

10,000 Years of Scottish Star Gazing

Ancient interpretations of the night skies of northern Scotland

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Introduction

This booklet is for anyone who is interested in a native Scottish interpretation of the northern night skies. It was inspired by the creation of a new International Dark Sky Park for the Scottish Cairngorms in November 2018 - the Tomintoul – Glenlivet Dark Sky Park. Our hope is that this booklet may be used to inform interpretation of the night sky in future, both within the Dark Sky Park, and across Scotland as a whole.

Our modern view of the night sky and constellations is based on Romano – Greek mythology. However our ancestors had their own unique understanding of the starry heavens. They told their own stories about the sun, the moon and the stars. The aim of this little book is to help restore the myths and legends of the Scottish night sky to their rightful place in our cultural heritage. The subject matter is divided into five sections in broadly historical order:

- Hunter Gatherers: 10,000 – 4,000 BC (Mesolithic)
- First Farmers: 4,000 – 2,200 BC (Neolithic)
- Beaker Folk: 2,200 – 700 BC (Bronze Age)
- Celts: 700 BC – 800 AD (Iron Age)
- Vikings: 800 – 1,500 AD (Navigators)
- The Last Millennium: 1,000 – 2,000 AD

For most of this period we only have the archaeological record to go on. Our journey through time starts with the discovery that Mesolithic hunter gatherers in Aberdeenshire were already tracking the movements of the moon in 8,000 BC. This was over 5,000 years before the first formal calendars were created by the Babylonians. Next we present new perspectives on Neolithic and Bronze Age megalithic monuments that have been provided by recent astro-archaeological research and comparative ethnography. From the mid Iron Age onwards there is occasional mention of the Celtic world by classical authors. Archaeological evidence from this period includes a luni-solar Celtic calendar, more accurate than the Roman one that replaced it! We discover that the astronomical skills of the northern Celts were held in high regard by classical authors such as Caesar and Tacitus. Even when the Celts latterly mastered the art of writing, it was still forbidden to commit their knowledge of the stars to books or manuscripts. That had to wait until Christian monks created their record of an oral tradition that stretched back over many centuries. In those days there was no distinction between astronomy and astrology. A fresh look at the evidence in those medieval manuscripts has provided a solid basis for reconstructing the indigenous story of the Scottish night sky. Recent geological and astronomical evidence suggest a basis for some of the more apocalyptic accounts in these traditions. Folklore provides another source for other long standing stories of the Scottish night sky.

In conclusion we reconstruct a uniquely Scottish version of the night sky. We hope that it will be of interest not only to astronomers and cultural historians, but to the general reader as well. My thanks are due to Sam Robinson, Patricia Grant, Bruce MacDonald and Imogene Newland for the time they took to proof read this work.

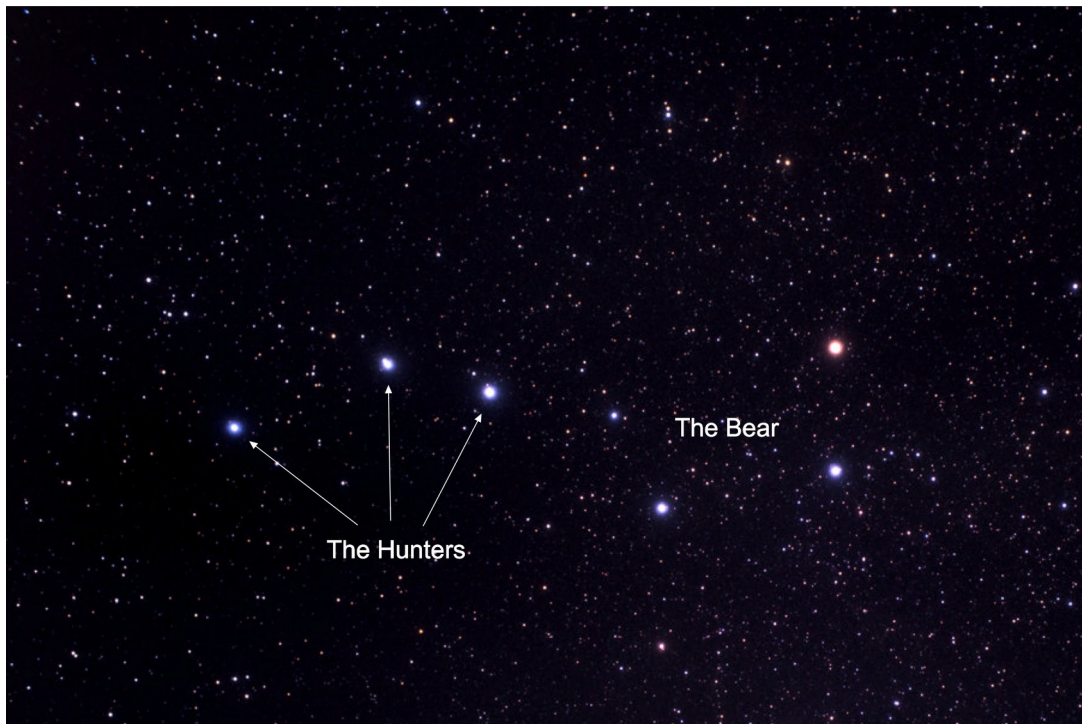
Stone Age Hunters

(10,000 – 4,000 BC)

Hunter gatherers began to arrive in Scotland in small numbers soon after the end of the last Ice Age. The remains of their temporary shelters have been found across Scotland from Orkney to the Solway Firth. They travelled along the coast in small groups, fishing and foraging the shoreline for food. By the end of the Mesolithic period there was a significant population of hunter gatherers in Scotland. Stone age societies generally recognised individual or small groups of stars rather than large constellations. These are often taken to represent individuals or groups of animals or people.

The Cosmic Hunt

The seven stars that we now call The Plough represent a hunt. Three men pursue a bear or an elk. The men are symbolised by the three stars of the 'handle' of the plough (Alkaid, Mizar and Alioth) and the animal by the 'body' of the plough itself (Megrez, Phad, Merak and Dubhe). The fainter star Alcor, adjacent to Mizar, often either represents a dog or a cooking pot.

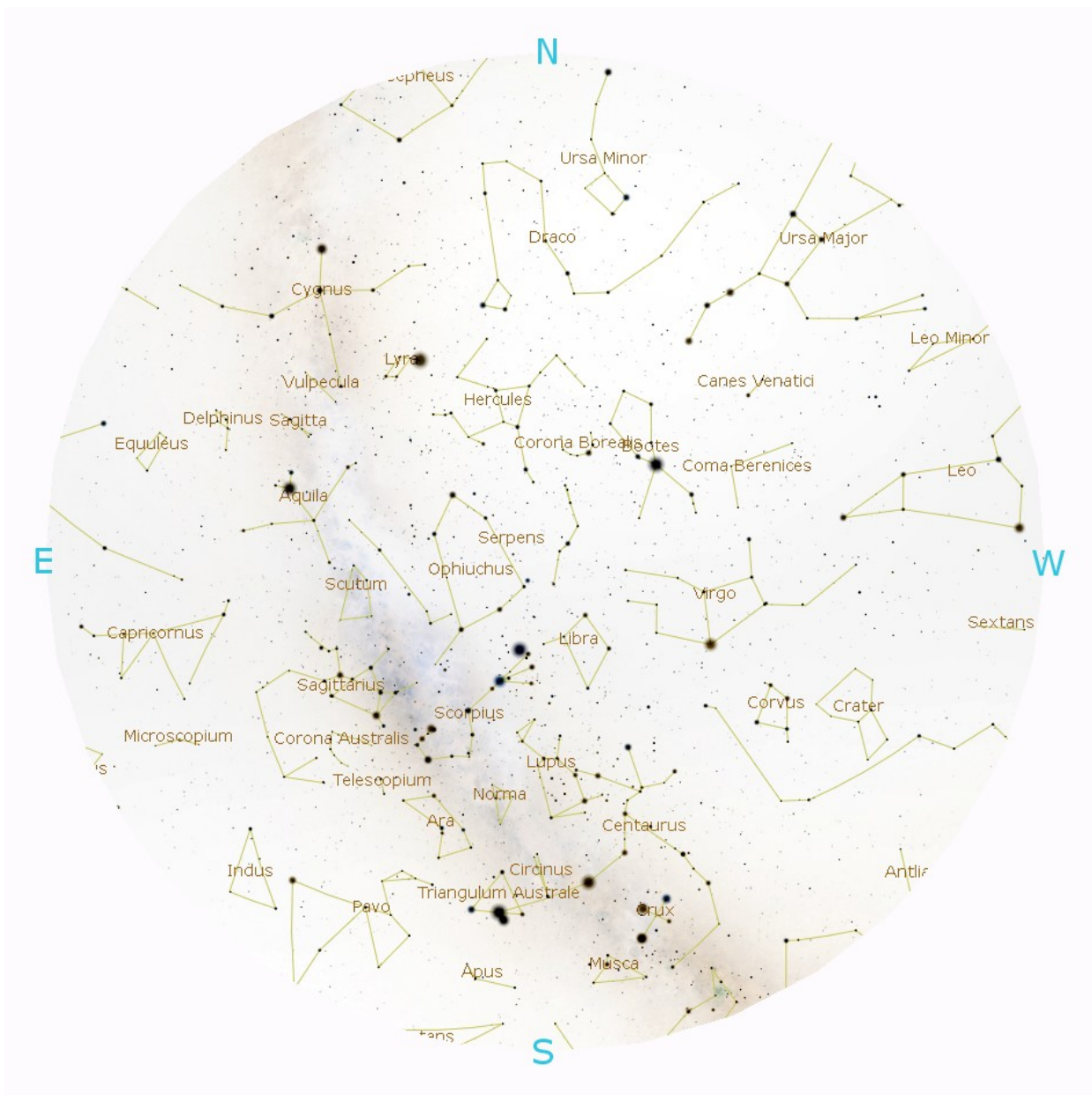


The hunters pursuing the bear. Image: European Space Agency

This story has been told all the way across northern Eurasia as far as the north American continent. In order to have crossed the Bering land bridge into North America, it is believed to be at least 13,000 years old. Through stories like this, the experience and way of life of a culture were handed down through the generations using patterns in the night sky. The first hunter gatherers to arrive in Scotland over the North Sea land bridge probably brought their own version of this legend with them. Over the following millennia they would come to know this group of stars as the Great Bear.

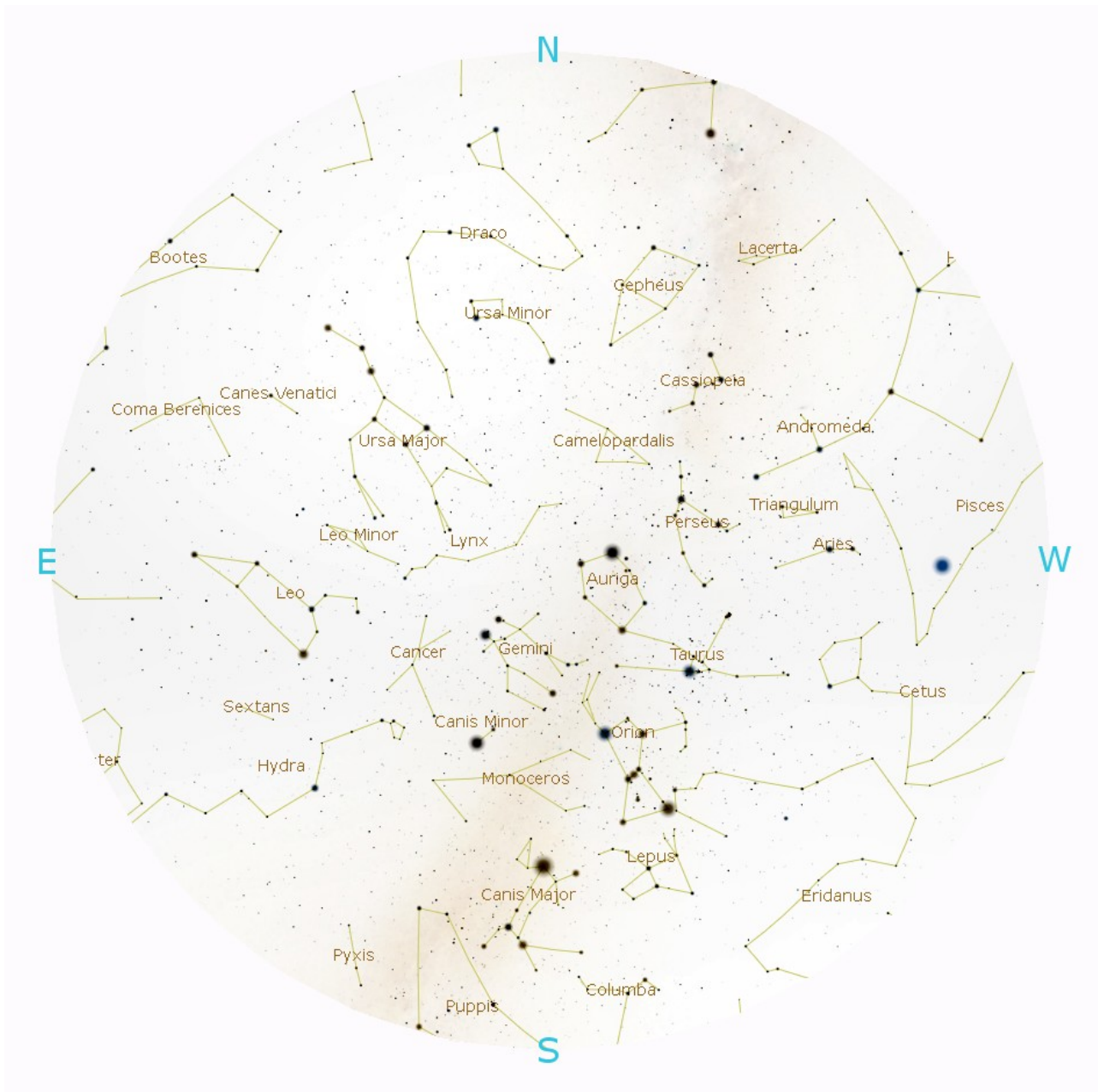
The Mesolithic Night Sky

The Earth's axis points at a place in the sky that we call the celestial north pole. This point appears to remain stationary whilst all the other stars rotate around it. However the night sky looked very different during the Mesolithic age because of the precession of the equinoxes. Over a period of 25,772 years, the axis of the earth slowly moves round in a large circle when compared to the background stars. Right now the celestial north pole is marked by a star called Polaris. In those days it was marked by a star in the nearby constellation of Hercules that we call Tau Herculis. This difference in the position of the celestial north pole had several consequences for people living in northern Scotland:



The Winter Solstice at midnight in 8,000 BC. Image: Stellarium

- The stars rose and set almost five months earlier in the year than they do now.
- The bright core of the Milky Way dominated the night sky during winter and spring. The (now) southern stars of Centaurus, Lupus and the Southern Cross were also conspicuous at that time of year. These are all invisible from Scotland in modern times.
- The circumpolar stars were in Ursa Major, Ursa Minor, Cepheus, Draco, Cygnus, Lyra, Hercules, Corona Borealis and Bootes. These stars were always visible and never set. Hercules, Corona and Bootes, are now only visible at certain times of the year.
- The stars of Orion and his dog Canis Major were never seen at all from Scotland during the Mesolithic age.



The Winter Solstice at midnight in 2020 AD. Image: Stellarium

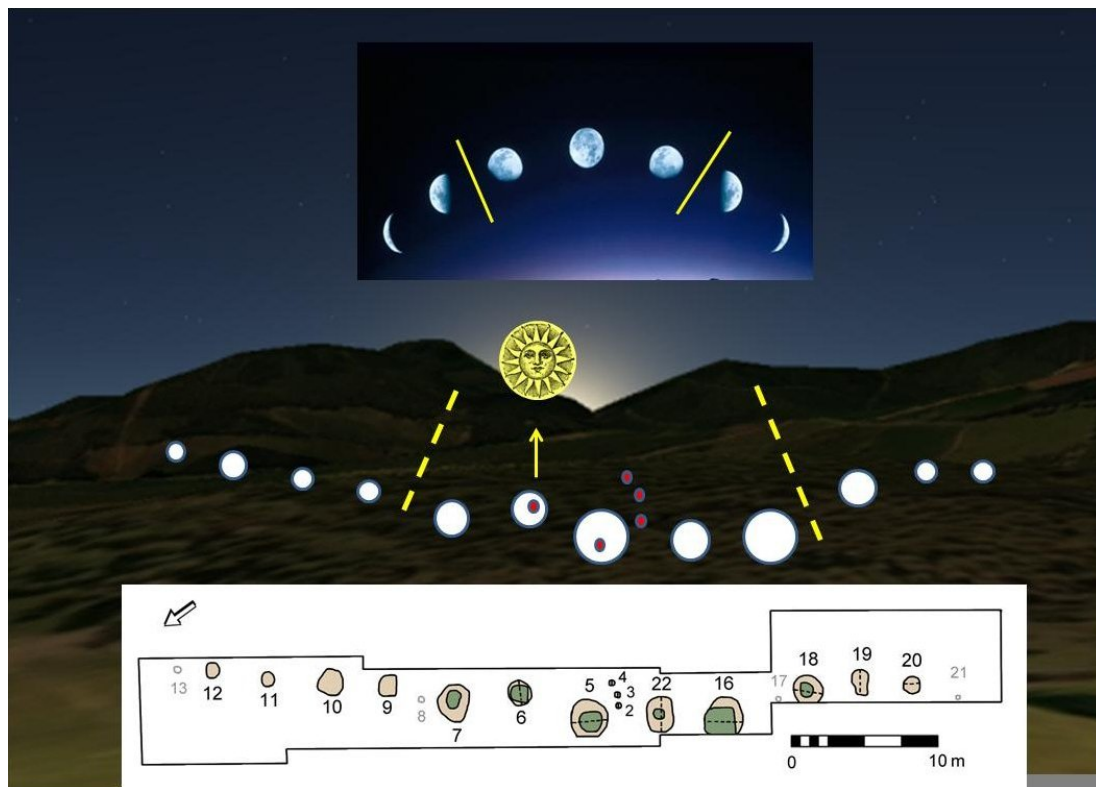
Tracking the Sun and Moon

Warren Field, Aberdeenshire (8,000 BC)

(Canmore 36671, NO737966)

Some time during the 8th millennium BC our Mesolithic ancestors started to dig pits at Warren Field near Crathes Castle in Aberdeenshire. Over several hundred years these were extended to form a group of twelve pits roughly aligned south west to north east. Excavations suggest that fires were lit in these pits from time to time over a period of four thousand years. The location of the smaller central pit appears to have been carefully chosen to frame the mid-winter sunrise in the pass on the southern horizon between the low hills of Cairn-Mon-Earn and Craigberg. The other pits seem to reflect the phases of the moon and may have been used to track the lunar months over the course of a year. The solstice alignment could have been used to synchronise the lunar calendar to the solar year when necessary.

This suggests that the hunter gatherers of Mesolithic Scotland were able to track time across the years and correct for the drift of the lunar year as opposed to the solar year. All this happened in Scotland almost 5,000 years before Babylonians created the first formal calendars in the 21st century BC. Warren Field is unique. There is no known comparable site in Britain or Europe for several thousand years.



Schematic of the pits at Warren Field, Crathes. Based on Murray et al. 2009

First Farmers

(4,000 – 2,200 BC)

Neolithic farming brought permanent settlements to northern Scotland by around 4,000 BC. Discarded rubbish from middens in Orkney shows that the farmers kept cattle, sheep and pigs as well as growing barley and wheat. They also gathered shellfish along the shoreline as well as fishing from boats. The adoption of farming and a more sedentary lifestyle brought increased prosperity and a potential for food surpluses at times.

In modern Stone Age societies the availability of surplus resources is often accompanied by the emergence of political control. One of the ways that leaders of these societies assert control is by building permanent structures and organising public events such as feasts. The creation of substantial megalithic monuments during this period suggest that this was the case in Neolithic Scotland. The central square stone setting in the stone circle at Stenness, Orkney may well have been a hearth. Bones of cattle, sheep wolves and dogs found in the surrounding ditch also suggest ritual sacrifice and feasting. Both ritual ceremonies and large feasts require advance planning to ensure that all of the resources and people are available at the appointed time. In modern stone age societies this function is usually discharged by the local shaman. He advises the right time for the event by observing the movements of the sun, moon, planets and stars in relation to fixed terrestrial markers. There is no doubt that many of the Scottish megalithic monuments would have ideally lent themselves to this purpose.

However the case for using megalithic astronomical observatories in timing the agricultural year may have been somewhat overstated by some writers in the past. In the Neolithic most ordinary folk would have had a good working knowledge of the annual movements of the brightest stars in relation to the seasons. In any case farming activities depend on a number of factors, not the least of which is the weather!

The Neolithic Night Sky

By the dawn of the Neolithic:

- The stars rose in the east and set in the west three months earlier in the year than they do now.
- The closest star to the north pole was now Edasich (Iota Draconis).
- The bright core of the Milky Way still dominated the night sky during late winter and throughout the spring. The stars of Centaurus and Lupus were still visible from Scotland.
- The circumpolar stars were the ones in Ursa Major, Ursa Minor, Cepheus, Draco, Lyra, Hercules, Corona Borealis and Bootes. These were visible all year round and never set. However Cygnus was now no longer always visible.
- The stars of Orion and Canis Major could now be seen at certain times of the year.

Connecting the Earth to the Sky

The sun brings light or darkness and warmth or cold depending on the time of day and season. It always rises and sets in the same direction depending only on the time of year. The moon however changes shape throughout the month, eventually disappearing to leave the night sky in darkness, dominated by the stars and planets. The moon can also be seen by day as well as by night. It can also eclipse the sun during the day and itself be cast into shadow at night. Thus, the moon possesses the supernatural capacity to destroy the Sun, but only for a short time.

Lunar Standstills

Unlike the sun, the moon's direction of rising and setting is complex, playing out over a period of 18.6 years. The orbit of the Moon around the Earth is inclined at an angle of roughly five degrees to the orbit of the Earth around the Sun. This means that whereas the Sun rises and sets in the same place for a given time of year the Moon does not. In fact the moon goes through a cycle of maximums and minimums in terms of its distance from the sun along the horizon. These maximums and minimums are called the major and minor lunar standstills.

Astro-aligned Megalithic Monuments

Scottish Neolithic farmers were part of a Europe-wide Megalithic culture that produced many monuments built from massive stones and rocks. The horizon seems to have been a special place for them because it separated the sky from the land and sea. The sites for many of these monuments seem to have been chosen with great care so that important events taking place along the horizon could be viewed in relation to significant features in the surrounding landscape. By carefully choosing the sites for their monuments they were able to create a connection between the earth and the sky.

Whilst these monuments were unlikely to have been used as accurate observatories in the modern sense, the effort required to build them suggests that they highlighted events of great importance to their builders.

Full Moons

The events highlighted by the Neolithic monuments included the summer and winter solstices (longest and shortest days of the year). The full moon seems to have had special significance for them. At the full moon there is no darkness at all because the sun shines throughout the day and the moon throughout the night. Their builders' knowledge of the movements of the Moon was evidently fairly sophisticated because they incorporated the directions of the major and minor lunar standstills into several of their monuments. However it is unlikely that they were aware of the celestial mechanics that governed these movements.

During the Scottish Neolithic the first appearance of the bright red star Aldebaran in the dawn sky could have been used to predict that the next full moon would be the mid summer one.

Stenness, Orkney (3,100 BC)

(Canmore 2105, HY 306125)

At Stenness on Orkney the ancient Scots laid out a circle of twelve huge stones with a diameter of about 32m. These thin slabs are approximately 30 cm thick with sharply angled tops. The circle is surrounded by a ditch that was cut into the bed rock. It has a single entrance on the north side.



The Stenness stone circle, Orkney. Photo: David Newland

Solstices at Stenness

Around the winter solstice the full moon rises out of a gap between the hill of Ernie Tooin and Starling Hill, as seen from the stone circle. The last golden rays of the sun, reflected off the waters of Loch of Stenness, are replaced with the silver light of the moon mirrored by Loch Harray. The light of the sun has been replaced by the moon which passes high across the sky as the long night progresses. Finally Loch Harray reflects the pale moonlight just before the sun rises out of Ward Hill on Mainland. The sky has been continuously lit by the sun and the moon for 24 hours.

At midsummer the last rays of the setting sun are reflected off the waters of Loch Harray. Dropping into the dip between Vestra Fold and Kier Fold the sun's light is replaced by that of the midsummer full moon rising out of Mid Hill. The silver light of the moon is mirrored in the waters of Loch Stenness as it passes low over the water before setting into the hill of Culags on Hoy. As the sun rises its first light is reflected from Loch Harray just as it ascends from the pass between Ward of Redland and Ernie Tooin. Once again the sky has been alight for 24 hours.

The exact location of the Stones of Stenness was obviously chosen with great care to underline a connection between the landscape, water and sky. It must have seemed a very special and magical place to the ancient Scots.

Callanish, Lewis (2,900 – 2,600 BC)

(Canmore 4156, NB 213330)

Another circle of thirteen stones was constructed at Callanish, on the island of Lewis. A single standing stone is located near the middle and five rows of standing stones are connected to the circle. Two long rows form an avenue running to the north-north-east. The other three rows lie to the west-south-west, south and east-north-east. The row of four stones to the west of the circle marks the direction of the setting sun at the equinoxes. The row of four stones to the east of the circle marked the direction of the rising Pleiades in 1,750 BC. There is also a chambered tomb inside the stone circle to the east of the central monolith. It was all built using the local and ancient Lewisian gneiss. Callanish continued in use until around 1,400 BC.

Solstices at Callanish

From the stone circle, the mid-winter full moon rises out of the hill of Ròiseal Mòr just after the sun sets into Coltraiseal Beag. The light of the sun is replaced by that of the moon which passes high overhead as the long night progresses. It sets into the west side of Tolsta a' Chaolais just before the sun rises out of Clèitseal a Deas, its golden light briefly reflected onto the waters of Loch Ròg an Ear. As at Stenness the sky has been continuously lit by the sun and the moon for 24 hours.

At midsummer full moon the sun sets into the west side of Beiin Croir. Just after sunset the full moon rises out of the northern slopes of Clèatseal a Deas opposite, its silver light reflected off Loch Ròg an Ear. The light of the sun has once again been replaced by the light of the moon. At the maximum lunar standstill the moon would have barely skimmed the tops of the hills to the south. Finally, just as the moon sets into the gap between Sgeun and Coduinn the sun rises to the east of Beinn Choinnich. Once again the sky has been alight for 24 hours.

Every eighteen and a half years the 'Shining One' was said to walk up the avenue from the stone circle at the setting of the midsummer full moon. His appearance was heralded by the cuckoo and coincided with the major lunar standstill.

In the 6th century BC, the Greek historian Hecataeus wrote of stories that were ancient even in his time. He reported that the ancient Hyperboreans had lived on an island situated in the far north of the world. In fact their home was so far north that the moon sometimes seemed to be only a short distance above the earth. On this island there was a notable temple which was spherical in shape and sacred to the god Apollo. Every nineteen years the island was visited by Apollo at the vernal equinox. When the god appeared, he danced continuously throughout the night until the rising of the Pleiades.

The legendary temple of the Hyperboreans had several features in common with Callanish on the island of Lewis:

- It was a circular temple.
- It was sited in a place that highlighted the nineteen year lunar cycle in relation to the surrounding landscape.
- The midsummer full moon was so low that it appears to be much closer to the earth than at more southerly latitudes.
- The western row aligns with sunset at the equinoxes.
- The eastern row marked the rising of the Pleiades around 1,750 BC

According to Hecataeus there was a festival every nineteen years that started at the vernal equinox and lasted until the heliacal rising of the Pleiades. Now during the late Neolithic and early Bronze ages the Pleiades were hidden by the glare of the sun at the vernal equinox. So we can only assume that by the rising of the Pleiades, Hecataeus was referring to their first reappearance in the dawn skies after the equinox. It must have been a marathon festival because in 1,750 BC, 50 days would have elapsed between the vernal equinox and the reappearance of the Pleiades in the dawn skies.



Callanish stone circle, Island of Lewis. Photo: Nachosan

From the Sky to the Underworld

The Grey Cairns of Camster, Caithness (3,000 BC)

(Canmore 8686 and 8693, ND 260442 and ND 260440)

Several huge mounds of stone stand on the open moor just south of Wick in Caithness. Each has a passage that leads to a chamber in the centre of the mound. The Grey Cairns of Camster are some of the best preserved Neolithic chambered cairns in Britain. The entrances to the passages all face the east towards the rising sun.

Archaeological excavations suggest that excarnation may have been practised at these tombs. Excarnation is a form of sky burial. The deceased is placed on a platform for the flesh to be removed by birds, before the remaining bones are placed in the tomb. These kind of burial practices were no doubt intended to aid the soul's passage to the afterlife. For those whose bones lay within, the afterlife was most likely in the sky, – the power of the rising sun helping them to participate in an everlasting cycle of death and rebirth.



Camster Cairns, Caithness. Photo: David Newland

Maes Howe, Orkney (2,700 BC)

(Canmore 2094, HY 318127)

A grassy mound over seven metres high and thirty five metres across stands on level ground near the south eastern end of Loch Harray. An entrance on the south-west side of the mound leads into a stone-built passage. This passage runs straight into the mound for over nine metres, leading to a chamber in the middle. This is the largest of seven tombs of this type found only on Orkney.

Mid-Winter Solstice at Maes Howe

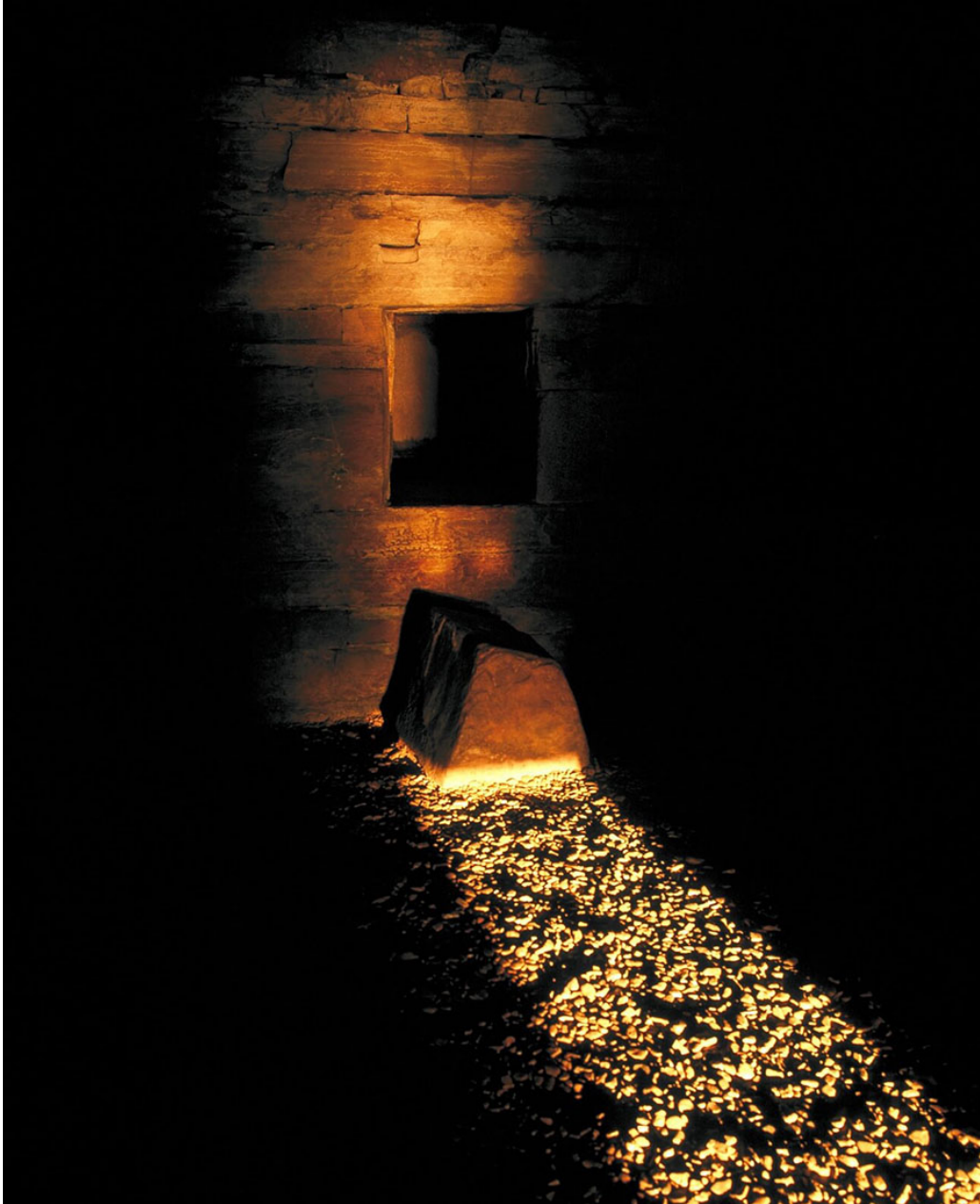
For a few days either side of the winter solstice the light of the setting sun penetrates the entire length of the passage to illuminate the entrance to the cell at the end. The mid-winter sun has particular significance because its power had been decreasing for the previous six months. In the following days its strength would begin to increase again starting a new cycle of life.

Archaeological excavations suggest that excarnation may have been practised at these tombs as well. For those whose bones lay within, it was the power of the resurrected mid-winter sun that aided participation in the perpetual cycle of death and rebirth.



Maes Howe, Orkney. Photo: David Newland

During the twelfth century Viking raiders broke into Maes Howe to shelter from a storm. As they waited for the storm to blow over, they amused themselves by carving graffiti on the walls. They left behind one of the largest and most interesting collections of Viking runes in Europe. Some of their comments are not repeatable here.



Sunlight illuminating the interior of Maes Howe at midwinter sunset.

Photo: Lizzie Linklater

Bronze Age Smiths

(2,200 – 700 BC)

From around 2,500 BC copper working technology came to Scotland. Around this time farming communities in Aberdeenshire started to build recumbent stone circles that were aligned to the south west. Over the following centuries, inhabitants of the river valleys in the Inverness area created their own unique monuments to celebrate events occurring in the south western sky. These were the Clava Cairns. In Perthshire and on the west coast of Scotland, standing stones were used to mark places that aligned significant landscape features with the rising and setting of the sun and moon at key times. The compact distribution of these various types of monument indicates that there were strong regional differences in the expression of underlying astronomical themes.

By 2,200 BC a new group of people arrived called the Beaker Folk. They brought a more advanced metal working technology with them. By adding tin to copper they created a stronger, more durable metal called bronze. This new material enabled them to make more sophisticated tools, weapons and ornaments than had been possible previously.

The Beaker Folk have been so called because of their practice of burying their cremated dead in distinctive beaker shaped urns accompanied by grave goods. These burials for high status individuals were very much in contrast to the communal burials of the preceding Neolithic period. They probably represent an increasing consolidation of political power in the hands of a ruling elite. Their arrival seems to have been one of migration rather than cultural adoption. Over the course of just a few centuries, they managed to replace up to ninety percent of the local Neolithic gene pool with one one of Asian Steppe related ancestry.

The Early Bronze Age Night Sky

By the dawn of the Bronze Age:

- The stars rose and set two months earlier in the year than they do now.
- The closest star to the North Pole was Thuban (Alpha Draconis).
- The bright core of the Milky Way was still visible in the spring and the stars of Lupus were still visible from Scotland.
- Although the Bronze Age inhabitants of Scotland no doubt recognised certain groups of stars as constellations, these were probably quite different to most of the ones we know today.
- The stars of Cassiopeia were now always visible. The other circumpolar stars belong to the constellations we now know of as Ursa Major, Ursa Minor, Cepheus, Draco, Lyra, Hercules, Corona Borealis and Bootes.

Rock Art

There are at least 2,400 prehistoric carved rocks scattered across the Scottish landscape. By far the most common type is cup marks. A rough circular hollow was carved into the rock surface which is sometimes surrounded by one or more concentric rings. These rock carvings can occur in isolation, or they can be combined to form complex designs. Each design is unique. The cup marks are often associated with natural features such as cracks or hollows.

Most of these enigmatic carvings were made during the Neolithic and Early Bronze Ages (roughly 4,000-1,800 BC). Some are found on natural rock surfaces in the open landscape. Others are found on rocks built into Neolithic and Early Bronze Age monuments, such as burial cairns, stone circles, and standing stones. Some of these stones may have been moved from their original sites in the open countryside, others may have been carved when the monuments were constructed.

We can only guess at the purpose of the carvings but plausible ideas include astronomical alignments and marking ritual places. Studies of societies that produce rock art today suggest that our prehistoric carvings may never have had a single, fixed meaning. Meanings may have also changed over time depending on who was using them. This would account for the many legends and folk stories involving fairies, magic, and giants associated with prehistoric carved stones.

Carved stones were also re-used in later structures, such as Iron Age hill forts, brochs, and souterrains, or Pictish symbol stones.



*Cup marks at Sunhoney stone circle, Aberdeenshire.
Photo: David Newland*

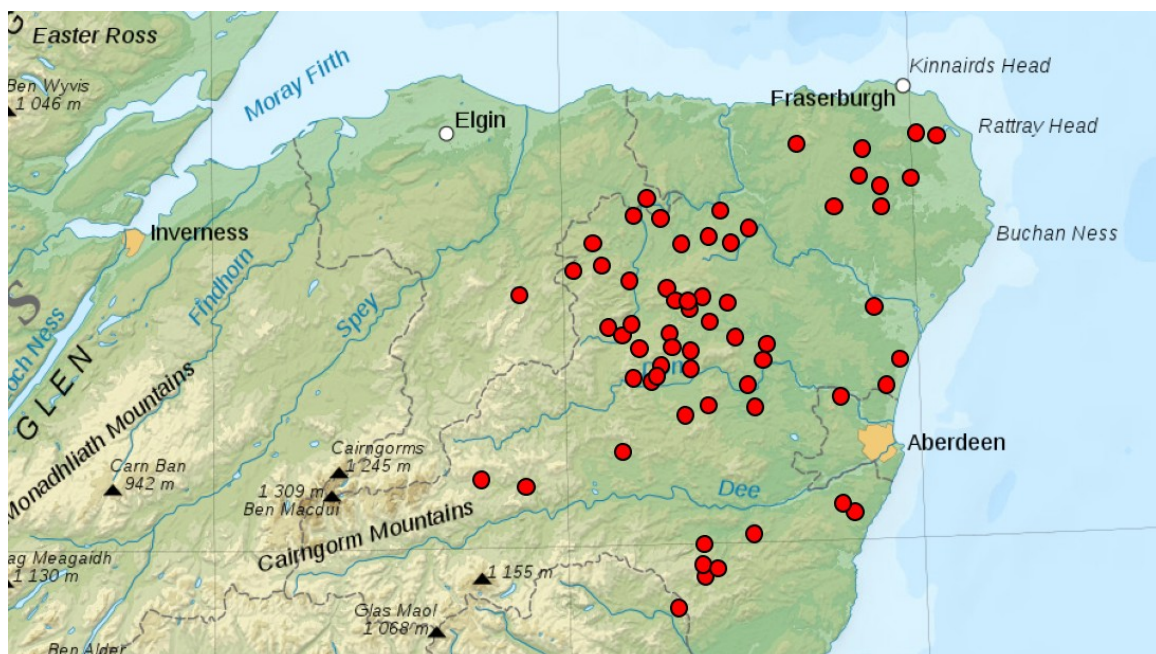
Windows on the Sky

Aberdeenshire Recumbent Stone Circles (2,500 – 2,200 BC)

In Aberdeenshire the megalithic builders created their own unique variation on the design of the stone circle. The distinctive feature of their creations was the inclusion of a large recumbent stone flanked by two upright stones. Together these three stones formed a frame that directed the attention to a particular part of the sky as viewed from the circle itself.

Different coloured stones were chosen for various parts of the structure. White or grey stones such as quartz may have symbolised the moon while red stones may have represented fire or the sun. There is usually a gradation in the height of the stones with the highest adjacent to the recumbent decreasing to the smallest on the opposite side of the circle. Smashed quartzite scattered over the area at a number of sites suggests that the builders may have seen a connection between the gleaming white rock and moonlight. Cup marks are found at significant locations on some of the stones in some of the circles. These circles are usually found on the crests of hills or terraces with wide southerly views. The recumbent and flankers all lie within a ninety degree range centred on south-south-west. They mark a stretch of horizon which usually contains a prominent hilltop.

There are over sixty recumbent stone circles in the Aberdeenshire area. These were constructed during the late Neolithic and early Bronze Ages, from around 2700–2000 BC. Most belong to the early Bronze Age. The evidence suggests that they were local ritual centres for groups of subsistence farms living in territories of around 10 square kilometres.



Distribution of the Aberdeenshire Recumbent Stone Circles

Tomnaverie

(Canmore 17006, NJ 486034)

There is a well preserved recumbent stone circle set on a small hilltop at Tomnaverie on Deeside. It's construction dates to around 2,500 BC. Lochnagar is conspicuous through the window framed by the recumbent stone and flankers from the centre of the circle. At the time that this monument was built, half a dozen of the brightest stars in the sky set into the recumbent stone between the two flankers:



Tomnaverie stone circle, Deeside. Photo: David Newland

The View Through the Window

- After the autumn equinox Rigel set into the recumbent stone just before dawn. At intervals of a few days it was followed first by Saiph, then the three stars of Orion's belt and finally Sirius. This spectacle was repeated every night throughout the winter.
- For the period over the three lunar months around the winter solstice the sun itself would have set into the stone window. In some years it would have been followed by Venus as the evening star. As the great constellation of Orion approached the 'window' before dawn the ever higher sun moved away to the north bringing lengthening days.
- Just before the spring equinox Rigel disappeared into the setting sun for the last time. It was quickly followed by Saiph, Mintaka Alnilam, Alnitak and finally Sirius. None of these stars would have been seen again until after midsummer as the days started to get shorter.
- After the spring equinox the bright core of the Milky Way would have been framed by the window until the bright summer mornings blotted it out two months later.
- At midsummer the full moon would have usually set inside the viewing window. Exceptionally, around the major lunar standstill, the moon would have appeared so low on the horizon that it barely scraped the hills to the south, setting before reaching the window itself.



*Rigel, Saiph, Sirius and Orion's Belt setting into the Tomnaverie recumbent stone - 2,500 BC.
Stellarium simulation: David Newland*

Once again a lot of effort had gone into constructing a monument that celebrated the unfolding of the year within the surrounding landscape.



Midsummer moonset approaches at Tomnaverie, Deeside. Photo: David Newland

Other nearby recumbent stone circles that are worth a visit include:



Old Keig, Keig (NJ596193 – Canmore 17530). Photo: David Newland



Midmar Kirk, Echt (NJ699064 - Canmore18001) Photo: David Newland



Sunhoney, Echt (NJ715056 – Canmore 18543) Photo: David Newland



Easter Aquorthies, Inverurie (NJ732207 – Canmore 18981) Photo: David Newland

Rothiemay Stars

Rothiemay Stone Circle, Huntly

(Canmore 17820, NJ 550487)

This ruined recumbent stone circle is about twenty eight meters in diameter. The site is in a flat field, and all of the interior ring cairn material has been removed. The massive recumbent stone and a few other substantial stones remain in position.

Midsummer Full Moonset

From the centre of the ring the recumbent stone covers a band of horizon 17° wide, from $197^\circ.9$ to $215^\circ.7$. A horizon of about one degree in height behind the recumbent gives a declination range from $-30^\circ.2$ to $-25^\circ.3$. This means that the southern full moon at the major standstill would have set over the stone, on its left side.



The Rothiemay Stone Circle. Photo: David Newland



The Rothiemay Recumbent Stone. Photo: David Newland

Rock Art at Rothiemay

The recumbent stone at the Rothiemay circle is the most decorated of any of the Aberdeenshire stone circles. There are least ninety nine cup marks, some of which are emphasised by the addition of a surrounding ring. These cup marks can be interpreted as a representation of the night sky. It has been suggested that the most central ringed cup mark represents Thuban which was the ‘north star’ at around the time the carvings were made. It was the only star in the sky that never moved during the Bronze Age. The other stars are arranged around Thuban anticlockwise in order of culmination (maximum altitude). The distance from Thuban roughly represents the declination / maximum altitude of each star. Almost all of the stars represented are magnitude three or brighter. These stars are visible even when the full moon is above the horizon.

Needless to say these carvings were not executed with the precision of a modern map-maker. Indeed their purpose is much more likely to have been to illustrate the movements of the heavens in relation to the time of year. These carvings may even represent a Bronze Age Scottish calendar.

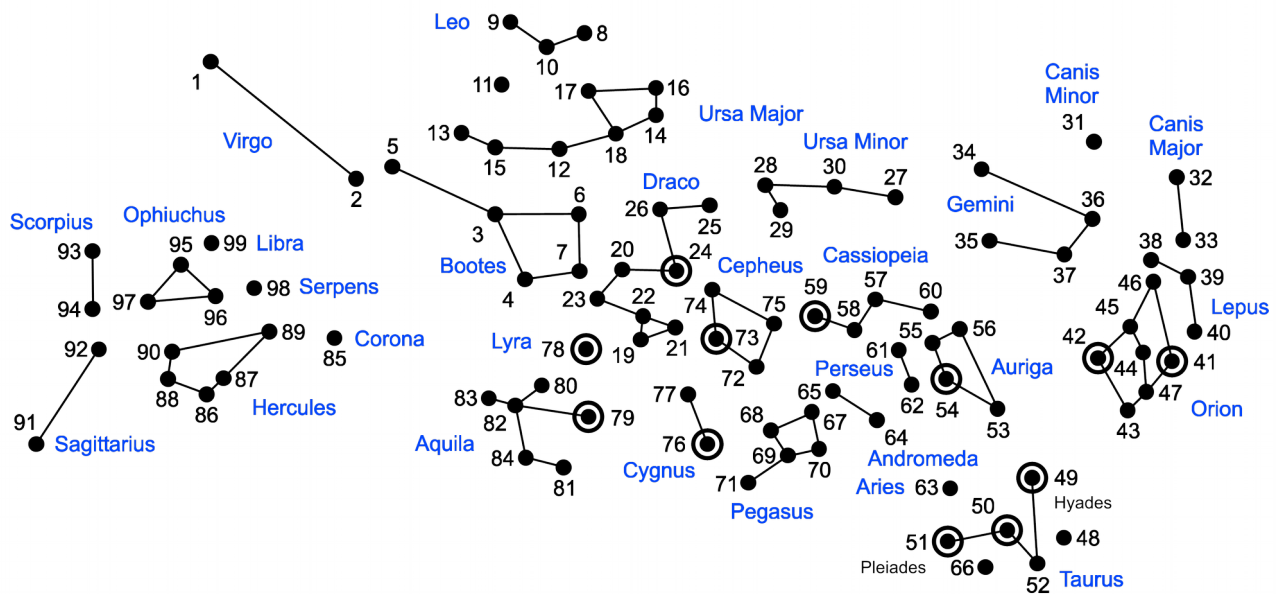


Diagram of the Rothiemay Stars and Cupmarks

A Scottish Bronze Age Calendar

Some stars were marked as more important than the others by their size and the addition of rings. The most important of the seasonal stars were the Pleiades, Aldebaran, Betelgeuse, Rigel, Altair and Capella. Using the movements of these stars for 2,000 BC we can tentatively reconstruct a calendar of the most significant events of the astronomical year for the carvers of the Rothiemay recumbent stone. Midsummer was marked by the framing of full moon set over the recumbent stone. The winter solstice was marked by sunset in the same place. Other significant times of the year would have been marked by the rising and setting of the more prominent stars.

Only the eight brightest of the twelve modern zodiacal constellations are represented on the stone.

- The summer began with the first appearance of the Pleiades in the spring morning skies. Capella had been visible in those skies since the late winter.
- The summer solstice was celebrated as the bright red star Aldebaran was first seen in the sky at dawn and the full moon performed its annual ritual over the recumbent stone at Rothiemay.
- Over the following weeks first Betelgeuse and then Rigel appeared in the pre dawn skies, warning of darker days to come. Capella was now visible all night long.
- As autumn advanced, Betelgeuse and Rigel chased Aldebaran and the Pleiades across the night skies as darkness gradually replaced the long days of summer. After the autumn equinox Aldebaran and The Pleiades were setting before sunrise.
- The rising of Altair in the pre dawn skies marked the start of winter. Capella was now invisible by sunrise and the Sun was dying.
- As the darkness reached its maximum, the sun would have set across the recumbent stone at the winter solstice just as the full moon had done at midsummer. But just as the sun was at its weakest, the re-appearance of Capella in the morning skies heralded the return of life giving light over the following months.
- Throughout the late winter Betelgeuse and Rigel slowly lost their dominance of the night skies until they were banished by the returning light. The Pleiades finally disappeared from view about a week before the spring equinox. The spring equinox itself was marked by the last sunset sighting of the three stars of Orion's belt; Alnitak, Alnilam and Mintaka.
- Finally the return of the Pleiades would have marked the victory of light over darkness and the start of a new agricultural year.

Several other stars were also ringed as having greater importance than the others. These were Vega, Deneb, Caph and Alfirk. Since these stars were always visible after sunset in those days we can only guess that they were seen as eternal and unchanging – the abode of the gods.

The Stars on the Stone

These are the stars and constellations recorded on the recumbent stone at Rothiemay. The numbers in column four give the magnitude (brightness) of each star. The stone includes most of the brightest stars of magnitude three or higher. Ringed cup marks are highlighted.

Star Name No.	Constellation	Mag.	Star Name No.	Constellation	Mag
1 Spica	Virgo	0.95	41 Rigel	Orion	0.15
2 Vindemiatrix	Virgo	2.85	42 Betelgeuse	Orion	0.45
3 Arcturus	Bootes	0.15	43 Bellatrix	Orion	1.60
4 Izar	Bootes	2.50	44 Alnilam	Orion	1.65
5 Muphrid	Bootes	2.65	45 Alnitak	Orion	1.85
6 Seginus	Bootes	3.00	46 Saiph	Orion	2.05
7 Nekkar	Bootes	3.45	47 Mintaka	Orion	2.40
8 Algieba	Leo	2.20	48 Tabit	Orion	3.15
9 Denebola	Leo	2.10	49 Aldebaran	Taurus	0.85
10 Zosma	Leo	2.55	50 Ain	Taurus	3.50
11 Cor Caroli	Canes Venatici	2.85	51 Alcyone	Taurus	2.85
12 Alioth	Ursa Major	1.75	52 Theta Tau	Taurus	3.40
13 Alkaid	Ursa Major	1.85	53 Alnath	Taurus	1.65
14 Dubhe	Ursa Major	2.00	54 Capella	Auriga	0.05
15 Mizar	Ursa Major	2.20	55 Menkalinan	Auriga	1.90
16 Merak	Ursa Major	2.30	56 Theta Aur	Auriga	2.65
17 Phad	Ursa Major	2.40	57 Navi	Cassiopeia	2.15
18 Megrez	Ursa Major	3.30	58 Shedir	Cassiopeia	2.20
19 Etamin	Draco	2.20	59 Caph	Cassiopeia	2.25
20 Eta Dra	Draco	2.70	60 Ruchbah	Cassiopeia	2.65
21 Rastaban	Draco	2.75	61 Mirphak	Perseus	1.75
22 Altais	Draco	3.05	62 Algol	Perseus	2.05
23 Aldhibah	Draco	3.15	63 Hamal	Aries	2.00
24 Thuban	Draco	3.67	64 Mirach	Andromeda	2.05
25 Giasar	Draco	3.80	65 Almaak	Andromeda	2.15
26 Kappa Dra	Draco	3.85	66 Menkar	Cetus	2.50
27 Polaris	Ursa Minor	1.95	67 Alpheratz	Pegasus	2.05
28 Kochab	Ursa Minor	2.07	68 Scheat	Pegasus	2.40
29 Pherkad	Ursa Minor	3.00	69 Markab	Pegasus	2.45
30 Eps Umi	Ursa Minor	4.21	70 Algenib	Pegasus	2.80
31 Procyon	Canis Minor	0.40	71 Enif	Pegasus	2.35
32 Sirius	Canis Major	-1.45	72 Alderamin	Cepheus	2.45
33 Mirzam	Canis Major	1.95	73 Alfirk	Cepheus	3.20
34 Pollux	Gemini	1.15	74 Errai	Cepheus	3.20
35 Castor	Gemini	1.90	75 Zeta Ceph	Cepheus	3.35
36 Alhena	Gemini	1.90	76 Deneb	Cygnus	1.25
37 Tejat	Gemini	2.85	77 Sadr	Cygnus	2.20
38 Arneb	Lepus	2.55	78 Vega	Lyra	0.00
39 Nihal	Lepus	2.80			
40 Mu Lep	Lepus	3.25			

Star Name No.	Constellation	Mag.	Star Name No.	Constellation	Mag
79 Altair	Aquila	0.75	91 Kaus Australis	Sagittarius	1.75
80 Deneb el Okab	Aquila	2.95	92 Nunki	Sagittarius	2.05
81 Theta Aql	Aquila	3.20	93 Antares	Scorpius	1.06
82 Deneb Okab	Aquila	3.35	94 Shaula	Scorpius	1.60
83 Al Thalimain Prior	Aquila	3.40	95 Kappa Oph	Ophiuchus	3.15
84 Eta Aql	Aquila	3.85	96 Rasalhague	Ophiuchus	2.05
85 Alphekka	Corona Borealis	2.20	97 Cebalrai	Ophiuchus	2.50
86 Sarin	Hercules	3.10	98 Unukalhai	Serpens	2.60
87 Kornephoros	Hercules	2.75	99 Zubeneschamali	Libra	2.60
88 Mu Herc	Hercules	3.40			
89 Zeta Herc	Hercules	2.85			
90 Pi Herc	Hercules	3.15			



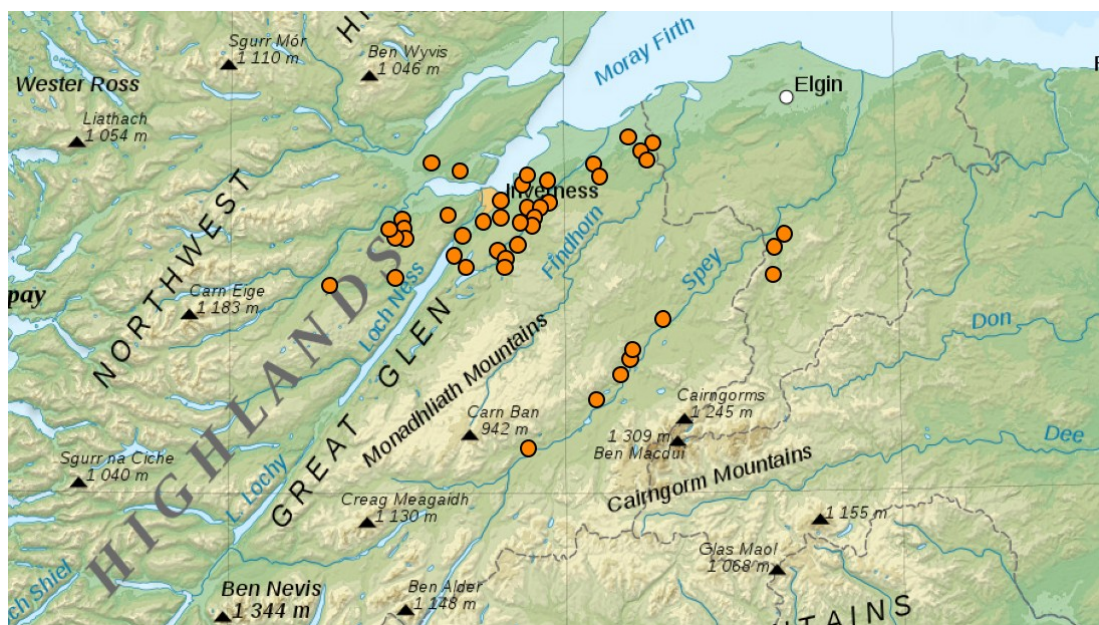
Constellation of An Sealgair Mór (Orion). Photo: David Newland

Circles of the Moon

Clava Cairns (2,300 - 2,000 BC)

Clava Cairns are a particular type of circular chambered cairn, that are found in the Inverness area. They were built along the river valleys of the Spey, Muckle Burn, Nairn, Ness, Enrick and Beaully. These rivers all flow predominantly from the south west to north east. The sites chosen by the Clava Cairn builders were usually ones with a clear south westerly aspect. As far as we know, the upper Findhorn valley is the only major river system in this area that has none of these cairns. The Findhorn is exceptional for both it's high sided valley and lack of visibility to the south western horizon that other rivers in the area possess.

Clava cairns consists of a central cairn that is usually retained by a kerb of larger stones. The cairns are surrounded by stone circles. Where the cairns have formal entrances these are usually orientated towards the south west. The heights of the standing stones vary so that the tallest are around the entrance and the shortest are directly opposite it. The choice and placement of particular types and colours of stone appears to have been significant. Redder stones were usually selected for the south western part of the surrounding circle. Whiter stones were placed on the north eastern side.



Distribution of the Clava Cairns

Midsummer Full Moon

Particular interest seems to have been taken in events around the major lunar standstill every 18.6 years. On these nights the moon appeared at its lowest in the sky. From some sites it even vanished altogether! At times like this our ancestors may well have thought that the moon was in danger of disappearing below the southern hills for ever. At other times the moon would have appeared much higher in the sky.

Doune of Delmore, Glenlivet

(Canmore 16029 at NJ185309)

Doune of Delmore sits on a raised plateau above the junction of the rivers Livet and the Avon. Seven stones still remain of the sixteen metre outer circle. These enclose a thirteen metre wide retaining kerb with an inner rectangular enclosure.

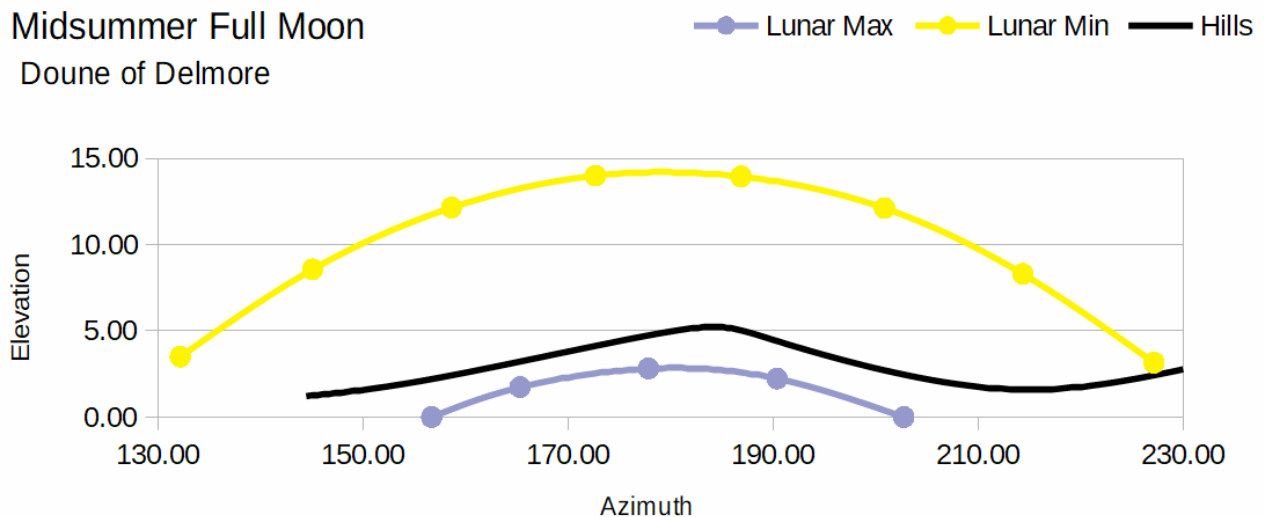
From the stone circle the midsummer moon would have become invisible for a few days around full, at lunar maximums. At these times only a faint ghostly glow would have been seen moving behind the hills of Blairfindy Moor. An event that only occurred once every 18.6 years would have been just once or twice in a lifetime for much of the population.



Doune of Delmore, Glenlivet. Photo: David Newland

Midsummer Full Moon

Doune of Delmore



Lagmore West, Ballindalloch

(Canmore 16016, NJ176358)

High above the confluence of the rivers Avon and Spey at Ballindalloch lie the remains of another stone circle and cairn. Four stones are still standing, the tallest being a little over two metres high. A fifth stone has fallen. Within the circle there is a cairn with a central chamber entered through a passage to the south. The passage, which still has one lintel remaining, has a slight bend in it. The cairn is retained by a kerb of rectangular blocks with the largest blocks adjacent to the entrance passage. The entrance is formed by two stones that project from the kerb. This is the closest well-preserved Clava Cairn to the Dark Sky Park. It is easily accessed from Ballindalloch.

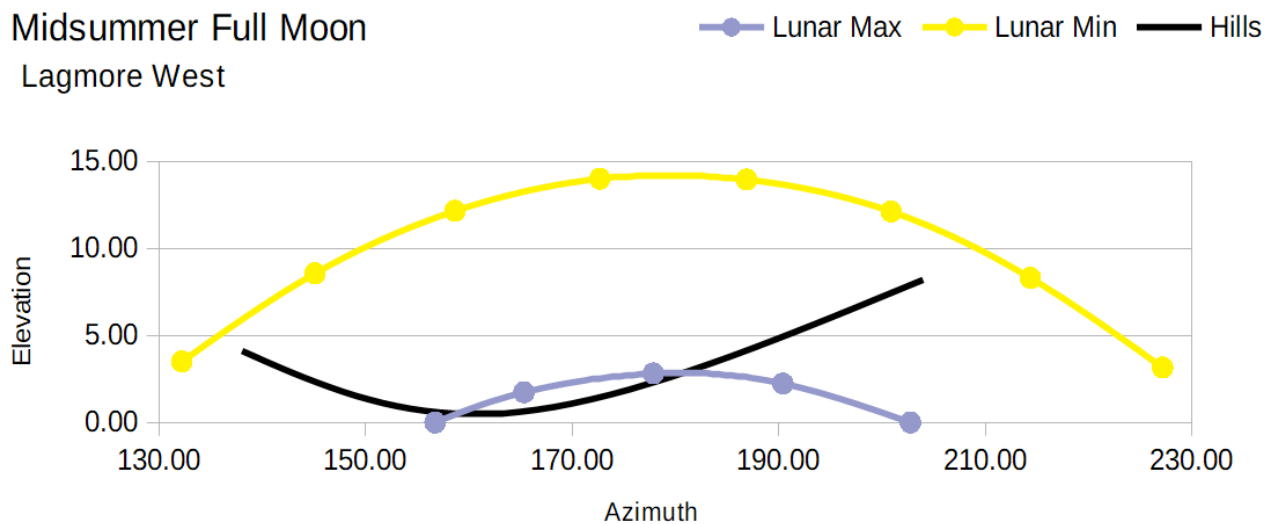
At lunar maximums the midsummer full moon would have appeared at the bottom of the Avon valley and rolled up the southern hillside before vanishing into it.



Lagmore West Clava Cairn, Ballindalloch. Photo David Newland

Midsummer Full Moon

Lagmore West



Three hundred metres down the hill side to the north west lie the remains of Lagmore East. (Canmore 15989 at NJ179359). These were once part of a thirty metre wide stone circle which enclosed a central cairn. Just three standing stones are now visible from the road on the south side of the A95. The most north-easterly stone is cup marked and two more stones have fallen. The view of the midsummer full moon would have been similar to that from further up the hill.

Marionburgh, Ballindalloch

(Canmore 16006 at NJ183364)

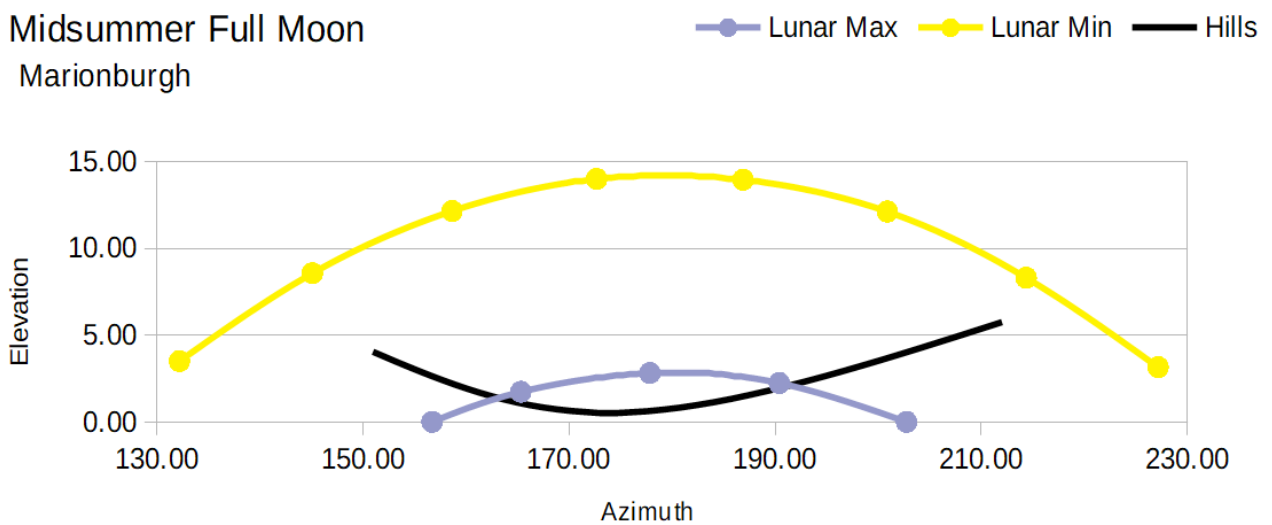
Five stones of the original circle remain standing in a small woodland just to the west of the entrance to Ballindalloch Castle grounds. Inside the circle there is a cairn about fourteen metres wide which would have once been enclosed by a boulder kerb.

At lunar maximums the midsummer full moon would have appeared out of Cairnacay, briefly crossed the Avon valley to the south before setting into the side of the Cromdale Hills.



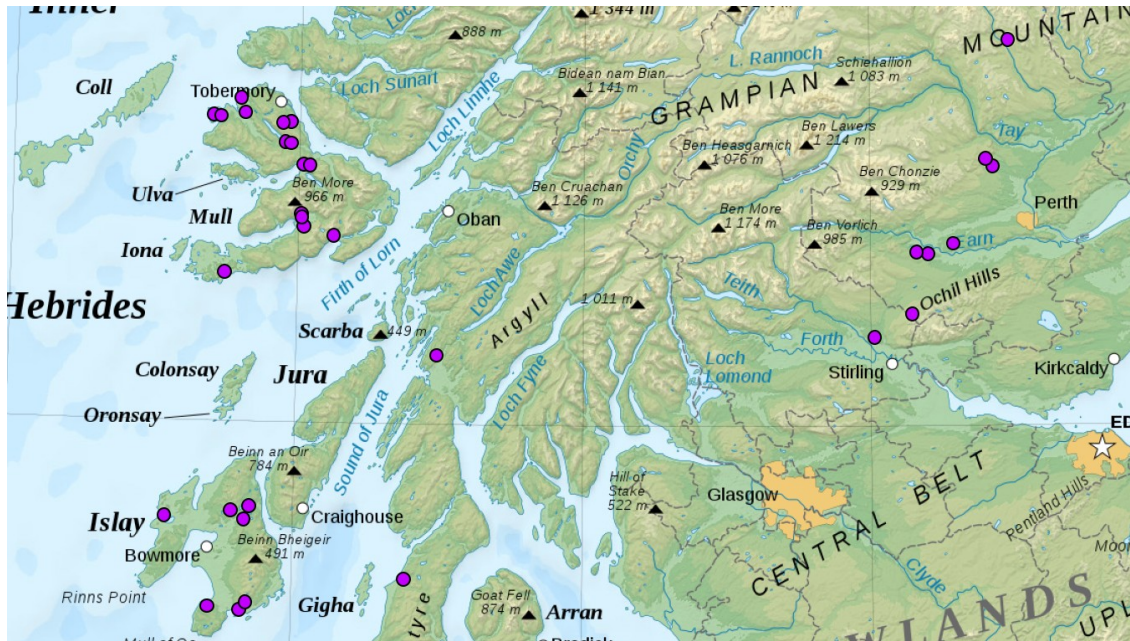
Marionburgh Clava Cairn - Ballindalloch. Photo: To be replaced

Midsummer Full Moon Marionburgh



Standing Stones

Standing stones are not uncommon on the west coast of Scotland. Many seem to have been deliberately positioned within the landscape to highlight key astronomical events – especially those of the moon. Further east, short stone rows are found in Perthshire that are similarly orientated. These standing stones may have been used in conjunction with landscape features to plan the timing of festivals and feast days.



Distribution of Standing Stones in Sky, Mull and Perthshire



The Moon. Photo: David Newland

Nether Largie, Argyll

(Canmore 39471, NR 828976)

Six large stones stand in a field at Nether Largie in Argyllshire. Five of them form a cross pointing from the north east to the south west. All but one of the stones are decorated with cup marks.

Tracking the Lunar Cycle

The position of the stones and their layout was carefully chosen so that the setting moon lined up with prominent landscape features at its major standstill every 18.6 years. From the central stone, the mid summer moon would set into Blarantibert when looking over the right hand southern stone at this time. Moving to the southern pair of stones and looking over the westerly one from the easterly one points to the southern top of Creag a' Mhadaidh Mòr. This is where the full moon would have set in mid winter.

By marking the extreme setting positions of the moon, the stones indicate the part of the sky where the moon always sets.



Nether Largie, Argyll. Photo: John Lord

Ballochroy, Kintyre

(Canmore 38960, NR 730524)

There is a line of three standing stones at Ballochroy in Kintyre just above the sea.

Solstice Sunsets at Ballochroy

From the central standing stone at midsummer, the sun sets in the col between Beinn Shiantaidh and Cora Bheinn on Jura. In 1,800 BC the sun's last appearance would have been a brief flash on the right side of Cora Bheinn before finally sinking from view.

From the northern end on the row the mid-winter sun sets over the Isle of Cara.



Mid summer sunset over Jura from Ballochroy, Kintyre. Photo: Christine Russell

Super Weapons of the Gods

About 15,000 years ago the solar system had a close approach from a white dwarf - Van Maanen's star. Its path took it through the outer regions of the Oort Cloud to within 3.1 light years of the sun. Now the Oort Cloud is that part of the solar system where long period comets originate. The star's path undoubtedly disturbed a number of these icy bodies, sending some of them hurtling towards the inner solar system. Astronomical research suggests that at least one of these comets subsequently broke up as a result of a major collision in the asteroid belt. The fragments were further dispersed by planetary perturbations. Astronomers believe that as a result the sky was busier over past millennia than it is now, as Earth repeatedly encountered the debris. The remnants of the residual rubble are still with us in the form of Comet Encke and the Taurid meteor showers.

In 1,200 BC there was a major impact at Kaali in Estonia. This space rock fragmented in mid air and fell to Earth in pieces. The largest produced a crater with a diameter of 110m that is still considered to be a sacred lake. Local legend tells that it was created by Thor's hammer.

Sometime around 350 BC a huge fireball ripped the skies apart over Scotland and northern Europe. It struck the ground in the Chiemgau area of Bavaria almost entirely wiping out the local population. The explosion would have been seen from at least 600km and was probably heard over 1,000km away. Its passage through the atmosphere would have been clearly visible from Scotland. The Chiemgau area was struck by either a loosely bound asteroid or comet core of about 25 – 50 metres in diameter, exploding with the force of a massive hydrogen bomb. The impact area was devastated by large craters with diameters of up to several hundred metres.

This event seems to have had a profound effect on the European Celts and their world view. Whereas their spirituality had previously been very much nature orientated, this event forced them to re-evaluate their relationship with the sky to explain what had happened. Their religion changed to one more focussed on gods of thunder and fire with the practice of wicker man human sacrifice emerging shortly afterwards.

After this cataclysm the first Celtic tribes to move back into the area were the Noricans. Their smiths were able to make steel so strong and sharp that it was largely unrivalled until the twentieth century. The source of their success may well have come from the impact of the comet, which had ingrained traces of titanium and other minerals into the local ores. From then on the Noricans thrived on a lucrative arms trade with the Romans, who called the ore Noricum Black Gold.

Other significant impact craters had been created at:

- Morasko, Poland in 3,000 BC
- Ilumetsa, Estonia in 4,500 BC

Airbursts

Some meteorites disintegrate entirely in the air leaving little long term evidence on the Earth's surface. However these airbursts can still have the force of a large thermonuclear explosion and may cause devastation at ground level. More recent examples include Tunguska (1908) and Chelyabinsk (2013).



Devastation after the Tunguska event of 1908. Photo: Evgeny Krinov - 1929

Mythological Memories

Memories of events like these come down to us in Irish and Scottish legend. In Gaelic mythology, Lugh the god of light is called Lugh Long Arms. At the second battle of Maighe Tuireadh he was seen to rise in the west. This is an uncannily accurate description of how an incoming comet in the approximate orbit of the Taurids would look like just before dawn.

Then arose Bres, the son of Balor, and he said: "It is a wonder to me", said he, "that the sun should rise in the west to day, and in the east every other day". "It were better that it were so", said the Druids. "What else is it?" said he. "The radiance of the face of Lugh of the Long Arms", said they.

[From: The Fate of the Children of Tuirreann]

One of Lugh's most prized possessions and one of the four treasures of the Tuatha Dé Danann was the *Lúin Celtchair*. This was a magic spear that had to be physically restrained in a cauldron of cold water to prevent it catching fire and killing everyone in sight. A similar fate to being caught out under a meteor or comet airburst!

It is a very deadly spear belonging to the King of Persia, the Luin it is called, and every choice thing is done by it, and its head is kept steeped in a vessel of water, the way it will not burn down the place where it is.

[From: The Fate of the Children of Tuirreann]

The second battle of Maighe Tuireadh was said to have brought three days of destruction. It wasn't only Lugh who had a supernatural weapon at this battle. Balor, one of the Fomorian leaders on the opposite order of battle, had a death dealing eye:

An evil eye had Balor. That eye was never opened save only on a battle-field. Four men used to lift up the lid of the eye with a (polished) handle which passed through its lid. If an army looked at that eye, though they were many thousands in number they could not resist.

[From: The Second Battle of Maighe Tuireadh]



Lugh's bloodthirsty magical spear. Illustration: Harold Millar

The Celtic Iron Age

(700 BC – 800 AD)

The Celts were a group of Caucasian peoples who first emerged in Austria around 1,200 BC. Their language and culture were of Indo European origin. They were thus related to the Hellenic Greek, Anatolian Hittite and the Indus valley Harappa cultures. The Celts had their own languages, the ones that survive today being: Gaelic, Welsh, Cornish and Breton.

They were adept blacksmiths who were able to make weapons and other technologically advanced items from iron. They were also skilled farmers and diplomats. By the early part of the first millennium BC the Celts had strong cultural and commercial connections all over Europe. They arrived in Scotland around 700 BC.

Roman Reports

Caesar is the most informative classical writer about the beliefs and customs of the Celts 2,000 years ago. He writes of the Gauls and Britons: 'They measure periods of time not by days but by nights; and in celebrating anniversaries, the first of each month, and the New Year, they follow the rule that night precedes day'.

On education he tells us that: 'The subjects they [the druids] discuss and teach to their students are Astronomy, Geography and Natural Science, as well as a good deal about the superior powers of the immortal gods'. In another place he says: 'They are said there to get by heart a great number of verses; some continue twenty years in their education; neither is it held lawful to commit these things [the Druidic doctrines] to writing'. We also learn from Caesar that Britain was regarded as the place where Druidism developed and that students were sent there from Gaul to learn about it.

He also wrote that: 'Their most important doctrine is that souls do not perish, but transmigrate after death from one body to another. They consider fostering this belief to be the best way to encourage bravery in battle, since any fear they have of death can thus be overcome'. Elsewhere he tells us that 'The druids officiated at the worship of the gods, regulated public and private sacrifices and gave rulings on religious questions. If one wished to contact a god, this would have been done through a druid'.

The Celtic World Order

Caesar's comments, together with those of other classical writers, demonstrate that Celtic culture was relatively advanced as compared to earlier northern European cultures. Their society was comparatively well developed, with political control in the hands of an elite warrior class. The Celtic universe was one in which humans and gods co-existed, competed and co-operated in accordance with cosmic law. This world order was understood through and mediated by a priestly class of druids, who were chaplains to their local war lords.

The available evidence suggests that by 800 BC the Celts had devised a sophisticated luni-solar calendar that only had an error of one day in every 195 years.

The Origin of the Twelve Constellation Zodiac

The twelve constellation zodiac as we know it was first devised by an Indo European people somewhere in the Black Sea region just before 2,000 BC. This evolved into four main branches:

- In Hellenistic Greece it evolved into the version of the night sky that was eventually adopted by modern astronomy.
- The Indus valley Harappa civilisation produced a second branch in the shape of the Vedic sky lore and constellations.
- At Hattusa in Anatolia the Hittites formulated their own variant of the night sky which later influenced Assyrian and Babylonian astronomy.
- In central Europe the Celts developed a fourth branch that gave rise to Ghaulish, Brythonic and Gaelic interpretations of the constellations.

The Celtic Night Sky in Scotland

- The constellations rose and set one month earlier than they do now (2020).
- The closest star to the North Pole was Kochab (Beta Ursa Minoris).
- The bright core of the Milky Way could no longer be seen from Scotland although the stars of Lupus were still just visible.
- Cassiopeia was now always visible. The circumpolar stars were in Cassiopeia, Ursa Major, Ursa Minor, Cepheus, Draco, Lyra, Hercules, Corona Borealis and Bootes.



Dun Cooley (Aldebaran) and the Cat Stars (Hyades): Photo: David Newland

The Mythology of the Pictish Sky

Pictish culture and language spread into southern Scotland some time after the 8th century BC, probably through cultural contact rather than mass invasion. During their occupation of Britain, the Romans named the tribes living in north eastern Scotland the Pictii. Their somewhat lurid reports conjure up images of wild naked warriors painted blue.

The Picts were farmers who lived in small communities. They kept sheep and pigs whilst cattle and horses were status symbols. Place names suggest that transhumance was common. Cereal crops included barley, oats and rye. In addition they grew kale, cabbage, onions and leeks, peas, beans and turnips. Meat and milk products were a major part of the diet of ordinary people, while the elite would have eaten a diet rich in meat from farming and hunting.

Pictish culture was based on Indo European traditions that were over 3,000 years old even then. Continental Celtic mythology probably diverged from the Classical tradition as early as 1,000 BC. By 500 BC a distinct Brythonic culture was emerging on mainland Britain. The three principle sources for Brythonic mythology and star lore are The White Book of Rhydderch [*Llyfr Gwyn Rhydderch*], The Red Book of Hergest [*Llyfr Coch Hergest*] and The Book of Taliesin [*Llyfr Taliesin*].

The shapes of the constellations seen by the Picts in the night sky were similar to the more familiar ones from classical tradition. This is hardly surprising because those cultures also had Indo European roots. However Pictish mythology was substantially different from classical mythology. A significant number of the Pictish constellations represented legends about the house of Don. Don was the mother goddess of the Picts and the legends relate the exploits of her family; most notably king Math and the sky goddess, Arianrhod. The bulk of remaining constellations represent characters from precursors to the king Arthur stories of medieval romance. The most dominant of these concern the tasks set by Ysbaddaden for Culhwch as his price for marriage to his daughter Olwen. It is a distinct possibility that the name 'Arthur' is derived from 'Arth Vawr' - the Brythonic name for the constellation of the Big Bear. Finally there are constellations that relate to stories about the house of Llyr. In particular Pwyll and his wife Rhiannon who had attributes of the Celtic horse goddess.

Because the Pictish language has long been forgotten, names are given in its nearest modern equivalent – Welsh.

A Home for Gods and Heroes

For the Picts the circumpolar regions were the home of the Gods because they were always visible. The Milky Way was called **Caer Gwydion** (Gwydion's Circle). This was the divine path in the night sky taken by the gods and great sages on their way to the northern stars above.

Math
(Bootes)

King Math

Legends tell that when King Math was not at war he needed to rest his feet in the lap of a virgin, or he would die.

Math's nephew Gilfaethwy had become obsessed with Goewin, Math's virgin foot holder. Gilfaethwy's magician brother Gwydion devised a plan to make Goewin available. Gwydion told his uncle about a new animal called a pig, and how he could get them from their owner, Pryderi. He took a band of men, including his brother, to King Pryderi's court, where they disguised themselves as bards to gain audience.

Now Gwydion was a skilled storyteller and regaled the court with his tales. Having charmed the king, he offered to trade the pigs for some horses and dogs, which he had conjured up by magic. Pryderi agreed to the trade and Gwydion and his men took the pigs back home. But Gwydion's trickery was revealed when everything turned back into its original form. So Pryderi waged war against Math and while Math went off to battle, Gilfaethwy raped Goewin.

The war ended when Gwydion killed Pryderi in single combat. On return to his castle, King Math went to rest his feet in Goewin's lap, but could not, as she was no longer a virgin. So he took her as his wife to save her honour.

However Gilfaethwy and Gwydion were in big trouble: Math turned Gwydion into a stag, and his brother Gilfaethwy into a hind. 'Since you are both in league with each other,' said Math, 'you shall go into the forest, take on the form of deer and mate with one another'. So off they went, and a year later returned leading a young fawn. Math took the fawn and changed it back into human shape calling it Hyddwn ('Stag-Man').

But Math wasn't finished with them yet. So he turned them into pigs. Gwydion was now a wild sow and his brother Gilfaethwy a wild boar. Off they went into the forest again and returned a year later with a piglet. Math took the piglet, changed it back into human shape and called it Hychddwn Hir ('Dark-Red Pig').

But Math still hadn't finished with them so Gwydion he changed into a wolf and Gilfaethwy into a she-wolf. Off they went into the forest and once again they returned a year later with a youngster. Math took the wolf pup, changed it back into human shape and called it Bleiddwn ('Wolf-Man').

Deciding that they had enough Math said: 'Men, you have been punished enough for your crime, for it is a great shame and a great humiliation that each of you has born offspring to the other'. And so the punishment of Gwydion and Gilfaethwy ended and they were changed back into their human forms.

Caer Arianrhod
(Corona Borealis)

Arianrhod's Court

Arianrhod was the daughter of Dôn, sister of Gwydion and Gilfaethwy and niece to Math.

When Goewin lost her virginity Math needed another foot holder. It was suggested that his niece Arianrhod should be next to fill the role. However when Arianrhod was asked to step over Math's rod in order to prove her virginity she immediately gave birth to a son. Abandoning the child she fled in shame, letting drop a second child which was borne away by Gwydion and concealed in a chest.

The firstborn son of Arianrhod was acknowledged by his uncle Math and given the name Dylan. However, as soon as Dylan came into contact with water, he took on the characteristics of a marine creature. Plunging into the sea, he moved through the seawater as perfectly as any fish, thus earning his new name, Dylan ail Don.

The unnamed second child grew precociously and he and Gwydion became very attached to one another. After four years Gwydion took the boy to see his mother, who refused to recognise him out of shame and anger that Gwydion should have nurtured the boy. So she placed a *tynged* (fate or destiny) on him that he should have no name unless she gave it to him herself.

To trick her into naming him, Gwydion disguised himself and the boy as shoemakers. As they were making shoes for her, the boy threw a stone at a bird and killed it. Arianrhod declared 'The fair one struck with a deft hand', and thus he was named Llew Llaw Gyffes, 'Fair-Haired One of the Skilful Hand'. Now that Gwydion's first trick was revealed Arianrhod placed another *tynged* on the boy. He would not be able to take up arms until she gave them to him. Time passed and Llew grew big and strong.

Again, Gwydion disguised his nephew and himself, this time as bards, and entertained Arianrhod's court with stories. In the morning, Gwydion deceived Arianrhod into believing that her court was under attack. When she asked for his advice, he bade her gird a sword on Llew Llaw Gyffes, who he said was a skilful fighter. No sooner had she done so than Gwydion revealed the truth. Furious at having been tricked for a second time, Arianrhod placed a third *tynged* on her son, that he would never have a human wife. But that is another story.

Llys Dôn
(Cassiopeia)

The Court of Dôn

Dôn was the mother goddess of the Picts. Her name is remembered in the river Don [*Uisge Deathan*] that descends from the Cairngorms and flows across Aberdeenshire into the North Sea.

Llwyn Blodeuwedd **Blodeuwedd's Coppice**
(Coma Berenices)

Blodeuwedd was created out of the blossoms of oak, broom, and meadowsweet by Gwydion and Math as a bride for Llew Llaw Gyffes. She was known as 'Flower Face'.

Later Blodeuwedd had an affair with Gronw Pebr, and the two lovers conspired to murder Llew. Blodeuwedd tricked Llew into revealing how he might be killed. It turned out that he could only be killed at dusk, wrapped in a net, with one foot on a bath and one on a black goat, by a riverbank and with a spear forged for a year during the hours when everyone was on holiday. Blodeuwedd secretly had the spear made. Then she persuaded Llew to demonstrate how he could be killed, after she had arranged for Gronw to ambush him. Struck by the spear, Llew was transformed into an eagle and flew away wounded.

His uncle Gwydion searched for him and found him as the constellation Aquila after traversing *Caer Gwydion*, the Milky Way. Llew was nursed back to health by Gwydion and Math. He then reclaimed his lands from Gronw and Blodeuwedd. Gronw is killed by Llew and Gwydion turned the fleeing Blodeuwedd into an owl with the following curse:

'You will not dare to show your face ever again in the light of day, and that will be because of enmity between you and all other birds. They will harass and despise you wherever they find you'.

Drostan and Essylt **Drostan and Essylt**
(Perseus and
Andromeda)

Drostan was sent to fetch Essylt from Ireland to wed the king. However, on the journey home Drostan and Essylt accidentally consumed a love potion and fell helplessly in love. Although Essylt married the king, she and Drostan were forced to become lovers by the potion.

The couple avoided detection for a long time, but eventually the king found out about their affair. On acquiring proof of their guilt the king sentenced them to death; Drostan was to be hanged and Essylt burnt at the stake. However Drostan escaped on the way to the gallows and rescued Essylt. Together the lovers escaped into the night sky.

Afang Ddu
(Draco)

The Black Beaver

The Afang Ddu was a monster that preyed on any one foolish enough to fall into or swim in its lake. It lived in a cave near the 'Palace of the Sons of the King of the Tortures'. The palace was named thus because every day the Afang slew the three sons of the king. Each day the maidens of the court resurrected them so that they could ride out and fight the monster again on the following day.

When Peredur asked to ride out with the three sons they did not accept his company because if he was killed they would not be able to bring him back to life. Wishing to increase his fame by killing the creature, Peredur continued to the cave on his own. On his journey he meets Angharad Golden Hair who told him that the beast was invisible and killed its victims with poison darts. To help she gave him an adder stone to make the creature visible. On entering the cave, Peredur immediately spotted the Afang Ddu and beheaded it.

Arth Vawr
(Ursa Major)

The Great Bear

By the time of the Picts the story of the bear hunt in the night sky had been told and retold in Scotland for over 7,000 years. But by now the hunters had been lost in the mists of time and the seven stars represented Arth Vawr – the Big Bear.

The similarity of the expression Arth Vawr to the anglicised Arthur of Brythonic legend suggests a deep prehistoric origin for that figure.

Gwenyn
(Camelopardalos)

The Bees

One of the tasks set by Ysbaddaden for Culhwch as the price for marriage to his daughter Olwen was: 'Get honey that is nine times sweeter than the honey of the virgin swarm, without scum and bees, do I require to make bragget for the (wedding) feast'.

Perhaps the bear was after the honey as well!

The Seasonal Constellations

This part of the night sky unfolds as the year progresses, marking the changing of the seasons.

Sêr Cathod (The Hyades)

The Cat Stars

Cath Palug was a monstrous cat that was born to a pig. It started life as a black kitten and had two siblings, a wolf and an eagle. Perhaps with a premonition of things to come the kitten was thrown into the sea by the swine herd that found it.

However the kitten found its way ashore and was raised by the sons of Palug. They did not realise that it would become one of the three great plagues of the land. Later the cat terrorised the island, and is said to have killed nine score warriors before Cai finally finished it off.

Y Cystadleuwyr (Gemini)

The Rivals

Pwyll became separated from his companions whilst out hunting and was passed by a pack of hounds with white coats and red ears. They easily outran his own hounds and killed a stag. But Pwyll drove them away and set his own hounds to feast on the carcass. Just at that moment Arawn arrived on the scene and claims that the stag was his. Now Pwyll owed Arawn a favour:

Arawn asked Pwyll to take his place in the other world to fight Havgan. Pwyll accepted Arawn's challenge and lived Arawn's life for a year and one day. Finally he fought Havgan and mortally wounded him with a single blow. Although Havgan begged Pwyll to finish him off, Pwyll would not because he had promised Arawn not to do so.

Arawn and Havgan represent the kingdoms of winter and summer. Pwyll and Arawn as winter figures must merge with summer to explain the seasonal changes that fall brings to the land. Pwyll's task is to merge the two kingdoms without destroying either.

Another story tells of Gwyn ap Nudd who was the son of Nudd and nephew of Arianrhod. Gwyn abducted his sister Creddylad from her betrothed, Gwythyr ap Gridawl. Every May day they fight over the lady, until a battle on Judgement Day, when the victor will keep her forever.

Ceffyl
(Cancer)

Rhiannon

Rhiannon first appeared to Pwyll as a beautiful woman riding a white horse. For two days Pwyll sent his best horsemen after her. But she always remained ahead of them, though her horse never did more than amble. On the third day he followed her himself and did no better, until he finally appealed to her to stop.

Rhiannon asked Pwyll to marry her a year and a day later to save her from a forced marriage to Gwawl. At the wedding feast of Gwawl and Rhiannon, Rhiannon tricked Gwawl by asking him to fill a magic bag with food. When Gwawl jumped in the bag to press down the food, Pwyll stormed into the hall with ninety-nine horsemen and captured Gwawl. At the request of the court, Pwyll does not destroy Gwawl in what the Welsh call the game of 'Badger in the Bag'.

Neuadd Arthur
(Orion)

Arthur's Hall

The first recorded mention of Arthur was around the end of the 6th century in the *Gododdin* [*Y Gododdin*]. The Gododdin were a group of warriors that came from as far afield as Pictland and Gwynedd. Having spent a year feasting at Edinburgh [*Din Eidyn*] they moved south to attack the Angles at Catterick [*Catraeth*]. After several days of fighting against overwhelming odds they were almost all wiped out. The name of the hill 'Arthur's Seat' in Edinburgh may well recall the first part of this incident.

In *Culhwch and Olwen*, Gluydyn Saer is credited with building Arthur's hall *Ehangren* ('wide and spacious'). Glewlwyd Gafaelfawr served as the gatekeeper to Arthur's hall where he protected convention by denying Culhwch entry until Arthur requested his presence.

The shape of the constellation is reminiscent of the form of brochs – dry stone Iron Age defensive structures found in northern Scotland.

Ci Mawr
(Canis Major)

The Great Dog

Drudwyn was the magical dog used by Culhwch to hunt the enchanted boar Twrch Trwyth. Drudwyn was so strong that no leash could hold him except for one made from the beard of Dillus Farfog.

Goewin
(Virgo)

Goewin

Goewin was king Math's virgin foot holder

Baedd Gwyllt
(Libra)

The Wild Boar

Twrch Trwyth, the son of Taredd Wledig, was cursed to become a wild boar with poisonous bristles. He carried a pair of scissors, a comb and a razor on his head between his ears.

One of the tasks set by the giant Ysbaddaden for Culhwch as the price for marriage to his daughter Olwen was to get the comb and scissors from between the ears of Twrch Trwyth so that the giant could arrange his hair for the wedding feast. Culhwch enlisted the aid of King Arthur to pursue the enchanted boar with the aid of Mabon the hunter and the dog Drudwyn.

Pair Caridwen
(Crater)

Caridwen's Cauldron

Caridwen was a magician. She had a beautiful daughter, Creirwy, but her son Morfran was hideous. No magic of hers was going to cure his appearance. So Caridwen sought to give Morfran the gift of wisdom and knowledge to compensate for his lack of good looks. To do this she gathered special herbs which had to be constantly stirred and cooked for a year and a day in her cauldron. The first three drops of liquid from this cauldron would make one 'extraordinarily learned and full of the spirit of prophecy'. The rest would be a fatal poison.

A blind man, Morda was employed to stir the cauldron whilst a young lad called Gwion Bach stoked the fire underneath it. After all her hard work Caridwen sat down and accidentally fell asleep. While she was asleep the first three drops sprang from the cauldron. Gwion Bach pushed Morfran out of the way so that he could get the three drops. Instantly, he gained wisdom and knew that Caridwen would be very angry once she found out what had happened. So he ran away.

All too soon he heard the sound of her pursuit so he turned himself into a hare to escape. She became a greyhound so he turned himself into a fish and jumped into a river. She became an otter so he turned into a bird and flew away. She became a hawk and forced him into a barn, where he turned into a single grain of corn. But she became a black hen and ate him.

Becoming pregnant with the grain of corn, she decided to kill the child knowing it was Gwion. But when he was born he was so beautiful that she couldn't do the deed. Instead she put him into a hide covered basket and threw him into a lake.

Brannos
(Corvus)

The Crow

Morfran, the son of Caridwen, was also known as 'Great Crow'.

Peredur
(Ophiuchus)

Peredur

Peredur was the seventh son of Efracw, a northern Earl. Before Peredur was old enough to fight, his mother fled to the woods with him and raised him in isolation. Eventually, he met a group of knights in the forest and decided to become like them, so he travelled to the court of King Arthur. There he was ridiculed by Cai and set out on further adventures, promising to avenge Cai's insults to himself and those who defended him.

While travelling, he met two of his uncles. The first educated him in arms and the second uncle showed him a salver containing a man's severed head.

Peredur met many adversaries during his ongoing adventures, but his real enemies were the *Gwiddonod Caerloyw* - the Nine Witches of Caer Lloyw ('The Shining Fortress'). He found out that the severed head at his uncle's court had belonged to his cousin, who had been killed by the Nine Witches.

Peredur defeated the witches after giving them three chances to yield, thus breaking the magic of their spells.

Eryr
(Aquila)

The Eagle

After Lleu Llaw Gyffes had been killed by Gronw Pebr, his uncle Gwydion searched everywhere for him. Eventually, after traversing *Caer Gwydion*, (the Milky Way) he discovered him in the sky as the constellation Aquila.

In Gwrhŷr's quest for Mabon, the Eagle was one of the oldest and wisest animals in the world. It was said to peck at the stars.

Ebol
(Equulus)

The Colt

In the third year of her marriage to Pwyll, Rhiannon gave birth to a son. When her son was kidnapped, Rhiannon's maids, in fear for their own lives, smeared animal blood on Rhiannon whilst she was asleep and blamed her for his death. Rhiannon's punishment was to remain by the mounting-block by the gate at the court of Arberth for seven years. There she had to tell her story to anyone who might not already know it. She also had to offer to carry guests and strangers to the court on her back.

Her punishment ended when Teirnon Twrvliant and his wife discovered Rhiannon's son outside their mare's stable, who had just given birth to an amazing colt. The mare had foaled every Beltane, but her colt was usually seized by a claw from the other world. On this particular Beltane, Teirnon prevented the abduction and the boy was discovered outside.

The boy was soon recognised as Rhiannon's child. Rhiannon was so pleased with her release from suffering that she called her son, Pryderi or 'anxiety', in memory of her trials.

Eogiaid
(Pisces)

The Salmon

The salmon was the oldest and wisest of all animals in Gwrhŷr's quest for Mabon.

Baedd Coed
(Pegasus)

The Boar of the Woods

White Tusk was the chief of boars. In the tasks set by Ysbaddaden for Culhwch, the first boar hunt is for 'Ysgithrwyn Pen Baedd', – 'White Tusk Chief of Boars'. His tusk was needed to shave Ysbaddaden for the wedding of Culhwch and Olwen. It should have been extracted whilst Ysgithrwyn was still alive but an axe had to be used to 'split his head in two' so as to get the tusk out.

Other constellations recognised by the Picts include:

- **Telyn** (Lyra) - The Little Harp
- **Cerbidwr** (Auriga) - The Charioteer
- **Cy Fychan** (Canis Minor) - The Little Dog
- **Bwch Gafr** (Capricorn) - The Goat
- **Bwa'r Milwr** (Sagitta) - The Soldier's Bow
- **Môrvil** (Cetus) - The Whale

Sky Lore of the Kingdom of *Dál Riata*

During the middle of the first millennium AD a group of Gaelic speaking peoples migrated into Scotland from Northern Ireland. By the fifth century, their kingdom of *Dál Riata* was well established on the west coast. Gaelic culture was based on the same Indo European traditions that had formed Pictish ideas. At the same time as Brythonic culture was emerging on mainland Britain, a distinct Gaelic tradition had risen in Ireland. To a large extent the constellations seen by the Gaels in the night sky had similar shapes to the more familiar ones from classical tradition. This is hardly surprising because those cultures also had Indo European roots. Gaelic mythology was however substantially different from classical mythology. The three principle sources for the original Gaelic mythology and star lore are The Book of Ballymote [*Leabhar Bhaile an Mhóta*], The Book of the Dun Cow [*Lebor na hUidre*] and The Book of Leinster [*Lebor Laignech*].

The Gaelic gods were known as the Tuatha Dé Danann – children of the goddess Danu. It was they who ruled the skies of the kingdom of *Dál Riata*. The vault of the sky itself was known as *Pupall Medba* or the tent of Medb. Gaelic legends also told stories about the Fianna – a mythical band of warrior hunters who were led by Fionn mac Cumhaill.

The Sun, Moon and Planets

Gaelic from the book of Ballymote	Description	Latin Name
Greina	The sun was represented by three rays. Greina was the sun queen.	Sun
Éasca	The moon was represented by a crescent. The goddess of the moon was Medb.	Moon
Luct	The star of the Gaelic warrior god – Lugh.	Mercury
Rii	The free roving star of Brigit that marked the passage between day and night at dawn and dusk.	Venus
Goac	The red wandering star of the champion Ogmos.	Mars
Tuct	The star of the Dagda.	Jupiter
Milni	The Celts regarded the length of Saturn's orbit as their longest measure of time. It is likely that they used it to correct their calendar by dropping one month every thirty years, when Saturn completed its protracted journey along the zodiac, returning to the constellation of the Bull (Taurus).	Saturn

Eclipses and Lunar Nodes

The Gaels were also aware of the two nodes where the path of the moon crosses the path of the sun. These move around the sky along the ecliptic much as the planets do, but on an 18.6 year cycle. Of course the inhabitants of Scotland had already known about this lunar cycle for over a thousand years. They had even built it into some of their megalithic monuments. But the druids treated the lunar nodes as if they were invisible planets.

- Caen was the north lunar node – the dragon’s head
- Losta was the south lunar node – the dragon’s tail

Whenever both the sun and the moon simultaneously pass through one or other of the lunar nodes we get an eclipse. These reoccur over a cycle of 223 lunar months. This is very close to the 18.6 year lunar cycle. So over a period of 6,585.3 days we usually get usually 43 solar and 29 lunar eclipses. It is quite likely that the druids were able to predict lunar eclipses by tracking the position of the lunar nodes. The shadow of the earth on the moon is quite large and would have given a reasonable margin for error. However it is unlikely that they would have had much success with solar eclipses because the shadow of the moon on the earth is so much smaller, giving less room for error.

The Stars

Name	Description	Classical Name
Druuios	The Wren – a former north star	Thuban
Lucotios	The Mouse – the current north star	Polaris
Esus	Holy Lord	Vega
Smertus	The Sword	Deneb
An Seabhag	The Hawk	Altair
Aretorios	The Charioteer	Arcturus
Don Cooley	The Dun Bull of Cooley	Aldebaran
Cormac	The Light Chariot Driver	Alpha Lepus
Reul na Madra	The Dog Star	Sirius
Fintan	The White Elder	Fomalhaut

Circumpolar Constellations

Although the names of the constellations are given here in Scottish Gaelic not all of them may be familiar to modern Gaelic speakers. The originals were often replaced with ones derived from classical mythology or later folklore. The stories told here are based on Irish sources. These are the legends that the Scots would have brought with them when they emigrated from Ulster.

An Crann
(Ursa Major)

The Plough

Bres was the son of Balor and king of the Tuatha Dé Danann. Bres made slaves of the Tuatha, forcing them to carry firewood and dig trenches. But because Bres neglected his duties of hospitality the Tuatha rebelled. After losing the second battle of Maighe Tuireadh, his life was only spared when he promised to teach the Tuatha how to plough, sow and reap.

Dachaigh Danu
(Cassiopeia)

Danu's Court

Danu was the wife of Bilé and mother goddess of the Tuatha Dé Danann. Her name is commemorated in the river Don [*Uisge Deathan*].

The Tuatha Dé Danann gave four gifts to the Gaelic people:

- Stone of Fál (*Lia Fáil*) – The stone of destiny.
- Spear (*Sleg*) of Lugh – No one could win against it.
- Sword (*Claiomh solais*) of Núada – No one could escape from it
- Cauldron (*Coire*) of the Dagda – No one left it hungry

An Eala
(Cygnus)

The Swan

Aengus was one of the Tuatha Dé Danann. He was the god of youth and love and son of The Dagda and Boann.

As Aengus slept he dreamt that he saw a woman called Cáer Ibormeith (Yew Berry), the Celtic goddess of sleep. Falling in love with her he followed her to Loch Bel Dracon with his friend Bodb. Once there they saw 150 women, Cáer among them, paired with silver chains. Aengus discovered that every second Samhain, Cáer and her sisters were transformed into swans and remained in that form until the following Samhain. If he was able find her whilst she was a swan he could marry her. Choosing correctly, he then turned into a swan himself. It is said that as they flew away together to his palace, they sung such beautiful music that everyone who heard it fell asleep for three days and three nights.

Dagda
(Hercules)

Dagda

Dagda [*An Daghdha*] was one of the Tuatha Dé Danann. He was husband to the Morrígan and lover of Boann. His children included Aengus, Brigit, Bodb Dearg, Cermait, Aed, and Midir.

He had three magical possessions:

- A staff that killed with one end and brought to life with the other.
- A cauldron that never ran empty.
- A harp that could control men's emotions and change the seasons.

Clàrsach
(Lyra)

Harp

After the second battle of Maighe Tuireadh Dagda discovered that his harp and harper had been stolen by the Fomorians. Arriving at the Fomorian camp he spied his harp hanging on the wall of the great hall. Calling the harp to him, it flew across the hall to him killing all in its path. He immediately began to play:

- First the *goltraí* (strain of weeping), causing the Fomorians to lament their defeat.
- Second the *geantraí* (strain of merriment) which made the Fomorians fall about laughing.
- Finally the *suantraí* (strain of sleeping), making the Fomorians all fall asleep. So the Dagda and his companions were able to easily escape.

Eithne
(Coma Berenices)

Eithne

Eithne was the daughter of the Fomorian leader Balor.

A druid had prophesied that Balor would be killed by his grandson so Balor imprisoned Eithne in a tower away from all contact with men. Balor had also stolen a magical cow belonging to a man called Cian. To even the score, Cian broke into the tower with the help of a fairy called Biróg, and seduced Eithne.

Eithne gave birth to triplets, but Balor gathered them up in a sheet and sent a messenger to drown them in a whirlpool. The messenger drowned two of the babies, but unwittingly dropped one in the harbour, where it is rescued by Biróg. She took the child back to his father, who gave him to his brother, Gavidia the smith, to raise. The boy was named Lugh and grew up to kill his grandfather Balor.

Zodiac and Southern Sky

King Ailill had a wonderful circular palace in the shape of a wheel. It was called Rath Cruachan. In it there was a large room with twelve windows. Through these windows Ailill could see the twelve houses of the sun (zodiacal constellations). Another room had twenty seven windows from where Ailill could admire his twenty seven star maidens. These marked the passing of the moon on its monthly journey around the sky.

Ceann Balor

Balor's Head

Balor was the leader of the Fomors. He had an evil eye that could kill thousands at a glance. He usually kept it closed to avoid random destruction, but it is said to have taken four men to lift his eyelid in battle. He was eventually killed by his grandson Lugh.

An Tarbh

(Taurus)

The Bull

Medb, the warrior queen of Connaught, argued with her husband, Ailill, over their respective wealth. Because Ailill owned the White Bull of Connaught, Medb decides to steal the Dun Bull of Cooley from Ulster. So the Connaught army heads off to Ulster for the Cattle Raid of Cooley [*Tàin Bó Chuailgne*].

Now the Ulster army has been temporarily disabled by a curse, but Cú Chulainn, the youthful Ulster champion, is exempt and fights off the Connaughtmen single handed. The climax of the fighting is a three-day combat between Cú Chulainn and Ferdiad. Cú Chulainn is victorious, and nearly dead from wounds and exhaustion, he is joined by the Ulster men who rout the enemy. However, in the chaos, the Connaught men capture the brown bull and return home with their prize. On arrival the brown bull picks a fight with Ailill's white-horned bull, kills it and promptly drops dead from the effort.

A' Chorra-Monaidh

(The Pleiades)

The Crane

Aoife's jealous rival Iuchra turned her into a crane whilst they were swimming in the sea. Aoife remained as a crane for two hundred years before eventually dying. Aoife's husband Manannán made a sacred bag of her skin to hold precious tokens symbolic of his powers: a knife, a shirt, a leather harness, a whale hook, blacksmith's tongs, shears, a helmet and the bones of Assal's swine. These magical items could always be found in the bag at high tide but at low tide they were gone.

The bag eventually became the property of Fionn mac Cumhaill.

Aedh
(SW Gemini)

The Fiery Eye

Aedh was the father of Fand and foster father of Manannán. His name meant 'Fire eyebrows'. Although not visible to the naked eye there is a supernova remnant (IC443) within Aedh which may have exploded as recently as 3,000 years ago. When it went off it could easily have been bright enough to be visible in daylight.

An t-Each
(Cancer)

The Horse

Macha was said to be one of three sister goddesses known as the Morrígan.

Some time after the death of Cruinniuc's first wife, Macha appeared at his house. Without speaking, she began keeping house and acting as his wife. Soon she became pregnant by him. As long as they were together Cruinniuc's wealth grew. But she warned him that she would only stay with him as long as he did not speak of her to anyone.

One day he left to go to a festival organised by the King of Ulster. However, during a chariot race, he boasted that his wife could run faster than the king's horses. The king ordered Cruinniuc to make good his claim.

Although she was heavily pregnant, Macha was brought to the gathering and the king forced her to race his horses. She won the race, but then she gave birth to twins on the finish line; a boy named Fír ('True') and a girl named Fial ('Modest').

For this humiliation she cursed the men of Ulster to be overcome with weakness at the time of their greatest need. This weakness would last for five days and the curse would last for nine generations.

Sgàil Medb
(Eridanus)

The Veil of Medb

Medb was queen and wife of Ailill mac Máta. She was the enemy (and former wife) of Conchobar mac Nessa, King of Ulster, and is best known for starting the *Táin Bó Cúailnge* ('The Cattle Raid of Cooley') to steal Ulster's prize stud bull Donn Cúailnge.

She was eventually killed by a piece of cheese whilst bathing. The cheese was sent on its deadly path by Furbaide, son of Conchobar, using a sling shot.

An Sealgair Mór
(Orion)

The Big Hunter

Fionn mac Cumhaill was a hunter-warrior. He was the son of Cumhaill, leader of the Fianna, and Muirne, daughter of the druid Tadg mac Nuadat. His father Cumhaill had been killed by Goll mac Morna, who took over leadership of the Fianna.

As a boy, Fionn was left in the care of Bodhmall and a fighting woman, Liath Luachra. They brought him up in secret, teaching him the arts of war and hunting. The young Fionn then met the druid Finn Eces near the river Boyne. Finn Eces had spent seven years trying to catch the Salmon of Knowledge so that he would gain all the knowledge in the world. Eventually the old man caught it, and told the boy to cook it for him. While cooking it, Fionn burned his thumb. Instinctively putting his thumb into his mouth, he instantly gained some of the salmon's wisdom. When Finn Eces saw what had happened he gave young Fionn the whole salmon to eat. Fionn then knew how to gain revenge against Goll.

Arriving at Tara with his father's crane-skin bag of magical weapons. Fionn kept himself awake by touching the point of his enchanted red-hot spear to his forehead. After Fionn kills Aillen the burner with the spear, Goll willingly steps aside to become a loyal follower of Fionn.

The exploits of Fionn and his followers the Fianna, are told in the Fenian Cycle (*an Fhiannaíocht*). His sword was called the *Mac an Luinn*.

Crios an t-Sealgair

The Hunter's Belt

This belt was made by Goibniu, the metalsmith of the Tuatha Dé Danann. It belonged to Fionn mac Cumhaill.

Am Madadh Mór
(Canis Major)

The Big Dog

Bran was Fionn mac Cumhaill's big hunting dog.

Bran and Sceolan were both Fionn mac Cumhaill's hunting dogs. Their mother was Fionn's aunt Tuiren. Tuiren had been transformed into a hound by a sidhe woman Uct Dealbh, who was irritated by Tuiren's marriage with her husband.

An Cù Beag
(Canis Minor)

The Little Dog

Sceolan was Fionn mac Cumhaill's little hunting dog.

An Fiadh Òga (Leo)

The Young Deer

Oisín [*Oisean*] was the son of Fionn mac Cumhaill and Sathbh (daughter of Bodb Dearg) and a warrior of the Fianna in the Fenian Cycle. His name literally means ‘young deer’ or fawn. A druid had turned his mother into a deer before he was born. He was found by his father’s dogs Bran and Sceolan.

One day Oisín was hunting a hare. Wounding it, he followed it into a thicket where he found a door leading into the ground. On entering he found a large hall with a young woman sitting on a throne. She was bleeding from a leg wound. In Celtic myth the fairy folk sometimes shape shifted into hares. Hares were therefore regarded as supernatural animals and it was forbidden to eat them.

In *Oisín in Tir na nÓg* Oisín was visited by Niamh Chinn Óir, one of the daughters of Manannán mac Lir. Now Manannán had turned his daughter’s head into a pig’s head because of a prophecy. On meeting Oisín she told him that she would return to her original form if he married her. He agreed and they returned to *Tir na nÓg* (‘the land of the ever young’) where Oisín became the king. Together they had a son, Oscar, and a daughter, Plor nam Ban.

Oisín was regarded as the greatest poet of all poets and the composition of the Fenian Cycle is attributed to him.

An Draoidh (Virgo)

The Druid

Cathbad was the chief druid in the court of King Conchobar mac Nessa in the Ulster Cycle. He was reputed to have the ability to foretell the future.

In the story of Conchobar’s birth, Nessa, daughter of Eochaid Sálbuide the king of Ulster, asked Cathbad what it was an auspicious time for. Cathbad replied: ‘for begetting a king on a queen’. Since there were no other men around, Nessa took Cathbad to bed and conceived a son Conchobar.

On another occasion, the young Cú Chulainn overheard Cathbad prophesy that anyone who took arms on that day would have everlasting fame but a short life; Cú Chulainn immediately ran to Conchobar and asked to be armed.

Am Fiadh
(Libra)

The Deer

Fionn met his best known wife, Sadhbh, when he was out hunting. A druid, Fear Doirich, whom she had refused to marry, had turned her into a deer. Fionn's hounds, Bran and Sceolan recognised her as human, so Fionn brought her home. She was transformed back into a woman the moment she set foot on Fionn's land, as this was the one place where she could regain her true form. She married Fionn, and was soon pregnant. Whilst Fionn was away defending his country, Fear Doirich returned and changed her back into a deer, whereupon she vanished. Fionn spent many years searching for her, but to no avail. Bran and Sceolan found her son Oisín in the shape of a fawn, whilst out hunting. Transformed into a child he grew up to become one of the greatest of the Fianna.

An t-Each-Uisge
(Hydra)

The Kelpie

The kelpie usually appears as a beautiful, powerful black horse that lives in the deep pools of rivers and streams in Scotland. It is also able to take on human form by shape shifting. When it appears as a human, the kelpie keeps its hooves. It preys on any humans that it finds. In some parts of Aberdeenshire it has a mane of serpents, whereas the Spey kelpie was white and could entice victims onto its back by singing.

An Feannag
(Corvus)

The Crow

Badhbh the crow was a manifestation of the Morrígan. She had three aspects in the shape of the three sisters Badhbh, Macha and Nemain – all appearing as ravens or crows. She is mainly associated with war and fate, especially with foretelling death or victory in battle.

The Morrígan encouraged warriors to do brave deeds, struck fear into their enemies, and was seen before battle washing the bloodstained clothes of those doomed to die.

An Coire Neo-Thioram
(Crater)

The Un-dry Cauldron

Dagda's magic cauldron was known as *an Coire Neo-Thioram* ('the un-dry cauldron') and was said to be bottomless. No man ever left it hungry. It was said to have a ladle big enough for two people to sit in.

An Neach-Cuir
(Scorpius)

The Sower

The early Gaels saw this constellation as a sower, throwing seeds for the oncoming year. Alternatively that region of the sky represented a deer (Caruos).

Dian Cécht
(Ophiuchus)

Dian Cécht

Dian Cécht [*Diancecht*], son of Dagda, was the Gaelic God of Healing. In order to acquire his knowledge of medicine he had to destroy a huge, destructive serpent.

Now the Dagda's fierce wife, the Morrígan had borne a son Mechi, of such terrible aspect, that Dian Cécht, foreseeing danger, advised that he should be destroyed immediately. This was done and when he opened the infant's heart, he found three serpents, capable of depopulating the whole country when they grew to full size. He lost no time in destroying these serpents and burning them to avoid the evil, which even their dead bodies might do. To make sure he flung the ashes into the nearest river, for he feared that there might be danger even in them. Indeed they were so venomous that the river boiled up killing every living creature in it.

An Seabhag
(Aquila)

The Hawk

The Hawk of Achill lived at the same time as Fintan mac Bóchra. Fintan was known as 'the wise', arrived before the deluge, and is said to have lived another 5,500 years to become the oldest man in Ireland.

Both the Hawk and Fintan survived into the time of Fionn mac Cumhaill, and became the most knowledgeable beings in Ireland. They met at the end of their lives and recounted their stories to one another.

An t-Iasg
(Pisces)

The Fish

In *The Boyhood Deeds of Fionn* a salmon ate nine hazelnuts that fell into the Well of Wisdom (*an Tobar Segais*) from the nine hazel trees that surrounded the well. By this act, the salmon gained all the world's knowledge. Legends told that the first person to eat the salmon's flesh would acquire this knowledge. That person turned out to be Fionn mac Cumhaill.

Na Ceithir Bailtean
(Square of Pegasus)

The Four Cities

There were four cities in the northern islands of the world. They were called Falias, Gorias, Findias and Murias. In each city there was a druid from whom the Tuatha Dé Danann learned science and knowledge. The four cities were represented by the four stars of the Square of Pegasus.

When the Tuatha Dé Danann migrated to Ireland, they are said to have brought their four magical treasures from these cities:

Other constellations and asterisms recognised by the Gaelic people include:

- **An Corran** (Western Leo) - The Reaping Hook
- **Am Boghadair** (Sagittarius) - The Archer
- **A' Gobhar** (Capricorn) - The Goat
- **An Saighead** (Sagitta) - The Arrow
- **A' Phoit Uisge** (Aquarius) - The Water Pot
- **An Reithe** (Aries) - The Ram
- **A' Mhuc-Mhara** (Cetus) - The Whale

The Milky Way (*Sgrìob Chlann Uis*)

The Great White Cow was one of the archaic Indo European symbols of light and day. In early Celtic legends the Milky Way was known as the *Bealach na bó finne* (the way of the White Cow). The bright spots in the Milky Way were fords where the 'Herds of Dawn' crossed over. The best known were:

- Ath Mor – the big ford (at Sagittarius)
- At Mhadra Alta – the ford of the wild dog (at Taurus / Gemini)
- At Mhedbha – the ford of Medb (at Cassiopeia)
- Ath Gabla – the ford of the fork (at Cygnus)

Deirdre of the Sorrows and the Children of Uisneach

Deirdre was daughter to the royal storyteller Fedlimid mac Daill. Naoise was a handsome young warrior at the court of king Conchobar.

When Deirdre met Naoise they fell in love. But since Conchobar had planned to marry Deirdre himself, she fled to Scotland with Naoise and his brothers Ardan and Ainnle. Later Conchobar invited them all to return to his court with a promise of safe passage. But on their return they were ambushed by Conchobar's warriors. Naoise, his brothers and their friends were all killed in the fight and buried in a mass grave. Deirdre threw herself into the pit to be with Naoise.

A little later Deirdre and Naoise were exhumed and buried on either side of the mound. Soon a tree grew from each of their graves and rose until they intertwined. Conchobar had the trees cut down, but soon another two trees rose from the graves. This happened several times, until the king had the bodies buried on either side of a loch too wide for the trees to span. But between the trees a cluster of stars gathered in a trail of light.

Thus the Milky Way is known in Gaelic legend as *Sgrìob Chlann Uis* (the way of the Children of Uisneach). This is very much the view that we now get of the autumn Milky Way which is separated by the Great Rift just above the horizon.

Merry Dancers (*Na Fir-Chlis*)

On winter nights when the weather is calm the Merry Dancers may be seen performing in our northern skies.

In Scottish Gaelic folklore the Northern Lights are known as *Na Fir-Chlis* – ‘The Nimble Men’. But stories tell that these dancers were inclined to violence as they often fight over a fairy lady. As the proverb says:

‘When the mirrie dancers play, they are like to slay’.

The bright red sky sometimes seen beneath the moving lights is called ‘the pool of blood’. When the blood falls to earth it congeals to form blood stones which are often found in the Hebrides. These beautiful green heliotropes, speckled with red are also known as *Fuil Siochaire*, which means fairy blood.



Sgriob Chlann Uis and blood red Aurora from Glenlivet. Photo: David Newland

The Shandwick Stone, Easter Ross (*Clach a' Charridh*)

(Canmore 15278, NH 855747)



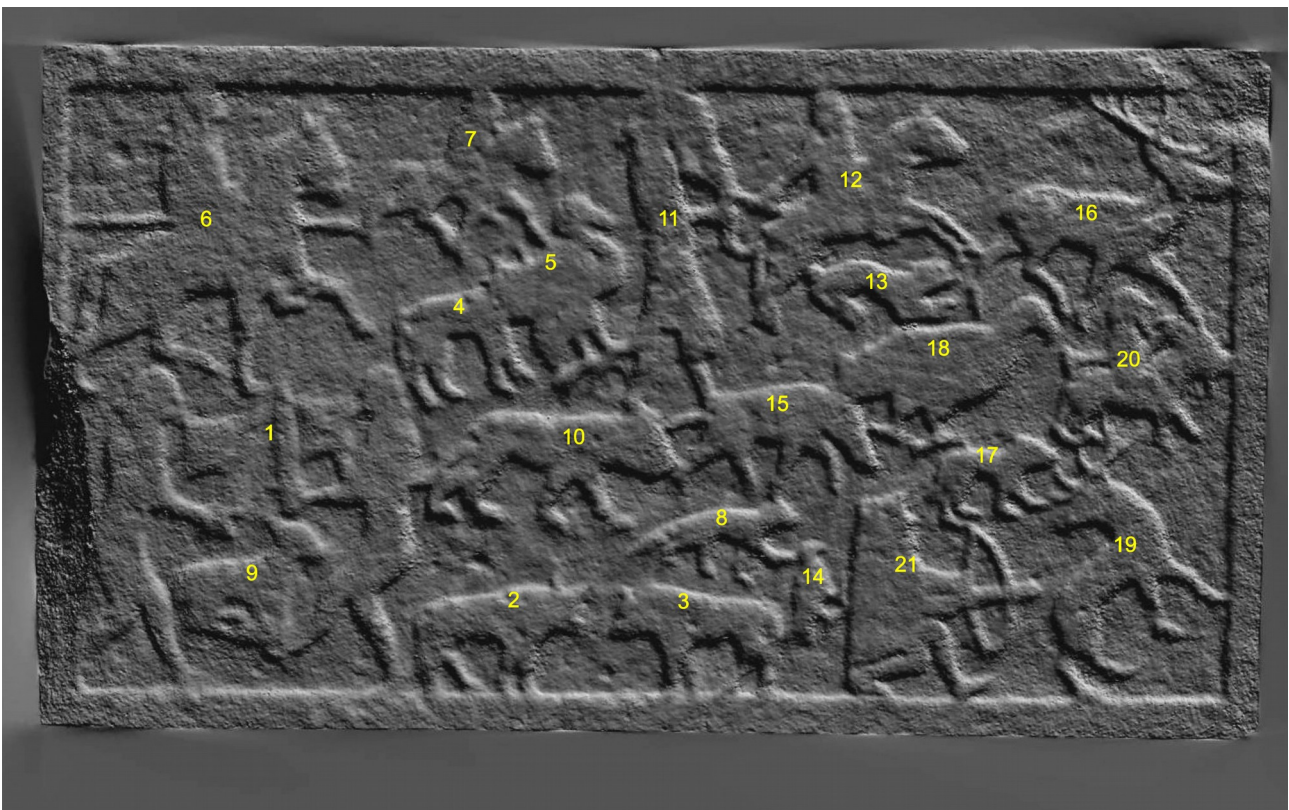
The Shandwick Stone, Easter Ross. Photo: Postcard

In the far north of Scotland stands the *Clach a' Charridh*, an intricately carved slab of sandstone facing the North Sea. On the seaward side there is a cross, whilst the landward side contains six panels with Pictish symbols, including what at first sight appears to be a hunting scene.

The stone can be dated to around 780 AD. By this time there had been Gaelic influence on the Scottish mainland for over 200 years and there were close political and cultural connections with the Pictish tribes in the east. By the time of the carving the local mythology was most likely a blend of Brythonic and Gaelic traditions. These traditions had always been quite similar in any case because of their common Celtic roots. Most of the figures portrayed on the Hunting Panel bear more than a passing resemblance to scenes from those mythological traditions. Only two of the images appear to have been uniquely Pictish. It therefore seems entirely possible that the Shandwick stone is a representation of the night sky.

The order that the carvings appear on the panel from left to right is roughly the same as the order in which they appear in the night sky. The time of year in 780 AD at which Gemini rose just after sunset and Scorpius / Sagittarius rose with the sun was the winter solstice. The sun itself rose on the cusp between Sagittarius and Capricorn.

The Shandwick stone seems to be a portrayal of the Christian message using the old iconography on one side and the new on the other. So the Shandwick hunting panel is likely to be a representation of the night sky at Christmas in 780 AD.



The Shandwick Stone Hunting Panel, Easter Ross. Photo: NOSAS Archaeology

Stars, constellations and rising times at the winter solstice of 780 AD:

No.	Image	Scottish Gaelic	Associated Mythology	Classical Name	Leading Star	Time
Visible after sunset						
1	The Rivals	Na Farpaisich	Pwyll and Havgan Gwyn and Gwythyr	Gemini	Castor	16:15
2	Bull	Tarbh Geal	White Bull of Connaught	Auriga	Alnath	16:15
3	Bull	Tarbh Dearg	Dun Bull of Cooley	Taurus	Aldebaran	16:15
4	Lynx	An Lince	The Cat Stars	Hyades	Theta Tau	16:15
5	The Crane	A' Chorra- Monaidh	Aoife	Pleiades	Alcyone	16:30
Rising during the hours of darkness						
6	The Big Hunter	An Sealgair Mór	Fionn mac Cumhaill	Orion	Betelgeuse	17:00
7	The Horse	An t-Each	Rhiannon	Cancer	Asellus Borealis	17:15
8	Little Dog	A' Choin as Lugha	Sceolan	Canis Minor	Procyon	18:15
9	Young Deer	An Fiadh Òga	Oisín	Leo	Algieba	19:00
10	Big Dog	Am Madadh Mór	Bran	Canis Major	Sirius	20:30
11	Maiden	A' Mhaighdeann	Goewin	Virgo	Vindemiatrix	22:45
12	Horseman	An Marcach	King Math	Bootes	Arcturus	22:45
13	Pine Marten	An Taghan	Unidentified	Corona Borealis	Alphekka	23:00
14	Crow	An Feannag	Badhbh	Corvus	Gienah	01:15
15	Boar	An Torc	Twrch Trwyth	Libra	Zubeneschamali	03:30
16	Stag	An Damh	Gwrhыр	Ophiuchus	Rasalhague	04:00
17	Hare	An Geàrr	Oisín and the hare / Gwion Bach and Caridwen	Sagitta	Gamma Sge	06:00
18	Eagle	An Iolaire	Lleu Llaw Gyffes	Aquila	Altair	07:00
19	Stag	An Damh	Old Celtic constellation	Scorpius	Antares	07:00
Rising with the sun						
20	Goat	A' Ghobhar	Old Celtic constellation	Capricorn	Dabih	09:30
21	Archer	Am Boghadair	Old Celtic constellation	Sagittarius	Nunki	09:30

The Scottish Night Sky

(500 AD onwards)

At the time of the Roman invasion of Britain, the Scots were a Celtic tribe living in Northern Ireland. They were first named the Scotii by the Romans and subsequently moved to what is now Scotland by way of the west coast. Their Gaelic kingdom of *Dál Riata* eventually came to culturally and politically dominate their neighbours in Pictland by the end of the eighth century.

The Scots were cattle farmers. Their year revolved around the movement of animals from winter pastures to summer pastures and back again.

Fire Festivals

For the Scots the most important festivals were Samhain, Imbolc, Beltane and Lughnasa. The festivals were each marked by the position of the full moon in relation to the zodiac. This knowledge was preserved and handed down through oral tradition by the druids [*draoidh*].

Caesar tells us that for the Celts the cosmic cycle always started with darkness so the day began with sunset. Likewise their agricultural festivals were celebrated at the full moon because that is the point in the month at which the night sky will start to become darker.



Modern Beltane Fire Festival. Photo: SixSigma

Samhain

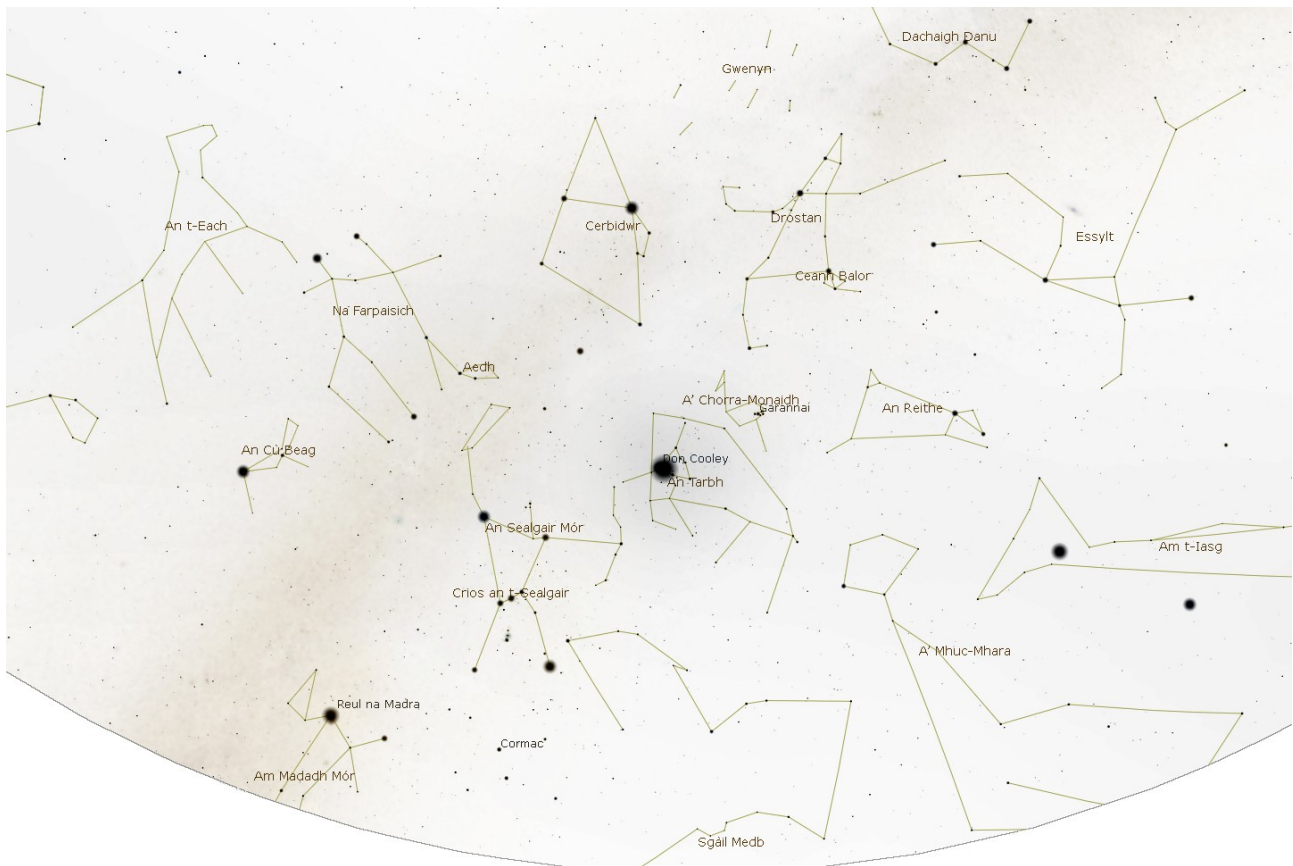
Samhain was celebrated when the full moon appeared between Aoife (the Pleiades) and the horns of the Dun Bull of Cooley (the Hyades). The Celts believed that their souls originally came from the Pleiades.

Samhain marked the beginning of winter. Cattle were brought down from hill pastures because the summer grass was gone. As the weather got colder it became possible to keep meat in the freezing conditions. Now was the time to choose which animals would be slaughtered for the winter. The sudden food bonanza made a perfect excuse for feasting and drinking so that perishable supplies were put to good use.

Starting at the new moon before the festival a 'doorway' had opened up to the other world. Shortly after sunset the Great Rift of the Milky Way had appeared exactly where the sun had recently set. This gigantic dark hole in the bright band of the Milky Way was one of the portals to the other world. Its appearance where the sun had just been opened the door to the spirit world.

After Samhain the Pleiades would have become visible in the evening sky immediately after sunset, thus marking the approach of winter.

Samhain was the ancient forerunner of Hallow e'en and Guy Fawkes night.



The full moon in the constellation of Tarbh at Samhain: Stellarium / David Newland

Imbolc

Imbolc was celebrated when the full moon appeared in the constellation of Fianna Óga – the young deer (Leo).

Imbolc marked the beginning of spring. It was celebrated in honour of the Celtic goddess Brigit. Brigit was one of the Dagda's daughters and one of the Tuatha Dé Danann. She represented the light half of the year, and the power that changed winter darkness into spring.

On Imbolc eve people would make an image of Brigit from bundles of oats and rushes which were dressed and put in a basket overnight. The day itself was celebrated with bonfires, bannocks, milk and cheese, as well as meat kept over winter. A bannock is a flat bread that was cut into wedges.

After the festival the bright core of the Milky Way would become increasingly visible in the pre dawn skies as a prelude to the coming of spring.



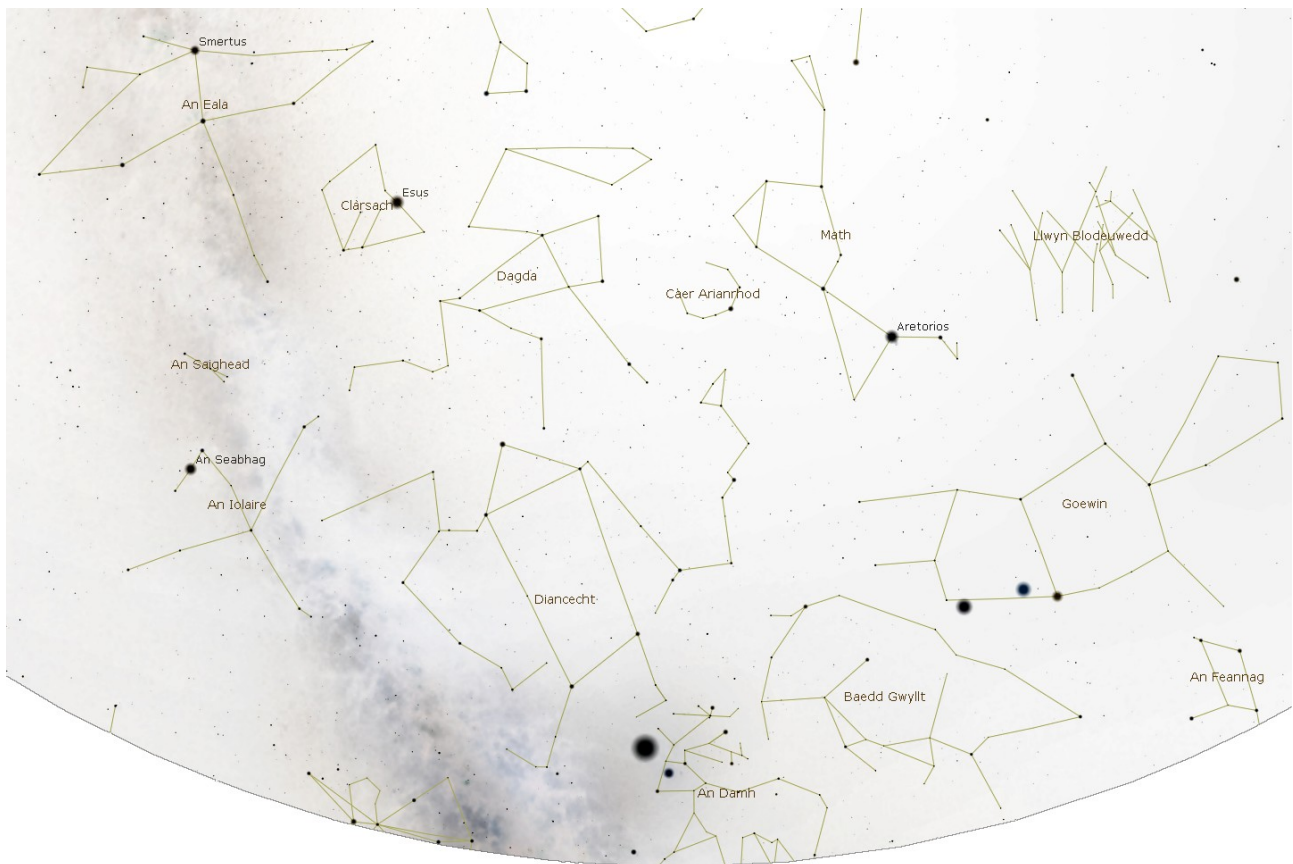
The full moon in An Corran (the Sickie) at Imbolc. Image: Stellarium / David Newland

Beltane

Beltane was celebrated when the full moon appeared in the constellation of Frasadair – the sower (Scorpius)

The Beltane fire festival marked the beginning of summer. The new seasons growth was starting to sprout. Grass was beginning to grow again and the trees were coming into leaf. The people and their cattle would walk around or jump over the Beltane fires to protect themselves and their animals from disease. All other fires would be put out and re-lit from the Beltane fire. Beltane bannocks were baked and a piece offered to each of the spirits to protect their livestock. A thick syrupy drink called a caudle was made from eggs, butter, oatmeal and milk. Some of the mixture was poured on the ground as an offering to the spirits. The assembled company drank the rest. Once the cattle had been protected in this way they were driven out to their summer pastures.

Beltane is now celebrated in Scotland as May Day.



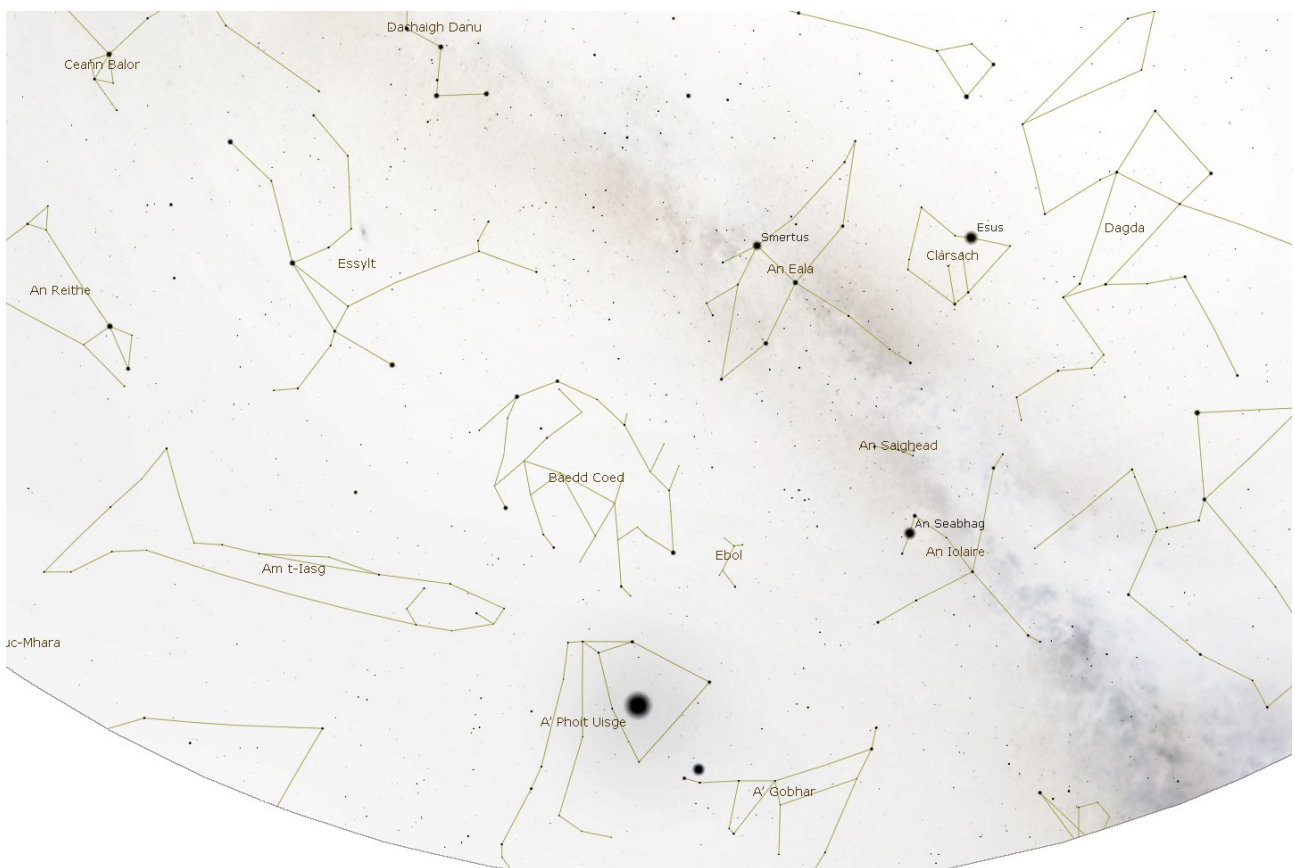
The full moon in the constellation of the stag at Beltane. Image: Stellarium / David Newland

Lughnasa

The first appearance of bright Betelgeuse in the morning sky would have heralded the arrival of Lughnasa at the following full moon. The festival was celebrated when the full moon appeared in the constellation of A' Phoit Uisge – the water pot (Aquarius).

Lughnasa was named after the Celtic god Lugh, who was one of the most prominent Gaelic mythological figures. He was a member of the Tuatha Dé Danann – a warrior king and master craftsman. Lughnasa was a celebration of Lugh's triumph over the spirits of the other world, who had tried to keep the harvest for themselves. It was a time of feasting and plenty. At the festival a bull and the first fruits of the harvest were sacrificed to Lugh. A feast followed including the bull's flesh and new foods like bilberries that were only available at harvest time. There were also athletic contests which have been handed down to us as the Highland Games, and are still celebrated throughout Scotland.

Lughnasa was the Celtic harvest festival.



The full moon in the constellation of A' Phoit Uisge at Lughnasa. Image: Stellarium / David Newland

The Circumpolar Stars



The Circumpolar Stars. Image: Stellarium / David Newland

Vikings

(800 – 1,500 AD)

The Vikings occupied Shetland, the Orkneys and Hebrides from the 8th until the 15th centuries AD. They were hugely successful navigators, not only of the North and Hebridean seas, but also ultimately of the whole North Atlantic Ocean. They made direct sea crossings from Norway and then from Scotland on to the Faroes, Iceland, Greenland and eventually the American continent.

Claims that Norse navigators steered by the stars are exaggerated. While they were good sailors they were not stupid. Sailing across the North Atlantic in an open boat during the long winter nights when the stars are visible is not a good idea because of the weather. Most long distance crossings would have been made during summer when the north star would have only been visible for a short time around midnight each day. That would have given plenty of room for navigation errors during the long days when the stars were not visible.

Instead the Vikings relied on two ingenious devices called the Sun Shadow Board and the Sun Compass. As their name suggests these two aids allowed them to navigate by the sun. Sometimes they also brought birds with them which they let go and then followed to the nearest shore.

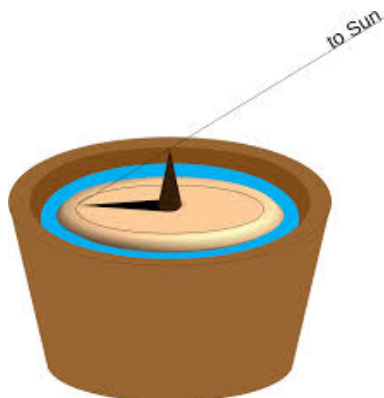
Navigating by the Sun

Sun Shadow Board (*Solskuggerfjøl*)

The Sun Shadow Board allowed the Vikings to sail along a line of latitude by making adjustments to their course at noon each day.

It was a circular wooden board about 250 to 300 millimetres in diameter. In the centre was a gnomon, the height of which could be set to the time of the year. To keep the board level, it was placed in a bowl of water. The shadow of the noon sun was observed on the board. A circle on the board showed the Viking sailors the line the sun's shadow should reach if their ship was travelling on the desired latitude for the time of year.

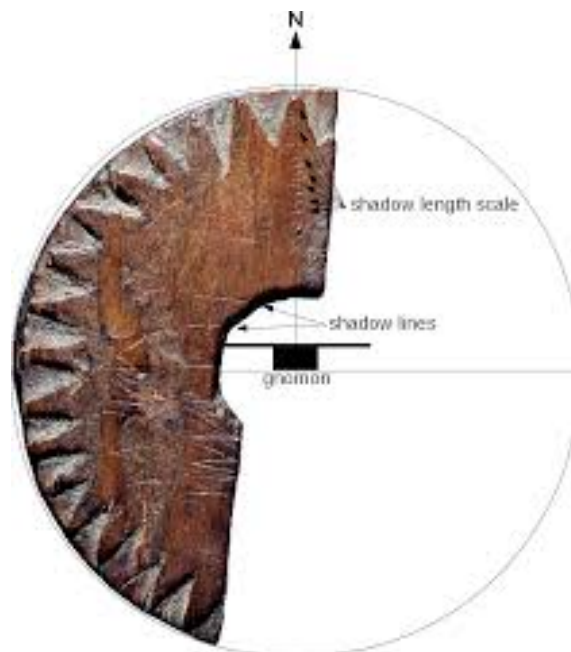
This was important because even a small change in course could result in not reaching their planned destination.



*Sun Shadow Board: Credit:
Markus Neilbock*

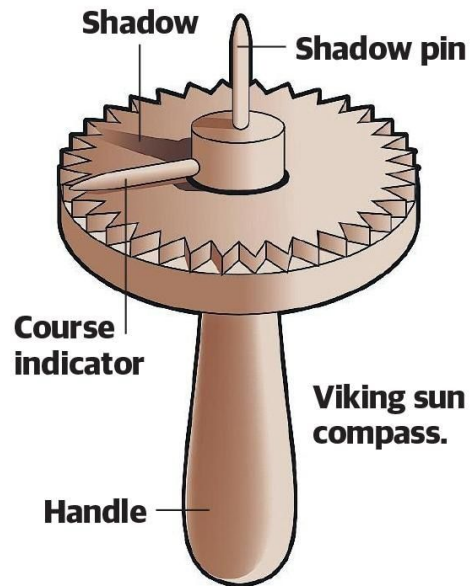
Sun Compass (*Solkompass*)

In 1948 a fragment of an eleventh-century navigational tool was found under the ruins of a Benedictine convent in Uunartoq, Greenland. It consists of half of a round wooden disc with a diameter of 70 mm (2.75 in.) and many deep scratches.



Viking compass, Greenland. Photo: Lennart Larsen, Annotation Markus Neilbock

The sun compass was a small platform with a vertical pin in the middle and a pointer that marked the direction of travel. A number of lines were marked on the board, each of which would show the course of the tip of the pointer for various times of the year at the latitude of their destination. When the sun shone on the sun compass it created a shadow behind the vertical pin. By rotating the platform until the tip of the shadow coincided with the line for the desired time of year and destination they could determine their direction of travel.



*Viking sun compass reconstruction.
Credit: thewest.com.au*

Sun Stone

On overcast days the Vikings relied on the sun stone to help them find the sun's position. This stone, which was made of a mineral called Icelandic spar, would change colour slightly as it was turned in the light. A certain colour marked the position of the sun even through fog and cloud. However the Vikings could only use the sun stone when they were able to see at least a hint of blue sky.



Grioglachan (the Pleiades). Photo: David Newland

The Last Millennium

(1,000 – 2,000 AD)

Roman culture and learning had gradually been adopted in southern parts of the British Isles since Caesar’s conquest in 54 BC. However when Christianity first arrived in Scotland in the 5th century, Scotland was still firmly rooted in Gaelic culture. From the late 7th century the Celtic churches adopted the Roman method of calculating the date of Easter, as agreed at the Synod of Whitby. This was just another mile stone along a continuing process of adopting Roman culture and learning in Scotland.

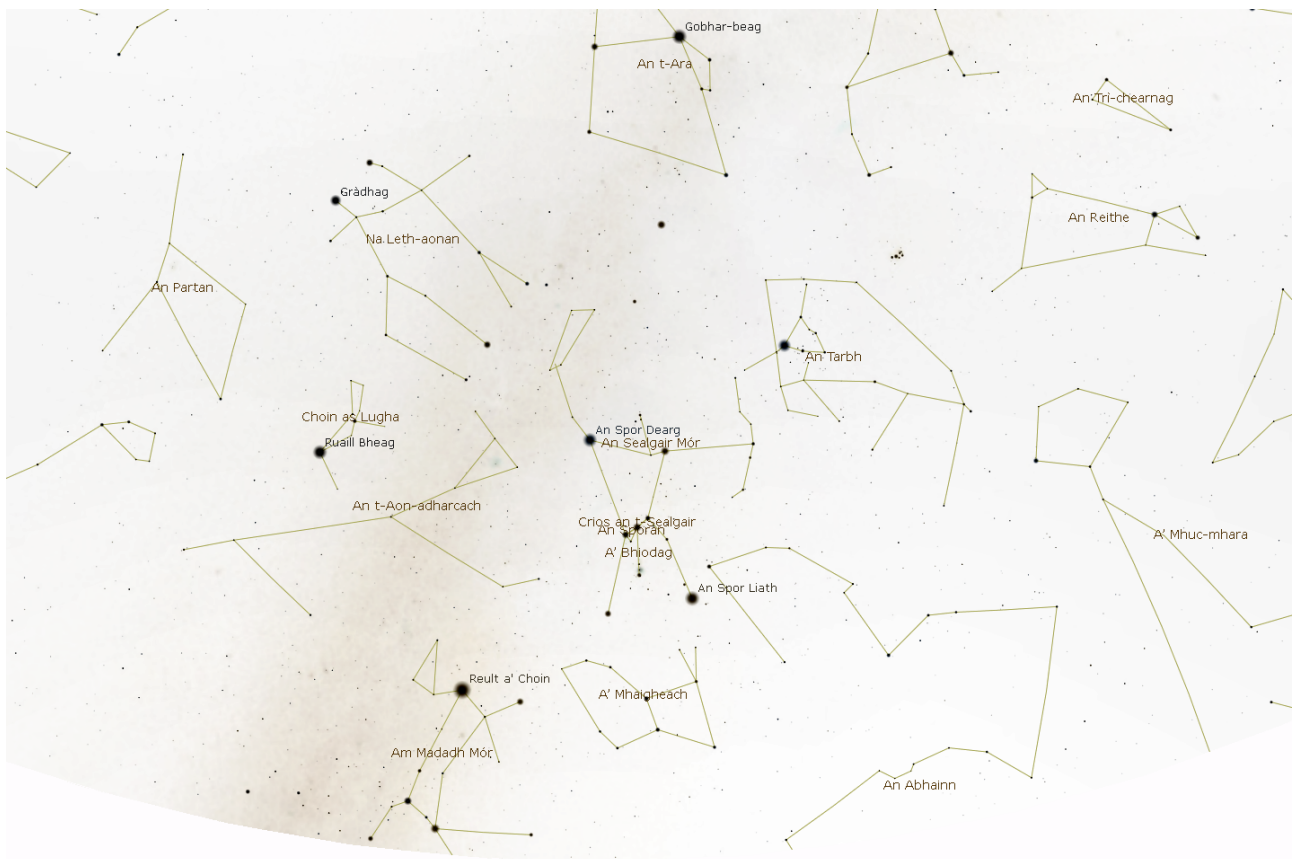
Throughout medieval times the monasteries were the main places of learning. After the influence of the monasteries declined, universities became the new principle sources of education. In both of these establishments it was Greek and Roman traditions and knowledge that were taught and studied. By the birth of scientific astronomy during the renaissance Romano-Greek mythology dominated maps of the night sky. Gradually the old sky traditions were forgotten and became increasingly diluted although some interesting folklore traditions remained.

Modern Gaelic Name	Notes	Latin Name
Romano – Greek and Renaissance Constellations and Planets		
A’ Chrois-tara	The Northern Cross. Probably dates from Johann Bayer's 17th-century star atlas ‘Uranometria’.	Cygnus
Na Leth-aonan	The Twins were Castor and Pollux. This is a significantly different interpretation of a pair when compared to the rivals handed down by Pictish mythology.	Gemini
An Partan	In Greek legend Karkinos the crab appeared whilst Hercules was battling the Hydra. He killed Karkinos for interfering after it bit him in the foot. Hera, who was not a fan of Hercules, immortalised it by putting it in the stars. The Crab replaced the old Gaelic commemoration of the Celtic Horse goddess in the night sky.	Cancer
An Leòmhann	The Lion. Lions are unknown in Scotland. This was the Nemean lion that was killed by Hercules. It replaced the old Gaelic interpretation of the “Young Deer”.	Leo
Meidh	The Scales. Another icon that was borrowed from Romano-Greek sky lore. It replaced the old Gaelic images of the Deer or	Libra

	Loop.	
Sgairp	The Scorpion. Scorpions are unknown in Scotland. This scorpion was sent by Artemis to kill Orion in Greek legend. It replaced the old Gaelic image of 'The Sower' and the Pictish image of 'The Stag'.	Scorpio
Fear-Giùlain Uisge	In Greek and Roman legend the 'Water Pot' of the ancient Gaels had a man added to pour out the water.	Aquarius
A' Chathair	The Chair. This is Cassiopeia's throne. She was condemned to be tied to it and spin around the north pole for eternity as punishment for sacrificing her daughter Andromeda to Cetus the sea monster. It replaced the home of the mother of the gods from both Pictish and ancient Gaelic legend.	Cassiopeia
Na Buachaille	The Herdsman. According to Greek legend Bootes was the ploughman who drove the oxen in the constellation of Ursa Major. The Picts portrayed this constellation as representing the mythical king Math.	Bootes
Iorcal	Hercules was the iconic Greek hero who undertook the twelve labours. He replaced the Dagda as icon of this constellation.	Hercules
Grugadan	The Seven Sisters. These were the Pleiades - daughters of Atlas the Titan. Zeus placed them in the heavens so that they would not be seduced by Orion whilst Atlas was busy holding up the world. They replaced 'The Crane' of ancient Gaelic legend.	The Pleiades
Planets		
Mearcar		Mercury
Bhèineas		Venus
Màrs		Mars
Cruinne-cé		Earth
Iupatar		Jupiter
Satarn		Saturn
Rionnag nan Roth	Literally the star of the wheel. Probably referring to Saturn's rings that were first observed by Christiaan Huygens through a telescope in 1695.	Saturn

Winter Constellations and Stars

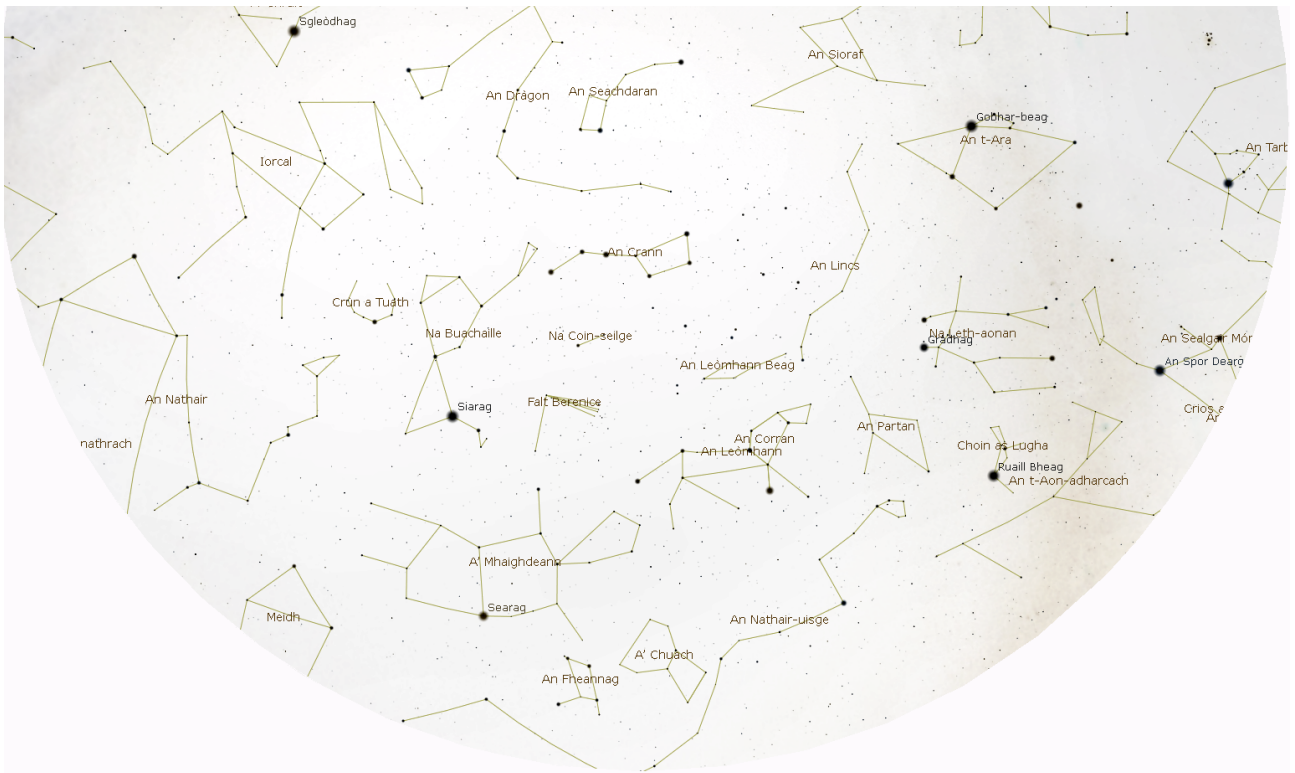
Modern Gaelic Name	Notes	Classical Name	Source
An Reithe	The Ram	Aries	Old Gaelic
Grioglachan	The Star Cluster	The Pleiades	Folklore
Grugadan	The Seven Sisters	The Pleiades	Romano-Greek
An Tarbh	The Bull	Taurus	Old Gaelic
An Sealgair Mór	The Big Hunter	Orion	Old Gaelic
Crios an t-Sealgair	The Hunter's Belt	Orion's Belt	Old Gaelic
A' Bhiodag	The Dirk. M42, M43 and ι Orionis	Orion's Sword	Folklore
An Sporan	Lies adjacent to the horse head and flame nebulae	σ Orionis	Folklore
Am Breacan	The part of Orion above Betelgeuse	μ , ν , ξ , χ^1 and χ^2 Orionis	Folklore
Am Madadh Mór	The Big Dog	Canis Major	Old Gaelic
Caigeann a' Choin as Lugh	The Little Dog	Canis Minor	Old Gaelic
Na Leth-aonan	The Twins	Gemini	Romano-Greek
Gobhar-beag	The Little Goat	Capella	Romano-Greek
Aibhseag		Aldebaran	Folklore
Gaolag (na Caiginn)		Castor	Folklore
Gràdhag (na Caiginn)		Pollux	Folklore
An Spor Dearg		Betelgeuse	Folklore
An Fhadag Uachdair, An Fhadag Àrd		Bellatrix	Folklore
An Fhadag Ìosal		Saiph	Folklore
An Spor Liath		Rigel	Folklore
An Sgalag	The workman	Alnitak	Folklore
An Cù	The dog	Alnilam	Folklore
An Gille	The boy	Mintaka	Folklore
Na Ruailleán		Sirius and Procyon	Folklore
Ruail Bheag		Procyon	Folklore
Reult a' Choin	Dog Star	Sirius	Folklore
Reul an Iuchair		Sirius	Folklore



Modern Gaelic Winter Constellations and Stars. Image: Stellarium / David Newland

Spring Constellations and Stars			
Modern Gaelic Name	Notes	Classical Name	Source
An Crann	The Plough	Ursa Major	Old Gaelic
(Cóig) Gadhair Osgair	The Five Mastiffs of Oscar	Alkaid, Mizar, Alioth, Megrez, Phecda in the Plough	Folklore
An Seachdaran		Ursa Minor	Folklore
Na Laoigh	ϵ Ursae Minoris (Yildun) and δ Ursae Minoris	Ursa Minor	Folklore
An Partan	The Crab	Cancer	Romano-Greek
An Leòmhann	The Lion	Leo	Romano-Greek
An Corran	The Reaping Hook	Leo	Old Gaelic
A' Mhaighdeann	The Maiden	Virgo	Pictish

An Reul-iùil	The Guiding Star	Polaris	Folklore
An Ceann-mathain	The Head of the Bear	Alkaid	Folklore
Tulga is Talga	The Pointers	Merak and Dubhe	Folklore
Bodachan a' Chroinn		Mizar	Folklore
Am Bodachan	Little old man	Alcor	Folklore
Searag		Spica	Folklore



Modern Gaelic Spring Constellations and Stars. Image: Stellarium / David Newland

The Planets

Grian		Sun	Old Gaelic
Gealach		Moon	Folklore
Easga		Moon	Old Gaelic
Mearcar		Mercury	Romano-Greek
Bhèineas		Venus	Romano-Greek
Reult na maidne	Morning Star	Venus	Folklore
A' Mhaidneag	Morning Star	Venus	Folklore
Reul an fheasgair	Evening Star	Venus	Folklore
Màrs		Mars	Romano-Greek
Corg		Mars	
Iupatar		Jupiter	Romano-Greek
Am Bliogh		Jupiter	
Satarn		Saturn	Romano-Greek
Rionnag nan Roth	Star of the wheel	Saturn	Renaissance
Ùranus		Uranus	Romano-Greek
Neaptun		Neptune	Romano-Greek
Plùto		Pluto	Romano-Greek

Appendices

Scottish Gaelic Astronomical Terms

English	Gaelic
Astronomy	Reul-eòlas, Sgoil-reul
Astronomer	Reul-eòlaiche
Star gazers	Luchd-amhairc nan reul
Dark Sky Park	Páirc nan Speuran Dorcha
Sky, Heavens	Iarmailt
The Heavens, Space, The Night Sky	Na Speuran
Star	Reult, Rionnag
Stars	Reultan, Rionnagan
Starlight	Solas nan Reultan
Constellation	Reul-bhad, Reul-bhuidheann, Cruinn-reul
Constellations	Reul-Bhadan
Star Cluster	Grioglachan, Griogchan, Griogaran, Grioglan, Griogadan
Nebula	Neul-Reultan
Galaxy	Reul-chrios
Milky Way	Sgrìob Chlann Uis
Planet	Planaid, Reul shiùbhlach (archaic)
Giant Planet	Mòr-phlanaid
Dwarf planet	Beag-phlanaid
Comet	Comaid, Reul-chearbach, Rionnag na smùide
Orbit	Reul-chuairt
Meteor	Dreag
Northern Lights	Na Fir-Chlis

Continental Connections

The Nebra Sky-Disc

A bronze disc was found at Mittelberg in Germany. It can be dated to around 1,600 BC and is decorated with sheet-gold depictions of a crescent moon, stars and the sun. A cluster of seven stars depicts the Pleiades whose significance to residents of Scotland during the Bronze Age has already been mentioned above.

Two gold arcs, attached to either the edge of the disc, mark the positions of the rising and setting of the sun at the solstices as observed from the Mittelberg. At the bottom of the disc there is a ship – the celestial vessel in which the sun is thought to have travelled on its daily cycle is also depicted in sheet gold.



The Nebra Sky Disc. Photo: Dbachmann

The Gundestrup Cauldron

The Gundestrup cauldron is a richly decorated silver cooking vessel, dating from between 200 BC and 300 AD. Hospitality on a large scale was an obligation for the Celtic ruling class. This exceptionally large and elaborate cooking pot, reminds us of Dagda's cauldron, from which no one ever left hungry.

Although the workmanship appears to be of Thracian origin the imagery owes more to Celtic stylistic tradition that found on other artefacts. The Gundestrup Cauldron is the largest known example of European Iron Age silver work.

The iconography of the cauldron appears to relate to the cosmos. It covers a number of themes including the sun, moon, planets and constellations. Some of the images are strikingly reminiscent of figures found in Celtic myths and legends later recorded in Gaelic and British medieval manuscripts.



The Gundestrup Cauldron. Photo: Rosemania

The Coligny Calendar

When the Romans invaded Gaul, they made it law for the people to use the Julian calendar. Despite this the Sequanii tribe, seem to have been able to keep the old calendar of the ancient Celts alive right up until the end of the second century.

A bronze tablet in 73 pieces was discovered in a well at Coligny in 1897. The restored tablet shows a five year lunisolar calendar displaying 62 months in sixteen vertical columns. Written in the Gaulish language it is the most important piece of evidence for the reconstruction of the ancient Celtic calendar. A similar calendar found nearby at Villards d'Heria is preserved in just eight small fragments.



The Coligny Calendar. Photo: Andrew Dalby

The calendar normally had a twelve month year. Over the course of the five year period two intercalary months were inserted in order to keep the annual solar cycle tolerably in synchronisation with the lunar months.

- The five year calendar had 1,831 days.
- Each five year period had 62 lunar months. The actual length of these would have been $62 \times 29.530585 = 1,830.8963$ days, giving an error of only 0.1037 days in every five years or 0.0207 days per year.

- Reconciliation with the tropical year was not so good: Five tropical years last $5 \times 365.24219052 = 1826.21$ days, giving an error of 4.7890 days in every five years or 0.9578 days per year

Alignment of the lunar cycle with the tropical year was probably improved by using the cycle of Saturn's orbit as mentioned by Pliny in his *Naturalis Historia*. Saturn's sidereal period is 29.6501 years, or 10,829.46747 days. That is the length of time it takes Saturn to return to the same point against the background stars. It is a little longer than Saturn's true orbit of 29.4571 years, but it is what the Celtic astronomers would have been able to observe. If one intercalary month were dropped every time that Saturn returned to its starting point in the constellation of Taurus then:

- The amended thirty year calendar would now have had $1,831 \times 6 - 30 = 10,956$ days.
- Each thirty year period would have had 371 lunar months. The actual length of these is $371 \times 29.530585 = 10,955.8470$ days, giving an error of only 0.1530 days in every thirty years or 0.0051 days per year.
- Thirty tropical years last $30 \times 365.24219052 = 10,957.2657$ days, giving an error of only 1.2657 days in every thirty years or 0.0422 days per year

The months of the calendar are each divided into fortnights by the word *atenoux*. Within each fortnight the days are numbered in Roman numerals.

Month	Name	
	Gaulish	Modern
1	Samonios	Dec - Jan
2	Dumannios	Jan - Feb
3	Riuros	Feb - Mar
4	Anagantio	Mar - Apr
5	Ogronnios	Apr - May
6	Cutios	May - Jun
	(Ogmios)	Intercalary
7	Giamonios	Jun - Jul
8	Semiuisonna	Jul - Aug
9	Equos	Aug - Sep
10	Elembiu	Sep - Oct
11	Edrinios	Oct - Nov
12	Cantlos	Nov - Dec

Interpretation and Forgeries

Classical Geographies and Histories

The works of the earliest classical historians and geographers such as Hecataeus and Pytheas have barely survived the ravages of time. Some of the subjects that they wrote about were ancient even in their own day, and the authors themselves were often reporting hearsay. The few fragments of their works that have come down to us were copied by later writers before being lost to history. Later Roman authors from Caesar onwards wrote from the point of view of conquerors. They saw themselves as bringing the civilising influence of 'Pax Romana' to the barbaric native island tribes of the north!

Insular Celtic Accounts

The earliest documented sources that we have for Gaelic and Brythonic mythology were recorded by Christian monks from ancient oral traditions. These monks were no doubt torn between a desire to record their native culture and their religious hostility to pagan beliefs. Later sources may also have formed part of a propaganda effort designed to create a history for the Gaelic and Brythonic peoples. The monks were probably also influenced by the epics of classical literature that came with Latin learning. Thus in the process of recording, many of the old Gaelic and Brythonic gods were reduced to the status of heroes.

Iolo Morganwg and the Barddas

Edward Williams (10 March 1747 – 18 December 1826) is better known by his bardic name Iolo Morganwg. He was an influential Welsh antiquarian, poet, collector, and literary forger.

The Barddas is a book of material compiled and written by Iolo Morganwg. Claiming to be an authentic compilation of ancient Welsh bardic and druidic theology and lore, its contents are nevertheless mainly Iolo's own invention. The work was published by John Williams for the Welsh Manuscripts Society in two volumes, 1862 and 1874. It is ironic that much of these publications are now better known than the authentic material.

Macpherson's Ossian

The eighteenth century Scottish poet and historian James Macpherson claimed to have translated his poems 'Ossian' from ancient sources in the Scottish Gaelic language. Although they were based on authentic Gaelic ballads, he adapted them by altering the original characters and introducing a large number of his own ideas. His poems had a widespread influence on many writers including Goethe and the young Walter Scott.

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