University of Wales Trinity St David

ARCHAEOASTRONOMY AND THE SACRED LANDSCAPE OF STRATA FLORIDA

Landscape, Skyscape and Structure from 2000BC to 1200AD

Olwyn Pritchard
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All the photographs in the dissertation are the work of the author , except Figures 5, 6, and 13 which are credited individiually.

Abstract

Professor David Austin has noted that Strata Florida Abbey and its environs represent a 'transcendently numinous place, perhaps from a time before the Cistercians arrived'. In this paper, the author sets out to investigate the evidence for a continued reverence of 'sacredness' or numinosity in the landscape surrounding the abbey precinct, from the time of the earliest surviving prehistoric monuments, to the building of the Cistercian Abbey. Archaeoastronomy is used as a way of gauging the beliefs of earlier peoples in this respect, taking as a given that, for them, celestial events and heavenly bodies had a spiritual meaning, and that this in turn lead to astronomical alignments or certain directions being incorporated into the structures they created. The results of the project (although somewhat limited by time and space constraints, and the necessity of ploughing a fresh furrow) show that if indeed the placing of structures with regard to certain celestial events does indicate a spiritual /ritual dimension to those structures, then the landscape and skyscape of this valley and its environs have indeed been a 'transcendently numinous place' since well before the coming of the Cistercians.

INTRODUCTION:

This dissertation provides something never previously attempted, an assessment of the contribution made by archaeoastronomy to monuments constructed through time in one locality, over a period of in excess of 3000 years. Beginning with the uppermost layer, the remains of the Cistercian Abbey of Strata Florida, Ceredigion, Wales, the study moves back through the pre-Norman phase, and the Iron Age to the Bronze Age. The relationship between landscape, skyscape and humanly created structure for each chronological and cultural period is investigated. Different celestial events and times of year have been emphasised through the ages, but at no time, it seems, were they irrelevant.

What is archaeoastronomy?

Archaeoastronomy is a sub-discipline of archaeology, which takes as a starting point the idea that human beings across time and space have consistently found meaning and significance in the various phenomena of the sky.

Modern westerners live their lives largely indoors, with electric light which defeats the darkness. We are relatively unaware of the sky and especially the night sky. Yet the sky makes up roughly half of any landscape, fundamentally there is no landscape without a skyscape, and indeed 'Landscapes cannot be seen without the sky; without the light of the Sun which creates day and, at periodic intervals, the light of the full Moon which mitigates the darkness of night. Simply, landscapes do not exist without skyscapes. Neither does life: the sky is the source of warmth, the air which we breathe and, from rain, much of the water we drink (Campion 2013:2).'

The sky is not just the source of warmth and life giving rain. It contains a multitude of moving, luminous objects, the Sun, Moon, planets and 'fixed' stars, an enduring source of fascination. It would seem that they have fascinated humanity for millennia, so much so that alignments to particular solar, lunar or stellar events have been found incorporated into a host of human constructions, from as far back in time as the European Neolithic, the Egyptian pyramids or the pre-Columbian cultures of the American southwest.

A simple definition of archaeoastronomy according to the Sophia Centre is 'the study of the incorporation of celestial orientation, alignments or symbolism in human monuments and architecture' (Sophia Centre 2012), while Clive Ruggles defines archaeoastronomy as 'the study of beliefs and practices relating to the sky in the past, especially in prehistory, and the uses to which people's knowledge of the skies was put' (www.cliveruggles.net).

The identification of astronomical components in ancient sites can become a means to building a fuller picture of the belief systems, or cosmologies, of ancient cultures. Such cultural astronomies may be identified via a combination of textual evidence (history), ethnographic study, and/or archaeoastronomy, depending on the time depth involved (Campion 2013:4).

In the contemporary west, astronomy is regarded as a scientific discipline, but in the past it had strong links with religion, with the Sun, Moon and stars being regarded as divinities by many cultures (North 2008:3). Astrology, the art or science of divination by observing the movements of celestial bodies is a form of cultural astronomy, far reaching in terms of time depth, and spatial distribution. Forms of astrology are known from at least as early as the first millennium BC and there is almost no culture worldwide which does not lend some credence to a belief in the ability of celestial events to influence human destiny (Campion 2008:6). It appears that in earlier times the practices of planetary observation, reverence, and divination were less separate disciplines than they are now (Brady 2013).

There is increasing recognition of the potentially very broad scope of archaeoastronomy and its significance and usefulness for understanding past cultures. Early UK researchers chiefly studied astronomical alignments involving the horizon at prehistoric megalithic sites, such as Callanish (Somerville 1912), Stonehenge (Hawkins 1988, Atkinson 1956, Lockyer & Penrose 1901, Lockyer 1906), British stone rows (Burl 1993, Thom 1967), and other circles (Thom 1967, 1971), focussing predominantly on astronomy, looking for statistical similarities, and regarding the sites in many cases as 'observatories'. In the Americas alignments incorporated within less ancient

indigenous structures were in many cases accompanied by extant documentary evidence of ritual and meaning, something which the prehistoric Old World sites generally lack. Baity et al provided a thorough review of the earlier work in both the Old and New World (Baity 1973).

In recent years, following extensive critiquing, the earlier approach has been broadened. Silva (2012) has demonstrated a link between stellar alignments at dolmens in Portugal and legends regarding the name of a nearby mountain range. Malville and Ruggles in relation to the Peruvian monuments at Chankillo in the Andes argue that the notion of ancient astronomers using prehistoric observatories should probably be replaced by concepts of ritual and shamanistic participation in a living cosmos composed of undistinguished sky and land (Malville 2011:160). Frank (1993) combines astronomy and folklore in her work on Sky Bears. Brady has demonstrated that a combined study of myth, astrology and astronomy can illuminate otherwise ambiguous early texts (Brady 2011, 2013). In the UK a cross disciplinary combination of ideas incorporating archaeoastronomy within broad phenomenological theories of sacred landscape have been adopted by writers and theorists of the Neolithic, such as Mark Edmonds (2002) Julian Thomas (1999), and Chris Tilley (1994). Oswald (1997) and Parker Pearson (1996,1999) have attempted to devise an Iron Age cosmology based on a statistical analysis of roundhouse door orientation.

In Britain, most archaeoastronomy to date has involved stone built Neolithic and Early Bronze Age monuments, located either in England or Scotland. Prehistoric earthen monuments in the UK generally have received little attention (except see North, 1996,2008 and Harding et al 2006). Medieval cultural astronomy has been confined to studies relating to the orientation of churches (Cave 1950, Benson 1956, Ali & Cunich 2001, McCluskey 2004). In Wales, few sites from any period have been studied, except by writers such as Heath (2008, 2010), whose work is not peer reviewed. Therefore the following study of the archaeoastronomy of Strata Florida, a Cistercian Abbey in mid Wales, and its surrounding landscape, including a number of earlier earth built monuments, represents a journey into largely uncharted waters.

An introduction to Strata Florida

The scope of this work is broader in terms of both time and space than a simple consideration of the Cistercian Abbey of Strata Florida. Yet the abbey ruins are the best known, most visible, and most accessible remains, so it is with the abbey that our story will begin, before moving back in time.

A visitor or pilgrim who makes their way to the site today will find only the lower walls of the cloisters, chapter house, chancel, nave and transepts of the abbey church still standing, plus the well preserved iconic arch which once contained the west door.

The remains of the monastery lie in a flat bottomed, glaciated valley trending east-west on the west facing side of the Cambrian Mountains in mid-Wales. The buildings are set close to the confluence of two rivers.

The River Teifi flows west along the north side of the valley floor, from its source in the hills above, and a tributary, the Glasffrwd, enters from the southeast. The canalisation of the Glasffrwd, now redirected along the south side of the valley, allows for the drainage and cultivation of around 100 acres of level, fertile

meadows stretching from the Abbey precinct westwards toward the village of Pontrhydfendigaid – the Bridge-Ford of the Blessed Ones.

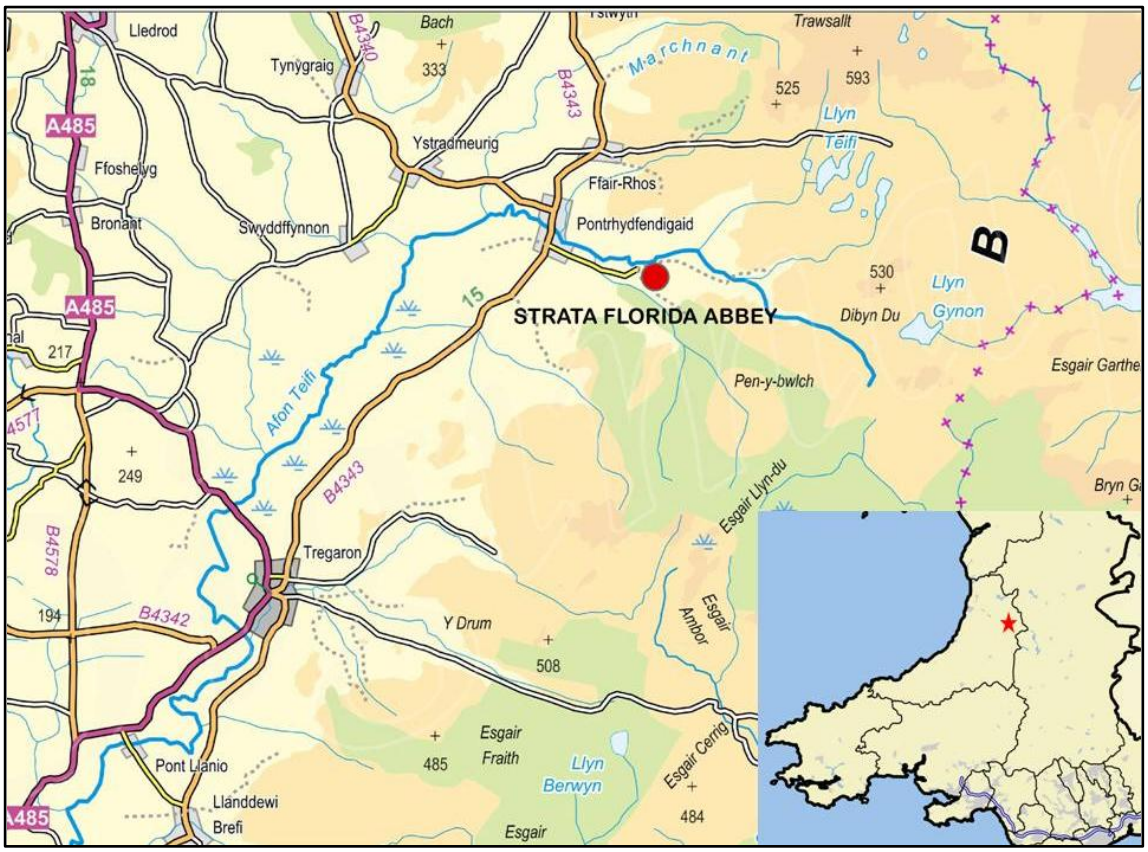


Figure 1. Location of Strata Florida. © OS 1:250,000 series. Edina Digimap.

History of Strata Florida Abbey

Strata Florida Abbey was established as a daughter colony of Whitland Abbey, a Cistercian house which had been founded directly from Clairvaux in 1140, initially under Norman patronage. The Cistercian order followed the ascetic Rule of St Benedict, which sought to occupy the 'waste' places of the world - the wilderness – and through *ora et labor* (prayer and work), make them productive.

The first group of monks under their abbot, David, were welcomed to a site on the banks of the Fflur Brook, to the south of the present site, by Robert Fitz Stephen, the Anglo Norman lord of central Ceredigion, in June 1164. But within a year, as recorded in the *Brut y Tywysogion* 'all the Welsh united to throw off the rule of the French' and the Kingdom of Deheubarth, extending over most of the three counties of Dyfed, came under the control of Rhys Ap Gruffudd – The 'Lord Rhys' (Robinson 2007:9).

In 1184, the monastery relocated to its present site (Burton 2012), with the construction of the Abbey Church being officially begun on Easter Sunday, 1184 (Ali & Cunich 2001:177). This was thanks to the generosity of Rhys, who had granted the monks a considerable area of land. In fact, Strata Florida was held in such esteem by Rhys and the Deheubarth dynasty that a number of the Welsh princes were buried there (Robinson 1997:9). Rhys supported not just Strata Florida, but the Cistercian order in general, and during the last few decades of the 12th century, he was instrumental in the founding of Cwmhir near Rhyader (1176) and Strata Marcella (1170)(Robinson 2007:9, Burton 2012).

The monastery flourished during the late 12th and 13th centuries, prior to the overwhelming of Wales by Edward I of England. During this time it established a reputation for scholasticism and political affiliation and as a centre of healing and spiritual well-being. From the later 13th century onwards, the buildings began to deteriorate, although it remained one of the greater monastic houses, especially in the popular imagination, until the Dissolution of the Monasteries in 1539 (Austin 2012).

Strata Florida and the upper Teifi valley before the Cistercians

As David Austin notes, the site is still a 'transcendently numinous place, perhaps from a time before the Cistercians arrived, but certainly after they left and even today remains the source of a powerful *hiraeth* in the emotion and spirit of Wales' (Austin 2012). Almost as soon as the altar was consecrated in 1201, Strata Florida became a centre for a growing nationalist ideology of Welsh identity and power. Unlike most Cistercian houses, it created manuscripts in

Welsh, rather than Latin, including the great history of early Wales, *Brut y Tywysogion* (The Chronicle of the Princes) and supported the literary and sculptural arts (Austin 2012). Austin (2013) hypothesises that this could have been because the abbey site was previously occupied by a religious foundation with pre-Norman, native antecedents, and there is some evidence to support this suggestion.

Figure 2. The well within the nave of the abbey church lies on a slightly different alignment.

Firstly, the well, discovered beneath the nave of the abbey church, and on a slightly different alignment has architectural similarities with many other 'Holy' wells across Wales, with Christian connections, which mostly date from the Early Medieval period (Jones 1992) and are connected with local saints. Secondly, air photos of the abbey ruins show that the church appears to overlie the neighbouring Parish burial ground. Austin (2013b) maintains that if this burial ground was established after the building of the abbey, it is the only known example of such a practice. He believes that there was a pre-existing early Christian burial ground on the site, and this is supported by the existence of a bank within the current churchyard, on a different alignment to the abbey buildings, which could represent one side of an enclosure extending under the abbey site, incorporating the well on its south side.

The third piece of evidence for an earlier religious foundation on the site is the presence in the churchyard of an inscribed stone dating to the 9th or 10th century.

In keeping with most of the rest of Wales, there is little incontrovertible evidence for settlement in the upper Teifi valley during the Early Medieval period, although the remains of a castle known to date from around 1100 at Ystrad Meurig, some 5km to the northwest, and directly linked by road to the abbey, may occupy the site of an earlier Llys. This settlement is hypothesised to have been the seat of the royal house of Ceredigion (Bezant & Austin pers comm.). If so, then the presence of pre-Norman stones marking graves attributed to 'Welsh Princes' at Strata Florida would not be anomalous, and neither would the continuing tradition of nationalism and royal patronage after the establishment of the Abbey in the late 12th century.

The Roman Period

Roman period activity is represented by a hoard of 16 Roman coins found c.1850 'at Strata Florida' with a bronze bowl (Davies 1994:313), having an estimated deposition date of 290AD. A Roman presence in the wider area is well attested by the fort at Trawscoed (Davies 1994:300) approximately 15km to the northwest, served by a north-south routeway, 'Sarn Helen', passing 10km to the west of Strata Florida. The fort was decommissioned around 150AD, but Roman influence persisted as is shown by the discovery of a villa dating from the late 3rd/early 4th century at nearby Abermagwr (Davies & Driver 2012). In the summer of 2013 Toby Driver flew over Strata Florida and photographed a roughly 7x7m rectangular banked enclosure on the end of a spur immediately to the east of the abbey, which he hypothesised could be the remains of a small fortlet or signal tower. Geophysical survey showed the rectangular feature to be sited within a round/oval ditched enclosure (Bezant pers comm.).

The Iron Age

Iron Age occupation near the abbey precinct is most obviously represented by the hill-top structure known as Pen-y-Bannau, immediately to the north of the

abbey ruins. It occupies a precipitous crag reaching 352m with extensive views over Cors Caron, to the west and south, and across the uplands bordering the Teifi Pools to the east and north.

The enclosure, which is a long oval, measures overall c.180m NE/SW by 60m and is divided roughly in two by the summit of the crag. There are the remains of stone walls and several house platforms. At the north eastern end of the crag, the ramparts turn in to form the main /entrance gateway , protected by two further ramparts below. Driver (2005:389) suggests that the entrance was intended to be viewed from a trans-Cambrian route way passing to the northeast, hence explaining its orientation.

He also suggests that the construction at Pen-y-Bannau shares common architectural elements with a small group of other similar structures, which he refers to as hill forts in the vicinity of Cors Caron, one of which, Pen-y-Ffrwyd Llwyd, above and to the northeast of Ystrad Meurig, is visible on the horizon from the abbey ruins.

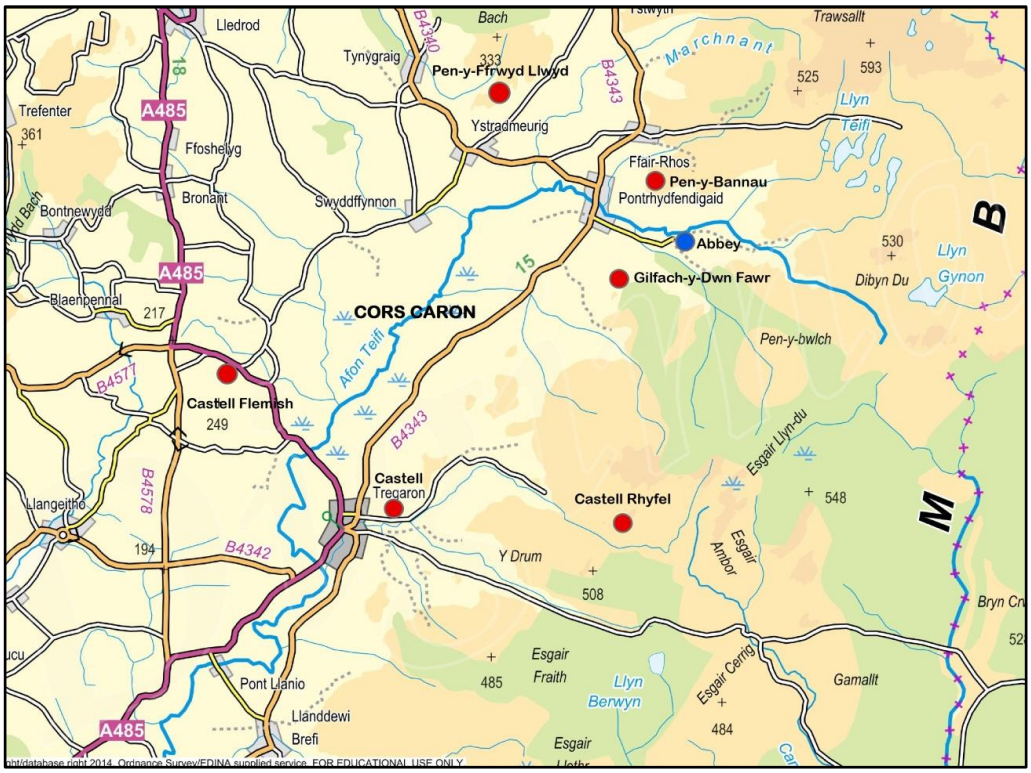


Figure 3. Map showing locations of six still visible, presumed Iron Age hilltop enclosures overlooking and encircling Cors Caron. © OS 1:250,000 series. Edina Digimap.

Life in the British Iron Age revolved around settled mixed farming, with evidence of similar diets and lifestyles occurring in widely differing locations across the UK (Jay & Richards 2007). Animal husbandry, featuring cattle, sheep/goats, and pigs with some horses plus cultivation of grains and legumes seems to have been ubiquitous. Environmental evidence from around Cors Caron (Moore 1994:40) shows progressive and extensive woodland clearance occurring from the late Bronze Age into Iron Age and Roman periods, with a ratio during the Iron Age of tree to non tree pollen similar to that of the present day.

The six hilltop enclosures marked on the map, and their astronomy will be discussed in greater detail below.

The Bronze Age

The evidence for activity in the Strata Florida landscape during the Bronze Age consists mainly of monuments on the uplands to the east of the abbey site. A notable cluster of cairns, some with still visible cists set into the fabric, is situated around the headwaters of the Glasffrwd. Briggs (1994:129) believes that most of upland Britain was farmed during the earlier Bronze Age, a period of especially favourable climate. Although none of the Blaen Glasffrwd cairns has been excavated other similar monuments in the mid/north Ceredigion area have and dates range from the late 3rd millennium to the mid 2nd (Briggs 1994:125, Murphy & Wilson 2011, Schlee 2011)

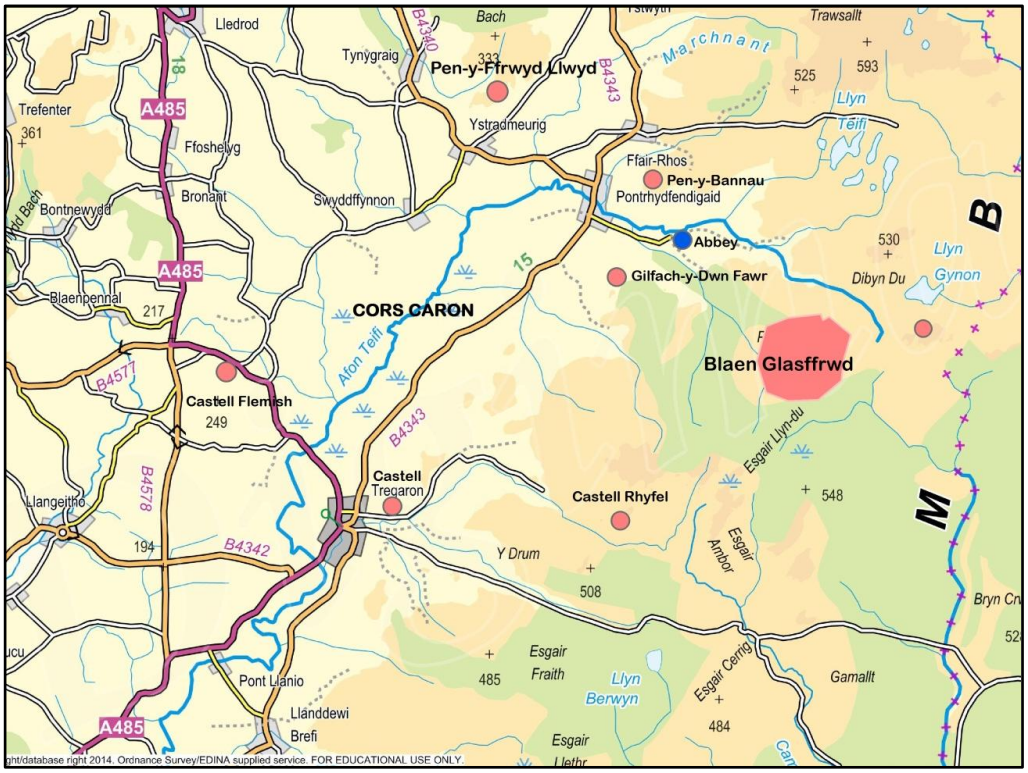


Figure 4. Map showing locations of Bronze Age monuments in the vicinity of Strata Florida. The Iron Age sites have been included as their sites in several instances occupied highly visible parts of the Bronze Age 'sacred' landscape. © OS 1:250,000 series. Edina Digimap

Pollen analyses from sites inland of Aberystwyth (Penrhyncoch, Penbont and Troedrhiwgwinau) 15km north of Strata Florida, suggest a mixed woodland incorporating *Corylus*, (hazel), *Quercus* (Oak), and Tilia (lime) which became progressively thinner as the Bronze Age advanced, while pollen of grasses and arable weeds became more abundant. This was interpreted as evidence of increasing cultivation. Turner (1965, cited by Moore 1994) found signs of short lived woodland clearance during the Bronze Age near Tregaron, with bracken appearing, followed by grasses and sorrel, and an increase in bracken following woodland clearance at Pwll-nant-ddu, near Trefenter (Moore 1994:40).

Evidence for actual settlement is scanty, although a burnt mound, one of several in the vicinity, and a ring ditch, near Swyddfynnon, 5km away at the head of Cors Caron excavated in 2012 suggest Bronze Age domestic activity. Occupation of the valley bottom where the abbey is situated is a possibility - at Llanerchaeron (SN47736035) in a similar topographical situation a trial excavation on the floodplain within the grounds of the National Trust property

showed the presence of a Bronze Age settlement (Bates 2011, unpublished). Prehistoric activity around Strata Florida is suggested by occasional finds of worked flint at the UWTSD excavations of the abbey gatehouse (Williams pers comm.).

The Neolithic

Evidence for occupation at Strata Florida during the Neolithic (4000-2300BC) is even scantier, because the chief sign of Neolithic activity in Wales is the presence of stone monuments (Lynch 2000:43), and none are known within the valley or the surrounding upland. Stray flints in the valley topsoil (Williams, pers comm.) do occur, and several Neolithic polished stone axes (Houlder 1994:123), have been discovered in the area, one at Pontrhydfendigaid. Houlder (1994:110) reports an assemblage of charred plant remains from Plas Gogerddan, near Aberystwyth, dated to 3500BC, which included grains of both spelt and emmer wheat, barley, hazelnut fragments and apple pips (Murphy 1986/7), showing a mixed economy involving the gathering of wild food alongside arable cultivation. Finds elsewhere in Britain testify to the presence of domesticated cattle and pigs. The Irish Sea is accepted as having acted as a main thoroughfare during the Neolithic (Cummings & Fowler 2004, Bowen 1969, 1970) and occupation appears to have spread from the coastal lowland along river valleys (Houlder 1994:110). The position of Strata Florida in a wide flat valley on the upper reaches of a large river, the Teifi, and not far from the upper reaches of the Aeron and Ystwyth, with abundant hazel could have made it an attractive location for Neolithic people.

STRATA FLORIDA AND THE CONCEPT OF SACRED LANDSCAPE

The concept of Strata Florida Abbey as part of a wider sacred landscape in terms of both space and time has recently been promoted by David Austin (Austin 2013(a), 2013(b)). But how should the term 'sacred landscape' be defined? Ideas and definitions of sacred landscape in literature are somewhat fluid. For instance, the idea of sacredness in terms of a specifically Welsh landscape is expressed by Llywelyn (1999:11) thus '[the] divine presence [is experienced] in specific places in Wales – places which mediate holiness…the key divine attribute is immanence, and the role of place is as mediator or sacrament of the divine'. For Llywelyn, ideas of land, religion and nationalist sentiments are inextricably linked, and Strata Florida perhaps embodies this kind of sacredness for many visitors, especially those who identify as Welsh.

For other writers, such as Jones (1954), in his work on holy wells, or Walsham (2011), sacred sites are 'specific sites in the environment perceived to be the dwelling places of the gods, or apertures through which human beings could gain access to them' (Walsham 2011:20). For pagans, wells, springs, bogs, mountain tops, notable rocks, or trees, caves, chasms, forests and groves were all likely arenas at which communication with numinous forces were considered possible (Bradley 2000:6, Hutton 1991:297), and we can imagine that this may have been the situation in the landscape around Strata Florida in the more distant past. The early 'Celtic' church may have colonised such *loca sacra,* partly through the mediation of the saints and

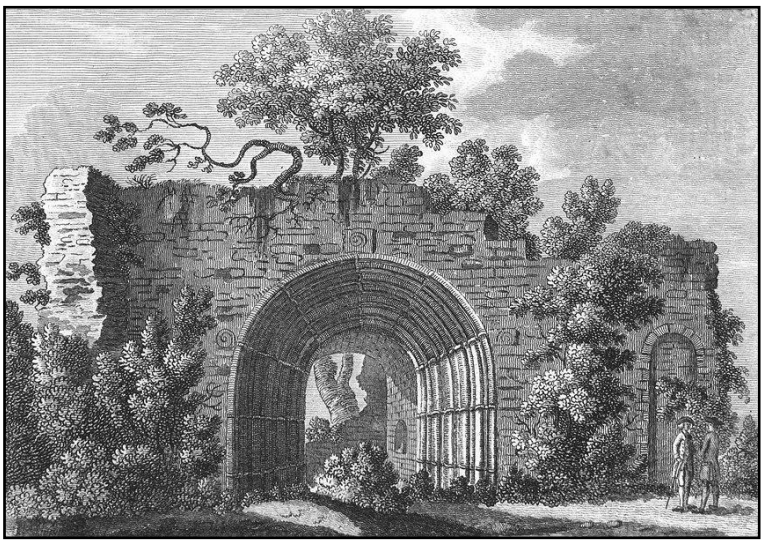


Figure 5. Engraving by an unknown 18th century artist in romantic style of the west door of the Strata Florida Abbey church.

enclosed them (Bowen 1969:51, Jones 1992:vii), although some (e.g. Aquae Sulis at Bath) had previously already been assimilated into Roman belief systems, adding another layer to the spiritual palimpsest (Walsham 2011:21).

The trope of ruined abbeys in romantic landscapes is familiar in both art and literature (Lord 2000, Moore 2005), and as such a ruin, since the dissolution, Strata Florida has acquired a particular local narrative of sacredness, iconographically expressed from the 18th century onwards by depictions of the west door. This most recent narrative involves not just numinosity, but a complex of ideas and emotions involving nationalism and *hiraeth*, as described by Llywelyn, enhanced by the grave of poet Daffydd ap Gwilym under a spreading yew tree in the adjacent churchyard (Austin 2013(a):4).

The tree itself is the stuff of legend, with a certificate in St Mary's church declaring it to be several hundred years older than the abbey ruins, although this cannot be scientifically verified (Bale 2010, pers comm).

For the Cistercians, the site of their abbey, and especially the abbey church, would have been their central *locra sacra,* a venerated and consecrated structure in which to worship and experience the divine. The preference of the Cistercians for settling in the 'waste' places is often quoted (Robinson 2007), and while it is true that the wider lands granted to the monks by Rhys ap Gruffyd do include huge tracts of now wild mountain land, the valley containing the abbey itself is not remote. It seems likely, especially in the wake of this research, that the abbey was deliberately located to take advantage of a convenient, accessible, central site, set within a larger landscape which already had spiritual and political importance long before the coming of the Cistercians. David Austin has already suggested that this may have been the case (Austin 2013(a):12).

In support of this Austin quotes the presence of the apparently earlier well, architecturally reminiscent of many 'holy' wells in other parts of Wales (Jones 1992:2), and the fact that aerial photography shows that the abbey church appears to have been built over a pre-existing burial ground, or Llan, with an

anomalous section of bank still visible in the modern St Mary's parish churchyard.

The gradual substitution of Christian churches for sites previously revered by local people with pagan beliefs is well attested and at Strata Florida, there are indications within the landscape that the hypothesised pre-conquest Christian settlement could have replaced an even earlier shrine of some kind. The well which was enclosed by the nave is fed by a powerful spring rising at the foot of the hill behind the abbey ruins and the site lies at the confluence of two rivers, one of them, the Teifi, being one of the longest rivers in Wales and a major landmark with political and cultural significance extending to the present day. The headwaters of the other, its tributary, the Glasffrwd appears to be marked by a monument complex dating back at least to the Bronze Age.

The abbey ruins are close to a sizeable Iron Age hillfort, Pen-y-Bannau, above the valley to the north, and it seems likely that other associated earthworks once existed on the lower slopes or the valley floor (Driver 2013), which in turn attracted burial during the Early Medieval. There is evidence from other sites in Ceredigion of early Christian burial taking place within Iron Age earthworks as at Crugiau Cemaes and Gaer, Bayvil both near Cardigan (James 1988 and Murphy, forthcoming).

Bronze Age mounds have also been re-used for burial by early Christians, as at Kilpaison Burrows, Pembrokeshire (Fox 1933) and Merthyr Mawr, Glamorgan (Ward 1918). Early Medieval, Christian burials at Tandderwen, Clwyd (Brassil et al 1991), and Crugiau Cemaes, Cardigan are located close by still visible Bronze Age mounds.

Bradley (2005:118) points out that during prehistory, the re-use of earlier 'ritual' monuments, sometimes for what we would now regard as secular activity, such as metalworking, is common, as is the apparent replacement of a habitation by a 'ritual' structure. So it need not be that earlier secular monuments, such as Iron Age settlements, were necessarily regarded as still extant sacred places in the landscape, per se (Bradley 2000, 2005) but simply revered as 'marked', ancient and therefore powerful. He hypothesises that

archaeologists create an artificial distinction, due to our cultural inheritance, between secular and sacred which may not have existed to the same extent for prehistoric people (Bradley 2005:120).

Figure 6. Aerial photograph of Strata Florida Abbey church ruins. The abbey church appears to impinge on the burial ground, in which a small section of curving bank can just be made out on the right hand side of the picture.© RCAHMW

This may partly explain why, especially with regard to Iron Age sites, it is hard to distinguish 'sacred' sites in terms of deliberately constructed 'ritual' monuments from presumed domestic or defensive enclosures. Additionally, discoveries of bog bodies, and structured deliberate depositions of material culture in watery places dating from the Iron Age suggest ritual activity took place within the natural environment and wider landscape, leaving little trace (Bradley 2005, Glob 1969).

With reference to this apparent veneration of bogs during the first millennium BC, it may be significant that Strata Florida Abbey is located only a few miles upstream of Cors Caron, an extensive bog, from which according to an antiquarian report a bog body was recovered during peat cutting to the southeast of Ystrad Meurig in the nineteenth century (Briggs 1994:150). It is also close to the marshy headwaters of a major river system.

In terms of the wider abbey landscape, and even greater time depth, the upland surrounding the abbey in its valley are dotted with Bronze Age cairns and

mounds, with an especially dense concentration at the head of the Glasffrwd, which, before canalisation, flowed across the valley past the site of the abbey.

Prehistoric cairns and mounds placed on hilltops and near springs appear to be sited in liminal locations where, for instance, it could be conceived that the earth met the sky, or where water flowed from within the earth (Bradley 2000:13). As well as marking such significant 'sacred' locations, they seem to be placed alongside ancient route ways, or boundaries, possibly pre-dating the Bronze Age. These routes may have been not simply about trade, but also involved elements of pilgrimage (Bradley 2000:6, Harding 2006:46). Similar mounds excavated elsewhere have produced few burials, clearly representing only a small section of the population, who may not have been an elite as is commonly supposed, but a form of ritual deposit (Green 2013, Bradley 2005:170-2, Briggs 1994:146, Lynch 1993:152-4), further sacralising elements of the natural landscape.

So, to sum up, there are signs within the location of the abbey itself and its wider landscape setting, a place well endowed with landforms such as mountains, rivers, springs and forests, which suggest that it may have been regarded as especially numinous for several thousand years. Hypothetically people then celebrated this with monument building from at least the Early Bronze Age. I hope to show that the different monuments created here through time relate to elements of the local skyscape, as well as landscape, demonstrating that the various constructions were arranged at least partly to showcase certain celestial events and significant directions.

METHODOLOGY

The entire project has been carried out using a loosely applied Grounded Theory methodology. This is a way of working which was developed in the 1960's as a way of formalising qualitative research (Brady, pers. comm ,Glaser & Strauss 1967). In Grounded Theory, rather than a top down, conventionally 'scientific' approach, which begins with a formal hypothesis, devises research strategies to test it, and then sets out the results, the hypothesis is arrived at by a more grassroots approach.

A broad hypothesis or idea forms the starting point, which is accepted as implicitly influenced by and dependent upon the researcher's beliefs, interests and general psychological make-up. In this case, the author has a belief (based on previous experience) that there has been, historically, a human interest in cyclic celestial events which could be observed in conjunction with the local landscape. She further believes that this was so throughout different periods of history and prehistory, and that these interests, possibly amounted to veneration and influenced the design and location of human constructs.

Data is collected, for this research by repeated field work consisting of site visits at different times of the day and throughout the year. Observations and measurements are made, as well as pictures taken and ambiences felt. Saturation is achieved, data is sorted and as patterns emerge, reading is done to gain a greater understanding.

The theory then *emerges* – the theory is seen as implicit in the data – it merely requires recognition. The writing stage is reached. The author is indebted to Bernadette Brady (pers comm.) for sharing her knowledge of the technique, which she teaches.

In the case of this dissertation, the only landscape which can be studied by this method is the one which currently exists. It contains topography which is relatively unchanging, vegetation which has changed over the last 10,000 years, and continues to do so, and humanly created structures which are all to some extent degraded compared to their original form. The skyscape, as well as being available for observation, can additionally be computer generated to see it as it

was at any point previously, and although our view of the stars has changed somewhat the sun and moon are still occupying substantially the same space as they have for millennia.

The author accepts that the results of her body-based observations regarding the landscape may not be the same as those gleaned by people living around Strata Florida in historical or prehistorical times, both because land-use and vegetation will have changed, as well as monuments degrading, and also because of cultural differences between ancient and modern people which might affect perception. The results will therefore inevitably be somewhat personal.

Technical methodology

All measurements of azimuths and horizon altitudes were made in the field using a Suunto combined compass and clinometer, corrected for the current magnetic variance of 2.54◦ west.

In the case of the nave of the abbey church, a linear structure with surviving walls, bearings along the walls of the nave, and along the centre, were taken in both directions, east to west, and west to east, and the same result was gained. The precise point on the eastern horizon which lined up with the central axis of the nave was determined by placing two ranging poles centrally at measured distances from the inner walls, standing to the west end and moving from side to side until the illusion of a single rod was seen. The point where this cut the sloping eastern horizon was noted, and measured with the clinometer. This method allowed for an accurate measurement of the axis of the nave to be obtained.

In the case of an elevated local horizon, as here, the altitude angle alters according to how close or how far the observer is from the landform (in this case a nearby hill), which is creating it. For the purposes of this research, the initial altitude angle was obtained from a point roughly one third of the way along the nave from the west end. The angle was not measurably different from the east end of the nave, so for the purposes of this investigation, I intend to assume that the same altitude angle holds good for the entire length of the nave and chancel.

Glasffrwd monument complex

In this case, the author made observations of azimuth and horizon altitudes from both the upper and lower cairns near the headwaters of the Glasffrwd. Horizon altitude at the various different monuments varied between around +10 ◦ at the lowest cairns and a negative value which was harder to calculate, but a field observation of the setting sun at summer solstice showed it to be around -4◦. The lower cairns enjoy a bowl like location with a raised local horizon, especially toward the north and east. At each cairn bearings were taken and horizon altitude measured, especially to the NE, SE, SW, N and NW. No attempt was made to calculate precise declinations, as both the backsights (mounds of stones) and foresights (distant rounded hills or closer undulating horizons with areas of forestry), were somewhat imprecise. The field work was based on a loose Grounded Theory methodology, as taught by Brady (pers comm.).

The Iron Age enclosures

Essentially the same method was used as for the cairns, because the banks of the monument are set on a high promontory, horizons tend to be relatively distant all round and level with the site or below it. There are in all cases clearly marked entrances, visible as a dip/gap through the ramparts, and the original intention was to measure the orientation of these in the same way as the axis of the abbey church, using ranging rods. However, because of the lack of linear features, such as walls, to align the rods with, it proved impractical, and a general bearing was taken from inside out through the middle of the gap instead. Consequently, the azimuths given for the hillfort entrances are general rather than precise.

Here too there was additionally a Grounded Theory element involving sitting inside the structures and on the banks and studying the surrounding landscape, which led to certain patterns becoming apparent.

Post field analysis.

All astronomical details which required it were analysed using Chris Marriott's SkyMap software. The linearity of the abbey church and the known date of construction made it possible to calculate a precise position and conjunction of

sun and moon. For the cairns, and the hill-top enclosures, bearings have been taken to distant or sometimes, medium distance, foresights on the horizon. The astronomy which would have been visible has been calculated using SkyMap set to 2000BC in the case of the Cairns, and 500BC for the enclosures, after the RCAHMW database which infers that these monuments would have been constructed at the earlier end of the potential Iron Age spectrum (Coflein).

RESULTS – ARCHAEOASTRONOMY OF THE ABBEY CHURCH, STRATA FLORIDA

Measurements taken with a compass along the central axis of the ruined nave of the abbey church, originally dedicated, like all Cistercian abbey churches, to Mary, the Mother of God, gave a clear bearing of 80◦ E when facing towards the altar/east end, and 260◦ W, when the direction was reversed, towards the west end/door. This reading was the same as that obtained by Ali & Cunich (2001:162), who used more sophisticated equipment.

The orientation of the church is therefore 80-260◦ and this is shown diagrammatically below.

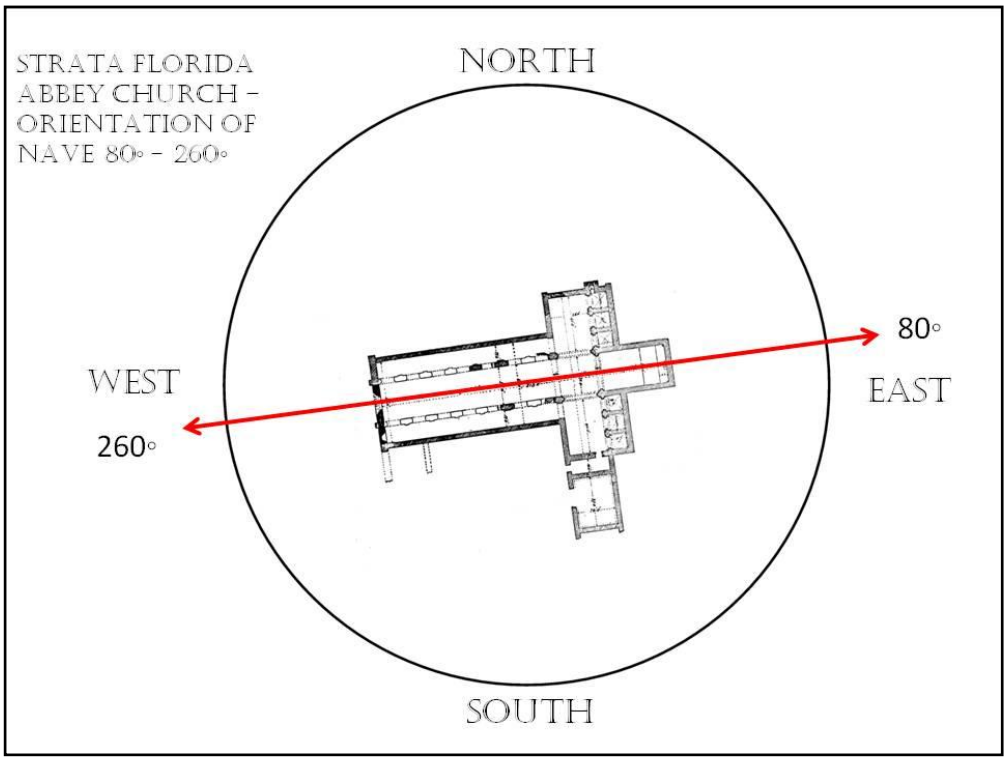


Figure 7. Diagram showing the orientation of the Abbey Church, Strata Florida

Ali and Cunich's hypothesis (2001:155) was that prestigious 12th century churches might have been laid out using a magnetic compass. If their naves had been aligned using a compass, then theoretically, given the Christian tradition of east-west orientation, they should show orientations of close to 90-270◦, i.e. east-west, deviating by a standard amount due to magnetic variation. They

studied 143 cathedrals and monastic churches established during the 11th and 12th centuries, and found that the majority had apparently inexplicable and differing variations in orientation to either side of due east-west. This led them to consider the alternative possibility of orientation to sunrise on the 'patronal' festival of the building, i.e, the saint's day of whatever saint the church was originally dedicated to.

A number of other researchers (Cave, Benson, McCluskey, Hoare and Ketel) have also studied the orientation of medieval churches in an attempt to determine whether this accounts for the deviation from due east-west which is so often observed. The poet William Wordsworth was an early adherent of the theory, and wrote a poem inspired by it (Ali & Cunich 2001:155). Not all these authors realised that the altitude of the local horizon was a crucial factor in determining the position of sunrise on a given day, or that the current (Gregorian) calendar does not exactly match the one (Julian) in use in the Middle Ages, so their conclusions have varied.

The author, however, being fully cognisant of the need to calculate both the horizon altitude, and the 'proleptic' day, next set about determining the local horizon altitude, using the clinometer part of the compass. The eastern horizon observed beyond the end of the chancel ruins is formed by a sloping hillside, as may be seen in Fig 8.

The clinometer gave a reading of 8◦ for the point directly above and in line with the centre of the end wall and altar footings.

Figure 8. The sloping horizon beyond the east end of the nave.

The nave, being a rectangle and longer than it is wide, potentially creates an alignment with two ends, so an altitude reading of the western horizon was also taken. This is more difficult as a modern hedge and a tree obscure the view, but an estimated 3◦ was arrived at following a certain amount of walking around. The valley opens out toward the west creating a much lower horizon.

The SkyMap programme was set for 1184, as documentary evidence (Knowles and Hadcock 1971) states that building work commenced on the church on Easter Day, 1184.

It transpired that 1184 was a lunar maxima year, which meant that 1165, being 19 years earlier, would also have been a lunar maxima year, and that was the date which the *Brut-y-Tywysogion* records for the establishment of the first phase of the monastery on the banks of the Fflur brook, 3km to the south. So hypothetically, certain lunar and solar phenomena occurring at the present site could have been observed in 1165, and if astronomy or celestial events were important in Cistercian cosmology, or to members of, or advisors to, the Welsh court or the masons responsible for the construction, then the decision to begin work on a particular date in 1184 may hypothetically have been influenced by the relative positions of the sun and moon which would have been predictable for anyone conversant with the metonic lunar cycle.

One of the features of the metonic cycle is that the moon will only rise at the same phase, in the same place, on the same day, once every 19 years, so a particular effect visible on a given date in 1165, would recur in 1184. Nevertheless, nothing in any of the existing literature suggested that churches were aligned with respect to the moon, sunrise being the event usually associated with the orientation of Christian structures, so sunrise seemed the obvious place to start.

To determine whether a church dedicated to Mary has a patronal sunrise orientation is complicated by the fact that there is no single feast day. The four major Marian feast days are February 2nd, March 25th, August 15th and September 8th. None of these dates would have supplied a sunrise at the correct

point on Strata Florida's high horizon, neither did April 1st or the 8th, two proleptic dates suggested by Ali and Cunich (2001:177). The proleptic day is the date, according to the Julian calendar, which would have been in use at the time of the church's construction.

The west end was checked for a sunset alignment on any of the above days, but again, there was no match. An inquiry as to what dates in 1184 did have sunrises or sunsets at the appropriate degrees returned the following. (A calculation is made automatically by the SkyMap software to allow for the difference in calendar date for a given declination of the sun between our current, Gregorian, calendar, and the Julian calendar used during the middle ages. Therefore the dates given below are corrected, and are the 'proleptic' days, as they would have been in 1184).

Sunrise at 8◦ altitude and 80◦ azimuth, at the east end of the nave, occurred on or around April 14th. This did not fit with any of the Marian feasts, or Easter 1184. However, sunset at 3◦ altitude and 260◦ azimuth lined up with the west end of the nave at the end of February, or very beginning of March, according to the Julian calendar of 1184. And March 1st is St David's Day.

Patronal sunset alignments were found by Ali & Cunich (2001:173-4) at about 20% of the churches they studied and also by Erlandson (1948:9) so it would seem that if we follow them and consider the possibility of a sunset orientation dedication then the abbey church at Strata Florida appears to have a secret 'back door' dedication to St David, built in to the fabric, whilst being officially dedicated to Mary.

To return to the issue of 1184, the year building started, being a lunar maxima year; SkyMap shows that on Feb 27th, two days before St Davids day, 1184, the full moon rose from behind the horizon to the east of the church at an azimuth of 80 degrees, shortly after the sun set on the other side of the sky at 260 degrees. On the previous evening, 26th February, the moon would have visible, apparently full, just above the eastern horizon at sunset, and again at 80 degrees of azimuth.

In other words, it was potentially this combination of simultaneous moonrise and sunset, almost on the eve of St Davids day, in the year of the lunar maximum, which, taking into consideration the local horizons, created an axis of 80-260 degrees, and it was on this axis that the nave of the church was laid out. Although the full moon would rise roughly in the east within 4 weeks of the equinox every spring, it would not line up so neatly with the St David's day sunset until another 19 years had passed. For this to happen in the year building commenced by luck seems less likely than that someone involved in the planning was aware of celestial events and kept track of the cycles of sun and moon.

The sunset on St David's day, however, would happen every year, and the low sun would shine in through the iconic still surviving arch of the west door, and illuminate the altar and everything on it. This would happen for 4 or 5 days in total, but the best effect would have been seen on March 1st itself, as the sun lined up with the nave just before it set, sending a horizontal beam for several minutes along the axis created by the body of the church.

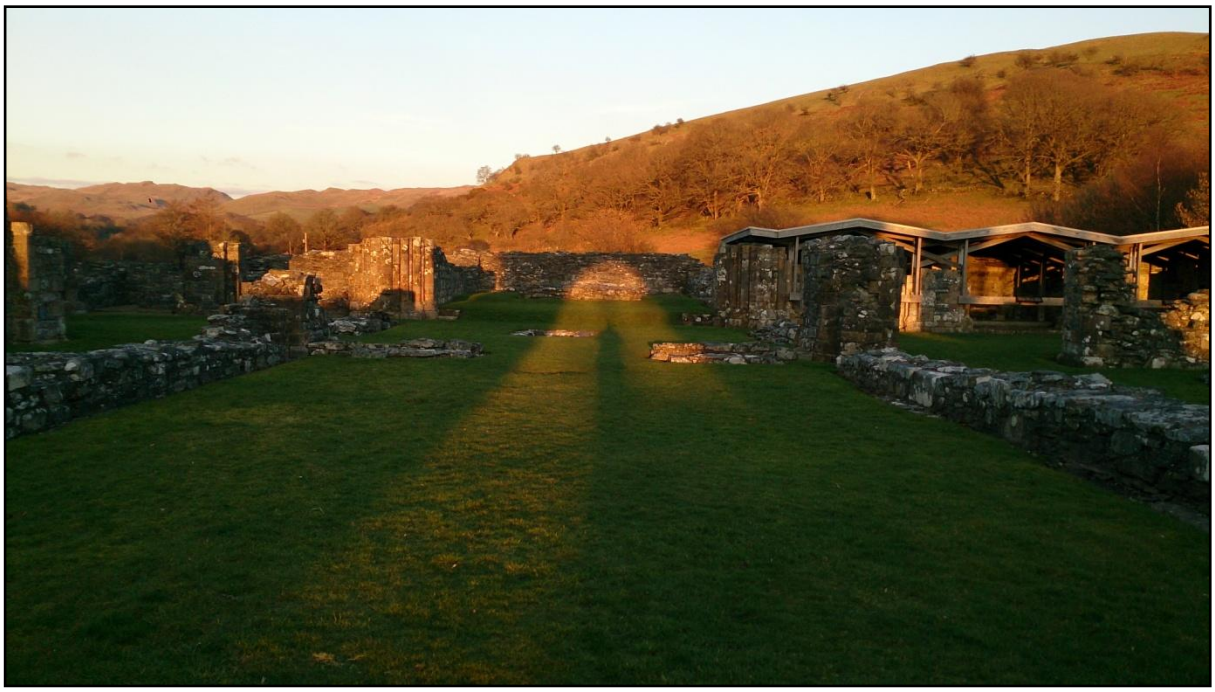


Figure 9. Illumination of the abbey church altar by the setting sun on March 10th 2014, showing the effect which would have been created on St David's day during the middle ages.

ASTRONOMY OF THE WELL WITHIN THE NAVE

The well appears to pre-date the ruined Abbey church which surrounds it. The evidence for this is that the rectangular well structure has a slightly different alignment to the surrounding walls of the nave. The long axis is oriented more nearly due east-west than the church, and it is set slightly to one side of the exact centre of the crossing point of nave and transepts, an asymmetry which contrasts noticeably with the careful symmetry of the surrounding Cistercian buildings.

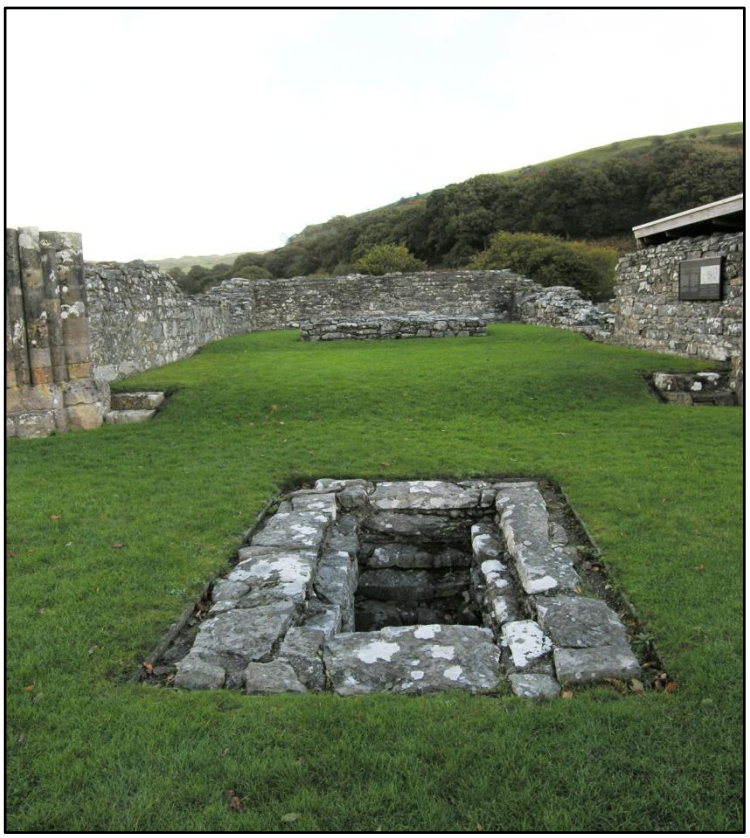


Figure10. It can be seen that the well structure is on a slightly different alignment from that of the surrounding building.

Although these architectural anomalies suggest that the well is of an earlier date than the Abbey church, as no excavation has taken place, it is impossible to say how much earlier. In Cornwall, similar to Wales in terms of exhibiting a plethora of saints and Holy wells, the earliest minor chapels associated with named saints, whose hagiographies describe visits to wells, springs and caves, date from the 9th century. It is possible that some could incorporate sites with

earlier, even pre-Christian sanctity, such as the Constantine well chapel, St Merryn (Todd 1987:293, cited in Turner 2003:184), but here also, there is a lack of archaeological evidence.

In Wales, Jones (1954:27) lists several small chapels enclosing wells with dedications to specifically Welsh saints. He makes a case for the structure at St Seiriol's Well, Penmon Priory, Anglesey being 6th century in origin, and likewise another similar well chapel at Llangybi in Caernarvonshire. A long derelict church at Llandilo Llwydiarth, near Maenchlochog in Pembrokeshire once had a Holy well close by, accompanied by two 'megaliths' with Latin and Ogham inscriptions, suggesting 5-6th century origins. Wells accompany churches at Llanllawer near Fishguard, where an cross-inscribed stone is set into the church wall, at Gumfreston near Tenby, and Cwm Tyddu near Newquay, Ceredigion, which revealed a standing stone built into the fabric of the church during renovations. All these, and many other examples across the west of Britain, serve to suggest a connection between wells, stones and sanctity at early Christian sites, some of which, additionally marked by prehistoric standing stones, may have been sacred springs before the coming of Christianity.

The rectangular form of the well at Strata Florida, aligned east-west as it is, suggests that it was at one time enclosed by, or immediately adjacent to, a cardinally aligned building or chapel of some kind, perhaps similar to the examples mentioned by Jones, above. At Llangybi in Caernarvonshire there are two stone built rectangular well chambers and an adjoining cottage, with the remains of an Iron Age defended enclosure on a hilltop above.

The same conjunction is seen at Strata Florida, where Pen-y-Bannau and Gilfach-y-Dwn Fawr Iron Age hill forts occupy hilltops near the well and burial ground. At St Seiriol's Well, Penmon Priory, Anglesey, Jones suggests that the structure enclosing the well represents the nave and chancel of a now disused chapel, with the adjoining foundations of an oval structure being regarded as the dwelling of the saint. (1954:25, 28).

Figure 11. St Seiriol's Well, Penmon Priory, Anglesey.

Although traditionally dating from the 6th century, modern sources (Edwards & Lane 1992:8) reveal that the building enclosing the well itself dates from the 18th century, and that an excavation of the forecourt area by Edwards (1986:26-27) did not reveal anything of ancient origin.

Fieldwork carried out by the author at St Seiriol's showed that the roughly square structure with stone benches adjoining the well is cardinally aligned, allowing the midday sun to shine along the path and directly into the well chamber. The west side of the forecourt/antechamber is built against a low limestone cliff, but the east side faces toward the mountainous country across Conwy Bay. The adjacent oval foundations traditionally considered to be the remains of St Seiriol's humble home are also built against the foot of the cliff. The door faces southeast, toward the direction of midwinter sunrise, over a horizon studded with mountain peaks.

As with the hypothesised well chapel at Strata Florida, precise orientations at St Seiriol's are difficult to obtain, especially given the ruinous nature of the older

structure. Perhaps the best that can be said is that the buildings both seem likely to have been cardinally aligned, something which is/was standard procedure for sacred Christian structures, including the early ditched square grave enclosures, as at Tandderwen (Brassil et al:1991).

It is interesting to note, however, that the surviving stonework structure surrounding the well at Strata Florida is oriented at its east end to a point on the hillside with an azimuth of 88 - 90◦ and an altitude of about 10◦ .
Hypothesising that this construction dates from around 800AD, this would correspond to a sunrise on or around 10th April, which, given that the spring equinox was 15 March at that point in history, (by the Julian calendar) is within the possible date range for Easter.

The west end would be aligned to sunset on the equinox, give or take the odd day.

Full moon rise roughly on the well's orientation would have occurred at some point in mid February and mid October during the 9th century. An exact 90 degree moonrise would have been rarer, once every 19 years.

It is unknown whether the hypothetical well chapel was dedicated to a particular saint, many churches were either not dedicated or were re-dedicated following the Norman conquest. The most influential saint in the Strata Florida area in the earlier middle ages was Padarn, who's chief feast day is now celebrated on April 16th. Although the sun broke the horizon a little too far north to exactly line up with the end of the well on 16th April, during the 9th century, if there was a window placed in a wall above then the rays of the rising sun on that day could have illuminated the interior through it in the same way that the setting sun did later through the west door of the abbey church.

Whatever the truth or otherwise of this, it is suggestive that the well is on a different orientation to the (presumed) later Abbey church. There must have been some reason for the 12th century builders of the abbey to change from a true east-west orientation to one which was 10 degrees 'off' and the author contends that the most likely reason was to accommodate an alignment with an

astronomical event, and presumably a different one to that which perhaps originally influenced the alignment of the well and its hypothetical chapel.

Discussion – possible reasons for the Abbey Church's alignment

If the hypothesis that the nave of the abbey church is astronomically aligned, on a relatively rare event, the combination of a full moon rising at the exact opposite side of the sky to the St David's Day sunset, is correct, what might be the significance of this ?

St David is the patron saint of Wales, and the diocese of St Davids extends over a wide area of west and south Wales.

In the earlier Middle Ages this area was divided into three, with only the western area, then known the cantref of Pebidiog, presided over by St David. A central strip, extending from the Dyfi to the Gower, was known as Seisyllwg. This was St Padarn's territory, administered from Llanbadarn Fawr on the edge of Aberystwyth. Seisyllwg ceased to exist in 904 AD when the Welsh prince Hywel Dda became overall ruler of Seisyllwg and annexed Pebidiog, creating the new larger kingdom of Deheubarth. It seems that in time, on the ecclesiastical level, St Padarn was ousted by St David, and the boundary of the diocese of St Davids even in modern times is roughly equivalent to that of medieval Deheubarth.

Most of what is known of St David is from his 'life', written in the 1090's, allegedly based on documents found in the cathedral archives. This is unlikely to be a strictly factual account – it was written 500 years after David died and one of author Rhygyfarch's aims was to establish independence for the Welsh church, which sought a metropolitan status equal to that of Canterbury. Even so, St David does seems to have been a 'saint' in the Celtic tradition, he appears to have been a real historical person, who was a Welshman born and bred, who lived or was at least active, in the second half of the sixth century, and who

founded a monastery near the far western tip of Pembrokeshire, traditionally on the site now occupied by St Davids cathedral.

David was allegedly both an abbot and a bishop, standard practice in the 'Celtic' church (Davies 1992), even, according to Rhygyfarch, an archbishop. This potentially conferred a lot of prestige on the See of St Davids and its metropolitan status as an archbishopric was later supported by Bernard, Bishop of St Davids, Geoffrey of Monmouth and Geraldus Cambrensis.

Bernard, a Norman bishop installed after the conquest seems to have 'gone native' and took up St David's cause and it is thanks to him that David was officially recognised at the Vatican in 1120. It was only at this point that the 1st March, traditionally the day of David's death, became a holy day.

Despite all this 11th and 12th century religio-political manoeuvring, David's status as a spiritual figurehead for Wales even before the Norman conquest, and before his official canonisation, is shown by the existence of a poem, Armes Prydein Fawr, written around 930, which foretold how, in the future, even though all might seem lost, the Welsh people would unite behind the standard of David to defeat the Anglo Saxons ; so we can see that St David was already a figurehead associated with Welsh Independence even at that time.

These sentiments must have been just as strong during Rhys ap Gruffydd's time, although by then it was the Anglo-Normans who were the threat to Welsh Independence.

In the late 12th century, at the time Strata Florida was built, Geraldus Cambrensis was campaigning for a Welsh archbishop at St Davids, (preferably himself) and for independence for the Welsh church from Canterbury. He was actively engaged in promoting St Davids as a major ecclesiastical centre.

At the same time, Rhys ap Gruffydd, patron of Strata Florida and seemingly with a special fondness for the abbey, had been engaged in a major struggle to free the kingdom of Deheubarth from Anglo-Norman secular control, and unite Wales as a single, independent nation.

It seems entirely possible that Rhys would want this great church which he was sponsoring at Strata Florida to be dedicated to the patron saint of Wales, whose image over the centuries seems to have become synonymous with Welsh independence, and whose elevation to official sainthood, with his own feast day, was still relatively recent.

In some ways in the late 12th century Rhys ap Gruffydd and St David represented the secular and ecclesiastical sides of the same nationalist coin, and Rhys was buried in St Davids, rather than Strata Florida, where many of his family are interred.

However, because the abbey was a Cistercian foundation, with a standard dedication to Mary, it would theoretically be possible that the east end was reserved for her, while the west end, with its iconic door, facing in any case roughly in the direction of St Davids, was aligned to St David's day sunset.

Mary and the Moon.

The suggestion that the east end of a Christian church was oriented toward a moonrise may be regarded as controversial, additionally, because the movements of the moon are so variable, unless the start date of building works at a particular site is precisely known it would be hard to demonstrate that this was unequivocally the case. At Strata Florida, however, we know that work on the church was begun in 1184, supposedly at Easter. Astronomically, in terms of the buildings orientation, that date seems to be incorrect. But, the combination of the pre-equinox full moon and the position of the setting sun around St Davids Day in 1184 did create an alignment which, co-incidentally or not, was substantially the same as the orientation of the long axis of the abbey church. The full moon of the following month, which would have been the true 'paschal' moon on which the date of Easter is traditionally, and was even in the 12th century, based, also occurred almost 180 degrees from the sunset, but a building whose orientation was based on this would have been aligned at 100 – 280 degrees.

Strata Florida's sister house, Abbey Cwmhir, on the far side of the Cambrian mountains also has its nave oriented to 80-260 degrees, which suggests there was some common factor operating. Here the exact year of commencing construction is unknown so moon positions cannot be precisely calculated, but 80 degrees could represent a February full moon-rise.

This is speculative, but there are many allusions to the Virgin Mary having analogies with the moon, particularly in art, and some evidence that certain Marian shrines, especially at Guadalupe in Mexico, were placed on the sites of already venerated sacred places with lunar connections. In the case of Guadalupe, where icons of the virgin always include lunar imagery, there had been a long standing tradition of worshipping a previous, pre-hispanic deity known as Tonantzin, 'Our Lady Mother' who was closely associated with the moon. It took a long time to persuade the local population to make the switch, and stop hedging their bets by praying to both (Wolf 1959:35).

Numerous explanations have been devised by Christian writers to accommodate the links in the popular imagination, which have existed throughout history, between Mary and the moon into standard church doctrine. This often involves quoting the famous passage from Revelation. "*And a great sign appeared in heaven: A woman clothed with the sun, and the moon under her feet, and on her head a crown of twelve stars"*. Revelation 12:1

Even recently a blog by a catholic priest attempted to provide a reason for the connection (Father Ray 2012). He explained that Mary 'reflected' the light of Christ. In the middle ages the true astronomical relationship between sun and moon was not known, but medieval writers surmised that the moon absorbed the light of the sun, and 'mediated' it, as Mary mediated between Christ and humanity. During the 12th century, the cult of Mary was very popular and Bernard of Clairvaux, the founder of the Cistercian order, was recorded as having been especially devoted to Mary and in his writings several times addressed her ' O Mother of Mercy, the Moon' (Gambero 2000:141), also referring to her as a 'star' her name – Mary apparently meant 'star of the sea' – "If the winds of temptations surge, if you run aground on the shoals of troubles,

look to this star, call upon Mary" (ibid,140). Astronomical allusions involving both Christ and Mary abound in his writings.

It may be speculative, but perhaps as well as being dedicated to Mary, in the light of the founders devotion to her and even calling on her as 'Moon', maybe the east ends of Cistercian abbey churches were commonly aligned on a particular full moon rise ? It would be interesting to do more work on this. February begins with the ancient pagan early spring festival of 'Bride', the young, virgin aspect of the Goddess, which has been translated into the Christian calendar of festivals as Candlemass (Hutton 1991). The 2nd February also remains one of the four celebrated Marian festivals, 'the Purification of the Virgin' while the month of February is named after the Etruscan god Februus, god of the underworld and also a god of purification. Perhaps there may be hints here of why a February full moon might be preferred?

IRON AGE ARCHAEOASTRONOMY IN THE STRATA FLORIDA LANDSCAPE

Figure 12. Pen-y-Bannau hillfort viewed from the Northeast, showing the still impressive ramparts.

Strata Florida Abbey was built close to two Iron Age hill top enclosures, Pen-y-Bannau and Gilfach-y-Dwn Fawr, which stand on high ground to either side of the Abbey road as it leaves Pontrhydfendigaid. Both overlook this west end of the valley. These earthworks form part of a group of six similar monuments which cluster around the Tregaron bog, Cors Caron, which lies along the course of the River Teifi, downstream of Pontrhydfendigaid (see Figure 3, page 12).

Pen-y-Bannau (SN 74188 66899) is constructed around the end of an elevated spur approximately 1 km to the north of the abbey ruins. The highest point inside the enclosure is recorded as 352 m. The entrance faces northeast towards a gently rising slope, which leads in turn to the high ground of the Cambrian massif, some 4km distant. A traveller approaching the structure from this direction receives the impression of a massive, multivallate 'fort' with still steeply sloping ramparts (Fig.8). The area behind the earthworks is less strongly fortified, being in any case surrounded by precipitous slopes, especially on the north side. The interior is divided into two by a rocky outcrop. The eastern end

shows the remains of a stone perimeter wall, while the western end has a low bank which may have been the support for a palisade. Remains of hut platforms can be seen around the perimeter of the interior (Driver 2005:578).

Although no excavation has taken place, it is assumed that the structure dates from the Iron Age, somewhere between 800 BC and 100 AD, based on its similarity to other similar earthworks with known dates elsewhere in the region, such as at Pen Dinas, Aberystwyth (Brown & Driver 2001).

Pen-y-Bannau is close to Strata Florida but not readily intervisible with it, another, slightly lower hill, Banc Gwyn, blocks the view of the Abbey from most of the enclosure.

Gilfach-y-Dwn Fawr (SN 73436 64612), is situated to the southwest of the Abbey, overlooking the valley of the Fflur Brook, as well as much of the upper Teifi/Glasffrwd valley, and Cors Caron. Below the south west facing entrance and ramparts lies Old Abbey Farm, Pontrhydfendigaid, traditionally considered to be the initial site of Strata Florida abbey before the Welsh victory over the Normans. The summit reaches 290m, at the southwest tip of an elongated rocky spur. Driver (2005:589) notes that the earthwork/terrace which stretches along the less steep, north side of the hilltop curves around the northeast corner, possibly indicating the presence of a second (opposing) gateway in the northeast. A site visit by the author found a small entrance at the northeast corner, above the substantial terrace, overlooking a lower, level area bounded by a low bank. This 'castle green' was in turn accessed by a path, in some places worn into a rudimentary hollow way, running up through the woods from the direction of the Abbey ruins.

The wider Iron Age landscape

There are currently six, broadly similar, hill top enclosures situated on elevated ground around Cors Caron. These comprise Pen-y-Bannau, and Gilfch-y-Dwn Fawr, discussed above, plus Pen-y-Ffrwyd Llwyd, above Ystrad Meurig, (SN 70923 68778) which can be seen silhouetted on the horizon from Strata Florida; Castell, (SN 65403 63209) on the eastern edge of Tregaron, and Castell Flemish

(SN 65413 63198), located on the southwest side of the bog, near Tyncelyn. An outlier is Castell Rhyfel (SN7320 5987), located on a hilltop overlooking the headwaters of the Nant Groes Fawr, a tributary of the Afon Brennig which flows through Tregaron before joining the Teifi. It is included among the Caron group because although the enclosure is almost 7km distant from it, the bog is still visible from the 503m summit, and because phenomenologically its site and construction is similar to that of the others. The ramparts at Rhyfel are low, and in places barely visible, but enough remains to show that this enclosure also originally had its entrance in the northeast.

Figure 13. Pen-y-Ffrwyd Llwyd, one of the six hill top enclosures referred to in the text. The northeast facing front entrance cutting through the ramparts, can be seen in the lower centre. Another feature, common to all of the Caron forts is a level area outside the entrance and the remains of a smaller 'back door' with track approaching, diametrically opposite. ©RCAHMW.

Of these six, the only one without a broadly northeast facing entrance is Gilfach-y-Dwn Fawr, where the ramparts face southwest. Driver considers that the whole group share similar structural elements (2005:578), especially large, complex, multiple ramparts surrounding the entrance, sites selected to take advantage of the difficult access created by the natural topography, such as cliffs

and steep slopes, and stone revetting to strengthen the faces of the banks, including in some cases large quantities of white quartz (ibid 559).

Driver suggests that the architecture and siting of the Caron fort's entrances relate to the presence of long distance, overland route ways passing in a generally east-west direction, from the coast across the mountains toward England, and more especially, in the opposite direction (2005:15). He hypothesises, that, for instance, the impressive facade of Pen-y-Bannau faces toward a road which passes along the nearby ridge, and was intended to create a display of power and prestige to awe approaching travellers (2005:578).

Likewise, Pen-y-Ffrwyd Llwyd and Castell Flemish are positioned close to, and above, still extant roads and their architecture may have been be designed to impress passing travellers. Castell Rhyfel overlooks an untarred, but still visible ancient road joining Tregaron with the Abergwesyn pass, as does Castell at the Tregaron end where this same valley route meets the north-south road. Gilfach-y-Dwn Fawr is situated above another now very minor road which turns into a bridleway, joining the main north-south road near Pontrhydfendigaid with the Abergwesyn road.

Astronomy of the Caron hill top enclosures

Pen-y-Bannau, occupying an elevated position as it does, enjoys an unobscured distant horizon for almost 360 degrees, with panoramic views. Visibility extends to Snowdonia in the North, across Cors Caron and down the Teifi valley to the southwest, to the sea in the west, and towards the slightly higher land of the Cambrian Mountains to the east. Apart from the rising ground to the northeast of the enclosure, the horizon offers little in the way of notable foresights which could offer a conjunction with celestial events, and the nearer northeast horizon only has an altitude of one or two degrees.

There are no visible structures remaining within to allow study of their orientation, and the entrance, a 2m wide, weathered gap in the uppermost earthen rampart, faces somewhere between 42 and 50 degrees. This is broadly

compatible with mid-summer solstice sunrise, at 48 degrees, and probably not far enough north to be aligned upon the most northerly moonrise, which occurs at roughly 38/39◦.

This is, astronomically speaking, vague, but the overall skyscape as seen from the hilltop is magnificently expansive – ideal for star gazing, and providing an excellent view of all solar and lunar phenomena.

It is true that the position of Pen-y-Bannau on a promontory, where the easiest and most level approach is from the northeast, does make a northeast facing entrance and facade logical, but observation shows that there are other hills in the immediate locality which could have been enclosed, providing the possibility of an alternative entrance direction. There is also a small secondary entrance at the southwest end, accessed by a steep track.

Pen-y-Ffrwyd Llwyd (Driver 2005:576) (see Figure 13) likewise has a northeast facing entrance: yet here the topography would easily allow for a southwest gate, and a farm track does lead in this direction, suggesting that the northeast end was chosen for reasons other than ease of access. The horizon is similar to that at Pen-y-Bannau, being level and distant, with views of Cors Caron, and a slightly elevated, nearer, east/northeast section, at the end of a level area of ground stretching away from the entrance facade.

Castell Flemish has a northeast facing entrance, and a second break in the bank to the southeast, although this may be more recent, an adaptation to the space restrictions created by widening of the modern road. The ramparts have been slightly truncated by the road cutting, but still appear to have been largest and most developed on the northeast facing quadrant. Again, there is a level horizon all round, with a slight rise to the north.

Castell, on the edge of Tregaron (ibid 575), has an entrance on the east /northeast – again, as at Pen-y-Bannau, a steep sided rocky promontory site has been chosen which makes entering from the other directions more difficult. It does allow for a level area to the northeast of the structure, and a slightly raised horizon on this side. Here, the ramparts / facade face away from the road, as

they also do at Castell Rhyfel, further up the same valley, which, like most of the others in this group, has a level, distant horizon, with a slightly higher, closer section to the east/northeast, at the end of a level area sloping gently upwards away from the entrance.

Of the 6 hill top enclosures in the vicinity of the bog, only Gilfach-y-Dwn Fawr has its main entrance and ramparts on the west side, yet even here there is a small entrance at the northeast corner, above a substantial terrace, overlooking a lower, level area bounded by a low bank.

Discussion of the Iron Age archaeoastronomy

In the context of a body of research, such as this, where the principal focus is on skyscapes, it would seem reasonable to hypothesise some cosmological significance in the predominance of broadly northeast facing facades and entrances among these six hill top enclosures, all with their axes aligned NE/SW. The work of several authors, (e.g. Hill 1995, Oswald 1997, Guilbert 1975, Wait,1985, and Parker Pearson 1996, 1999) on the orientation of Iron Age roundhouses, seems to show a tendency for doorways to face east. A smaller body of work on non-domestic Iron Age and late Bronze Age structures in Britain and Ireland has also shown an apparent preference for east facing entrances (Prendergast 2012, Jones 2010, Oswald 1997:92, Waddell 1998) among 'ritual' and 'defensive' structures.

Hill (1996), Pope (2007:214) and Ralston(2007:123) have noted a tendency for Iron Age hill top enclosures entrances in England to be on the east side, although Pope (2007:225) also found a number of alternative, but still apparently solar-derived directions (e.g. midsummer sunset), among such structures in north and central Britain.

Little work has been done on hill top enclosures in mid Wales, beyond that by Driver (2005), and his remarks on possible cosmological influences are as follows.

As regards the debate regarding the function of these structures, (generally, and here, referred to as 'hillforts') i.e., are they primarily defensive, or not, Driver finds 'increasing evidence to suggest that the entire fabric of the hillfort may have been initiated and shaped by a non-utilitarian symbolic agenda on occasions' (2005:467). citing Bowden and McOmish, 1989 (ibid 464) who suggested a primarily symbolic and ceremonial function, principally because so many hillfort interiors are visible and overlooked. He also quotes Parker Pearson and Richards (1999:38) who said 'the structuring of space incorporates cosmological and symbolic principles in many situations' (ibid 468), although not finding any strong tendency to eastern entrances among the entire body of north Ceredigion hillforts.

Driver does hypothesise that there may have been a 'correct path of movement' through some Ceredigion hillforts (2005: 470) – that the visitor must 'seek out' or 'discover' the gateway, this could be the case particularly where the ramparts hid the actual entrance, requiring the traveller to wend a circuitous path to reach the interior, and then perhaps leave by a second gate at the far end.

The literature relating to the apparent preference of Iron Age people for east facing entrances is largely based on excavation evidence from sites in southern England, such as Haddenham, Fengate, Stanstead, the Nene and Ouse valleys, and the upper Thames valley, with small amounts of data from northern England, especially the Arras culture area of Yorkshire, which do appear to show the same phenomena occurring there.

One of the first archaeologists to notice the standardisation of Iron Age roundhouse doorway orientations was Guilbert (1975), whose excavations at Moel-y-Gaer hillfort in northeast Wales, revealed a settlement where there appeared to have been an almost slavish adherence to the construction of southeasterly facing doorways during the earlier 7th century BC phase of the site, moving to nearer due east later (Oswald 1997:91).

Excavations at other sites in northwest Wales, however, did not show the same pattern, with the doorways of the houses seeming to show a greater regard for

inter-relationships between the buildings within the space, than a desire for an homogenous orientation (Oswald 1997:91).

Pope (2007:211-214) has provided a critique of the theories of eastern dominance in Iron Age doorway design, allegedly inspired by sun-worship, which reached its fullest flowering with two papers by Mike Parker Pearson (1996,1999). In a nutshell, Parker Pearson hypothesised that the predominance of east facing doorways, discovered by Oswald et al, demonstrated a strong concern with diurnal and annual solar cycles among British iron Age populations. This, in his view, informed by recent ethnographic parallels, led to a ritualistic use of the domestic space inside the roundhouse, with movement taking place in a sunwise direction, daytime activities being performed on the south side, and sleeping areas confined to the north. Pope presented a re-analysis of 690 circular structures from across the UK, with known door orientations, and came up with a diagram where, although the directions were more scattered, the majority of entrances were still on the east facing side. However, she preferred a functional explanation, such as a desire for the maximum light, combined with shelter from prevailing winds, in a time of increasingly stormy weather (2007:214), than a primarily ritual rationale.

A similar study of domestic architecture and doorway orientations on the continent found a majority of randomly aligned doorways (Ayan Vila 2008:28).

So to sum up, statistically it does seem that the Caron group of hill top enclosures are exhibiting an unusual conformity in terms of entrance orientation and overall phenomenology, something not widely reflected elsewhere in the region (Driver 2005:469). Five of the six have their main entrance facing northeast, in each case between 40 and 60 degrees, and the sixth, has a subsidiary entrance in that direction. These structures are set close to Trans Cambrian routes linking middle England with the coast, and it could be that we are seeing the result of cultural influences on design which have spread westwards from the areas studied by Oswald and Parker Pearson, and/or an Irish influence. Alternatively, since the strongly northeasterly, rather than east or southeast directionality of the facades does not seem to be reflected

elsewhere in the literature, they could represent a local tradition, possibly an archaic one (see Bronze Age section below).

Although without excavation there is little evidence on which to base a hypothesis of a primarily ceremonial function for these 'forts', the author is inclined to think that their ready road access, common orientation, lack of defences behind the facade, and level 'green' to the front of the ramparts/at the northeast end, seen in all cases except at Castell Flemish, where modern road widening has cut through this area, suggest meeting or gathering places as much as defensive structures. One English parallel could be Gussage All Saints which has large level forecourt for 'gatherings' outside the east facing entrance (Cunliffe 2005: 576).

The visible presence of the bog, encircled by these hill tops, may not be purely fortuitous, given the well known veneration of watery places during the Iron Age, with many records of apparently votive depositions, including apparent human sacrifices.

An appreciation of solar cycles and the direction of rising of all celestial bodies, the east, seems likely, notwithstanding Pope's critique of these theories. An awareness of lunar cycles during the Iron Age is also suggested by Cunliffe (2005:577) who notes that the ditch and bank at Danebury seemed to have been cleared, making it white again, about every 19 years, i.e. in sync with the metonic cycle of the moon. Likewise at Fiskerton, the causeway was renewed around every 18 years, (between 457 and 317 BC), seemingly to co-incide with lunar eclipses, some of which were not visible from the site (Pryor 2003:285). The causeway extended out to an island, and offerings were thrown from it – the excavator suggested that it represented a liminal space, and that it was its liminality which made it especially suited to ritual activity. At the Caron enclosures, their hilltop location could also be seen as liminal, between the upper, sky world and the everyday, as the causeway above the surface of the bog or fen might represent a liminal space between the everyday and the lower world.

This is purely speculative, but would make sense in terms of continuity since the Iron Age followed the Bronze Age, where incontestably ritual structures were commonly sited in liminal positions adjacent to roads and trackways.

THE SACRED LANDSCAPE OF STRATA FLORIDA IN THE BRONZE AGE

During the Bronze Age, the sacred landscape of Strata Florida appears to have had its principal focus around the valley and headwaters of the River Glasffrwd. The evidence for this remains in the form of many cairns clustered in the bowl-shaped cwm on the edge of the Cambrian plateau, where the various Glasffrwd springs rise, as well as on the higher ground representing the watershed between the sources of the Glasffrwd and the Teifi.

An enlarged section of Figure 4, showing the location of the cairn cluster at the head of the Glasffrwd, and on the watershed between the Glasffrwd and the source of the Teifi.© OS 1:250,000 series. Edina Digimap.

The wide flat lower valley which later became the site of the Cistercian Abbey is traversed by the Teifi, which now runs along its northern side, as well as the Glasffrwd. The Glasffrwd is a tributary of the Teifi, canalised to flow along the southern side, and currently the two join near the western end of the valley, on the edge of Pontryhdfendigaid. In pre-Cistercian times, according to geophysical

surveys carried out by Jemma Bezant for UWTSD, the Glasffrwd flowed across the valley floor in a continuation of its natural trend, i.e. northwest, in a series of braided streams, before joining the Teifi.

To our modern eyes, the Teifi is the more significant river. Yet the Uplands Survey of the south Cambrians and the Myro valley (Hall & Sambrook 2012a and 2012b), found only a few prehistoric remains around the headwaters of the Teifi.

By comparison a survey carried out by the RCAHMW in 2005 recorded 14 cairns in and around the headwaters of the Glasffrwd (Coflein), and others discovered during field visits by the author in the summer of 2014 have increased this number to a total of at least 20.

Figure 14. The view from the top of the cwm, looking northwest across the valley of the Glasffrwd and the abbey precinct towards Pen-y-Ffrwyd Llwyd, and the sea beyond, with one of the Bronze Age cairns (e), visible as a pale area in the foreground.

As noted by Hall and Sambrook, the increasingly lush vegetation in the uplands of Ceredigion (due to reduced stocking levels) plus young trees recolonising areas of cleared forestry, make finding low mounds and stone features progressively more difficult (2013:3). Nevertheless, enough monuments remain visible to suggest that the area around the headwaters of the Glasffrwd did constitute a ritual landscape during the period when these cairns and cists were constructed. There are also enough visible to form hypotheses regarding the relationships of the various cairns to the local skyscape.

Dating evidence

No recorded excavation of any of these monuments has taken place, so we do not have any incontrovertible dating evidence. However it is reasonable to ascribe a Bronze Age date based on comparison with similar excavated sites elsewhere, such as at Brenig in north Wales (Lynch 1993), Talsarn in Ceredigion (Schlee, 2011 and forthcoming), Pant-y-Butler, Ceredigion (Murphy 2012). There are also similarities in terms of location with the cluster of Bronze Age barrows near to Rams Hill, at the head of a valley, on the north facing scarp of the Berkshire Downs (Bradley and Ellison 1975).

No clearly demonstrable Neolithic remains have been found in the Glasffrwd/Strata Florida area, although Hall & Sambrook (2013:23-24) record a possible Neolithic chambered cairn, Cerrig Clochesti, near Llandewi Brefi (NPRN529508/9), and RCAHMW recorded a linear, Neolithic style mound in the Glasffrwd cairn cluster in 2005 (NPRN403044). In July 2014 this feature could not be located – presumably it has become overgrown by the thick *juncus* thriving on the lower lying parts of the site.

The other similar monuments in Ceredigion recently investigated, and mentioned above, at Talsarn and Pant-y-Butler have shown Bronze Age re-use of sites previously occupied during the Neolithic. The range of Radiocarbon dates from the apparently typical Bronze Age round mounds at Pant-y-Butler near Cardigan included a Neolithic date of c 3400 – 3100 BC obtained from a charred hazelnut shell found in a pit below the first of two mounds excavated, whilst bone from the burials there dated to between 2300 and 1800 BC. At

Talsarn, cists containing cremated remains from beneath ploughed out cairns on a hilltop overlooking the Aeron valley produced both urns and a decorated pygmy cup belonging to the Food Vessel ceramic tradition, usually ascribed to the Early Bronze Age – c. 2300 – 1800 (Brindley 2007). The associated bone dated to between 2050 and 1740 BC. Yet here too a pit was found with material dating to 3600-3525 BC (Schlee 2011 and forthcoming).

It seems likely that, as at Pant-y-Butler and Talsarn, there would have been a Neolithic presence in the Blaen Glasffrwd area, and worked flints recovered during excavations by UWTSD at the abbey gatehouse support this. However there are no confirmed monuments remaining which would allow for a study of Neolithic archaeoastronomy in the Strata Florida landscape.

Based on evidence from elsewhere, as set out above, the cairns and cists which are visible around the head of the Glasffrwd will be assumed to date from the earlier Bronze Age, and for archaeoastronomy, a date of 2000 BC will be ascribed to them.

Bronze Age ritual practice

British and Irish Bronze Age religious belief is not well understood, although the physical remains, including vestiges of 'ritual' , left by these people are commonly found. Bradley (1998) has flagged up the change from broadly linear and rectilinear types of monuments and houses during the Neolithic to circular houses, settlements and monuments during the Bronze Age, a trend which continued into the Iron Age. This seems to have been accompanied by the construction of many roughly circular mounds and cairns, frequently though not exclusively in geographically elevated locations.

Depositional practices have been discussed by for instance Pryor (2003) and Bradley & Yates (2010). Deposits of metal especially but also ceramics and organic materials from watery contexts are well known and it has been suggested by these authors that the 'hoards' of metal objects found buried on dry land may have had a ritual significance as much as a practical one.

Stone circles, rows, single or paired standing stones and a variety of circular cairns and earthen barrows seem to have been the favoured monuments on dry land. There was presumably some rationale behind the location of such structures, and a phenomenological relationship with the surrounding landscape and skyscape seems, hypothetically at least, to be likely.

Lynch (1993:6) notes that the group of cairns and barrows she investigated at Brenig are clustered around the head of the Nant Fechan, a tributary of the Brenig which is itself a tributary of the Alwen, which ultimately feeds the Dee. The valley of the Brenig is described as broader and shallower than its neighbours and trending north-south. The surrounding upland is heath covered moorland, with areas of marsh. An ancient track way leads up the river valley to a pass above the headwaters.

The ritual complex at Ram's Hill on the chalk downland of southern England is similar – here an unusually early, Bronze Age embanked enclosure on the edge of the scarp overlooks a substantial group of barrows below, clustered round the spring-line at the head of the Lambourne River (Bradley & Ellison 1975:180). The Lambourne is a tributary of the Thames. Again there are track ways up this valley leading onto the higher downland.

Ram's Hill is broadly north facing, Brennig is south facing, and Blaen Glasffrwd is an open bowl, but with the most distant views to the north and west.

Hypothetically, it appears that in each case, the monument complexes are preferentially built close to where water issues from the ground, but also close to the sky, with a mixture of both distant and nearer horizons, creating a complex skyscape. Additionally, in each case, there are ancient route ways in the vicinity.

The purpose of these Bronze Age round mounds or cairns, which may contain slab built cists in upland Wales or simple pits in less rocky landscapes, is widely considered to be burial – and they are often loosely referred to as burial mounds (see for instance Briggs 1994:144, Ruggles 1999:139). This is unsurprising given that they usually contain at least one burial. At Brenig, however, Cairn 47

contained no burials, and in her discussion of it Lynch mentions a number of other contemporary sites in the UK where the same phenomenon of mounds without burials were discovered, for instance Silbury Hill.

Brenig 47 produced a RC date from the late Neolithic, from a charcoal spread under the mound, making it as much as 500 years earlier than the majority of the other monuments which seem to reference it. This particular mound also occupies a prominent site visually, it can be seen from the valley below outlined against the sky at the head of the pass, it is visible from high ground round about, which the rest of the Brenig monuments are not, and it enjoys excellent views in all directions – including to the distant peaks of Snowdonia, with a contrast between highland and lowland (1993:44-46). There are notable parallels here with the landscape settings and views from the different monuments and landforms at Blaen Glasffrwd.

Lynch notes with reference to the empty mounds that perhaps 'Bronze Age burials [were] only part of more complex and varied ceremonials, and may not [have been] the most important part of them', although 'we still cannot be much more precise about the role and nature of these rituals (1993:45)'. She also mentions that during the approximately 500 year life of the 'cemetery' at Brenig, comprising some ten mounds, no more than 21 interments were made(1993:152). Briggs likewise notes that in his estimation only 5-10% of Ceredigion's 'burial monuments' contain burials (1994:146). It may even be that the human remains found in mounds and cairns represent a form of ritual deposit, in the same way as a sword thrown into a lake, rather than a burial in the modern sense.

If the mounds were not constructed primarily to receive burials, then what were they for? The author's survey of the Blaen Glasffrwd cairns inclines her to hypothesise that they mark significant points with respect to views of the local land and skyscape. As Tilley suggests for Neolithic monuments, it seems possible that the Bronze Age inhabitants of Britain had a relationship with their landscape similar to that enjoyed by native Australians, where certain features were not only created by deities, but in some way continue to house them (Tilley 1994:44-50). As the research detailed below shows, the same combinations of

hills, islands and directions of significant celestial events occur repeatedly among the views from the various monuments.

Ruggles, in discussing the results of his North Mull project suggests that the Bronze Age cairns and rows he and his colleagues studied were placed to provide a certain kind of view – in which exact conjunctions of horizon, e.g., a mountain peak, with a particular sun or moon rise or set seemed less important than an overall vista which allowed for certain celestial events to be viewed occurring in proximity to locally prominent peaks. Additionally, with regard to the stone rows, especially, there seemed to be a desire to mark the point at which a distant peak appeared or disappeared from view, with the row marking the boundary between areas with visibility, and areas without (Ruggles 1999:123-4, Fisher et al, 1997).

Blaen Glasffrwd cairns – description, landscape setting and archaeoastronomy.

A distant perspective – the flat-topped hill. One possible solution to the question of why the Glasffrwd, rather than the Teifi, seems to have attracted the attention of the Bronze Age ritual landscape engineers may be found by approaching the abbey on foot. As the traveller walks east into the valley from Pontrhydfendigaid, a prominent flat topped hill on the horizon draws the eye, the land rises gradually towards it as the valley narrows, seeming to funnel walkers toward the upper reaches of the Glasffrwd. The Teifi, emerging from behind the bluff at the head of the valley, appears as the tributary.

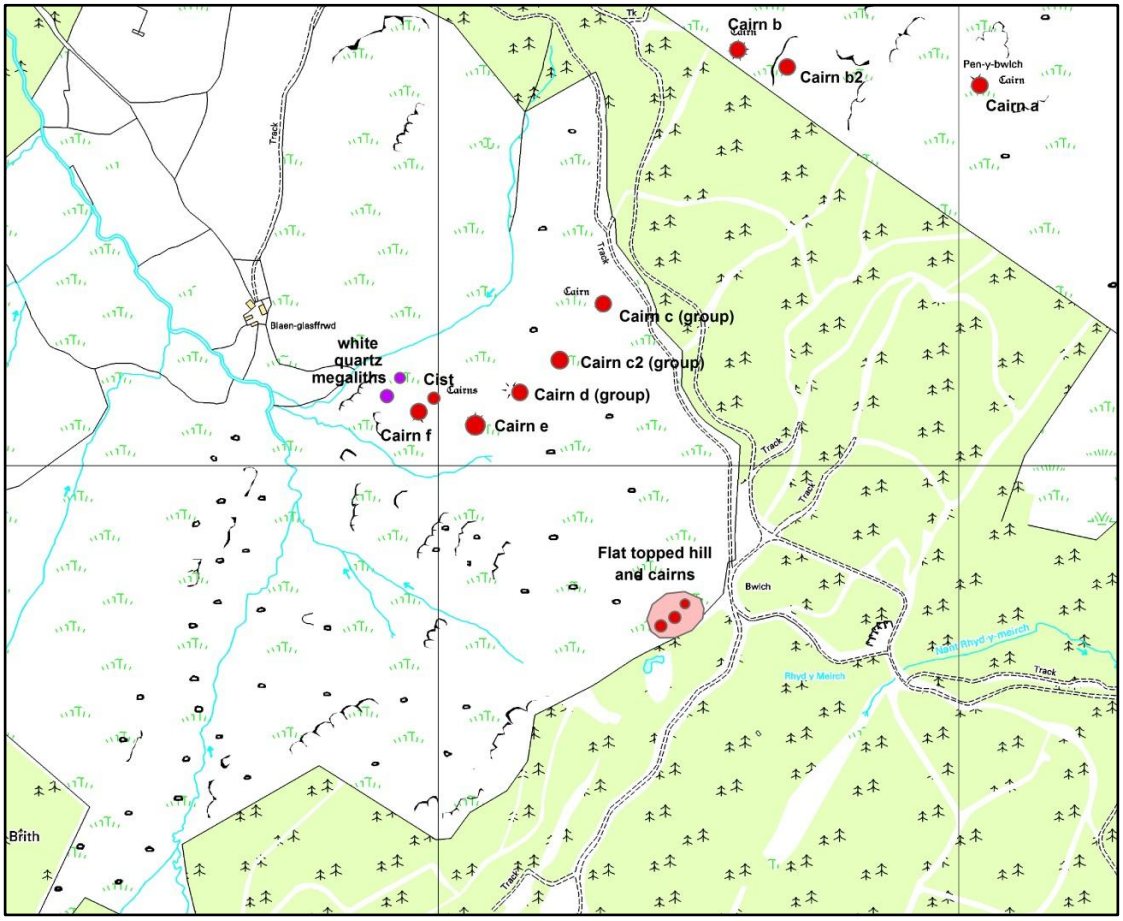
The flat topped hill overlooks the basin, below and to the northwest of it, in which the various springs which feed the Glasffrwd rise. There are the remains of three cairns still visible on its summit, and twelve or more around the headwaters below. Most but not all are intervisible with the flat-topped hill. There is also a named hilltop above the valley – Pen-y-Bwlch – indicating the presence of a pass through the Cambrian massif at this location. There is indeed a still extant ancient route way now followed by forestry roads which joins the larger Abergwesyn pass.

When viewed from the eastern end of the valley near Pontrhydfendigaid, below the steep slope and rounded summit of Pen-y-Bannau, the flat topped hill lies in the direction of winter solstice sunrise – 132◦. When the traveller reaches the summit, Bardsey Island, (only visible on very clear days) and Pen-y-Ffrwyd Llwyd, a hill top enclosure above Ystrad Meurig, lie in the general direction of summer solstice sunset. 312– 316◦. The hilltop has a fairly clear view all round, although a nearby hillock obscuring the distant horizon, to the NE, at 39◦ would co-incide with the most northerly moonrise.

Figure 15. View up the valley of the Glasffrwd. Photo taken from the bridge on the Abbey Road at the edge of Pontrhydfendigaid. The un-named flat topped hill at the centre of the horizon forms a visually striking feature as the traveller enters the valley.

Bardsey, an island off the end of the Llyn Peninsula, has signs of prehistoric activity, and subsequently became a centre of 'celtic' Christianity, and a place of pilgrimage, from as early as the 6th century.

The Cairns.



Above - locations of the cairns as described in the text. © OS 1:250,000 series. Edina Digimap

Glasffrwd Cairns: Analysis following fieldwork.

Cairns visited by the author have been identified a, b, b2, c, c2, d, e, and f, going from the highest to the lowest, plus 'flat-topped hill', with the remains of three cairns. Several of these – c, c2, and d, comprise groups of cairns close together. In these cases, as it is the location which is of interest rather than the precise monuments, they have been ascribed a single identifier, linked to one representative NPRN number.

The results of a field survey of the upper Glasffrwd by the RCAHMW in 2005 may be accessed via Coflein, which lists the monuments found on that occasion using a numbering system which runs from I to XII, as well as the NPRN system. The authors own field work located some cairns which the RCAHMW

survey seemed to have missed, while, conversely, being unable to find NPRN 403044.

Glasffrwd Cairn a SN 7803363736, 503m, marked by the OS as Pen-y-Bwlch. NPRN 303644.

This currently looks like a relatively modern 'walkers' cairn. It may have been constructed over a prehistoric monument, some stones can be seen protruding through turf around the base, and RCAHMW describe it as a denuded cairn, believed to be ancient. From here the view consists of a horizon fairly level for the full 360 degrees – at 503m, this summit is on a par with most of the Cambrian tops.

Figure 17. View to the north east, showing Cairn a in the foreground, with Crug Gynon, set on a flat-topped hill above the headwaters of the Teifi, breaking the horizon.

Another sizeable cairn is visible on a flat-topped hill to ENE at 80◦, identified by the OS as Crug Gynon, above the headwaters of the Teifi. To the West and NW, the sea, Bardsey on a clear day, and possibly the end of the Llyn Peninsula may be seen on the horizon, plus Pen-y-Bannau, Pen-y-Ffrwyd Llwyd, and the high ground above the Ystwyth on the far side of it. This is a circular, level horizon with a clear vault of sky above and no obvious foresights, the kind of land/sky scape traditionally associated with Bronze Age monuments and ritual landscapes (Bradley 1998).

Figure 18. The view to the north west from Cairn a, with sea visible beyond the hill in the middle distance.

Glasffrwd Cairn b2 SN 7765363779 480m– remains of a cist on a level area at the top of a natural hillock. Not apparently previously recorded.
Cairn b2 appears to mark the point at which, on the distant horizon, the top of a peak becomes visible in the notch created by the intersection of an elevated ridge to the northeast of Pen-y-Ffrwd-lwyd and a wooded scarp on the west side of Mynydd Bach (SN 7072570245)

Figure 19 . The cist (cairn b2) and the view to the west and northwest.

This notch lies roughly in the direction of summer solstice sunset. Bardsey will be visible on the distant horizon on a clear day beyond this peak. From this cairn/cist, three hillforts are visible. Pen-y-Bannau lies in the middle distance, Pen-y-Ffrwd-lwyd is outlined against the sea, and in the angle created by this ridge and Mynydd Bach, just visible, is Pen Dinas just to the south of Aberystwyth (SN5842380449). All three hills are roughly aligned in the direction of summer solstice sunset, as seen from this viewpoint.

Figure 20: The notch created by Pen-y-Ffrwyd Llwyd and Mynydd Bach, in which the very top of Pen Dinas at Aberystwyth may be discerned, outlined against the sea.

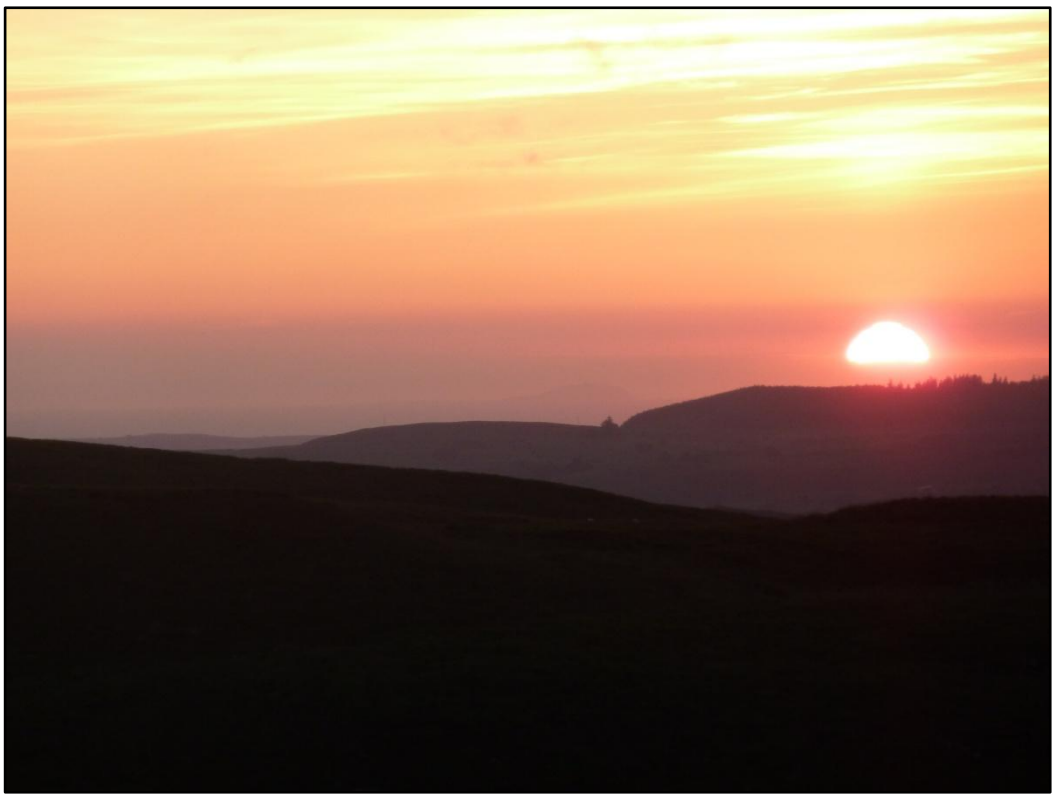
Glasffrwd Cairn b

Figure 21. Glasffrwd cairn b, view to the west

Located at SN 7757563791, at 460m. NPRN 303646. The cairn now appears as a disturbed pile of stones with the central cist, if there was one, completely robbed out. There are some signs of a subsidiary cist remaining on the north side. From here, the whole of Bardsey, on the distant NW horizon, may be seen beyond the notch created by Pen-y-Ffrwyd Llwyd and Mynydd Bach. A direct observation of summer solstice sunset by the author found that it occurs 2 degrees to the north of the island when viewed from this spot. This arrangement would create a definitive marker of solstice, and a warning of its imminence, with the sunset moving northwards across the island during the week leading up to the standstill and returning through the week following.

Locally high ground to the east of this spot, formed by the hillock containing cist/cairn b2, breaks the horizon which is otherwise, level and unremarkable all round. Pen Dinas is no longer visible.

Figure 22 & 23. Summer solstice sunset, June 21st 2014, observed from Cairn b, with Bardsey just visible beyond the notch- the conical object is a small stand of forestry.



Glasffrwd Cairn c

SN 7731363314, 440m. NPRN 303643. Cairn c is the highest of the cairns below the forestry road, on the sloping ground leading down into the bowl formed by the headwaters of the Glasffrwd. It is in fact the largest of a small group of cairns, distinguishable from the surrounding marsh grass as slightly elevated, round mounds with a few stones protruding through short dry turf. The cairns at this location enjoy a distant view to the NW, with a sea horizon just visible across the top of the ridge immediately to the far side of the bowl, with closer, slightly higher land around the rest of the horizon, especially from NE to SE.

Modern forestry obscures the hilltops to the northeast, so we cannot definitely say whether there were horizon markers for sun or moon rises as observed from Cairn c. According to the map, however, it appears that Pen-y-Bwlch, the peak which hosts Cairn a, might well have acted as a foresight for summer solstice sunrise, as viewed from Cairn c.

Figure 24. View to the northwest from Cairn c

The most northerly moonrise could have been viewed emerging from behind Cairn b2. It seems very likely that the summer solstice sunset was an event of visual interest here also, as with most of the other cairns disposed along the low

rocky ridge which stretches, finger like, in a south westerly direction across the marshy cwm. From Cairn c Bardsey is just visible in the notch to the east of Pen-y-Ffrwyd Llwyd, which is outlined against the sea.

A repeat visit is required on a clear day, to check, but in theory, according to their relative heights Bardsey should be just visible in the angle where Pen-y-Ffrwd-lwyd meets Mynydd Bach, and the solstice sun should sink into the top of it. The notch appears to lie at around 314◦ azimuth, which given the lower foresight than observing point, should be pretty exact.

Glasffrwd Cairn C2 SN 7721063231, 430m. NPRN 403054. This is another small group of cairns set amongst the elongated rocky outcrop stretching out into the marsh. No measurements were taken from this point as these monuments seemed broadly similar in outlook to the next group, collectively referred to as Cairn d.

Glasffrwd Cairn d – SN 7713563144, 415m. NPRN 303642. A substantial grassed over mound with stones protruding through the turf, to the east side of a spine of rocky raised ground with some exposed vertical slabs along the sides, running roughly northeast-southwest through the marshy headwaters area. There are the remains of several other, smaller cairns nearby.

From here, the sea is visible to the northwest, with Pen-y-Ffrwyd Llwyd in the distance at around 312-314◦ just breaking the horizon. From this slightly lower perspective (lower than Cairn c) Bardsey cannot be seen. The most visually interesting and distinctive area of horizon visible from Cairn d is the northern sector. Deneb at 2000 BC, with a declination of +36.5◦ would have come down and dipped behind the 'sugar loaf' from this viewpoint, disappearing briefly before emerging again on the other side. Vega at +41.5◦ and an altitude of 3◦ would earlier have just grazed the top of the hill. Only from the particular viewpoint provided by cairn d do the landforms on the near and far horizons to the north co-incide in this way.

Figure25. Northern horizon from Cairn d – the sugar loaf, shaped like a mirror image of Bardsey, lies due north and at 2000 BC would briefly have occluded Deneb at its lowest culmination.

Figure 26. The northwest horizon from Cairn d, with Pen-y-Ffrwyd Llwyd almost on a level with the sea; Bardsey has disappeared.

Glasffrwd cairn e – SN 7706863081, 410m. NPRN 303641

Cairn e is placed at the end of the spur or spine of rock which stretches out into the marshy cwm. It is the most visually striking of the cairns, being still devoid of vegetation and with a large central cist, from which the capstone has been moved, now resting at an angle, leaning on the northern side. There are remains of other smaller cists within the fabric of the cairn, and some evidence on the western side of a kerb composed of larger blocks.

The rectangular cist, comprising four large slabs of local rock, appears to be aligned with its longer axis running NW-SE. On the horizon to the NW, at roughly 312 degrees, lies Pen-y-Ffrwyd Llwyd, just visible above a rounded hill in the middle distance, which forms part of the edge of the cwm. Standing on the cairn raises the viewers eye level sufficiently to separate the hillfort from the

nearer horizon. A small amount of sea horizon is visible to the west of Pen-y-Ffrwyd Llwyd.

Figure 27. View across Cairn e to the northwest

The land which forms the remaining horizon is much closer, being made up of the hills surrounding the marshy bowl in which the springs rise. To the north is a visually interesting series of rounded dips and hollows with a horizon altitude of around 6 degrees. Various circumpolar stars including Deneb would have dipped down here, disappeared, and risen again around 2000 BC.

Figure 28 & 29. Overleaf – above- Cairn e - view to the north, and, below, looking towards Cairn d and the northeast

To the NE in the middle distance lies cairn d, not easy to see in the picture as it is grass covered. Forestry plantation now obscures any original horizon marker for summer solstice sunrise which could have been seen from cairn e, although cairn d is located roughly in that direction when viewed from across the cist,

which has its short sides aligned NE-SW, and can be made to break the horizon if the observer crouches down.

Figure 30. Above, looking across Cairn e to the south, and below Figure 31, the flat topped hill and southeast/winter solstice sunrise.

To the southeast, aligned with the long axis of the central cist, the flat-topped hill at SN 7744562711 with an altitude of 4 degrees as viewed from Cairn e, appears to mark the direction of winter solstice sunrise, as it does from the bridge on the Abbey Road near Pontrhydfendigaid. The southern and south western horizon lies in the middle distance, again at an altitude of around 4 degrees. Once more the summit is clothed with dense softwood plantation, obscuring the peaks beyond, some of which have large cairns, and may have marked winter solstice sunset. In any event, there is a medium distance, open southern horizon with nothing to obscure the view of the low midsummer moon or midwinter sun as it rose, traversed this sector and set again.

Glasffrwd Cairn f SN 7696363094, 390m. NPRN 403046

This is the most westerly and lowest of the cairns, with many small to medium stones protruding through the grass and signs of at least one small cist placed roughly centrally. From this point there is no distant horizon in any direction, the skyline consists entirely of the nearby land which forms the rim of the bowl. Cairn e is not visible – a small cliff face rises in that direction, 120◦, as viewed from Cairn f, and the stones forming the cairn are set back from it by around 10m, hiding it from below.

Cairn f has several features which set it apart from those on the rocky outcrop above. As well as the lack of any distant horizon, Cairn f boasts a pair of large white quartz boulders (NPRN 303640) set about 10m away at roughly 228◦ from the centre of the stone scatter – the direction of winter solstice sunset. One is firmly fixed in the ground, and the other fallen. The stones are blocky rather than tall, yet still create the impression of a gateway. About 3m to the north of the cairn edge is a large cist (NPRN 403045), seemingly devoid of mound material and with its capstone displaced. This feature is aligned north south.

Figure 32. Cairn f - white quartz boulders in the direction of winter solstice sunset

Although the quartz boulders could be a natural feature there is nothing else similar in the vicinity and they are located at a significant solar direction with reference to cairn f, so it seems likely that they are deliberately placed prehistoric monuments. Hall and Sambrook (2013:28) record a similar pair of white quartz outliers (NPRN 529398), also to the south side of another cairn with similar horizon views at Esgair Fraith in the south western Cambrians.

Figure 33. Looking across cairn f toward cairn e, invisible beyond the break of slope but positioned at 120◦ from f, horizon altitude 8◦, the cliff obscures the flat-topped hill.

Discussion – archaeoastronomy of the Glasffrwd cairns

Little literature exists regarding previous research into the archaeoastronomy of Bronze Age cairns. The most thorough study is the North Mull project (Fisher et al 1997, Ruggles 1999). Here a small group of cairns and five short stone rows on North Mull were studied statistically using GIS as well as field observations, in order to determine if common visibility factors might have played a part in the location of these monuments.

Comparisons were made, and the results analysed statistically, between the monuments and other, randomly generated, alternative locations nearby. Both cairns and rows seemed to have been precisely sited to facilitate particular horizon views, which were less well displayed from even nearby alternative locations. Ruggles concluded that the rows, even where in some cases intervening ground just blocked the line of sight, were placed and aligned to emphasise a conjunction of low midsummer moon, sea horizon, and Ben More,

the highest peak on the southern part of Mull. The cairns, on the other hand, seemed placed to facilitate the best possible, and most extensive, view of the sea to the north of the Island, to the west, and south/southwest, where lies the Island of Ulva. The researchers could not suggest a reason for this beyond saying that the sea must have had importance for an island population. The cairns are also intervisible with the sea, and it may be that, as suggested by Robinson (2007) in relation to the passage 'graves' on the Isles of Scilly, that they served, at least in part, a navigational purpose.

In the case of the Glasffrwd group, the methodology used by the author was different, comprising a ground based theory derived from pure field observation over several visits, no GIS and no random sites selected for comparison. However, there are similarities to the situation on North Mull. It seems the Glasffrwd monument builders demonstrated a definite interest in seeing the distant horizon to the northwest, which incorporates a stretch of sea, including views of the island of Bardsey from the higher monuments.

On North Mull the stone rows (Ruggles 1999:123-4), seemed to divide the landscape into two parts, based on whether Ben More could or could not be seen. Here at the head of the Glasffrwd, Cairn c2 appears to mark the dividing mid-point. From cairns below this group Barsdey cannot be seen, but from those higher, and further north, it can. The three highest cairns (a, b and b2) have a similar relationship to Pen Dinas, where Cairn b is below the threshold of visibilty, and b2 is just above. Bardsey in the direction of summer solstice sunset may be seen readily from these higher monuments.

At Cairn e, the long axis of the central cist is aligned NW-SE, toward summer solstice sunset in the direction of Pen-y-Ffrwd lwyd, which forms the most prominent object on the NW horizon as observed from this level, while the flat-topped hill and it's row of three, now denuded cairns mark winter solstice sunrise in the opposite direction at the south eastern edge of the cwm.

Cairn d seems to have a special focus on the northern horizon, as well as the only-just-visible summit of Bardsey. It could be that refractive effects due to

varying atmospheric conditions may cause the island to appear larger or smaller on different occasions when viewed from Cairn d.

Cairn f, with its large adjacent cist and white quartz 'gate' enjoys a quite different, more sheltered near horizon, formed by the slopes of the cwm. The cairn is invisible from the flat-topped hill. The landscape does open out toward the south, where the lower positions of sun and moon over the valley and a tributary stream would be well displayed. Here the axial polarity seems to have shifted to NE-SW, especially the direction of winter solstice sunset apparently marked by the white quartz outliers. The freestanding cist, aligned north-south, highlights the centre of the southern horizon. Cairn f is also relatively close to the stream and the unusually large cist could even, perhaps, have been for cooking, as at Drombeg stone circle in County Cork.

Roese (1980) found that standing stones in Wales, which he ascribed to the Bronze Age, often occupied sites at relatively low elevation and near to water, this certainly holds true for the quartz outliers and indeed the entire Cairn f monument if cairn, cist and outliers are taken as a unit. The white stones, emphasised southerly horizon (as at Ruggles (1999) Scottish sites) and nearby water give this site a lunar ambience. The higher cairns (a to e) seem to relate visually to the sky, the flat-topped hill and other peaks, plus the distant sea/island horizon in the direction of summer solstice sunset. This is further emphasised by the NW-SE axis of the large cist in Cairn e. These cairns have a more open and daytime/solar quality.

As previously mentioned, the flat-topped hill seems to have parallels with Cairn 47 at Brenig, and the Ram's Hill enclosure, in terms of its location at the upper edge of a valley, commanding distant views, and being visible itself from lower in the valley, possibly acting as a marker for travellers. Although not previously listed as a monument, on close inspection it appears to have a level terrace running around it, 4 to 5 m below the top, and even a line of stones above this on the northern side which could be the remains of revetting. At the north eastern 'corner' a gently sloping and curving ramp leads up from the trackway to the level summit, passing by a line of flat stone slabs in a rectangular depression, suggesting a collapsed cist or even the ruins of a chambered

monument. Other large stones above this could be related to some kind of gateway.

The general form is similar to the sub-rectangular/oblong Ram's Hill (Bradley & Ellison1975:30) which had many breaks in the original Bronze Age encircling bank, but the largest at the north eastern corner. Castell Rhyfel, a similar feature, regarded as possibly a Bronze Age ceremonial enclosure (Coflein NPRN303624) a few kilometres to the south of the Glasffrwd, discussed in the Iron Age section (see page xx) also has a zig-zag path leading up to a break in the low bank at the north east, with scattered boulders.

It seems likely therefore that the 'flat-topped hill' is an integral part of the monument complex at Blaen Glasffrwd, and may even have been subject to some landscaping to enhance its natural shape. The result is something which bears a passing resemblance to Silbury Hill, as well as having a line of cairns constructed on the top.

As previously mentioned, in the absence of bona-fide Neolithic monuments, we must consider this complex the earliest example of a deliberately manipulated ritual or sacred landscape in the Strata Florida locale, and, as discussed above, the monuments clearly relate to both the surrounding land and skyscape.

CONCLUSION

Archaeoastronomy and the sacred landscape of Strata Florida from 2000 BC to 1200 AD

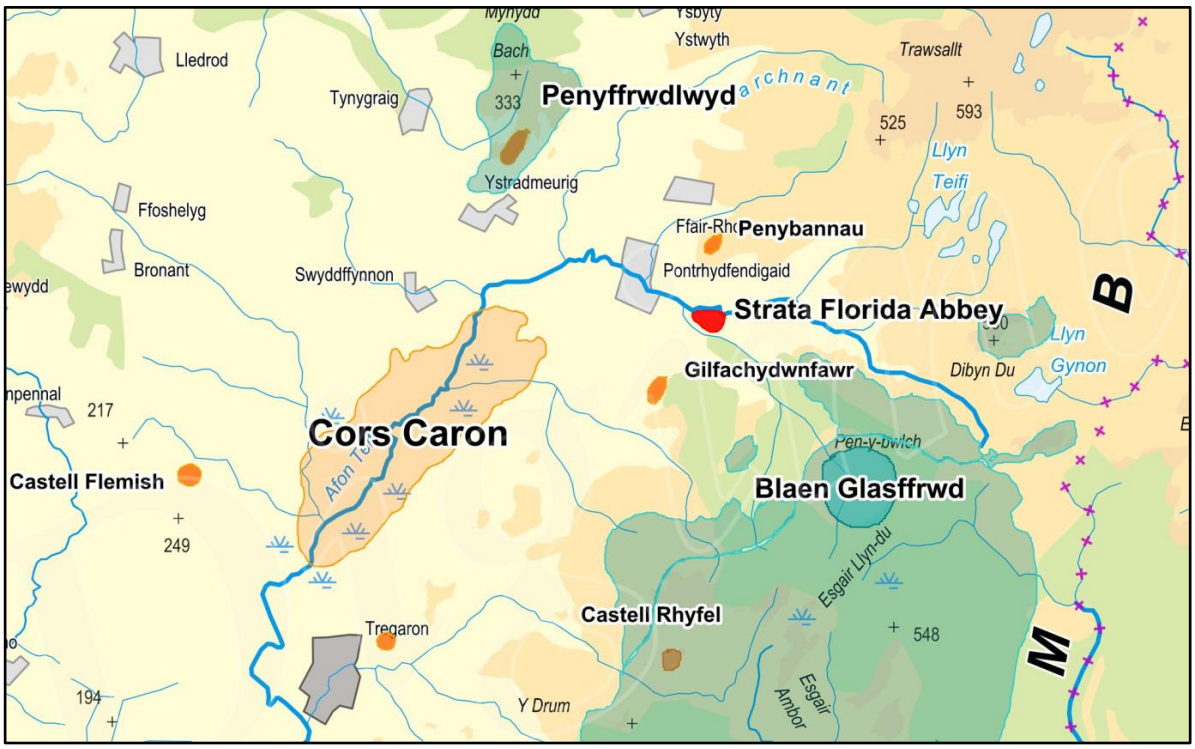


Figure 34. Map showing the approximate areas of the 'sacred landscape' in the upper Teifi valley during different chronological periods. The Bronze Age land and skyscape, shown in blue, was extensive. Centred on the cwm at the headwaters of the Glasffrwd, landforms acting as horizon markers for celestial events included surrounding high ground as well as more distant lands to the northwest. During the Iron Age, the focus seems to shift to Cors Caron, and a surrounding ring of astronomically aligned hilltop structures, marked in orange. The much more localised Christian sacred landscape of Strata Florida is confined to the floor of the glacial valley, shown in red. © OS 1:250,000 series. Edina Digimap

Although the main part of the dissertation moves back in time, from the 12th century to the Bronze Age, in this summary we will consider the Bronze Age monuments at the head of the Glasffrwd first, and move sequentially through the succeeding periods.

It appears that the Glasffrwd cairns were carefully located to create or mark viewpoints which showcase particular areas of the sky and surrounding horizon. There is a strong focus on the northwest, with the same area of distant sea

visible from most of the sites. The sea horizon provides a striking backdrop for the hill which became known as Pen-y-Ffrwyd Llwyd, plus glimpses of Bardsey. As well as this common distant vista, the varying heights and locations of the different cairns allow for different views of nearer landforms, creating a range of horizon markers for significant celestial events and times of year.

The most commonly indicated direction seem to be the northwest – southeast axis, reflecting summer solstice sunset opposite winter solstice sunrise. Two landforms in particular are involved in this – the flat-topped hill at the head of the Glasffrwd, and the ridge which now hosts the hilltop enclosure of Pen-y-Ffrwyd Llwyd. These hills are intervisible, and one or both are visible from many locations in between, including Cairn e and the abbey precinct. The large cist in the centre of cairn e is also on this alignment, with the long axis running northwest – southeast, mirroring and emphasising the topography.

Pen-y-Ffrwyd Llwyd is visible from the lower valley, near Strata Florida Abbey. It may be seen on the horizon from the road outside the west end of the ruins, at 312◦, being silhouetted by the setting sun at summer solstice. The flat-topped hill above the Glasffrwd can be seen on the skyline, when travelling east along the Abbey Road from Pontrhydfendigaid.

From the upper Glasffrwd (Pen-y-bwlch) cairns, Bardsey, a notable holy island and pilgrimage destination during the medieval period, and which also shows signs of prehistoric occupation, is visible on the horizon in the northwest, also in the direction of summer solstice sunset.

The opposite axial polarity, southwest – northeast, reflecting winter solstice sunset, summer solstice sunrise, is less emphasised, although the white quartz outliers of cairn f, placed to the southwest of the cairn, at 228◦, the direction of winter solstice sunset, and the well displayed clear southern horizon as viewed from this spot are suggestive, as are some features of Cairn d. At the time of its construction Cairn e may have facilitated views of all four solstice positions, the rectangular central cist is aligned to NE-SW along its short axis, and NW-SE along the long one . Unfortunately forestry plantation now obscures the northeast and southwest horizons as seen from Cairn e.

North (and the circumpolar Deneb and Vega) is highlighted by the unique horizon arrangement visible from Cairn d.

The most clearly marked azimuths seem to be the four solstice rising and setting positions, suggesting a solar emphasis. Extreme lunar positions may be indicated by a nearby small hill as viewed from the flat topped hill, (northerly winter rising) and the southerly aspect of Cairn f. (See figure xx)

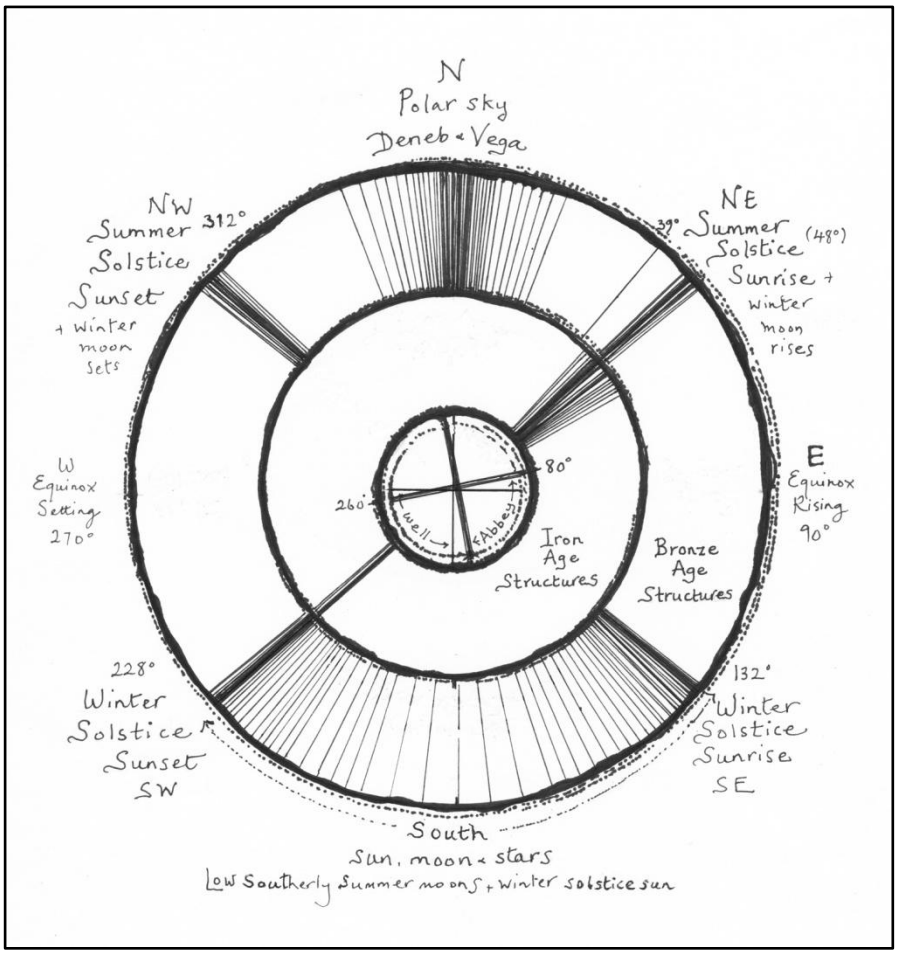


Figure 35. Diagram illustrating the azimuths apparently indicated by the structures relating to each chronological period – Bronze Age in the outer ring has NE,SE,S,SW,NW, and N.

Iron Age hillforts around Cors Caron show a predominant NE-SW alignment.

In the Christian period, not only is the sacred space more localised, but a broadly cardinal directionality with an emphasis on the east-west axis can be observed. © O.Pritchard 2014.

Moving on to the Iron Age, the hilltop enclosures encircling Cors Caron all show a common northeast-southwest alignment. This seems likely to reflect the summer solstice sunrise, winter solstice sunset axis, with the entrance facades of all except one facing northeast, and all having a level 'gathering space' at the northeast end. The range of indicated astronomical directions appears much

more restricted than at the Bronze Age sites (see fig xx). Yet arguably the Iron Age structures did respect the skyscape visible from the Bronze Age cairns, as the hills which are transformed with banks and complex entrance facades into 'hillforts' during this period are some of the same ones which acted as foresights during the preceding Bronze Age, especially Pen-y-Ffrwyd Llwyd. Pen Dinas at Aberystwyth is just visible through a notch from the top cairns above the Glasffrwd, a and b2, and this hill became a major enclosure/fort during the Iron Age. Pen-y-Bannau is visible from Cairn a and b2, as is Gilfach-y-Dwn Fawr.

The oval shape and ubiquitous northeast entrances of the six hill top enclosures have parallels elsewhere in Britain, e.g. at Ram's Hill in Berkshire, originally a Bronze Age monument associated with a number of mounds, later extensively reworked during the Iron Age, with a primary entrance in the northeast (Bradley 1975), and at Gussage All Saints, which Cunliffe suggested had a 'gathering' space outside its ENE entrance (2005:584) and arguably at the flat-topped Glasffrwd hill, which seems to have a ramp like feature leading up to the northeast corner.

Northeast is the direction of summer solstice sunrise. Although it is the solstice sunset position which seems to be highlighted by many of the Glasffrwd cairns, the indicated season, midsummer, arguably remains the same between Bronze Age and Iron Age monuments.

It is also true that the northeasterly entrances of the Iron Age enclosures would face mid-winter moon rise, though the level areas to the front of the ramparts at most of the enclosures suggest spaces for gatherings or 'fairs' which would seem more likely in summer. A function as meeting and gathering places might explain the presence of nearby long distance roads and track ways which Driver (2005) emphasises.

Winter solstice sunset may also be highlighted by the hill top enclosures. One, Gilfach-y-Dwn Fawr, has a southwest facing entrance facade, but all the Caron forts are aligned NE-SW and have an entrance at the southwest end, even if only a small one. Gilfach-y-Dwn Fawr by contrast has a secondary entrance and a levelled area to the north east.

As well as a possible connection with summer solstice sunrise and winter solstice sunset suggested by the orientation of these structures, there could be a lunar involvement. Full moon occurring at the winter solstice will rise in the north east, as the sun sets in the southwest. The exact position of moonrise is variable, but arguably a moonrise/sunset observation may have been involved in the placing of these structures. Their elevated situations would facilitate a good view of any sun/moon rise/set as well as the full complement of stars.

The presence of the bog, Cors Caron, might be significant in terms of Iron Age sacred landscape. As the map (fig xx) shows, the 'hillforts' roughly encircle the bog, and although not directly facing it, it can be clearly seen from all of them. Considering the well known Iron Age veneration of watery places it may be that during the later first millennium BC the sacred landscape centred on the bog rather than the uplands, a change of emphasis which could explain the more restricted astronomy.

All six hill top enclosures/forts, whether defensive or ceremonial structures, have adjacent settlements. Each has a village close by. Especially interesting is Ystrad Meurig, below the 'hillfort' Pen-y-Ffrwyd Llwyd, set on the hill which lies in the direction of summer solstice sunset as viewed from many of the monuments at Blaenglasffrwd. Evidently this hill represented an important landmark in the Bronze Age, which was then enclosed with a bank and multiple ramparts at the northeast end during the Iron Age. The settlement of Ystrad Meurig, on the slopes of the valley below seems to have contained a major local power base during the earlier middle ages. Austin and Bezant believe that the royal llys of the ruling family of Ceredigion was located here. A Norman castle was constructed, apparently on the same site, in 1110, which was fought over throughout the 12th century (coflein). A motte was also constructed nearby, and a monastic settlement belonging to the Knights Hospitaller, all of which suggests that Ystrad Meurig was a politically sensitive location before during and after the conquest.

It is interesting to note that the initial site of the Cistercian Abbey of Strata Florida, founded by the Normans, was on the banks of the Fflur Brook, below

the ramparts of Gilfach-y-Dwn Fawr, but that after the Welsh overthrew the Normans, the abbey was moved to a position almost mid way between the head of the Glasffrwd/flat topped hill and Pen-y-Ffrwyd Llwyd, at the upper end of a valley overlooked by three of the 'hillforts' – Pen-y-Bannau, Gilfach-y-Dwn Fawr and Pen-y-Ffrwyd Llwyd. This location suggests a situation and landscape setting chosen not just because it was spacious or numinous but also because by 1184 it carried a historico-political depth, stretching back thousands of years, creating a sense of sacredness infused with an indigenous ancestral meaning and power still appreciated by those modern visitors who come in search of a particularly Welsh sacred landscape.
As Christianity took over in the centuries after the roman occupation, replacing the earlier pagan religions, with their outdoor ceremonies celebrating deities of the natural world and its forces, the focus of the astronomy shifts away from the solsticial directions and toward the cardinal directions. East dominates, the direction of equinox sun/moon rise and set, which does not seem to feature noticeably in either the Bronze Age or Iron Age skyscape.

This is possibly a function of Christianity originating in the Mediterranean area, and it's evolution from a Hebrew forerunner. Gordon mentions that as far back as pre-urban, Old Testament times, the Hebrew 'tent of meeting' faced east, and the Hebrew word for 'east' was synonymous for 'the front', with 'west' equating to 'back'. He quotes several passages from the Old Testament which show that east was certainly the direction favoured by God, and the one from which He might 'shine in glory' (1971:212). Meanwhile Chadwick in his History of Christianity (1998), suggests that Christianity was, right from the start, a syncretic religion, and that it picked up symbolism from other faiths which were locally current in its early years. He suggests that the emphasis on light, solar cycles and an emphasis on the direction of east, came from Roman religions, for example, Mithraism.

The spiritual focus narrows from an extensive upland landscape and correspondingly significant skyscape during the Bronze Age, through a more site specific, and possibly more limited, astronomy during the Iron Age, to an indoor ritual space under Christianity, albeit within a structure apparently astronomically aligned on a spring sun setting opposite a full moonrise. This has

echoes of the quasi linear, double ended, albeit solsticially aligned, rather than equinoctially aligned, arrangement of the Iron Age hill top enclosures – could it be that after 1000 years in the pagan lands of northwest Europe, some older tradition was influencing the invader ?

The valley of the Glasffrwd/Teifi trends east-west – which Austin has suggested would be particularly suitable for a Christian sacred centre, where the body of the church would likewise be so aligned. The valley also takes the form of a bowl, open to the west, and this is something which was a feature of the Bronze Age complex in the cwm at the head of the Glasffrwd, as well as Cors Caron with its encircling ring of hills.

Chalices, a potent Christian symbol and cauldrons, much featured in myth and legend, and found buried in bogs, are both forms of bowl, and hold water. So do wells, and perhaps in the pre-Cistercian well 'phase' of the Strata Florida sacred landscape we can see a transition from earlier beliefs grounded in natural phenomena such as sun moon and stars, springs, pools and wells, rocks and mountains, to a different kind of sacred landscape, bounded and formed by humanity, with straight lines and rectangles.

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