Contextualizing Astrology in the Islamic Tradition

Philosophical Foundations and Celestial Influences*

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Abstract

This paper examines the theoretical foundations of astrology within the Islamic intellectual tradition, with a particular focus on the adaptation and transformation of Aristotelian cosmology through key texts and figures. It analyzes the *Ghāyat al-Ḥakīm* (Picatrix) and *Fī l-tadbīrāt al-falakiyyah*, attributed to Alexander of Aphrodisias and adapted by the circle of al-Kindī, tracing their role in the conceptual development of astrology as a science. The study investigates how al-Kindī, his intellectual circle, and Abū Maʿshar al-Balkhī contributed to the integration of astrology within a broader philosophical and theological framework, emphasizing the cosmological and providential roles of the heavenly bodies. By contextualizing the influence of Baghdad as a centre of translation and synthesis, the paper highlights the gradual development of astrological thought that later found resonance in 10th-century al-Andalus. The analysis revisits the notion of the 'astrologization of the Aristotelian cosmos' and examines the relationship between astrology, providence, and human free will, offering new insights into the ways medieval Islamic scholars reconciled celestial influence with metaphysical doctrines. Ultimately, this paper situates astrology within the broader trajectory of medieval Islamic philosophy, shedding light on its epistemological and practical dimensions.

Key Words

Astrology; Al-Kindī; cosmology; Alexander of Aphrodisias; Ptolemy; Ghāyat al-Ḥakīm; astrologization of the Cosmos; Abū Maʿshar Al-Balkhī

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> In the creation of the heavens and the earth and the alternation of the day and night there are signs for people of reason
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> *Qurʿān* 3:190

I. *Cosmology in Context: Between 9th-century Baghdad and 10th-century al-Andalus*

Despite the significant spatial and temporal gap between the *Ghāyat al-Ḥakīm* (*The Aim of the Wise*), known in the Latin West as *Picatrix*, and the short treatise *Fī l-tadbīrāt al-falakiyyah* (*On the Governments of the Spheres*), attributed to Alexander of Aphrodisias (2nd–3rd century AD), several common elements can be identified when the latter is taken as a point of reference.[1] This treatise is, in fact, a translation and adaptation, produced within the circle of al-Kindī (3rd century H/9th century CE), of Alexander's *Περὶ προνοίας* (*On providence*). It explores not only the concept of divine governance and the mediating roles attributed to the heavenly bodies but also the arrangement of the cosmos in terms of God's creation and providence.

[1] This paper represents a further development of a discussion that followed my contribution to the 27th annual Colloquium of the S.I.E.P.M. (Société Internationale pour l'Étude de la Philosophie Médiévale), held in Trento. I had the honor of presenting a talk on the theoretical relationship between the *Ghāyat al-Ḥakīm* (*The Aim of the Wise*), i.e., *Picatrix*, and the *Fī l-tadbīrāt al-falakiyyah* (*On the Governments of the Spheres*), attributed to Alexander. The proceedings of the colloquium will be published shortly. Cf. Giulio Navarra, « Alexander of Aphrodisias and the Influence of the Stars: 'Arabic Aristotelianism' as Metaphysical Foundation of Astrology and the Practice of Divination », in *27th Annual Colloquium of the S.I.E.P.M.* (*Société Internationale pour l'Étude de la Philosophie Médiévale*) *'Medieval Debates on Foreknowledge: Future Contingents, Prophecy, and Divination', Trento (Italy), 12–15 September 2023*, Brepols (forthcoming). The publication of my PhD dissertation consisting of the first Arabic edition, English translation and an analytical introduction of the Kindī-circle Alexander's *Fī l-tadbīrāt al-falakiyyah* is forthcoming. The manuscripts preserving the *Fī l-tadbīrāt al-falakiyyah* are two: ms. El Escorial Árabe 798, fol. 77b–82b (= E), and ms. Istanbul, Süleymaniye Kütüphanesi, Millet-Carullah 1279, fol. 51a–53a (= C). The Escorial manuscript is more reliable. An earlier edition, which does not distinguish between the two Arabic translations of Alexander's *Περὶ προνοίας*, is in: Hans-Jochen Ruland (ed.), « Die Arabischen Fassungen von zwei Schriften des Alexander von Aphrodisias Über die Vorsehung und Über das liberum arbitrium », PhD Dissertation, University of Saarland, 1976. Other editions based on Ruland's: Silvia Fazzo, Mauro Zonta (eds.), *La Provvidenza. Questioni sulla provvidenza*, BUR, Milano, 1998; Pierre Thillet (ed.), « Un traité inconnu d'Alexandre d'Aphrodise sur la Providence dans une version arabe inédite », in *L'homme et son destin d'après le penseurs du Moyen Âge. Actes du Ier Congrès International de Philosophie Médiévale*, Nauwelaerts, Louvain – Paris, 1960, p. 313–324 (new edition by Thillet in: *Alexandre d'Aphrodise, Traité de la Providence. Περί προνοίας. Version arabe de Abū Bišr Mattä Ibn Yūnus*, Éditions Verdier, Lagrasse, 2003). For the circle of al-Kindī, fundamental are: Gerhard Endress, « Die wissenschaftliche Literatur », in Helmut Gätje (ed.), *Grundriß der arabischen Philologie. Bd. II: Literaturwissenschaft*, Ludwig Reichert Verlag, Wiesbaden, 1987, p. 400–506; Id., « The Circle of al-Kindī: Early Arabic Translations from the Greek and the Rise of Islamic Philosophy », in Gerhard Endress, Remke Kruk (eds.), *The Ancient Tradition in Christian and Islamic Hellenism. Studies on the Transmission of Greek Philosophy and Sciences dedicated to H.J. Drossaart Lulofs on his Ninetieth Birthday*, CNWS publications, Leiden, 1997, p. 43–76.

Both aspects are essential to *Fī l-tadbīrāt al-falakiyyah* and serves as critical backdrop to the development of Islamic astral sciences.

Indeed, these two works were composed in different contexts: 9th-century Baghdad for the *maqālah* of the Kindī-circle, and 10th-century al-Andalus for the composition of the *Ghāyat al-Ḥakīm*.[2] As is known, Maslama b. Qāsim al-Qurṭubī (d. 353 AH/964 AD), the learned scholar supposed to be the author of the *Ghāyat al-Ḥakīm*, travelled from Cordova to the Eastern Islamicate world, visiting Baghdad, before returning to al-Andalus. During his travels, he acquired vast knowledge in *ḥadith*, philosophy, mysticism and occult sciences.[3] Consequently, Baghdad and al-Andalus were deeply connected as routes of knowledge exchange.

Central to the exploration I propose here is Gad Freudenthal's thesis of the 'astrologization of the Aristotelian cosmos',[4] which suggests a significant shift in the medieval reception of Aristotelian cosmology, characterized by an increasing emphasis on celestial influence. This shift can be viewed from the perspective of: (a) the new centrality given to the heavenly realm as intermediary in Creation and God's governance (providence) over the sublunary realm; and (b) the role of heavenly bodies as 'mediators', 'causes', or 'indicators' of earthly events; thus, (c) the foundational role of meteorology for astrology.

In this contribution I will attempt to deepen this perspective by connecting the two aforementioned texts through a few threads: Ptolemy's conception of the stars and planets in his *Tetrabiblos* (*Apotelesmatika*); the foundational cosmology found in the astrological works of 'the first philosopher of the Arabs', Abū Yūsuf Yaʿqūb ibn Isḥāq al-Ṣabbāḥ al-Kindī (d. 256 AH/870 AD circa); and the teachings of the most prominent astrologer of medieval Islam, Abū Maʿshar Jaʿfar b. Muḥammad b. ʿUmar al-Balkhī (d. 271 AH/886 AD), who was a direct pupil of al-Kindī. These interwoven themes connect 9th-century Baghdad and 10th-century al-Andalus. Moreover, this connection illustrates how the 'astrologization of the Aristotelian cosmos' unfolded within Islamic thought and its Latin reception.[5] The core

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[2] Cf. Maribel Fierro, « Bāṭinism in Al-Andalus. Maslama b. Qāsim al-Qurṭubī (d. 353/964), Author of the *Rutbat al-Ḥakīm* and the *Ghāyat al-Ḥakīm* (*Picatrix*) », *Studia Islamica*, 84/2 (1996), p. 87–112. See also: Godefroid de Callataÿ, Sébastien Moureau (eds.), « Again on Maslama Ibn Qāsim al-Qurṭubī, the Ikhwān al-Ṣafā'and Ibn Khaldūn: New Evidence from Two Manuscripts of the Rutbat al-ḥakīm », *Al-Qantara: Revista de Estudios Arabes*, 2/37 (2016), p. 339–372.

[3] Fierro, « Bāṭinism in Al-Andalus », p. 87–92.

[4] Gad Freudenthal, « The Medieval Astrologization of the Aristotelian Cosmos: From Alexander of Aphrodisias to Averroes », in *Mélanges de l'Université Saint-Joseph*, 59 (2006), p. 29–68; Id., « The Astrologization of the Aristotelian Cosmos: Celestial Influences on the Sublunar World in Aristotle, Alexander of Aphrodisias, and Averroes », in Christian Wildberg, Alan C. Bowen (eds.), *New Perspectives on Aristotle's* De Caelo, Brill, Leiden – Boston 2009, p. 239–281.

[5] Ibn al-Nadīm, *Fihrist*, ed. Gustav Flügel, Vogel, Leipzig 1871–1872, p. 277.1–8; Peter Adamson, « Abū Ma'šar, Al-Kindī and the Philosophical Defence of Astrology », *Recherches de théologie et philosophie*

questions that led to this shift and the reformulation of cosmology in Abrahamic terms include: (i) What kind of science is astrology, that is, what study we need to predict future events? (ii) How do the heavenly bodies govern and influence human life and events on Earth? (iii) How is this Aristotelian cosmos re-structured to preserve the absolute separateness of God (i.e., the First Cause), His absolute will and providence? (iv) How far does the influence of the heavenly bodies on human actions extend? Is there astrological determinism, or does it allow for human free will?

II. *Astrology as a Science and Art*

Astrology has historically been conceived as both a science and a divinatory art, particularly since its scientific formalization in the Hellenistic world. Rooted in Ptolemy's *Tetrabiblos*, this divinatory practice allowed astrologers to forecast future events by interpreting heavenly signs and the dispositions and configurations of the stars and planets.[6] However, in the medieval Arabic-Islamic world, astrology underwent an unprecedent transformation, characterized by a high degree of mathematization, which distinguished it from earlier traditions. Islamic scholars not only preserved but also expanded upon Hellenistic astrological concepts, incorporating advanced mathematical techniques and developing sophisticated instruments to enhance their predictive accuracy.

As a prognostic science grounded in mathematical astronomy, the 'science of the stars' has historically been divided into two main areas: (i) the mathematical study of the positions and movements of the stars in relation to each other and to the earth (i.e., astronomy), and (ii) the divinatory art related to the heavenly signs whose interpretations allow the astrologer to predict the future (i.e., astrology in the strict sense).

More specifically, it was Ptolemy (100–170 AD circa) who distinguished between mathematical astronomy as the astronomical prediction of the movements and relationships of the heavenly bodies (e.g., the times of equinoxes, eclipses, or planetary conjunctions) and astrological prediction of future events

médiévales, 69/2 (2002), p. 245–270. Cf. CHARLES BURNETT, « Agency and Effect in the Astrology of Abū Maʿshar al-Balkh (Albumasar) », *Oriens*, 47/3–4 (2019), p. 348–364; DAVID A. KING, « Astrology », in MICHAEL J.L. YOUNG, JOHN D. LATHAM, ROBERT B. SERJEANT (eds.), *Religion, Learning and Science in the ʿAbbāsid Period*, Cambridge U.P., Cambridge (MA) 1990, p. 290–300, in part. p. 297–298.

6 CHARLES BURNETT, « Ptolemy's Differentiation between Astronomy and Astrology in the Greek-Arabic-Latin Tradition », *Cahiers de recherches médiévales et humanistes - Journal of Medieval and Humanistic Studies*, 47/1 (2024), p. 373–403.

related to birth or the date of conception, or judicial questions, or interrogations.[7] Ptolemy's approach also reflects the view that astrology is closely connected to philosophy, as astrological judgments apply philosophical reasoning to interpret celestial influences and their relationship to earthly events. This dual role positions the astrologer as both a practitioner of divinatory arts and a philosopher engaging with the underlying principles of causation and order in the cosmos.

Indeed, 'genethliac astrology' (casting nativities) provided the basis for the subsequent subdivisions of this art into 'general astrology' or 'astrological history' (forecasting future trends and developments in the community as a whole), 'catarchic astrology' or 'electional astrology' (determining the most beneficial and rewarding moment in time to undertake a venture),[8] and 'interrogatory' or 'judicial astrology' (providing answers to queries posed by a questioner based on the disposition of the heavens at the time of the question). Other forms of astrology ran alongside these as variants, such as 'astrometeorology', 'astral medicine' and 'military astrology'.[9]

As a benchmark of the transmission of astrology from the Hellenic world to the Islamic empire, Ptolemy's *Tetrabiblos* was read and translated not only in the Hellenized Middle East but throughout the entire Mediterranean basin in different languages, becoming the starting point for the debate on astrology's scientific nature and its effectiveness.[10] Ptolemy was aware that astrology lacked a solid scientific foundation as it could not approach demonstrative proofs; according to him, it was clear that astrology was not an apodictic science, at least as Aristotle intended syllogistic demonstrations.[11] Rather, astrology as a divinatory practice is a conjectural science, closer to medicine than to physics. As such, although it is not infallible, this science deserves the highest respect as prognostication, just as medicine does: the course of terrestrial events is not completely determined or ordained by a superior necessary cause, but it can be modified by an external

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7 Ptolemaeus, *Tetrabiblos*, I.1; I.2, ed. Frank E. Robbins, Harvard U.P., Cambridge (MA) – London 1940. In short, prediction of movements and prediction of effects: cf. Burnett, « Ptolemy's Differentiation », p. 373–403, in part. p. 388–394.

8 In the Islamic world, and later in the Latinate, 'catarchic astrology' was composed of three branches, as inherited from the Hellenistic world: (i.) *ikhtiyārāt* (elections, καταρχαί); (ii.) *masā'il* (interrogations, ἐρωτήσεις); (iii.) *taḥāwil al-sinīn* (*revolutiones annorum*). Cf. Rafael Muñoz Jiménez, « Una maqāla astrológica de al-Kindī », *Boletín de la Asociación Española de Orientalistas*, 15 (1979), p. 127–138.

9 For a general view of this field see the entry « Astrology » in *Encyclopedia Britannica*, by Robert A. Gilbert, David E. Pingree (eds.): <https://www.britannica.com/topic/astrology> (published March 2024, accessed June 2024). See also: King, « Astrology », in Young, Latham, Serjeant, *Religion, Learning and Science*, p. 290–300.

10 On Ptolemy's reception in the Middle Ages see the articles in David Juste, Benno van Dalen, Dag N. Hasse, Charles Burnett (eds.), *Ptolemy's Science of the Stars in the Middle Ages*, Brepols, Turnhout 2020.

11 Ptolem., *Tetrabiblos*, I.2.15, ed. Robbins.

independent cause, such as the course of disease, on which a physician can intervene.

Astrology and medicine indeed belong to the same field of prognostics, and Ptolemy adopted anti-determinism to defend astrology as a science: its weakness and uncertainty mark its scientific value.[12] Moreover, the encounter with a bad astrologer, the influence of profit on the astrological response, and even the simple failure or error of the prediction do not diminish the validity of this science but rather show the conjectural nature and the close connection between its two parts.

As a science of the Ancients (*ʿulūm al-qudamāʾ*) and part of the Alexandrian curriculum of study, the *ʿilm al-nujūm* ('science of the stars') entered the Islamic world as a foreign science and reflected the duality of the cosmological tradition in form and contents: it was both mathematical astronomy (*ʿilm al-nujūm al-taʿlīmī*), intended also as cosmography (*ʿilm al-hayʾa*), and judicial astrology (*ʿilm aḥkām al-nujūm*), concerning both the divine upper realm of the cosmos and the lower sublunar world.[13] This entry took place through the translations of Ptolemy's works, writings attributed to Hermes Trismegistus, and other pieces translated from the Hellenic, Indian and Persian astrological traditions.[14] Naturally, Sasanian and Syriac sources directly influenced the Arabic astrological literature during the Graeco-Syriac-Arabic translation movement, with the Persian influence being particularly crucial. Iranian astrologers were prominent among translators and

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[12] Silvia Fazzo, « Alessandro d'Afrodisia e Tolomeo: Aristotelismo e astrologia fra il II e il III secolo d.C. », *Rivista di Stodia della Filosofia*, 43/4 (1988), p. 627–649, in part. p. 635–637. For the Latin context, cf. Giulio Navarra, « From Toledo to the Court of Frederik II. The 'Science of the Stars' and the Human Soul in the 4th *Distinctio* (*De Anima*) of Michael Scot's *Liber Introductorius* », *Bulletin de Philosophie Médiévale*, 65 (2023), p. 35–63.

[13] A reference to this study is in my « Astrology as the 'Queen of the Sciences' in Michael Scot's *Liber introductorius* », *Intersezioni. Rivista di Storia delle Idee*, 44/2 (2024), p. 197–213. Cf. Tzvi Langermann, « Arabic Cosmology », *Early Science and Medicine*, 2/2 (1997), p. 185–213; Fuat Sezgin, *Geschichte des Arabischen Schrifttums*, Bd. VII: *Astrologie, Meteorologie und Verwandtes bis ca. 430 H.*, Inst. für Geschichte der Arab.-Islamischen Wiss., Brill, Leiden 1979; George Saliba, « Islamic Astronomy in Context: Attacks on Astrology and the Rise of the Hayʾa Tradition », *Bulletin of the Royal Institute for Inter-Faith Studies*, 4/1 (2002), p. 25–46; Id., *Astronomy and Astrology in medieval Arabic thought*, in Roshdi Rashed, Joël Biard (eds.), *Les doctrines de la science et l'antiquité à l'âge classique*, Peeters Publisher, Leuven 1999, p. 131–164. See also: Toufic Fahd, « Nudjūm (Aḥkām al-) », in Clifford E. Bosworth, Emeri van Dozel, Wolfhart P. Heinrichs, Gérard Lecomte (eds.), *The Encyclopaedia of Islam*, New Edition, vol. VIII, Brill, Leiden 1995, p. 105b–108b. Cf. Shlomo Pines, « The Semantic Distinction between the Terms Astronomy and Astrology according to al-Birunī », *Isis*, 55/3 (1964), p. 343–349.

[14] Ibn al-Nadīm, *Fihrist*, ed. Flügel, p. 297.12–15; transl. Dodge, p. 638–639. As for the relation between Hermeticism and learned astrology, the *Kitāb ʿarḍ miftāḥ al-nujūm* attributed to Hermes and edited by Alessandro Bausani is particularly noteworthy: Alessandro Bausani, « Il *Kitāb ʿarḍ miftāḥ al-nujūm* attribuito a Hermes: prima traduzione araba di un testo astrologico? », *Atti della Accademia Nazionale dei Lincei. Classe di Scienze morali, storiche e filologiche*, 27/8.2 (1983), p. 83–140.

literati of the ʿAbbāsid period.[15] Furthermore, it is essential to remember that Ḥarrān, a city historically significant for hosting a Neoplatonic school purportedly founded by Simplicius of Cilicia (480–560 AD circa) and other philosophers who sought refuge after Justinian's closure of the Athenian Academy in 529, was not merely an intellectual haven. This city was deeply rooted in ancient astral cults, notably venerating the Moon, which underscores the profound interplay between its philosophical and religious traditions.[16]

Therefore, the translation movement marked a turning point in the history of astrology in the 3rd/9th century, and vice versa, astrology was crucial for the constitution of the ʿAbbāsid caliphate and its cultural policy.[17] This turning point concerns the construction of the astronomical tables, the development of the use of the astrolabe, and the increase in the amount of astronomical data and calculations, but also the elaboration of celestial omens, the interpretation of nativities, and the practice of 'astrological history'. Astrological history, as a specialized branch of judicial astrology, focuses on interpreting celestial influences to understand and predict the rise and fall of religions, dynasties, and the governance of peoples, thereby linking astrology to political and historical narratives. How the upper world affects the lower one was a metaphysical theme related to the study of nature and, in particular during the caliphate of al-Maʾmūn (r. 198 AH/813 CE – 218 AH/833 CE), to the newly introduced Peripatetic physics and its notion of 'heavenly power'.[18]

Medieval Islamic astrologers, such as al-Kindī, Abū Maʿshar, and Abū Rayḥān al-Bīrūnī (d. 440 AH/1048 CE), contributed significantly to this dual approach by integrating astrology with mathematics and philosophy. They expanded

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15 Above all, Māshāʾallāh b. Atharī al-Baṣrī (d. 200 AH/815 AD *ca.*), whose influence went beyond the Islamic world and passed through Latin, Hebrew and the Byzantine Greek, and Abū Ḥafṣ ʿUmar ibn al-Farrukhān al-Ṭabarī (d. 197 AH/813 AD), who is said to be the author, among other works, of an abbreviated version of Ptolemy's *Tetrabiblos*.

16 Tamara M. Green, *The City of the Moon God: Religious Traditions of Harran*, Brill, Leiden – Boston 1992; David E. Pingree, « The Ṣābians of Ḥarrān and the Classical Tradition », *International Journal of the Classical Tradition*, 9/1 (2002), p. 8–35. About this syncretic view on the stars inherited by the Islamic culture: Alessandro Bausani, *Appunti di astronomia e astrologia arabo-islamiche*, Venezia 1997 (I would like to thank the librarians of the Warburg Institute in London for kindly providing me with a copy of this typescript).

17 Dimitri Gutas, *Greek Thought, Arabic Culture. The Graeco-Arabic Translation Movement in Baghdad and Early ʿAbbāsid Society (2nd–4th/8th–10th Centuries)*, Routledge, London – New York 1998; Mirella Cassarino, *Traduzioni e traduttori arabi dall'VIII all'XI secolo*, Salerno Editrice, Roma 1998.

18 Cf. Alexander's *Quaestiones* 1.8 and 2.19 in Robert W. Sharples, *Alexander of Aphrodisias, Quaestiones 1.1–2.15*, Duckworth, London 1992; Id., *Alexander of Aphrodisias, Quaestiones 2.16–3.15*, Duckworth, London 1994. Cf. Silvia Fazzo, Hillary Wiesner, « Alexander of Aphrodisias in the Kindī-circle and in al-Kindī's cosmology », *Arabic Sciences and Philosophy*, 3 (1992), p. 119–153; Silvia Fazzo, *Alexander Arabus. Studi sulla tradizione greco araba di Alessandro di Afrodisia*, Petite Plaisance, Pistoia 2018.

Ptolemaic frameworks by introducing sophisticated methods to calculate planetary influences and their effects on sublunary affairs. Central to their approach was the belief that astrological judgments, while conjectural, relied on rigorous geometrical and arithmetical models, paralleling the predictive nature of medical diagnosis. Unlike in earlier traditions, medieval Islamic astrology developed its own distinctive computational methods and mathematical tools, which were essential for interpreting planetary influences.

Astrologers employed advanced arithmetical and trigonometric algorithms, astronomical tables (*zījāt*), and specialized instruments, such as the astrolabe, to perform calculations related to: (a) the division of astrological houses (*taswiyat al-buyūt*), which required precise calculations to determine the twelve segments of the sky relative to the observer's location; (b) the projection of rays (*maṭraḥ al-shuʿāʿāt*), used to determine planetary aspects and their angular relationships, critical for forecasting outcomes; (c) progressions and directions (*tasyīr*), methods that involved calculating the movement of celestial bodies over time to predict events in an individual's life.[19]

These mathematical techniques were not mere borrowings from astronomy; they formed a distinct and sophisticated branch of applied mathematics specifically tailored to astrological predictions. As outlined by Edward S. Kennedy and John D. North, Islamic astrologers classified multiple methods for calculating planetary aspects and progressions, refining earlier Greek techniques.[20]

Through translations of works such as Ptolemy's *Tetrabiblos*, the writings attributed to Hermes Trismegistus, and contributions from Indian and Persian traditions, astrology was transmitted across the Islamic world and into Latin Europe.

Abū Maʿshar, in particular, authored works that drew from Hellenic, Indian, Persian, and Ḥarrānian themes. While following Ptolemy's abstention from using the terminology of demonstration (*burhān*) and irrefutable proofs in reference to

[19] Josep Casulleras, « The Instruments and the Exercise of Astrology in the Medieval Arabic Tradition », *Archives Internationales d'Histoire des Sciences*, 63 (2013), p. 517–540; Josep Casulleras, Jan P. Hogendijk, « Progressions, Rays and Houses in Medieval Islamic Astrology: A Mathematical Classification », *Suhayl*, 11 (2012), p. 33–102; Josep Casulleras, « The Astrological Computations Attributed to Ptolemy and Hermes in Medieval Arabic Sources », in Juste, van Dalen, Hasse, Burnett (eds.), *Ptolemy's Science of the Stars in the Middle Ages*, Brepols, Turnhout 2020, p. 201–221.

[20] John D. North, *Horoscopes and History*, The Warburg Institute, London 1986; Edward S. Kennedy, « The Astrological Houses as Defined by Medieval Islamic Astronomers », in Josep Casulleras, Julio Samsó (eds.), *From Baghdad to Barcelona. Studies in the Islamic Exact Sciences in Honour of Prof. Juan Vernet*, Instituto Millás Vallicrosa de Historia de la Ciencia Arabe, Barcelona 1996, vol. II, p. 535–578 (Reprinted in Id., *Astronomy and Astrology in the Medieval Islamic World*, Variorum, Aldershot 1998, ch. xix).

astrology,[21] he nonetheless maintained the notion of 'analogy' (*qiyās*) as a form of conjectural reasoning to develop judgements about future events. Astrology concerns what may or may not happen: possibility (*mumkin*) refers to particular heavenly configurations and powers having particular effects on the sublunar world or delineating aspects of an individual life.[22] This is similar to medicine, whereby the doctor analyses the signs and symptoms of a disease to propose a cure for that particular case: from the general knowledge of the relations of the signs and symptoms of a disease, the physician defines the particular cure in relation to that particular body affected by that disease.

The prognostic and conjectural nature of astrology prevented it from being confined strictly within the framework of Aristotle's *Organon*. Rather, it held a position that also aligned with the approach of the 'purely Islamic sciences', such as grammar (*naḥw*), religious law (*fiqh*), tradition (*ḥadīth*), and theology (*kalām*).[23] Abū Maʿshar's use of *qiyās* (analogical reasoning) appears to reflect this connection.

III. *On the Heavenly Power as Nature, the Heavenly Bodies as 'Indicators', and their Will*

Abū Maʿshar not only adheres to the text of Aristotle,[24] but also aligns with the cosmology developed within the circle of al-Kindī, which is compatible with Islam, specifically with the two Islamic dogmas of absolute monotheism and creationism. In this view, the cosmos is divided into the upper divine realm and the sublunar

[21] Charles Burnett, « The Certitude of Astrology: The Scientific Methodology of al-Qabisi and Abu Maʿshar », *Early Science and Medicine*, 7 (2002), p. 198–213. On the methods of astrological judgements according to Ptolemy: Burnett, « Ptolemy's Differentiation », p. 373–403, in part. p. 390–394.

[22] Adamson, « Abū Ma'šar, Al-Kindī », p. 245–270; Burnett, « Agency and Effect », p. 348–364; Id., « The Certitude of Astrology », p. 198–213.

[23] Although Islamic theology is still in its formative stage, the two distinct approaches to the sciences of the Ancients are already clearly visible. The theologians and traditionists tend to adopt a cautious and often critical stance towards these sciences, prioritizing religious orthodoxy and scriptural interpretation. In contrast, philosophers and astrologers engage with the sciences of the Ancients more openly, seeking to reconcile them with Islamic thought and incorporating them into their broader intellectual framework. This divergence highlights the emerging tension between theological conservatism and philosophical exploration within the early Islamic intellectual landscape.

[24] Richard J. Lemay, *Abū Maʿshar and Latin Aristotelianism in the Twelfth Century. The Recovery of Aristotle's Natural Philosophy through Arabic Astrology*, American University of Beirut, Beirut 1962. Fidelity to Aristotle's works is also verifiable where the Islamic astrologer speaks of the infinite power of the heavenly bodies: cf. Abū Maʿshar al-Balkhī, *Kitāb al-mudkhal al-kabīr*, ed. Keiji Yamamoto, Charles Burnett, Brill, Leiden – Boston 2019, I.3.9c.

realm, created by God and well-ordered through the governance of the heavenly bodies over the sublunar bodies. Consequently, the heavenly bodies serve as intermediaries of divine government (providence) and the intermediaries of God's creation. In these terms, the 'astrologization of the Aristotelian cosmos' initiated by Alexander of Aphrodisias continues and finds a significant development in the Kindī-circle's work, particularly in the *Fī l-tadbīrāt al-falakiyyah*.

The Islamic understanding of the cosmos places significant emphasis on the roles and attributes of the heavenly spheres, carefully distinguishing them from God's essence and unique nature. This emphasis serves to avoid any implication of associating the spheres with divinity or equating their characteristics with those of God. On the other hand, this emphasis on the heavenly bodies within the chain of being as Neoplatonic *hypostases* of God's creation allows for the mediated involvement of God in earthly events and their influence over the cosmos. Indeed, the dual nature of providence is central to the *Fī l-tadbīrāt al-falakiyyah*. Here, heavenly power is responsible for the individual and general arrangement of all beings and species in the universe. Thus, it coincides with nature and establishes the overall order and perpetuity of the cosmos.

In his work on the philosophical foundation of astrology, the *Great Introduction to Astrology* (*Kitāb al-mudkhal al-kabīr ilā ʿilm aḥkām al-nujūm*), known in the Latin world as *Introductorium maius*, Abū Maʿshar maintains the prominence of the heavenly bodies and a similar concept of 'heavenly power':

> [T]he celestial bodies move, change, and transfer the terrestrial bodies from one to another. *This is because of the power in the celestial bodies, which moves, alters, and changes the terrestrial bodies, and the receptivity to movement, alteration, and change by the celestial bodies which is in the terrestrial bodies, because of their natural connection one to the other.* Since these terrestrial bodies shift one into another by the power of the movements of the celestial bodies, and coming-to-be and passing-away arise in them, then natural changes in these four elements and coming-to-be and passing-away may result from the natural movements over this world and, since coming-to-be and passing-away in this world result from their movements, *they bear the indication over what comes to be and passes away*.[25]

The Persian astrologer posits that the heavenly bodies exert a profound influence over terrestrial phenomena through their movements and interactions. These movements not only affect the physical elements on Earth but they also contribute to the processes of generation, continuing in existence and dissolution. This basic perspective aligns with the idea that the heavenly bodies serve as mere 'indicators' of events in the earthly world, where events unfold according to natural laws and are subject to contingency, thus manifesting the realm of possibility.

[25] Abū Maʿshar al-Balkhī, *Kitāb al-mudkhal al-kabīr*, ed. Yamamoto, Burnett, I.3.6 (emphasis mine).

In the context of the *Ghāyat al-Ḥakīm*, which explores magical practices involving celestial influences, this connection becomes clearer. The 10th-century text acknowledges that celestial powers are not just symbolic but have tangible effects on the material world. This is astral magic.[26] Each star and celestial body, according to the *Ghāyat*, possesses distinct properties and energies that can be harnessed through rituals, images and talismans. This aligns with Abū Maʿshar's view that celestial movements directly impact earthly substances, influencing changes and events. Therefore, the art of *siḥr* (the Latin *nigromatia*), as described in the *Ghāyat*, involves understanding and manipulating these celestial influences to achieve specific outcomes. Whether it is creating talismans, using stones, or preparing herbs, practitioners seek to channel and utilize the inherent properties of celestial bodies to effect change in the earthly realm,[27] providing detailed instructions on how to harness these properties for various magical purposes, including love spells, vendettas, evocations of demons, summoning, etc. In this case, it is the sympathetic relations within matter that guide the actions of the magician, who engraves the symbol of the decanic demon or the planetary lord of the decans they wish to invoke, or from whom they want to harness benefits, onto the stone or amulet.[28]

As such, this interconnectedness between the celestial and terrestrial realms underscores a worldview where cosmic forces play a decisive role in shaping the possibilities and outcomes within the natural world. Specifically, Abū Maʿshar's definition of the science of astrology contains several elements of interest for reconstructing this common theoretical background. He writes:

> [*Astrology*] is *the knowledge of the nature of every planet and sphere, and the property of their indications*, and *what arises and happens as a result of the powers of their different movements*, and *their natural imprint on this world* which is under the sphere of the Moon, in respect to the difference of times and the *alteration of the 'natures'*, i.e., fire, air, water, and earth, and <their imprint> on the individual animals, plants, and minerals which arise from these 'natures'. Information on this second species,

[26] Cf. Charles Burnett, « The Three Divisions of Arabic Magic », in Liana Saif, Francesca Leoni, Matthew Melvin-Koushki, Farouk Yahya (eds.), *Islamicate Occult Sciences in Theory and Practice*, Brill, Leiden – Boston 2021, p. 43–56.

[27] Pseudo-Majrīṭī [al-Qurṭubī], *Ghāyat al-Ḥakīm*, ed. Hellmut Ritter (*Picatrix. Das Ziel des Weisen*, Teubner, Leipzig 1933), p. 148.8–149.5. *Picatrix Latinus*, III.1, ed. David E. Pingree (*Picatrix. The Latin Version of the Ghāyat al-Ḥakīm*, The Warburg Institute, London 1986), p. 91.9–12. Eng. transl. Dan Attrell, David Porreca, *Picatrix. A Medieval Treatise on Astral Magic*, The Pennsylvania State University Press, University Park (PA) 2019, p. 131–132. See also the IV Book of the *Ghāyat* on talismans, the art of images and herbs.

[28] Cf. David E. Pingree, « Some of the Sources of the *Ghāyat al-Ḥakīm* », *Journal of the Warburg Institute and Courtauld Institutes*, 43 (1980), p. 1–15, in part. p. 7.

> which is the science of astrology, is obtained through the first species of the science of the stars, which is *the science of the universe* (i.e., *astronomy*).[29]

Based on the knowledge of mathematical astronomy, astrology concerns the nature, properties and 'indications' or 'signs' (*dalālāt*) of each star and their effects on the four elements that constitute the sublunar world. This world is influenced by the powers emanating from the various movements of the heavenly bodies (*min quwwā ḥarakāti-hā al-mukhtalifah*).[30] Although heavenly power is differentiated according to each planet and star, it remains one and the same as a derivative of the First Cause.

Significantly, a comparable conception of the status of the heavenly bodies in the cosmos as instrumental causes and signs is articulated in one of the most relevant works of the circle of al-Kindī, the so-called *Theology of Aristotle* (*Uthūlūjiyyah Aristūṭālis* or *Discourse on the Divine Sovereignty*). This pseudepigraph is the Arabic rendering of Plotinus' *Enneads* IV-VI attributed to Aristotle, translated by ʿAbd al-Masīḥ Ibn Nāʿima al-Ḥimṣī and corrected by al-Kindī himself for Aḥmad ibn al-Muʿtaṣim, son of the caliph who reigned from 833 to 842 AD (218–227 AH).[31] As such, this text presents itself as the work where Aristotle complete the analysis

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[29] Abū Maʿshar al-Balkhī, *Kitāb al-mudkhal al-kabīr*, ed. Yamamoto, Burnett, I.2.4 (emphasis mine).

[30] Cf. Ptolem., *Tetrabiblos*, 1.2–5, ed. Robbins, p. 4–9.

[31] Arabic editions: Friedrich Dieterici (ed.), *Die sogenannte Theologie des Aristoteles aus arabischen Handschriften zum ersten Mal herausgegeben*, J.C. Hinrichs'sche Buchhandlung, Leipzig 1882; ʿAbdurraḥmān Badawī, *Aflūṭīn ʿinda al-ʿArab. Plotinus apud Arabes. Theologia Aristotelis et fragmenta quae supersunt*, Maktaba al-nahḍa al-miṣriyya, Cairo 1955[1], 1966[2] (Islamica, 20); reprinted in Kuwait 1977. Partial edition and Italian translation in: Plotino, *La discesa dell'anima nei corpi (Enn. IV 8 [6]). Plotiniana arabica (pseudo-Teologia di Aristotele, capitoli 1 e 7; 'Detti del sapiente greco')*, ed. Cristina D'Ancona, Il Poligrafo, Padova 2003; Id., *L'immortalità dell'anima IV 7 [2]. Plotiniana Arabica (pseudo-Teologia di Aristotele, capitoli I, III, IX)*, ed. Cristina D'Ancona, Pisa University Press, Pisa 2017. Cf. Maroun Aouad (ed.), « La *Théologie d'Aristote* et autres textes du *Plotinus Arabus* », *Dictionnaire des Philosophes Antiques* (hereafter *DPhA*) vol. I, Éditions du CNRS, Paris 1989, p. 541–590; Fritz W. Zimmermann, « The Origins of the so-Called *Theology of Aristotle* », in Charles B. Schmitt, William F. Ryan, Jill Kraye (eds.), *Pseudo-Aristotle in the Middle Ages: The Theology and Other Texts*, The Warburg Institute, London 1986, p. 110–240; Cristina D'Ancona, « Pseudo-Theology of Aristotle, Chapter 1: Structure and Composition », *Oriens*, 36 (2001), p. 78–112; Ead., « Tradizione greca e versione araba delle Enneadi: l'indipendenza reciproca e il caso del trattato Sull'immortalità dell' anima (IV 7[2]) », in Rosa B. Finazzi (ed.), *Del tradurre. Da Occidente verso Oriente come incontro di lingue e culture. Atti della giornata di studio su 'Traduzioni orientali e testi classici: lo stato della ricerca'. Brescia, 8 ottobre 2004*, Pubbl. I.S.U. Università Cattolica, Milano 2005, p. 39–66; Ead., « Aux origines du dator formarum. Plotin, l'*Épître sur la science divine* et al-Fārābī », in Elisa Coda, Cecilia Martini Bonadeo (eds.), *De l'Antiquité tardive au Moyen Âge. Études de logique aristotélicienne et de philosophie grecque, syriaque, arabe et latine offertes à Henri Hugonnard-Roche*, Vrin, Paris 2014 (Études musulmanes, 44), p. 381–414; Ead., « The Textual Tradition of the Arabic Plotinus. The *Theology of Aristotle*, its *ru'ūs al-masā'il*, and the Greek Model of the Arabic Version », in Aafke M.I. van Oppenraay, Resianne Fontaine (eds.), *The Letter before the Spirit: The Importance of Text Editions for the Study of the Reception of Aristotle*, Brill, Leiden – Boston 2012 (Aristoteles Semitico-Latinus, 22), p. 37–71.

of the four causes and his metaphysical discourse by focusing on the causal relationship between the One, the heavenly bodies and the sublunar world.

In a decisive passage at chapter 6, pseudo-Aristotle writes:

> We say that *the stars are like the instruments* established as intermediary between the craftsman and the craftwork; and they do not resemble the First Agent Cause, nor do they resemble the matter that assists in the perfecting of the thing, nor do they resemble the form in which some part act upon others. Rather, they resemble the words of the world and the words of the city that collect the facts of the city and put everything in its proper place. They also resemble the law (*sunnah*) through which the people of the city discern what they ought to do from what they ought to avoid. Through these laws, they are guided towards praiseworthy matters and refrain from blameworthy ones. By them, they are rewarded for their good deeds and punished for their evil deeds. And though the law may differ, do yet all conduce to one purpose, that is, the good (*al-khayr*). Law <indeed> is what leads to the good. Likewise, the words which are in the world lead things towards the good, for they are to the world what the law is to the people of the city. If anyone says: The words of the world are perhaps *signs (dalā'il) not agents*, we reply: *Their purpose is not merely to indicate* (*istadalla*)*, but they are within the domain of reason*. For it is through them that we might infer the consequences from the antecedent, and know the effect from the cause, and recognize the accidents from the preceding thing, and understand the compound from the simple and the simple from the compound.[32]

What we are considering here is the general assumption that the heavenly bodies are said to be the instruments and mediators of God's creation and order. In this, they are similar to the words used by the lawmaker or God's order in writing the law for people who accept it in order to act correctly and to distinguish between right, good actions and evil. As such, both the words of the law and the heavenly bodies indicate but do not directly act and have no volition or will of their own.

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[32] Ps.-Aristoteles, *Theologia* VI, ed. Badawī, p. 74.7–19 (= ed. Dieterici, p. 64.5–15); (own translation; cf. transl. Geoffrey L. Lewis, p. 135):
فنقول: إن الكواكب هي كالأداة الموضوعة المتوسطة بين الصانع والصنعة، وإنها لا تشبه العلة الفاعلة الأولى ولا تشبه أيضا الهيولى المعينة في إتمام الشيء، ولا تشبه أيضا الصورة التي يفعل بعضها في بعض. بل إنما تشبه كلمات العالم <و>الكلمات <المدينة> [المدنية Ba] التي تضم أمور المدينة وتضع كل شيء منها في موضعه، وتشبه السنة التي فيها يتعرف أهل المدينة ما ينبغي لهم أن يعملوا مما لا ينبغي، وبها يهتدون إلى الأمور الممدوحة ويمتنعون من الأمور المذمومة، وبها يثابون على حسن أعمالهم ويعاقبون على سوء أعمالهم. والسنن وإن احتلفت، فإنها كلها تدعو إلى شيء واحد وهو الخير. والسنة هي التي تسوق إلى الخير. وكذلك الكلمات التي في العالم تسوق الأشياء إلى الخير لأنها في العالم كالسنة في أهل المدينة. فإن قال قائل: إن كلمات العالم ربما كانت دلائل غير فواعل - قلنا: إنه ليس غرضها أن تدُلَّ، لكنها لما كانت في طريق العقل، وذلك أنه ربما استدللنا على الأول من الآخر، وعرفنا المعلول من العلة، وربما عرفنا العوارض من الشيء السابق، والمركب من المبسوط والمبسوط من المركب.

As shown by Liana Saif,[33] the Arabic root used by Abū Maʿshar to say 'indication' or 'signification' is √*d-l-l*, from which comes the verb *dalla* (first form), meaning 'to show', 'to indicate', 'to prove', 'to demonstrate'. From this root, we derive the nouns *dalīl* and *dalālah* (pl. *dalāʿil*, *dalālāt*), meaning 'sign(s)', 'guidance(s)', 'indication(s)', 'clue(s)', 'symptom(s)', and the verb *istadalla*, which means 'to deduce'. This same root and its semantic richness are shared by the adaptor of the circle of al-Kindī, who adopts the same terminology and context.

This linguistic and conceptual framework allows the astrologer to view the celestial bodies as instruments of divine indication rather than independent agents of causation. The root √*d-l-l* and its derivatives emphasize a process of interpretation, whereby the astrologer reads the signs presented by the heavens to infer divine will or cosmic order. This approach aligns with the broader intellectual traditions of al-Kindī's circle, where the natural world, including the movements of the stars, is understood as a system of signs pointing toward deeper metaphysical truths.

Crucially, this perspective establishes a clear distinction between causing an earthly effect and merely indicating events without directly causing them. The heavenly bodies are not regarded as agents that actively bring about events but rather as symbols that reflect the underlying causal chain established by God. They serve as intermediaries that reveal, rather than produce, the interconnectedness of cosmic and terrestrial phenomena. In this sense, the stars 'indicate' through their motions and configurations the divine plan and the sequence of causation, allowing the astrologer to discern patterns and deduce outcomes without attributing any volitional or causal agency to the celestial entities themselves.

This distinction is central to Abū Maʿshar's defence of astrology, as he was acutely aware of the critiques posed by traditionalists. Having previously been a traditionist himself, he was well-acquainted with their arguments and sought to address them comprehensively. Beyond situating astrology within a theological framework, Abū Maʿshar emphasized its foundation in sense perception (*ḥiss*) and empirical experience (*tajriba*). He argued that astrology, rather than being speculative or arbitrary, is rooted in careful observation of both celestial phenomena and human experiences, revealing consistent relationships between the movements of heavenly bodies and earthly events. This reliance on empirical evidence bolstered his defence, presenting astrology as a science firmly grounded in observable reality.[34]

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[33] Saif, *The Arabic Influences*, p. 23.

[34] Charles Burnett, « Obvious, Clear, and in Front of Our Eyes: Defending the Science of Astrology by Means of Experience », in Hannah C. Erlwein, Katja Krause (eds.), *Revisiting Premodern Islamic Science and Experience*, Springer, New York (forthcoming). I am grateful to Charles Burnett for generously sharing the draft of his work with me.

For Abū Maʿshar, the astrologer is akin to a natural philosopher who systematically studies the interconnectedness of the cosmos through sensory experience and rational deduction, thereby aligning astrology with both Islamic theology and scientific inquiry.

This perspective resonates with the approach found in Kindī-circle's version of Alexander's *maqālah*, which emphasizes the causal role of the heavenly bodies as doers of earthly events, when the adaptor writes that:

> [T]he celestial bodies do not only govern [*laysat tudabbiru...faqaṭ*] these changing bodies, but they are also the cause of their being and permanence [*ʿillah kawni-hā wa-thabāti-hā*].[35]

However, this causality is understood as mediated and derivative, aligning closely with Abū Maʿshar's conception of the stars as instruments that reflect divine causation rather than act independently. As causes of the existence and permanence of earthly bodies, the heavenly bodies are aware of them and do not miss anything that occurs on Earth, as earthly events follow their will (*irāda*):

> This is because the things [i.e., the heavenly bodies] that know their substances and natures by themselves in an essential way have knowledge of the things of which they are the cause, and *nothing they know is contrary to their will*. And it is now clear that the activity of the first and noble bodies is not for the sake of the subsistence of the earthly world, nor for the sake of its perpetuation; and *nothing of what happens in the earthly world escapes them*, and there is *nothing that does not happen according to their will*, since they [the celestial bodies] *are the cause of the substances of the earthly world and their generation*. Nevertheless, *this does not derive from them intentionally*, rather the generation of the substances of these changing bodies and their order necessarily happens because of those <celestial> bodies. And there is nothing that escapes their knowledge, since these sublime bodies have a large share of the upper power and that is why they are complete and perfect.[36]

Although earthly events follow the will of the heavenly bodies, as they are the causes of the sublunar bodies, this order is not intentionally determined by them but necessarily derives from the First Cause. Therefore, this is not a case of 'astrological determinism'. Moreover, the heavenly bodies are said to have

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35 [Alexander Aphrodisias], *Fī l-tadbīrāt al-falakiyyah*, ms. E, f. 82r 13–15:
فيه فنقول إنّ الأجرام السماويّة ليست تدبّر هذه الأجرام المستحيلة فقط، لكنّها هي علّة كونها وثباتها أيضاً كما قلنا مراراً.

36 [Alex. Aphrod.], *Fī l-tadbīrāt al-falakiyyah*, ms. E, f. 80r 3–9:
وذلك أنّ الأشياء التي تعرف جواهرها وطبائعها معرفة ذاتيّةً هي معرفة الأشياء التي هي علّة كونها ولا يعرف فيها شيء من الأشياء من غير إرادتها. فقد بان إذن أنّه ليس فعل الأجرام الأول الشريفة من أجل ثبات العالم الأرضيّ ودوامه وأنّه لا يفوتها شيء من الأشياء ممّا يحدث فيه ولا يكون دون إرادتها، وأنّها علّة جواهر العالم الأرضيّ وكونها.

knowledge *per essentiam*, that is to say, they know their effects directly through their own essence rather than through reasoning process.[37] This form of apprehension pertains only to the superior bodies and implies an immediate and complete understanding of all possible effects that can rise from their essences, insofar as they are principles and causes. This knowledge is not discursive, but instantaneous and intrinsic, it is the apprehension of causal relationship and presupposes a hierarchical order of beings, i.e., the Neoplatonic chain of essences. As such, there is no intention in the order of the sublunar events established by them, but they accomplish the assignment received by God through creation: they cause the generation and becoming of the sublunar bodies and preserve the arrangement of the world through divine power. Thus, how is it possible that the sublunar order, which mirrors the divine because of the heavens, presents adverse events and evil in general?

In a subsequent passage, the adaptor clearly asserts that the cause of evil is the reception of privation by matter. The presence of evil in the lower realm thus depends on the material entity's capacity to fully receive the form or its privation:

> [M]atter is not one of the things in act, but *only in potency*, so that it *frequently does not receive the act of the agent due to its weakness*, *since everything which is being-in-potency is deficient and incomplete*, and matter is every being-in-potency; therefore, it is so weak and defective that *error enters into it* and it is not able to receive all the forms that the shaper (*al-muṣawwir*) informs in it, but matter sometimes refrains from doing so, not because of the maker [demiurge], but because of itself, as we have clarified and explained. Furthermore, we also say that matter is receptive both of privation and of form and, insofar as it is receptive of the form, it tends towards *the excellent nature, that is, the power of the celestial body*, and is informed by it, and yearns for eternity and permanence; while, i*nsofar as it is receptive of the privation, that is, not being one of the things in act*, it does not tend to the power of the celestial body, it does not get affected by this power, it does not receive a form, and it does not yearn for eternity and permanence, but rather *it yearns for dissolution and annihilation*. For this reason, *the error* may enter the earthly world, not because of the celestial bodies, but because of matter, just as we have explained and made clear.[38]

[37] On the rationality of the Kindī-circle Alexander's cosmos as determined by divine power, cf. Giulio Navarra, « Reason and Rationality in Arabic-Islamic Cosmology. The Case of the *On The Governments of the Celestial Spheres* (*Fī l-tadbīrāt al-falakiyya*) », in *Atti del Convegno 'La ragione nella storia dal Medioevo all'Età moderna'* (*Foggia, 2–3 marzo 2024*), Quaderni di Noctua (forthcoming).

[38] [Alex. Aphrod.], *Fī l-tadbīrāt al-falakiyyah*, ms. E, 82v 10–22:
وذلك أن الهيولى ليست شيئا من الأشياء بالفعل لكنها بالقوة فقط، فلذلك ربما لم يقبل فعل الفاعل لضعفها، لأن كل شيء بالقوة ناقص غير تام والهيولى هي كل شيء بالقوة، فلذلك صار ضعيفة ناقصة يدخل عليها الخطأ ولا تقبل جميع الصور التي يصور فيها المصور لكن ربما امتنعت من ذلك لا من أجل الصانع لكن من أجلها، كما بينا وأوضحنا. ونقول أيضا إنها قابلة

This passage suggests that events in the sublunar world are governed not by necessity but by contingency. Matter interacts with celestial influences as a passive recipient of forms, existing in a state of pure potency that can potentially accommodate forms. This interaction means matter may either successfully receive the form or, alternatively, errors, imperfections, and evil may result.[39] The incapacity of matter is not related to the superior agent, but rather, when matter receives form, it tends towards an 'excellent nature', associated with the power and influence of the celestial bodies, desiring a stable, eternal status. Conversely, when receptive to privation, matter remains deficient, inclined towards dissolution, and ultimately tending towards annihilation. This distinction clarifies the relationship between the superior agent, termed 'the shaper' or 'the maker', and the inherent, contingent limitations of matter.

This ordering of contingency is also preserved in Abū Maʿshar. His concept of the 'connection' (*ittiṣāl*) between the celestial and the terrestrial realms occurs out of necessity, owing to the influence of the heavenly bodies transmitted through their movements.[40]

IV. *On Contingency and 'Astral Determinism': What does 'Astrologization' Mean in Cosmology?*

The idea that astrology is rooted in Aristotelian meteorology, rather than merely containing a branch dedicated to weather forecasting, as we will explore later, is a compelling aspect when examining the theoretical background of this tradition. In Aristotle's *De generatione et corruptione* and *Physics*, the coming-to-be and passing-away of beings, namely, the order of nature, is related to the distance,

للعدم وقابلة للصور؛ فلأنها قابلة للصور تميل إلى الطبيعة الفاضلة، أعني قوة الجرم السماوي، ويتصور منها ويشتاق إلى الدوام والبقاء؛ لأنها قابلة للعدم، أعني أنها ليس شيئا من الأشياء بالفعل لا تميل إلى قوة الجرم السماوي ولا ينفعل فيها ولا يتصور ولا يشتاق إلى الدوام والبقاء، لكنها تشتاق إلى الفناء والتلاشي. فلهذه العلة ربما دخل الخطأ في العالم الأرضي لا من أجل الأجرام السماوية، لكن من أجل الهيولى؛ كما بينا وأوضحنا.

39 A correspondent passage is in the well-known *Liber de causis* (*Kalām fī maḥḍ al-khayr*), chapter 23. Arabic editions: Badawī, *Aflūṭīn ʿinda al-ʿArab*, (1955[1], 1966[2], 1977[3]); Richard C. Taylor (ed.), « The *Liber De Causis* (*Kalām fī maḥḍ al-khair*). A Study of Medieval Neoplatonism », PhD Diss., University of Toronto 1981 (unpublished dissertation, courtesy of the author whom I thank); Otto Bardenhewer, *Die pseudo-aristotelische Schrift über das reine Gute bekannt unter dem Namen Liber de causis*, Freiburg im Bresgau 1882 (reprinted in Frankfurt a. M. 1961). Latin text: Adriaan Pattin (ed.), « Liber de causis », *Tijdschrift voor Filosofie*, 28 (1966), p. 90–203; Thomas de Aquino, *Super Librum de causis expositio*, ed. Henri D. Saffrey, Vrin, Paris 2002; Tommaso d'Aquino, *Commento al Libro delle cause*, ed. Cristina D'Ancona, Rusconi, Milano 1986. Cf. Cristina D'Ancona, Richard C. Taylor (eds.), « Liber de causis » in *DPhA*, *Supplément*, Éditions du CNRS, Paris 2003, p. 599–647.

40 Cf. Abū Maʿshar al-Balkhī, *Kitāb al-mudkhal al-kabīr*, ed. Yamamoto, Burnett, Introduction, p. 10–11.

disposition and movements of the heavens. In *Meteorology*, Aristotle explains that the sublunar world is continuous with the heavenly region, and the movements of the heavenly bodies regulate the order of nature and its transformation in the sublunar region.[41] Both of these works form the basis of Alexander of Aphrodisias' *Περὶ προνοίας* (*On providence*),[42] which is the Peripatetic reply to the Stoic conception of providence as an all-embracing divine power regulating the order of nature ('πνεῦμα' or divine 'λόγος').[43] As such, Alexander's conception of divine power is far from the Stoic concept of a material pervading force. Instead, it is an informing principle transmitted by contact in relation to proximity, so that it coincides with nature. And this conception of nature dovetails with the Islamic one, as Alessandro Bausani has defined it: nature is the « impronta impressa dall'atto puntuale di Dio alle cose, [sicché] in certe lingue musulmane si usa per 'natura' persino un termine come *qudra*, potenza (divina creante) ».[44]

This principle, as partially seen above, constitutes the sublunar bodies and informs them with the soul proper to each, delineating a twofold order of the cosmos: one is the First Cause's governance over the heavenly realm; the other is the governance of the sublunar world exerted by the heavenly spheres.[45] This

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41 Arist., *DGC*, 2.10, 338a 19–338b 1; *Phys.*, 3.1, 200b 12; *Meteor.*, 1.2, 339a 15–24, 340a 20–21. Cf. Liana Saif, *The Arabic Influences on Early Modern Occult Philosophy*, Palgrave Macmillan, London 2015, p. 17–18; Ead., « The Universe and the Womb: Generation, Conception, and the Stars in Islamic Medieval Astrological and Medical Texts », *Journal of Arabic and Islamic Studies*, 16 (2019), p. 181–198.

42 This text is lost in the original Greek but preserved in two Arabic translations: the first is the *Fī l-tadbīrāt al-falakiyyah*, the other is the translation by Abū Bishr Mattā ibn Yūnus (328 AH/940 AD), entitled *Fī l-ʿināyah* (literally, *On providence*). The latter, because of the different theoretical aims of the milieu where Abū Bishr worked, the so-called Peripatetic School of Baghdad, and because of some fragments of the original Alexander's *Περὶ προνοίας* found in Cyril of Alexandria's *Contra Iulianum* (5th century CE), is more faithful to the original text than the Kindī-circle's translation/adaptation. Cf. Ruland (ed.), *Die Arabischen Fassungen*; Fazzo, Zonta (eds.), *La Provvidenza*; Thillet, « Un traité inconnu d'Alexandre »; Silvia Fazzo, « La versione araba del *Περὶ προνοίας* di Alessandro di Afrodisia e i frammenti greci nel trattato *Contra Iulianum* di Cirillo Alessandrino », *Aevum*, 74 (2000), p. 399–419.

43 See Alexander's rejection of the Stoic theory of matter in his *De mixtione* (*Περί κράσεως και αὐξήσεως*): *Alexandri Aphrodisiensis praeter commentaria scripta minora*, ed. Ivo Bruns, *Commentaria in Aristotelem Graeca suppl. 2.2*, Reimer, Berlin 1892.

44 Bausani, *Appunti di astronomia e astrologia*, p. 20.

45 [Alex. Aphrod.], *Fī l-tadbīrāt al-falakiyyah*, ms. E, f. 79v 8–11:
فنقول أنّ التدبير ضربان:[١] أحدهما تدبير الأجرام السماويّة من فلك الأقصى الى فلك القمر؛ [٢] والآخر تدبير العالم الذي تحت فلك القمر. فأمّا تدبير الأجرام الأوّل فيكون من قبل الفاعل الأوّل، وأمّا تدبير العالم الأرضيّ فيكون من قبل الأجرام الأوّل لما صار فيها من القوّة الأولى.
« And we say that government is of two kinds: [i.] the first of these two is the government of the celestial bodies from the outermost sphere to the Moon's sphere; [ii.] the second one is the

intermediary role of the planets and stars in the arrangement of the cosmos concerns both its creation and its maintenance (providence). God is the only absolute cause of the universe, completely separate from the whole, creating it out of nothing through the mediation of the heavenly bodies, the so-called 'first bodies' (i.e., the first to be created).

This 'Origination' (*ḥudūth*) coincides with the emanation (*fayḍ*) of divine power over all beings through the mediation of the first bodies. As such, this creation is upheld as an eternal preservation according to number (heavenly bodies) and according to form (sublunar species). The resulting order is understood as 'universal government' (*tadbīr kullī*), exerted by God.

This is the order of providence described in the Kindī-circle Alexander's *maqālah*, which seems to have been, if not one of Abū Maʿshar's Hellenic sources (after Aristotle and Ptolemy), at least an inspiring text for the explanation of the causality of the heavenly bodies in his *Al-mudkhal al-kabīr*. Astral agency is not mechanical; although Alexander's defence of the causal connection between the order of sublunar nature and the orderliness and proportionality of the distances of celestial motions (with the notion of 'proximity') is preserved in Abū Maʿshar, it is rather volitional. This aspect is peculiar to the Kindī-circle Alexander's cosmology: there, however, one can only find the seminal elements for rethinking astral agency, but not a thorough exploration of the subject. In contrast, Abū Maʿshar elaborates an ordering of astral causation based on the analogy with medicine.[46] The first bodies are indeed responsible for the *imtizāj* ('mixture'), namely, the blending of the four simple natures in the sublunar bodies;[47] they are the informing principles of the various souls entering the sublunar bodies but even more:

> We know that all the stars share with the Sun in the indications for atmospheric conditions, the differentiation of individuals from species, the composition and bringing-into-being of each individual, the natures of the cities, the conditions of their inhabitants, and the things which are in them, but the Sun has the most general indication for atmospheric conditions, the composition of individuals, animal souls, their mixture with the body, nature, characters, religions, sects, minerals, plants, and growth, God willing. As for the planets, their indications are most general for the dress of their inhabitants and their other conditions.[48]

government of the world which is under the Moon's sphere. As for the government of the first bodies, it comes from the First Agent [*al-fāʿil al-awwal*]; whereas as for the government of the earthly world, it comes from the first bodies, because of what they receive from the First Power ».

[46] Cf. Abū Maʿshar al-Balkhī, *Kitāb al-mudkhal al-kabīr*, ed. Yamamoto, Burnett, I.2.23c–2.24b; I.2.25a; I.5.36b; III.9.3.

[47] This is the Latin *complexio* (*mizāj*), cf. Chiara Beneduce, « Complexio. Across Disciplines – Introduction to this Special Issue », *Early Science and Medicine*, 28 (2023), p. 257–269.

[48] Abū Maʿshar al-Balkhī, *Kitāb al-mudkhal al-kabīr*, ed. Yamamoto, Burnett, III.3.12.

The heavenly bodies are signs of meteorology and life in the sublunar realm: they can indicate the course of nature, weather events, and social history, as well as the possible developments of human individual lives. The first and most important role as an indicator is that of the Sun, followed by the configurations of the Moon and the other planets. Moreover, the heavenly bodies are causes of the composition and generation of bodies and souls in this world (always: God willing). As we have seen, the receiving principle is as important as the informing principle, so that matter in the sublunar world has a receptive attitude which allows it to be ordered either as a mineral, or as a plant, or as an animal, or as a human being.[49]

In Kindī-circle Alexander's *maqālah*, the heavenly power, although unique and acting for its own sake, turns out to carry out a variety of activities:

> Therefore, if it is so, we <can> say that *nature, which is the celestial power*, *governs* the things subject to generation and dissolution until it [nature] reaches their completion and purpose, distinguishes between things, *separates* them from one another, and *preserves* their forms also through reproduction and generation of one from another.[50]

Both the composition of the sublunar bodies and the informing of the different souls depend on the emanation of divine power from the First Cause, mediated by the heavenly bodies, which are the proximate causes of the order of nature. As such, the heavenly bodies are responsible for the generation, becoming and dissolution of the sublunar bodies, a point emphasized in Abū Maʿshar's *Al-mudkhal*

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[49] [Alex. Aphrod.], *Fī l-tadbīrāt al-falakiyyah*, ms. E, f. 80v 17–23:
فإنّ كان هذا هكذا، قلنا أنّ الأجرام السماويّة تفيض قواها على جميع الأجرام الأرضيّة المستحيلة على نحو تهيّؤ قبول كلّ واحد منها. أعنى أنّ كلّ جرم، يقوى <على> أن يكون متنفّساً، فإنّما يكون متنفّسا من تلك القوّة. وكلّ جرم، يقوى على أن يكون حيواناً، فإنّما يكون حيواناً من تلك القوّة. وكلّ جرم، يقوى على أن يكون ذا عقل، فإنّما يكون ذا عقل من قبل قوّة ذلك الجرم. فإنّ هذه الأجرام المستحيلة تختلف اختلافاً كثيراً، فعلى حسب قبولها لتلك لقوّة، كذلك تفيض تلك القوّة فيها. والأجرام السماويّة مختلفة أيضاً.

« We say that the celestial bodies spread their power upon all the earthly changing bodies in conformity with the receptive attitude of each and every one of them, that is to say that every single body has the potency to be ensouled from that power, and that every single body that has the potency to be an animal, indeed becomes an animal because of that power, and every single body that has the potency to be endowed with the intellect, indeed becomes a body endowed with the intellect because of the reception of the power of that body. Indeed, these bodies subject to change differ greatly from each other, and this depends on the reception of that power to the extent that that power flows upon them and the heavenly bodies also differ ».

[50] [Alex. Aphrod.], *Fī l-tadbīrāt al-falakiyyah*, ms. E, 81v 12–15:
فإن كان هذا هكذا، قلنا إنّ الطبيعة، وهي القوّة السماويّة، إنّما تدبّر الأشياء الواقعة تحت الكون والفساد الى أن تبلغ تمامها وغايتها وتفصّل فيما بين الأشياء وتميّز بعضها من بعض وتحفظ صورها أيضاً بالنسل والتكوين بعضها من بعض.

al-kabīr.[51] Here, the astrologer asserts that the heavenly bodies move, change and are involved in the generation and corruption of earthly beings.[52] These sublunar beings are naturally inclined towards the astral agents, such that the elemental qualities are shared between both cosmic realms, yet they apply independently to sublunar bodies as well.[53]

Given this framework, the alignment of effects with their causes when describing astral influences might suggest determinism. The sympathetic or antipathetic correspondence between the configuration of the heavenly bodies and the elemental qualities manifested in the individuals could imply a rigid causal structure. Indeed, the 'natal chart' is used to define an individual's characteristics and dispositions from the moment of birth, and practices like nativities and genethliac astrology operate on these principles, thereby risking a deterministic interpretation.

This deterministic reading might emerge from the *maqālah* of the Kindī circle, where the will of the heavenly bodies is asserted as the direct cause of earthly event. Abū Maʿshar, instead, does not allow for doubts on determinism, not only by considering contingency as the mark of earthly events, but also by distinguishing between a general signification of the planet, pertaining to external conditions, and a specific signification, which pertains to individual conditions and aspects. In other words, the configurations of the heavenly bodies may only indicate the possibilities that could arise under certain external conditions. The transition from potentiality to actuality excludes a set of possibilities that become impossible and realizes one that becomes necessary. This is how Abū Maʿshar frees rational souls from determinism to preserve human free will.[54] Thus, far from being deterministic, astrology can present itself as a science of the possible and the contingent, sharing doctrinal elements with natural philosophy and medicine as well.

Another factor indicating the absence of astrological determinism in Abū Maʿshar's model is the repeated invocation to God's permission when discussing the will of the heavenly bodies. Their volition aligns entirely with God's will and is nothing beyond that. This is not merely a conventional expression of Islam but an integral part of Abū Maʿshar's model in *Al-mudkhal al-kabīr*. Once God's permission is acknowledged and affirmed, the cosmic order functions as a dual governance of

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51 Saif, *The Arabic Influences*, p. 18.

52 Cf. Abū Maʿshar al-Balkhī, *Kitāb al-mudkhal al-kabīr*, ed. Yamamoto, Burnett, III.3.3a–b.

53 Cf. Abū Maʿshar al-Balkhī, *Kitāb al-mudkhal al-kabīr*, ed. Yamamoto, Burnett, I.3.7d–3.8

54 On the position of Abū Maʿshar as determinist (Richard Lemay) or compatibilist (Peter Adamson), cf. Lemay, *Abū Maʿshar and Latin Aristotelianism*; Adamson, « Abū Maʻšar, Al-Kindī », p. 245–270. Here, I follow Liana Saif's analysis of Abū Maʿshar's terminology which allows to interpret the 'indications' or 'sings' outlined by the heavenly bodies not as causal connections, but rather as the order of things towards which the individual rational soul is inclined.

the universe.[55] Within this framework, the astrologer can forecast future events, as they are part of the already-established order determined by divine providence. In this sense, forecasting is not merely predicting; it is akin to reading and discovering God's will as it is manifested through the movements and positions of the heavenly bodies.

V. *Al-Kindī, the Astrologer*

The missing piece here is al-Kindī's personal production on astrology. In fact, we know that the 'father' of Arabic-Islamic philosophy wrote several works in a wide range of fields, from mathematics to medicine, from logic, psychology and philosophy to music, and of course astronomy and astrology. In the reconstruction I am providing, al-Kindī plays a pivotal role in the reception and development of astrology. His contributions helped integrate astrological thought into the broader intellectual landscape of the Islamic world, bridging Persian, Ḥarrānian and Hellenistic knowledge with the nascent Islamic philosophy, and framing astrology as a legitimate science tied to natural philosophy and divine providence. A section of Ibn al-Nadīm's *Fihrist* on al-Kindī is about « his books on the judgments of the stars (*kutubu-hu al-aḥkāmiyyāt*) ». I will not dwell on the astrological works of al-Kindī that have come down to us,[56] but I will focus on two epistles on weather

[55] Saif, *The Arabic Influences*, p. 19.

[56] A controversial work, surviving only in Latin as *De radiis*, has been attributed to al-Kindī. A text titled *Risālah fī l-shuʿāʿāt* (*Epistle on Rays*) is listed in Ibn al-Nadīm's *Fihrist* among al-Kindī's astronomical works (ed. Flügel, p. 257.11). However, it is not primarily astrological, but rather a treatise on magical arts, as reflected in its alternative Latin title *Theorica artium magicarum*. It explores the influence of astral rays on the elemental world and mutual influences within the elemental realm, merging scientific and occult traditions in both Islamic and Latin contexts. Although the work reflects al-Kindī's interest in natural philosophy, it stands as a hapax in his corpus and has recently been attributed to an anonymous Oxonian author from the 1250s or 1260s by Sylvain Matton. The strong defence of determinism, the radical appropriation of Stoic doctrines, and the specific terminology lead Matton to argue that the work is unlikely to be by al-Kindī. Cf. Sylvain Matton, « D'un rayonnement des grammairiens latins, ou le *De radiis* n'est pas d'al-Kindi », *Archives d'Histoire Doctrinale et Littéraire du Moyen Age*, 89 (2022), p. 443–456 (Engl. Version: Sylvain Matton (b), « An Irradiation of Latin Grammarians, or The *De radiis* is not by al-Kindī », *Magic, Ritual, and Witchcraft*, 17 (2023), p. 437–455. See also: Jean-Patrice Boudet, « L'harmonie du monde dans le *De radiis* attribué à al-Kindī », *Micrologus*, 25 (2017), p. 67–85. However, while not a direct translation, many scholars have endeavoured that it could still be considered a later work attributed to the Arab philosopher, incorporating revisions by translators or editors over time, as the doctrines are not far removed from his *De aspectibus* (on optics) and *De gradibus* (on medicaments). Cf. Peter Adamson, *Al-Kindī*, Oxford U.P., Oxford 2007, p. 188–206; Pinella Travaglia, *Magic, Causality and Intentionality: The Doctrine of Rays in al-Kindī*, SISMEL–Edizioni del Galluzzo, Firenze 1999; Graziella Federici Vescovini, « La tradizione stoica e il

forecasting (astrometeorology), which are particularly relevant as they significantly contributed to the foundation of this genre of astrology in the medieval world.[57] It is also noteworthy that al-Kindī wrote a *Risālah fī mudkhal al-aḥkām ʿalā al-masāʾil* (*Introduction to Astrology in accordance with Questions*)[58] and a *Kitāb fī mudkhal ilā ʿilm al-nujūm* (*Book on the Introduction to the Science of the Stars*), which was also transmitted under the title *Al-arbaʿūna bāban* (*The Forty Chapters*). The latter was known in the Latin West through two 12th-century translations: the first titled *De iudiciis* by Robert of Ketton, the other as part of the *Liber trium iudicum* and in the *Liber novem iudicum* by Hugo Sanctelliensis.[59] Since the former has not come to us, I will focus later on the theoretical background of *The Forty Chapters*.

Both the epistles on weather forecasting are based on Kindian cosmology as developed in his surviving works titled *Risālah fī l-ibānah ʿan al-ʿillat al-fāʿilat al-qarībah li-l-kawn wa-l-fasād* (*On the Proximate Agent Cause of Generation and Dissolution*),[60] and *Risālah fī l-ibānah ʿan sujūd al-jirm al-aqṣā wa taʿāti-hi li-llāh* (*On the Prostration of the Outermost Body and Its Obedience to God*).[61] The latter work is a *tafsīr* of the Qurʾānic Sura 55, āyat (verses) 1–7.

pensiero di Alkindi », in Ead., *Studi sulla prospettiva medievale*, Giappichelli, Torino 1965. Although hardly attributable entirely to al-Kindī, the *De radiis* shows important doctrinal elements that align with his metaphysical and astrological elaboration. It can, in fact, be considered a translation interpolated with various heterogeneous elements, strongly influenced by Stoicism and closely related to *Picatrix* and the Kindī-circle's adaptations. I am grateful to Dag Hasse for discussing this point with me.

57 Gerrit Bos, Charles Burnett, *Scientific Weather Forecasting in the Middle Ages: The Writings of Al-Kindī. Studies, Editions, and Translations of the Arabic, Hebrew and Latin Texts, London*, Routledge, London 2000.

58 Ibn al-Nadīm, *Fihrist*, ed. Flügel, p. 259.7–8.

59 Charles Burnett, « Al-Kindī on Judicial Astrology. 'The Forty Chapters' », *Arabic Sciences and Philosophy*, 3 (1993), p. 77–117. Edition of the two Latin translations by Robert of Ketton (probably late 1130s or early 1140s) and Hugo Sanctelliensis (probably between 1119 and 1150) in: Charles Burnett, *Al-Kindi. De Iudiciis. The Two Latin Versions*, London 1989 (I am grateful to Charles Burnett for kindly providing me with his personal copy of the work). The section *On the phenomena of the atmosphere* of *The Forty Chapters* (*De iudiciis*) is preserved in Arabic and Latin and translated in: Bos, Burnett, p. 397–408 (Arabic: ms. Jerusalem, Khālidi Library, 21(2)-Astr. 2; Latin: Robert of Ketton's and Hugo Sanctelliensis' translations).

60 Al-Kindī, *Risālah fī l-Ibānah ʿan al-ʿillah al-fāʿilat al-qarībah li-l-kawn wa-l-fasād*, ed. Muḥammad A. Abū Rīdā, Dār al-Fikr, Cairo 1950–1953, vol. I, p. 214–237; Eng. transl. by Peter Adamson, Peter E. Pormann, *The Philosophical Works of al-Kindī*, Oxford University Press, Karachi 2012, p. 155–172.

61 Al-Kindī, *Risālah fī l-Ibānah ʿan sujūd al-jirm al-aqṣā wa taʿāti-hi li-llāh*, ed. Muḥammad A. Abū Rīdā, Dār al-Fikr, Cairo 1950–1953, vol. I, p. 244–261; Eng. transl. by Adamson, Pormann, *The Philosophical Works of al-Kindī*, p. 174–186.

Both al-Kindī's *Letters* on weather forecasting come to us in two Hebrew translations and various revised Latin versions,[62] since the original Arabic is lost.[63] These epistles are entitled *On Moistures and Rain* (*Letter I*) and *On the Causes of Forces Related to the Heavenly Bodies Which Indicate Rain* (*Letter II*, in Arabic: *K. Risālati-hi fī ʿilal al-qūwāt al-mansūbati ilā-l-ishkhāṣ al-ʿāliyati al-dāllati ʿalā maṭari*, as listed among al-Kindī's astronomical works in Ibn al-Nadīm's *Fihrist*).[64]

In both the epistles, al-Kindī begins by discussing the knowledge required to become an astrologer. According to al-Kindī, one cannot be an astrologer without being a philosopher and acquiring knowledge in the four mathematical sciences and meteorology, in line with his *On the Quantity of Aristotle's Books and What is Required to Attain Philosophy* (*Risālah fī kammiyyāt kutub Arisṭūṭālīs wa-mā yuḥtāj ilay-hi fī taḥṣīl al-falsafah*).[65] Thus, he transitions from reflecting on meteorology to addressing technical astrological matters. In addition to highlighting the impact of Ibn al-Biṭrīq's translations of Aristotle's *Meteorology* and *On the Heavens*, these astrological texts clearly anchor the science of the stars in Aristotelian physics, demonstrating the practical application of astrology. On this, al-Kindī aligns with his pupil, Abū Maʿshar. As outlined by Peter Adamson, the core of this meteorological study is the phenomenon of the exhalations from heated water and earth which causes a series of meteorological events, including clouds and rainfall.[66]

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62 Alkindi Latinus' *De mutatione temporum* (hereafter *DMT*) has also been transmitted under the title *De pluviis*. Together with other works attributed to al-Kindī, the *DMT* includes technical extracts that appear to originate from a collection of sentences by various authors. Al-Kindī is a key contributor, alongside figures such as Abū Ḥafṣ ʿUmar ibn al-Farrukhān al-Ṭabarī (also known as Omar Tiberiades, d. ca. 815), Abū 'l-Ḥasan ʿAlī ibn Abī 'l-Rijāl al-Shaibānī (i.e., Albohazen filii Haly Abenragel, an 11th-century astrologer from Qairouan), and even Hippocrates. Given the Latin tradition of the *DMT*, it is more plausible to consider it as part of a collection of astrological writings circulated under the name of 'Alkindi/Alkyndus'. Editions and commentaries of these texts can be found in: Bos, Burnett, 2000 (see especially p. 12–39).

63 Bos, Burnett, 2000, p. 29–95.

64 Ibn al-Nadīm, *Fihrist*, ed. Flügel, p. 257.19–20.

65 Al-Kindī, *Risālah fī kammiyyāt kutub Arisṭūṭālīs*, ed. Muḥammad A. Abū Rīdā, Dār al-Fikr, Cairo 1950–1953, vol. I, p. 363–384. Another edition: Michelangelo Guidi, Richard Walzer, « Studi su al-Kindī, I: Uno scritto introduttivo allo studio di Aristotele », *Memorie della R. Accademia Nazionale dei Lincei. Classe di Scienze Morali, Storiche e Filosofiche*, ser. VI, 6/5 (1940), p. 373–419 (reprinted in Fuat Sezgin, Māzin ʿAmāwī, Carl Ehrig-Eggert, Eckhard Neubauer (eds.), *Abū Yūsuf Yaʿqūb ibn Isḥāq al-Kindī (d. after 256/870). Texts and Studies*, Institut für Geschichte der Arabisch-Islamischen Wissenschaften, Frankfurt a.M. 1999 (Islamic Studies, 5), p. 285–329.) Cf. Al-Kindī, *Letter I*, ed. Bos, Burnett, 2000, p. 97–98, Eng. transl. p. 161–162; Id., *Letter II*, ed. Bos, Burnett, p. 203–205, Eng. transl. p. 243–245.

66 It is noteworthy that a similar conception on the Moon's influence on rainfall is present in both *Letter I* and *On the Proximate Agent Cause*, as well as in the Kindī-circle's *Fī l-tadbīrāt al-falakiyyah*. The Moon is described as having a moist nature, which leads to moisture in the earthly realm. By gathering and condensing vapours, it contributes to the formation of clouds and rainfall. Rainfall

In *Letter I*, as in the Kindī-circle's *On the Governments of the Spheres*, there is a series of *reductiones ad absurdum* aimed at demonstrating the roles of the Sun, the Moon, and other planets, as well as their relationships with the Zodiac signs, their motions, and distances, in influencing life on the sublunary world. After establishing the meteorological foundation for astrology, the author delves into technical astrological details to illustrate how each connection, motion, and disposition of the planets affects the earthly realm. In *Letter II*, translated by Kalonymus ben Kalonymus (d. after 1328), al-Kindī discusses the effects of each planet on Earth, the lunar mansions, and the methods for calculating rainfall.

In his *The Forty Chapters*, al-Kindī introduces the basics of cosmology and then develops each single chapter of judicial astrology: Nativities, Commencements, Interrogations, and Choices, such as when to undertake a journey, when to besiege a city or begin a war, whether or not to support an uprising against the king, when to irrigate the fields and proceed with specific agricultural activities, etc.[67] These are just a few examples from a rich list of events that people have historically sought guidance for from the stars. At the end of Robert of Ketton's translation (1130s–1140s), we read:

> It is established among wise men that the comings-to-be and the passings-away of things happen by the perpetual movement of the heavenly bodies, whose effect principally proceeds from the nature, condition and order of the luminaries, the other planets and the heavenly sphere when the luminaries are in conjunction and opposition.[68]

This framework represents a non-determinist approach to judicial astrology, based on Aristotelian meteorology, likely shared by both Abū Maʿshar and the author of the *Ghāyat al-Ḥakīm*. It posits that earthly events, including generation

is said to be heaviest during the Moon's waning phase, while it decreases significantly as the Moon waxes, ceasing altogether at the full Moon. Cf. Al-Kindī, *Risālah fī l-ibānah ʿan al-ʿillat al-fāʿilat al-qarībah*, ed. Abū Rīda, p. 231–232, Eng. transl. Adamson, Pormann, 2012, p. 168 (IX.1–2); Id., *On Moistures and Rain*, ed. Bos, Burnett, 2002, p. 182, 44–45; [Alex. Aphrod.], *Fī l-tadbīrāt al-falakiyyah*, ms. E, f. 78v. The same conception, probably starting from the Kindī-circle's *maqālah*, is in Averroes' *Epitome of the Metaphysics*, ed. Carlos Q. Rodriguez (Estanislao Maestre, Madrid 1919); *Compendio de Metafísica*, ed. Puig Montada (Universidad de Córdoba, Córdoba 1998), p. 166–168 (§ 74–77); German translations: *Metaphysik des Averroes*, transl. Max Horten, Max Niemer Verlag, Halle an der Saale 1912 (Abhandlungen zur Philosophie und ihrer Geschichte), p. 201–203 and *Die Epitome der Metaphysik des Averroes*, transl. Simon Van der Bergh, Brill, Leiden, 1924, p. 141–143. Cf. Freudenthal, « The Medieval Astrologization », p. 242.

67 All of these are chapters of the *De iudiciis*.

68 Burnett, « Al-Kindī on Judicial Astrology », p. 79. Latin text (§ 699): « Constat apud sapientes rerum generationes corruptionesque motu perpetuo celestium corporum contingere, quarum effectus ex luminum et ceterorum planetarum celique natura, modo simul et ordine, in luminum coniunctione oppositioneque principaliter procedit ».

and dissolution, are influenced by the continuous movement of celestial bodies. Key factors determining these influences include the nature, condition, and alignment of the luminaries (the Sun and Moon), other planets, and the celestial sphere, particularly during significant alignments like conjunctions and oppositions. The work begins with a detailed description of the cosmos and the Zodiac signs, highlighting their natures, properties, mutual relationships, and effects. This underscores a belief in the interconnectedness of heavenly phenomena and earthly events, which is foundational to judicial astrology and constitutes the core of Al-Kindī's *The Forty Chapters* (*De iudiciis*). Through this lens, and similarly to Abū Maʿshar, astrology is viewed not merely as a predictive tool but as a science grounded in the natural order and the dynamics of the cosmos, built on the entire spectrum of knowledge that leads to wisdom, from exploring the deep nature of the cosmos to predicting the development of divine providence and God's will.[69] The influence of the Kindī-circle Alexander's *maqālah* is not only related to its contents but also foundational, as the theme of providence is closely tied to astrological (or astro-meteorological) prediction.

Consequently, Kindian astrological writings represent another stage in the process of the 'astrologization of the Aristotelian cosmos', in that they place astrology at the pinnacle of scientific knowledge and, even more, inextricably link it to metaphysics, thus bringing it out of a twilight zone in which it had been mixed with the vulgar superstition. This perspective would profoundly impact 13th- and 14th-century Latin thinkers and astrologers, including Daniel of Morley (d. 1210 circa), Michael Scot (d. 1235 circa), and Henry Bate of Mechelen (d. after 1310). They not only regarded astrology as the highest form of science but also championed a form of wisdom that seeks to question, experiment with, and transform nature'.[70]

VI. *Conclusions*

To conclude, the integration of astrology within the Aristotelian cosmological framework in the Islamic world reflects a unique fusion of philosophical and scientific traditions. By grounding astrology in meteorology and physics, Arabic-

[69] Cf. Adamson, *Al-Kindī*, p. 197.

[70] Crucial works: Tullio Gregory, « Astrologia e teologia nella cultura medieval », in Id., *Mundana Sapientia*, Edizioni di Storia e Letteratura, Roma 1992, p. 291–328; Charles Burnett, « Michael Scot and the Transmission of Scientific Culture from Toledo to Bologna via the Court of Frederick II Hohenstaufen », *Micrologus*, 2 (1994), p. 101–126 (repr. in Id., *Arabic into Latin in the Middle Ages. The Translators and their Intellectual and Social Context*, Routledge, Farnham 2009); Carlos Steel, Steven Vanden Broecke, David Juste, Shlomo Sela (eds.), *The Astrological Autobiography of a Medieval Philosopher: Henry Bate's Nativitas (1280–81)*, Leuven U.P., Leuven 2018, p. 31–43.

speaking astrologers and philosophers established a scientific framework for this art while preserving its practical aspects. The cosmological framework found in the Kindī-circle Alexander's *Fī l-tadbīrāt al-falakiyyah*, al-Kindī's *Letters* on weather forecasting, and his introduction to judicial astrology (*The Forty Chapters*) was preserved and further developed by Abū Maʿshar's *Al-mudkhal al-kabīr* and al-Qurṭubī's *Ghāyat al-Ḥakīm*, though technical issues sometimes differ. Collectively, these contributions bridged cultural and intellectual traditions, solidifying the scientific status of astrology in Islamic lands and ensuring its influence in the Latin West.

The 'astrologization of the Aristotelian cosmos' partially coincides with the foundation of the 'science of the stars' on Aristotle's *Meteorologica* and *De generatione et corruptione*. Although the *Ghāyat al-Ḥakīm* is a more technical work focused on magical practices – where each planet has specific effects on individuals in conjunction with others – the underlying theoretical background is shared among all these texts. A key distinction, however, must be made between astrological judgments, which interpret celestial signs as indicators of events, and astral magic, as presented in the *Ghāyat al-Ḥakīm*, which involves the invocation of stars as active participants in summoning rituals. This distinction underscores the dual role of celestial bodies as mediators of divine governance and as active agents in magical practices. In addition to this distinction, it is essential to highlight that astrology possesses a high-level mathematical and geometric component, which sets it apart from astral magic and other comparable disciplines. Unlike astral magic, which relies on symbolic and ritualistic practices, astrology is deeply rooted in precise computational methods, involving intricate astronomical calculations, trigonometric models, and geometric frameworks. The mathematical foundations of astrology enhance its scientific credibility by establishing it as a structured discipline with predictive and analytical rigor. These foundations are embedded within a broader theoretical foundation that integrates celestial and terrestrial dynamics, shaping astrology into an advanced system of knowledge characterized by several key features:

- Planetary positions and secondary causality: The study of planetary positions, motions, and alignments frames the stars as both actors and signs, operating as secondary causes within the overarching framework of divine providence. This duality blurs the dichotomy of determinism and anti-determinism, as celestial bodies influence earthly events while remaining subject to God's primary causality.
- Astrology and astronomy in Ptolemy's framework: Ptolemy's view of astrology as a prognostic science highlights its focus on predicting the effects of celestial influences, distinguishing it from astronomy, which

focuses on the mathematical prediction of astral motions. Astrology thereby serves as a bridge, linking natural phenomena with human understanding of divine order.

- Aristotelianism in the Islamic thought: The conceptual framework of Aristotelian meteorology and physics, as interpreted by Alexander of Aphrodisias, were further recontextualized by the Kindī-circle to align with the Islamic worldview. This adaptation integrated celestial influences into a metaphysical structure that accounted for divine causality and cosmic order.
- Cosmic harmony: The concept of cosmic harmony captures the interconnected relationships between the qualities of the heavenly bodies, the properties of the sublunar elements, and the hierarchical structure of causality. This harmony reflects the integration of celestial and terrestrial realms into a unified and coherent system.
- Divine power and cosmic interactions: The divine force that pervades the cosmos manifests through multiple active influences emanating from the stars. These forces interact with earthly matter, producing a variety of reactions and effects, which illustrates the intricate interplay between celestial and terrestrial realms.

These elements mark a significant evolution in the medieval reception of Aristotelian cosmology within the Islamic context, laying the groundwork for subsequent developments in both astrology and natural philosophy.

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