Archaeoastronomy: Introduction to the Science of Stars and Stones by Giulio Magli

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Giulio Magli's *Archaeoastronomy* is a welcome addition to the literature regarding this relatively new science. Readers of the *Nexus Network Journal* will be familiar with Prof. Magli's work as well as that of his colleagues, such as Robert Hannah, Juan Antonio Belmonte, Michael Rappenglück and others, who published their research in a special issue of the *NNJ* (vol. 15, no. 3, 2013) that grew out of a session at the 2012 Nexus conference in Milan and was guest-edited by Magli himself.

What exactly is archaeoastronomy? “Born” as a science about a half century ago, archaeoastronomy is the study and reconstruction of the ancient sky and celestial phenomena—the determination of the positions of heavenly bodies and the occurrences of solstices, equinoxes, heliacal rising of stars, etc., at a given moment in the past—and how these are reflected in the artefacts that have come down to us from the peoples that experienced them.

The determination of ancient skies is carried out by means of a combination of two kinds of data. The first concerns the site itself, a site survey with instruments as ready-to-hand as magnetic compasses, inclinometers and theodolites and as sophisticated as global positioning systems and virtual globes, makes it possible to attempt a reconstruction of its original aspect and visible horizon. The data gathered is then used to calculate, for directions of interest on the site, the two angles in the horizontal coordinate system that locate a precise point on the celestial sphere: altitude, or angle above the horizon, and the azimuth, or angle from north (or sometimes from south) to east. Once the site is related to the celestial sphere via the alt-azimuth coordinates, the second necessary set of data is obtained via a calculation and simulation of the appearance of the sky at a particular moment in time. This can now be accomplished through the use of astronomy software. This

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makes it possible to analyse the alignments of artefacts (structures or objects) in the landscape in relationship to celestial phenomena as well as—importantly—relationships among structures to identify potentially intentional relationships across a site.

I have intentionally included technical terms here to make it clear that claims of discoveries of connections between the ancient sky and cultural artefacts cannot be made on the basis of ‘intuitions’ or ‘insights’ gleaned from an examination—even a careful examination—of landscapes, structures and naked-eye sightings of stars. This kind of pseudo-science is all too common in an area where results are difficult to verify, and heaven knows that seemingly inexplicable but tantalisingly attractive ancient structures are frequently the objects—or victims—of such claims.

This is why I am particularly glad to have received Magli’s *Archaeoastronomy* (Fig. 1). This is not a walk-in-the-park book for interested layman, or work in popular science. His is a textbook, the fruit of his years of experience teaching the only course in the subject offered in an Italian university (the Politecnico di Milano). As a textbook, this volume is clearly organised in three parts to introduce the student (or scholar) to the methods (Part I), ideas (Part II) and places (Part III) that characterise this science, and includes, at the end, a section of exercises for practice. The author puts his hands out in front of himself in the introduction,

Fig. 1 Cover of *Archaeoastronomy* by Giulio Magli

avoiding any claims for exhaustiveness in the treatment of sites, but rightly states that this present volume will make it possible for the reader to continue on to more advanced works, providing him or her with the knowledge required to understand them. Magli himself has written books that encompass such studies; his *Misteri e scoperte dell'archeoastronomia* (2005), translated into English with the title *Mysteries and Discoveries of Archaeoastronomy* (2009), and the more recent *Architecture, Astronomy and Sacred Landscape* (2013) have both been reviewed in these pages. Those volumes offered exciting examples of what could be achieved in archaeoastronomy. What this latest textbook provides is an introduction to the methods and ideas on which those achievements are based. It also provides a good description of the state of the art, with Part III describing the latest findings in four different regions/ages complete with bibliographies to allow the reader to continue to study in greater depth.

There is no doubt about the relevance of archaeoastronomy to our field of architecture and mathematics. As he says, 'architecture was linked to astronomy at such an early time that the history of architecture and the history of astronomy are virtually inseparable' (2016: 69). It is to be hoped that we will begin to see Magli's book appearing in the bibliographies of future research dealing with the relationships of 'stars and stones', indicating that authors have availed themselves of scientific methods to back up claims inspired by intuitions.

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