

On common ground: what do Cultural Heritage Management, Landscape Archaeology and Archaeoastronomy have in common?

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This paper addresses recently held views about Cultural Heritage Management (CHM) and explains CHM's use of theory and GIS-based visibility analysis for understanding the nature of cultural landscapes and the relevance for CHM.

Landscape Archaeology likely grew out of the Interpretative philosophical tradition, which moved on from Schleiermacher's 19th century quest to 'illuminate conditions for possible understanding and its modes of interpretation' (Johnson and Olsen 1992, p. 421) to Droysen's 19th century distinction between 'understanding' and 'explanation' in history (Droysen 1986). The latter asserts that the only appropriate approach to history is a hermeneutic one relating the whole and its parts – specifically, 'The part is understood within the whole from which it originated, and the whole is understood from the part in which it finds expression' (Droysen 1977 cited in Johnson and Olsen 1992). This quote emphasises the importance of context, the interconnectedness of knowledge and things and its critical application for our understanding of anything. Such thinkers, along with Humboldt, Herder, Dilthey and others, influenced the work of the hermeneutic phenomenologists of the 20th century, like Husserl, Sartre, Merleau-Ponty, and Heidegger and humanists alike. The idea of the importance of context led to a questioning of the unnecessary division between nature and culture (hence UNESCO writes). In the same way, it was realised that the tangible in heritage cannot be understood without the intangible, for they are all part of the larger system of human experience (Higginbottom 2014).

One of the quandaries for both CHM and investigating prehistory was always 'how do we know where a monument begins and ends?' However, the contextualization issues expressed above in philosophy revealed to archaeologists that monuments must not be considered separately from the treatment of other places in the landscape, and indeed, not separated from the landscape itself (Bradley 1998), finally reaching a point in international CHM, where the assessment for World Heritage Status includes consideration of the largest buffer zone of a 'site' that covers every location that is in its viewshed; by default this is marked-out by the horizon - the farthest point one can see.

The work presented here, and done in the past, considers monuments built by a community, with the underlying assumption that monuments gather, focus, direct and manifest the self-

interpretations of that same group and that engaging with these monuments reinforces, or draws anew, their own world view (Higginbottom et al. 2015). By studying such monuments within the entire visual landscape, then, we uncover the concomitant tangible and intangible heritage of megalithic cultures, for the monuments situation invites us to take in and consider everything we can see from *this* viewpoint, where the horizon is the most distant, and thus final, point people can see on the Earth (Higginbottom et al. 2003). The horizon itself, or parts of it, then, may be of particular significance to the builders of the monuments.



Fig. 1. A 360°-panoramic image of Armadoiro, Barbanza, Galicia.

Initially, then, this research investigated cultural astronomy linked to celestial bodies as they rose and set along *the horizon*. Now, though, this work also looks at the sky above the horizon line, for it tries to uncover all-containing, large cosmologies that explain the way of the known 'Universe' - how people in different places and times upheld the way the world worked.

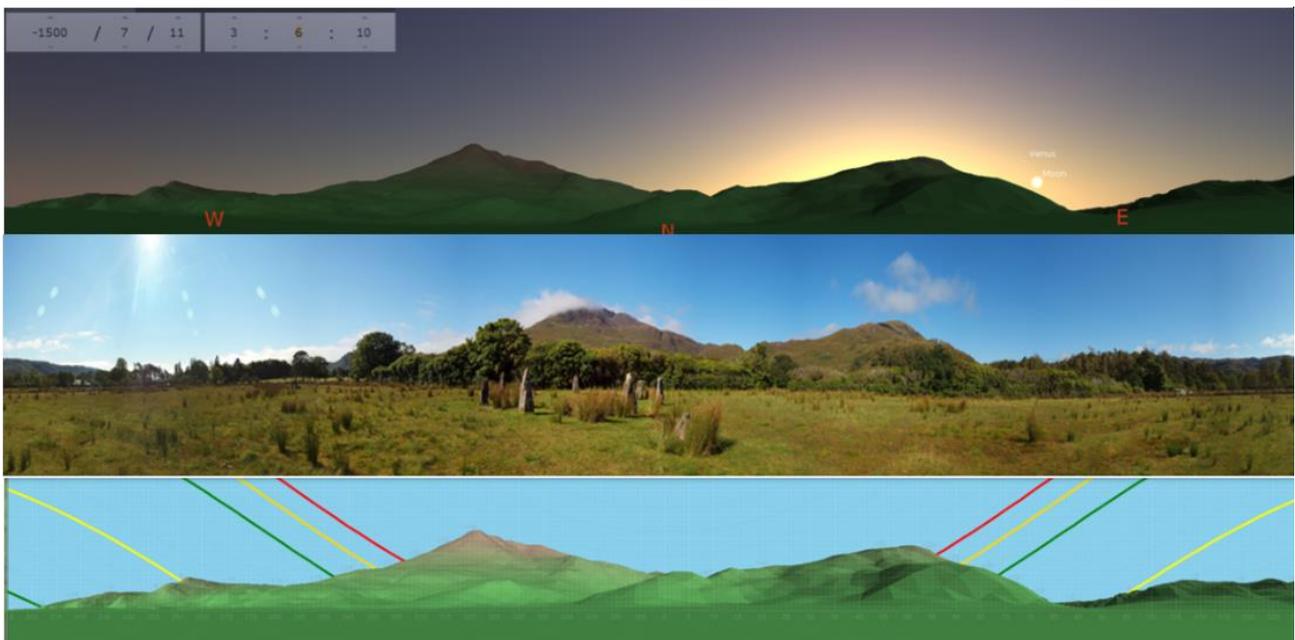


Fig. 2. Three 360°-panoramic views of the landscape surrounding the circle of Lochbuie (Mull). 2a: still from a Stellarium video of the time just before summer solstice sunrise (3 AM). 2b: a panorama created with the ICE image stitching software. 2c: a topographic viewshed with astronomical paths created with the Horizon software of A. Smith.

The current project applies 3D panoramic and video GIS view-shed methods to interrogate local landscape and cosmological (astronomy) data to obtain this objective, as well as to discover the reasons behind the existence of standing stone monuments. Specifically, for the prehistoric landscape reconstructions various digital tools have been used: Microsoft's *Image Composite Editor* is used to create panoramic images (360°) from digital field images (fig. 2b). These are used in tandem with the 3D panoramic landscapes created by *Horizon* software from Andrew G. K. Smith of the University of Adelaide (Smith 2013) (Fig. 2c). *Horizon* also outputs computational topographic data (see Fig. 3) and astronomical data for statistical analyses. *Stellarium*, a public domain astronomy software package, can turn the whole observation exercise into a

cinematographic experience through its video-like animation and 'frame rate' options (Zotti et al. 2021; Chéreau 2016; Gates, M, Zotti, G, Wolf, A & Gerdes, B 2016). By inserting a specific panoramic image of the landscape surrounding a monument and locking in the geographical position from which the panoramic photograph was taken, it is possible to create moving heavens and their approximate resultant lighting over the landscapes from the point of *real time* motion to faster time frames, allowing the researcher to pick-up patterns of movement of astronomical and lighting phenomena more readily (Fig. 2a).



Fig. 3: Three horizon contours of three major monuments at Lochbuie as calculated with the Horizon software, projected on a ZoomEarth image. The highest horizon feature is Ben Buie in the NNW, 717 m high, indicated by a white triangle at -36 degrees North in this figure. This is the highest mountain see fig. 2 above. The other protruding ridge at 54 degrees North is closer and only 400 meters high. It is obvious that the horizon, as seen from the stone circle (green contour) in both the Western and Eastern directions, differs significantly from that seen from the other monuments.

Using these methods has revealed in what ways different sets of monuments, in different regions and across time, likely have different cosmological systems, but more importantly, what these systems might be. Most significantly it has become clear that the entire topography (if not more) surrounding each monument is relevant, thus clearly demonstrating and supporting, the thinking behind World Heritage Status considerations of buffer zones that cover every location within the viewshed plus the farthest points that one can see.

References

For a comprehensive list of relevant references see Higginbottom, G (2020).

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