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*Astronomy, Weather, and Calendars in the Ancient World: Parapegmata and Related Texts in Classical and Near Eastern Societies* by Daryn Lehoux

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In *Astronomy, Weather, and Calendars in the Ancient World*, Daryn Lehoux offers a comprehensive look at the interplay between *parapegmata* and the often eclectic astrometeorological and calendric traditions of the Classical and Ancient Near Eastern worlds. The primary objective is to show how these traditions developed over time and explore the sources that they drew upon.

The book is largely addressed to a general audience with little technical experience in astronomy or the *parapegma* tradition. It includes a balanced amount of introductory material (explaining, for example, what is meant by the rising and setting of fixed stars) and extensive footnotes pointing the interested reader in the direction of both more specialist treatments and alternative arguments. The book is divided into two sections. Part 1, ‘*Parapegmata* and Astrometeorology’ consists of seven chapters that constitute the body of the discussion, while part 2 ‘Sources’, making up roughly two-thirds of the book’s total size, presents the text and translation of extant *parapegmata*, as well as a number of handy cross-referenced tables.

The somewhat oblique chapter headings in part 1 (‘The Rain in Attica Falls Mainly under Sagitta’, ‘Spelt and Spica’) are supported by useful and descriptive subheadings—highlighting the strength of the book as a reference work. Chapter 1 outlines the astronomical origins of weather prediction and introduces us to both literary and inscriptional *parapegmata*. Chapter 2 explores the important relationship between fixed-star astronomy and agriculture, and how the need for the accurate timing of seasonal events spurred the development of increasingly accurate solar calendars. The presence of

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regulated solar calendars led, in turn, to a change of emphasis in later Roman *parapegmata*. Chapter 3 is concerned with the use of fixed-star phases as ‘signs’, and whether these were actually observed on a regular basis after the initial ordering and calibration of *parapegmata* had taken place. Lehoux contends that regular observation was, in fact, unlikely. Chapter 4 addresses various calendrical cycles and how they relate to the development of *parapegmata*. Chapters 5 and 6 look at Babylonian and Egyptian material respectively, in search of possible Near Eastern origins or influence. Chapter 7 draws together the various discussions and concludes that ‘ancient systems of astronomical weather prediction relate to calendrical systems in fairly complex and diverse ways’ [143]. That there exist seemingly related elements of the *parapegma* tradition in the apparently independent traditions of Egypt, Mesopotamia, and Greece should come as no surprise owing to the universal need to regulate agricultural, navigational, and political events across cultures.

The sources presented in part 2 provide an invaluable resource for those interested in ancient calendars, time-keeping, and *parapegmata*. The first section catalogues the *parapegmata* under types (astrometeorological, astrological, astronomical, and so forth) and provides a brief description of each. The second section provides a translation of all extant *parapegmata* (excluding the farming manuals of Varro and Pliny, for example).<sup>1</sup> The first of two appendices documents authorities cited in *parapegmata*, while the second provides a handy table of correspondence between Lehoux’s catalogue and those of Rehm and Degraasi. As well as a comprehensive general index, there is also an astrometeorological index which allows the interested reader to locate references to such diverse subjects as ‘heat’, ‘Meton’, and ‘Hyades’ in the extant *parapegmata*.

Many interesting points are addressed in this book, and the author pays special attention to the varied use of predictive texts within different cultural contexts. An analysis of the Greek and Roman construction and use of *parapegmata* shows clearly that the universal goal of prediction is adopted and adapted to changing needs and technologies. Lehoux asserts that although in many cases the Greek

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<sup>1</sup> Greek or Latin is included in many cases unless, as the author notes, ‘a specific text will be on the bookshelf of the average classicist or of a moderately good university library’ [217n1].

astrometeorological material is ‘preserved, reworked, and augmented’ in the Roman tradition, there remain fundamental differences [28]. Where the Greek literary *parapegmata* tend to exist as entities in their own right—whether as a stand-alone text (Ptolemy) or as a dedicated section in a longer work (Geminus)—Roman authors tended to intersperse this information throughout works dedicated to much else besides—usually with an agricultural theme (Pliny, Columella). Lehoux sees in this a peculiarly Roman curiosity in not just tracking the various calendric, astrometeorological, astrological, and cultic cycles, but in understanding the fundamental relationship *between* these cycles. The Roman agricultural writers were committed to what Lehoux calls an *intercyclical approach* to periodic phenomena.

In the astrometeorological *parapegmata*, the stars act as signs for weather prediction. The extent to which these signs relate to actual observation, however, is an issue that Lehoux puts under serious scrutiny. He believes that despite the fact that ancient authors explicitly emphasize observation,<sup>2</sup> *parapegmata* ‘became a locus of authority that *canonized* the timing and sequence of the stellar phases and weather’ [55]. Observation is thereby made redundant as the *sign* moves from the observed phenomena to the text, table, or instrument—what Lehoux calls the ‘sign-in practice’. Indeed, Lehoux maintains that the day-to-day observation of stellar phases is entirely impractical in an agricultural context as most of the meteorological phenomena (e.g., rain, storms) clearly make it impossible to view the stars! A certain degree of interpolation based on observation under clear skies would be necessary. Lehoux asserts, however, that provided the peg was moved every day (or the calendar date known) even this observation is unlikely. He does concede that observation could be used to calibrate the *parapegmata* but seriously downplays this point to the extent that Ptolemy and Sextus, despite their insistence on observation, are seen as *deliberately suppressing* the shift from observable stellar signs to observing markers in the *parapegma*-tradition [69].

Overall, the author has presented a lucid and well-researched survey of the various astronomical, calendrical, and meteorological traditions from which the *parapegmata* and related texts develop. The detailed footnotes make it ideal for those with a casual interest in

<sup>2</sup> At least of the ‘foundational’ variety.

the subject, while the catalogue of extant *parapegmata* make it an essential one-stop reference for the specialist.