Clive L. N. Ruggles, editor, *Handbook of Archaeoastronomy and Ethnoastronomy*. Part II (pp. 313–530): "Methods and Practice"

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The Handbook of Archaeoastronomy and Ethnoastronomy, edited by Clive L. N. Ruggles, is less a handbook than a celebration of the diverse study areas that archaeoastronomy and ethnoastronomy cover throughout the world. In his preface, Ruggles claims that this three-volume handbook sets out to be a picture of the state of the discipline as well as to provide a source of reference for theory, method, interpretation and best practice (p. vi). With different section editors for each of the major parts, Parts I and II variously discuss the key concepts and themes in archaeoastronomy, whereas the major content of the handbook is concerned with case studies in the widest possible sense, geographically and through times and cultures. No single reviewer could be expected to have enough experience to cover all the material from this worldwide celebration of archaeoastronomy, nor could a brief review do it justice, so we can only point out to readers its encyclopaedic range. Nevertheless, Parts I and II, which deal with overall issues and methodology, have a universal appeal so having reviewed Part I "Themes and Issues" in *JSA* 1.2, the review of Part II, "Methods and Practice" follows here.

As Clive Ruggles has said elsewhere, "Methodology is central to our endeavours as archaeoastronomers" (Ruggles 2011, 8), and so it is not surprising that Part II of this comprehensive volume is devoted to methodology and practice. The section editor here is Stephen C. McCluskey, who has long been interested in the practices of cultural astronomy and who, along with Ruggles, set up the International Society for Archaeoastronomy and Astronomy in Culture (ISAAC) in 1996. He is the author of one of the first three chapters in this sector, which all deal with cultural interpretation but from different evidential perspectives: archaeological, historical and ethnographic. The first of these (Chapter 21 in the volume) is by Stanislaw Iwaniszewski, who as an archaeologist

recognises the problems of studying the material record of the past yet notes that the problems are no different whether you are an archaeologist or an archaeoastronomer. They both study the same past, and he says it is necessary to understand that despite their distinct views on the nature of the evidence archaeology is not a "monolithic" research field (p. 318). Indeed, recognising the relationship between archaeoastronomy and archaeology, he suggests that archaeoastronomy can be categorised as "a type of a thematic archaeology or as a part of symbolic and cognitive archaeologies" (p. 318).

McCluskey continues the theme by looking at the nature of historical evidence relating to astronomy, whether it be the historical records of outside observers or the records generated within the cultures. He says (p. 337) that this type of evidence has the advantage of complementing other evidence and provides a unique insight into how cosmologies change over time. The third chapter on cultural interpretation is dealt with ably by Alejandro Martín López. He starts (p. 343) with the premise that ethnoastronomy uses the methodological tools of anthropology, but suggests that rather than produce a set of interesting cultural facts it must explain them with recourse to current social theory.

Of the 15 chapters in Part II, Ruggles has contributed no less than six which draw on his wealth of experience of conducting archaeoastronomical surveys over a long career. In his chapter "Nature and Analysis of Material Evidence Relevant to Archaeoastronomy", he says that archaeoastronomy has moved on from seeking to explain cultural phenomena in exclusively astronomical terms to a broader interpretation embedded in the wider cultural context (p. 353). Therefore, he advises that "archaeoastronomical interpretation can never proceed in isolation from archaeological endeavour as a whole" (p. 354). This of course is the premise of skyscape archaeology, and Ruggles (p. 360) makes a convincing case to show that the best hope for interpretation comes from multiple lines of evidence leading to the same conclusion – in other words, "convergent methodologies" – instead of through the pursuit of a single chain of inference. From his early researches in Scotland (for example Ruggles 1984) Ruggles has long advocated data-driven approaches but here he agrees that these have their limitations, as among other things they provide no insights into significance and meaning and their focus on only principal orientations overlooks other factors which may have been important (p. 361). His following chapter, "Best Practice for Evaluating the Astronomical Significance of Archaeological Sites", shows the reader just how to combine theoretical issues with scientific methodology to prevent the downfalls of the past. These include selecting "interesting" alignments whilst ignoring those that are less promising astronomically (p. 376), and the ethnocentric use of preconceived targets such as the lunar standstill, the equinox or the brightest stars (p. 382). His solution for best practice is to thoroughly document all the choices made in a survey (p. 382). As in his previous chapter, Ruggles makes the distinction between structural orientations, light and shadow effects, and symbol counts to cover the different permutations of evidence and practice for world archaeoastronomy in order to disconnect from the "green vs brown divide" (p. 355) which dogged archaeoastronomy for decades. Whereas of course good methodology is universally valid, this seems an overambitious aim given that these categorisations are modern ones.

McCluskey's second chapter in this part looks at light and shadow interactions, which he says are sometimes called "solar hierophanies" (p. 427). These effects may have been built into the design or recognised and marked later. Because the properties of shadows change with the annual motion of the Sun he says they tend to be more frequent in the region of the equator to about 12° beyond the tropics (p. 431). Apart from Newgrange, little is said about European sites despite new findings in this volume by Belmonte at Risco Caído in Gran Canaria (p. 1123) and Esteban (p. 1164) at Iberian sanctuaries and elsewhere by Lomsdalen (2014) at the Maltese temples of Mnajdra. However, the chapter usefully demonstrates the minimum survey requirements and how they can be evaluated for intentionality.

The other chapters on techniques are more straightforward and educational. Frank Prendergast's "Techniques of Field Survey" and Georg Zotti's "Visualization Tools and Techniques" fall into this category. Prendergast (pp. 389–409) talks about the advance in geo-spatial measurement technologies, specifically those relating to azimuth and location, and how this improvement can help archaeoastronomers, though he points out that these techniques require a high level of technical expertise. In an earlier publication Ruggles (2011, 6), while questioning the viability of archaeoastronomy as a discipline, had suggested that it might be viewed as "a service-discipline"; in other words, a set of methods, techniques and skills which could be used by other disciplines when confronted by issues relating to the sky. Field surveying is one of these techniques. Paralleling Prendergast's work on the ground, Zotti takes us to the sky via computer processing (pp. 445–457). His chapter is an overview of current computer software and processing methods that can be used to build accurate representations of sites of interest to archaeoastronomy. It covers computer graphics, archaeological maps, digital terrain models, digitally measured horizon data and the resulting digital models that can be constructed. This is a subject which has come on leaps and bounds in recent years and has added a valuable aid to understanding existing sites of archaeoastronomical interest or even adding an archaeoastronomical interest to sites not previously considered in that vein.

It might have been more advantageous to locate Ruggles' chapter "Basic Concepts of Positional Astronomy" before Zotti's visualisation techniques or even as the first chapter of Part II. As an introduction to basic horizon astronomy and its related terms such as azimuth and declination that archaeoastronomers are already familiar with, it would have served as a better foreword to this technical section. Indeed, Ruggles says it was written more for archaeologists and ethnographers than archaeoastronomers (p. 459). The chapter covers the main factors such as co-ordinate systems, the annual cycles of the Sun and the stars, the motions of the Moon and the planetary cycles, in a reasonably comprehensible way. His following chapter builds on this explanatory astronomy, this time explaining the long-term changes in the appearance of the sky through the effects of the precession of the equinoxes and the gradual change in the obliquity of the ecliptic. Ruggles includes tables (pp. 475–478) for the declinations of 25 of the brightest stars separated by tranches of 1000 years, but as for example the shift over that period of Aldebaran is roughly 5° it would perhaps have been better to have shown the change every 500 years.

The last four chapters which complete Part II are all subtitled "Identification and Analysis" and in turn look at solar alignments (Juan Antonio Belmonte), lunar alignments (A César González- García), alignments on Venus and other planets (Ivan Šprajc) and finally stellar alignments (Clive L. N. Ruggles). They all address the strengths and pitfalls of identifying and using each particular alignment in clear and precise terms, but the phrase I liked best was from González-García, namely, "absence of evidence is not evidence of absence" (p. 504).

Archaeoastronomers have fought long and hard to prove their methodology to be sound and scientifically rigorous, and all these chapters in Part II demonstrate this. However, when we look at the past it is as well to remember Evans' advice that history is "bridging a series of gaps, in time, culture and experience, through the use of a disciplined historical imagination" (Evans 2000, 214). Scientific objectivity is the unrealistic ideal but phenomenology, inspiration and intuition, when coupled with sound methodology and practice, are useful aids in archaeoastronomical research.

References

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