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**Antonio Panaino, A Walk through the Iranian Heavens: Spherical and Non-Spherical Cosmographic Models in the Imagination of Ancient Iran and Its Neighbors. Leiden and Boston: Brill, 2021. Pp. 220. €69. ISBN 978-1-949743-14-2 (Hbk).**

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Antonio Panaino is an Italian historian born in 1961 and has a Ph.D. in Iranian Studies from the University of Naples “L’Orientale”. Currently, he is a Professor of Iranian Studies at the University of Bologna. His area of expertise is pre-Islamic Iranian Studies and Iranian religious history and linguistics, with a special emphasis on Avestan and Mazdaean literature and intercultural connections between East and West.

His monograph, ‘A Walk through the Iranian Heavens: Spherical and Non-Spherical Cosmographic Models in the Imagination of Ancient Iran and Its Neighbors’ was originally published by the Jordan Center for Persian Studies from the University of California “Irvine” in 2019, after which Brill published it in 2021 as the ninth volume of their Ancient Iran Series. The work’s principal theme is a closer explanation of Iranian cosmography and its chronological evolution, with a clear emphasis on many scholars’ methodological mistakes. As the title implies, the author tries to find interconnectedness between the cosmographical and cosmological ideas of the ancient Iranian populace and their neighbors.

In the first chapter, the author explores the idea of methodological correctness in the study of Iranian cosmography by acknowledging the possible mistake of imposing a Western understanding, which is derived from Greek thought and their idea of the sphere. *Σφαῖρα* is nonexistent in Akkadian or Babylonian sources; “The Three Stars Each”, the oldest Mesopotamian star catalogue, only has references to the “Cattle Pen” (*tarbaṣu* in Akkadian; *TÙR* in Sumerian) in which stars are represented as cows and planets as sheep. Prof. Panaino argues that the Sumerian *TÙR* can be seen only as a

circular, not as a spherical object. There we can introduce ourselves to the term circularity which is often by mistake equalized with sphericity.

The next chapter, 'The Ancient Iranian Witness', is dedicated to the Iranian understanding and imagining of the sky above them, after the author tried in brief notes to explain understanding Indian, Mesopotamian, and Chinese cosmographical thoughts. The author deduces two Iranian ideas by a careful reading of the Mazdaean myths. First is that of the celestial chariot occurring in Yašt, a collection of hymns recorded in the Avestan language, where Earth is introduced as circular: 'I (demon *Snāuuiōka*; author's note) am an adolescent, not an adult. If I could become an adult, (then) I shall use the earth (as) a wheel, I shall use the sky (as my) chariot' (p. 33). The second is that of the egg, which leads us to the notion of a concave sky that covers the Earth, found again in Yašt: '*...I (Ahura Mazdā; author's note) have held apart, o Zoroaster, younder sky which (is) above, shining, transparent, which surrounds all around this earth, as it were a bird (around) an egg...*', but Prof. Panaino is critical of identifying the aforementioned notion with the sphere (pp. 39-41).

The third chapter is devoted to the etymology of a name present among ancient Iranians – *Spiθra(i)dátēs* (in the Greek sources *Σπιθρα(ι)δάτης*) – giving readers a brief scientific overview of philological thought on the subject. The author succeeded in showing the audience different scholars and their role and significance in exposing ancient Iranian ideas. The debate can be simplified if it is presented as a conflict of opinions about the meaning, usage, and origin of the word *spiθra* – was it always a borrowed Greek word *σφαῖρα*, or was it used in the context of the color white? The author explains that: 'Old Iranian \**spiθra-* can be easily explained from Indo-Iranian \**ćuitrá-* "white," so that its semantic interpretation as "heavens," or even "sphere," remains highly uncertain...' (p.44). Prof. Panaino concludes the chapter with the acceptance of the theory that it's illogical to believe that *spiθra* would be used for determination of the sphere before a greater Greek influence which can be seen in the late post-Achaemenid period of Iranian history.

The fourth chapter, 'The Ancient Iranian Cosmography and its Evolution' can be seen as the main part of the reviewed monograph. Using myths found in Avestan and Persian sources (*Yasna*, *Yašt*, *Bundahišn*, *Dādestān ī Dēnīg* – primary sources of religious nature), he paints a picture of the evolution of cosmographic thought from the understanding of the Earth as a circle and the heavens as quadrangular to a spherical understanding. Great attention is paid to the etymology of words that appear as determinants for the categorization of the heavens and the stars. One great example is the author's explanation of correlating clouds to the sky with a parallel to the English language that is built upon conclusions of authors such as H. Bjorvand, Fr. O. Lindeman, C. D. Buck, M. L. West, and R. Lazzeroni:

'The use of a word meaning "cloud" in order to describe the heavens is not isolated, and it corresponds to the English adoption of the word "sky," which derives from an Old Norse term for "cloud." Neither *diiu-* nor *asman-* (sky; author's note) appear in Old Avestan; on the contrary, they appear only in Young Avestan literature, where *diiu-/diiu-*, m. (cf. Ved. *dyáv-/dív-*, m./f.) is only a hapax legomenon, preserved as a fossilized form in the, so to say, "permafrosted" expression [...] *patat diiaoš* "(Anra Mainiiu) fell down from the sky".' (p.56).

One conclusion of this chapter is that Iranian thought was under the influence of the Mesopotamian idea of a threefold sky (present in *Yasna* and *Yašt* among other pieces of Avestan literature and *Dādestān ī Dēnīg*, Mazdaean source) and earlier Indo-Iranian concepts. The Ionian philosophical school was well acquainted with this Iranian cosmographical idea.

The next chapter is dedicated to the cosmogonic and cosmological source written in the Pahlavan language - *Bundahišn* and the celestial organization presented in it. Ahura Mazdā created the celestial sphere and put on it fixed stars, twelve Zodiacal constellations, and several lunar mansions, also he: '*Ohrmazd established this sphere like the year: the twelve constellations fixed on it were directly compared with the twelve months*' (p.102). In *Bundahišn* it is written that the spheres of

those stars were like a spinning wheel – the notion of the spheric celestial organization is here lost. The author points out the problem of the emergence of such a vision - it is greatly influenced by the Greek (Ptolemaic) spherical understanding, but older Avestan elements that are non-spherical continue to appear (that of the wheel). The multidisciplinary nature of the work is best presented here - the author uses astronomical, philosophical, and linguistic knowledge to clarify ancient Iranian thought that has encountered foreign influences and thought currents. An excellent example of this is his candid and short representation of the reception of Ptolemy's model of heavens and circular motions of celestial objects among Aristotelians and later philosophers and astronomers - until Copernicus.

In the final chapter, 'First Conclusions and Further Problems', Professor Panaino presents the most basic conclusions of his monograph in a few pages. Pre-Islamic Iran has been open to external intellectual influences, especially since the time of the Achaemenids, and they have sought a compromise between external thought currents with their own. The other key element of the chapter in question is his suggestions about the next possible historiographic steps on the path of a deeper understanding of Iranian intellectual history – Prof. Panaino thinks that Aristotelian thought in the Ancient East should be reconsidered, as well as its relation to Neoplatonism. Both of the aforementioned philosophical currents were present in Iran, so the author share with his readers a new problem: Mazdaean stance on the eternity of God's creation and their place in the 'intellectual fight' between Aristotle and Philoponus.

Panaino's monograph is a highly specialized informative work that no doubt requires a thorough knowledge of various elements of Achaemenid and Sassanid cultural history in order to understand. It is by no means entry-level work. In essence, it is very successful in its intention to show the conflict between spherical and non-spherical cosmogony and cosmography in ancient Iranian thought. It offers a depiction of Mazdaean mythology and in the spirit of his striving for interconnectedness - he does not hesitate to raise some questions in the domain of Greek philosophy. However, the author's multidisciplinary approach, generally well implemented, makes greater

deviations from the main flow of thought in a few places which can be confusing at times.