

Astronomy, ritual and the creation of Neolithic landscapes at the passage graves of Ireland and Scotland

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Abstract

Recent work has begun to establish clear patterns in the typology, location and orientation of Neolithic passage grave sites in Ireland and northern Scotland. This paper will argue that passage-graves should be considered in terms of a 'network' comparable to Neolithic networks of interaction reconstructed on mainland Britain. Such networks display a common set of features: the distribution of similar monuments, portable objects and ritual and exchange practices. It will be argued that there is a further element that defines the Irish and Scottish passage-grave network: their orientation to key points in the solar cycle. This, it will be suggested, has significant implications for developing our understanding of the ways in which landscapes were created in the Neolithic. Such a landscape was understood in terms of the relationship between time and place, the earthly and heavenly realms and the movement of time and its cyclical return. Constructing a landscape out of such ritual and cosmological understandings was, it will be suggested, a major influence on later Neolithic monuments and on the ways in which agriculture came to be accepted and developed across the British Isles.

Introduction

Understanding the ways in which large tracts of land, whether at 'local', 'territorial' or 'regional' levels, came to be known and used during the Neolithic in the British Isles has long been a subject for investigation and remains a key question in terms of the adoption and spread of agriculture. Central to this question is the emergence and spread of monuments. Recent work has begun to establish that monuments were a primary medium for the shift from a hunter-gatherer to an agricultural conception of landscape (e.g. Barrett 1994, Tilley 1994, Bradley 1998). Monuments, it is argued, facilitated a change in thinking about the ways in which land could be seen, used and understood. In so doing, they helped to make possible the increased clearing of the landscape for horticulture and pastoralism, because they provided a medium through which indigenous communities could conceive of and thus exploit an increasingly domesticated landscape.

Included in this work is a focus on the development and potential role of what Richard Bradley and Mark Edmonds have called 'networks' (1993). Bradley and Edmonds define a network as a discrete zone of interaction demarcated by similar sets of monuments (and different from sets in other areas), the distribution of a discrete repertoire of portable objects, and by implication, a shared set of exchange, social and ritual practices that underpin the typology and distribution of the monuments and objects.

The concept of networks emerged from earlier attempts to explain the close typological similarities between monuments which in some cases were many hundreds of miles apart. In particular, clarifying why there were highly similar examples of late Neolithic henge monuments in the far north and south of the British Isles was key to wider paradigms about the development of the Neolithic. In the 1970s, Colin Renfrew used the similarities between Scottish and Wessex henges to reject the culture-historical idea of diffusion and promote the idea of systems theory (1973, 1979). But Renfrew's processual approach – that henges arose independently because of similar social structures – couldn't adequately account for discrete clusters of similar monuments and objects found so far apart. If there had been an abandonment of movements of people across the landscape as a plausible explanation of such patterns, the movement of their objects and ideas remained a powerful possibility.

Networks of interaction: examples and interpretations

By the early 1990s, Bradley and Edmonds had been able to define and reconstruct several networks or zones of interaction in both the earlier and later Neolithic in Britain; one of which, dubbed the 'henge-Grooved Ware network', explicitly explained the distribution of late Neolithic henges as representative of a network of interaction between northern and southern Britain (1993: 179-91).

The shift to thinking about the development of monuments across the landscape in terms of networks not only helped to explain how discrete typological sets of monuments existed within and across regional areas in the British Isles. It also helped to extend speculation about why people were building monuments across the landscape, in this way. Approaches varied from the small scale and theoretical to the large scale and more practically grounded. Christopher Tilley used the basic insight of a 'network' of monuments to focus on the earlier Neolithic landscape of south Wales (1994). Combining this insight with a phenomenological approach, Tilley was able to show how monuments defined existential or 'sacred' locales (places of belonging or being) rather than claims to an economic or agricultural territory.

Tilley argued there was real continuity between the Mesolithic and early Neolithic uses and understandings of the landscape (1994: 202-8). Monuments appeared to be the key innovation in this transition, and were used, he argued, to 'fix' a landscape already understood in terms of core motifs such as places of natural power and the paths between them. Monuments may therefore have 'fixed' pre-existing Mesolithic 'networks', already understood in terms of the creation of a human community within the natural world. It was therefore the artificial way in which monuments 'memorialised' this landscape that formed one of the conditions through which the encounter with domestication was first grasped among these indigenous groups.

While Tilley's focus was small-scale, Bradley and Edmonds were concerned with evidence for interaction zones across far larger territories. In particular, they argued that the pivotal network to develop in earlier Neolithic Britain was one that extended from Yorkshire, across the Pennines into Cumbria, lowland Scotland and Ulster (1993:158).

The Yorkshire Wolds sequences suggest that during this phase long barrows were succeeded by round barrows and collective cremation rites were replaced by single inhumations of adult males. Similar long-round barrow monuments are found across the Pennines in the Eden valley, in eastern Ireland, and down the east coast of Britain, into East Anglia and the Thames valley. As the early Neolithic developed, long-round barrows are found in these regions in increasing proximity to other monuments. In Yorkshire and elsewhere, barrows are directly associated with both cursus monuments and with early Neolithic enclosures and these monumental complexes often "command the main routes across the Pennines into Cumbria" (1993:162). It is at these monuments that major concentrations of elaborate artefacts including axes, some originating from other parts of the country, were deposited.

Bradley and Edmonds argued that the construction and use of these mortuary, ritual and enclosure monumental complexes would have "provided the opportunity for large numbers of people to gather together at single locations" (1993:162). Once there, they exchanged objects and engaged in ritual practices such as burial and deposition. Moreover, over time, this Yorkshire-based network became a dominant zone of interaction, pulling in others, particularly those of southern England (1993: 164-78).

Among the key points to emerge from this work was the emphasis on evidence in the earlier Neolithic for relatively long distance networks of interaction. Central to the spread of these 'culture zones' were the construction of similar monuments, exchange of material objects with social and ritual as well as economic value, and a shared set of ritual practices, including burial and feasting. In addition, these zones of interaction had sufficient cultural clout to displace and supersede other discrete cultural networks. In other words, this evidence points to interactions that include but go beyond a formalising of Mesolithic values in respect to the landscape. They indicate innovations in landscape use that relate to core aspects of the take up of agriculture.

An emphasis on long distance exchange and ritual at monumental complexes indicates the importance placed on land clearance and the use of paths for pastoralism, the exchange of objects that symbolise

the tools of clearance (axes) and the exchange and feasting of domesticated animals. It also indicates the importance placed on bringing more and more people to similar places, the sharing of cultural values and world views: an expansion of the social and cultural as well as the economic landscape. Finally, the power of one network to displace and take over another would suggest the value of innovation and control, of specific ways of doing and being that include and refer to, but also transform earlier social, economic and ritual practices.

Irish and Scottish passage-graves: a Neolithic network?

This tension, between the formalising and respecting of ancient, hunter-gatherer approaches to landscape and the pursuit of innovation within and across it is pivotal to the ways in which social territories in the Neolithic became established and acted in turn as instigators for further change. Perhaps this is best illustrated by the major claim of this paper: that the passage-graves of Ireland and Scotland should be seen as a network, comparable to those reconstructed on mainland Britain.

It has long been recognised that passage-graves have a unique Atlantic-based distribution pattern (Iberia, Brittany, Ireland, Wales and northern Scotland) reflecting social beliefs and practices specific to this region. Earlier generations of archaeologists such as Stuart Piggott advanced diffusionist or culture-historical explanations for their distribution, and the debate about the degree to which it reflects movements of people across the sea, from Brittany to Ireland and Ireland to Scotland, is ongoing (see for example, Cunliffe 2001, Sheridan 2003). But passage-graves have not been explored in terms of a network as defined by Bradley and Edmonds. Yet, in all respects, passage-graves conform to the generic features of those networks reconstructed elsewhere in the British Isles.

Between c 37-3000 BC, the number and size of passage-grave sites across Ireland and northern Scotland increased dramatically (Mercer 1992, Bergh 1995). The monuments shared typological features, a characteristic that became increasingly emphasised over that long time frame (Sheridan 1986). The Irish sites also shared a common set of portable objects that are routinely deposited at the passage-graves across their distribution. Key features of their typology and use indicate a set of shared ritual practices and moreover, the nature of their distribution pattern indicates an emphasis on paths, high places, rivers and the sea – a network much like that identified by Tilley in south Wales, but on a larger scale (Prendergast 1998, Cooney 2000).

The formal identification of passage-graves as a ‘network’ may be instructive for two reasons. The first is that, as Bradley has argued, the emergence in Brittany of a round monument with a passage and chamber may indicate the first monumental tradition in the earlier Neolithic of North West Europe that draws directly on indigenous views of time and space (1998: 51-67). Clearly passage-graves invoke a different concept of space than the long mound tradition that so overtly recalls the Neolithic long houses of mainland Europe. Moreover, the addition of a passage and chamber, through which the dead can be repeatedly accessed, suggests the practice of ancestor cults rather than the funerary rituals associated with long mounds (Barrett 1994: 50-2).

These innovations, along with the well established presence of Mesolithic groups across the Atlantic zone distribution of passage-graves, would suggest they reflected strong indigenous traditions – comparable to those indicated in the Mesolithic-early Neolithic transition in south Wales. At the same time, passage-graves possess many of the features of large scale Neolithic networks. As such, they may provide us with very direct evidence as to how such groups negotiated the uptake of farming in the context of those traditions that impeded and those that facilitated such a change.

The second is that the evolution of passage-graves across the western half of the British Isles is crucial in terms of our understanding of the emergence of the monuments and networks of the later Neolithic. Like the Yorkshire-based interaction zone, the typology and use of passage-graves may have come to influence other areas. In recognising the ways they functioned as a ‘network’, it may be possible to explore more fully and precisely exactly what it was about passage-graves that contributed to the emergence of a new set of monuments – and the practices with which they were associated - from around 3000 BC.

The passage-grave network: key features

Using Alison Sheridan's five stage framework for passage-grave evolution in Ireland, it is possible to isolate key typological aspects that represent the developing role of passage-graves as 'places of power' (1986). Between stages one to four these included: the evolution of passages and chambers giving access to the remains of the dead, the emergence of megalithic art, the addition of 'roof boxes' above passage entrances and the deposition of a range of objects including beads, balls, pendant miniatures, pins and flint flakes.

Stage five, dated to 3100-2900 BC, represents the zenith of passage-grave construction in Ireland. Monuments of this phase include Knowth, Dowth and Newgrange at the Boyne valley, Maeve's cairn, Knocknarea, Co. Sligo, Loughcrew cairn D, and possibly the passage-graves at Tara and Fourknocks. These massive monuments have kerbs of between 50-90m in diameter, three to six times larger than other tombs in their respective clusters, and are much more elaborate versions of pre-existing forms. Features of these monumental complexes include quartz walls facing around the tomb entrance, other entrance settings and features such as standing stones, the Newgrange roof-box, decorated and finely worked stone basins and the distinct and elaborate 'official' art style covering many of the megaliths at the Boyne valley. There is also an increase in exotic and cultic items: the familiar deposits are accompanied by objects such as ceremonial maceheads and conical stone objects.

Moreover, the locations of the large sites directly invoke their connections as inter-related places. In the words of Martin Brennan:

The view from Loughcrew is panoramic, from the mountains near Sligo in the far west to those above Carlingford on the east coast. Visible to the naked eye from this height are a number of important megalithic sites, including Fourknocks and Tara. In turn, Tara is visible from all three of the major mounds in the Boyne valley - Knowth, Newgrange and Dowth (1983:69).

Passage-graves and astronomy

If we can locate a series of key features that point to the ways in which passage-graves represented places in the landscape where people gathered for exchange and ritual, there is one feature that perhaps above all others helped to articulate such gatherings. This was the focus on astronomy that became most elaborate with the building of the large sites c 3000 BC.

At the Boyne valley sites, it is well established that Newgrange is oriented to the winter solstice rising sun (O' Kelly 1983). If we take the evidence for all three large passage-graves at the Boyne valley, and their satellite passage-graves, a more complex astronomical pattern emerges. Their passages and chambers appear to be oriented to mark the movement of the winter solar cycle, from equinox to equinox, with a focus on mid-winter solar alignments at Newgrange and Dowth at the heart of the complex (Prendergast 2004).

Functional and complex astronomical orientations have been documented at the Loughcrew passage-graves, as has the close relationship between astronomy and megalithic art (Brennan 1983, O' Brien *et al.* 1987). At Loughcrew cairn T, the light of the rising sun at spring and autumn equinox focuses a beam of light directly through the passage onto the back of the chamber (Brennan 1983:94-5). At the back of the chamber it hits stone 14, which is highly decorated with notations, wheels and solar emblems. As the shaft of light moves across the stone it focuses directly on, and frames these solar images, before moving out of the chamber.

At cairn L, the beam from the rising sun on the November/February cross-quarter day enters the chamber and hits the inner standing stone. After ten minutes, the beam moves away from the standing stone and hits stone 17, the reflected light of which fully illuminates the chamber recess, with its stone basin and elaborately decorated back lintel (1983:110-1).

Similar – but more elaborate – interplays between astronomy, passage-graves and rock art are evident at the Boyne valley. Brennan – and more recently Moroney (1999) - have shown that the rock art in the chamber at Dowth clearly had meaning and significance in relation to its winter solstice setting sun orientation. Both Brennan (1983:127-205) and O' Brien (1988) have detailed the integral relationships between passage-grave art and the winter solstice and equinoctial orientations at Newgrange and Knowth. As Aubrey Burl has commented on the passage-graves at the Boyne valley:

The conjunction of art and astronomy in these tombs is striking. 'A tradition had long existed that the rising sun at some unspecified time, used to light up the 3-spiral stone...in the end chamber of the tomb' at Newgrange (O' Kelly 1978:111), suggesting that the spiral itself may have symbolised the sun or the journey that the dead were believed to follow (1981:247).

A similar emphasis on astronomy and rock art is evident at the passage-graves on Orkney in northern Scotland. The late passage-graves, on the Mainland and other islands, are typologically almost identical to those of the Boyne valley and were probably built around the same time. Euan Mckie has demonstrated that the passage and chambers of Maes Howe – the largest and most elaborately constructed of the Orcadian passage-graves - have orientations close to and designed to mark the winter solstice setting sun (1997). In addition, the rock art at several Orcadian passage-graves is almost identical to that at the Boyne valley (David and Henshall 1989: 82-3, Eogan 1992: 124) and may have interacted in comparable ways with astronomical alignments.

Astronomy and the development of networks

If astronomy was such an important part of prominent passage-graves such as those at the Boyne valley, what role did it play in helping to articulate the wider network of passage-graves? Further, in what way did it represent both old – hunter gatherer - and new – agricultural - values? To frame the question more precisely: with the emphasis on the winter solstice at the Boyne valley and Maes Howe on Orkney, how and why did an emphasis on the *winter solstice* help to articulate such values?

First and most obviously, the date for gatherings at the monuments would have been structured by a moment such as the winter solstice. Such dates, and the meanings associated with them, would have provided the timing for exchanges, burials, deposition and initiation.

What meanings may the winter solstice have had in relation to such ritual? Perhaps the most important thing to stress about solstice orientations is that they represent a focus on *seasonality*. That is, they are concerned to mark the turnings and moments in the cosmological cycle, whether annual or bigger in scale - such as solar and lunar harmonisation or the precession cycle – from a highly terrestrial perspective. A concern with the seasons – defined by the solstices and equinoxes – is one found equally with European hunter gatherers and early agriculturalists. In non-tropical latitudes, the seasons govern most resource availability whether wild or domesticated (see for example Mellars (1994) and Mithen (1994) on the highly seasonal nature of European Upper Palaeolithic and Mesolithic resource procurement strategies). They are hence of prime concern when marking key points in food production and consumption cycles whether these are based on hunting or herding, plant gathering or horticulture.

Thus, we can see how a focus on the winter solstice acted to cut across the hunting and gathering and agricultural divide; of equal importance to both, the transition to agriculture represented and was represented by the innovative practice of enshrining a concern with seasonal cycles into ritual architecture, placed across the landscape.

If we can directly identify the place of the winter solstice as one of continuity between hunter gatherer and agricultural subsistence cycles we can therefore directly locate its importance in helping to define a network that itself invoked an ancient understanding of landscape *and* acted to transform it. An emphasis on winter reveals the inter-connected nature of economic and cosmological understandings of landscape, since not only did it invoke ritual associated with resource availability, it also had overt cosmological symbolism. The winter solstice is the darkest point of the year and thus, as a special astronomical moment, a gateway to the heavens. The darkest point invokes a journey to death, clearly evidenced at Newgrange by the penetration of the sun through the specially constructed roof box to the burial depositions in the inner chambers. It also invokes a 'return', both in terms of death and a rebirth as the days get longer, but also in terms of the passing of time and the return, each year, to the same

still point of the solstice. In other words, a ritual focus on the solstice invokes the play between time and its passing, and timelessness, a moment of return which is also eternal.

If these meanings, and their reproduction across the Irish and Orcadian sites, were being invoked by and at passage-graves, this may enable us to identify how these ritual concerns helped to define the ways in which the passage-grave network was developed and elaborated. The reproduction of meanings associated with astronomy, including the winter solstice, may also help to further our understanding of the influence of this Irish-Scottish network on the emergence of the monuments of the later Neolithic.

Passage-graves to henges: astronomy in the later Neolithic

We have already seen that the Yorkshire-based network of the earlier Neolithic displaced those of southern England from around 3300 BC. This was in turn superseded c 3000 BC by the 'henge-Grooved Ware' network - defined by the distribution of henges from the far north, in Orkney, as far south as Wessex in southern England (Bradley and Edmonds 1993: 179). It is generally agreed that henges – and Grooved Ware (the pottery with which the monuments were associated with) – were first found in the far north of Scotland, most likely on Orkney itself. Moreover, there is strong chronological, typological and spatial evidence to suggest that Scottish henges emerged directly out of the late Orcadian passage-graves, built c 32-3000 BC.

The direct evolution of northern henges and stone circles (which were often found within henge or henge-like banks and ditches) from large passage-graves has been explored in some detail (Bradley 1998a and 1998b). Bradley argues that there is little doubt that the shape of passage-graves formed the basis for the round open air monuments that followed. In addition to continuity in meanings associated with the circular monumental form, there are continuities in placing astronomy at the heart of the new henges and stone circles, and using it to define and shape ritual practice (for a general discussion of the relationship between astronomy and henges, see Burl 1983). The Ring of Brodgar, a kilometre away from Maes Howe, has clear orientations embodied into its stone circle (Ruggles 1999: 63-7). This central feature of the Orcadian henges is reproduced at other sites during the transition and development of the later Neolithic in Scotland.

Although the direct typological origins of Wessex henges lies with the causewayed enclosures of the south, as the henge-Grooved Ware network developed c 3-2500 BC, they displayed an increasing convergence with northern henges. Close typological similarities exist between northern and Wessex henges, including timber circle henges such as Balfarg in northern Scotland and Durrington Walls in Wessex (Mercer 1981). Grooved ware is increasingly deposited at southern henges in a direct reproduction of practices at their northern counterparts. And astronomy is a notable feature of many of the Wessex monumental landscapes, including the great sites of Avebury and Stonehenge.

What is remarkable at Stonehenge is that the astronomical evidence indicates an emphasis on the summer and winter solstices, with a particular focus on the winter solstice sun. There is strong evidence that the primary axial orientation at Stonehenge itself is to the winter solstice setting sun (North 1996). Moreover, current excavations have revealed that this was complemented by an orientation to the winter solstice rising sun at the nearby Durrington Walls henge (Owen 2007). In other words, like the Newgrange, Knowth and Dowth passage-graves at the Boyne valley and Maes Howe on Orkney, the monumental complex at Stonehenge functioned primarily as a site dedicated to astronomy and the ritual meanings associated with it, with an emphasis on the meanings associated with the winter solstice.

Such a repeated emphasis on the winter solstice suggests it was a key Neolithic cult. We have explored how it helped to articulate the complex transition between hunter-gatherer and agricultural world views by representing a cosmic and cosmological 'fixed' point for both hunting and gathering and domestic forms of production, and the sacred meanings associated with them. We have also explored how it was reproduced across long distance monumental networks as the Neolithic gathered pace. As such, it was a core astronomical motif within the wider ritual deployment and elaboration of astronomy at Neolithic monuments. And this use of astronomy was one element in a range of architectural and ritual elements designed and used to 'hold together' a landscape that was still understood in terms of ancient values but which was also changing fast.

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