

Philosophical and Scientific Issues in Abū Maʿšar

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Abstract

Abū Maʿšar al-Balḥī is one of the most ancient sources for the spread of philosophical ideas in Islam. This paper considers the *Book of the Great Introduction to Astrology* and gives special emphasis to themes related to Aristotle. The most extensive philosophical text referred to in the *Great Introduction* is found in Abū Maʿšar's examination of the ten kinds of opposition to the science of astrology. Abū Maʿšar notes that many deny astrology because the stars do not indicate the possible. Instead, he aims to show that the possible exists and that it is determined by the stars, conceived as animate beings capable of thinking and choosing. This 'saves astrology' because when a human being chooses, he is predetermined – without knowing it – by the rational soul of the stars. A discussion of the 'contingent futures' in Aristotle is implied in this conclusion. Further examples of philosophical and scientific conceptions complete the study.

Introduction

Although Ġaʿfar ibn Muḥammad Abū Maʿšar al-Balḥī (Balḥ 787 – al-Wāsiṭ 886) is mainly known as an astronomer and an astrologer, numerous philosophical and scientific remarks are nonetheless evident in his work. I began studying Abū Maʿšar's *Great Introduction to Astrology* when Richard Lemay asked the former Istituto Universitario Orientale in Naples to publish his edition of the work, but it was difficult to find a publisher because of the costs of publication of the 9-volume work. We chose to print the text as typed out by Lemay; I had tried to revise it previously and I remember a 14-page list of misprints, but I was unable to establish whether Lemay had ever made the emendations.¹

I am not an expert in astronomy, and even less so in astrology, so I focused on the scientific and philosophical aspects of the work, mainly in terms of the relationship between astronomy,

¹ See Abū Maʿšar al-Balḥī [Albumasar], *Liber Introductorii maioris ad scientiam judiciorum astrorum*, ed. R. Lemay, I-IX, Istituto Universitario Orientale, Naples 1995. Lemay based his edition on eight manuscripts: Paris, BnF, arabe 5902; Oxford, Bodleian Library, Or. 565; Istanbul, Süleymaniye Yazma Eser Kütüphanesi, *Carullah Efendi* 1508; Istanbul, Süleymaniye Yazma Eser Kütüphanesi, *Halet Efendi* 541; Leiden, Bibliotheek der Rijksuniversiteit, Cod. Or. 47; Mašhad, *ʿumumī* 5382, *riyaḍī* 155; Istanbul, *Nuruosmaniye* 2806 and Oxford, Bodleian Library, Hyde 3. Abū Maʿšar, *Liber Introductorii maioris*, I, p. 175. On this edition see Abū Maʿšar, *The Great Introduction to Astrology*, ed. and tr. K. Yamamoto – Ch. Burnett, with an Edition of the Greek Version by D. Pingree, I-II, Brill, Leiden-Boston 2019 (Islamic Philosophy, Theology and Science. Texts and Studies, 106), I, p. 30. The new edition (for which Keiji Yamamoto was primarily responsible, while Charles Burnett translated the work into English) is based on the same manuscripts except for the Mašhad MS, supplemented by five more manuscripts: New Delhi, Hamdard University Library, 1325; Eton, Eton College, 65; Rampur, Raza Library, 4193; Tehran, Dānišgāh 470 and Tehran, *Maḡlis* 6514. Abū Maʿšar, *The Great Introduction to Astrology*, I, Introduction, pp. 30-33.

astrology, and medicine.² I studied the embryological texts in particular. Abū Maʿṣar considers the influence of the planets on the embryo to be entirely authentic, even though this theory is usually associated with popular beliefs. I have counted more than forty references to embryology, the longest of which appeared to be more or less the same as two passages in the “Book on the diseases of the womb” in the *Kitāb al-Ḥāwī* of the great physician Abū Bakr al-Rāzī (d. 925/935).³ Al-Rāzī identifies as his sources Galen and Ḥunayn b. Isḥāq (d. 873). Nonetheless the antiquity of the *Great Introduction* is relevant in deciding the question of the sources.⁴

The chronology of the life of Abū Maʿṣar makes him one of the most ancient sources for the spread of philosophical ideas in Islam. Ibn al-Nadīm (d. 990) states that in 834 Abū Maʿṣar came to be acquainted with the ‘philosopher of the Arabs’ al-Kindī (d. ca. 870), who urged him to study arithmetic and geometry.⁵ It is distinctly possible, however, that he knew Greek doctrines as well as astronomy.⁶ Charles Burnett identifies medical and geographical texts among the Greek philosophical sources of Abū Maʿṣar, and “Aristotle’s works on logic and natural science, unusual in an astrologer”, probably “due to his association with al-Kindī, and to his knowledge of the Neoplatonic literature of the star-worshipping Ṣābiʿans of Ḥarrān, but he was also aware of a Greek chronicle by Annianus”.⁷ Abū Maʿṣar was also familiar with the esoteric tradition of the ‘three Hermes’ and quotes several authors linked to this tradition: among these is Tinkalus, who is often identified with Teuchros. In the *Great Introduction* we also find references to philosophy itself: in VII 9.8a (Engl., p. 813), Mercury is linked to prophethood and philosophy, and to divination, despite the negative qualities attributed to this planet. In VIII 4.56 (Engl., p. 891) Abū Maʿṣar says that philosophy belongs to Saturn, and experience to Mercury.

Aristotelian Themes in the Great Introduction

This paper reconsiders some philosophical and scientific aspects of the *Great Introduction*, with special regard to themes related to Aristotle.

² See C. Baffioni, “Il rapporto astrologia-medicina nelle considerazioni embriologiche del *Kitāb al-Mudḥal al-kabīr* di Abū Maʿṣar al-Balḥī”, in *Studi in memoria di Pier Giovanni Donini, Oriente moderno* n.s. 24(85) (2005), pp. 269-85.

³ See C. Baffioni, “L’embriologia araba fra astrologia e medicina. Abū Maʿṣar al-Balḥī e Muḥammad ibn Zakariyāʾ al-Rāzī”, in R. B. Finazzi – A. Valvo (ed.), *La diffusione dell’eredità classica nell’età tardo-antica e medievale. Il “Romanzo di Alessandro” e altri scritti*, Edizioni dell’Orso, Alessandria 1998, pp. 1-20; Ead., “Il rapporto astrologia-medicina” [quoted above, n. 2], pp. 274 and 281-2).

⁴ Baffioni, “Il rapporto astrologia-medicina” (above, n. 2), pp. 272-3. On Hippocrates’s influence see Abū Maʿṣar, *The Great Introduction to Astrology* (above, n. 1), I, Introduction, pp. 14-15 and 19.

⁵ On al-Kindī’s influence see Abū Maʿṣar, *The Great Introduction to Astrology* (above, n. 1), I, Introduction, p. 11; also, Abū Maʿṣar, *Liber Introductorii maioris* (quoted above, n. 1), I, pp. 16-19.

⁶ Abū Maʿṣar knew the astronomical and astrological works of the Greeks – Dorotheus (see for example Abū Maʿṣar, *The Great Introduction to Astrology* [above, n. 1], VII, 5.10; Engl., p. 771. I quote from Burnett’s translation, to whom I am deeply indebted for the magnificent gift of the book. References include, in Roman figures, the Part ‘*Qawl*’, and in Arabic figures the Chapter ‘*Faṣl*’ and the Paragraph of Abū Maʿṣar’s *Liber Introductorii maioris*, followed by the corresponding pages of the English translation. All references are understood to belong to vol. I) and Vettius Valens besides Ptolemy, though Persian and Babylonian heritages are not to be overlooked. The great conjunctions of Saturn and Jupiter belonged to Persian astrology; of Indian origin were the *nawbabrāt* and the decans. *Ibid.*, I, Introduction, p. 4.

⁷ Abū Maʿṣar, *The Great Introduction to Astrology* (above, n. 1), I, Introduction, p. 4.

Abū Maʿšar usually refers to Aristotle as *al-faylasūf* or *al-ḥakīm*,⁸ and numerous issues related to him are approached in the *Great Introduction*. An example is the opening assertion in I 1.7a (Engl., p. 45), according to which ‘the fulfilment of the desire of the wise resides in the fulfilment of the knowledge of what they seek’: Aristotle identified the origin of philosophy in *Metaph.* A 2, 982 b - 983 a as the sensation of wonder. Subsequently, Abū Maʿšar achieves his aim for clarity through the processes of diairesis and analysis. In *The Great Introduction to Astrology* I 3.2a (Engl., p. 81) the scientific method of Aristotle is accurately echoed: ‘Since everyone who writes a book must explain the intention of his book at the beginning of his undertaking’, Abū Maʿšar states his purpose and lists the ‘scientific questions’ that were widespread among Muslim philosophers:

The Wise Man has provided for us a definition in respect to the knowledge of things which everyone who wants to know something, should give his attention to. It <consists of> four points: the first is that he should know concerning the thing which is asked about and sought, ‘Does it exist or not?’; the second is ‘What is it?’; the third is ‘How is it?’; the fourth is ‘Why is it?’.⁹

This approximately corresponds to the approach to knowledge discussed in the *Prior and Posterior Analytics*.¹⁰

In *The Great Introduction to Astrology* I 2.5 (Engl., p. 55) Abū Maʿšar claims that most of the science of astrology and astronomy is ‘obvious, clear and in front of our eyes’ and that what is not so can be inferred through clear analogies (that is, rational arguments) drawn from physics. He also discusses error in astrology:

If error occurred in [astrology], this is not due to this profession, but only due to the lack of knowledge of many of the theoreticians in this profession, without comprehensive understanding of its science, and their weakness in grasping the subtleties of the causes and reasons according to which analogies are made in its entirety (I 2.27a; Engl., pp. 73-5),

and lists more causes of error in this and the following paragraph 28a, where his reference to the profundity and distance from the senses (cf. Engl., p. 75) of astrological research is noteworthy.

⁸ But in V 12.1 (Engl., p. 507) we find an ‘*Astrātū*’ that does not seem to be Aristotle; Burnett does not identify him, see Abū Maʿšar, *The Great Introduction to Astrology* (above, n. 1), I, p. 495, n. 244.

⁹ On the ‘philosophical questions’ see also Abū Maʿšar, *The Great Introduction to Astrology* (above, n. 1), I, Introduction, p. 10.

¹⁰ The series of the four questions, however, features as such in the Alexandrian *Prolegomena* literature, and typically in David’s *Prolegomena*, p. 1.15 Busse (CAG XVIII.2). The strong influence of David’s *Prolegomena* on the rise of Arabic philosophy has been detailed by C. Hein, *Definition und Einteilung der Philosophie: von der spätantiken Einleitungsliteratur zur arabischen Enzyklopädie*, P. Lang, Frankfurt am Main 1985; Abū Maʿšar here might depend upon al-Kindī’s *On First Philosophy*. See *Rasāʾil al-Kindī al-Falsafiyā*, I-II, ed. M.ʿA.H. Abū Rīda Cairo 1950, vol. I, pp. 97-162, on p. 101; cf. Alfred Ivry’s translation and commentary in Al-Kindī’s *Metaphysics. A Translation of Yaʿqūb ibn Ishāq al-Kindī’s Treatise “On First Philosophy” (fī al-Falsafah al-Ūlā)*, with *Introduction and Commentary* by A.L. Ivry, State University of New York Press, Albany 1974, pp. 56 and 123 respectively. For this comment I am indebted to one of the peer-reviewers of my study. For al-Kindī as a possible intermediary between the ancient world and Abū Maʿšar see also *infra*, n. 36.

Aristotle's *Physics* springs most readily to mind. In Part I, for example, the perfection of circular motion is considered (I 3.2d; Engl., p. 81) along with action by direct contact or through a medium (I 3.5a; Engl., p. 85). And in V 4.3a (Engl., p. 457) we read: '[...] fire is not established by being adjacent to water, because each of them destroys the other'. Distinctions are also made between acts of will and acts of nature (I 3.7a; Engl., p. 87) recalling Aristotle's ethics. The distinction among cause (*fi'l*), effect (*maf'ul*) and result (*munfa'al*) also has its root in Aristotle. I 4.10 ff. echoes other issues in physics but it seems to me that from paragraph 16 onwards Abū Ma'shar's views diverge from Aristotle's.

The most extensive philosophical text referred to in the *Great Introduction* is found in Abū Ma'shar's examination of the ten kinds of opposition to the science of astrology, as listed in I 5.2 ff. This deals with the issue of 'future contingents'. I have already studied this passage,¹¹ but I reconsider it now in the light of Burnett's new edition and translation.

Richard Lemay considered the passage to be either a translation – though different from the classic Ishāq b. Hunayn (d. 910) version of the *On Interpretation* – or a paraphrase drawn from this and other works of Aristotle.¹²

The most relevant part for our discussion begins at paragraph 7, when the third category of opponents to astrology is introduced:

The people of reflection¹³ and disputation refute the science of astrology, saying that the stars do not indicate a thing which comes to be in this world. They argue this¹⁴ by claiming that the stars do not indicate the possible (contingent). We shall now discuss some arguments of the Ancients who rejected the possible. Then we affirm the possible. Then it will become clear that the stars indicate the possible (Engl., p. 111).

As we now learn through Burnett,¹⁵ Lemay incorrectly believed that Abū Ma'shar had revised his text. I noted, however, that these lines would be clearer if we accepted the excision mentioned by Lemay¹⁶ of lines 727-728 – namely of the words *fa-nadkuru 'lān huḡaḡ ba'd al-awwalīn alladīna dafa'ū 'l-mumkin* – in the description of the third group of adversaries of astrology. In this case the text would read:

The people of reflection and disputation refute the science of astrology, saying that the stars do not indicate a thing which comes to be in this world. They argue this by claiming that the stars do not indicate the possible (contingent). Then we affirm the possible. Then it will become clear that the stars indicate the possible.¹⁷

¹¹ See C. Baffioni, "Una citazione di *De interpretatione*, 9 in Abū Ma'shar?", in C. D'Ancona – G. Serra (eds), *Aristotele e Alessandro di Afrodizia nella tradizione araba*, Il Poligrafo, Padua 2002, pp. 113-32. See also Abū Ma'shar, *The Great Introduction to Astrology* (above, n. 1), Introduction, p. 13, n. 53.

¹² See Abū Ma'shar, *Liber Introductorii maioris* (above, n. 1), I, pp. 32 and 61, n. 14; II, p. 86, n. 15.

¹³ Abū Ma'shar, *The Great Introduction to Astrology* (above, n. 1) gives: *al-nazar*; Abū Ma'shar, *Liber Introductorii maioris* (above, n. 1), II, p. 32.725, has instead: *al-ḥadīṭ*.

¹⁴ Abū Ma'shar, *The Great Introduction to Astrology* (above, n. 1) gives: *إحتجوا*; Abū Ma'shar, *Liber Introductorii maioris* (above, n. 1), II, p. 32.726, has instead: *إحتاجوا*.

¹⁵ See Abū Ma'shar, *The Great Introduction to Astrology* (above, n. 1), I, pp. 7-8.

¹⁶ See Abū Ma'shar, *Liber Introductorii maioris* (above, n. 1), II, p. 86; cf. II, p. 32.725-728 and I, p. 180.

¹⁷ See Baffioni, "Una citazione" (above, n. 12), p. 116.

As we shall see, the addition clearly results from Abū Maʿšar's misunderstanding – or pretended misunderstanding – of Aristotle.

In paragraph 8 Abū Maʿšar continues the argument:

The people who reject the judgement of the stars as the cause of the possible argue by saying that the Philosopher stated that there are three conditions (*aḥwāl*) of things in the world: the necessary, e.g. that fire is hot; the impossible, e.g. that a man flies; and the possible (contingent), e.g. that a man is writing—and that the stars only indicate two of these categories (*unṣurayni*): the necessary and the impossible, but they do not indicate the possible, so the profession of astrology is futile (*bāṭila*) (I 5.8; Engl., p. 111¹⁸).

Then in paragraph 9a Abū Maʿšar speaks of the puzzlement of 'some astrologers and many ancient philosophists (*kaṭīr min al-mutafalsafīn al-awwalīn*)' who were in favour of astrology:

Some astrologers and many ancient philosophists who affirmed that the stars indicate things coming to be in this world in a steady and compulsive way,¹⁹ when they²⁰ came across this abstruse question and were unable to answer it, rejected the possible and said that there were only two categories: the necessary and the impossible (Engl., p. 113²¹).

Lemay argued that this is Abū Maʿšar's most important demonstration in astrology because it deals with the opposition between fatalism and freedom.²² He adds that 'Abū Maʿšar coats Aristotle's "liberalism" with a layer of determinism that makes it almost unrecognizable: he does this through a subtle shift from the realm of epistemology to that of ontology and from the realm of propositional logic to that of concrete reality.'²³

Paragraph 9a-c then introduces an abstract dichotomy between affirmation – that which exists and is necessary (*naʿam, waǧīb, wuǧūd*) – and negation – that which is non-existent and impossible (*lā, mumtaniʿ, ʿadam*):

For we only know two alternatives: 'Yes' or 'No', and they mean 'existing' and 'non-existent' <respectively>. 'Yes' indicates 'existing'; 'No' indicates 'non-existent'. 'Existing' is the necessary alternative, and 'non-existent' is the impossible one. This is called a 'mutually incompatible matter' (*al-qāḍiya al-mutanāqida*), because if one side is true, the other is false,

¹⁸ Abū Maʿšar, *Liber Introductorii maioris* (above, n. 1), II, p. 32.729-732, and Baffioni, "Una citazione" (above, n. 12), p. 114.

¹⁹ Cf. Burnett's interesting n. 118 in Abū Maʿšar, *The Great Introduction to Astrology* (above, n. 1), p. 113. I gave a different translation, cf. Baffioni, "Una citazione" (above, n. 12), p. 115. The text should mean that astrologers consider the indications of the stars imply, and refer to, necessary events.

²⁰ Abū Maʿšar, *The Great Introduction to Astrology* (above, n. 1) gives: *fa-innahu lamma*; Abū Maʿšar, *Liber Introductorii maioris* (above, n. 1), II, p. 32.734 has instead: *fa-annahum li-mā*.

²¹ *Ibid.*, II, pp. 32.733-33.736, and Baffioni, "Una citazione" (above, n. 12), p. 115.

²² See Abū Maʿšar, *Liber Introductorii maioris* (above, n. 1), I, p. 60. The scholar also hints at the influence of Plotinus and Alexander of Aphrodisias, *ibid.*, pp. 60-1 and n. 15.

²³ See *ibid.*, I, p. 61. See on the same theme but in a different context C. Viano, "Aristote contre les astrologues (Olympiodore, *Sur le De interpretatione* 9)", in S. Husson (ed.), *Interpréter le De Interpretatione, Études réunies et éditées*, Vrin, Paris 2009 (Bibliothèque d'histoire de la philosophie. Nouvelle série), pp. 69-87.

and it is impossible for both to be true for one thing at the same time. It is like two people,²⁴ one of whom says ‘Tomorrow there will be rain’, the other ‘Tomorrow there will not be rain’. Without doubt one will be speaking the truth – this is the necessary <statement> – and the other lying – this is the impossible <statement>. Similarly, if someone were to say today that something will happen tomorrow, if that thing were to happen tomorrow, it will have happened because its occurrence is necessary. If someone were to say that it will not happen, if it were not to happen, it will not have happened because its occurrence is impossible, and since one of the two is speaking the truth, the other is lying. Similarly, if someone said ‘He will walk’, and he walks,²⁵ then he walks because it is necessary that he walks. If he said ‘He will not walk’, and he does not walk, then he does not walk because it is impossible that he walks (Engl., p. 113).

Here, Abū Maʿṣar is considering statements regarding events that will or will not occur in the future and future personal choices as if they were indications of the stars, which are related to the future. Therefore, true and false are linked to an affirmation or a negation according to whether the event is necessary or impossible: i) if the affirmation is true it is because the occurrence of the event and its necessity are predetermined, whereas ii) if negation is true it is because of the non-being/not happening/not possible nature of the event. Even the choice of doing something (a sort of affirmation) is a matter of the predetermination of its necessarily being, and in the same way the choice of not doing something (a sort of negation) is a consequence of its predetermined impossibility.

Abū Maʿṣar, however, seems to forget that Aristotle limited the truth or falsehood of affirmations and negations according to their correspondence or non-correspondence with reality to statements regarding universal and individual objects either in the present or in the past (*De Int.* 9, 18 a 28-31²⁶). If this condition were valid for the future as well, any affirmation regarding a future event would be either i) true if the event were predetermined to occur, when its negation would be false; or ii) false if the event is predetermined not to occur and its negation would be true.

Now, if all this is so, Aristotle continues, ‘there is nothing that happens by chance or fortuitously; nothing will ever so happen. Contingency there can be none; all events come about of necessity’ (*De Int.* 9, 18 b 5-7, tr. H.P. Cooke).²⁷

Abū Maʿṣar concludes in the same sense:

They said that people are compelled (*muğbarūn*) to do the things they do, and when they do something, they do it because they are compelled to do it, and this is necessary. If they do not do something, then they do not do it because it is impossible that they do it. In the case of everything²⁸ that comes to be, its coming-to-be is necessary, and for that which does

²⁴ Abū Maʿṣar, *The Great Introduction to Astrology* (above, n. 1) gives: *ka-rağulayn*; Abū Maʿṣar, *Liber Introductorii maioris* (above, n. 1), II, p. 33.740, has instead: *k-al-rağulayn*.

²⁵ Abū Maʿṣar, *The Great Introduction to Astrology* (above, n. 1) gives: *فمشی*; Abū Maʿṣar, *Liber Introductorii maioris* (above, n. 1), II, p. 33.745, has instead: *فممشا*, and later as well.

²⁶ Cf. Ishāq b. Ḥunayn’s translation in ‘A. Badawī, *Mantiq Aristū*, Dār al-kutub al-Miṣriyya, I-II, Cairo 1948-49, I, p. 73.2-4.

²⁷ Aristotle, *The Organon I The Categories; On Interpretation*, tr. H.P. Cooke; *Prior Analytics*, tr. H. Tredennick (Loeb Classical Library 325), Harvard U.P., London-Cambridge MA 1938.

²⁸ Abū Maʿṣar, *The Great Introduction to Astrology* (above, n. 1) gives: *wa-kull*; Abū Maʿṣar, *Liber Introductorii maioris* (above, n. 1), II, p. 33.748, has instead: *fa-kull*.

not come to be, it is impossible that it should come to be, and the stars only indicate these two <conditions>, and the possible does not exist at all (I 5.9d; Engl., p. 113).

Astrology as prediction of the possible would hence be nullified: when the supporters of astrology were not able to resolve this question, they denied the possible, claiming the existence of a determinism inherent in the stars in order to ‘save’ astrology. But Abū Maʿṣar forgets another crucial passage in Aristotle, *De Int.* 9, 18 a 34-39:

When, however, we come to propositions whose subjects are singular terms, while their predicates refer to the future and not to the present or past, then we find that the case is quite changed. Propositions, whether positive or negative, being themselves true or false, every predicate that we affirm must belong to its subject or not. Hence it is that, if someone declares that a certain event will take place, while another declares it will not, one will clearly be speaking the truth, while the other as clearly will not. Both predicates cannot belong to one subject with regard to the future.

This passage holds that the necessity or impossibility of a future event seem to result from the truth or falsehood of the corresponding affirmation or negation. The same is evident in the Arabic translation of the passage by Iṣḥāq:

If every affirmation and negation were true or false, it would be necessary for everything to be either existent or not-existing. So, if one would say of something that it will be, and another one that it will not be, it is clear that by necessity one says the truth if every affirmation is true or false. In fact, it is not possible that both the determinations exist together in this and similar cases.²⁹

Whereas Abū Maʿṣar considers it to be the reasoning of those who deny astrology as prediction of possible future events, Aristotle’s reasoning is clearly an argument per absurdum.

According to Aristotle, the truth or the falsehood of affirmations and negations cannot determine the existence or non-existence of something: he simply states that with regard to a single future event its affirmation or its negation must be either true or false: they cannot be true or false at the same time in that they are opposites.

After his provisional conclusion in favour of the non-existence of the possible, Abū Maʿṣar introduces the proofs established by Aristotle in favour of the possible and adheres more closely to the ‘original’ text – whichever that may be. In I 5.10a we read: “[...] the Philosopher [...] has established possibility [...] with many arguments. Then he mentioned afterwards that possibility leads eventually to necessity or impossibility” (Engl., p. 113).

To refute those who deny astrology because the stars indicate only the necessary and the impossible, whereas possibility exist, Abū Maʿṣar aims now to demonstrate i) the existence of the possible and ii) that astrology deals with possible. More arguments in favour of the existence of the possible follow (I 5.11 a - 15 d³⁰), which Abū Maʿṣar relates to Aristotle –, despite Lemay’s remark above; I have been unable to determine the passages in question.

²⁹ Cf. Badawī, *Mantiq Aristū* (above, n. 25), pp. 70.16-71.2.

³⁰ E.g., in Abū Maʿṣar, *The Great Introduction to Astrology* (above, n. 1), I 5.14: “there is a single potential in necessary [...] or in impossible things [...] But we may see many things in which there are two potentials: that the thing comes to be as it is, and that it does not” (Engl., p. 119).

The first argument introduced by Abū Maʿṣar for establishing possibility is the following:

necessity and impossibility are known at <all> three³¹ times through the necessity or impossibility in their nature.³² But our actions are different from this, because they are possible (I 5.10a; Engl., p. 115).

In fact:

Since³³ a person does not know without doubt what he will wish to do, this <action> is not compulsory, but is possible (I 5.10c; Engl., p. 115).

Other arguments consider the event of a choice between two opposite possibilities. They demonstrate the existence of the possible.

But, Aristotle insists, “We cannot contend, notwithstanding, that neither proposition is true. For example, we cannot contend that a certain event neither will nor will not come to pass in the future” (*De Int.* 9, 18 b 17-18). And this, not only because “although one affirmation or denial should prove to be false, yet the other would still not be true” (*De Int.* 9, 18 b 18-20), but because ‘if some event neither will nor will not come to pass on the morrow, contingency there will be none’ (*De Int.* 9, 18 b 22-23).

In 9, 18 b 23 these lines introduce the famous passage about the naval battle – to be discussed later:

Let us take, for example, a sea-fight. It is requisite on our hypothesis that it should neither take place nor yet fail to take place on the morrow [...] No need would there be for mankind to deliberate or to take pains [...] it is quite immaterial whether contradictory predictions were actually made beforehand. For that someone affirmed or denied does not alter the course of events. And events are not caused or prevented by someone’s affirming or denying that at some future time they would happen. Nor yet, let us add, does it matter how old the predictions may be (*De Int.* 9, 18 b 23-19 a 1).

The naval battle is not mentioned in Abū Maʿṣar. We are led to conclude that he is not referring to a translation and to consider the text as a gloss of the passage. In paragraph 15 Abū Maʿṣar introduces the three kinds of possibility:

So it has become clear that the possible exists, and <operates> in three ways. The first of them is ‘natural’ (*ṭabīʿī*), and this is easy (likely to happen): for example, one hopes for rain when there is a covering of rainy clouds in winter; there is a greater likelihood that it will rain than that it will not rain. The second is ‘by desire’ (*bi-l-amaniyya*), which is difficult (not likely to happen): for example, some wretched and poverty-stricken people hope to obtain power and honour: that they acquire no power is more likely than that they do, and if they do acquire power, then it is only because of extraordinary circumstances. The third is ‘equal possibility’, which is what arises in thought (*bi-l-fikr*): it is like the hope of a

³¹ Abū Maʿṣar, *The Great Introduction to Astrology* (above, n. 1) gives: الثلاثة; Abū Maʿṣar, *Liber Introductorii maioris* (above, n. 1), II, p. 33.753, has instead: الثلثة.

³² Abū Maʿṣar, *The Great Introduction to Astrology* (above, n. 1) gives: *bi-ṭabīʿ atihā*; Abū Maʿṣar, *Liber Introductorii maioris* (above, n. 1), II, p. 33.753, has instead: *bi-ṭabīʿ atihimā*.

³³ Abū Maʿṣar, *The Great Introduction to Astrology* (above, n. 1) gives: فإذا; Abū Maʿṣar, *Liber Introductorii maioris* (above, n. 1), p. 34.764, has instead: فإذن.

pregnant woman that she will give birth to a boy, for her hope for this is not stronger than her fear that she will give birth to a girl (I 5.15a-c; Engl., p. 119).

Strange as these examples may be, the text corresponds to the Greek distinction into ἐπὶ τὸ πολὺ, ἐπι᾿ἐλαττον and ἐπι᾿ὑψηλῶς. Calling the first kind of possible *ṭabiʿī* indicates that Abū Maʿšar's source considered ἐπὶ τὸ πολὺ to be the 'necessary' – in fact according to Aristotle's view of science 'necessary' is not only what always happens, but what happens in most cases. The *On Interpretation*, on the other hand, aims to demonstrate that:

Thus, it is clear that not everything is or takes place of necessity. Cases there are of contingency; no truer is then the affirmative, no falsier, than the negative statement. Some cases, moreover, we find that, at least, for the most part and commonly, tend in a certain direction, and yet they may issue at times in the other or rarer direction (*De Int.* 9, 19 a 18-22).

In paragraph 16 we come to the core of the argument. According to 'the philosopher', Abū Maʿšar says, 'possible leads to necessity or to impossibility':

It is like someone saying 'I shall walk tomorrow' or 'I shall not walk'. For walking or its opposite are possible. But once he walks, then walking has become necessary for him, because, before he walks, walking is possible for him, but once he walks, the possibility is taken from him and he enters the field of necessity. If he does not walk tomorrow, he enters the field of the impossible, because walking is no longer available for him (I 5.16; Engl., pp. 119-21).³⁴

If walking or its opposite, in that they are both choices, are possible it follows that once a person walks then walking becomes necessary and non-walking impossible. That means that potentiality has been transformed into actuality.

Aristotle said in the *On Interpretation*:

[...] those things that are not uninterruptedly actual exhibit a potentiality, that is, a 'may or may not be.' If such things may be or may not be, events may take place or may not (*De Int.* 9, 19 a 9-11).

And again:

What is must needs be when it is; what is not cannot be when it is not. However, not all that exists any more than all that which does not comes about or exists by necessity. That what is must be when 'it is' does not mean the same thing as to say that all things come about by necessity. And so, too, with that which is not. And with two contradictory statements the same thing is found to hold good. That is, all things must be or not be, or must come or not come into being, at this or that time in the future. But we cannot determinately say *which* alternative *must* come to pass. For example, a sea-fight [...] (*De Int.* 9, 19 a 23-30).

Here we notice another difference. It appears that Abū Maʿšar considers each of the two alternatives to be possible, whereas Aristotle's text and its Arabic version emphasise the necessity of the pair 'being or non-being' to be possible:

³⁴ Burnett refers to Arist., *Metaph.* Θ 3, 1047 a 15-29 and *Eth. Nic.* Γ 5, 1112 a 18 ff. as sources in Abū Maʿšar, *The Great Introduction to Astrology* (above, n. 1), I, p. 121, n. 133.

[...] a sea-fight must either take place on the morrow or not. No necessity is there, however, that it should come to pass or should not.

What is necessary is that it either should happen to-morrow or not. And so, as the truth of propositions consists in corresponding with facts, it is clear in the case of events where contingency or potentiality in opposite directions is found that the two contradictory statements about them will have the same character.

With what is not always existent or not at all times non-existent we find this exactly the case. For one half of the said contradiction must be true and the other half false. But we cannot say which half is which.

Though it may be that one is more probable, it cannot be true yet or false.

There is evidently, then, no necessity that one should be true, the other false, in the case of affirmations and denials. For the case of those things which as yet are potential, not actually existent, is different from that of things actual. It is as we stated above (*De Int.* 9, 19 a 30-b4).

To return to Abū Maʿṣar: having demonstrated the existence of the possible he explains that the stars give indications about what is ‘possible’, and hence that a relationship exists between what is necessary and what is possible: “[...] the stars indicate the three categories, i.e., the necessary, possible, and impossible” (I 5.17a; Engl., p. 121). If we re-examine line 17 of p. 118, which says that ‘possibility is reduced to (Burnett’s transl.: “leads”) to necessity or impossibility’, we realize that the verb *yuʿawwilu* clarifies the interdependence of necessary, possible, and impossible. Possible is potentially necessary or impossible according to the occurrence or non-occurrence of an event. The term *mutabayyaʿan* (‘available’) at p. 120.2 is different from *muḡbarūn* (‘compelled’) at p. 112.13 because it indicates the ‘predetermination’ of the choice between two alternatives that is the real cause of the transformation of the possible into necessary or impossible. This reflects Abū Maʿṣar’s interest in potentiality rather than the alternative true-false.

I hope to reconsider these arguments in future and to compare them with the statements by al-Fārābī in his commentary on chapter 9 of the *On Interpretation* that may have also conditioned Avicenna’s ontological distinction of necessary per se and necessary per aliud.

In what follows, Abū Maʿṣar departs from Aristotle and returns to his former assumptions about the indications of the stars.

[...] a sea-fight will necessarily take place tomorrow or it will not. But our saying that a sea-fight will take place tomorrow is not necessary, neither is our saying that it will not take place tomorrow.

What is necessary is that it takes place or does not. Therefore, from that it necessarily follows that since true statements happen according to their matters (*umūr*), it is clear that [for] the one that happens in one whatsoever of two possibilities and supports contrariety [with respect to the other possibility], the opposite also necessarily happens like that.

This follows necessarily for the [event] the being of which is not always, or the not-being of which is not always. If the matter is like that, it is necessary that one of the two parts of the contradiction is true or false: not one or the other of the two contradictories, but whatsoever.

Sometimes one of the two contradictories is more probable to be true, but it is not by necessity that it is true or false.

From that it is clear that of every contradictory affirmation and negation no one is true by necessity and the other false by necessity, because for what is not existent but is possible or not possible, the matter is not like that of what is existent, but it goes as we have described (Ishāq b. Ḥunayn, in Badawī, *Mantiq Aristū*, p. 75. 4-18).

In paragraph 18a the author observes that ‘The Philosopher mentioned that the stars are alive and have rational souls’ (Engl., p. 121)³⁵ – and hence must be animated beings empowered to think and choose, to deliberate and determine: in other words, they have a kind of potentiality. It seems noteworthy that the rational soul of a human being is able to choose because the stars indicate the harmony of the rational and animal components in bodies; for that reason, rational souls are also joined to the rational soul of the stars. In paragraph 19, Abū Maʿṣar concludes:

The astrologer only considers things in which there is a potential for the possibility of receiving something or its opposite and their outcome. He does not consider their property [... for example,] whether fire burns or not, because he knows that it burns [...] But he does consider whether or not fire will burn tomorrow an object that can receive burning [..., because] it is equally possible for them to occur and not to occur. When the stars indicate by their natural movements that something will not occur, it is impossible for it to occur, and when they indicate the occurrence of something [...], its occurrence is necessary. If they indicate that it will occur in the future, then their indication of that event is only potential until the moment it occurs. If the thing happens from necessity and likewise if no impediment prevents a person from speaking, he has speech potentially until the time at which he speaks; when he speaks, this speaking is necessary at that time (I 5.19a-d; Engl., p. 123).

In paragraph 20a-b we read:

the stars indicate possibility and choice, in two respects: first, in composition: an individual has the possibility to accept or reject things, and to choose, which belongs to his soul; secondly, in the things whose coming-to-be at a future time is indicated by [the stars] [...] Just as the stars indicate the possibility and choice that belong to a man, so they indicate that someone will only choose what the stars indicate, because his decision to accept or reject something is brought about by the rational soul whose mixture with the animal soul in individuals is determined by the indications of the stars (I 5.20a-b; Engl., pp. 123-5).

For example, one has the possibility of moving or not; the choice to move or not to move lies in the field of necessity or impossibility. ‘But the person only chooses the necessity or impossibility that the stars indicate for him’ (I 5.20c; Engl., p. 125). When the rational human soul chooses, it is predetermined – without knowing – by the rational soul of the stars. As eternal beings, they cannot be outside the realm of necessity and impossibility. In some ways, these considerations recall the relationship between human choice and divine omniscience.

³⁵ As we have seen, in these contexts Abū Maʿṣar means by ‘the philosopher’ Aristotle, though nowhere does Aristotle make such a claim. Burnett refers to *De Caelo*, II, 12, 292a20 (cf. Abū Maʿṣar, *The Great Introduction to Astrology* [above, n. 1], I, p. 121, n. 135), but this context considers stars ‘as partaking of life and initiative,’ according to Guthrie’s translation (μετεχόντων [...] πράξεως καὶ ζωῆς; cf. Aristotle, *On the Heavens*, with an English Translation by W.K.C. Guthrie, Heinemann-Harvard U.P., London-Cambridge Ma 1939, pp. 206-7). The statement might also recall the places where Aristotle reports the idea of his predecessors that the stars were gods, and/or the regularity of the motions of the stars (although in *De Caelo* such motions are necessitated by the nature of the stars themselves). In the Arab world, the doctrine of spiritual entities presiding over the motion of the stars is widespread (also in the Iḥwān al-Ṣafā’ which we will deal with shortly), even though Islam is very clear that they are not divine in nature. Cf. for example the story of Abraham narrated in Qur’an 6:74-79.

Other Philosophical Themes in the Great Introduction

There are many other philosophical themes in the *Great Introduction*, which I hope to deal with more thoroughly in the future. Here I limit myself to mentioning an echo of the Platonic “fifth nature” of the *Timaeus* (I 3.2d; Engl., p. 81)³⁶ and the concept of the “spontaneous generation” (I 4.18c; Engl., p. 105).

In VII 4.6-7 there is an interesting discussion about what arises from two things mixed together – a new thing and also conservation of the old thing. The author moves from the idea that “when the two planets conjoin, the natural indication of each one of them singly is nullified, and from their conjunction an indication of something different from their natures occurs” (VII 4.6; Engl., p. 743). The argument is that “whenever two existent things around us come together and are mixed, a third thing, different from the two, arises from their mixture, and the two have an influence in their nature through their mixture and not singly” (VII 4.6; Engl., pp. 743-45).

The example is that of water and wine mixed together. In the following paragraph, it is opposed that:

even if the two things are mixed and one of the two destroys the other’s essence by mixing, nevertheless the quality of each one of them is found in them in their mixture, as it is found in them singly (VII 4.7a; Engl., 745).

Afterwards, the principle is applied to the planets.³⁷ Similar arguments are dealt with in the embryological texts. For example, in Hippocrates’s *Περὶ γονῆς* we read:

[...] It is impossible for the child to be completely alike to his/her mother and not at all to

³⁶ The doctrine of the five regular geometric solids is due to Euclid, but Plato, some decades before, was the first who related them to the elements in his dialogue *Timaeus*. This is recalled by Attilio Frajese in *Gli Elementi di Euclide*, ed. A. Frajese – L. Maccioni, Unione Tipografico-Editrice Torinese, Torino 1970, p. 852, with reference to fire, air, water, and earth only. Plato, in fact, spoke not of a ‘fifth nature’, but of a ‘fifth combination’ of surfaces, *συστάσεις πέμπτη* (55c): it is the dodecahedron that is supposed to characterise the sphere (τὸ πᾶν, the text says). The same ambiguity is noticeable in Galen’s commentary on *Timaeus* that reached us in Arabic translation only. He mentions *šūra uḥrā u’ilat li’l-‘alam bi-ağmi’ibi* (“*Etiam alia forma exstat propter totum mundum exstructa*”). Cf. Galeni *Compendium Timaei Platonis aliorumque dialogorum synopsis quae extant fragmenta* ed. P. Kraus – R. Walzer (*Plato Arabus* ed. R. Walzer [...]), Warburg, London 1951, pp. 15.5 (Arabic text) and p. 60 (Latin translation). Al-Kindī dedicates an epistle to “Why the ancients related the five geometric solids to the elements” (*Fī’l-sabab alladī labu nasabat al-qudamā’ al-aškāl al-ḥamsa ilā’l-uṣṭuqūsāt*), but even from him the issue does not appear clearly defined as he speaks of attribution *ilā’l-‘anāšir al-arba’a wa-ilā’l-falak* (cf. *Rasā’il al-Kindī al-Falsafiyya* (above, n. 10), vol. II, p. 54.10 Abū Rīda; the epistle occupies pp. 54-63). However, the idea of a ‘fifth nature’ is quite widespread in Islamic philosophical literature, included the Iḥwān al-Ṣafā’ (they speak of *al-ṭabā’i’ al-arba’a wa’l-ḥāmisa al-falakiyya*, “four natures plus the fifth, the celestial”; cf. L.E. Goodman – R. McGregor ed. and tr., *Epistles of the Brethren of Purity. The Case of the Animals versus Man Before the King of the Jinn: An Arabic Critical Edition and English Translation of Epistle 22*, Oxford U.P. - Institute of Ismaili Studies, New York 2009, pp. 29.4 [Arabic text] and 92 [English translation]). This might suggest that Abū Ma’sar took information via intermediary sources, as it seems also testified in n. 10 above (*In Tim.* 39 E -40 D the idea that the stars are gods is also mentioned). On the ambiguity of al-Kindī’s text and Galen’s commentary on the *Timaeus* I had occasion to discuss many years ago, in “Platone, Aristotele e il pitagorismo kindiano”, *Annali dell’Istituto Universitario Orientale di Napoli Sez. orientale*, 45 (1985), pp. 135-44, on pp. 135-8.

³⁷ See also Abū Ma’sar, *The Great Introduction to Astrology* (above, n. 1), VII 4.18.

his/her father, or completely alike to his/her father and not at all to its mother, or to none of them, but necessarily the child will resemble both of them in something, as the semen comes to the child from the bodies of both of them [...].³⁸

And in his *Περὶ σπέρματος*, after having recalled Athenaeus's opinion on the interbreeding of animals, Galen says:

[...] (he admits that) what comes from the mother brings about a change to a completely different kind: [...] the fetus does not have only the kind of the father, but a mixture from both parents;³⁹

and again:

If the material principle of the coming birth, the principle by which the kind of animal was shown to be determined, happened to be in the menstrual blood alone, the offspring would be born of precisely the same kind as the mother, just as, if the active principle were only in the semen, (the offspring) would always be similar to the father. But [...] each of them has a share in both principles [...].⁴⁰

More generally:

Therefore it is not at all surprising that the offspring resemble each of the parents in different parts.⁴¹

In a next future, I hope to put Abū Maʿšar's definitions of astrology⁴² and astrologer into relationship with the ideas underlying these embryological passages.⁴³ Abū Maʿšar's definitions confirm the similarity between stars and natural beings – and especially human beings – highlighted above.

Abū Maʿšar also gives special attention to numerology, for example when he explains in II 3.2-3 (Engl., p. 191) why there are twelve constellations. In VI 3.6a (Engl., p. 613) he refers

³⁸ Cf. Hippocrate, *Oeuvres complètes*, ed. É. Littré, I-X, J.-B. Baillière, Paris 1839-61 (anastatic repr. Hakkert, Amsterdam 1973-78), VII, *De la génération*, Baillière, Paris 1851, p. 481.

³⁹ De Lacy's translation, p. 155 in Galen, *On semen*, ed., tr., and comm. by Ph. De Lacy, Akademie Verlag, Berlin 1992 (*Corpus Medicorum Graecorum*, 5, 3, 1).

⁴⁰ *Ibid.*, p. 167.

⁴¹ *Ibid.*, p. 181.

⁴² Abū Maʿšar, *The Great Introduction to Astrology* (above, n. 1), III 2.3-5: "I say that the definition of astrology is 'knowledge of what the power of the movements of the stars at a specific time indicates for that time and for a specified future time'. As for the 'knowledge' that we mentioned in the definition, it is like the genus. Everything that follows is like <its> divisions. As for what we say in this definition – 'what the power of the movements of the stars indicates' – we say that because the power of their movements has an action in this world [...]. Many things may indicate a thing while they are not that thing itself [...]. Likewise, the stars may indicate what happens in this world by the power of their movements, but they are not that event that they indicate [...] the astrologer who is knowledgeable in astrology [...] has inferred from a specific time something <occurring> in that time or at some future time" (Engl., pp. 233-5).

⁴³ Abū Maʿšar, *The Great Introduction to Astrology* (above, n. 1), III 2.6: "The astrologer is 'the person who knows the conditions of the stars and their indications, and who informs at a specific time what happens as a result of them at that time and at a specified future time'. As for 'the person who knows', he is like the genus. Everything that follows is like <its> divisions" (Engl., p. 235).

to “Philosophers specializing in numbers...”, though Burnett notes that John of Seville omits the words “specializing in numbers”.⁴⁴ Finally it seems to me that the distinction between i) the word *ṭabāʿi* – explained by Burnett as ‘elements’ and translated as “naturans” – and ii) the word *maṭbūʿ* – explained as ‘products of elements’ and translated as “natured” – introduced in I 4.1 and referred to repeatedly throughout the work partially echoes the distinction between *natura naturans* and *natura naturata*, which has a long history in modern European philosophy though etymologically rooted in Arabic.

Scientific Themes in the Great Introduction

Among the scientific themes that can be approached with regard to the *Great Introduction* there is the relationship of the Iḥwān al-Ṣafāʾ with Abū Maʿṣar. Their name should then be added to the people – not only astronomers – whom Burnett suggests in his Introduction have been influenced by Abū Maʿṣar.⁴⁵

The Iḥwān al-Ṣafāʾ place astrology and medicine among the noblest and most secret sciences. It is noteworthy that Abū Maʿṣar calls medicine ‘terrestrial’ (I 2.26a; Engl., p. 71), later remarking that the errors of physicians and sailors have more serious consequences than those of astronomers. This is considered to be a further proof of the nobility of astrology (I 2.30-31; Engl., pp. 77-9).

Even though many topics in Abū Maʿṣar are not approached by the Iḥwān al-Ṣafāʾ, the *Epistles* and the *Great Introduction* have several common issues. Examples include the idea of the effects of the stars (I 1.7a) and their indications in the sublunar world (I 4.15), the distinction between acts of will and acts of nature (see above, p. 502), the description of the seasons (II 5.6), attention to environment (III 3.5) and the characters of people in relation to the stars (III 3.9 ff.), the ebb and flow of tides (III 4.1 ff. and 5.1 ff.), and the seven climes (VI 2). The Iḥwān also share technical aspects of astronomy and astrology,⁴⁶ though generally in more concise form. By examining these common topics and Abū Maʿṣar’s stated awareness of Indian, Babylonian, and Persian doctrines we might understand more fully the foreign influences affecting the astronomical and astrological views of the Iḥwān.

Another interesting issue is the examination of foreign technical terms in the Iḥwān al-Ṣafāʾ that are discussed in Abū Maʿṣar: examples include *nawbahrāt* in *Epistle on Magic* – the “nineths” (see V 17.1 ff.; Engl., p. 517) and *kadhudā* and *haylāg* in *Epistle on Conception* – the master and mistress of the house (see VIII 5.3; Engl., p. 911).

In VI 12.1 ff. Abū Maʿṣar speaks of the correspondence between the members of the human body and the zodiacal signs (*al-burūġ*). I shall try in a future paper to compare these observations with the commentaries on the *Sefer Yeṣirah*, the first Jewish script on the origin of creation from the letters of the alphabet. These commentaries, written by Dunaš ibn Tamīm (the Arabic Abū Sahl, b. ca. 885, d. after 955, according to other sources 900-960) and Šabbatay Donnolo (b. in Oria ca. 913, d. not before 982), contain significant similarities with the encyclopaedia of the Iḥwān al-Ṣafāʾ and hence open new avenues of research into the link between the encyclopaedia and the Fatimids and its spread through the Fatimids into southern Italy.

⁴⁴ Abū Maʿṣar, *The Great Introduction to Astrology* (above, n. 1), I, p. 613, n. 473.

⁴⁵ *Ibid.*, I, pp. 5-6.

⁴⁶ Such as the prediction about an absent person or a fugitive in Abū Maʿṣar, *The Great Introduction to Astrology* (above, n. 1), I 6.19 (Engl., p. 173).

Conclusions

Abū Maʿšar was a real scientist – this is clearly demonstrated throughout the *Great Introduction* – who gave attention to numerical values and to actual experience in every assertion. From the outset (I 1.14; Engl., p. 49) Abū Maʿšar considers astrology – mainly in its theoretical aspects – to be a ‘science’, and later (I 2.2; Engl., p. 53) he says that the “science of the universe” (*‘ilm al-kull*) consists in the knowledge of spheres and stars. In I 2.3c (Engl., p. 53) he says that such science is attained by “observation” (*bi-l-‘iyān*), and “To what is not found by observation, analogy (rational argument) <is applied>” (*ibid*). In I 2.4 (Engl., p. 55), astrology is the second of the sciences concerning spheres and stars. In that it is the science of the ‘indications’ of the stars, a link is established with the sub-lunar world. After I 2.5 there are several examples drawn from experience of the influences of the movements of the stars (especially the Sun and Moon) on the three natural kingdoms. In I 2.12 we read that the “masters of different arts” (Engl., p. 59) profit from this knowledge, as explained in the following chapters. In I 2.17 we read:

Similarly, for the practitioners of all professions there are subtle things in their professions that they know from the length of their experience and they do not make mistakes in them. They say that the reasons by which they know these things are only due to the length of their experience of the alteration of the air, its diversity, and the mansions of the Sun and the Moon (Engl., p. 63).

The independence of Abū Maʿšar’s judgment is no less relevant. The experience of obstetricians and physicians is described afterwards, and in this regard he remarks:

The profession of both doctors and astrologers is universal because it is involved in every existing species <of thing>. These people know in depth the science (theory) of their profession from the obvious effect of the planets on the ‘natures’ and the effect of the natures on individual separate things, and by deduction (analogy) from what they find to the cause that is hidden from them. But the science of the stars is nobler, higher, and more splendid than the science of medicine, because [...] the astrologers infer what happens [...] in this world from the movements and effect of the planets on these ‘natures’ and their alterations [...] (I 2.25a-b, Engl., p. 69).

It should not be forgotten, however, that the opening eulogy (I 1.2; Engl., p. 43) – retained by John of Seville except for the sentence referring to Muḥammad but omitted by Hermann of Carinthia – is not less noteworthy. We read at p. 42.2-4:

الحمد لله الذي خلق السموات والأرض⁴⁷ بما فيها من عجائبها وجعل الكواكب زينة ومصايح وجعلها دلائل وهداية يهتدي⁴⁸ بها وجعل الأرض مهادا وقدر فيها أقواتها فلا إله إلا الله وحده لا شريك له وصلى الله على محمد النبي عبده ورسوله و⁴⁹آله وسلم كثيرا.

⁴⁷ Missing in Abū Maʿšar, *Liber Introductorii maioris* (above, n. 2), II, p. 2.4: *wa-l-ard*.

⁴⁸ Abū Maʿšar, *Liber Introductorii maioris* (above, n. 2), II, p. 2.4 فيهتدي.

⁴⁹ Abū Maʿšar, *Liber Introductorii maioris* (above, n. 2), II, p. 2.4 adds على.

Praise be to God who created the heavens and the earth with those wonders which are in them, and made the stars an adornment and illumination, and made them indicators and a guidance by which one is guided⁵⁰ and He made the earth a place of repose,⁵¹ and He apportioned its nourishments to it.⁵² There is no God but God alone; He has no sharer.⁵³ May God bless the Prophet Muḥammad, His servant and messenger, and his family, and may He give peace in abundance.⁵⁴

Here we have the usual praise to God the Creator with words that suggest an astrological context such as *zīna* and *maṣābiḥ*, echoing some Qur'anic verses. *Dalīl* is also found in the Qur'an in reference to the sun, and the roots *H-D-Y* frequently occur in the Holy Book. Two Qur'anic verses are also partially quoted here; the mention of the prophet's family, usually proper to Šī'ī contexts, is particularly remarkable.

⁵⁰ Burnett remarks that “[ohn of Seville] adds ‘rationalibus’ (‘for rational beings’)” (cf. Abū Maʿṣar, *The Great Introduction to Astrology* [above, n. 1], p. 43, n. 1).

⁵¹ Burnett indicates this to be a quotation of Qur'an 78:6 (*ibid.*, p. 3, n. 2).

⁵² This is a partial quotation of Qur'an 41:10.

⁵³ This is a partial quotation of Qur'an 2:163.

⁵⁴ Burnett remarks that “H[ermann of Carinthia][ohn of Seville] omit ‘May God bless... in abundance’” (cf. Abū Maʿṣar, *The Great Introduction to Astrology* [above, n. 1], p. 43, n. 3).