



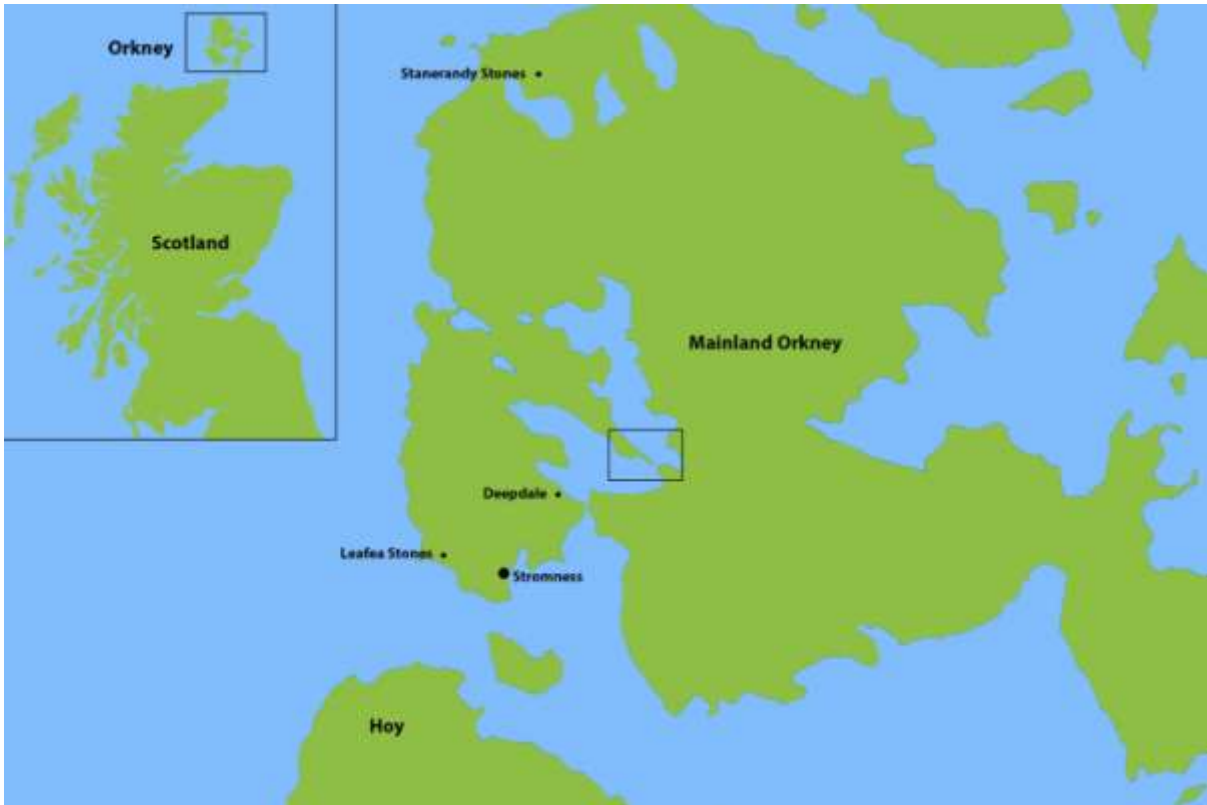
The Temples of the Sun and Moon, Orkney

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Introduction: This paper presents new evidence which shows that the original entrance of the passage tomb of Maeshowe on Orkney, Scotland, would have prevented the midwinter sunlight from entering its central chamber. The solar and lunar alignments of other Orcadian monuments are also shown and discussed. Some of this research appeared in the book “The Stones of the Ancestors”, but this new information only became available after this was published in March 2020. It is generally accepted that the Vikings broke into Maeshowe, but an assessment of its 19th century excavation now questions this.

Maeshowe was built on Orkney about 5000 years ago and is one of the finest Neolithic passage tombs in Europe. It is located about a kilometre to the east of the Brodgar and Stenness stone circles. It was originally a 15 metres high cone shaped hill, which was surrounded by a wide oval ditch. From the original south-west entrance a 17 metre long straight passage led to a 4.5 metre squared by 4.7 metre high central chamber that has three small ‘burial’ cells built into its walls (Figure 1). The outer section of the passage was a 7 metre long by 0.70 cm square tube, which was removed in the 19th century. From the modern entrance the remaining inner passage opened up to a height of 1.60 metres that was 1.2 metres wide and 10 metres long. Just inside the modern entrance there is a northern recess holding a stone that was used to block the removed lower outer passage. At the corners of the central chamber there are four stone buttresses faced with tall standing stones. These stones and those forming the inner passage could have been part of an earlier stone circle, as the socket of a standing stone was found during later excavations.



These maps show the locations of the monuments discussed in this paper



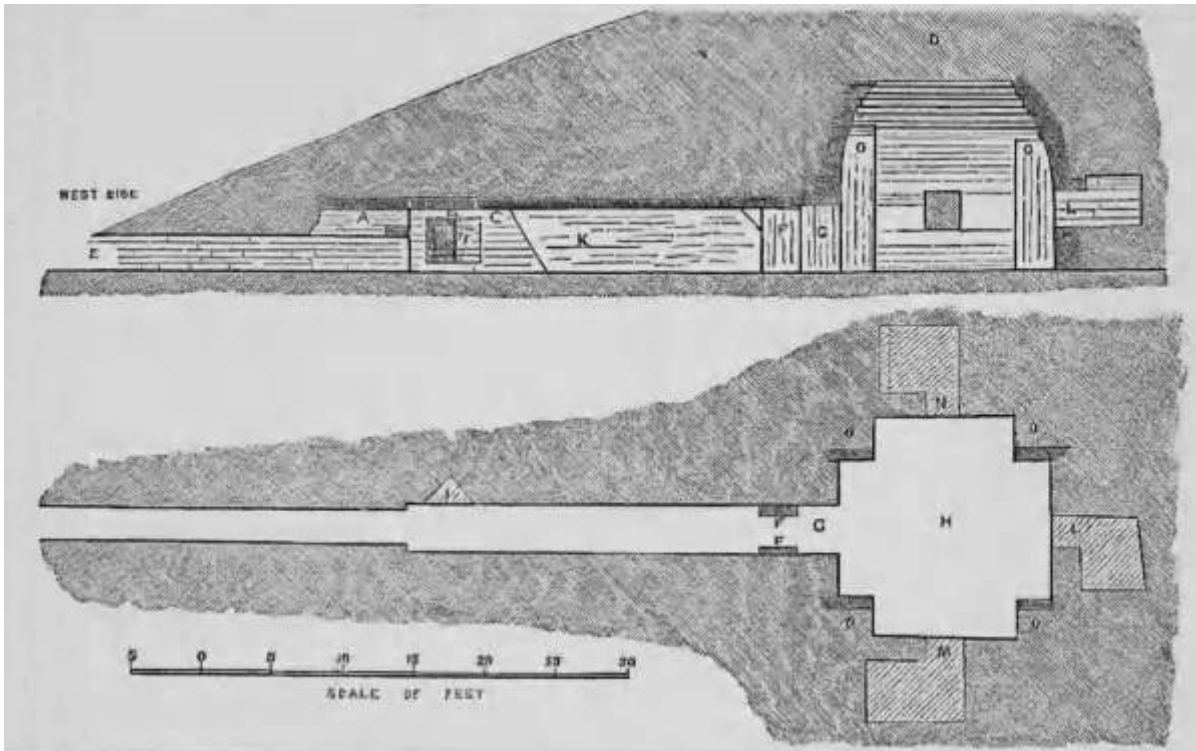


Figure 1. Petrie's simple plan of Maeshowe shows the original straight length of its passage, which Farrer said they entered by lifting lintel stones A and B (Petrie, 1861). Other plans were drawn by Gibb during the excavation, and these were later copied by Dryden and Burke.

Maeshowe is first mentioned in the 12th century *Orkney-Inga Saga*, which said that on the 13th day of Christmas, while travelling from Hamnavoe to Firth, Earl Harald and his war band sheltered in Maeshowe during a blizzard, and while there, two of the men went insane. In his 1772 book, the Reverend George Low depicts Maeshowe as a high pointed hill with a hole on its top, which he said was made by Oliver Cromwell's troops (Anderson, 1879) (Figure 2). This would have been in the 1690s. In the late 1840s, Captain Thomas excavated monuments in the Ness of Brodgar area, which included finding the entrance to Maeshowe. Thomas said "Many attempts been made to explore it, as there are small heaps upon its sides, but at last sufficient force and perseverance was brought to work on its sides, and a huge misshapen mass upon the east side shows that the explorers were successful" (Thomas, 1852). The copy of a plan of Maeshowe credited to Thomas shows the large hole on its top (Figure 3). This means that he must have explored the inside of Maeshowe.

In 1861 James Farrer and George Petrie, along with other antiquarians, began to excavate the passage of Maeshowe (Petrie, 1861) (Farrer, J. 1862). Petrie says that it was fortunate that they start digging directly above the passage. Farrer describes the original size of the entrance and that the roofing stones of the outer lower passage had either fallen in or had been removed. However, the plans by Thomas, Petrie, and MacKie show that they thought it was completely covered with lintel stones. Farrer said they entered the passage by lifting stones A and B. They could only have done so at stone B, as Gibb's plan shows the area below stone A was blocked by the lintel stones above the lower passage (Figures 1 & 5). ~#

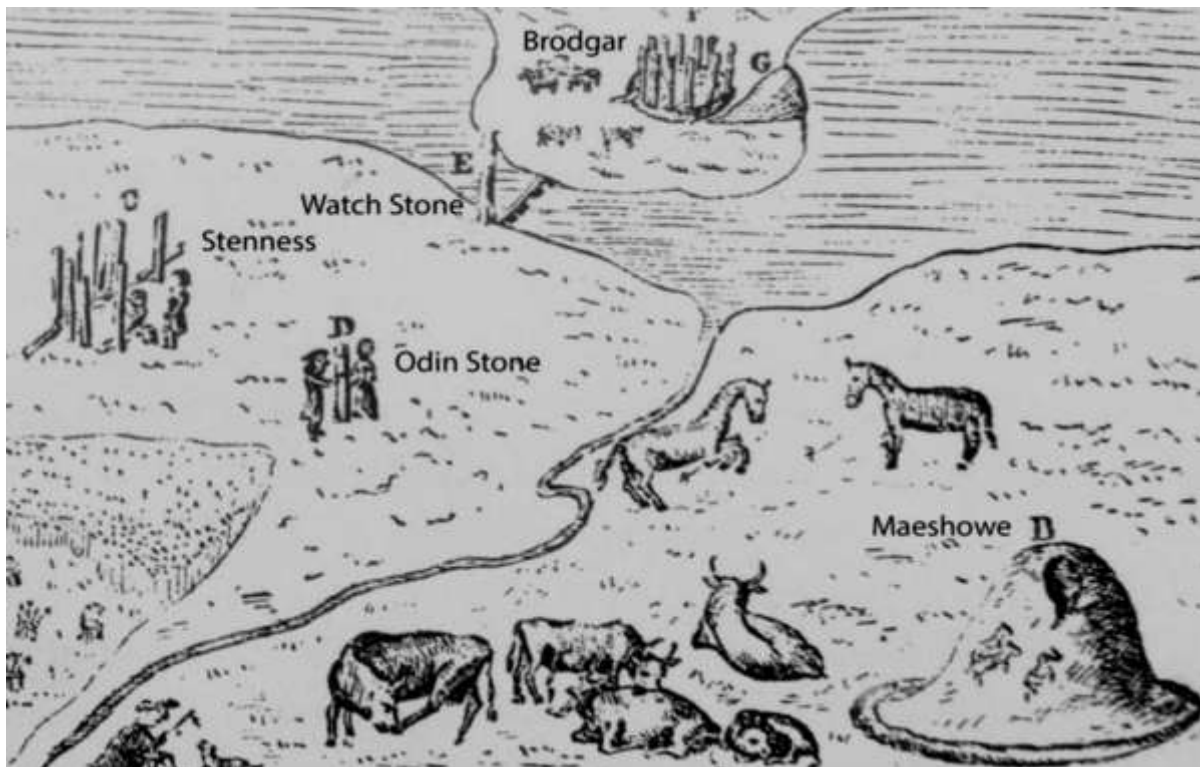


Figure 2. This is part of Low's 1772 drawing showing the Stenness and Brodgar stone circles and the hole on the top of Maeshowe. People are also shown using the monuments in a marriage ceremony.

When the central chamber was found to be blocked with earth, they decided to enter Maeshowe through the hole in its roof (Farrer, J. 1862). John Stuart, one of the antiquarians helping Farrer, described this hole; *"Here is a great depression, of which the cause soon appeared. After a time the covering slabs of the chamber were reached; but at one place it appeared to be forced, or to have given way at some previous time when the superincumbent stones and earth had been precipitated into the area below"* (Stuart, J. 1862-64, 247-79)(Figure 3).

Farrer also said: *"It has undoubtedly been entered at some remote period, probably by the Northmen, who, as is well known, were not deterred by feelings either of religion or superstition, from opening and ransacking any place likely to repay them for their trouble"* (Farrer, J. 1862). This has been accepted ever since. As the earth was cleared from the chamber, Norse Runes were found carved on its walls. The only other finds were a piece of a human skull, some fallen roof stones, and those used to block the three small empty cells. Mr. Balfour, the landowner, replaced the roof of Maeshowe in 1869, reducing it to its present 8 metre height. Heritage Environment Scotland (HES) in their Statement of Significance say that the outer passage was removed in the 19th century and that the modern entrance was constructed.

The Vikings could not have entered Maeshowe through its roof, as it would have taken them days to have dug through the 6 or so metres of earth to reach the roof of the central chamber. The *Orkney-Inga Saga* also said that although they were slowed down by the men who had gone insane, they reached Firth by nightfall. This means that the Vikings could only have entered Maeshowe along its passage. Thomas said that Maeshowe had already been entered, and from his copied plan, he must also have done so between 1848 and 1851.

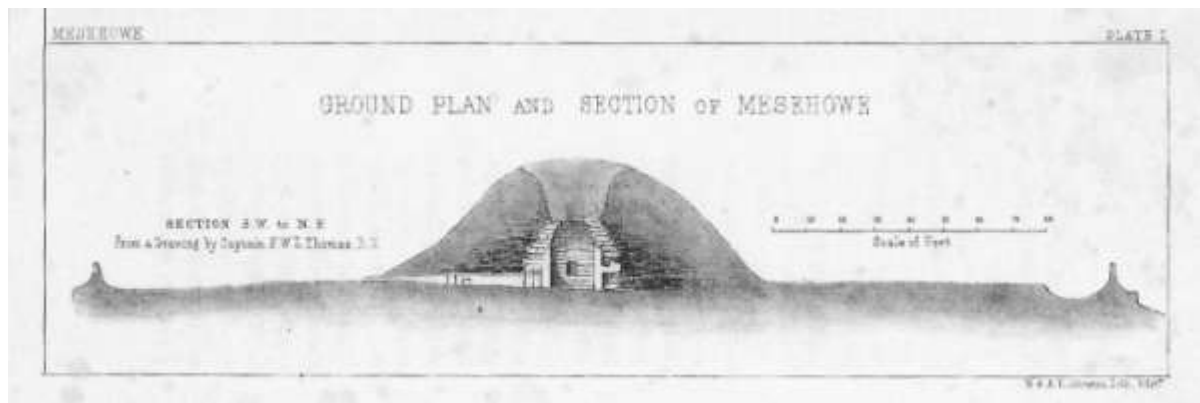


Figure 3. This plan of Maeshowe says it was copied from a drawing by Captain Thomas, and it shows the chamber and passage free of soil. (Mitchell, J.M. 1863). This can be explained as the earth from the hole would have been thrown over its sides until the roof of the chamber was breached. Over the following years, the soil from the sides of the hole would have slipped in filling the chamber.

Magnus Spence carried out astronomical observations of Maeshowe from 1890-1903. In 1893 he mentions that the entrance was 2½ feet wide by 4 feet high, which means that the original lower outer passage had been removed by this time. Spence describes how the midwinter and midsummer sun rose and set in line with the passage:

“Now placing oneself at the innermost end of the central chamber on the N.E. side, and looking out through the long passage on the surrounding landscape, the view is very limited, not extending farther in breadth than a few yards. Strange to say, in the centre of this contracted view, and at a distance of 42 chains, stands the Monolith of Barnhouse, one of the most conspicuous of the few outstanding menhirs not embraced in the circles. The alignment from this long passage of Maeshowe and Standing Stone of Barnhouse indicates directions to remarkable to be merely accidental. The straight line thus formed points in a south-westerly direction to the point where the sun sets some ten days before the winter solstice, whilst the same alignment in the opposite direction points unequivocally to the point where the sun rises at midsummer” (Spence, M. 1893. 407).

Spence described the midsummer sun rising above Maeshowe from the Barnhouse Stone:

“This important alignment points to the solstitial summer sunrise as it occurred when Maeshow was built, and within 1 ½ degrees of the present sunrise. Now it is a fact, although not a well-known one, that owing to secular change in the earth's movements, as pointed out by Sir William Hamilton in his “Natural Philosophy,” and Sir Norman Lockyer in his “Dawn of Astronomy,” the sun does not rise exactly relatively to alignments on land as it did centuries ago. The present solstitial sunrise is S. of its former position. In other words, it rose seven thousand years ago 3 deg. 32 min. N. of where it rises now. Then, assuming that this important alignment was originally planned by sun-worshippers to point to the rising sun on midsummer morning, it must now point slightly to the N. of that position. This is exactly what we find it does. On the morning of the 23rd June, 1899 — the first clear morning after the solstitial sunrise — two friends and the writer erected a pole on the centre of the mound of Maeshow, which was also that of the chamber, and placed two more in line with Barnhouse stone, and we chose our position to wait the sunrise, about 30 chains (c603 metres) from Maeshow, near the Turmiston Burn, where the pole on Maeshow stood partly above the Maeshow and the Standing Stones of Stenness”. As far as I know no one has mentioned Spence's observations in the past 128 years.

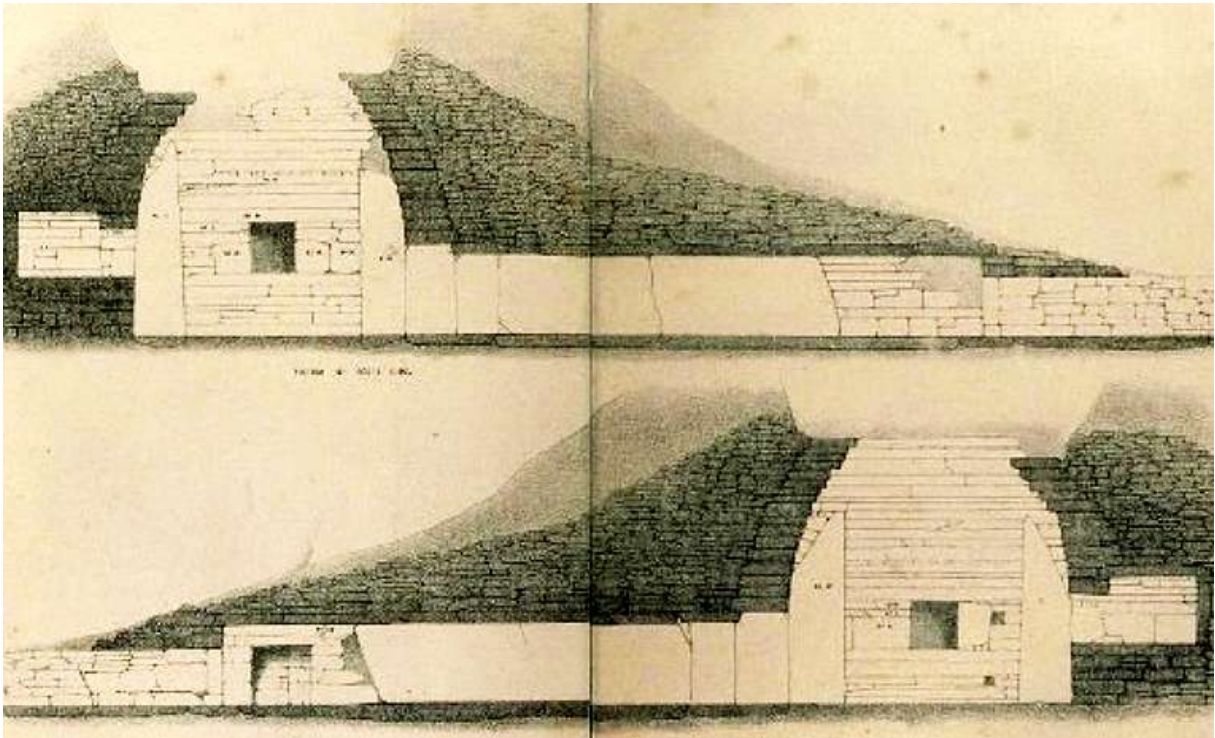
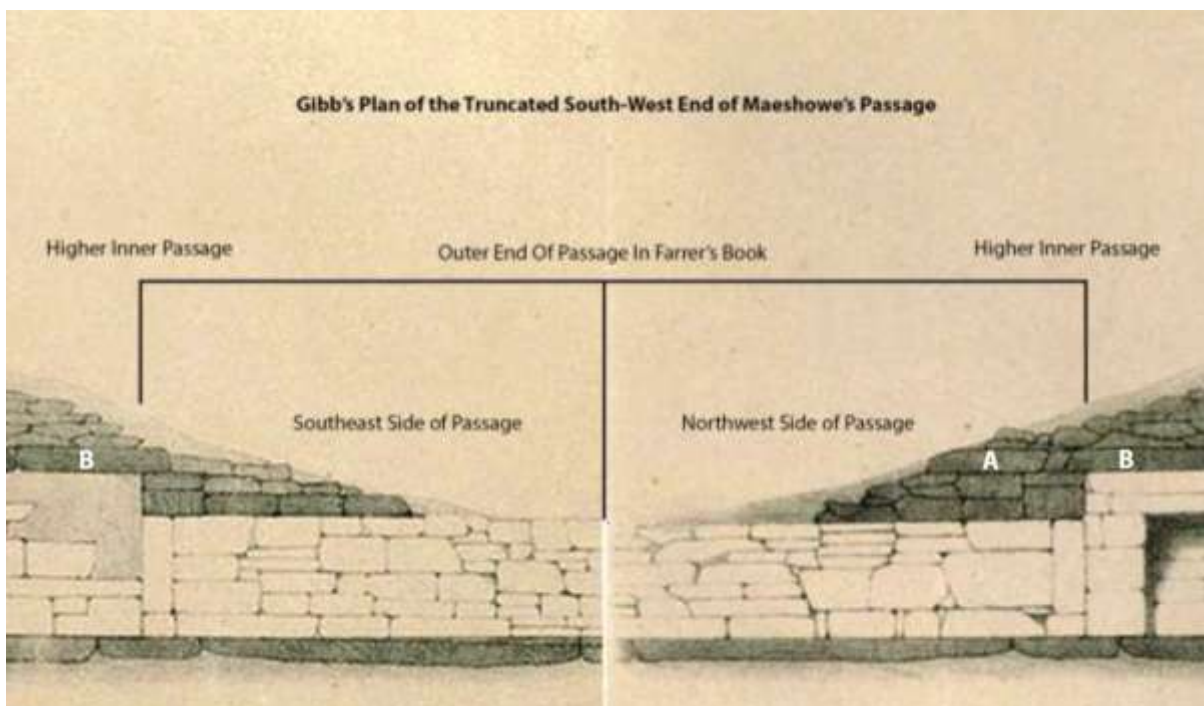


Figure 4. Although in Gibb's plan, the outer half of the lower passage was cut to fit the pages of Farrer's book. However, even if the outer passage was uncovered to the lintel stones shown in his plan, the midwinter sunlight would still not have been able to enter the chamber.

Figure 5. Farrer and Petrie could only have entered the passage by lifting Stone B as Stone A is blocked by the stones above the lower passage. The 'light slit' area is also closed by these stones, which are not shown by Petrie. The lintel stones above the lower passage show that it is likely that it was covered along its entire length.



Other researchers have proposed that like Newgrange in Ireland, Maeshowe had a light slit in its passage to allow the midwinter sunlight to enter its central chamber (Fairly and Welfare, 1980), (MacKie, E. 1997) (Reijs, V. 1998). MacKie's plan shows that the roofed outer passage would have hidden the midwinter sun, but he suggested that the gap above a darkened stone in Petrie's plans was the light slit (MacKie, E.1997) (Figure 1). However, Petrie and his fellow antiquarians do not mention this stone or a light slit. Gibb's plans clearly show that the 'light slit' area was blocked by the darkened stones above the lighter lower outer passage (Figures 4 & 5.). Victor Reijs' has shown that as the midwinter sun set on Ward Hill, the resulting low angled light entered the modern entrance to touch the lower back wall of the central chamber 30-28 days before midwinter (Reijs, V. 1998).

My 1993 survey from the Barnhouse Stone found that the midsummer sun would have originally risen above Maeshowe. From the Barnhouse Stone on the 27 June 2018, the midsummer sun was photographed rising to the upper right of Maeshowe (Figure 7). This was due to the small shift in the Earth's axis over the past 5000 years. A few hours later from the entrance to Maeshowe, the midsummer sun was photographed rising to its upper right on the 27th June 2018 (Figure 8). My surveys and photographs confirmed those by Spence, but I was unaware that he had proposed and watched these events in 1893.

Calder's 1928 plan of Maeshowe show that the passage sloped down toward the entrance. By adding the length of the removed outer passage from Dryden's plan of Maeshowe to that by Calder, this means that as the low angled sunlight entered the original entrance it could only have reached halfway along the inner passage (Figure 6). However, when this occurred, the passage would have been filled with golden light. The narrow outer passage seems to have been designed to ensure that people entered the sacred space of Maeshowe, humbly on their hands and knees. I propose that the builders of Maeshowe did not align the passage to the winter solstice sunset as they would have lost the main orientations of the three small burial cells of the central chamber, which are aligned to the hidden rising and setting midsummer sun, and to the midwinter sunrise (Figure 6).

Orientations to the hidden sun and moon can be seen in cairns in other parts of Scotland. In northern mainland Orkney, the two standing stones on top of the Staneranda burial cairn, mark the midwinter sunrise and the midsummer sunset (Figure 20). The false portals of the Culcarron and Kintraw cairns in Argyll were each aligned to the rising and setting midwinter sun. During its excavation, a large cup marked slab was found in front of the Culcarron false portal (Peltenburg, E.J. 1972). The Strontoiler Kerb cairn near Oban was excavated and the remains of a cremation were found (Ritchie, G. N. J. 1971). The cairn is graded in height to three stones forming a false portal, which my survey showed was in line with the southern major standstill moonrise every 19 years. Some of the kerb stones of the Clava type cairns also have false portals. From the centre of the Delfour Clava type ring cairn, a sightline through the highest south-west 'false portal' kerb stone to a large standing stone marks the midwinter sunset (Thom, A. 1967) (Scott, D. 1992). This was photographed on the 21st December 1995 (Scott, D. 2016).

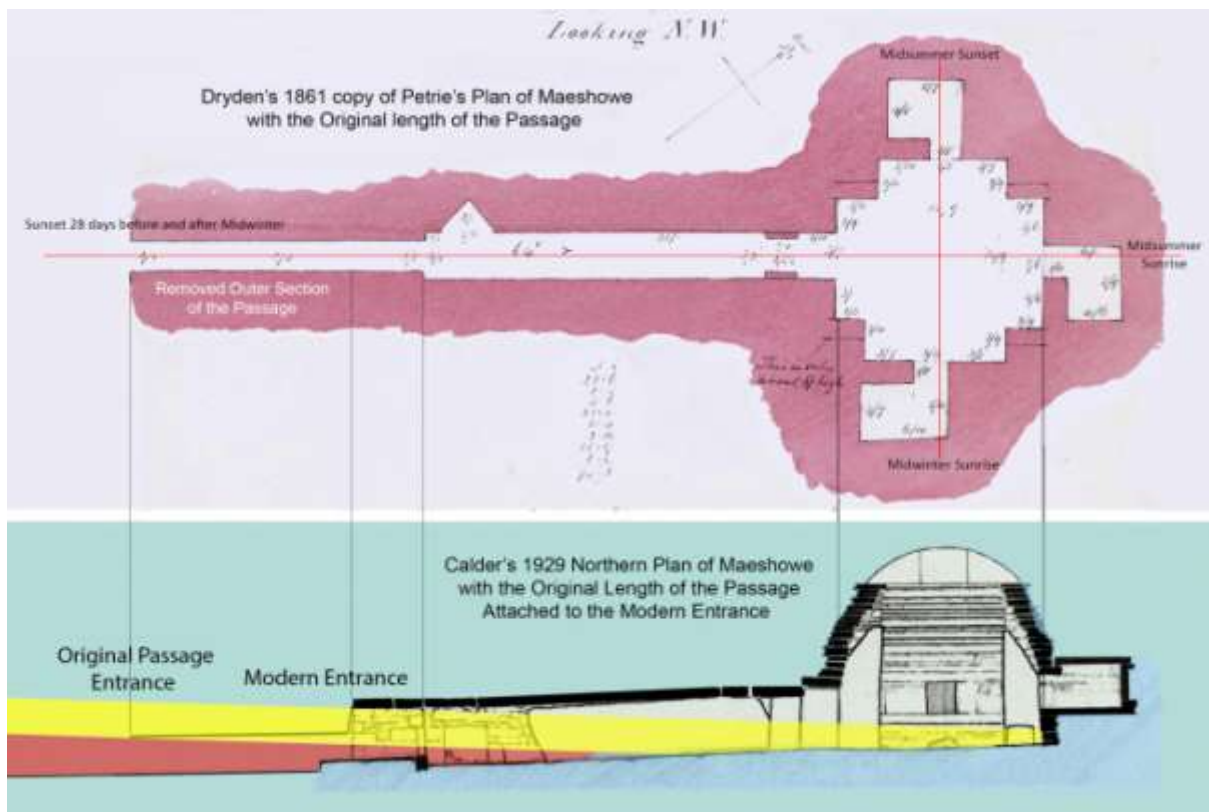
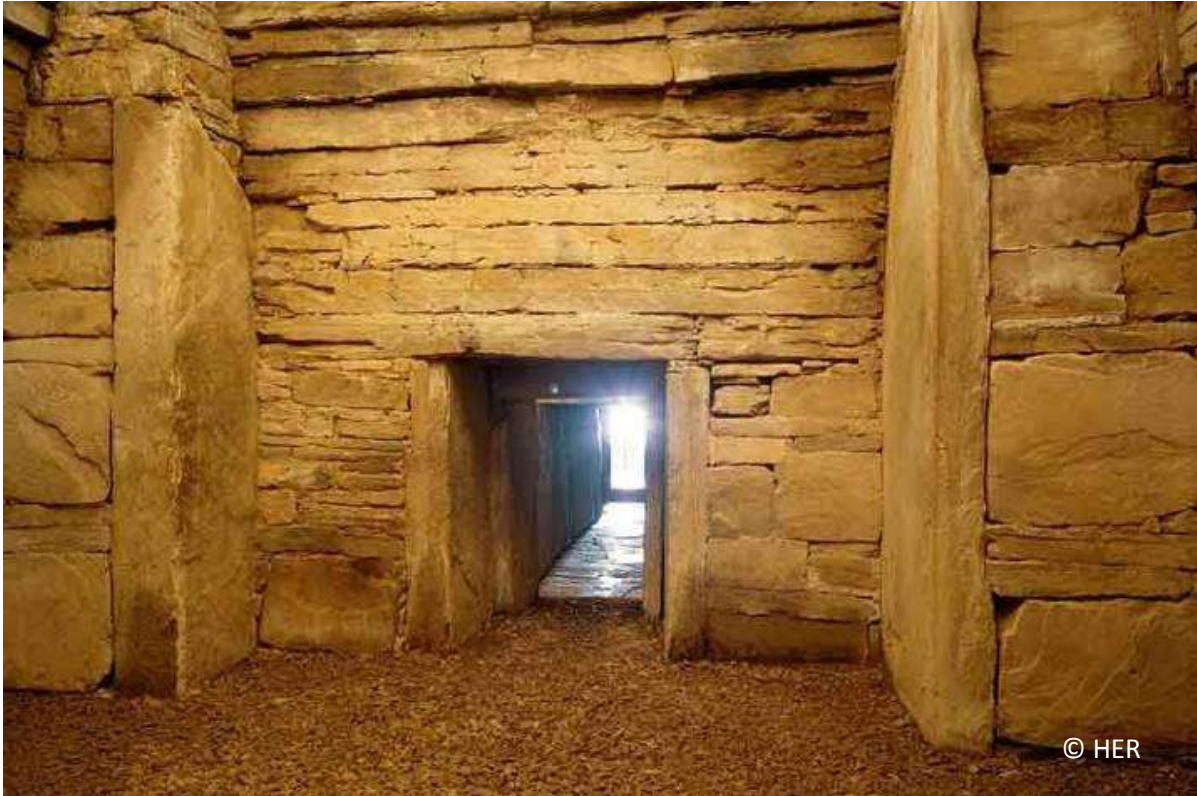


Figure 6. The yellow line shows how, as the midwinter sun sets on Ward Hill today, its light will enter the modern entrance to touch the back wall of the chamber. Adding the original length of the outer passage from Dryden's to Calder's 1929 plan, shows (in red) that the sunlight would only have reached halfway along the passage. When the blocking stone was in position, the low angled sunlight could not have reached high enough to shine over its top into the inner passage.

The long axis of the Druid temple Clava passage cairn is aligned through a large 'false portal' to the midwinter sunrise. This could only have been 'seen' by the ancestors from within the burial chamber. Somerville proposed that the two passage cairns at Clava near Inverness are aligned to the midwinter sunset (Somerville, 1923). I photographed the midwinter sunset for the first time from both passage cairns in 1989. The lowest outer kerb stones of the north-east passage cairn form a false portal that is in line with where the northern major standstill moon will rise every 19 years (Scott, D. 2010)(Scott, D. 2016).

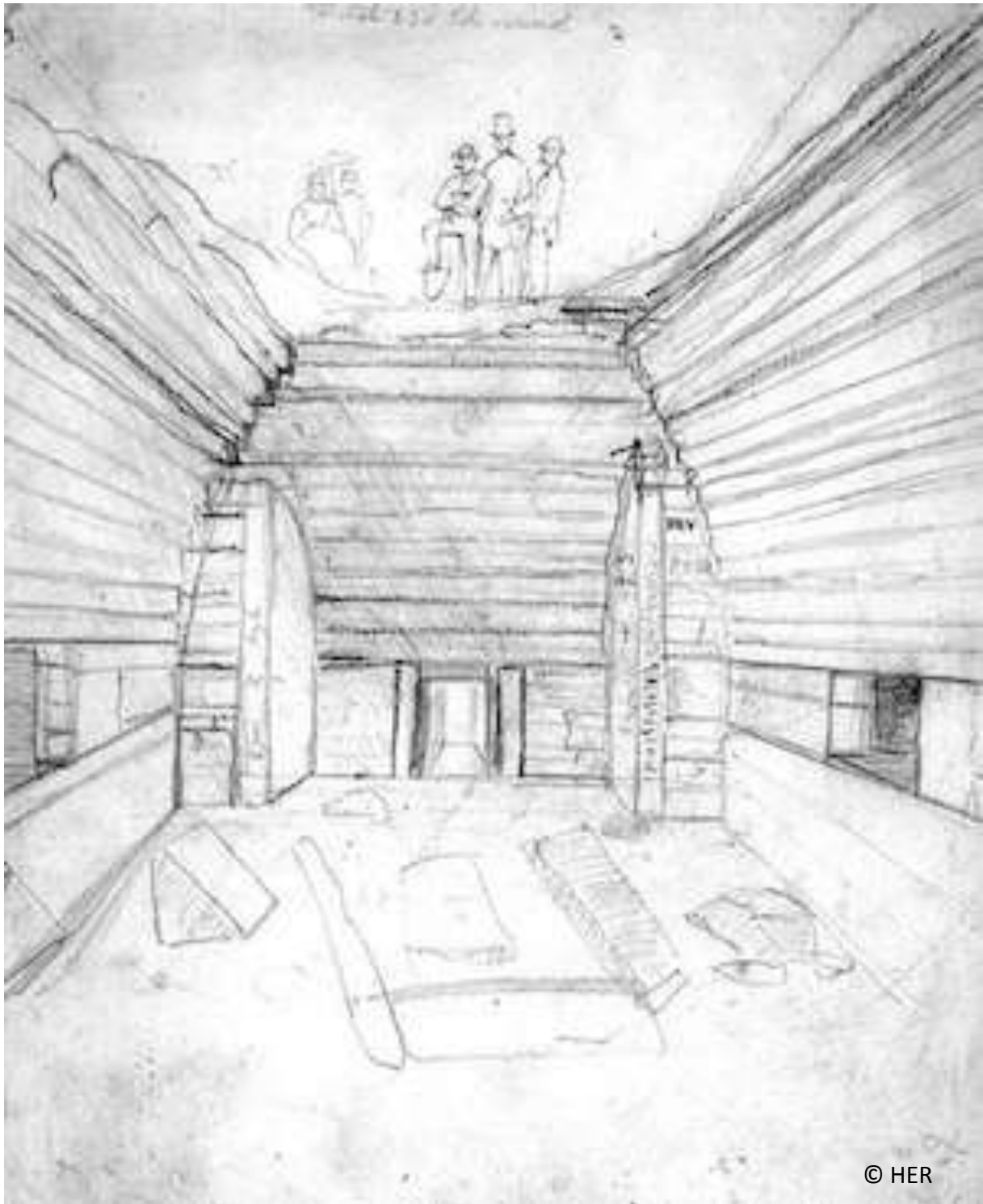
It has been proposed by Prof. Richard Bradley that the Recumbent Stone Circles were large false portals and these have been found to be aligned to the sun in early November, February, midwinter and to the lunar standstills (Ruggles & Burl, 1985) (Ruggles, 2000) (Bradley, R. 2007) (Scott & McHardy 2020). In the midwinter aligned passage tomb of Newgrange in Ireland, two of the three small alcoves off the central chamber held large stone basins, in which the cremated remains of the dead were perhaps placed. The stones forming the sides of the alcoves are carved with solar spirals, which are generally in line with the hidden midsummer rising and setting sun, and with the midwinter sunset. From the centre of Stenness its circle stones marked the rising and setting sun and moon at different times (Figures, 9, 10, 11, 12, 13, and 14). The sun will set in line with the 5 metre high north-west Watch Stone some 21 days before and after midsummer (Figure 9).



This picture shows the inner entrance of the passage from inside the chamber and two of the standing stones placed at its four corners. The Neolithic zigzag carving is located on the lower outer side of the standing stone to the right.

The four large standing stones forming the corners of the chamber were aligned to the hidden rising and setting midwinter and midsummer sun. The opening of the small right cell is in line with the midsummer sunrise, while that to the left is to the midsummer sunset.





This drawing was probably drawn by Gibb and it perhaps shows Farrer with some of his fellow excavators of Maeshowe after the earth had cleared the earth from the chamber. On the walls to the left and right are two of the small cells with their closing stones lying on the floor below them. Some of the fallen roof stones are lying at the centre of the chamber. Two of the four standing stones can also be seen on either side of the entrance passage.

The stump of another standing stone was found 5 metres to the south-east of the Watch Stone during the road works in 1936. The alignment of the Watch Stone would suggest that the two stones were aligned to the midwinter sunrise and to the northern major standstill moonset. In the 1980s, Colin Richards excavated the sockets of the Odin Stone and that of an unknown companion stone, some 90 metres to the north-west of Stenness which were in line with the nearby Odin House (Richards, C. 1991). A survey from the centre of Stenness and the Dolmen Stones, found that the Odin Stones had been aligned to the northern major standstill moonset every 19 years (Figures, 9, 10, 11 and 12). The Odin Stones to the south-east marked the midwinter sun rising above the Stenness stone circle. The Barnhouse Stone some 500 metres south-east, marked the sunrise in early November and February.

I also found that 6 pairs of Orcadian standing stones were aligned to the sun near some of the eight divisions of the year, and 2 pairs to the moon during its minor and major standstills. The Lochview standing stones mark the rising and setting sun in early November and February and in May and August (Figure 15). The southern of the two Deepdale stones was removed, and the fragments of charcoal that were found in its socket might suggest that the stone marked a cremation burial (Burton, J. 1977-78). A survey from the northern stone found that both stones had indicated the rising southern major standstill moon every 19 years (Figure 16).

The Comet Stone and its two standing stone stumps were aligned to the rising and setting minor standstill moon and midsummer sun (Figures 17 & 18). Further research in late 2020 found that Prof. Thom had already proposed this (Thom, A. *Antiquity*, 1975). To the west of Stomness, the Leafea standing stones were aligned to the midwinter sun setting on the island of Hoy (Figure 19). The two Staneranda stones on either side of a burial mound mark the midwinter sunrise and the setting midsummer sun (Figure 20).

Excavations at Barnhouse to the north-east of Stenness have found the remains of the earliest buildings on Orkney (Richards, C. 1991). The 2012-2014 surveys found that some of the entrances to these buildings were solar and lunar aligned. A burial was found inside House 2, which Richards said looked like a cross between a burial cairn and a house (Richards, C. 2013) (Figure 22). From the burial at the centre of House 2, the minor standstill moon would have risen in line with its entrance. House 2 was eventually pulled down to make way for another larger squared building called Structure 8 which was located just to the south. From its large square central hearth, the northern major standstill moon would have set in line with its north-west entrance. To the south-east, Structure 8 is aligned to the hidden midwinter sunrise (Figure 23).

From the central hearth in House 3, the door-way would have framed the rising midwinter sun. Richards proposed that hearth at the centre of the nearby Stenness stone circle, that was excavated by Ritchie, was part of an earlier squared building like Structure 8 at Barnhouse (Ritchie, J.N.G. 1975-76) (Richards, C. 2013). From the central hearth the northern major standstill moon could have set in line with the entrance of the Stenness building.



Figure 7. From the Barnhouse Stone, 5000 years ago, the summer solstice sun would have risen above Maeshowe. Although the higher horizon was hidden by cloud, the midsummer sun rose to the upper right of Maeshowe at 3.43 a.m. on the 27th June 2018.

Figure 8. The long axis passage alignment to the midsummer sunrise was confirmed as the sun rose to the upper right of Maeshowe at 5.02 a.m. on the 27th June 2018.



The Ness of Brodgar complex was surrounded by a wall with entrances to the north-west and south-east. These buildings were not domestically used, and this has led to the suggestion that they were temples or ceremonial centres (Mackie, E. 1997). From the south-east cup marked doorway of Structure 1, the stump of a nearby standing stone is aligned to where the southern major standstill moon rises every 19 years (Figure 24). This sightline would have been blocked by the later erection of Structure 12. The entrance of Structure 27 was aligned to the sunrise in early May and August. The Ness of Brodgar structures were torn down before Structure 10 was built and its entrance was aligned towards Maeshowe. A remote survey from the entrance of Structure 10 suggested that the sun rose above Maeshowe at the spring and autumn equinoxes. This was photographed at 7.22 a.m. on the 21st September 2016 (Figure 25). Perhaps when the sunlight originally flooded into Structure 10, it was intended to shine on the bones of some revered ancestor or other sacred objects on the stone dresser that was found near the west wall? From inside Structure 10, the stump of hidden western standing stone outside Structure 1 marks the equinox sunset.

Burial Cairns and Rock Art in Early Written and Oral Accounts

The surveys have shown that many ancient monuments were aligned to the sun near the times of the later Gaelic festivals of Samhain and Beltane. In the 12th century Irish manuscripts there are accounts of people entering cairns to interact with their spirit inhabitants at Samhain in early November. This led me to consider if these were perhaps fragments of prehistoric beliefs (Scott, D. 2015). The view that there may be some aspect of ritual use of burial cairns and standing stones in traditional stories has also been expressed by other archaeologists (Ritchie, 1975, Burl, 1976, O’Kelly, 1988, Richards, 2014). It may be contentious to some, but just as Homer’s book *Iliad* gives an insight into Greek beliefs, so also books such as the *Lebor Gabala*, “The Book of Invasions”, tell us that the cairns were believed to be inhabited by spirits called the Sidhe, (Shee) or the Tuatha De Danann, ‘Tribe of the Goddess Danu’. These stories were written down from oral sources as a foundation for Irish history, forming a link with the original spirit guardians of the land. They tell of how Ireland was once ruled by these supernatural beings and when they were defeated by the invading Gaels, they retreated to the underworld where each lived in a burial cairn. It has been suggested that the Irish myths were rooted in the Bronze Age (Waddell, J. 2014). It might seem that these stories would have changed over time, but as Gantz points out:

“when originally recited by the Celtic Bards, while each recital of the story might have varied depending on the performer, the main structure would have remained intact and it was only later when written down that they deteriorated” (Gantz, J.1981).

Gantz also comments that this oral tradition “originated in the mists of Irish prehistory (some elements predating the arrival of the Celts in Ireland)” (Gantz, 1981). The Tuatha De Danann are described in the Irish *Book of Armagh* as the ‘dei terreni’ or earth gods who exacted tributes of food or milk from people to ensure rich harvests (Wentz, W.Y.1911). As the majority of the people were illiterate, these expensive books could not have been the source of these traditions, which continued to circulate among them until the 19th century.

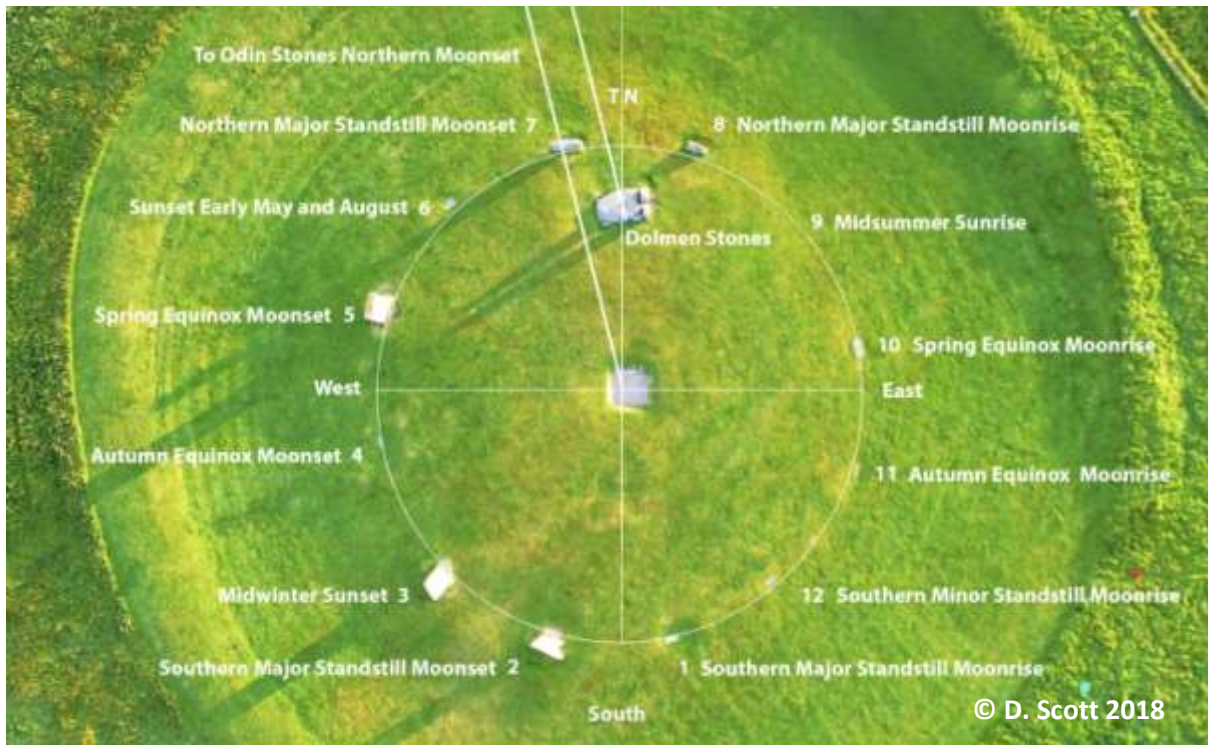


Figure 9. This aerial photograph of the Stenness shows its remaining circle stones and the central hearth of the earlier building. The sockets of the missing stones are marked with concrete blocks and their proposed solar and lunar indications are also shown.

Figure 10. This photograph shows the remains of the Stenness stone circle and some of the north-west monuments. The Odin Stones were digitally created. From Stenness, the sun will set in line with the Watch Stone some 21 days before and after midsummer, Azi. 213°.Alt. 0° 40'. Decl. +21° 26'. This time could have been known by those who erected the stones by simply counting these days.





Figure 11. During the 3003 BC major standstill, the first crescent northern moon would have set near the Odin Stones on the 4th June, Azi. 333°. Alt. 0° 20'. Decl. +28°. On the 12th December the same year, the midwinter full moon would also have set in line with these stones.

Figure 12. The lower stars in the constellation of Leo Minor were hidden by cloud in this photograph taken at 20.41 p.m. on the 20th September 2016. Overlying this with a star chart showed that the star, FK 4908, set near Odin House. As this star has the same +28° declination as the northern moon, this means that the moon would have set in line with the Odin Stones every 19 years.



Evidence of these beliefs was found by Gaelic and Norse folklore researchers in the 19th and 20th century (Carmichael, A. 1928), (Fraser, J.G. 1914) (Wentz, W.Y. 1911) (Davidson, H.R.E.1964, 1993). It was also believed that by entering a cairn, people could travel to the Otherworld (Davidson, H.R.E. 1964, 1993). This could be a faint echo of the shaman's spirit journey to connect with the ancestors. To the Gaels this Otherworld was Tir Nan Og, the Land of the Ever Young, and Samhain, (Halloween), was the most sacred time of the year when they believed that the living and the dead could cross over to each other's worlds. In Gaelic Scotland cup marks were known as 'Clach Aoraidh', or worship stones and there are oral and written accounts that they were where the Sidhe spirits lived. Martin wrote that in the Hebrides milk was poured on a stone for the Brownie spirit inside it, and that it was believed that the moonlight shining on the crops increased their vitality (Martin, 1703). In 1899, the Reverend J.B. Mackenzie was told by an old Perthshire crofter, that he could not break up or bury cup marked stones lying about his croft, as this would incur the wrath of the supernatural beings living within them (Mackenzie, J.B.1899-1900).

Another belief was that if the woman of the house failed to fill the cup marks with milk each night to appease the Gruagach, the goddess of cattle, the best cow would run dry and be found dead in the morning (Carmichael, A. 1928). Milk was still poured on a cup marked stone in Laggan in Inverness-shire, and in Sweden until the 1960s to thank the Sidhe or Elves for the harvests (Richardson, D. 1990), (H.R.E. 1964). Cup marks in Sweden are called 'Alvkarn' or Elf mills, in which (as in Scotland and Ireland), a stone was turned clockwise (per comms Hakansson, H, 2020). My surveys of cup marks on approximately 100 monuments have shown that they were aligned to the sun and moon at the times stated.

People on Orkney traditionally married by first going to the Circle of the Sun, and then to the Circle of the Moon, where they would kneel and pledge themselves to each other in turn. They then held hands through the hole in the Odin Stone and finalised their wedding by taking the Oath of Odin (Figure 1). There is also a traditional story of someone by the name of Thorodale, who, it was said, visited the Odin Stone for nine full moons and circled it nine times on his knees, before looking through the hole in its side (Marwick, E.W. - Ritchie, G.N. L. 1975).

The Orcadian tombs were believed to be haunted by guardian spirits called the Hogboon, which is Norse for "Ghost in the Tomb" (Stuart, J. 1862-64). It was thought that these spirits looked after the fertility of the land around each tomb and, like the Sidhe or Elves, they were placated by having beer poured through a hole on top of their cairn. It was also believed that anyone entering the cairns would have to fight the Hogboon for their treasure (Stuart, J. 1862-64). The high regard in which the Elves were held can be seen in Norway where "sacrifices were made to an early king Olaf, Elf of Geirstad in his Howe (Burial Mound) of plenty as they once did to Freyr the sun god" (Davidson, H.R.E. 1964). Gifts of food and pebbles were also left at the Odin Stone, and when the tenant farmer destroyed it and some of the Stenness circle stones in 1814, the enraged Orcadians tried to burn house his down.



Figure 13. This photograph shows the midsummer sunrise at 4.28 a.m. on the 27th June 2018, which would have originally risen in line with the destroyed Stone 9. In the north of Scotland it never gets very dark after the midsummer sun sets, and it is possible to follow its bright progress under the northern horizon until it rises some six hours later.

Figure 14. From the central hearth at 3.45 p.m. on the 19th December 2018, the midwinter sun set in line with Stone 2 and on the southern side of Ward Hill on the island of Hoy.



Spence quotes Sheriff Brand of Kirkwall on the supernatural beliefs in Orkney in 1701:

“Almost every family had a Brownie or evil spirit, which served them; to whom they gave sacrifices for his services, as when they churned (butter) they took a part and sprinkled it every corner of the house, for the brownie’s use. When they brewed they had a stone with a hole in which they poured some wort for a sacrifice. When not sacrificed to, the ale fell dead. All these brownies have disappeared in place-names; but, strange to say, the only place where we know the name to have a permanent hold is the slope immediately adjoining the standing stones, and the farmer of Brodgar speaks of it to this day as Brownie; showing that the sacrifices here were of a more imposing and popular nature than the less known family brownies.

Brand further commented about the Brodgar and Stenness stone circles:

“Many of the people do say that the larger (Brodgar) was the circle of the sun, and the smaller (Stenness) that of the moon, and were worshiped by the pagan inhabitants of these isles” (Spence, 1903).

This was repeated almost word for word a few years later by Martin, which shows that this was commonly known on Orkney. Martin further adds:

“The hills and circles are believed to have been places designed to offer sacrifice in times of pagan idolatry; and for this reason the people call them the ancient temples of the gods”(Martin, M. 1703).

The Reverend William Stukeley was the first to suggest that ancient monuments in Britain had been aligned to the sun. This was after he had watched the midsummer sun rise at Stonehenge in 1723, which he published in 1740 (Stukeley, W. 1740). As this was 39 years after Brand’s comments, Stukeley could not have influenced Brodgar and Stenness being called the “Circles of the Sun and Moon”. Although there is no evidence for solar orientations for the Ring of Brodgar, the same cannot be said for the Stenness stone circle. The moon rising and setting in line with the Stenness circle stones and Odin Stones, and Thorodale’s ‘lunar rituals, suggests that the names for Brodgar and Stenness, were indigenous, and had been passed down through the generations on Orkney for more than 5000 years. The offerings of food and drink to these powerful fertility guardians of the land seem to suggest that they were the faint cultural memory of those whom we call the ancestors.

Conclusions

The surveys of ancient monuments throughout Scotland ranging from burial cairns, stone rows and rock art, have been found to be generally aligned to the sun near the eight divisions of the year, and to the moon near its major and minor standstills. Hidden solar and lunar orientations have been found in some burial cairns in Scotland and Europe. The curvilinear rock carvings from the Pierowall cairn on the Orkney island of Westray form a link with the rock art of the Boyne Valley passage cairns in Ireland. The south-west orientation of the short section of the passage of the Pierowall cairn might have been aligned to the mid-

winter sunset. This contact with Ireland could have been maintained via Callanish on the Isle of Lewis; but the safest route was south along the east coast of the Moray Firth, by the lochs in the Great Glen. The choice of this route is shown by the solar and lunar aligned Orkney-Cromarty passage cairns to the north of Inverness (Scott, D. 2015). Although the Clava Cairns near Inverness were built a thousand years after the Orkney-Cromarty cairns, their similar orientations show a solar/lunar continuity (Bradley, R. 2000) (Scott, D. 1992).

Prof. Alexander Thom proposed that ancient monuments were aligned to horizon notches to assess the northern and southern extremes of the sun and moon to a high degree of accuracy. However, from the hundreds of monuments that I have surveyed throughout Scotland, there was no evidence of this, and they were only generally aligned to the sun and moon near these times. This could have been done by simply watching and marking where this occurred at what were perhaps believed to be sacred times. The remains of the dead and the grave goods found in some monuments show that these Neolithic people believed in an afterlife. The orientations of the monuments would suggest that the sun and moon and the ancestors were revered as powerful fertility gods. Rather than being used for astronomy, the Neolithic farmers could have used these times to thank these gods with food offerings for good harvests? The non-domesticated use of the buildings around the Ness of Brodgar could suggest that they were used by a special group of people. It would have been these elites that maintained the social and religious balance through rituals to their ancestors, as their gods rose out of, or set into the Underworld.

Acknowledgements

I would like to thank Thomas Scott, Maggie Struckmeier, David Connolly, Hakan Hakanson, Hamish Fenton and Stuart McHardy for their help with this paper. The views expressed here are my own and do not necessarily reflect any of the above people mentioned. I would also like to add that I do not have any religious beliefs.

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Figures 15-25 can be seen in the following pages.



Figure 15. The sun will set in line with the Lochview stones in early May and as shown on the 7th August 2014, some 45 days before and after midsummer. To the south-east they mark the sunrise in early November and February, about 45 days before and after midwinter.

Figure 16. **The Deepdale Stones, HY 272 117. Lat. 58° 59' N. Long. 3°16' W.** These two stones marked where the moon briefly rose and then set, near, but not at its extreme southern major standstill, Azi. 178°. Alt. 2° 45'. Decl. -28° 30'. This moonrise will occur again at 23.46 p.m. on the 10th June 2025.





Figure 17. At 2.41 a.m. on the 27th June 2018, the moon near its minor standstill set in line with the Comet Stone stumps and some burial cairns on the nearby horizon, Azi. 223°. Alt. 2°00'. Decl. -20°.

Figure 18. The midsummer sun rising in line with the Comet Stone stumps at 3.23 a.m. on the 27th June 2018. The midsummer will also set in line with these stones. Azi. 40°. Alt. 1° 30'. Decl. +23° 30'. The minor standstill moon also rises in line with these stones.





Taken at 2.21 p.m. on the 19th December 2018

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Figure 19. The two Leafea standing stones were aligned to where the midwinter sun originally set on the island of Hoy, Azi. 209°. Alt.3°. Decl.-24°. The sun could have reappeared in what looks like the open mouth of a giant head, which is naturally formed by the western cliffs of Hoy.

Figure 20. The Staneranda stones stand on a burial cairn. To the north-west below they mark the midsummer sunset, Azi.323°. Alt.0°. Decl. +23°39'. To the south-east they mark the midwinter sunrise. Azi.143°. Alt.0°30'. Decl.-24°. The top of the broken stone is lying nearby.



HY 2674 2761 Lat. 59° 07' 44" N 3° 16' 54"W

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Figure 22. A burial was found under the trapezoid shaped flagstone in the centre of House 2, which Richards said looked like a cross between a house and a burial cairn (*Richards, 2013*). From the burial, the southern minor standstill moon would have risen in line with the doorway.

Figure 23. From the central hearth the entrance to Structure 8 at Barnhouse, is aligned towards the northern major standstill moonset. The building is also aligned to the hidden midwinter sunrise.

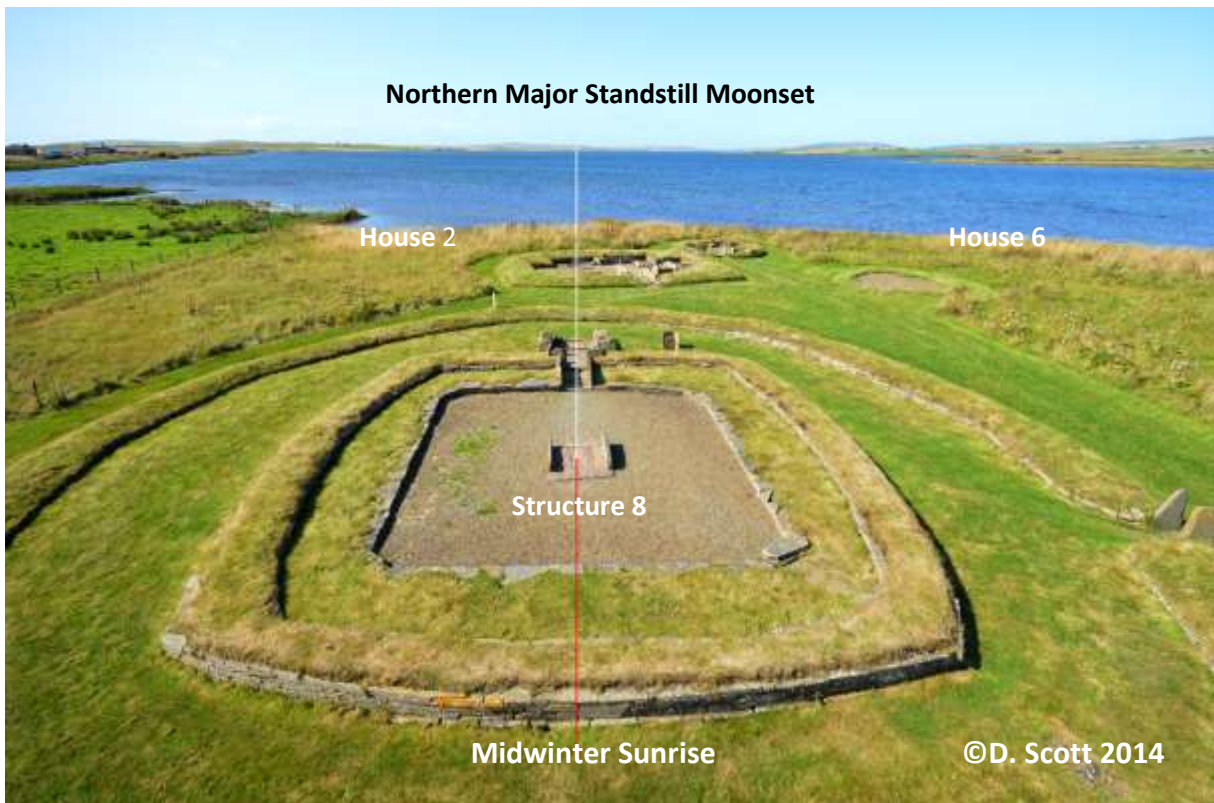




Figure 24. Structure 1 has four cup marks on the lower left side of its south-west entrance, from which the southern major standstill moon will rise in line with the once higher standing stone.

Figure 25. At 7.16 a.m. on the 21st September 2016, the partially obscured equinox sun rose just to the north of Maeshowe. The squared shape of Structure 10 is visible under the plastic sheeting.

