remainder of the peat sequence may be divided into three principal units on the basis of discernible differences in consistency and composition. The upper surfaces of these units were often characterised by small erosional channels that hint at periods of relative stasis in peat formation. The lowest of these units, representing accumulation to a maximum height of –1.65 m OD comprised dark reddish-brown fibrous peat typified by the occurrence of large root boles and fallen trunks throughout, as well as smaller roundwood branches and twigs that appear to represent a well preserved alder carr woodland horizon.

The remaining two units represent peat accumulation to a maximum height of –0.6 m OD and comprised a dark blackish-brown fibrous peat. Analysis of the macrobotanical remains from these upper peat units indicated the presence of willow/poplar (*Salix/Populus)*, birch (*Betula*), ash (*Fraxinus excelsior*), and hazel (*Corylus avellana*), as well as the ubiquitous alder (*Alnus*), and may be taken to indicate a more diverse woodland environment than previously.

The palaeochannel sequence
In addition to the peat sequence described above, a large palaeochannel was situated within Trench 2 (Fig. 2). This measured 30 m wide and up to 2.65 m deep within the confines of the trench but extended further to the west beyond the limits of the excavation and must have comprised a significant element of the local hydrological system.

The sequence of fills recorded in this channel is complex and consisted of a series of broadly

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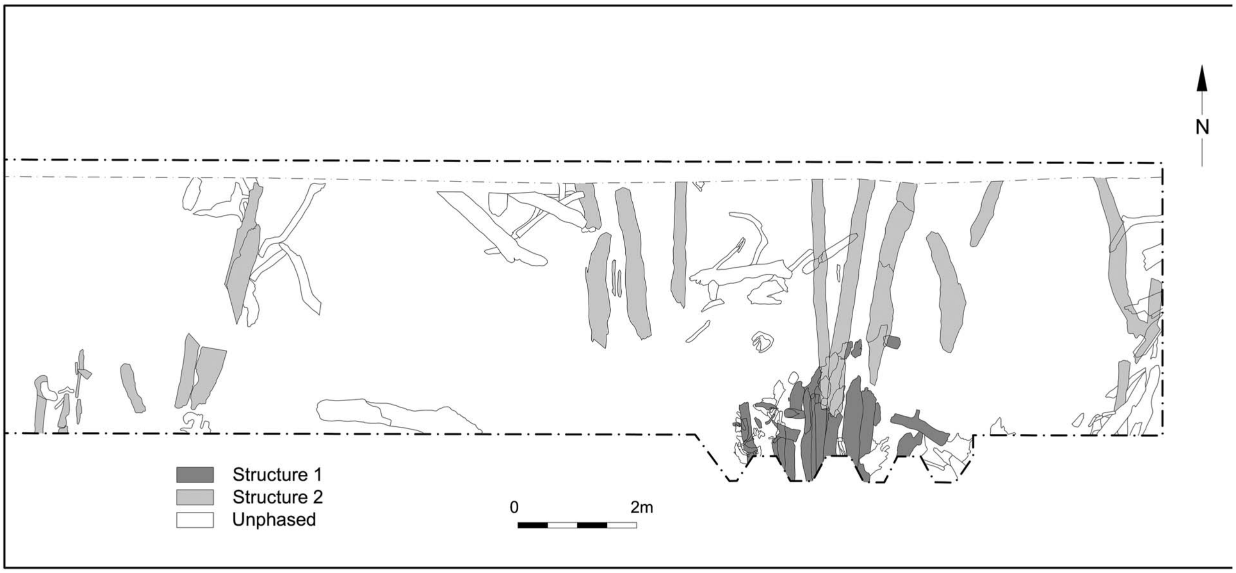

Fig. 5.
Plan of Trench 1, showing Structures 1 and 2

sub-horizontal beds of alternating minerogenic and organic-rich sediments. Large blocks of reworked peat, probably derived from the main peat beds noted adjacent to the channel, were incorporated into the channel fill. These deposits were associated with infilling of the channel under moderate energy conditions during which phases of erosion and higher energy activity were attested to by the presence of the peat blocks. Analysis of the microfossils present indicated initial infilling of the channel under freshwater conditions, with an increasing tidal influence in the upper parts of the sequence (Bates *et al.* forthcoming). Macrobotanical remains demonstrated a wider range of taxa that was almost certainly due to the dynamic depositional regime in which they were laid down (they are likely to have derived from a wider catchment area), and indicated a range of vegetation environments, including alder carr and fen, as well as more open habitats and woodland.

The relationship of this channel to the main tripartite sequence was difficult to ascertain but the erosive nature of the cut through the peat sequences in Trench 2 coupled with the presence of blocks of peat incorporated within the channel fills suggested that infilling (although not inception) of the channel post-dated much of the peat accumulation sequence. The main infilling of the channel appears to have been completed by the time elements of the upper parts of the minerogenic sequences had accumulated and consequently the channel appears to infill during a period of time represented by the transition from the peats to the minerogenic sediments.

THE NEOLITHIC TRACKWAYS

(Mike Bamforth, Diccon Hart and Peter Marshall)

As stated above, the Neolithic trackways were discovered towards the base of the peat sequence (Fig. 4). On the basis of differences in the absolute levels of the relevant timbers and their subsequent arrangement, it is possible to perceive two distinct structural elements (Fig. 5): the northern limits of a north–south aligned trackway of closely laid planks (Structure 1), partially overlain by a more extensive and dispersed arrangement of largely unconverted logs that appears to represent the substructure of an east–west aligned trackway (Structure 2). Much of the material encountered was in extremely poor condition, lying at the limits of preservation for meaningful analysis. The degradation seems to have been caused by a mixture of later root intrusion, compression and general microbial attack over time.

Structure 1 trackway

Structure 1 lay at around –2.2 m OD and measured up to 1.5 m in width and 2 m in length, although it continued to the south beyond the limits of the excavation

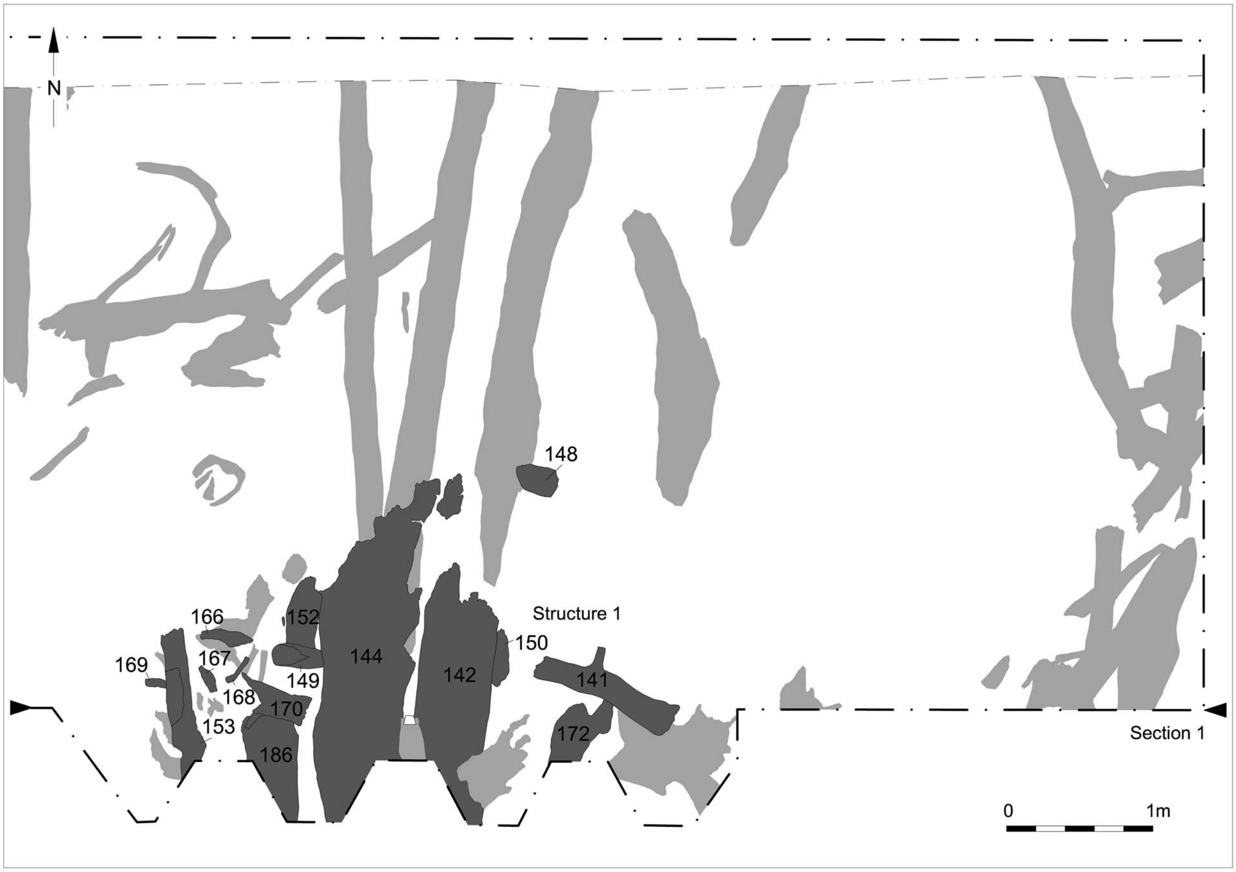

Fig. 6.
Detailed plan of Structure 1 trackway

(Figs 6 & 7). The structure consisted of eight timbers, four pieces of roundwood, and four pieces of debris and appears to represent the northern limits of a simple north–south aligned timber trackway, in essence comprising a walkway of two large parallel split alder timbers laid directly on the underlying peat and perhaps held in place by retaining posts, at least one of which may represent later maintenance or stabilisation of the structure. Species identification of samples recovered from the structure indicate alder, hazel, and ash were used in its construction, all of which would have been readily available in the immediate vicinity and which have been recorded in the corresponding pollen sequence associated with the trackway.

The main deck of the Structure 1 measured around 1.14 m wide and was constructed of two large tangentially split alder timbers [142] and [144], aligned north–south, with their converted faces up. Both were straight grained, knot and side branch free, suggesting they are the butt ends of large trees. Due to the poor condition and high degree of fragmentation, ascertaining the conversion of the timbers was extremely challenging, even when studying sub-samples in the laboratory. No evidence of tooling remained. The converted face of [142] was typical of that seen on split timbers. The converted face of [144] was too degraded to see any such evidence.

A smaller alder/hazel timber [150] lay off to one side. Again, this was a tangentially converted timber from the outside of a log, lying bark face down, split face up. Alder/hazel timber [180] (not shown) comprised a radially converted plank. Four further timbers that appear to have been dislodged are also associated with this structure. All four were again tangential outer conversions, with three converted face up [141], [170], [172] and one converted face down [153] (Fig. 6).

Significant variation in the dimensions of these timbers was evident, though this seems in part to be a

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Fig. 7.
Structure 1 trackway under excavation

result of deliberate selection. Timbers [142] and [144], which form the main walkway of the trackway, were of comparable dimensions, measuring between 0.58 m and 0.61 m wide and 0.07–0.11 m thick, while the remaining timbers showed greater variation, 0.12–0.21 m wide and up to 0.04 m thick.

In light of the high levels of degradation and bioturbation and the setting of most of the timbers converted face up, it remains possible that the timbers may have been converted by natural, post-depositional factors. However, there is a high degree of confidence that these timbers were converted by cultural agency: split into shape and set into position. The setting of the timbers edge to edge and the degree of parity in conversion and size all support this premise, as does the radially aligned [180] that lay on one of its converted faces.

Of the four pieces of roundwood recorded, two, [148] and [149] were driven into the underlying peat at an angle of *c.* 45°. These measured 0.10–0.17 m in diameter and may represent retaining posts, though this interpretation is far from certain. Radiocarbon dating of timber [149] indicates a somewhat later date than the main deck of the trackway (see below) and the downward forking timber [148] was not directly associated with the deck of the structure.

The two other items of roundwood, [152] and [168], were lying horizontally and had their bark intact. Item [168] is of particular interest. The morphology of the piece, having a straight, even, side-branch free stem and central pith, raises the possibility that it is the product of coppicing (Rackham 1977). One end has a clear tool facet where it has been trimmed from one direction with an edged tool – presumably

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an axe. This represents the only evidence of secondary tooling from Structure 1.

Four small and medium pieces of debris are also assigned to Structure 1. Radially quarter-split timber debris [166] is interesting in that it is the only worked item identified as ash, and as such is derived from a timber not recorded during the excavations. Hazel debris [167] is derived from a small diameter piece of roundwood. Although only a short length it again has the straight, even stem often associated with coppiced material (Rackham 1977). Fragment [169] is a split away knot. This type of debris is fairly common in woodworking assemblages as knots are hard to work and, as such, undesirable. Fragment [176] (not shown) is a small piece of unclassified debris. A large sheet of bark (0.66 × 0.33 × 0.02 m) was also recorded, lying partially over timber [142] and possibly representing an upper layer of material that has almost completely degraded away. The debris may represent a phase of activity, such as a small construction platform, that has not survived in any other form.

A single piece of beaver gnawed oak roundwood was also recovered in association with this structure.

DATING

The distribution *Last group_3* shown in Figure 10 provides a date for the construction of Structure 1 of very shortly after *3900–3705 cal* BC *(95% probability; group_3)* and probably *3820–3710 cal* BC *(68% probability)*. However, a somewhat later radiocarbon date of 3640–3370 cal BC (4709 ± 30 BP, Wk 25056, Table 1) has been obtained for timber [149] and may be taken to indicate either later intrusion or repair to the structure.

Structure 2

Structure 2 is more problematic to understand within the confines of the excavation, due in no small part to its apparently incomplete preservation; certainly, as surviving, it is difficult to understand how it could have functioned except as a support or substructure for a structural element that no longer exists. The surviving timbers have been interpreted as the transverse sleepers of an east–west aligned trackway, though it should be noted that this interpretation is far from certain and it is possible that the timbers represent the substructure of a more extensive construction such as a platform, or even as a gridiron or similar structure.

The structure comprised an extensive layer of north–south aligned timbers, relatively dispersed over an area *c.* 18 m by at least 4 m and partially overlying Structure 1 (Figs 8 & 9). It is possible to perceive at

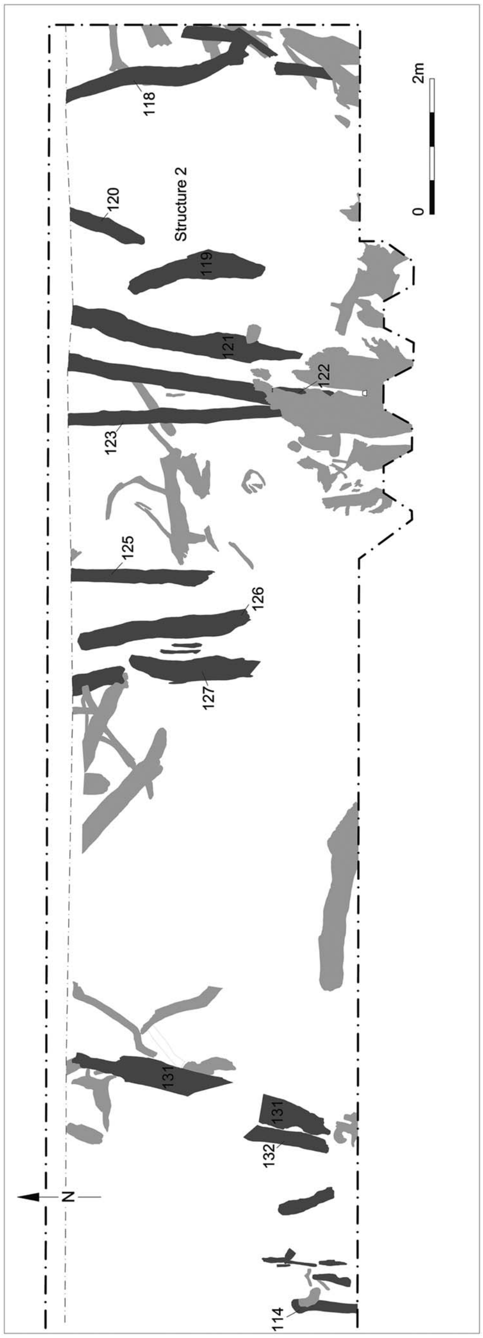

Fig. 8.
Detailed plan of Structure 2 trackway

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Fig. 9.
Structure 2 trackway under excavation

least three and perhaps four distinct groups of timbers within this array, with the westernmost group including timbers, [114], [132], and [131], a central group with timbers [127], [126], and [125], and an eastern group composed of [123], [122], [121], [119], and [120]. Timber [118] may represent a further cluster of timbers further east again. The spacing between these groups varied from *c.* 5.5 m to 2.1 m and the distance between timbers within groups varied from less than 0.1 m to 0.45 m.

The material is somewhat better preserved than that of Structure 1, although significant compression damage was still noted. Nine items were sub-sampled for detailed recording and species identification, which showed the range of species present in this group to be comparable to those of Structure 1, with alder dominating the assemblage and single instances of ash and willow. The items are relatively large, with the longest logs measuring up to 4 m in length, despite being truncated by the shoring of the trenches northern baulk. However, significant variation in the size of the timbers used was noted, with diameters varying from 0.13 m to 0.36 m. Just four of the sub-sampled items displayed evidence of conversion. Timber [114] is a tangentially aligned outer split, whilst [119], [121], and [122] are all radial 1/3 splits.

DATING

The distribution *Last group_7* (Fig. 10) provides a date for the construction of Structure 2 of very shortly after *3810–3655 cal* BC (*95% probability; group_7*) and probably *3775–3705 cal* BC (*68% probability*)

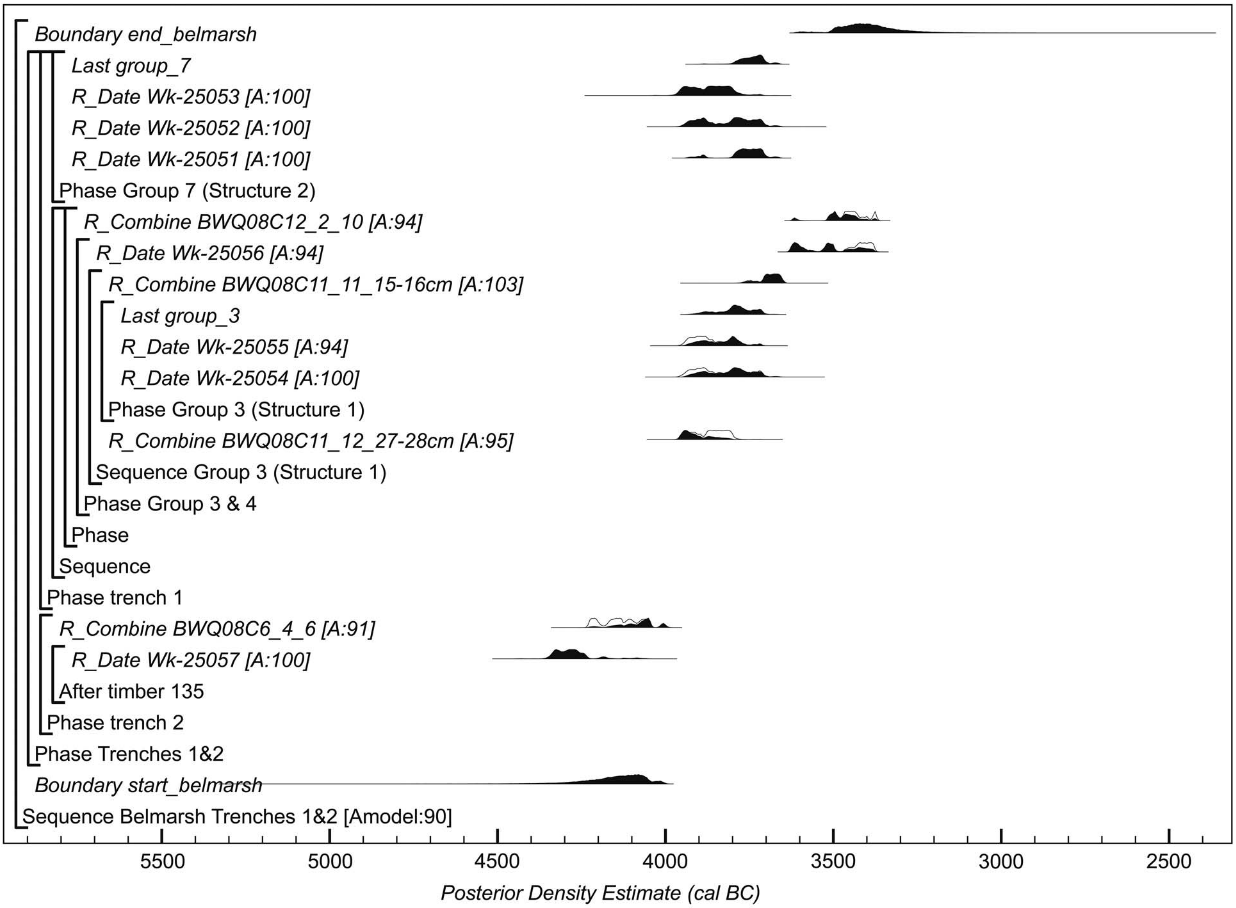

Fig. 10.
Probability distributions of dates from Belmarsh: each distribution represents the relative probability that an event occurs at a particular time. For each of the radiocarbon dates two distributions have been plotted, one in outline, which is the result of simple calibration, and a solid one, which is based on the chronological model used. Distributions other than those relating to particular samples correspond to aspects of the model. For example, the distribution *Last group_3* is the estimated date when the group 3 timber structure (Structure 1) was built. The large square brackets down the left hand side along with the OxCal keywords define the model exactly

THE PALAEOENVIRONMENTAL SEQUENCE ASSOCIATED WITH THE NEOLITHIC STRUCTURES

(Lucy Allott, Sarah Jones, Mike Walker, & Alison Weisskopf)

An extensive programme of bulk and column sampling was undertaken during excavations at Belmarsh West. Sampling aimed to recover remains that could be used as environmental indicators such of pollen, phytoliths, microfauna, wood and macrobotanical remains as well as to provide detailed geomorphological and geochemical data. The following section summarises the results of the analysis of the macrobotanical remains, pollen and phytoliths associated with Structures 1 and 2. Details of the various methodologies employed may be found in the archive.

Macrobotanical remains from the peat deposits (Lucy Allott)

At the onset of peat formation in Trench 1, occasional alder seeds and catkins are evident. An anomalous deposit containing small quantities of charred wood flecks was recorded at the base of the peat sequence in Trench 2 (overlying the clay/gravel and beneath peat spit [135]) and as charcoal was not recorded in any of the other bulk

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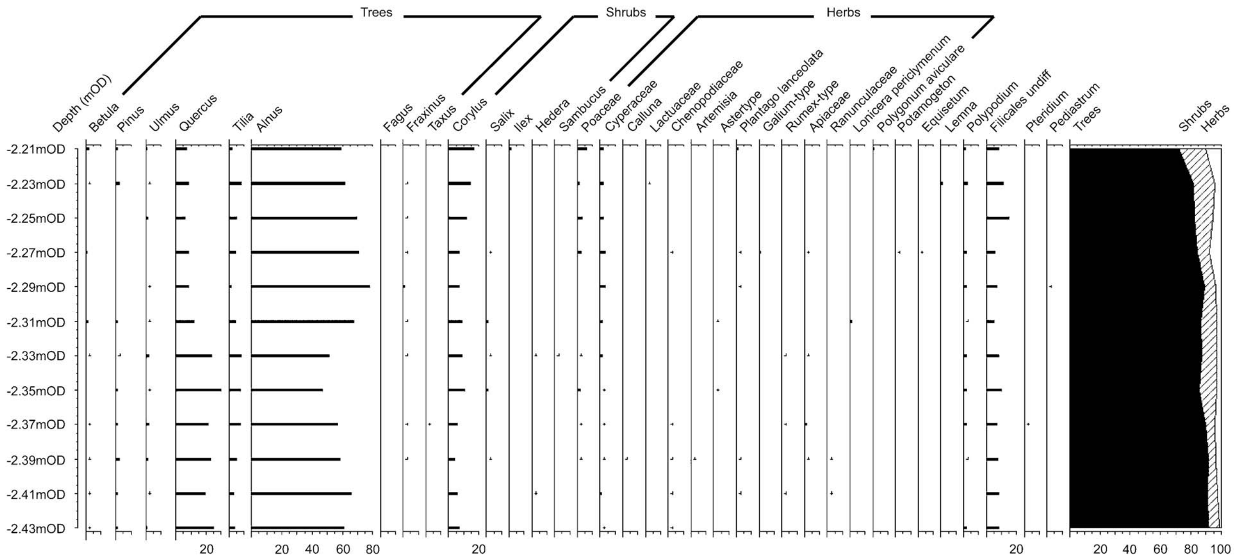

Fig. 11.
Pollen diagram through Structure 1 trackway (Column C11)

samples this deposit is unusual within the sequence. Although not directly associated with Structures 1 and 2 this charcoal rich deposit is roughly contemporaneous and in close proximity and suggests the presence of fuel-using anthropogenic activities in the area. The basal peat deposits contained a single piece of oak wood and in subsequent layers hazel and alder were recorded.

The peat deposits associated with Structure 1 are dominated by small wood fragments, twigs, monocotyledon stem fragments, and root wood although occasional seeds, predominantly alder and catkins, are also present. No wood chips that would suggest *in situ* woodworking are apparent in the assemblages although it should be noted that preservation in these deposits is generally poor and wood fragments are soft and frequently distorted. Both roundwood and root wood were frequently observed in the bulk samples, although these roundwood fragments do not provide direct evidence for brushwood being used for consolidation of the structure as has been recorded in contemporary structures elsewhere, such as Corlea, Co. Longford, Ireland (Raftery 1996). Peat located immediately above Structure 2 contained hazel nut shell fragments and a possible juvenile acorn.

Summary: Samples from deposits associated with the Neolithic timber structures have produced limited assemblages of macrobotanical remains. The small assemblages support the evidence for alder dominated vegetation as anticipated and suggest the presence of hazel and oak in the vicinity which corresponds well with taxa recorded in the pollen sequence. Bulk samples provide little insight into the broader range of taxa, including understorey elements that must also have been present and that are indicated in a borehole pollen sequence (Bates & Jones 2008) and in the pollen sequence from this site. The absence of species such as lime or yew (*Taxus baccata*) is notable as these are recorded in the corresponding pollen diagram, albeit in low counts. These samples provide no conclusive indication of anthropogenic influences on vegetation, either in the immediate environment or in the broader landscape.

Pollen
(Sarah Jones & Mike Walker)

The pollen diagram (Fig. 11) is dominated by arboreal and/or shrub taxa, particularly alder, most probably *A. glutinosa*, which is recorded in counts of 45% TLP in all samples. Other arboreal and shrub taxa that are well represented include oak, lime, and hazel. There are isolated counts for birch, pine (*Pinus*), elm (*Ulmus*), ash, yew, and willow, suggesting only a limited local presence of these taxa. Values for non-arboreal pollen are low, with only grasses (Poaceae) and sedge (Cyperaceae) showing a consistent presence in the pollen record, although there is a relatively strong representation of ferns (*Pteridophyta*), including *Polypodium*. Sporadic occurrences of herbaceous pollen suggest the presence of both tall herb (eg, Apiaceae: cow parsley) and low herb (eg, *Ranunculus*; buttercup) communities, while the occurrence of taxa often associated with saline habitats (eg, *Chenopodium*: goosefoot, and *Aster*: daisy) point to the nearby presence of saltmarsh. Overall, the pollen record reflects a floodplain vegetation of alder fen carr with a ground flora dominated by ferns, interspersed with stands of mixed deciduous woodland in which alder, oak, lime, and hazel were the dominant elements. There is, however, a gradual change in the pollen record through the C11 diagram. The highest values for oak and lime are found in the pre-structural peats, below –2.35 m OD and both elm and pine also occur in these levels, but from 2.35 m OD upwards, there is a decline in (or disappearance of) all of these woodland taxa. This is reflected in the phytoliths, which suggest wood types dominate below the trackway but grass types dominating above.

Phytoliths
(Alison Weisskopf)

Phytoliths were present in all the samples although preservation was variable and mostly poor. There is a clear variation in densities of phytoliths between samples (Fig. 12). The sample from C11 –2.21 to –2.22 m OD contains the most morphotypes per gram of sediment (223,786) in contrast to C11 –2.25 to –2.26 m OD; 4959. Preservation does not seem in anyway related to the depth of the sample. The most common single cell morphotypes (long smooth – grass leaves, cones – Cyperaceae, platey – dicot/wood) have been plotted (Fig. 13) and exhibit a clear pattern. Grass percentages tend to increase over time, while platey forms decrease. Cyperaceae only appears in the lower samples.

Below –2.37 m OD phytoliths are dominated by high proportions of platey forms suggesting this part of the sequence was dominated by woody plants. In places multi-celled jigsaw puzzle shaped phytoliths are also present. These are found in leaves, usually from trees. There are few grasses, and all indicate leaf/stem fragments. Between –2.33 and –2.34 m OD the peat contains evidence of sedges (cones), which are most commonly found on the nutlets of Cyperaceae. Diatoms were also present in this particular sample, although degraded and unidentifiable to species, pointing to a damper environment than the other samples. Black phytoliths are also present and suggest burning.

At a depth of –2.29 to –2.30 m OD (base of Structure 1) there is little variation in single cell morphotypes.

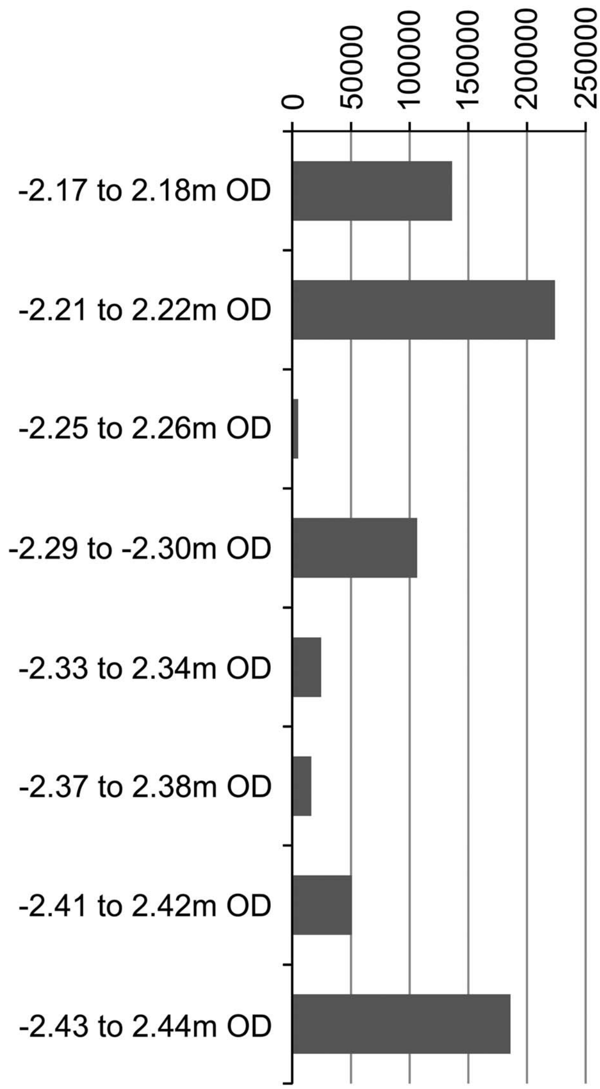

Fig. 12.
Total phytolith densities per gram of sediment

Grass leaf/stem is present and there are also phytoliths indicative of wood. The relatively high level of multicellular forms from grass husks might suggest the deposit was laid down during the summer months. Of the identifiable dicotyledons there was evidence of dicot leaves (polyhedrons). This morphotype is often found in oak leaves but is not restricted to oak. The short cells from grass leaves (rondel, bilobe, and saddle shaped) suggest a mixture of grass sub-families, mostly Pooid (rondels/*Stipa* type rondel) but with a rare Panicoid (bilobe). This sample also contained the highest proportion of Cyperaceae (sedge).

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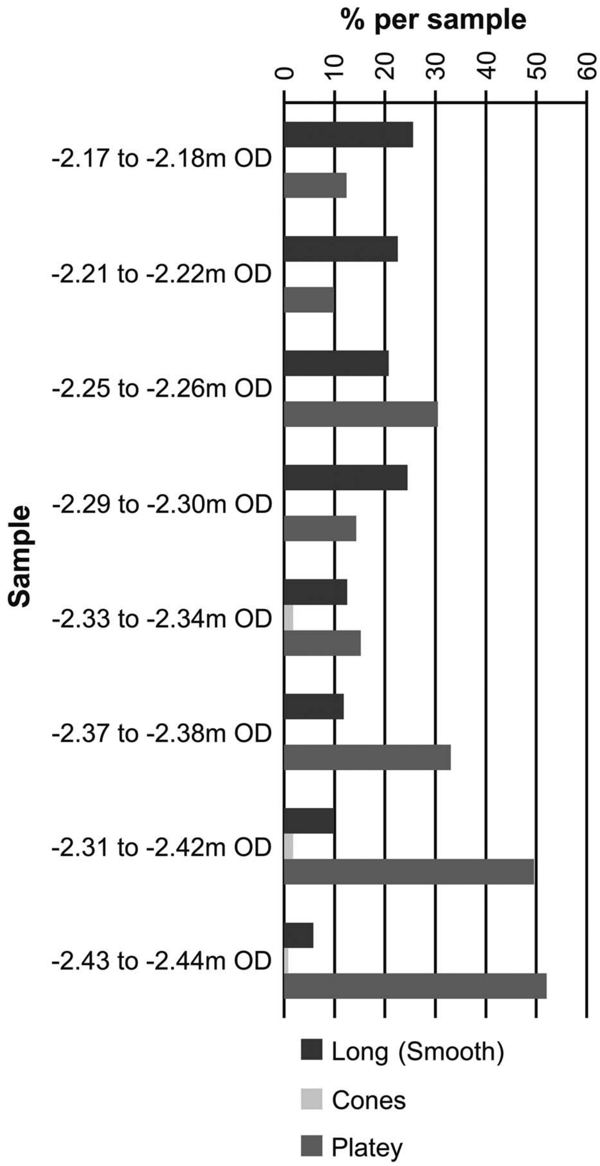

Fig. 13.
Percentage of grass, Cyperaceae and wood single cell morphotypes

DISCUSSION

(Mike Bamforth, Martin Bates, & Diccon Hart)

Aspects of technology and construction

In terms of primary working and conversions, basic methods of splitting are recorded from the Mesolithic onwards, as is a wide range of examples of secondary splitting. Similarly, the main categories of secondary working are also well represented from the Mesolithic onwards (Coles & Orme 1983, 43). Therefore, the simple reductions of the timbers from these structures are in keeping with the woodworking technology of the Early Neolithic period.

Similar large timbers, tangentially split from the outside of a round, were recorded as part of a Neolithic platform in Stirlingshire. However, it was postulated that these large items may have been debris resulting from squaring up a large timber (Ellis *et al.* 2002, 253). The primary method of conversion employed in the Silvertown structure also appears to be tangential splitting, with examples from both the outside of a round and from inner sections of a parent trunk present (Crockett *et al.* 2002, 204).

Experimental work and comparative studies carried out on prehistoric wooden remains from the Somerset Levels concluded that whilst the introduction of metal tools did not greatly affect the techniques of woodworking, the change in tool technology did lead to differences in the style of woodworking (Coles & Orme 1983, 43). However, it has been shown that metal tools are somewhat more efficient at many tasks than stone tools (Mathieu & Meyer 1997). This differing efficiency may contribute to at least one technique that seems to be unique to the use of stone tools. Experimental archaeology has shown that stone tool efficiency can be increased by relying on techniques of cleaving rather than cutting (Jorgensen 1985). Essentially, this technique relies on cutting parallel grooves in the wood and then cleaving away the material between the grooves. Supporting evidence for this postulated method has been recorded on the Mesolithic material from Star Carr in the form of parallel sided, tangentially aligned woodchips which also display parallel grooves (Mellars *et al.* 1998; Conneller *et al.* 2013). Parallel-sided Neolithic wood chips have also been noted from the Stanwick Long Barrow (Taylor & Bradley 2007). Although no parallel-sided wood chips were recorded from this assemblage, timber [153] has parallel grooves that may be indicative of this method of woodworking.

In constructional terms, Neolithic and Bronze Age trackways in Britain and Ireland utilised a wide range of materials, including brushwood, roundwood, coppiced poles, unconverted logs, and split timbers, in almost every conceivable combination to achieve their primary purpose: to facilitate access across soft or boggy ground. These range from simple paths of brushwood, such as the Garvins tracks of the

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Somerset Levels (Coles & Orme 1977) or many of the Bronze Age examples from the north-east London wetlands (eg, Meddens 1996; Stafford *et al.* 2012), which utilised readily available resources in the vicinity with a minimum of modification, to sophisticated cradle-type constructions such as the Sweet Track (Coles & Coles 1986), which required careful planning and preparation of various component parts off-site prior to assembly.

In construction the Belmarsh trackways are similar to the plank paths found in Irish and British Bronze Age contexts and which generally consist of a single or double line of longitudinally laid planks, usually supported on short transverse 'sleepers'. Of course, there is no evidence for the use of supporting tranverses in the construction of the Structure 1 trackway, though it is quite possible that any such structural elements lay beyond the limits of the excavation. Alternatively, the trackway could have been constructed without recourse to transverses, such as the Early Bronze Age trackway excavated at Bramcote Green, which consisted of little more a line of cleft oak logs laid directly on the peat (Thomas & Rackham 1996) and which probably comprises the closest parallel to the Structure 1 trackway. In contrast, all that appears to remain of the Structure 2 trackway are the transverse sleepers themselves and no trace of any walkway superstructure survived. The reasons for the absence of such a superstructure can only be surmised, although given that the prime function of any platform or trackway within a wetland environment is to provide an elevated deck or walkway above water, it is probable that such an elevated superstructure would have suffered greater decay than a largely submerged substructure. Similar differential preservation has also been noted elsewhere in the Thames floodplain, including the Golf Driving Range platform in Beckton (Carew *et al*, 2010, 15) and the Middle–Late Bronze Age possible platform Structure 61 excavated on the A13 Woolwich Manor Way site (Stafford *et al*. 2012, 63). It is, of course, also possible that the trackway was partially dismantled on falling out of use, particularly if the walkway was constructed of well-finished timbers that could have been used elsewhere with a minimum of modification. Alternatively, it is also possible that no such superstructure ever existed and the parallel sleeper construction of Structure 2 may have functioned more like a gridiron or similar, perhaps as an aid to moving boats in and out of the adjacent river channel (J. Sidell pers. comm.).

Perhaps the closest parallel to the Structure 2 trackway is the Bronze Age Meare Heath trackway in the Somerset Levels, which consisted of parallel transverse sleepers supporting a plank walkway, much of which had also since disappeared (Coles & Orme 1978). There are numerous similarities between the structures, such as the uneven spacing of the transverses, presumably as dictated by ground conditions, the degree of variation in the sizes of the timbers used, or their methods of conversion, being either radial or transverse splits. There are some noticeable differences too, however: the Meare Heath trackway was built predominantly in oak, for instance, while Structure 2 was built with alder, nor is there any evidence that the transverses of Structure 2 were mortised to receive securing stakes as at Meare Heath, although given the size of some of the timbers used at Belmarsh it is possible that securing stakes were not required. At any rate, it is perhaps folly to expect close correlation between structures of such disparate date, particularly given the known variation in trackway construction.

The reasons for such variability in construction are undoubtedly manifold. While cultural tradition may play a part, the form and construction of the majority of trackways and platforms probably reflects the interplay between three principal factors: the availability of resources, local ground conditions and the intended purpose of the structure. The Neolithic trackways in the lower Thames floodplain, such as those excavated at Belmarsh and Silvertown are characterised by a preference for alder timbers, usually in a wide range of sizes, which suggests a somewhat uncritical selection of material available in the immediate vicinity of the trackways. In fact, probably the only timbers in the Belmarsh trackways that appear to have been specially selected are the two large split alder timbers used to form the walkway of Structure 1, both of which are of similar size and conversion and which suggest a degree of care in the construction of the walkway itself. Similarly, the Early Bronze Age trackways at Bramcote Green, Bermondsey, were constructed utilising timbers of comparable dimensions to those used in earlier Neolithic trackways. Again, the earlier trackways show a preference for alder that indicates exploitation of timber in the immediate vicinity, although the latest trackway was constructed of oak, which must have been transported from some distance away (Thomas & Rackham 1996).

In contrast, the Middle and Late Bronze Age trackways in the north-east London Wetlands to the

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north of the Thames, which are sited along the edge of the floodplain, show a preference for brushwood in their construction that may, in part at least, reflect proximity to managed woodlands that fringed the floodplain. This would certainly seem to be the case with the various structures recorded on the A13 road scheme, analysis of which suggests the predominance of material derived from managed woodlands over wildwood timber (Stafford *et al*. 2012, 144), although elsewhere in the north-east London wetlands, evidence for woodland management appears to be minimal (J. Sidell pers. comm.; Seel 2001). The preference for larger, alder timbers in the Neolithic trackways at Belmarsh and Silvertown may reflect either increased distance from managed woodlands (both sites are located some distance into the floodplain) or minimal woodland management in the London basin during the Early Neolithic. While the balance of the evidence probably suggests the latter, the possible coppiced piece associated with the Structure 1 trackway does raise the possibility of at least some form of management in the vicinity at the time.

It should also be noted that brushwood trackways, though easily built, are relatively high maintenance structures that require the regular addition of new bundles of brushwood, perhaps almost on a seasonal basis, as previous layers of material sank into the soft underlying peat with continued use. Such periodic repairs have been noted in various brushwood trackways in the east London wetlands, including trackways excavated at the Golf Driving Range site (Carew *et al.* 2010, 20), Movers Lane, and Woolwich Manor Way (Stafford *et al*. 2012, 139). The logistics of transporting faggots or bundles of coppiced rods any appreciable distance might also be a factor at work in the construction of trackways further out into the floodplain (Stafford *et al*. 2012, 139). The use of heavier timbers in structures such as those excavated at Silvertown and Belmarsh, therefore, may attest to efforts to build more durable structures with locally available material that might not require such regular maintenance and repair.

The wider context of the Belmarsh structures: environmental change and Early Neolithic activity in the Thames floodplain

The reconstructed vegetation cover of alder fen carr and mixed woodland represented by column C11 is broadly similar to that recorded in pollen sequences of comparable age elsewhere in the lower Thames region (Batchelor 2009). There is, however, a significant change evident in both the pollen and phytolith sequences that broadly coincides with the construction of the Structure 1 probable trackway, marked by an increase in grassland taxa at the expense of woodland taxa. While this change could reflect anthropogenic clearance of the regional mixed oak woodland, an alternative (and more likely) explanation is that wetter conditions locally, arising from increased flooding and/or higher atmospheric moisture levels, led to a reduction in areas of suitable habitat for the mixed woodland trees. Certainly, the rise in the curve for alder, accompanied by an increase in sedges, points to an expansion in areas of alder fen carr at the expense of the mixed oak woodland. If this was the case, then it is apparent that the trend to wetter habitats and, perhaps, waterlogging in the vicinity of the site, occurred prior to the construction of Structures 1 and 2. Hence the trackways might be seen as an anthropogenic response to these local (or regional) hydrological changes, and a means whereby the mobility of human groups could be maintained across an expanding wetland landscape.

In this respect, the proximity of Structures 1 and 2 to a large river channel deserves further consideration: though it remains undated, it is possible that this channel was active at the time the Belmarsh structures were built and acted as a focus for their construction. Certainly, the north–south alignment of the Structure 1 trackway suggests a routeway into the floodplain from its southern margins towards the river channel, though it is equally possible that the river channel comprised a navigable 'corridor' into the alder carr, with trackways such as Structure 1 leading into the wetlands from the channel edge. Similarly, an east–west aligned trackway such as that represented by Structure 2 provides evidence for navigation within the floodplain, providing access to the river channel from other locations in the floodplain and *vice versa*. The presence of a scatter of Early Neolithic struck flint at the base of the peat sequence at Belmarsh East, 650 m north-east of Structures 1 and 2 certainly attests to activity elsewhere in the floodplain at this time and it seems probable that trackways would be required to facilitate movement as much within the wetlands as providing access in and out of them. It is noteworthy that the surface of the Shepperton Gravels at Belmarsh East is recorded at around −1.5 m OD, significantly higher than the level of Structures 1 and 2 at Belmarsh West, and suggesting the presence of a gravel island in the expanding wetlands that may also have acted as a focus for activity during the Early Neolithic. Similar patterns of floodplain land-use have been noted elsewhere in the Thames valley, such as at Yarnton in the Upper Thames, for instance, where broadly contemporary early 4th millennium cal BC sites tend to be situated on gravel eyots in the floodplain, close to the river (Hey & Barclay 2007).

The preference for ecotonal locations adjacent to river channels appears to be a trait of early Neolithic land-use throughout the Thames valley (eg, Hey & Barclay 2007, 406; Hey & Robinson 2011, 221; Meddens *et al.* 2012, 148), where rivers would have provided access corridors through the often dense vegetation of the floodplain, as well as access to a variety of resources. In fact, in the context of the lower Thames floodplain at the time the Belmarsh structures were built, the expanding wetlands would have embraced a range of emergent ecological niches (eg, Bates & Whittaker 2004, 55) that might have proved attractive to Early Neolithic populations for a variety of activities such as fishing, fowling and hunting, as well as the collection of a range of plants. The continued exploitation of wild plants in the Neolithic is widely accepted (eg, Moffett *et al.* 1989; Robinson 2000), though the relative importance of wild foods as opposed to cultivars remains disputed (cf, Jones 2000; Robinson 2000; Rowley-Conwy 2004; Thomas 1999). Similarly, wild animal species continued to form a regular, albeit minor, component of Neolithic faunal assemblages (Thomas 1999, 26). The role of fish in Early Neolithic diet remains a contentious issue (eg, Richards & Hedges 1999; Milner *et al.* 2004; Richards & Schulting 2006; Milner *et al.* 2006) but should be considered as a possibility at least; the balance of the evidence to date suggests a range of dietary adaptations in the Early Neolithic, perhaps including consumption of marine foods (Milner *et al.* 2004; Milner 2010).

In summary, therefore, the evidence from Belmarsh can be taken to indicate the construction of trackways some distance into the floodplain during the 39th and 38th centuries cal BC (68% prob.) in order to ensure continued exploitation of the wild resources offered by the developing wetlands. The evidence for cereals at sites such as Yablsey Street, or Movers Lane (Coles *et al.* 2008: Stafford *et al.* 2012), or the evidence for cultivation apparent in pollen sequences from sites such as Union Street (Sidell *et al.* 2000) certainly indicate that cultivars formed a component of Early Neolithic subsistence regimes but the relative importance of wild over cultivated foods remains open to debate. In respect of this important point, it has been argued by some that certain areas within the expanding wetlands of the floodplain, particularly riverside environments similar to that in evidence at Belmarsh, may have encouraged the continuance of essentially Mesolithic subsistence strategies during the early 4th millennium (Wilkinson & Sidell 2007). It is certainly possible that the unsuitability of an alder carr dominated floodplain for Neolithic settlement and agriculture may have fostered a greater reliance on wild foods. Whilst it has been argued that Late Mesolithic subsistence strategies based on wild resources would not support a much larger Neolithic population (Rowley-Conwy 2004, 91) this might be countered to some extent by the apparently low population density evident in London throughout the period (eg, Lewis 2000; Sidell & Wilkinson 2004). In fact, it is possible to take this argument further and suggest that such a low population density may be a consequence or reflection of a subsistence strategy with a greater emphasis on wild foods. Undoubtedly, the reality of Early Neolithic subsistence practices in London is far more nuanced than the evidence can tell us but the argument for subsistence diversity, with a mosaic of different adaptations tailored to specific environments, has much to commend it (eg, Thomas 2003; Richards 2000; Milner 2010).

Of course it is important to note, however, that the evidence from Belmarsh and elsewhere in the lower Thames floodplain for continuity in subsistence is set against a backdrop of profound change in material culture. A recent re-appraisal of the start of Neolithic activity in Britain, for instance, as defined by the presence of markers such as cultivars, domesticates, pottery, and monuments, suggests the Greater Thames Estuary was one of earliest regions in which the appearance of Neolithic material and structures occurred, probably as early as the 41st–40th centuries cal BC (Bayliss *et al.* 2011, 738). Certainly, the burial at Yabsley Street, dated to 4230–3980 cal BC and associated with Early Neolithic Carinated Bowl pottery and struck flint, demonstrates that such early Neolithic activity was present in proximity to the floodplain (Cole *et al.* 2008). On the face of it, the sum of the evidence supports the contention made by Thomas and others (Thomas 1999) that abrupt changes in material culture were underpinned by much slower rates of transition in subsistence regimes, in the lower Thames floodplain at least.

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RÉSUMÉ

Chemins du néolithique ancien dans la plaine alluviale de la Tamise à Belmarsh ouest, circonscription de Greenwich, Londres, de Diccon Hart

En 2008 des excavations sur le site proposé pour la nouvelle prison de Belmarsh ouest, arrondissement de Greenwich, Londres, ont révélé les restes extrèmement pourris de deux voies surimposées du néolithique ancien. Ces structures, que l'on a datées au radiocarbone du premier quart du quatrième millénaire avant J.-C. en années calibrées comprennent certaines des plus anciennes structures jamais rencontrées dans le bassin londonien. Les chemins ont été découverts près de la base d'une séquence de tourbe, immédiatement au-dessus des graviers devensiens sous-jacents. Les paramètres paléoenvironnementaux associés donnent à penser qu'ils avaient été construits en réaction à une montée des niveaux de base à l'intérieur d'un environnement local de plaine alluviale dominée par des aulnaies, de manière à maintenir la mobilité à travers un paysage de terres humides en expansion. Nous présentons l'arrière-plan archéologique et géomorphologique de ces excavations et une description de leurs résultats en insistant particulièrement sur les structures néolithiques. Nous examinons la signification et le contexte plus vaste à travers une étude de leur construction, leur contexte paléoenvironnemental plus étendu et les diverses manières dont ces structures peuvent nous éclairer sur la nature des stratégies de subsistance et d'utilisation des terres au néolithique ancien dans la plaine alluviale de la Tamise.

ZUSSAMENFASSUNG

Frühneolithische Bohlenwege in der Flussaue der Themse bei Belmarsh, London Borough of Greenwich, von Diccon Hart

Ausgrabungen im Jahr 2008 auf dem Gelände eines geplanten neuen Gefängnisses bei Belmarsh West, London Borough of Greenwich, legten die stark zersetzten Überreste zwei übereinander liegender Bohlenwege aus dem Frühneolithikum frei. Diese Strukturen, die in das erste Viertel des 4. Jahrtausends cal BC radiokarbondatiert werden können, bilden nahezu die ältesten bislang im Londoner Becken freigelegten Strukturen. Die Wege wurden nahe der Basis einer Sequenz von Torfschichten gefunden, unmittelbar oberhalb einer gewachsenen Schicht aus weichselzeitlichem (Devensisan) Kies. Die damit verknüpften Paläoumweltdaten legen nahe, dass sie als Reaktion auf die steigende Erosionsbasis innerhalb einer lokalen Talaue, die von Erlenbruchwald dominiert wurde, angelegt worden waren um die Mobilität in der sich ausbreitenden Feuchtbodenlandschaft aufrecht zu erhalten. Dieser Beitrag stellt die archäologischen und geomorphologischen Hintergrunddaten zur Ausgrabung vor und präsentiert die Ergebnisse der Ausgrabung mit einem besonderen Augenmerk auf den neolithischen Strukturen. Die Bedeutung und der weitere Kontext der Strukturen werden diskutiert anhand einer Betrachtung ihrer Konstruktionsweise, des größeren neolithischen landschaftlichen Zusammenhangs und der neuen Einblicke, die die Strukturen auf die Art und Weise der frühneolithischen Subsistenzstrategien und der Landnutzung innerhalb der Themseaue geben.

RESUMEN

Pavimentos del Neolítico inicial en los aluviones del Támesis en Belmarsh, distrito de Greenwich, Londres, por Diccon Hart.

Las excavaciones realizadas en el 2008 en el emplazamiento de la nueva prisión de Belmarsh West, en el distrito de Greenwich en Londres, localizaron los restos muy deteriorados de dos pistas de madera superpuestas del Neolítico

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inicial. Estas estructuras, datadas en el primer cuarto del IV milenio cal BC, se encuentran entre las más tempranas identificadas en la cuenca de Londres. Los pavimentos se documentaron en la base de una secuencia de turbera, inmediatamente sobre gravas devensienses. El registro paleoambiental asociado sugiere que fueron construidos como respuesta a la crecida de los niveles basales, en un ambiente aluvial dominado por del aliso, con la finalidad de garantizar la movilidad en un terreno de humedal en expansión. Se presentan la información arqueológica y geomorfológica y una descripción de los resultados de las excavaciones, con un particular énfasis en las estructuras neolíticas. Se examina el significado y el contexto general incidiendo en su construcción, el contexto paleoambiental amplio, y las formas en las que estas estructuras pueden arrojar luz sobre la naturaleza de las estrategias de subsistencia y lo usos de la tierra en el Neolítico Inicial dentro de la zona de aluvión del Támesis.