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Published Version

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Bradley, R. and Watson, A. (2024) Sailing to Calanais: monument complexes and the sea in the Neolithic of western Scotland and beyond. *Proceedings of the Prehistoric Society*, 90. pp. 253-277. ISSN 2050-2729 doi: 10.1017/ppr.2024.10 Available at <https://centaur.reading.ac.uk/122106/>

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To link to this article DOI: <http://dx.doi.org/10.1017/ppr.2024.10>

Publisher: Cambridge University Press

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Sailing to Calanais: Monument Complexes and the Sea in the Neolithic of Western Scotland and Beyond

By RICHARD BRADLEY¹ and AARON WATSON²

Ever since Alexander Thom visited Calanais in the Outer Hebrides, groups of Neolithic monuments in western Scotland have been studied in relation to the land and the sky. Less attention has been paid to their close relationship with the sea. These places were secluded and could be difficult or dangerous to reach, yet details of their architecture suggest that there were close links between them. How important were long distance connections between 3000 and 2000 BC? Were some ceremonial centres visited by boat? And was the journey itself treated as a rite of passage? The case extends to structures in Orkney and Ireland.

Keywords: Stone circles, megaliths, henges, astronomy, seafaring, travels, rites of passage

In August 1933 Alexander Thom was on a yachting holiday in the Hebrides (Fig. 1). One evening he moored his boat in Loch Roagh on the island of Lewis. ‘As we stowed sail, I well remember looking up and seeing the full moon rising over the low land and there, silhouetted against the orb, were the Stones of Callanish’ (quoted by Burl 1993, 65). He went to visit the monument. He was already interested in astronomy but it was this experience that led him to embark on the studies for which he became famous. The relationship between prehistoric structures and the sky has dominated discussions of Callanish (modern researchers prefer to use its Gaelic name *Calanais*). Thom’s work helped to develop the discipline of archaeoastronomy and he took a particular interest in stone settings along the Scottish coast (Thom 1967).

That first visit to Calanais might have inspired a different kind of research. Why were those monuments near the water? And why did they overlook a sheltered inlet where visitors could moor their boats? Such questions are seldom asked by researchers concerned with landscape archaeology. They pay too little attention

to the relationship between stone circles and the sea which provides the subject of this paper. It is concerned with monuments on the west Scottish mainland and the islands of Lewis and Arran. It also extends to other parts of Scotland and sites in Orkney and Ireland.

The focus is on three groups of stone, timber, and earthwork circles. All are in regions where people could travel by water. Although the structures are low lying, there are mountains further inland. That might have discouraged long journeys across country, as it did in the historical period (Campbell 2001). The sites themselves date from the Late Neolithic, although their currency extended into the Chalcolithic and Early Bronze Age: a sequence that ran between about 3000 and 2000 BC. Some lack any evidence of chronology and are attributed to these phases by comparison with the archaeology of other regions. All the sequences began with a phase of cultivation and these places assumed their special significance only later.

Three complexes are considered in detail here. From north to south, they are: Calanais, Kilmartin Glen, and Machrie Moor. Kilmartin Glen is on the Scottish mainland but the other two are on islands (Fig. 2).

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CALANAIS SITE 1 AND ITS NEIGHBOURS

The monument encountered by Thom, Calanais Site 1, possessed several elements: an avenue of paired



Fig. 1.

A yacht moored on the sheltered water below the main stone circle at Calanais (photograph: Richard Bradley)

standing stones, three shorter rows of monoliths, an unusually tall stone circle, and a small chambered cairn (Ashmore 2016). The focal point was a crag, Cnoc an Tursa, below which was a cave (Richards 2013, 261–71). Like other prehistoric structures in the area, the site combined a prominent summit with a sloping ridge of high ground but it was more conspicuous than its counterparts and its distinctive shape could be identified from a distance. Viewed from lower ground, the circle and avenue dominated the skyline (Fig. 3).

Access

Thom first went to Calanais because of its protected location. To find a sheltered mooring he had sailed inland for 10 km from the open water of the Atlantic. As he said: '[Loch Roagh] lies on the north-west coast [of Lewis], its outer bastions of rocks and islands protecting it from the fury of the Western Ocean, here

subject to a gale frequency barely surpassed anywhere else' (Thom 1967, 122).

Like Thom, visitors could approach these monuments along Loch Roagh. They might also have followed Loch Barraglom. It seems as if the Calanais complex was unusually accessible by boat. The principal site was sheltered by an island immediately to its west and the high ground on which the Neolithic structures were built was bounded by water on three sides and separated from the area further east by a valley which could have been subject to flooding (Fraser Sturt pers. comm.). The standing stones were set apart from the surrounding region. That did not apply to smaller monuments in the vicinity, although one was close to the water. While there were other stone circles on Lewis (Burl 2000, 202), the emphasis was towards the west. That contrasts with the distribution of modern harbours which depends on more sheltered conditions along the east coast of the island (Fig. 4).



Fig. 2.

The locations of the sites considered in this paper

The local context

There were two groups of stone circles around Calanais (Richards 2013, 224–80). Four were not far from the shoreline, which was about 3 m below its modern level (Fraser Sturt pers. comm.). These monuments were conspicuous and solidly built, and Calanais Site 2 may have replaced a timber setting in the same location. Like Site 1, it would have overlooked a sea loch leading from the Atlantic. Another five stone circles were on rather higher ground. Colin Richards suggests that they were linked to the remaining examples by routes leading across the island (2013, 231–4). It would have taken less work to erect these monuments. The uprights might have lacked sockets. They were supported by piles of boulders and could not have remained intact for very long. One of these circles, Na Dromannan, has been excavated. In contrast to Site 1, it produced no artefacts apart from a single hammerstone (Richards 2013, 235–51).

Depending on the local tree cover (Bishop *et al.* 2018), the stone circles in both groups might have

been seen from one another, although only Site 1 would have had views in all directions. There have been many claims of celestial alignments within this complex. They involve both the sun and moon but the case is by no means clear as it draws on folklore of unknown origin and a subjective interpretation of the southern horizon as the profile of a recumbent human figure (Ponting 2007, 34–5). Thom's observation of the moon at Calanais Site 1 is consistent with more recent studies of stone rows (Ruggles 1984; Higginbottom 2020), but the simplest observations involve the position of the sun. Viewed from the end of the avenue, it would appear above Cnoc an Tursa and set into a distant mountain at the midwinter solstice (Burl 1993, 64). Today the cave emits a narrow beam of light which has been described as a 'sun dagger'. According to McHardy: 'Inspection revealed that the bright sun was shining through a small slit between the rocks ... The shaft moved from west to east ... Closest to midday the beam shines down directly into the cave ... as well as out into the forecourt... The length of the beam and the surrounding shadow vary from summer to winter' (McHardy 2014, 197).

This phenomenon might have drawn attention to the special character of this chamber. So could its resemblance to a megalithic tomb. The ridge with the standing stones had a similar profile to a Neolithic long cairn, but on a very much larger scale. The outcrop and the cave were towards its highest point.

Sequence

The comparison is intriguing as there are no structures of this kind nearby. The distribution of chambered cairns on Lewis is wider than that of stone circles (Henshall 1972, map 5). By the time that the first tombs were built, the site of the main monument at Calanais was already being used as farmland and a little cereal pollen is recorded from the vicinity (Bishop *et al.* 2018). The position of the later monuments was occupied by a small earthwork enclosure (Ashmore 2016). After it had gone out of use, cultivation resumed before the next structures were built there. The sequence is difficult to establish but it seems as if the alignment of monoliths was the most significant element. From the outset it was directed towards the cave (Bradley 2024a, 127–30). People approaching Cnoc an Tursa along this avenue



Fig. 3.

Views of the main stone settings at Calanais. (A): The monument complex seen in profile from the east. The stone circle is in the centre of the image. The avenue approaches it along the ridge from the north (right) and extends as far as the rock outcrop (Cnoc an Tursa) to the south (left). (B): The avenue approaching the stone circle from the north. (C): The natural cave below Cnoc an Tursa (photographs: Richard Bradley)

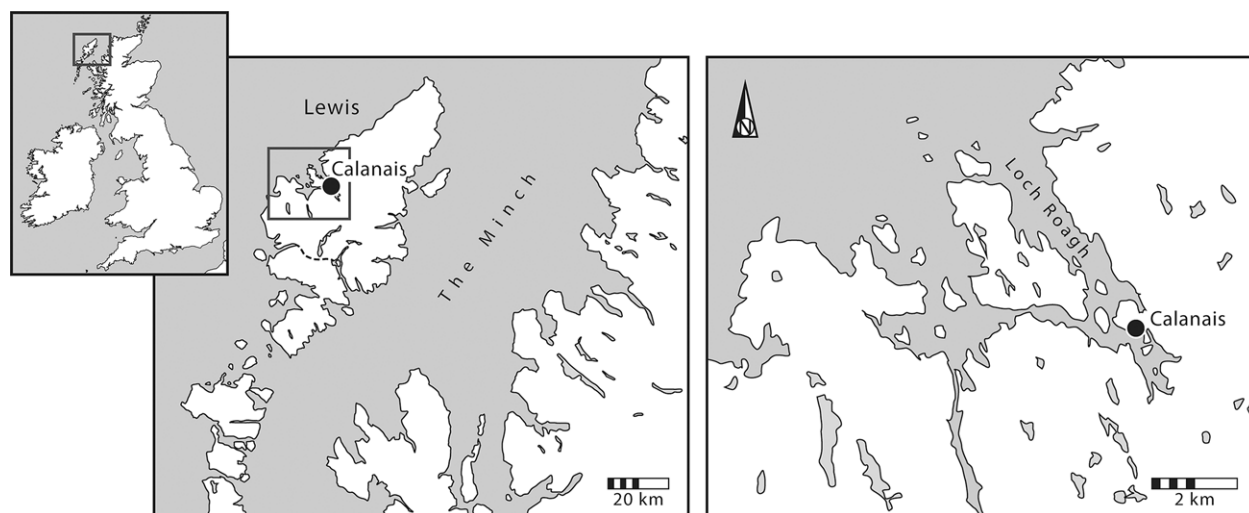


Fig. 4.

Map showing the location of Calanais in relation to the sea lochs to its west and the position of Lewis in the western seaways



Fig 5.
The chambered tomb inside the stone circle at Calanais Site 1 (photograph: Richard Bradley)

would have to pass through a setting of exceptionally tall standing stones (Figs 3 & 5). It was erected in front of the crag but 60 m to its north. Excavation showed that it was built in the early 3rd millennium BC (Ashmore 2016).

After that time the layout changed and a small wooden building was established on a clay platform inside the eastern half of the circle. It was succeeded by a cairn with a corbelled chamber which could have been intended to supplement or replace the cave (Fig. 5). Although its form resembled that of other Scottish megaliths (Henshall 1972, 461–2), it was associated with Beaker pottery and was an exceptionally late example (Ashmore 2016). During subsequent phases the site was re-used for Early Bronze Age burials. That also happened at the simpler monuments nearby.

Comparable developments have been identified at Kilmartin and on the island of Arran.

THE KILMARTIN COMPLEX

The monuments around Kilmartin are more diverse but had an equally long history. Pollen analysis has identified an initial phase of agriculture (Jones *et al.* 2011, 148–67), and the surviving structures extend from a group of Clyde Cairns and one or possibly two cursuses to post circles, a timber avenue, an earthwork henge, several flat cemeteries, and an alignment of Early Bronze Age cairns (Fig. 6; RCAHMS 1999; Sheridan 2012). The same region contains an unusual quantity and variety of rock art (Jones *et al.* 2011). There have been modern excavations, but much of the available information comes from work undertaken almost a century ago. That sets obvious limits on what can be said today.

Access

The history of sea-level change across Scotland is complex due to the differential distribution and

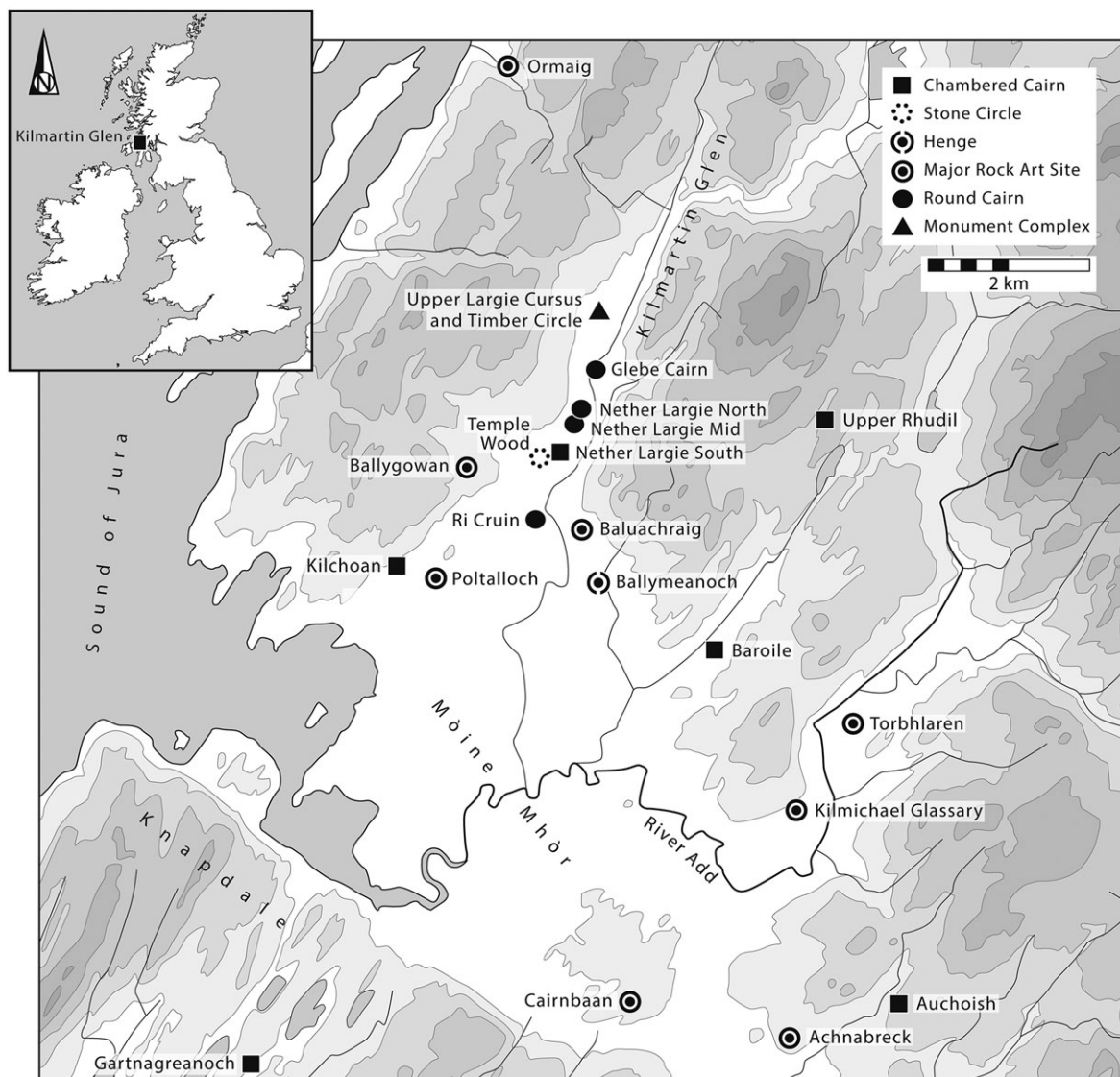


Fig. 6.
Outline map of the Kilmartin region, showing the key sites featured in the text

impact of glacial loading, subsequent erosion, and aggradation. Where sea levels were potentially lower at Calanais for the period considered in this paper, they were likely higher in the Kilmartin area due to its regional rate of isostatic uplift. This means that when the monument complex developed the shoreline was up to 8 m above its present level (Sturt *et al.* 2013; Fraser Sturt pers. comm.). It means that the local topography has changed since the Neolithic period. Mòine Mhòr, the low lying wetland between the early

structures and the coast, was once a shallow bay where deeper channels led through an intertidal zone. There were other connections to the sea (Figs 7 & 8). South of Kilmartin, Loch Gilp extended further inland than it does now and, on the exposed west coast, there would have been a small inlet at Ormaig and a larger bay at Kintraw. They could have provided shelter from the elements and, taken together, they enclosed the distribution of monuments. Further protection was provided by the island of Jura 7 km across the water to

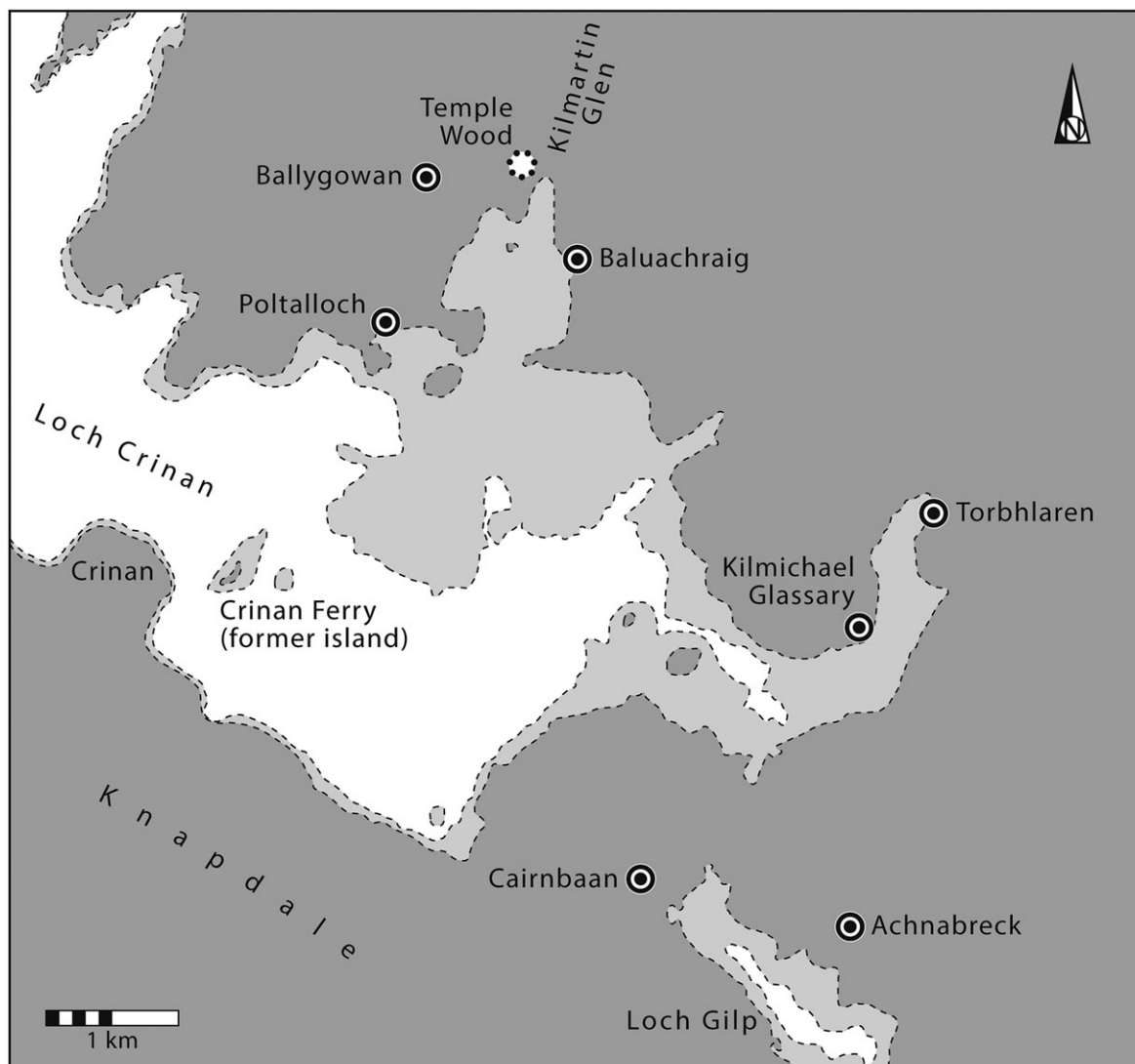


Fig 7.

Reconstruction of the shoreline around Kilmartin in 3000 BC, showing the position of the major panels of rock art and the location of a former island at Crinan Ferry. The extent of open water is unshaded, and the intertidal zone is indicated in light tone (analysis by Fraser Sturt)

the west. Analysis employing Geographical Information Systems shows that the panels of rock art commanded views out to sea (Jones *et al.* 2011, 227–36).

During the Neolithic period the major sites could be reached along four routes. They might be approached by boat along Loch Gilp and Loch Fyne or from the small bays on the west coast; panels of Neolithic rock art overlooked potential landing places at Achnabreck

and Ormaig (Fig. 6). Some of the prehistoric monuments were associated with a valley leading from the north-east, but the Mòine Mhòr must have provided the main way into this landscape. People left the open water of Loch Crinan and passed a conspicuous island separated from the mainland by a narrow tidal channel. It divided the Kilmartin complex from the coast but its archaeology is little known, although it



Fig. 8.

The entrance to the bay at Crinan, with the former island at Crinan Ferry in the centre of the picture (photograph: Richard Bradley)

includes a series of rock shelters (RCAHMS 1999, 107). One contained a Beaker burial.

The local context

Most analyses of the Kilmartin complex employ the methods of landscape archaeology. They consider the placing of monuments and panels of rock art in relation to paths and local topography (Barnett *et al.* 2022a; 2022b), but do not place sufficient weight on connections with the sea.

That is not surprising since almost all the local monuments were of kinds found in inland regions. It was their relationship with one another that made them so unusual. Their sheer abundance was exceptional and so was their variety. Like neighbouring areas, they included several Clyde Cairns, but they also featured one or two cursuses, stone circles, and post circles, as well as a timber avenue (Sheridan 2012). At Ballymeanoch there was the only henge in this part of the country (RCAHMS 1999, 24) and the Kilmartin complex contained an unusual concentration of flat cemeteries with burials in massive cists. There was also a line of Early Bronze Age cairns

which had only one parallel in northern Britain (Sheridan 2012).

The local rock art was exceptional, too. It was often ornate, and the panels were unusually extensive. The oldest pecked designs at Achabreck resembled Neolithic motifs in Orkney (Watson 2022) and those at Ormaig had parallels at Loughcrew in Ireland (Fig. 9; Shee Twohig 1981, 205–20). Their histories may have extended into later periods, and the results of fieldwork suggest that the simpler panels were associated with deposits of artefacts rather than the most complex sites (Jones *et al.* 2011). Two cists in the southern part of this complex re-used stones decorated in the same style as Late Neolithic Grooved Ware (RCAHMS 1999, 25 & 37). Others featured depictions of early metalwork (Watson & Bradley 2021). Ore was available locally but, at present, it seems more likely that copper was imported from Ireland (Sheridan 2012). It is no coincidence that Kilmartin was accessible from the sea.

Nearly all these elements had a feature in common for they shared a common axis extending from north-east to south-west. It was the orientation of Kilmartin Glen, but these directions were also those of the



Fig. 9.

Rock art at Achnabreck (left) and Ormaig (right). Both may have overlooked former landing places (photographs: Aaron Watson)

midsummer sunrise and midwinter sunset respectively. This was the axis of the stone settings at Temple Wood as well as a decorated outcrop at Torbhlaren. The Early Bronze Age linear cemetery followed the same alignment. In the winter the decorated outcrop at Achnabreck commanded a view of the sun as it passed over Arran (Watson 2022).

Sequence

Despite the problems of chronology, the sequence at Kilmartin is clear. There were local developments, as well as more general patterns.

The most obvious evidence comes from individual sites. In one case a ring of large posts was replaced by a stone circle with a square setting at its centre (Scott 1989). Other monuments were re-used after an interval. That was certainly the case with the long cairn of Nether Largie South (RCAHMS 1999, 21–3) and the same applied to the later of two neighbouring monuments at Temple Wood (Scott 1989). Decorated cist slabs in the Early Bronze Age cemetery might have begun life as monoliths (Watson & Bradley 2021), and the main panel of rock art at Achnabreck saw two distinct phases of activity (Watson 2022). Excavated structures in Kilmartin Quarry were built at intervals between the Early Neolithic and the Bronze Age. They included a small barrow or ring-ditch associated with an unusually early Beaker grave (Cook *et al.* 2010).

As their name suggests, Clyde Cairns were often near the sea, but it was in the Late Neolithic period that the distribution of so many different monuments

and petroglyphs focused on this particular area. Towards its outer limits, exceptional groups of rock carvings overlooked Loch Craignish and Loch Gilp. Some of the structures – a timber circle, an avenue, two stone circles, and a henge – were further from the water's edge and were more directly associated with Kilmartin Glen. This development continued in the Early Bronze Age when a line of cairns extended along the valley floor. They did not have views out to sea (Jones *et al.* 2011, fig. 8.14) but, on the northern edge of this complex, at Kintraw, another cairn was constructed near the water (Simpson 1967).

MACHRIE MOOR

Like Calanais, the monument complex on Machrie Moor is on a large island. Arran is between the Scottish mainland and the Mull of Kintyre and its mountains can be recognised on the horizon from the Kilmartin area 45 km to its north. A group of structures is located near the shore. The main concentration includes six stone circles of different forms and a conspicuous outlier (Burl 2000). The area contains a series of Beaker and later settlements, some of which have been excavated (Barber 1997).

Access

Like the monuments at Calanais, those on Machrie Moor were near the exposed west coast of the island, rather than the east coast where the main harbours are today (Fig. 10). On the other hand, one of the principal ways across the island is between the

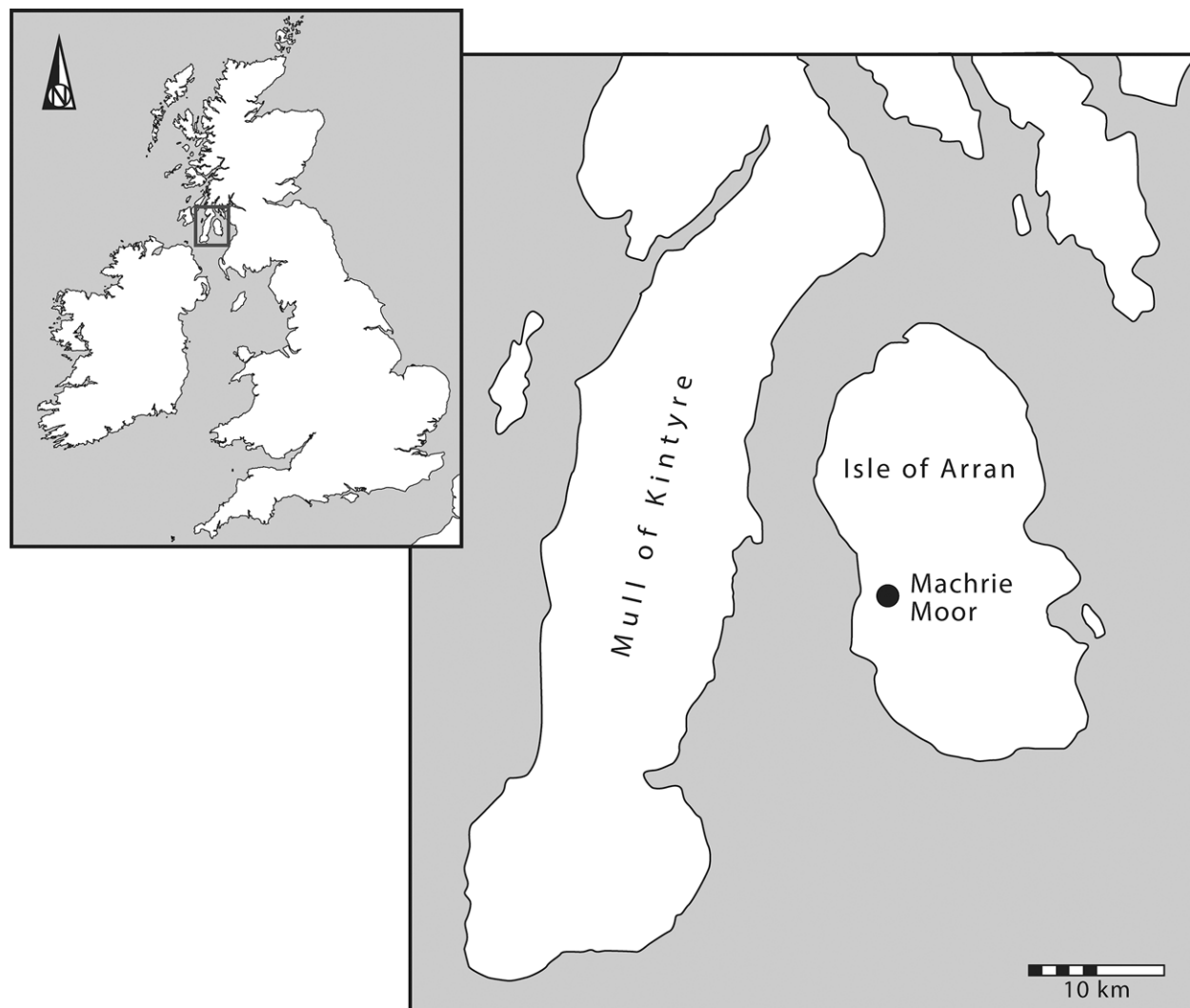


Fig. 10.
The location of Machrie Moor and the position of Arran in relation to the surrounding seaways

prehistoric structures and the modern port of Brodick which is overlooked by a major panel of rock art (Morrison 2010); this route might have been significant in antiquity. On a local scale, the main group of stone circles is connected to the sea along two routes. The shorter follows the course of the Machrie Burn for 2 km, and the other is along a valley running for 5.5 km from Blackwaterfoot.

Like Kilmartin Glen, Arran was subject to isostatic uplift during the post-glacial period and the position of the Neolithic shoreline was a short distance inland

from its modern counterpart (Fraser Sturt pers. comm.). There are indications that a bar separated the mouth of Machrie Burn from the open water and it may have been where people could land their boats. Although the west coast of Arran was exposed to strong winds, Kintyre provided some protection. While the monuments were near the sea, they occupied a natural basin from which it was concealed (Fig. 11). Only one structure – a ring cairn – is in sight of the coast and commands a view of the other structures. In most respects, they appeared to be isolated.



Fig. 11.

General view of the basin containing the main group of monuments on Machrie Moor (photograph: Aaron Watson)

The local context

Like the other complexes, Machrie Moor began with an episode, or episodes, of cultivation (Barber 1997). The main development was the construction of a series of monuments over a remarkably small area. As Aubrey Burl has observed, they are extraordinarily diverse and featured a ‘combination of architectural styles from other regions’ (2000, 89). These structures were of various sizes and there were striking contrasts in the heights of the standing stones, and their colours, shapes, and textures (Fig. 12). The builders drew on separate geological sources. Two of the circles were exceptionally tall and were constructed of pillars that may have been obtained on the coast. Another employed a more distant source in the mountains (Richards 2013, 54–9). Further construction materials included glacial erratics. It is obvious that their erection made very different demands, from the raising of small stone settings to the quarrying, transport, and erection of substantial monoliths.

Their local distribution is revealing. It is possible that four of the circles were designed as two pairs. That might account for the striking similarity between the tallest monoliths which were of the same red rock. It also applies to two neighbouring rings of stone which replaced timber circles. A field study investigated the placing of all these structures in the landscape (Barnatt & Pierpoint 1983). They would have commanded a view of the midsummer sunrise above a conspicuous feature on the horizon.

There were two unusual sites outside the main concentration. To the south-west, at Auchagallon, a circular mound with a massive kerb overlooked the coast (Welfare 2011, 493–5) and, to the south by the shore at Blackwaterfoot, was one of the largest Early Bronze Age cairns in Scotland. It covered an exceptionally rich burial containing a dagger with a gold pommel, but there is no trace of this structure today (Henshall 1968, 183).



Fig. 12.
The use of unusually tall monoliths on Machrie Moor (photograph: Aaron Watson)

Sequence

The earliest settlement on Machrie Moor could have been contemporary with the building of Clyde Cairns. They are widely distributed over the more fertile part of Arran and are recorded near the shore, but there was no concentration of chambered tombs in or around this complex (Henshall 1972, map 2). The earliest excavated monuments were two timber circles which were associated with Grooved Ware and radiocarbon dates between 3100 and 2950 BC (Haggarty 1991). They were less than 20 m apart, and the more complex structure consisted of a square setting of uprights enclosed by a ring of posts. There is no direct dating evidence for the remaining components, although the groups of exceptionally tall standing stones resembled monuments built at the beginning of the 3rd millennium. Burl compared two other structures with small square settings ('four posters') dated to the Bronze Age elsewhere in Scotland (Burl 2000, 90). It is interesting that their

positions were outside the main concentration on Machrie Moor. Like those at Kilmartin and Calanais, sites in this complex were re-used for later burials (Bryce 1862).

COMPARISONS

All three complexes had similar beginnings. They were first settled in the Early Neolithic, but only Kilmartin Glen had a concentration of Clyde Cairns. There is evidence of clearance and cultivation but, apart from an earthwork enclosure at Calanais, there is nothing to distinguish the archaeology of these places from the evidence along other sections of the coast. It is known that the inhabitants of Arran had links with distant regions. Pitchstone obtained on the island has been found across much of Scotland and in parts of northern England (Ballin 2009). It is present in Ireland, too.

The earliest monuments discussed in this paper were constructed around the beginning of the 3rd millennium BC. From the outset their architecture had certain features in common (although they were not unique to these sites). They included timber circles associated with Grooved Ware and rings of exceptionally tall uprights. At a local level they could either be isolated or they might have been paired, as they were at Temple Wood and on Machrie Moor. In each group wooden elements were eventually replaced in stone. It happened at Temple Wood, Machrie Moor Site 1, and in the main stone circle at Calanais where a small passage tomb replaced a timber building. Avenues of standing stones or posts formed part of the complexes at Kilmartin and Calanais, but their dates are uncertain.

The monuments illustrate a concern with the sky. The information from Calanais is complex and controversial. The position of the moon could have been important, as Alexander Thom supposed, and there is evidence of a connection with the midsummer sun. In Kilmartin Glen the orientations of monuments and panels of rock art indicate a similar concern but, in this case, the position of the midwinter solstice may have been equally important. Fieldwork on Machrie Moor has documented a connection between the placing of the stone circles and the position of the midsummer sunrise on the horizon to the north-east (Barnatt & Pierpoint 1983). Because these structures were in landscapes that had been settled for a long time the local inhabitants would have been familiar with the appearance of the sky at different times of year. The new development was to express that knowledge in architectural form.

All these places illustrate the importance of travel. Calanais and Machrie Moor were on islands a significant distance from the Scottish mainland; the nearest crossing to Arran is 24 km, and to Lewis it is 60 km. They provide indications of early connections by sea. These areas had been settled by farmers before most of the structures were built. They are associated with distinctive styles of megalithic tombs, decorated pottery, and stone axes. By the Late Neolithic phase, they were linked in other ways. They shared idiosyncratic features in common – from rock art to decorated pottery – and occasionally these connections were documented in physical form, like the unusually tall monoliths shared between Calanais and Machrie Moor. These complexes occupied distinctive locations. They could have been reached overland, but the main association was with the sea to their west. Away from

the exposed shoreline there were sheltered channels, inlets, and bays. On one level, coastal bars or islands provided some protection – this was the case at Kilmartin Glen and probably at Machrie Bay. On another level, there was the shelter provided by Kintyre and Jura. But neither observation applied to Calanais where the only protection was offered by sea lochs penetrating deep inland.

The modern harbours on Lewis and Arran are on the opposite side of the islands to the main stone circles. Both islands lacked earlier Neolithic monuments apart from chambered tombs. The complexes considered here were in very different locations. If they were accessed by boat, travelling there could have raised problems. Possible routes have been considered already. Journeys to, and between, these sites might have been demanding or even dangerous. Perhaps they were confined to the summer months when conditions were more favourable. It seems possible that these places were chosen specifically because such ventures were challenging. Stephanie Blankshein's simulation of prehistoric seafaring in the Outer Hebrides makes an interesting observation. Although there were potential landing places on the Atlantic coast of Lewis (including Calanais itself), any maritime havens used for longer periods would have faced east towards the Scottish mainland (Blankshein 2021).

Although the monuments were accessible by sea, they were cut off from their immediate surroundings. Calanais was effectively an island, bounded by water on three sides and by a valley on the fourth. Access to the Kilmartin complex was screened by a large island at Crinan, and Calanais was reached along two lochs leading for 10 km from the Atlantic. In the same way the stone circles on Machrie Moor were inside a secluded basin out of sight of the water. All three monument complexes shared the same characteristic. Not only were they offset from the shoreline where one might have expected to find them, they would have been secluded.

A final observation concerns the Beaker and Early Bronze Age periods. These complexes provide evidence that individual structures were re-used and new ones were created there.

WIDER CONTEXTS

Most of these comparisons extend to other areas of Scotland and Ireland. This section focuses on two

regions of Britain – Orkney, and parts of the Scottish mainland – and three locations in Ireland – the Boyne Valley, Ballynahatty, and Dundalk Bay. The most influential were probably Orkney, the Balfarg complex, and the Boyne.

Orkney

A group of Late Neolithic monuments on the Orkney Mainland extended along the isthmus between the Loch of Harray and the Loch of Stenness (Richards 2005; Edmonds 2019). They were 5 km from open water. Among the most important components were the great passage tomb of Maeshowe, two henges with internal stone circles, and a settlement, Barnhouse, where a specialised building was erected on a platform (Richards 2005). The complex was dominated by the walled enclosure on the Ness of Brodgar which contained even more elaborate structures (Card *et al.* 2020). During the Neolithic the local sea level was like that of Lewis, meaning that the amount of dry land was greater than it is today (Bates *et al.* 2013; Brend *et al.* 2020, 216–20). On the other hand, the basic topography has not changed and once the natural vegetation was cleared (Bunting *et al.* 2022) these structures would have commanded views in all directions.

The complex had many notable elements. They included decorated Grooved Ware (which probably originated in Orkney), and a distinctive style of rock art shared between houses, tombs, and artefacts. The stone circles combined raw materials brought from separate sources on the same island (Richards 2013, 68–89). The Late Neolithic dwellings featured circular buildings with square hearths in the centre, and space was organised in a similar way within the Stones of Stenness where the earthwork of a henge bounded a ring of unusually tall monoliths (Richards 2005, 644–78). Maeshowe was aligned on the midwinter sunset, but even the domestic dwellings observed solar orientations (Downes 2020).

Mainland Scotland

Two important complexes were linked to inlets of the North Sea.

Balfarg: The earlier example was at Balfarg and was connected by the River Leven to the historic port of Methil on the Firth of Forth 10 km away. A whole series of Neolithic and later monuments was excavated in advance of modern development (Mercer

1981; Barclay & Russell-White 1993; Gibson 2011). They included a pair of oval wooden structures which were interpreted as ‘mortuary enclosures’ but could have been roofed buildings (Tanja Romankiewicz pers. comm.). The same complex featured two henges, one of which was associated with both stone and timber settings. The other example was smaller, and less trace of it remained. A second stone circle (at Balbirnie) was associated with cremation burials. These early phases were associated with Impressed Ware and Grooved Ware. Later elements included a ring cairn and a Beaker burial in the middle of the larger henge; its position might have been indicated by a mound. During a secondary phase the circle of monoliths at Balbirnie was enclosed by a wall before it was covered by a cairn associated with a series of Early Bronze Age cists. Nearly all the structures in this complex have radiocarbon dates (Gibson 2011; Copper *et al.* 2021).

The Clava Cairns: In the north of Scotland, another group of important monuments was close to the mouth of the Great Glen, which provided one of the principal routes between the west coast and the North Sea. The sites were associated with the inner Moray Firth, and the main concentration was beside the Nairn, 15 km up-river and 5 km from the nearest shoreline (Bradley 2000). It is not certain when the first structures were built but they were later in date than those in Orkney. The earliest may have been a circular stone setting at Raigmore which was associated with a Late Neolithic timber building containing deposits of Grooved Ware (Simpson 1996). The structural sequence can be interpreted in more than one way (Bradley 2000, 168–70) but, like more complex structures in the vicinity, the site featured a ring of stones graded by height from north-east to south-west. Six kilometres away a linear cemetery at Balnuran of Clava included both passage graves and ring cairns; in both cases they were bounded by stone circles and, again, the kerbs and monoliths increased in height towards the south-west. These conventions must have been long lived because this complex dates from the Early Bronze Age (Bradley 2000). Two of the passage graves at Clava were orientated on the midwinter sunset.

There were related monuments in neighbouring areas to the east and south-east, although they did not occur in local concentrations by the coast. They featured ring cairns rather than passage graves but, again, they were bounded by circles of monoliths

graded in height towards the south-west where the most striking element was a recumbent stone flanked by two tall pillars (Welfare 2011). The selection of building materials was important in each region, and both these monuments and Clava Cairns were built from rocks of different colours. They seem to have shared the same chronology.

Ireland

The Boyne Valley: In Ireland the most famous group of monuments was established 12 km from the east coast and focused on a stretch of raised ground which is sometimes compared with an island. Until recently, it was best known for three enormous passage graves which occupied prominent positions above the River Boyne (O’Kelly 1982). Smaller monuments of the same kind were recorded, most of them associated with the great mound at Knowth (Eogan & Cleary 2017). Their distribution extended to the lower ground. Newgrange was enclosed by a ring of standing stones and, in the Late Neolithic period, a large pit or post circle was established beside the monument. A small timber circle with a square setting of posts in its centre was built outside an entrance to the main tomb at Knowth.

Although some earthworks had been recognised in the vicinity, air photography has provided new information. It documents a whole series of previously unrecognised monuments in between Newgrange and the Boyne (Condit & Keegan 2018; Davis & Rassmann 2021). They took several forms and the circular enclosures have been interpreted as henges. They were defined by continuous or interrupted ditches, palisades, or earthen banks around a recessed interior. Other structures were rectangular or square and were defined by massive posts. They have been compared with buildings on the Ness of Brodgar but were much larger. Other palisades defined an extensive area around Newgrange. At present only one of these elements has been dated (Leigh *et al.* 2018), but their closest parallels are Late Neolithic (Davis & Rassmann 2021). It is too soon to consider them in detail, but already two features stand out. The results of remote sensing document circular structures with square settings of pits or post-holes inside them. At the same time there were groups of enclosures of almost the same size as one another whose boundaries took completely different forms.

Ballynahatty: This complex is 8 km inland from Belfast Lough and is linked to the sea by the River

Laggan. It occupies an area of raised ground which has been compared with the position of Newgrange. Today the only visible element is a megalithic tomb inside an embanked henge monument. Again, new information comes from remote sensing, but this time it can be combined with the results of excavation (Hartwell *et al.* 2023). The most prominent element was the earthwork, Giant’s Ring, but it is now known that it was accompanied by a series of smaller enclosures and ring-ditches. The sequence began with a series of miniature burial chambers contemporary with those in passage graves during the period between 3300 and 2900 BC, but the scale and variety of monuments increased during the Late Neolithic period when a great palisade was built to enclose a circular building with a square of upright timbers at its centre. They were built on a large scale and their construction would have involved a considerable effort. They were associated with Grooved Ware and with radiocarbon dates between 2700 and 2500 BC. The authors of a new study compare some of the features at Ballynahatty with recently discovered monuments around Newgrange (Hartwell *et al.* 2023, 183–5).

Dundalk Bay: Another monument complex may have been linked to Dundalk Bay, but most of the information comes from antiquarian accounts. Those sources suggest that there was once a concentration of chambered tombs, henges, and stone circles (Buckley 1986; Bradley 1997, 119). Their distribution extended inland and might have been related to a series of rock art sites, some of which still survive (O’Connor 2006). There may even have been a passage grave enclosed by a ring of monoliths, like that at Newgrange. The only excavated evidence comes from Balregan, 2.5 km from the modern coast. Here the perimeter of a double-ditched enclosure was excavated before a motorway was built. Only a small area was available for investigation but sufficient remained to show that the earthwork had been associated with Grooved Ware (Delaney *et al.* 2020, 29–37). It is impossible to say much more, but the area was linked with the Boyne Valley because the local shoreline provided the cobbles deposited outside the largest tombs at Newgrange and Knowth (Mitchell 1992).

DISCUSSION

Chronologies

Not all the monuments were contemporary with one another. These complexes span several phases and it is

important to compare structures that date from the same periods. On the other hand, once a prominent stone or earthwork structure became established in the landscape it might be re-used or other monuments might be erected around it. Radiocarbon provides important information and can be supplemented by finds of diagnostic artefacts.

The available evidence is reviewed in a new study of Grooved Ware in Britain and Ireland (Copper *et al.* 2023). It seems likely that this kind of pottery originated in Orkney by about 3200 BC and the earliest examples in other regions play a prominent role in the discussion (Copper *et al.* 2021). They suggest links between five groups of monuments: the Stenness/Brodgar complex, Machrie Moor, an early phase of activity in Kilmartin Glen, Calanais, and Balfarg. In Ireland, Carlin (2017) has shown that passage graves in the Boyne Valley were still being used. If these complexes followed different sequences, they began at about the same time. They share enough features in common to be distinguished from structures further south which can date from subsequent phases in the history of Grooved Ware.

Once established, complexes like Calanais or Balfarg had long histories, but they were not necessarily continuous. For example, parts of the extraordinary complex on the Ness of Brodgar had gone out of use by 2800 BC: a time when impressive structures were being built in other places (Card *et al.* 2018; 2020). That was the case at Ballynahatty, which was first used as a cemetery before the adoption of Grooved Ware (Hartwell *et al.* 2023). Most groups of monuments remained important during the Chalcolithic and Early Bronze Age. Burials have been recorded inside the stone circles on Machrie Moor and there were others at Knowth and Raigmore. Lavish feasts took place outside the passage grave at Newgrange, where deposits of animal bones were associated with both Grooved Ware and Beakers (O'Kelly *et al.* 1983; Carlin 2017). The same happened on the Ness of Brodgar before the site was abandoned between 2290 and 2125 BC (Card *et al.* 2020). At Calanais, Beaker pottery was associated with a small passage grave inside the great stone circle, and there is even more striking evidence from two of the other complexes considered here. There was a remarkable series of burials in Kilmartin Glen. Some were in monumental cists decorated with images of early metalwork and several examples were covered by massive cairns that extended along the

valley floor (Watson & Bradley 2021). During the same period another row of specialised monuments was established at Balnuaran of Clava but in this case they were passage graves or ring cairns, each of them surrounded by a stone circle (Bradley 2000).

The locations of monument complexes

It would be easy to explain some observations in practical terms. That is especially true of Kilmartin Glen on the west coast of Britain. In 2001 Ewan Campbell published an article entitled 'Were the Scots Irish?'. He was referring to the early medieval period but his argument has wider implications. He observed that a belt of high ground separated major sites on the west coast of Scotland from regions further inland. As a result, people were likely to travel by water. That helped to account for the links between Ulster and Dalriada during the 1st millennium AD. The same argument might explain the siting of prehistoric monuments at Kilmartin, but it would not apply to Arran and cannot account for the monument complex on Lewis. Nor would this approach apply to the other regions considered here. Such places were connected to the water, but different factors affected their distribution.

Separation and seclusion were equally important. Some of these complexes were self-contained. That was particularly true of the Neolithic structures in the Boyne Valley and the monuments at Ballynahatty. It also applied to those in Kilmartin Glen and on Machrie Moor, as well as Calanais Site 1. In each case their positions were screened by the local topography and this contributed to their isolation. At the same time certain sites adopted prominent positions. They included the raised ground north of the River Boyne, the plateau at Ballynahatty, and the ridge on which the largest stone setting at Calanais was built. It is possible that certain structures were conceived as microcosms of a wider region and that would explain why they combined materials introduced from different sources. It happened at Temple Wood, both the stone circles in Orkney, and certain of those on Machrie Moor. It is equally relevant to passage graves in the Boyne valley.

Although Thom's research was inspired by observing the moon at Calanais, almost all these complexes were associated with the sun. Their positions must have been chosen with this in mind. Some of the relationships have been accepted for a long time, for example the solstitial orientations of Newgrange,

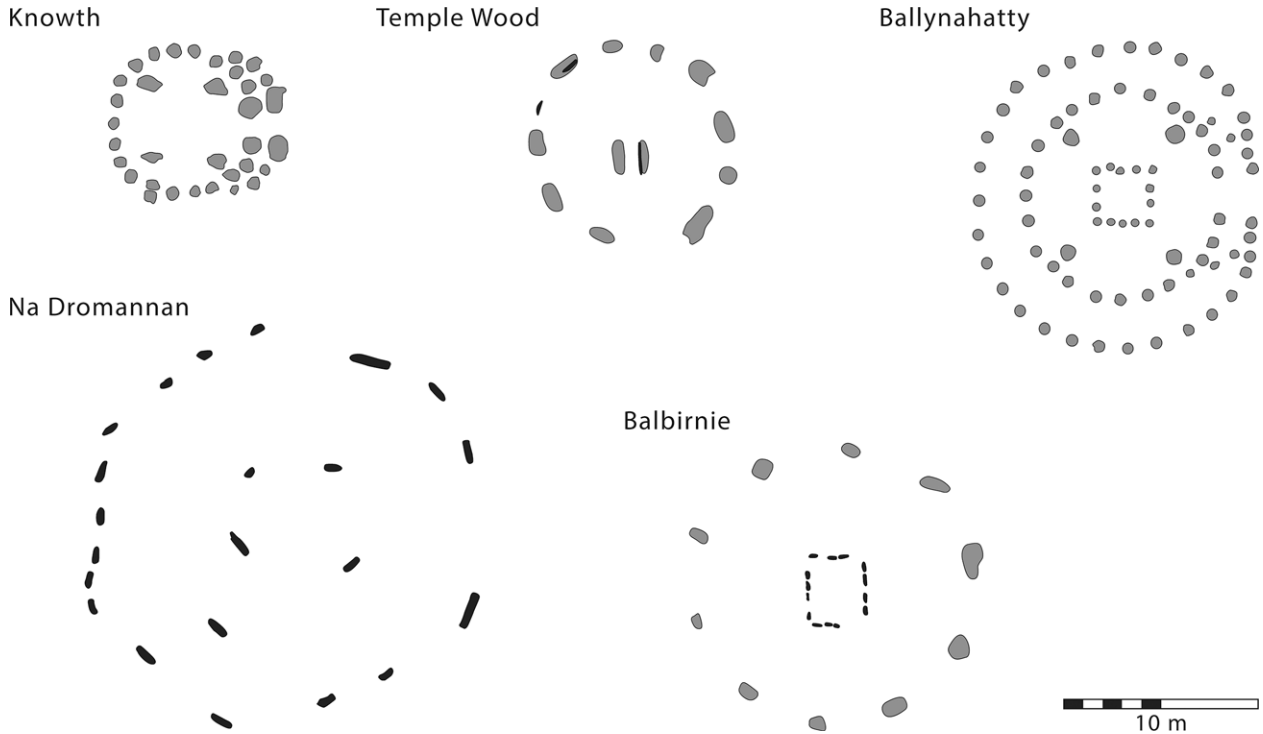


Fig. 13.

Outline plans of monuments defined by a square setting inside a circle at two Irish sites and three Scottish sites. Information from Eogan & Roche (1997); Scott (1989); Hartwell *et al.* (2023); Richards (2013); Gibson (2011)

Maeshowe, and the passage graves at Balnuaran of Clava. Others are more contentious or have been recognised only recently. They include the connection between the sun and Cnoc an Tursa and the directions faced by certain of the monuments and rock carvings at Kilmartin. The layout of such structures acknowledged the turning points of the year. It is revealing that Calanais Site 1 was associated with the summer months as conditions in the Atlantic would make it dangerous to travel there in winter.

Cross references between individual monuments?

There may have been more specific links between some of these structures (Sheridan 2004). Two are particularly striking.

In the Late Neolithic period several stone and timber monuments shared the same layout: a square inside a larger circle. It was adopted on very different scales, from small domestic buildings associated with Grooved Ware in Orkney to large wooden structures like that at Ballynahatty. It was also the plan of

excavated stone settings at Temple Wood and Na Dromannan (Fig. 13), and the same configuration was followed at the Balbirnie stone circle – a component of the Balfarg complex (Gibson 2011). It is documented in various forms throughout Britain and Ireland (Greaney *et al.* 2020) and has been identified by excavation and remote sensing in the Boyne valley (Davis & Rassmann 2021). A more tentative connection is between the large oval buildings at the Ness of Brodgar and two timber structures at Balfarg whose dates are more difficult to define (Fig. 14; Bradley 2019, 14–15).

Another feature was the selection of exceptionally tall monoliths, some which tapered to a point. They are found at two of the stone circles on Machrie Moor and are represented at Calanais Site 1, although the same preference was expressed on a smaller scale at nearby monuments. They have an obvious parallel in Orkney where the Stones of Stenness shared the same feature (Sheridan 2004; Richards 2005, 218–25). Like the principal circle at Calanais, this site dates from the beginning of the 3rd millennium BC. Another

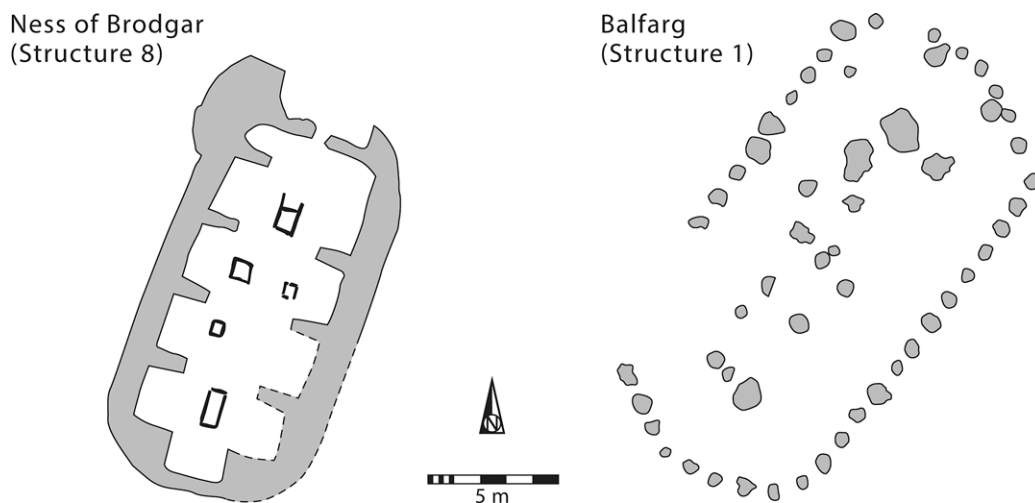


Fig. 14.

A timber structure at Balfarg compared with a stone building on the Ness of Brodgar. Information from Barclay & Russell-White (1993) and Card *et al.* (2020)

connection between individual monuments concerns the timber structure built on a platform inside Calanais Site 1. It is poorly dated, but their relationship recalls a similar arrangement among the Late Neolithic buildings at Barnhouse (Richards 2005, 129–56).

Sometimes monuments of a single type were defined in more than one way. The obvious examples are on Machrie Moor where individual structures seem to share characteristics with those in distant areas. Burl's original analyses made a good case that 'traditions from outside' were adopted there (Burl 2000, 89). Recent discoveries at Newgrange provide another example, for here there were groups of circular enclosures of similar dimensions. Again, they were built by very different methods. A new analysis compares them with examples in regions as far away as Wessex (Davis & Rassmann 2021).

Visual images suggest further connections (Fig. 15). The larger monument at Temple Wood is decorated with two motifs found in megalithic art (Scott 1989). A simple circular design is not particularly distinctive but the paired spirals on another stone have parallels at passage graves in Orkney (it is unnecessary to follow Jack Scott's suggestion that this design was executed in two stages). An exposed rock inside Site 1 on Machrie Moor was decorated with another unusual image: two opposing segments of a circle joined at the central point. According to the excavator:

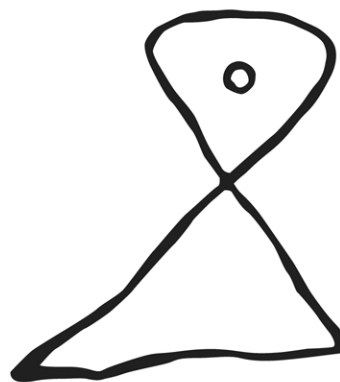
'[the monument] having been buried under peat in antiquity, its prehistoric origin is undoubted' (Haggarty 1991, 79). Since her account was published, examples of the same design have been found in Orkney where it is now known as the 'Brodgar butterfly' (Thomas 2016). It is uncertain whether the decorated stone was contemporary with either structure at Machrie Moor Site 1, but both were associated with Grooved Ware. Long-distance connections between Arran and Stenness are indicated by finds of pitchstone at Barnhouse and the Ness of Brodgar (Anderson-Whymark 2020).

Pecked motifs connect the Kilmartin complex with other area (Bradley 2023). Like Temple Wood, the first phase at Achnabreck features a series of linked spirals with parallels in Orkney chambered tombs (Watson 2022). In the same way, the decorated panels at Ormaig share motifs with the Irish cemetery of Loughcrew (Jones *et al.* 2011, 204–21). There is a more tenuous connection between megalithic art and Calanais Sites 1 and 2 where there is no indication that any of the standing stones had been modified. But they could have been chosen because of the striking geological patterns visible on their surfaces (Fig. 16). They included entirely natural circles and zigzags which resembled those at passage graves. Perhaps they were incorporated into these structures because people recognised the special significance of these forms.

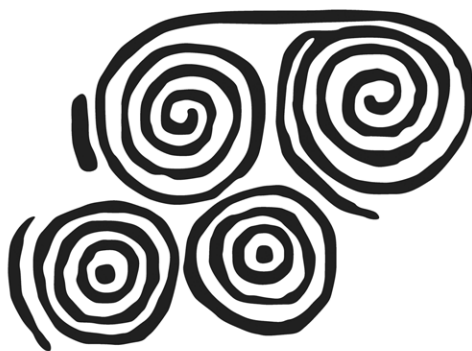
Ness of Brodgar



Machrie Moor



Eday Manse



Temple Wood

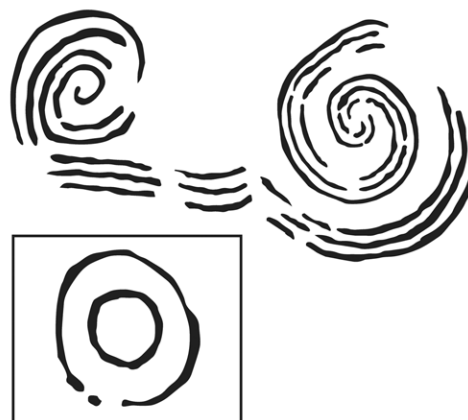


Fig. 15.

Pecked motifs at Temple Wood and on Machrie Moor compared with incised designs at Eday Manse and the Ness of Brodgar. Information from Scott (1989); Haggarty (1991); Shee Twohig (1981); Thomas (2016)

Such links were with Neolithic monuments, but connections between western Scotland and other areas extended to later phases, including the Copper Age and Early Bronze Age. The clearest link was between the linear cemeteries in Kilmartin Glen and at Balnuaran of Clava (Bradley 2000). The case is persuasive because they were built at the same time and are the only examples with this configuration in the north of Britain. They shared an alignment running from north-east to south-west. Although some of the last chambered tombs were along the Moray Firth, another was inside the main stone circle at Calanais (Ashmore 2016). It was smaller than its counterparts on the Scottish mainland and had a different orientation.

Other elements were shared between the complexes considered here (Fig. 17). North of Kilmartin there was an unusual cairn at Kintraw. Again, its kerbstones were graded in height, with the tallest to the south-west where excavation found a ‘false portal’ that looked like the entrance of a tomb (Simpson 1967). A similar feature has been recognised at Auchagallon on the shore of Machrie Bay. Again, its kerb included an unusual setting on the south-west side where a considerable flat-topped rock was flanked by uprights of a different raw material. It looks very like the focal point of a recumbent stone circle (Welfare 2011).

Taken together, these comparisons suggest two observations. In all three complexes on the west coast of Scotland exceptional monuments were still being



Fig 16.

Natural patterning on selected monoliths in the Calanais complex. Were they selected because of their resemblance to megalithic art? (photographs: Richard Bradley)



Fig. 17.

(Left) The cairn and standing stone at Kintraw on the edge of the Kilmartin complex. Its kerb was graded in height, with a 'false portal' at its focal point. Its form resembles a section of the kerb of a similar monument at Auchagallon, Arran (shown on the right) (photographs: Kintraw (© Kilmartin Museum Company Ltd) and Auchagallon (Richard Bradley))

constructed after the Late Neolithic period. Their forms were based on non-local models, but now they could be located *outside* the main concentrations of monuments. On Arran, this could apply to the Early Bronze Age cairn at Blackwaterfoot (Henshall 1968, 183).

TRAVELS TO SPECIAL PLACES

Nothing is known about the watercraft employed during the Neolithic period. Although seagoing vessels may be depicted on Breton megaliths (Cassen *et al.* 2019), no convincing evidence comes from Britain or Ireland. More can be said about ancient seaways.

Conditions along the coast, especially in western Scotland, mean that long distance journeys would have been difficult in poor weather (Callaghan & Scarre 2009; Carlin & Cooney 2020). Groups of significant monuments were long distances apart and travelling between them must have made significant demands. That was especially true where people followed the coast of the Outer Hebrides or crossed between the Scottish mainland and Orkney. It raises the question of why such voyages were undertaken.

One approach is suggested by the work of the anthropologist Mary Helms who has studied the importance of long-distance journeys in traditional societies. In her view knowledge of remote places and practices provides an important source of power. That is the thesis of her influential book *Ulysees' Sail* (Helms 1988). Her work has influenced prehistoric archaeology, in particular research on Bronze Age Europe (Kristiansen & Larsson 2005).

There are difficulties in taking the same approach to Neolithic Britain since Helms's interpretation depends on the unfamiliar – the acquisition of specialised knowledge and contacts with exotic places. While long distance travel might have posed a challenge, links between the places considered here took a different form. Monument complexes may have been considerable distances apart but they had much in common. Most structures adopted a circular plan and in some cases their layout was influenced (or even determined) by the position of the sun at significant times of year. These features extended from open arenas – earthworks, rings of monoliths, and wooden enclosures – to megalithic tombs like Newgrange and Maeshowe. Similar visual images were displayed there and these places were associated with similar kinds of artefacts.

Decorated buildings and panels of rock art provide other sources of information (Bradley 2023). Architectural elements were copied between different regions (Bradley 2024b); such links were first identified by Aubrey Burl (2000) and Alison Sheridan (2004). It is likely that these structures celebrated a system of belief shared between regions of Scotland and Ireland which were accessible from one another by boat. At the same time, not all these links were easy or direct. While these complexes were located near the sea, some were a short distance inland where they could be self-contained, even secluded. At times topographical features screened them from their immediate surroundings.

The challenge is to establish why these connections formed. A series of writers have considered the role of pilgrimage in Late Neolithic Britain and Ireland (Renfrew 1985; Scarre 2001; Harding 2013; Hensey 2015), but they have been most concerned with what happened at special sites and the nature of the artefacts deposited there. They devote less attention to the practicalities of making sacred *journeys*. The difficulties of doing so are rarely made apparent yet travel between these places may have been as significant as the ceremonies undertaken there (Skousen 2018).

An influential book published by Victor and Edith Turner in 1978 suggests a possible approach (Turner & Turner 1978). Rather than emphasising the *contents* of religious doctrines (which will always elude students of prehistoric Britain), they compare journeys to sacred places with the rites of passage documented by social anthropologists (Van Gennep 1909; their relevance to Neolithic archaeology is emphasised by Paul Garwood (2011). People depart from their familiar worlds and undergo 'rites of separation'. Participants enter a 'liminal state' in which the conventions of daily life are relaxed, suspended, or even reversed. Finally, they pass through 'rites of incorporation' and return to their normal lives with their identities, status, or beliefs transformed. Pilgrimage conforms to all three stages of the rites of passage, but it expresses them in spatial terms. The important point is that *people need to travel to, or between, special locations*. The journey is as significant as the final destination. Garwood (2011, 124) quotes a trenchant observation by Humphrey and Laidlaw (1994, 124): 'Rites of passage have three stages – not because they are *rites* of passage but because they are *rites of passage*'.

Although the Turners were studying Christian practice, the Neolithic period illustrates a similar principle. The layout of individual structures suggests that certain monuments did play special roles. Their architecture was distinctive, and in several cases access to the sites might have been controlled, for individual complexes were separated from the wider landscape. Although they could have been occupied before any specialised structures were built, from the time of their creation they do not seem to have been associated with ordinary settlements. Not all these locations were easy to reach and people may have travelled long distances to visit them. They shared similar components but were widely spaced.

Henges, stone circles, and related monuments seem to have been used in many ways – from

seasonal festivals celebrated by the living to cemeteries dedicated to the dead. Some provide evidence of feasting, and their construction must have brought together large numbers of people. The existence of such complexes invites speculation but more attention has been paid to the activities documented at these sites than the significance of the journeys to, and between, them. There is little to show how many people were involved or how far they had come, yet those undertakings could have played an important role in Neolithic society. In this case, the conventional term *rite of passage* assumes a second meaning.

Nowhere is that more evident than on sites like those at Calanais where access to a ceremonial centre involved an arduous passage by sea.

Acknowledgments We are very grateful to Fraser Sturt for his advice on ancient shorelines, commenting on a draft of this article, and for producing the map on which Figure 7 is based. We must also thank two anonymous referees for their helpful advice.

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RÉSUMÉ

Naviguer vers Calanais: complexes monumentaux et la mer dans le Néolithique d’Écosse de l’Ouest et au-delà, par Richard Bradley et Aaron Watson

Depuis les recherches d’Alexander Thom à Calanais dans les Hébrides extérieures, plusieurs ensembles de monuments d’Écosse de l’ouest ont été étudiés à travers leurs relations avec la terre et le ciel. Moins d’attention a été portée à leur relation étroite avec la mer. Ces lieux isolés pouvaient être d’accès difficile voire dangereux, toutefois, certains détails dans leur architecture indiquent qu’ils étaient étroitement liés les uns aux autres. Les connections longue-distance avaient-elles une importance particulière entre 3000 et 2000 avant notre ère ? Se rendait-on en bateau vers certains centres cérémoniels ? Et la traversée elle-même était-elle considérée comme un rite de passage ? Notre analyse s’étend à des structures situées dans les Orcades et en Irlande.

ZUSAMMENFASSUNG

Nach Calanais segeln: Megalithische Komplexe und das Meer im Neolithikum Westschottlands und darüber hinaus, von Richard Bradley und Aaron Watson

Seit Alexander Thom Calanais auf den Äußeren Hebriden besucht hat, wurden Gruppen megalithischer Anlagen des Neolithikums in Westschottland in Bezug auf das Land und den Himmel untersucht. Weniger Aufmerksamkeit erhielt ihre enge Beziehung zum Meer. Diese Orte waren abgeschieden und konnten schwierig oder gefährlich zu erreichen sein, dennoch lassen Details ihrer Architektur vermuten, dass es enge Verbindungen

zwischen ihnen gab. Wie wichtig waren Beziehungen über weite Distanzen in der Zeit zwischen 3000 und 2000 BC? Wurden manche der zeremoniellen Zentren mit dem Boot aufgesucht? Und wurde die Reise selbst als ein Übergangsritual betrachtet? Das Fallbeispiel wird auf Strukturen auf den Orkneys und in Irland ausgedehnt.

RESUMEN

Navegando hacia Calanis: complejos monumentales y el mar en el Neolítico del este de Escocia y más allá, por Richard Bradley y Aaron Watson

Desde que Alexander Thom visitó Calanais en las Héridas Exteriores, los grupos humanos relacionados con los monumentos megalíticos en el oeste de Escocia se han estudiado en relación con la tierra y el cielo. Sin embargo, se ha prestado menor atención a su cercana relación con el mar. Estos lugares eran apartados y podían ser difíciles o peligrosos de alcanzar, pero sus detalles arquitectónicos reflejan una estrecha relación entre ellos. ¿Cómo de importantes fueron las conexiones a larga distancia entre el 3000 y el 2000 BC? ¿Eran centros ceremoniales que se visitaban en botes? Y, ¿era el viaje en sí mismo considerado como un rito de paso? Este caso particular también se extiende a las estructuras en las Islas Orcadas e Irlanda.