

## Part II

# Case Studies

Although differing widely in cultural focus and astronomical details, these case studies apply the general approaches developed by Ruggles and others to a wide range of evidence, both archaeological and textual, from different parts of the world.

The first two case studies, Prendergast's island-scale study of Irish passage tombs and related cairns and Gonzalez-Garcia's examination of a ritual landscape in northern Spain, echo the earliest phase of Ruggles' work—and the earliest era studied by archaeoastronomers—the investigation of prehistoric stone monuments. Prendergast employs a method of scanning the local horizon as seen from his sites, a method pioneered in Ruggles' (1984) investigation of western Scottish sites, to establish whether passage tombs preferentially faced restricted, intermediate, or distant horizons. He found a noticeable preference for distant horizons centred in the northerly direction. Drawing on cultural analogues from cultures known to respect the direction north, he advances the hypothesis that the liminal northern horizon indicated by the Irish sites represented to the tomb builders the direction of the abode of their ancestors.

González-García expressly acknowledges the inspiration of Ruggles' earlier work on the Island of Mull, where he consciously shifted the focus of research from individual sites to a “wider ‘ritual landscape’” (Martlew & Ruggles, 1993: 63). González-García's focus on the landscape near the passage grave of Chabola de la Hechicera (the Sorceress' Shack) identifies a group of neighbouring sites which share similar orientations and from most of which a significant mountain, Lapoblación, which marks the summer solstice from Hechicera, is visible. Despite the importance of this mountain, he dismisses folklore associating Hechicera with the summer solstice as too recent to be associated with the builders of these sites. More secure placing of this group is found by cluster analyses of azimuths, which places this group in a distinct transitional place among similar Spanish regional groups.

With Boutsikas' examination of the orientation of Greek temples, we enter the world where archaeoastronomical studies are complemented by the existence of written sources, which give access to Greek astronomical concepts. One of these is the concept of the equinox, the utility of which Ruggles questioned in a classic

paper (1997), yet which recurs frequently in this volume. The Greeks defined the equinox either geometrically, in terms of the intersection of the equator and the ecliptic, or temporally, in terms of the equality of day and night. Boutsikas complements this textual evidence with measured data of the orientation of 131 Greek temples, which leads her to the cautious conclusion that “If any general astronomical concerns were responsible for the placement of Greek temples, the equinoxes seem to be the most likely candidate.” Looking more closely at the possible equinoctial data, she sees indications of a displacement toward the time when day and night was of equal length, possibly reflecting the cosmological importance of the equality of day and night in Greek religion.

Hannah provides another perspective on Greek astronomy. His discussion of stars and constellations addresses the broader historical question of “why did the Babylonians and Greeks . . . populate the sky with these particular figures?” Drawing on a wide range of textual material from these cultures, he contrasts the Greek constellations, in which adjacent constellations were actors in mythological stories, with the Babylonian ones, which lacked such mythological connections. He then sketches out the usefulness of such connected groups of constellations for navigation, agriculture, and ritual. He sees the need to establish a calendar to synchronize nature and agriculturally focussed religious rituals as a possible driving force in the development of star calendars. A brief, preliminary, study of Euctemon’s Fifth Century BCE parapegma suggests that by that time the relation of the constellations could be established by calculation, not merely by observation.

Adjacent constellations and Greek mythology take a surprisingly new role in Norris and Norris’s study of the Pleiades and Orion. They find very similar accounts of the Pleiades as seven girls being chased by a man associated with the constellation Orion in both Greek mythology and Australian Aboriginal folklore. If these stories have a common origin, it must date back some 100,000 years to the emigration of the ancestors of the Greek and Aboriginal Australian cultures from Africa. This has astronomical consequences; due to proper motion of the component stars, the Pleiades looked slightly different 100,000 years ago. In particular, at that time there were seven perceptible stars. Since a lost seventh sister is present in many cultures’ stories of the Pleiades, the authors suggest this theme reflects the great historical depth of this mythological tradition.

The final case study considers the mathematically focused astronomies of Mesoamerica. Iwaniszewski examines the relation between Maya lunar concepts expressed in the eclipse table of the Dresden Codex and the lunar series recorded in monumental inscriptions. He takes as a reference an inscribed record of a possible solar eclipse dated 9.17.19.13.16 5 Kib 14 Ch’en (July 790) that was recorded on Stela 3 at Santa Elena Poco Uinic. Analysis of these written records revealed the similar, but subtly different concepts used in these approaches. The Eclipse Tables incorporated a well-defined body of knowledge, including a regular lunar period of 5 or 6 lunar months, while the inscriptions recording a Lunar Series reflected locally defined concepts for establishing the current age of the moon, the number of days in the current month, and the place of that month in a 6 month “bundle” of lunar months.

As Iwaniszewski concludes, “Concepts regarding the lunar cycle ... represent a particular point of view that is embedded in social networks and relationships with the surrounding world, rather than in a fixed body of current knowledge.” If we draw an overarching theme from the case studies discussed here, it is that a culture’s astronomy reflects the diverse ways people interact with the heavens.

## References

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