ideal reader is probably someone who already knows a good deal about the Meinels and the projects to which they contributed, and who would perhaps have enjoyed being the reviewer more than I did.

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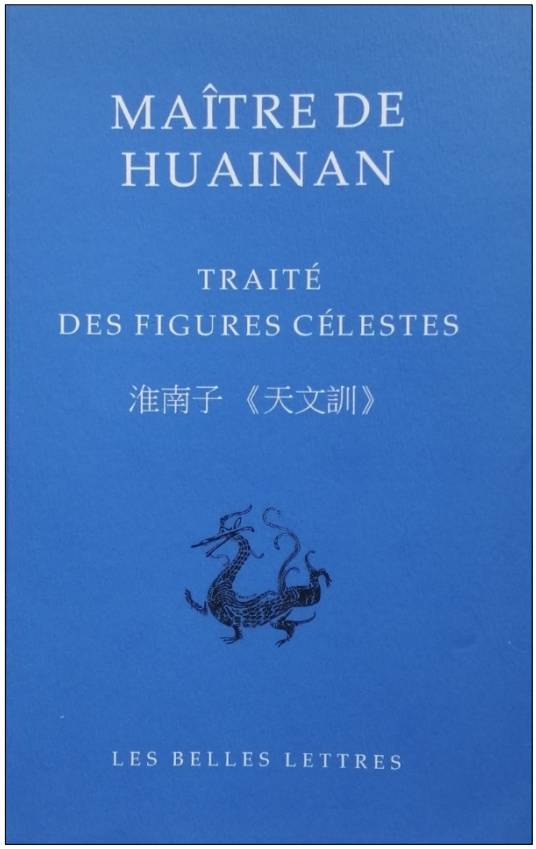
***Maître de Huainan: Traité des Figures Célestes* 淮南子《天文訓》, Texte introduit, traduit et commenté par Marc Kalinowski. (Bibliothèque Chinoise, Les Belles Lettres, 2022). Pp. clxxii + 300. ISBN 9782251453729 (hardback), 127 × 194 mm, €55.**

The Chinese work entitled *Huainanzi* (*Master of Huainan*) is an exceptional document of ancient Chinese literature. Precisely dated to the year 139 before the common era (139 BCE), it is known to have been composed by a large college of eminent scholars gathered under the direction of Lui An, Prince of Huainan, hence the name of the work. Liu An (179–122 BCE) was the uncle of Emperor Wu of Han and the work was officially presented to the Emperor and was specifically intended for him.

Although replicating some elements of previous and contemporary works, it appears very different in its form and content. It is an impressive synthesis, unprecedented and never reproduced, associating philosophy, politics, poetry and science in a dense and concise work.

The material is so esoteric and puzzling that until very recently there was no comprehensive non-Asian language translation. The first one was produced by Le Blanc (2003) with the publication of the complete translation into French in the prestigious 'La Pléiade' Collection (Gallimard), and the second in English under the direction of John Mayor (2010). The eclectic character of the work gives it a particularly attractive modern aspect which has largely contributed to its recent rediscovery in Europe and North America. The fatal destiny of the main author, Lui An, driven to suicide after a conspiracy accusation, also contributed to the legend of the work.

The text as a whole refers to multiple aspects of traditional Chinese culture as it was developed under the Han (202 BCE–220 EC) and is very strongly tinged with Taoist concepts already present in classic works such as the *Dao De Jing* (道德 经) and the *Zhuangzi* (莊子)(c. fourth century BCE). In its current version, it is structured in 21 chapters dealing with a large range of topics ranging from philosophy and metaphysics to astronomy, geography and music. It is so dense and so complex that until now it has been common to produce entire books devoted only to one or a few of its chapters, accompanied by a paraphernalia of commentaries and explanations to allow understanding for a modern reader.



In *Maître de Huainan: Traité des Figures Célestes*, Marc Kalinowski, a world-renowned specialist in divination practices and astronomy in ancient China and a Professor of Ancient Chinese History and Thought at the École Pratique des Hautes Études (EPHE-Paris), offers the complete translation in French of Chapter 3 of the *Huainanzi* with detailed commentaries.

This chapter is of particular importance because of its scientific content, an aspect often largely overlooked by sinologists. As the author underlines:

> *Les Figures célestes* is indeed the first writing on knowledges relating to the celestial sciences in the literature

> transmitted before the [calendar] reform of the year 104 BCE" (p. XLIX).

In his translation and comments, the author takes remarkable care in explaining these scientific concepts and revealing their importance and interest.

The book is divided in three major parts. The first part is the 'Introduction', a dominant contribution (more than one third of the book), devoted to explaining the general context and specific and technical concepts essential for the understanding of the Chinese text. The central part *Les Figures Célestes* is the full translation of the Chapter 3 of *Huainanzi*, nicely presented in pages face to face with the Chinese version opposed to the French text. The Chinese text, originally written linearly without punctuation or division, is organized here into 102 paragraphs grouped into six sections: *Cosmologie – Astres et Divisions Célestes – Le Soleil, La Lune et Le Calendrier – Harmonie Calendaire – Le Grand Yin: Usage Calendaires – Gnomonique et Dimensions du M onde.* The last part of the work 'Commentaries' (again one third of the book) is a detailed explanation of the contents, mainly devoted to cosmology and astronomy.

One can legitimately wonder here about the need for a new translation but the answer is straightforward. History of science in China is in constant revolution. The recent economic boom has brought new tools and human resources to dig efficiently into the past and every decade now shows a multitude of archaeological discoveries of tremendous importance.

To cite but a few examples: the *Huainanzi* (139 BCE) has been supplemented by astronomical documents from the famous *Mawangdui* Silk book (168 BCE) discovered in 1974 as well as astronomical texts and instruments dating to 220 BCE found in the Fangmatan site in 1978. Even more recently, a profusion of written texts on bamboo slips have been unearthed. Among them, documents called 'rishu' (日书-day books) were found to carry much important calendar information. An illustrative example uncovered in 1990 is shown in Figure 9 (page XCVII). Other slips found in 2018 in Jingzhou (Hubei) and dated 170 BCE show the first mention of the traditional Chinese 'Five agents' classification (Wuxing -五行). As underlined in the text:

> The first-hand data provided by the unearthed calendars redirected the debates in other directions, rendering many of the assumptions made until then obsolete. (p. LV).

The work provides therefore a very stimulating update. Let us just imagine if we could discover today in Europe authentic copies of ancient Greek works of Euclid or Hipparchus that presently only exist as largely corrupted IXth century versions!

This book therefore beautifully illustrates the fascinating on-going work in Chinese history of science. Apart from using the most updated documents, there is also a considerable effort in the book to clarify intricate notions such as the calendrical cycles and the Chinese planetary theory. Very useful tables are provided, such as the comparison of the synodic and sidereal periods for the five naked-eye planets quoted in different documents ranging from 168 BCE to 90 EC, showing accuracy mostly better than 1% (p. 73).

A very complete bibliography (in Chinese and European) and a useful Index are found at the end. There are only minor defects concerning the structure of the book. It is always surprising to see the persistent use of awkward Roman numerals to number pages in the Introduction (this seems to be a convention among historians) so overall there are no sequential page numbers. It is also strange to find the list of chronological markers and figures and tables placed in the middle of the book and not at the end.

The author has worked with as many as seven different editions, including the earliest printed version of 1194 EC, to build this beautiful synthesis about a cornerstone of the Chinese literature that best describes

> … the appearance in the 4th century BC of a philosophical naturalism based on the idea of unity and internal cohesion of the order of nature and society. (p. XXIII).

Though the text is obviously more naturally oriented towards specialists, the talent and explanatory pedagogy of the author makes the content of great interest for a more general audience, who will certainly draw from it a complete overview of the complexity and richness of ancient Chinese philosophy.

References

Le Blanc, C., and Mathieu, R., 2003. *Huainanzi, Philosophes Taoïstes*, *Tome II, "La Pléiade"*. Paris, Gallimard.

Major, J.S., Queen, S.A., Meyer, A.S., and Roth,

H.D., 2010. *The Huainanzi*. New York, Columbia University Press.

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Uranus and Neptune, by Carolyn Kennett. (London, Reaktion, 2022). Pp. 214. ISBN 978-1-78914-641-7 (hardback), 175 × 225 mm, US$40.

Like other books in the Solar System series being published by Reaktion (which, in the interests of full disclosure, includes my own book *Asteroids*), this one is geared to the non-professional reader who wants a compact no-nonsense study of each of the planets (there are also volumes on the Sun and the Moon). In this, Kennett's book largely succeeds.

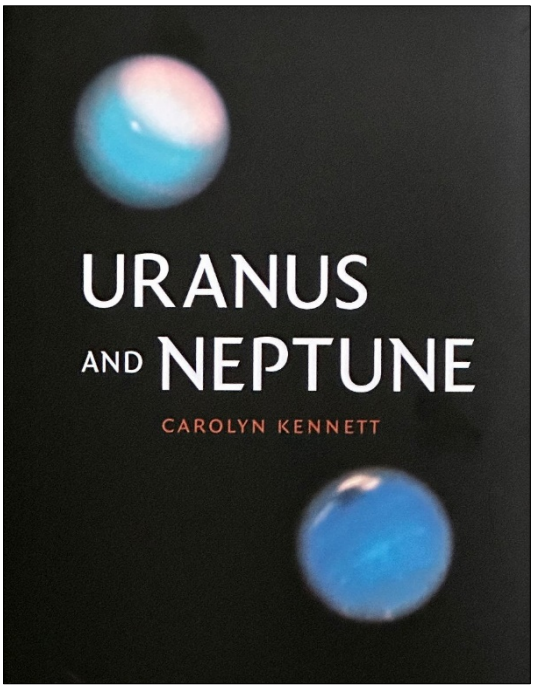
Since so little is known of the ice giants Uranus and Neptune, they have been considered together in this book. In each case Kennett devotes chapters to their discovery and early study, followed by a look at both Voyager spacecraft and post-Voyager studies, and finally the moons surrounding each planet. A chapter on how citizen scientists can observe these distant objects concludes the book, along with excellent appendices on basic data about the planets, their rings and satellites.

Despite its strengths, this book has serious issues. The author has not taken advantage of the most updated research, which could have included everything up to the year 2021, the date of the most recent reference in the book. Overall, the book includes very few references to any scientific literature more recent than 2015, and even relevant historical points are ignored. For example, discovery of the resonance nature of the rings of Uranus, and the prediction of new Uranian satellites by Aleksei Fridman and Nikolai Gor'kavyĭ in 1986, are not mentioned. This was not just hidden in an obscure Russian journal, but was published in a book by Springer (Fridman and Gor'kavyĭ, 1999).

In a discussion of Neptune's moon Triton, Kennett relies entirely on old Voyager data. But Zalucha and Cook (2019) state:

> Using radio occultation experiments (not conducted by *Voyager 2* at Triton), *New Horizons* confirmed the existence of a stratosphere (temperature increasing with height) extending to 25 km altitude.

There is no mention of the stratosphere in her section on Triton. And if one looks in the Index for *New Horizons*, one finds (among others) a listing for it on page 30; unfortunately, there is no mention of *New Horizons* on that page. When Voyager radio results are reported, Kennett writes "Voyager 2 was occultated by the planet Uranus …" when occulted was meant (page 48). Kennett does mention the *New Horizons* flyby of Pluto, which includes this unfortunate statement: "The striking images received from *New Horizons* caused astonishment among hardened scientists." (p. 67). Hardened scientists? Really?



There are several problems with the illustrations (which are generally quite informative and include many beautiful colour images of Uranus and Neptune). On page 75, we are given a half-page image of a Solar System map dating to 1841. The caption reads "Drawing of the solar system in which Uranus (still called Herschel) has six small satellites." In the image, which is 155 mm wide, the sketch of Uranus and its moons is 1 mm across. Even with a magnifying glass I had to use some imagination to see the six moons, some of which were the 'spurious moons' mistakenly identified by William Herschel. While quoting some authors who mentioned the spurious moons in the nineteenth century, Kennett offers no references to any historical study of them, including the