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The Greater Stonehenge Cursus – the Long View

By ROY LOVEDAY[1]

The WSW–ENE alignment of the Greater Stonehenge Cursus appears to have been prefigured by the line of Mesolithic post-holes found in the Stonehenge car park. If this is not a coincidence, a means of transmission must be hypothesised since the posts could not have survived the 4000 years separation. The fact that a significant number of henges in western lowland Britain adopt the same broad alignment hints at a very long-lived mental template. That, it is argued, is likely to have been celestially triggered and tied to seasonal rhythms. Simple luni-solar calculation (akin to that determining events as disparate as the ancient Olympic festival and present day Easter) rather than precisely measureable astronomical events, would create such azimuth clustering. The focus on April sunrises or October sunsets argues for an association with the pastoral cycle.

Cursuses have presented a challenge since the earliest days of British archaeology. William Stukeley, who discovered the first of these parallel sided enclosures 800 m north of Stonehenge in 1723, concluded from its huge dimensions (2730 x 100–150 m) that it was a race track – a cursus. Representations of horses and wheels on Late Iron Age coins provided him with an 'Ancient British' context and he adjusted his careful field observations to fit the hypothesis (Stukeley 1740, 43; Stone 1947, 7–8 n4; Loveday 2006a, 14–17). This idea was not finally consigned to the waste bin of history until the mid-20th century when sectioning of the cursus ditch recovered evidence for its construction far earlier, during the Neolithic/Early Bronze Age (Stone 1947). That dating has now been given precision by the work of the Stonehenge Riverside Project team: an antler recovered, from the base of the same ditch has returned determinations of 3632–3375 cal BC (4716±34 BP; OxA–17953) and 3630–3370 cal BC (4695±34 BP; OxA–17954) (Thomas *et al.* 2009). Thus the Greater Stonehenge Cursus has been confirmed as the first exceptional monument to be constructed in the Stonehenge landscape. The nearby Lesser Stonehenge Cursus appears broadly contemporaneous (3606–3200 cal BC: 4640±100 BP; OxA 1405; 3496–3042 cal BC: 4550±120 BP; OxA 1404; Richards 1990, 73–80, 259) but its two *c.* 200 x 60 m units are nationally unremarkable (Loveday 2006a), while the great henge enclosure of Durrington Walls and the sarsen structure at Stonehenge post-date the Greater Cursus by at least a millennium (Wainwright & Longworth 1971; Parker Pearson *et al.* 2007; Pitts 2008). The fact that the huge Greater Cursus enclosure continued to be respected as much as 2000 years after its construction when 'Wessex' style round barrows were aligned alongside it (Fig. 1), confirms its pivotal role in the development of the ritual focus.

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THE PROBLEM OF PURPOSE

But what was its purpose, and that of the many other such sites constructed between *c.* 3600 and 3000 cal BC (Barclay & Bayliss 1999; Loveday 2006a; Thomas *et al.* 2009)? Size and layout preclude mundane explanations yet these structures are quite simply too long, too wide, and too slight to have ever fulfilled the obvious monumental functions of ritual architecture – to lead, focus, and impress celebrants. St Peter's in Rome, at 187 m the longest cathedral in Europe, would only just fail to fit into one of the very shortest cursusues, Barford, Warwickshire (185 m), but that enclosure was defined by ditches no more than 2 m wide and 1.0 m deep (Loveday 1989). Even if posts had been set on its erased banks, it could never have

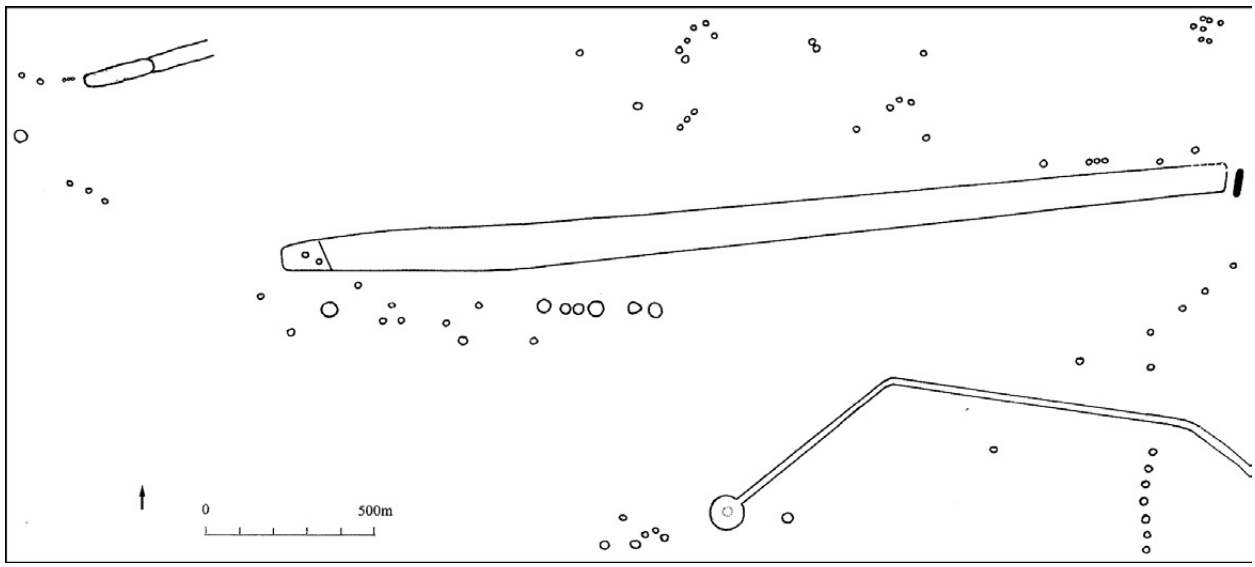

Fig. 1.
The Greater and Lesser Stonehenge Cursuses

been monumental. At the other end of the size continuum lie monuments up to 5640 m in length and 100 m in width, yet their ditches are little larger (eg. Barrett *et al.* 1991, 44–5; Thomas *et al.* 2009, fig. 6) and their interiors appear equally barren of obvious contemporary foci that might explain their purpose. The small monuments that cursuses do on occasions contain – pit-/post-circles and irregular ring-ditches (hengiforms) – are later elements by a margin of several centuries at least so cannot have furnished a primary *raison'etre* (Bradley & Chambers 1988; Whittle *et al.* 1992). Equally the earlier long mounds/long enclosures that some southern sites were either aligned upon or incorporated into their ditch lines were never so placed that the cursus could have functioned as an approach avenue like that linking the River Avon and the probable bluestone henge with Stonehenge (Catling 2009; Parker Pearson *et al.* 2010). Rather the relationship suggests closing down or burying while drawing on the earlier site's sanctity, a world-wide feature of major religious foci (eg, the Dome of the Rock, Jerusalem; Old Uppsala, Sweden).

These huge *temenoi* – for that appears their best designation, conceptualisations of space rather than functionally designed avenues or arenas – do, however, possess two distinctive features: a recurrent plan repertoire across the size continuum that points to conceptual origin in house form (Loveday 1999; 2004; 2006a; Thomas 2006) and overwhelmingly straight layout (Loveday 2006a, 24). The latter could have been a coincidental consequence of the former but the fact that cursus azimuths sometimes cluster within regions (eg, the four severely rectangular sites found in an 8 km radius of Dorchester upon Thames (Loveday 1999; 2006a, 139–41) points to deeper governing imperatives. In the search for these, landscape targets can, it seems, be excluded; they are almost entirely absent from the flat lowland terraces where cursuses are clustered and even where they do present themselves (eg, the Sinodun Hills at Dorchester upon Thames and Pentridge Hill on Cranborne Chase) the monuments are wilfully aligned away. This need not indicate disinterest (*ibid.*) but does suggest that other elements were the primary foci of those laying out the straight 'master' ditch that normally characterises one side of a cursus.

THE GREATER STONEHENGE CURSUS

The Greater Stonehenge Cursus could be an exception. The Stonehenge Riverside Project team have importantly drawn attention to the alignment of the westernmost section of its southern side ditch on a skyline notch near the summit of Beacon Hill, 8 km

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away to the east. They suggest that this was the 'master' ditch since aerial photographs reveal it to be the more regular of the two side ditches (Thomas *et al.* 2009, 51). The site might then have been a special case, incorporating alignments on both a natural feature and, after re-alignment, a man-made one – the Amesbury 42 long barrow that lies 40 m from the monument's eastern end. However, the fact that the section of cursus ditch aligning on the high ground of Beacon Hill comprises less than a quarter of the total length of the monument presents a problem. This is compounded by the fact that the rest of the southern side ditch is directed not to an obvious extremity of the long barrow, nor at its centre, but at a point about a quarter of the way along its length (Fig. 1). Additionally it is difficult to see how offsets from such a re-aligned master ditch could have resulted not in a similarly angled ditch on the north side but in one that followed an almost straight course coincident with the monument's centre line projected from the terminals. Adjustment of offset lengths to achieve this presupposes very considerable mathematical competence. Clearly the laying out imperatives of this site were complex as the authors suggest (*ibid.*), and perhaps point to an initial open ended enclosure at the western end from, or to, which the ditches were projected. The great enclosure at Godmanchester, Cambridgeshire furnishes a possible parallel as, at a lesser scale, do a number of cursus terminals that appear distinct from the bodies of their monuments (McAvoy 2000; Loveday 2006a,120–2).

That, nevertheless, the primary axis of the Cursus from such a putative early site was coincident with the straighter northern ditch, rather than the angled southern one, is strongly signalled by other features in the Stonehenge landscape. The Cuckoo Stone and Woodhenge lie on that ditch's projected line to the east (900 m and 1300 m away respectively), as 1700 m to the west does the commonly orientated Winterbourne Stoke 53 long barrow. To these can now be added the apparent pit-circle recently located by geophysical survey at Airman's Corner, *c.* 1200 m west (A. Chadburn pers. comm.). This is most unlikely to have been coincidental, particularly as the pattern is repeated elsewhere, albeit at a reduced and more generalised level (eg, Springfield, Essex; Catholme, Derbyshire; Holywood, Dumfries: Buckley *et al.* 2001; Buteux & Chapman 2009; Brophy 2000). As Aubrey Burl has commented, it is 'as though a hallowed alignment was being perpetuated' (1987, 43).

MESOLITHIC POST-HOLES

Some 700 m south of the Greater Cursus three large pits (1.5–2 m diameter x 1.3 m deep) found during extension of the Stonehenge car park in 1966 strikingly echo this alignment (Fig. 2). Faith and Lance Vatcher (1973) recovered evidence of post-pipes 0.75 m in diameter from two of these and reasonably assumed that they represented the remains of tall outlying posts associated with the Late Neolithic henge. When subsequent charcoal identification pointed to the sole presence of pine, a most unlikely species to be growing on the chalk at that time, radiocarbon determinations were obtained and their Early Mesolithic dates established: 8820–7730 cal BC (9130±180 BP; HAR–455) and 7480–6590 cal BC (8090±140 BP; HAR–456) (Cleal *et al* 1995, 43–7; Allen & Gardiner 2002). They do not represent a precise alignment – the central one lies off line by about 0.60 m – but as, taken at face value, their dates indicate they were not all standing at the same time, an approximate alignment could alone be expected. On the other hand their relatively even spacing, coupled with the comparable space left between the westernmost example and an isolated tree pit, points to purpose and integrity. Significantly of the three possible bearings, that between the outer two post-holes (A and C) alone intersects the tree-pit, conceivably marking the focus of interest. The alternative reconstruction of these features as the partially exposed shallow arc of a much larger feature would have to explain a projected diameter almost equivalent to that of the great circle at Avebury, as well as the absence of features beyond the tree-pit to the west (Fig. 2). A further feature that produced pine charcoal dated to the first half of the 8th millennium cal BC (OxA-4219–20 and GU-5109) was discovered 100 m away in 1988 (Cleal *et al.* 1995, 42–7), 30 m off the alignment of the 1966 post-holes and in the opposing direction to their slight curvature. Its post appears to have been removed and the pit refilled and shallowly recut for other purposes. It indicates further Mesolithic activity at the locale but seems not to be directly related to the 1966 alignment.

The Vatchers' report included no bearings but they do record placing aluminium poles in the centre of each post-hole to ensure accurate marking on the car park floor. Assuming these have been adhered to in the positioning of the current white blobs in the asphalt, a bearing across their centres should be reasonably accurate. Within the limits of prehistoric

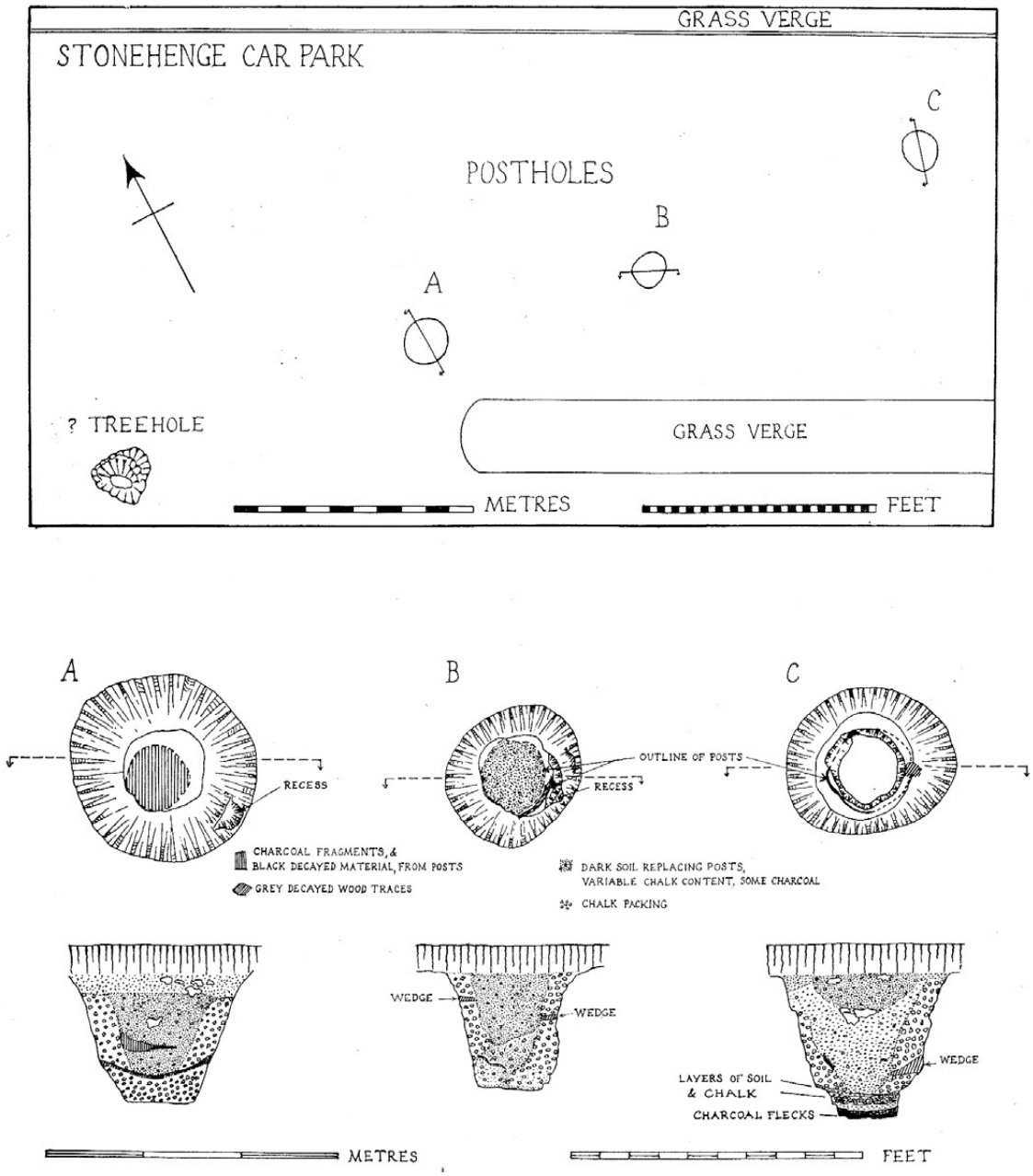

Fig. 2.
The Mesolithic post-holes excavated in 1966 (courtesy of Wiltshire Archaeological & Natural History Society)

'surveying' that between the outermost two (A and C: *c.* 86°) is effectively identical to that of the Greater Cursus alignment (north ditch 84°); the other possible bearings differ by only a few degress: B to C *c.* 83° and A to B *c.* 91°.[1] This cannot be explained in terms of a common landscape target. The 700 m separation of the north ditch of the Cursus and the Mesolithic post-holes directs observers to quite different points along

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the Beacon Hill ridge. Nor is it conceivable that the post-sockets were still visible features when the cursus was built some 4000 years later. Unless the pattern is coincidental, an alignment independent of physical markers but etched into a long enduring mental template must be supposed.

Only a celestial target would deliver such convergence and have the potential for cross-cultural transmission. Burl's suggestion (1987, 43) of approximate marking of the equinoxes by the cursus builders reasonably explains the Neolithic monument but is called into question by the far greater temporal depth furnished by the Mesolithic post-holes. The idea may adequately explain one but hardly both alignments, unless the same miscalculation was being employed. It must also be doubted that hunter gatherer groups were sufficiently sedentary to record the annual track of sunrises along a single horizon, let alone divide the resultant figure. Extreme moon rising and setting points furnish no answers, neither do those of the major stars; in addition to the absence of obvious targets, a star rising at *c.* 85° in the 9th–8th millennium BC would have risen at a significantly different point on the horizon by the mid-4th millennium BC (Ruggles 1999, 57). A common celestial target seems certain but no obvious example presents itself. Nor does one for the neighbouring, and not dissimilarly oriented, Lesser Stonehenge Cursus (*c.* 75°) that, importantly, aligns beyond the beguiling profile of Beacon Hill.

WIDER PATTERNING

Such ENE–E bearings are not restricted to the Stonehenge landscape, however. The Late Neolithic 'classic' henge monuments of the Upper Thames catchment (Barclay *et al.* 1995, fig. 35) also cluster in this arc (eg, Devil's Quoits, Stanton Harcourt, Oxfordshire, 83°; Westwell, Oxfordshire, 74°; Cutsdean, Gloucestershire, *c.* 67°). Of them only the Big Rings at Dorchester upon Thames, Oxfordshire lies on a radically different NNW–SSE alignment that suits its clear Vale of York affinities and possibly later date (Whittle *et al.* 1992). The basic tests for astronomically significant alignment – regional repetition and a lack of topographic determinants or targets (Ruggles 1999) – are satisfied not only by these sites in the Upper Thames catchment but by the wider dominance of ENE–WSW orientation in the west (Fig. 3): eight of 12 'classic' henges in a sector stretching from the Dee to the Exe estuaries projected from Oxford (Harding & Lee 1987, fig. 23; David 1998). These are the principal contributors to the very distinct ENE and WSW graphical spikes in Harding and Lee's national survey of henge entrance orientations (1987, fig. 27) and similar alignment has been noted amongst stone circles in Cornwall (Burl 1976, 127) and north Wales (Griffith 1960). To them might be added the 'east–west' entrances of the great Wessex henge enclosures at Avebury and Mount Pleasant (Wainwright & Longworth 1971, fig. 83). The fact that only two of the henges (Stanton Drew and Mount Pleasant) mirror the alignment of an immediately adjacent river precludes explanation in terms of respect (practical or spiritual) for the predominantly west–east drainage system of lowland Britain.

Strikingly, at Llandegai, Gwynedd, the azimuth of henge B (74°) differed by only 4° from that of the single entrance henge A 160 m away (258°, or 78° viewed in the opposing direction into the monument; Lynch & Musson 2004, 36 & 61). Clearly alignments at this complex were of critical importance to the henge builders. And here, as in the Stonehenge landscape, there is a suggestion that this interest may have preceded the Neolithic. On the axial line of the earlier henge (A), diametrically opposite its entrance, lay an elongated pit recorded as a 'fire trough'. It contained exclusively pine charcoal that has returned a date of 7050–6750 cal BC (7965±25 BP; GrN-27193) (*ibid.*, 39). Since the central features of the henge and a Late Neolithic cremation circle set just outside the henge entrance also align with the pit it is most unlikely that the relationship was coincidental. Yet again no obvious celestial target furnishes an explanation. Intriguingly graves in an early medieval cemetery overlying a cursus at this ritual complex are similarly orientated. In their case an immediate explanation lies in replication of the alignment of a founding mausoleum (71°) but Longley notes a wider pattern of adherence to this orientation amongst contemporary cemeteries in north-west Wales, with a peak at 75°. This he suggests corresponds to the centre of an arc of the horizon (from 66–90°) across which the sun rises at Easter, an important spring festival of resurrection and renewal (2004, 111). Could this offer an insight into the very much earlier pattern under discussion here?

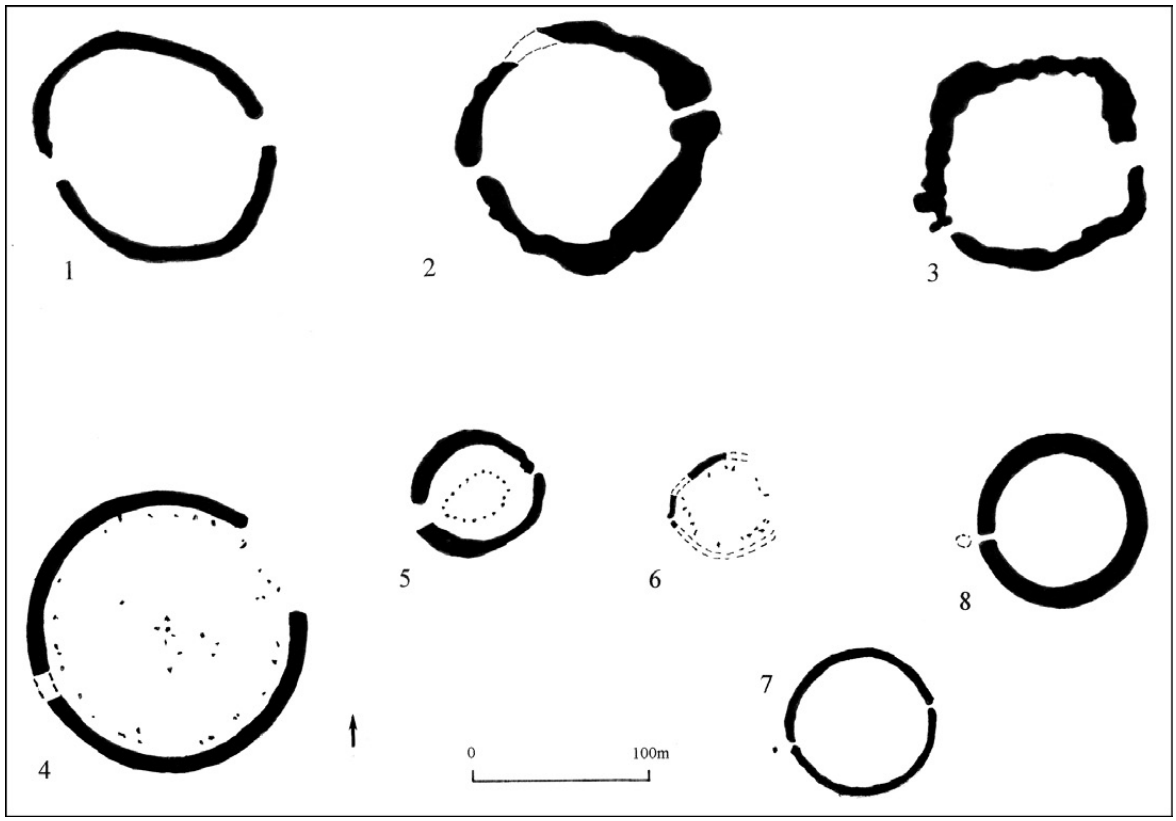

Fig. 3.
Henges in the Upper Thames catchment and western Britain with WSW–ENE bearings. 1. Devil's Quoits, Stanton Harcourt; 2. Westwell; 3 Cutsdean; 4. Stanton Drew; 5. Bow; 6. Stipple Stones; 7. Llandegai A; 8. Llandegai B (after Barclay *et al.* 1995; David 1998; Harding & Lee 1987; Lynch & Musson 2004)

ORIENTATION AND PURPOSE

The reawakening of nature would have been as much a source of relief and joy for hunter gatherers as agriculturalists but the co-ordination of gatherings at attendant festivals of supra-local extent – implied as much by substantial Mesolithic posts as by monument construction – would have presented problems. Apart from the observable extremities of the solstices, solar horizon signals (ie, risings behind a hill, declivity, or tree) could not be transposed from a local fixed point to farther flung communities, and it is to be doubted that prehistoric groups possessed either a grasp of equinox or the ability to record it adequately (Ruggles 1999, 148–51). There is no doubt that they were cognizant of the winter solstice but numerical competency to the order of 100 would have been required to establish an agreed spring sunrise signal counted from it, while the use of centrally dispatched heralds – the principal agents of festival co-ordination in societies such as classical Greece – must be seriously doubted.

Of course the moon is an obvious and universally recognised means of calibrating time that makes few numerical demands. The 11 day shortfall of its year (12 complete lunar monthly cycles) against the solar year, however, means festivals scheduled by lunar months fail to co-ordinate with the seasons (eg, Islamic calendar). Nonetheless Thorpe has noted ethnographic instances of the error caused by this discrepancy being rectified by observation of the sun, notably at winter solstice (Thorpe 1981, 277–8) and Lewis has drawn attention to the use of this solar extremity as the baseline from which lunar cycles were counted in the formative stage of the Chinese calendar

(2010, 197–8). More specifically the Olympic festival, traditionally established by 776 BC, was correlated with the second or third full moon after the summer solstice (Swaddling 1980, 12), and Hicks has suggested similar mechanisms underlay the timing of the major festivals of Celtic Ireland (2007, 190). Tacitus' statement that in Germany 'Except in cases of emergency they assemble on certain particular days, either shortly after the new moon or shortly before the full moon' hints at similar calculation; 'certain particular' (or 'fixed' according to translation) implying the use of a baseline (Mattingley 1970, 110). Here we have a simple means of widespread signalling: the fourth full (or new) moon after midwinter solstice, for instance, could be readily grasped and observed. Importantly festivals coordinated by that lunar event would coincide with sunrise azimuths as spread, but ultimately constrained, as those of Easter, a vastly later and unrelated case of luni-solar compromise and signalling (Hutton 1996, 179–81).

Alignment need not, of course, have been directed towards sunrise, nor monthly lunar cycles counted from midwinter solstice. The same pattern of clustered azimuths could have arisen instead from focus on sunsets and/or the use of midsummer solstice as the baseline from which lunar cycles were counted (roughly the third new/full moon in that case). Sunrises covered by the 67–84° arc broadly cover April and then mid-August–mid-September; sunsets broadly early February–early March and then October. We have no means of ascertaining which might have had significance in prehistory but April sunrises would mark the reawakening of nature and October sunsets its imminent demise as winter approached. Cosmologically then the ENE–WSW axis could have furnished a two-fold division of the year referencing life (spring/summer) and death (autumn/winter) (cf Darvill 1997 regarding solsticial axes). As would be expected given the common alignment of the Mesolithic post-holes, this axis appears more relevant to transhumance than the arable cycle (Evans 2000, 33–6; Fox 1996).

Molluscan evidence certainly points to the establishment of grazed downland in the area of the Greater and Lesser Cursuses (Allen *et al.* 1990, 256–7: Allen 1997, 128–31) and Barclay and Hey (1999) have argued that construction of cursuses in the Upper Thames Valley implies extensive local clearance, seemingly for grazing on a communal scale. Recent environmental evidence supports this picture both for the chalklands and the river valleys (Allen 2004; Allen & Gardiner 2009; French & Pryor 2005; French 2009; Robinson 2009). Historically transhumance was a common strategy in areas with limited arable land but sizeable uplands since it not only furnished lush, new grazing but prevented cattle trespass on the arable (Fox 1996). Comparable considerations based on restricted woodland clearance are likely to have drawn Neolithic farmers to seasonally available open land, whether upland or low-lying future flood plain, and comparable movement, albeit following rather than driving herds, undoubtedly characterised Mesolithic life ways. In both cases the Autumn division and Spring reassembly of a wider community by the practice is likely to have occasioned festivity and ceremonial as it did in the medieval period (*ibid.*, 14–15; Herring 1996, 39). If alignment of the Mesolithic post-holes with a probable tree-pit has significance it is likely to reflect focus on the tree rather than away from it, and hence toward sunset, October and dispersal.

It is the attendant assemblies that can be conjectured, particularly if marking seasonal thresholds, that seem the most plausible agents behind the huge longevity of alignment apparently witnessed. Sunstrom has drawn attention to comparable long term cross-cultural transference associated with the Black Hills of Dakota: 'immigrant groups tended to adopt the sacred sites recognized by their predecessors in the area ... this meant adopting the myths and constellations associated with particular locales, as well as adopting the places themselves ... Transference of such traditions took place between groups that differed in language, religion, economic focus, and area of origin' (1996, 187). An enduring focus, and perhaps bridge, for beliefs and attendant activities in the Stonehenge landscape conceivably lay in the Heel Stone; the fact that it alone amongst the substantial stones at Stonehenge attracted no finishing, hints that it could have been considerably older than the circle and thus sacrosanct (Pitts 2008, 15). That may equally be true of similar standing stones elsewhere (eg, Rudston, East Yorkshire: Loveday 2009, 45–6) and of outwardly unremarkable post-holes that, problems of residuality notwithstanding, the wider application of radiocarbon dating is demonstrating may have had a long ancestry, (Allen & Gardiner 2002; Murray *et al.* 2009; A. Barclay pers. comm.).

SYMBOLIC LINKS

Pit/post defined cursuses of Scotland that arguably pre-date the ditched defined sites in England and Wales (Thomas 2006; but see Whittle *et al.* 2011, 830) conceivably witness the fusion of Mesolithic pit/post settings and Neolithic house forms (cf. Crathes, Aberdeenshire: Murray *et al.* 2009). But recognition of post-holes within, and alongside the ditches of a number of the outwardly rather different, ditched cursuses of southern Britain (Topping 1982; Loveday 2006, 38–44) suggests these monuments may similarly have referenced earlier traditions, or at least shared the rudiments of above-ground structural form. The enlarged terminal banks and ditches of sites on the chalklands support the idea: although they have been interpreted as imitations of laterally placed long barrows they echo the greater size of terminal posts at the arguably earlier Scottish sites (Kendrick 1995; Rideout 1997, ill. 4; Thomas 2004, fig. 18.2). A common rationale seems likely, probably centred on the rendering of 'house' façades, *outside* which, after the example of long barrow facades, focal activity might be predicted. It is noteworthy that it is only from this point that the great Dorset cursus appears truly monumental (Loveday 2006a, 188–90).

Wherever the concept originated, as inflated long house precincts cursuses would have had the potential to symbolically express and materialise expanded group identity, presencing the summer assembled living and their collective ancestors on pasturelands during winter absence, whilst constituting negligible barriers (unless closely fenced) to free stock movement during seasonal occupation. In such a role their continued respect into the Early Bronze Age through annual 'recommissioning' festivals on group dispersal would be understandable. Group composition may have changed but the underlying pastoral mechanism with its attendant sense of greater collective identity is likely to have remained constant. The placement of round barrows in the landscape supports the idea. Away from the respected precinct of the Greater Cursus, their frequent positioning on slopes so they are skylined when viewed from coombe bottoms points to association with individual, probably seasonal, settlement locales rather than with an overarching sacred perimeter scheme delineating the environs of Stonehenge (Woodward & Woodward 1996; Watson 2002). The Lake dry valley where 'Wessex' barrows are concentrated but inexplicably largely invisible from the stone circle, exemplifies the pattern. It is repeated by the Rolleston, Shrewton, and Coniger groupings and by those along the valley of the Nine Mile River on the other side of the Avon (Loveday 2006b; Lawson 2007, 209–10). Only with the 1st millennium cal BC spread of arable farming are cursuses and barrows encroached upon.

CONCLUSION

The positioning of monuments in the Stonehenge landscape indicates that, there at least, cursus alignment was accorded great significance and was more likely to have been related to the heavens than to a local topographic feature. Broad clustering of comparable azimuths, from the nearby Mesolithic post alignment to far flung western henges, hints at associated and enduring rites probably determined by simply calibrated conjunctions of solar and lunar cycles related to the pastoral calendar. This is not to suggest an unchanging nationwide monument-based calendrical system. Elsewhere targets such as the solstices and the risen Belt of Orion can be isolated as the determinants of both cursus and henge orientation (Harding *et al.* 2006; Loveday 2006a, 137–42), while in the Stonehenge landscape the broad solsticial preference of henge builders is clear. Rather we might suppose monument form represented a widely acknowledged cosmological symbol that could be aligned to regional particularities of belief and observance, akin perhaps to the common mythologised ancestors claimed, according to Tacitus, by leagues of tribes in 1st century AD Germania (Mattingley 1970, 102). Such beliefs and observances, as the example of the Black Hills in North America demonstrates, may in some instances have been context anchored and of very long standing. The context of The Greater Stonehenge Cursus suggest it was both a successor to very much earlier elements that probably signalled seasonal change, and germinal to the elevation of the Stonehenge landscape as a supra-regional symbolic point of reference.

Endnote

[1]All alignments quoted are azimuths based on true north. Although declinations that take into account horizon height are required for precise calculation of celestial risings/settings, the alignments under discussion here are broad and little affected by elevated topography.

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BIBLIOGRAPHY

Allen, M.J. 1997. Environment and land-use; the economic development of the communities who built Stonehenge (an economy to support the stones). In B. Cunliffe & C. Renfrew (eds), *Science and Stonehenge. Proceedings of the British Academy 92*, 115–45. Oxford: University Press.

Allen. M. 2004. Discussion: the development of a farmed landscape. In C.J. Ellis, 2004, *A Prehistoric Ritual Complex at Eynesbury, Cambridgeshire*, 91–4. Salisbury: East Anglian Archaeology Occasional Paper 17

Allen, M. J., Entwhistle, R. & Richards J. 1990. Molluscan studies. In J. Richards, *The Stonehenge Environs Project*, 253–8. London: English Heritage Archaeological Report 16

Allen, M. J. & Gardiner, J. 2002. A sense of time: cultural markers in the Mesolithic of southern England? In B. David & M. Wilson (eds), *Inscribed Landscapes: making and marking place*, 139–53. Honolulu: University of Hawai'i Press.

Allen, M.J. & Gardiner, J. 2009. If you go down to the woods today; a re-evaluation of the chalkland postglacial woodland; implications for prehistoric communities. In Allen *et al*. (eds) 2009, 49–66

Allen, M., Sharples, N. & O'Connor, T. (eds). 2009. *Land and People. Papers in Memory of John G. Evans*. Oxford: Prehistoric Society Research Papers 2

Barclay, A. Gray, M. & Lambrick, G. 1995. *Excavations at the Devil's Quoits, Stanton Harcourt, Oxfordshire 1972–3 and 1988*. Oxford: Oxford Archaeological Unit

Barclay, A. & Bayliss, A. 1999. Cursus monuments and the radiocarbon problem. In A. Barclay & J. Harding (eds), *Pathways & Ceremonies. The Cursus Monuments of Britain and Ireland*, 11–29, Oxford: Neolithic Studies Group Seminar Paper 4

Barclay, A. & Hey, G. 1999. Cattle, cursus monuments and the river: the development of ritual and domestic landscapes in the Upper Thames Valley. In A. Barclay. & J. Harding (eds), *Pathways and Ceremonies The Cursus Monuments of Britain and Ireland,* 67–76. Oxford: Neolithic Studies Group Seminar Paper 4

Barrett, J., Bradley, R. & Green, M. 1991. *Landscape, Monuments and Society. The Prehistory of Cranborne Chase*. Cambridge: University Press

Bradley, R. & Chambers, R. 1988 A new study of the Cursus complex at Dorchester upon Thames. *Oxford Journal of Archaeology* 7, 271–89

Brophy, K. 2000. Water coincidence? Cursus monuments and rivers. In A. Ritchie (ed.), *Neolithic Orkney in its European Context*, 59–70. Cambridge: Macdonald Institute

Buckley, D.G., Hedges, J.D. & Brown, N. 2001. Excavations at a Neolithic Cursus, Springfield, Essex, 1979–85. *Proceedings of the Prehistoric Society* 67, 101–62

Burl, A. 1976. *The Stones Circles of the British Isles*. New Haven & London: Yale University Press

Burl, A. 1987. *The Stonehenge People*. London: Dent

Buteux, S. & Chapman, H. 2009. *Where Rivers Meet. The Archaeology of the Trent-Tame confluence*. York: Council for British Archaeology Research Report 161

Catling, C. 2009. Bluestonehenge. *Current Archaeology* 237, 22–8

Cleal, R. M. J, Walker, K.E. & Montague, R. 1995 *Stonehenge in its Landscape: the Twentieth Century Excavations*. London: English Heritage Archaeological Report 10

Darvill, T. 1997. Ever increasing circles: the sacred geographies of Stonehenge and its landscape. In B. Cunliffe & C. Renfrew (eds), *Science and Stonehenge. Proceedings of the British Academy 92,* 167–202. Oxford: Oxford University Press

David A. 1998. Stanton Drew. *Past* 28, 1–3

Evans, E.E. 1957. *Irish Folk Ways*. London: Routledge & Kegan Paul

Fox, H.S.A. 1996 *Seasonal Settlement. Papers Presented to a Meeting of the Medieval Settlement Research Group. Vaughan Paper* 39. Leicester: Department of Adult Education

French, C. & Pryor, F. 2005 Archaeology and environment of the Etton landscape. Cambridges: *East Anglian Archaeology* 109

French, C. 2009. A landscape tale of two soil histories in lowland zones of England: the fen-edge of Cambridgeshire and the downland of Cranborne Chase. In Allen *et al*. (eds) 2009, 88–104

Griffith, W.E. 1960. The excavation of Stone Circles near Penmaenmawr, north Wales. *Proceedings of the Prehistoric Society* 36, 305–18

Harding, A.F. & Lee, G.E. 1987. *Henge Monuments and Related Sites of Great Britain*. Oxford: British Archaeological Report 175

Harding, J., Johnson, B. & Goodrick, G. 2006. Neolithic cosmology and the monument complex of Thornborough, north Yorkshire. *Archaeoastronomy* 20, 28–53

Herring, P. 1996. Transhumance in medieval Cornwall. In Fox (ed.) 1996, 35–45

Hicks, R.E., 2007. Dún Ailinne's Role in Folklore, myth and the Sacred Landscape. In S.A. Johnston & B. Wailes, *Dún Ailinne. Excavations at an Irish Royal site 1968–1975*, 183–94. Pennsylvania: University of Pennsylvania Museum of Archaeology & Anthropology Monograph 129

Hutton, R. 1996. *The Stations of the Sun. A History of the Ritual Year in Britain*. Oxford: University Press

Kendrick, J. 1995. Excavation of a Neolithic enclosure and an Iron Age settlement at Douglasmuir, Angus. *Proceedings of the Society of Antiquaries of Scotland* 125, 29–67

Lawson, A. J. 2007. Chalkland: an archaeology of Stonehenge and its region. Salisbury: Hobnob Press

Lewis, M.E. 2010. Evolution of the calendar in Shang China. In I. Morley & C. Renfrew, *The Archaeology of Measurement. Comprehending Heaven, Earth and Time in Ancient Societies,* 195–202. Cambridge: University Press

Loveday, R.E. 1989 The Barford ritual complex: further excavations (1972) and a regional perspective. In A.M. Gibson (ed.), *Midlands Prehistory*, 27–50. Oxford: British Archaeological Report 204

Loveday, R. 1999. Dorchester-on-Thames – ritual complex or ritual landscape? In A. Barclay & J. Harding (eds), *Pathways and Ceremonies. The Cursus Monuments of Britain and Ireland,* 49–66. Oxford: Neolithic Studies Group Seminar Papers 4

Loveday R. 2004. Contextualising monuments. The exceptional potential of the middle Trent Valley. *Derbyshire Archaeological Journal* 124, 1–12

Loveday, R. 2006a. *Inscribed Across the Landscape: the Cursus Enigma*. Stroud: Tempus

Loveday, R. 2006b. The Valley of the Grand. *British Archaeology* 88, 22–3

Loveday, R. 2009. From titual to riches – the route to individual power in later Neolithic eastern Yorkshire? In K. Brophy & G. Barclay (eds), *Defining a Regional Neolithic: the evidence from Britain and Ireland*, 35–52. Oxford: Oxbow Books

Longley, D. 2004. The early medieval cemetery. In Lynch & Musson 2004, 106–115

Lynch, F. & Musson, C. 2004. A prehistoric and early medieval complex at Llandegai, near Bangor, north Wales. *Archaeologia Cambrensis* 150 (2001), 17–142

Mattingley, H. 1970. *Tacitus. The Agricola and the Germania*. London: Penguin Books

McAvoy, F. 2000. The development of a Neolithic monument complex at Godmanchester, Cambridgeshire. In M. Dawson, *Prehistoric, Roman, and post-Roman landscapes of the Great Ouse Valley*. York: Council for British Archaeology Research Report 119

Murray, H.K., Murray, J.C. & Fraser, S.M. 2009. *A Tale of Unknown Unknowns. A Mesolithic pit alignment and a Neolithic timber hall at Warren Field, Crathes, Aberdeenshire*. Oxford: Oxbow Books

Parker Pearson. M., Cleal, R., Marshall, P., Needham, S., Pollard, J., Richards, C., Ruggles, C., Sheridan, A., Thomas, J., Tilley, C., Welham, K., Camberlain, A., Chenery, C. Evans, J., Knüsel, C., Linford, N., Martin, L., Montgomery, J., Payne, A. & Richards, M. 2007. The age of Stonehenge, *Antiquity* 81, 617–39

Parker-Pearson, M., Pollard, J., Thomas, J. & Welham, K. 2010. Newhenge, *British Archaeology* 110, 15–21.

Pitts, M. 2008. Stonehenge, *British Archaeology*, 102, 13–17

Richards, J. 1990. *The Stonehenge Environs Project*. London: English Heritage Archaeological Report 16

Rideout, J.S. 1997. Excavation of Neolithic enclosures at Cowie Road, Bannockburn, Stirling, 1984–5. *Proceedings of the Society of Antiquaries of Scotland* 127, 29–68

Robinson, M. 2009. *Ena Montana* (Drap.) and Neolithic woodland regeneration in southern England. In Allen *et al*. (eds) 2009, 198–200

Ruggles, C. 1999. *Astronomy in Prehistoric Britain and Ireland*. New Haven & London: Yale University Press

Stone, J.F.S. 1947. The Stonehenge Cursus and its affinities. *Archaeological Journal* 104, 7–19

Stukeley, W. 1740. *A Temple Restor'd to the British Druids*. London

Sunstrom, L. 1996. Mirror of heaven: cross cultural tranference of the scared geography of the Black Hills. *World Archaeology* 28, 177–89

Swaddling, J. 1980. *The Ancient Olympic Games*. London: British Museum

Thomas, J. 2004. Materiality and traditions of practice in Neolithic south-west Scotland. In V. Cummings & C. Fowler (eds), *The Neolithic of the Irish Sea. Materiality and Traditions of Practice*, 174–84. Oxford: Oxbow Books

Thomas, J. 2006. On the origins and development of cursus monuments. *Proceedings of the Prehistoric Society* 72, 229–42

Thomas, J., Marshall, P., Parker Pearson, M., Pollard, J., Richards, C., Tilley, C. & Welham, K. 2009. The date of the Greater Stonehenge Cursus. *Antiquity* 83, 40–53

Thorpe, N. 1981. Ethnoastronomy: its patterns and archaeological implications. In C. Ruggles & A. Whittle (eds), *Astronomy and Society in Britain During the Period 4000–1500BC*, 275–88. Oxford: British Archaeological Report 88

Topping, P. 1982. Excavation at the cursus at Scorton, north Yorkshire, 1978. *Yorkshire Archaeological Journal* 54, 7–21

Vatcher, F. de M & Vatcher, L. 1973. Excavation of three post-holes in the Stonehenge carpark. *Wiltshire Archaeology & Natural History Magazine* 68. 57–63

Wainwright, G.J. & Longworth, I.H. 1971 *Durrington Walls: excavations 1966–1968*. London: Report of the Research Committee of the Society of Antiquaries of London 29

Watson, A. 2002. Round barrows in a circular world: monumentalising landscapes in Early Bronze Age Wessex. In J. Brück (ed.), *Bronze Age Landscapes: tradition and transformation*, 207–16. Oxford: Oxbow Books

Whittle, A., Atkinson, R.J.C., Chambers, R. & Thomas, N. 1992. Excavations in the Neolithic and Bronze Age complex at Dorchester-on-Thames, Oxfordshire, 1947–1952 and 1981. *Proceedings of the Prehistoric Society* 58, 143–201

Whittle, A., Healy, F. & Bayliss, A. 2011. *Gathering Time. Dating the Early Neolithic Enclosures of Southern Britain and Ireland*. Oxford: Oxbow Books

Woodward, A. B. & Woodward, P.J. 1996. The topography of some barrow cemeteries in Bronze Age Wessex. *Proceedings of the Prehistoric Society* 62, 275–91