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## Classical and Byzantine Astrology in Sassanian Persia

DAVID PINGREE

The notorious ninth-century astrologer from Balkh, Abū Ma'shar, once proclaimed to his curious student, Abū Sa'īd Shādhān, that: "The Chaldaeans were the first to write about the stars, their measurements, and observations of them; they knew their courses in nature [*i.e.*, astronomy] and in prorogations from base-nativities [*i.e.*, astrology]. After them were the Indians, then the Syrians, and then the Arabs."<sup>1</sup> This two-sentence history of ancient science, along with the rest of Shādhān's *Mudhākarāt*, was being read in Byzantium in the eleventh century,<sup>2</sup> and in 1260 or thereabouts the Greek version was made available to Western scholars in Latin dress provided, it seems most likely, by Stephanus of Messina.<sup>3</sup> Thereby the history of Shādhān's own text illustrates nicely Abū Ma'shar's main point, that astronomy and astrology were transmitted from culture to culture in the ancient and medieval periods. In fact, what is wrong about Abū Ma'shar's history is that it is too simple, representing the transmission as being linear when in fact the celestial sciences were constantly being transmitted in appropriate

circles, revolving back and forth between the peoples whom he mentions. In this paper I intend to explore some new evidence relevant to the question of the extent of scientific intercourse among Indians, Greeks, Persians, Byzantines, Syrians, Arabs, and Western barbarians. In the course of this investigation I hope to exemplify how, in the area of astrology as well as in other domains, the medieval tradition has surprising things to reveal to us about our classical Greek heritage, and incidentally to demonstrate that Paul Lemerle, in his eminently intelligent *Le premier humanisme byzantin*, did not do full justice to the Orient in trying to determine the origins of the revival of Byzantine scholarship in the ninth century.<sup>4</sup>

Abū Ma'shar, renowned as he was as an astrologer, did not foresee that, after the Arabs, the barbarians of the Latin West would appear as experts in the science of the stars. It is, however, in their tongue—or rather, in a most convoluted distortion of Latin—that was written the text that is the key to our inquiry, a translation from the Arabic executed by Hugo of Santalla for Michael, the bishop of Tarazona in northern Spain from 1119 to 1151. It was Harvard's great medievalist, Charles Homer Haskins, who first drew attention to this work in 1911;<sup>5</sup> it attracted the interest of Charles Burnett, my learned Warburgian friend to whom much of the research for this paper is due, and myself some seventy years later by its strange title. For it is called the *Liber Aristotelis de ducentis quinquaginta quinque Indorum voluminibus universalium questionum tam genetalium quam circularium summam continens*—*The Book of Aristotle Containing the Sum of Universal*

<sup>1</sup>This is my translation of the unpublished Arabic original. The abbreviated Byzantine version—chapter 32 of Book II of the *Μυστήρια Ἐποικίας*—was published in *Catalogus Codicum Astrologorum Graecorum* (hereafter *CCAG*), 5,1, p. 148.

<sup>2</sup>One of the two complete Greek manuscripts is Vat. gr. 1056, wherein the *Mudhākarāt* occupy fols. 194–221. Though this manuscript itself was copied in the 14th century, its source was a collection of texts put together in the 12th century; see D. Pingree in *DOP* 18 (1964), 138. But the translation into Greek seems to have been made simultaneously with the Byzantine translation of Abū Ma'shar's *Kitāb fī ahkām tahāwīl sinī al-mawālīd*, and that translation can be dated ca. 1000; see D. Pingree, *Albumasar's De revolutionibus nativitatū* (Leipzig, 1968), VIII.

<sup>3</sup>The Latin translation was evidently made by the Latin translator of Abū Ma'shar's *De revolutionibus nativitatū*, who seems to have been Stephanus of Messina working in 1262; see *Albumasar's De revolutionibus nativitatū*, VI. Stephanus used aphorisms from the *Mudhākarāt* in the *Hermetis Centiloquium* that he composed in 1262.

<sup>4</sup>See P. Lemerle, *Le premier humanisme byzantin* (Paris, 1971), especially ch. 2, "L'hypothèse du relais syro-arabe," 22–42.

<sup>5</sup>C. H. Haskins, "The Translations of Hugo Sanctallensis," *The Romanic Review* 2 (1911), 1–15. I have used the revised version found as ch. 4 in his *Studies in the History of Mediaeval Science* (repr. New York, 1960), 67–81; see especially 74–76.

*Questions, both Genethliological and Revolutionary, Drawn from the 255 Volumes of the Indians.*<sup>6</sup>

This is a bulky treatise whose popularity can be gauged by the facts that no manuscript of the Arabic original is known to exist, and that of Hugo's Latin version, aside from the basic, but now incomplete, manuscript, Digby 159 in the Bodleian Library, which was copied in England in the thirteenth century, there is just one other witness to the text, Savile 15, also in the Bodleian, which was copied from the Digby manuscript in the fifteenth century when the latter was still complete. Both manuscripts, it appears, were on the shelves of the great library assembled at Mortlake by the celebrated John Dee, to whom we owe the survival of this as of so many other ancient and medieval scientific texts, including the Greek *Anthologies* of Vettius Valens which will play a central role in our story.

From the pen of Hugo we have some ten works on astronomy, astrology, and divination translated from Arabic into Latin. In the preface to one of these translations—that of Ibn al-Muthannā's commentary on al-Khwārizmī's *Zīj al-Sindhind*—Hugo states that Bishop Michael found the Arabic manuscript of this treatise “in Rotensi armario et inter secretiora bibliotece penetralia.”<sup>7</sup> As Haskins long ago suggested,<sup>8</sup> this library at Rota was probably in the Muslim stronghold of that name, now called Rueda Jalón. This fortress was ceded to Alfonso VII by Sayf al-Dawla, the last of the Banū Hūd, in 1140–1141.<sup>9</sup> Assuming that the Arabic manuscript of the *Liber Aristotelis* was found in the same “secretiora bibliotece penetralia,” Hugo must have made his Latin version of it in the decade between 1141 and 1151.

About halfway through his tortuous prologue to the *Liber Aristotelis*, following the fulsome praise dutifully bestowed upon his patron bishop, Hugo rather abruptly launches into a bibliography of astrology,<sup>10</sup> in which are described and enumerated the varied treatises composed by Saraphies (who is Serapion of Alexandria), Aristotle, Hermes, Ptolemy, Doronius (that is, Dorotheus of Sidon), Democritus, Plato, Victimenus (undoubtedly a mis-

reading for Euctemon), Erato (who may be Aratus), Antiochus, Welis Egiptius (that is, Vettius Valens considered, in the Sassanian-Arab fashion, as an Egyptian from Alexandria rather than a native of Antioch), Alwelistus (apparently Erasistratus), and the Babylonians. Next is named the *Befida*, a “codex mirabilis” of the Indians; *Befida* seems to be an attempt to render *Bizīdaj*, the Arabic form of the Pahlavī *Wizīdak*, meaning “The Chosen”—a title reflecting that of Valens' work, the Ἀριθολογία. After this, Hugo names another work with a title originating in Sassanian Iran; his *Xaziur* represents the last part of the Pahlavī *Zik-i Shahriyārān*, the *Royal Astronomical Tables*. Hugo ends his catalogue with a reference to two other precious but here untitled volumes on nativities and on interrogations that have been preserved by the Indians—surely from Alexander's pillaging of the library at Ištākhr lamented by the author of the *Denkart*; it is the volume on nativities, he implies, that is the basis of the *Liber Aristotelis*. In the catalogue he has mentioned only 125 rather than 255 books, but still the identification seems reasonable; in texts like this, what difference could 130 extra sources make?

The identification, in any case, is confirmed by a most remarkable document found toward the end of a fourteenth-century Byzantine manuscript, Vaticanus graecus 1056, a magnificent codex whose core is an astrological compendium of the Comnenian period, and whose margins are filled with rare Greek translations from the Arabic.<sup>11</sup> On folio 242 of this manuscript is a catalogue of astrological authorities that turns out to be but a shortened and slightly variant version of the bibliography found in Hugo's *Liber Aristotelis*. The Byzantine text ascribes this bibliography to Μασάλα—that is to say, to Māshā'allāh ibn Atharī, a Persian Jew from Baṣra who participated in casting the horoscope of Baghdād for its founder, Caliph al-Manṣūr, on 30 July 762, and who lived on till about 810 since his astrological history, in which he predicted the imminent downfall of al-Manṣūr's dynasty, the Ḃbbāsids, was completed shortly before al-Ma'mūn became caliph in 813.<sup>12</sup>

The Greek version of the bibliography concludes with the statement, missing in Hugo's Latin,

<sup>6</sup> An edition with commentary by Prof. Burnett and myself will appear shortly.

<sup>7</sup> See E. Millás Vendrell, *El comentario de Ibn al-Mutannā a las Tablas Astronómicas de al-Jwārizmī* (Madrid-Barcelona, 1963), 95.

<sup>8</sup> Haskins, 70–71.

<sup>9</sup> R. Dozy, *Histoire des musulmans d'Espagne*, 3 vols. (Leiden, 1932), III, 154 note 1.

<sup>10</sup> This bibliography will be dealt with in detail in the forthcoming edition of the *Liber Aristotelis*.

<sup>11</sup> The relevant texts from this manuscript, which also contains Shādhān's *Mudhākarāt*, will be published elsewhere.

<sup>12</sup> Concerning Māshā'allāh see the articles by D. Pingree in the *Dictionary of Scientific Biography*, 9 (New York, 1974), 159–62, and by F. Sezgin in his *Geschichte des arabischen Schrifttums*, VII (Leiden, 1979), 102–8 (hereafter GAS).

that the author, Māshā'allāh, has compiled τὴν παροῦσαν βιβλίον ἀπὸ τῶν ῥηθέντων βιβλίων συνοπτικῶς ἐν τέσσαρσι λόγοις. Vaticanus graecus 1056 unfortunately does not preserve those four books, but the *Liber Aristotelis* does indeed contain four sections, separated by summaries in the text rather than by formal titles. These four sections are, respectively: on difficult points of astronomy; a collection of astrological definitions; on genethliology, organized according to the twelve places of the δωδεκάτοπος; and on two methods of continuous horoscopy, the revolution of the years of nativities and the periods and sub-periods of the native's life assigned to each of the planets. It seems plausible to hypothesize that the lost Arabic original of Hugo's *Liber Aristotelis* was the work of Māshā'allāh to which the bibliography served as a preface, perhaps his *al-Kitāb al-murdī* (*The Pleasing Book*) that is mentioned by the greatest of Arabic bibliographers, Ibn al-Nadīm. The association of the Latin text with Māshā'allāh is heightened by the fact that immediately preceding the *Liber Aristotelis* in Savile 15 is the unique copy of Hugo's translation of Māshā'allāh's *Kitāb al-mawālīd al-kabīr*.<sup>13</sup> This work also is not extant in Arabic, but was composed by the Baṣran in the late 780s or in the 790s since there are included in it horoscopes that can be dated 2 October 770, 7 February 771, and 17 July 784. We shall return to this text presently.

But in order to test the hypothesis that the *Liber Aristotelis* is, in fact, the translation of a lost opus of Māshā'allāh, it seems useful to compare the authorities used by the Arab astrologer in his known works with those cited or used in Hugo's text. Most of these authorities are Greek, but some are Persians of the Sassanian period. I shall discuss them briefly in chronological order; for they brilliantly illuminate the shady history of ancient and early medieval astrology.

We begin with Dorotheus of Sidon, who composed in about A.D. 75 a poem in leaden hexameters setting forth in five books both genethliological and catarchic astrology.<sup>14</sup> The original poem survived until at least the seventh century, and

prose paraphrases of it were available until the early eleventh century in Byzantium as it was used by the astrologer who cast the horoscope of Emperor Constantine VII Porphyrogenitus shortly after his birth on 3 September 905; by Demophilus, who is known to have been active in 989; and by an astrologer who cast an anniversary horoscope for 13 October 1011. But most of what we have in Greek of Dorotheus' poem is preserved in excerpts and in prose paraphrases in the Ἀποτελεσματικά of Hephaestio of Thebes, a gentleman whom his mother conceived on 20 February 380 and gave birth to on 26 November of that same year.

However, we know from a passage of the lost *Kitāb al-Nahmaṭān* of Ibn Nawbakht quoted by Ibn al-Nadīm that Dorotheus' hexameters were translated into Pahlavī under Ardāshīr I, the Sassanian emperor from about 222 to 237, or under his son, Shāpūr I, who ruled from about 237 to 267; and that it was later elaborated during the reign of Khusro Anūshirwān, between 531 and 578. The principal Arabic translation of the lost Pahlavī version of Dorotheus was apparently due to the efforts of 'Umar ibn al-Farrukhān al-Ṭabarī in about the year 800. This translation proves that Ibn Nawbakht was correct; for it contains not only a number of Arabic transliterations of Pahlavī technical terms, but two horoscopes that were added to the text as illustrations by Sassanian scholars. One is datable 20 October 281, the other 26 February 381.

Dorotheus' own examples are eight horoscopes cast for natives born between 7 B.C. and A.D. 43. Three of these together with other Dorothean material were incorporated by Māshā'allāh into his shorter *Kitāb al-mawālīd*, which also survives only in a Latin translation,<sup>15</sup> while a long section on lots in Māshā'allāh's *Kitāb al-mawālīd al-kabīr* in Hugo's translation is attributed to Dorotheus. This passage, however, corresponds only in part to the discussions of the various lots scattered throughout 'Umar's translation of Dorotheus; from this and other circumstances it is clear that Māshā'allāh did not use 'Umar's translation—which was probably, in any case, made only after the Baṣran had composed his works on genethliology—but rather he read the Pahlavī original, in a fuller form than appears in 'Umar's text and one that was accompa-

<sup>13</sup> I am currently preparing an edition with commentary of this work.

<sup>14</sup> The Arabic translation of the Pahlavī version made by 'Umar ibn al-Farrukhān together with the genuine fragments in Greek and Latin was edited by D. Pingree, *Dorothei Sidonii Carmen Astrologicum* (Leipzig, 1976). This volume contains discussions of all of the material referred to in this and in the succeeding paragraph. The *Apotelesmatica* of Hephaestio was edited by D. Pingree, 2 vols. (Leipzig, 1973–74).

<sup>15</sup> Edited by D. Pingree in E. S. Kennedy and D. Pingree, *The Astrological History of Māshā'allāh* (Cambridge, Mass., 1971), 145–74.

nied by a commentary. Confirmation of the existence of this fuller Pahlavī text of Dorotheus is to be found in an Arabic manuscript now in the library of the University of Leiden, Oriental 891, which contains on folios 1–28 a *Kitāb fī bayān al-ifrādāt* ascribed to Dorotheus.<sup>16</sup> Parts of this work are derived from Books II and V of Dorotheus' poem, but this version is different from and more expansive than that of 'Umar. Embedded in the Leiden Dorotheus are eleven horoscopic examples that can be dated between 13 June 765 and 17 June 768, a period when Māshā'allāh was active, though I can not yet offer any evidence for either his authorship or his use of this text.

What is remarkable, however, is that a number of the horoscopes in the Leiden Dorotheus are found in a vast Byzantine compilation entitled Εἰσαγωγή καὶ θεμέλιον εἰς τὴν ἀστρολογίαν and falsely attributed to one Aḥmad the Persian.<sup>17</sup> This *Introduction to Astrology*, divided into four books, is in fact a collection of chapters from Classical and Byzantine astrological texts mixed up with material translated into Greek from the Arabic; much of the latter comes from the early eleventh-century Byzantine translation of Shādhān's *Mudhākarāt*. The whole was apparently put together by Eleutherius Elias Zebelenus,<sup>18</sup> who has inserted into the second book an interpretation of his own horoscope, which can be dated 10 November 1343. Eleutherius, it should be noted, is responsible for another astrological compendium of a similar character that he falsely ascribed to Palchus. Though some eminent historians of Byzantine astrology have asserted that Palchus wrote in about A.D. 500, in fact his name is a transliteration of an Arabic ḏuḥma ἔθνικόν, al-Balkhī, which Eleutherius found in the *Mudhākarāt* wherein Abū Ma'shar is represented as including in a list of astrological authorities a *tarjamān al-Balkhī*, a translator from Balkh. One of Eleutherius' sources for pseudo-Palchus was the compendium of Rhetorius, another Byzantine astrologer important to our investigation.

But to return to Dorotheus. We have shown that one of Māshā'allāh's sources in his two books on

nativities was a Pahlavī version of Dorotheus with a commentary. It helps to connect Hugo's *Liber Aristotelis* with Māshā'allāh, then, that a substantial portion of the first two books of the Latin text is taken from a commentary on Book III of Dorotheus. Not only that; long passages in Books II and III of the *Liber Aristotelis* are versions, often variant versions, of the Dorotheus we know from 'Umar, replete with Pahlavī technical terms transliterated, through the Arabic, into Latin. This material includes the horoscope of 20 October 281 that had been inserted into the Pahlavī version of Dorotheus, proving that it goes back to the same Sassanian text that was translated by 'Umar.

But it is also clear from fragments of Dorotheus' poem preserved by Hephaestio, but not found in his Arabic translation, that 'Umar's text omits Dorotheus' chapters on professions, on army service, and on friendship. The first and last of these subjects are discussed in Book III of the *Liber Aristotelis* in words that in part reflect the fragmentary hexameters and prose paraphrases presented by Hephaestio; this allows us to recover from Hugo some of the lost instructions of Dorotheus. But these excerpts in the *Liber Aristotelis*, now shown to be Dorothean, also make it possible to identify as paraphrases of the Sidonian's poem a substantial part of a brief and anonymous Byzantine astrological compendium fortuitously preserved on the four folios, numbered 238 to 241, of Vaticanus graecus 1056 that immediately precede the astrological bibliography of Māshā'allāh.<sup>19</sup> This compendium, which includes some excerpts also from the work of Rhetorius of Egypt to which we will shortly turn, presumably goes back to the Comnenian exemplar from which Vaticanus graecus 1056 was copied, and perhaps to the earlier prose paraphrase of Dorotheus that was used by Byzantine astrologers of the tenth and early eleventh centuries. Thereby we have now recovered a significant part of the non-Hephaestionean paraphrase of Dorotheus in its original Greek.

It is now time to leave Dorotheus, whose tradition has been so unexpectedly magnified by Hugo, and to turn to Vettius Valens.<sup>20</sup> This astrologer of Antioch was conceived on 13 May 119 and born on 8 February 120. The nine books of his Ἀνθολογία have been corruptly and incompletely preserved in

<sup>16</sup>This text, together with some other late 8th-century Arabic works on astrology, I hope to publish soon.

<sup>17</sup>An edition of this enormous text is also in hand, but will take some time to complete.

<sup>18</sup>Concerning Eleutherius and his works, see D. Pingree, "The Astrological School of John Abramius," *DOP* 25 (1971), 189–215, especially 202–4, and "The Horoscope of Constantinople," Πρώματα. *Naturwissenschaftsgeschichtliche Studien* (Wiesbaden, 1977), 305–15.

<sup>19</sup>I hope to publish this shortly.

<sup>20</sup>D. Pingree, *Vettii Valentis Antiocheni Anthologiarum libri novem* (Leipzig, 1986). See also D. Pingree, "The Byzantine Tradition of Vettius Valens' *Anthologies*," *Harvard Ukrainian Studies* 7 (1983), 532–41.

a recension made in the fifth century of a version produced in the third. Probably contemporaneous with the third-century version was the Pahlavī translation of Valens' work. This Pahlavī Valens was quoted in both the expanded Sassanian text of Dorotheus translated by 'Umar and in the Pahlavī original of the *Kitāb al-mawālīd* ascribed to Zardusht, of which we will presently have more to say.<sup>21</sup> And, as we know from the bibliographical and biographical dictionaries of Ibn al-Nadīm<sup>22</sup> and Ibn al-Qiftī,<sup>23</sup> Valens' Pahlavī *Anthologies* were commented on by Buzurjmīhr—not, indeed, if we follow Christensen,<sup>24</sup> the alleged minister of Khusro Anūshirwān, but a contemporary sixth-century Sassanian scholar named Burjmīhr who, among other intellectual feats, translated the Sanskrit *Pañcatantra* into Pahlavī and introduced chess (caturāṅga) into Sassanian Iran—both acts with remarkable consequences for us. However, since the Arabic authorities consistently name him Buzurjmīhr, we will follow their erroneous practice. It is Ibn Hibintā, a Christian astrologer writing in Baghdād in about 950, who informs us that Buzurjmīhr's book was entitled *Bizīdaj*, and that it embraced the sayings of the wise men<sup>25</sup>—i.e., that, though perhaps based on Valens, it was yet another compendium of astrological doctrines gleaned from the ancient classics—though for Buzurjmīhr these would have included Iranians and Indians as well as Greeks.

We must now consider whether or not Māshā'allāh in his known works utilized Valens', either in an Arabic translation of the original Greek or in Buzurjmīhr's Pahlavī version. In Hugo's translation of Māshā'allāh's *Kitāb al-mawālīd al-kabīr* we find confirmation that he did indeed study Valens' *Anthologies*; for into Māshā'allāh's work is incongruously incorporated an incomprehensible version of chapters 21 and 22 of Book I of Valens, including the horoscopes that can be dated from the original Greek, though not at all from Hugo's

weird Latin, to 31 July 62, 26 July 114, and 8 February 120, which last is Valens' own nativity. Hugo, of course, being ignorant of Valens' astronomical and calendaric data, could make no sense of these horoscopes, but his gibberish suddenly becomes intelligible when one imagines the Arabic and Pahlavī versions that lie between it and the original Greek.

Moreover, a valuable manuscript preserved in the Laleli Mosque in Istanbul, no. 2122, contains a short compilation on interrogations by Māshā'allāh.<sup>26</sup> In this treatise, untitled in the manuscript, Māshā'allāh quotes from both Dorotheus and Valens—the latter on the subjects of buying land and of government, which are scarcely topics in our Greek *Anthologies*, but both of which are dealt with in the Arabic translation of a Pahlavī work on catarchic astrology ascribed to Valens, the *Kitāb al-asrār*, preserved on folios 31v–60 of manuscript no. 2920 of the Nuruosmaniye Mosque in Istanbul.<sup>27</sup> Māshā'allāh, in his *Kitāb fī qiyām al-khulafā' wa ma'rifat qiyām kull malik*, says that he has discussed the matter of government in his *Bizīdajāt*.<sup>28</sup> So Māshā'allāh's collection of astrological dicta on catarchic astrology and interrogations in Laleli 2122 may have borne the title that Buzurjmīhr gave to his expansion of Vettius Valens' *Anthologies*.

Having seen that Valens is indeed a source for Māshā'allāh, we are not surprised to find in the *Liber Aristotelis* a number of references to an astrologer named Welis. Some of these references head passages not to be found in our corrupt and incomplete Byzantine text of the *Anthologies*; and other passages that derive from the *Anthologies* are not expressly attributed to Valens by Hugo. More interesting is the fact that Buzurjmīhr, under the corrupt transliteration Zarmiharos, is said at the end of Book III of the *Liber Aristotelis* to have been a source for this *maqāla* on genethliology, and to have commended the subject matter of Book IV, that is, continuous horoscopy. We now need to remind ourselves that Ṣā'id al-Andalusī in his *Kitāb ṭabaqāt al-umam* records that Valens' *Bizīdaj* was concerned with nativities and their revolutions, and had an introduction to these topics.<sup>29</sup> This description precisely fits not the Greek Ἀνθολογία,

<sup>21</sup> The Zardusht text will be published in the same volume as the Leiden Dorotheus mentioned in note 16. Some notice of this text has been given in D. Pingree, "Māshā'allāh: Some Sassanian and Syriac Sources," *Essays on Islamic Philosophy and Science* (Albany, 1975), 5–14.

<sup>22</sup> Ibn al-Nadīm, *Kitāb al-fihrist*, ed. G. Flugel, 2 vols. (Leipzig, 1871–72), I, 269.

<sup>23</sup> Ibn al-Qiftī, *Ta'rikh al-hukamā'*, ed. J. Lippert (Leipzig, 1903), 261.

<sup>24</sup> A. Christensen, "La légende du sage Buzurjmīhr," *Acta Orientalia* 8 (1929), 81–128; the passage from Ibn al-Nadīm is cited on 92–93.

<sup>25</sup> C. A. Nallino, "Tracce di opere greche giunte agli arabi per trafila pehlevica," *A Volume of Oriental Studies Presented to Professor E. G. Browne* (Cambridge, 1922), 345–63, esp. 352.

<sup>26</sup> This also will be published in the collection of early Arabic astrological texts.

<sup>27</sup> This as well will appear in the same collection.

<sup>28</sup> Translated in *The Astrological History of Māshā'allāh*, 129–35; the reference to his *Bizīdajāt* is on p. 131.

<sup>29</sup> Ṣā'id al-Andalusī, *Kitāb ṭabaqāt al-umam*, trans. R. Blachère (Paris, 1935), 87.

but the Latin *Liber Aristotelis*, in which the introduction comprises Books I and II, Book III deals with nativities, and Book IV with the revolutions of the years of nativities. When we further remember that Hugo calls the *Befida* (i.e., the *Bizūday*) a “codex mirabilis” of the Indians, we may conjecture that much of Māshā'allāh's work was derived from Burzurjmīhr's Pahlavī compilation.

But Māshā'allāh had other sources in addition to the Pahlavī versions of Dorotheus and Valens. The principal one is a Greek compendium associated with the name Rhetorius, who was evidently the last astrologer of Egypt to write in Greek before the Arab conquest of 640.<sup>30</sup> Rhetorius excerpted, almost certainly at Alexandria, from a splendid library of astrological literature that had also been available to the Neo-Platonic philosopher, Olympiodorus, when he lectured on Paul of Alexandria's Εἰσαγωγή in the summer of 564.<sup>31</sup> Rhetorius' work survives only in epitomes, of which there are two principal ones, both probably of the tenth century.<sup>32</sup> The more complete epitome occupies most of a fourteenth-century manuscript, Parisinus graecus 2425, while a number of chapters from it are found also in Laurentianus 28, 34, a magnificent codex copied in about the year 1000. The second epitome, preserved in another fourteenth-century copy, Parisinus graecus 2506, and in Marcianus graecus 335 of the fifteenth century, was perhaps compiled by that late tenth-century astrologer, Demophilus, to whom we referred in discussing the Byzantine prose paraphrase of Dorotheus.

Rhetorius' date can be determined from the horoscopes that he cites—about a dozen from the fifth century, including several due to the astrologer of Emperor Zeno<sup>33</sup> as well as one cast by the philosopher Eutocius for a native born in 497. Rhetorius also quotes a horoscope of the early sixth century; but his most revealing example is one found in chapter 110 of Book V of the first

epitome, which can be dated 24 February 601. Since Rhetorius was already being pillaged in the eighth century, by Theophilus of Edessa, and says nothing to indicate that he is working under Arab rule, it seems most likely that he wrote at the beginning of the seventh century.

One of Rhetorius' fifth-century horoscopes is quoted by Māshā'allāh in his *Kitāb al-mawālīd*,<sup>34</sup> and another, cited by him in a lost work on astrological history, is found in the compendium that Eleutherius Elias attributed to Palchus and that contains much from Rhetorius.<sup>35</sup> This latter horoscope is one of a group of three that are associated with Emperor Zeno as are the horoscopes of Pamprepius and of Emperor Leo's son preserved at the end of Book V of the first epitome of Rhetorius' work. Incidentally, Māshā'allāh's treatise on astrological history contained five horoscopes that can be dated between 21 October 766 and 10 January 768, three of which are found in Eleutherius' compilation ascribed to Aḥmad the Persian; one of these three is also found in the Leiden Dorotheus.<sup>36</sup> Māshā'allāh wrote this work, then, in the 770s, and at that time was able to read Rhetorius' work—presumably in the original Greek. It is likely that he also derived from Rhetorius the seven other fifth-century horoscopes and the one of the sixth century in his *Kitāb al-mawālīd*.<sup>37</sup> We shall consider later how a Persian Jewish astrologer writing in Arabic in Baghdād was able to read a Greek astrological text. But first it will be relevant to describe the first epitome of Rhetorius' compendium and its relationship to the *Liber Aristotelis* more fully.

The epitome of Rhetorius is divided into six books. The first four constitute an independent recension of Ptolemy's Ἀποτελεσματικά, having some connections with the version in Laurentianus 28,34. Book V, on genethliology, is based largely on Dorotheus of Sidon, Vettius Valens, Antiochus of Athens, Porphyrius, and Paul of Alexandria. Whole chapters of Book V, including, I stress, the horoscope of 601, are found Latinized in Hugo's *Liber Aristotelis*. Hugo, while he never mentions Rhetorius' name, from time to time refers to the authors used by him—Durius or Doronius for Dorotheus, Welis for Valens, Anteijs for Antiochus, and Marius the Roman, perhaps for Porphyrius.

<sup>30</sup>D. Pingree, “Antiochus and Rhetorius,” *CPh* 72 (1977), 203–23. Much of the evidence mentioned in this and in the succeeding paragraph is discussed in detail in this article.

<sup>31</sup>Edited under the name of Heliodoros by E. Boer (Leipzig, 1962). Concerning Olympiodorus' authorship see J. Warnon, “Le commentaire attribué à Héliodore sur les Εἰσαγωγικά de Paul d'Alexandrie,” *Travaux de la Faculté de Philosophie et Lettres de l'Université Catholique de Louvain* 2 (1967), 197–217, and L. G. Westerink, “Ein astrologisches Kolleg aus dem Jahre 564,” *BZ* 64 (1971), 6–21. A new edition that will clarify the structure and original contents of Olympiodorus' lectures on Paul is under preparation.

<sup>32</sup>An edition of these earliest epitomes is nearing completion.

<sup>33</sup>D. Pingree, “Political Horoscopes from the Reign of Zeno,” *DOP* 30 (1976), 133–50, especially 144–50.

<sup>34</sup>*The Astrological History*, 163 and 172–73.

<sup>35</sup>“Political Horoscopes,” 139–42.

<sup>36</sup>“Political Horoscopes,” 135.

<sup>37</sup>*The Astrological History*, 155, 158–62, 164–67, and 169–74.

Book VI of the epitome of Rhetorius begins with a group of chapters containing astronomical and astrological notes and definitions culled from such sources as Dorotheus, Valens, Ptolemy, Theon of Smyrna, Serapio of Alexandria, Paul of Alexandria, Heliodorus, Julian of Laodicea, and Eutocius. Rhetorius' example of collecting such a hodgepodge of introductory information was followed in Books I and II of the *Liber Aristotelis*, though I so far have been able to identify only one direct quotation from Rhetorius in those two books. This comes from the chapter that Rhetorius compiled of the opinions of Serapio, whose name Hugo has transformed into Saraphies. At the end of Book VI, which unfortunately breaks off in the middle of a sentence in Parisinus graecus 2425, Rhetorius presents summaries of the contents of various astrological treatises, the majority of which are now lost, accompanied by biographical notes concerning their authors; those authors are: Erimarabus the Egyptian prophet, Phoredas (Bhūridāsa) the Indian, Odapsus the priest, Ptolemy, Paul of Alexandria, Demetrius, Thrasyllus, Critodemus, Callicrates, Balbillus, and Antiochus of Athens. Rhetorius' summaries are a most important source of information concerning the astrological literature of the first few centuries A.D. It also seems to have been the inspiration for Māshā'allāh's prefatory bibliography, though naturally the Baṣran has gathered information concerning a group of authors different from those summarized by the Egyptian.

Hugo's Latin translation of the compendium authored, if I may now pretend that my hypothesis is correct, by Māshā'allāh allows us to recover some of the previously lost material once included in the astrological poem of Dorotheus, in the *Anthologies* of Vettius Valens, and in the compilation of Rhetorius the Egyptian, and to repair some tattered passages in the Byzantine witnesses to those texts. It also permits us, in conjunction with various early Arabic translations of the Pahlavī translations of Dorotheus and Valens, to reconstruct something of the history of the passage of Greek astrologers through the hands of their Sassanian successors. I would like now to discuss briefly some other Sassanian texts pertinent to this inquiry.

Abū Ma'shar, our man from Balkh, wrote a *Kitāb aḥkām al-mawālīd* that survives in but one exemplar, Huntington 546 in the Bodleian Library, and there incompletely. In this work, which is a summary of the views on specific points of genethliology entertained by Ptolemy, Dorotheus, and Vettius Valens,

chapter 1 of the ninth *maqāla* is devoted to *al-nujūm al-bayabāniya* or "desert stars" as described by Hermes. The original Arabic work from which Abū Ma'shar draws his information survives in a manuscript, now at the Chester Beatty Library in Dublin, Arab 5399, folios 206v–208v, under the title *Kitāb asrār al-nujūm*,<sup>38</sup> of which the Latin translation, entitled *De iudiciis et significatione stellarum beibenarium in nativitatibus*, is attributed to Salio, a canon of Padua who served as astrologer in the court of Ezzelino da Romano, who died in 1259.<sup>39</sup> Salio was actively translating from Hebrew and Arabic into Latin at Toledo in Spain in 1218.<sup>40</sup> Since the Arabic word "al-bayabāniya" is an adjective formed from the Pahlavī word, "wiyābān," meaning "desert," the hypothesis has already been advanced that the *Kitāb asrār al-nujūm* was translated from a Sassanian source.<sup>41</sup> This conjecture is confirmed by the version of this little work incorporated into Book III of the *Liber Aristotelis*, wherein Hugo gives the names of five of the desert stars; four of these names are of easily demonstrable Pahlavī origin. Thus Hugo has for the star that the Greeks call Στόχυς, our α Virginis, the name Hacac corresponding to the Pahlavī "hōšag," "ear of corn"; for the Greek Λύρα, our α Lyrae, the name Kibar, a misreading of the Arabic transliteration of the Pahlavī "kennār," "lyre"; for the mouth of the Southern Fish, our α Piscis Australis, the name Sanduol derived from the Pahlavī Sadwās, that star's Persian name; and for the Northern Crown, our α Coronae, Hugo offers the choice of Sarben or Zarben, either one of which is a mutation of "abesar," the Pahlavī word for "crown." The fifth name in Hugo's text, Bariegini, represents the head of the first of the twins, that is, α Geminarum; I can only guess that it represents the Pahlavī "sar-i dōgānag," "the head of the twin."

In all Hugo lists twenty-seven desert stars, of which one is repeated to make twenty-eight; twenty-five of these are identifiable among the thirty stars in the *Kitāb asrār al-nujūm* and its Latin derivative, where they are given the same longi-

<sup>38</sup> Concerning this text see P. Kunitzsch, "Neues zum 'liber hermetis de stellis beibenis'," *ZDMG* 120 (1970), 126–30. The Arabic text with its Latin translation will be included in the volume of early Islamic astrological treatises.

<sup>39</sup> A defective edition was published some five times between 1484 and 1581; see F. J. Carmody, *Arabic Astronomical and Astrological Sciences in Latin Translation* (Berkeley, 1956), 55.

<sup>40</sup> L. Thorndike, "A Third Translation by Salio," *Speculum* 32 (1957), 116–17.

<sup>41</sup> P. Kunitzsch, "Zum 'liber hermetis de stellis beibenis'," *ZDMG* 118 (1968), 62–74, esp. 64.

tudes as they have in the *Liber Aristotelis*. These circumstances prove that Māshā'allāh used the Pahlavī version of Hermes. Indeed, Hugo attributes this section on the desert stars to Sarhacir astrologus, where the Arabic text reads *Hurmus ra's al-hukamā'*, "Hermes the head of the wise." It would seem that Hugo's Sarhacir corresponds to the Pahlavī "sar-i zīrak," "head of the wise," words which Māshā'allāh had transliterated into Arabic.

Rhetorius also summarizes Hermes' work, though he does not mention the Trismegistan by name. His list of thirty stars includes all twenty-seven found in Hugo's list, and must have coincided completely with the original Pahlavī list. Rhetorius' longitudes for these thirty stars are greater than those given by Ptolemy in Books VII and VIII of the *Almagest* by 3;40°; so that Rhetorius' source, who is presumably the astrologer who pretended to be Hermes, wrote in about A.D. 500. Rhetorius' longitudes of three stars, however, are corrupt; and for these stars as for most of the others the longitudes given by Hugo and in the Arabic *Kitāb asrār al-nujūm* agree with Rhetorius' mistaken values. Therefore, the common source of Rhetorius and of the Pahlavī translation of Hermes was a corrupt Greek manuscript copied after 500.

The Pahlavī translation must have been made during the sixth century, probably during the long reign of Khusro Anūshirwān, since it certainly existed by the beginning of the next century, when it was used in the Pahlavī version of the *Kitāb al-mawālīd* ascribed to Zaradusht. The Arabic version of this *Kitāb al-mawālīd* that is preserved in two manuscripts—one in the Nuruosmaniye Mosque in Istanbul and the other in the Escorial—claims that the original treatise, written in Old Persian by Zaradusht, was turned into Newer Persian by Māhānkard in, apparently, 637, the year in which Ctesiphon was captured by the Arabs. Māhānkard's Pahlavī version, the story continues, was translated into Arabic by Sa'īd ibn Khurāsānkhurrah for the Ispahbadh, Sunbadh, in the time of Abū Muslim; this would date the translation to the years between 747 and 754.

A reading of this fascinating text quickly assures one that its original was indeed a Sassanian production. Like the other translations to which we have referred, it is filled with transliterations of Pahlavī technical terms. It refers to various Indian astrological ideas; and we know from 'Umar's Dorotheus, from the *Denkart*, from the *Bundahīšn*, and from Ibn Nawbakht's *Kitāb al-nahmatān*, that Sanskrit astronomical and astrological texts had been translated into Pahlavī by the early fifth cen-

ture.<sup>42</sup> Also relevant is the fact that Dorotheus is called by pseudo-Zoroaster a king of Egypt; this is a misconception found also in 'Umar's translation of the Pahlavī version of Dorotheus, who himself came from Sidon, but who called Hermes, not himself, a king of Egypt. A revision of the Pahlavī *Kitāb al-mawālīd* during Anūshirwān's reign may be conjectured on the basis of a horoscope in the text that can be dated 6 October 549.<sup>43</sup>

But the claim that the work was "translated" by Māhānkard in about 637 also finds corroboration in the text. For the translator (*al-mufassar*) reports that the horoscope cast for the son of Adhīn indicated the passing of the reign of Ardashīr.<sup>44</sup> This clearly refers to Ardashīr III, who ruled from sometime in 628 till he was dethroned on 27 April 630. The horoscope, in which four planets and the ascendent are in Libra, can be dated within that brief span of time to November 629.<sup>45</sup> As Māhānkard claims to have been instrumental in interpreting this horoscope, he could have revised the *Kitāb al-mawālīd* eight years later. Unfortunately, he goes on to discuss the horoscope of a child born in Fahraj in the same year that he, Māhānkard, was born. This horoscope can be dated 1 August 487,<sup>46</sup>

<sup>42</sup> See, e.g., D. Pingree, *The Thousands of Abū Ma'shar* (London, 1968), 3–13.

<sup>43</sup> The positions of the planets in this and the next horoscopes are taken from B. Tuckerman, *Planetary, Lunar, and Solar Positions A.D. 2 to A.D. 1649* (Philadelphia, 1964).

Planets	Text	6 October 549
Saturn	Capricorn	Capricorn 25°
Jupiter	Sagittarius	Sagittarius 26°
Mars	Capricorn	Capricorn 10°
Sun	Libra	Libra 15°
Venus	quartile to ascendent	Leo 29°
Mercury	Libra	Libra 6°
Moon	Libra	Libra 12°
Ascendent	Taurus	ca. 8 P.M.

<sup>44</sup> This story passed from Zaradusht into the *Kitāb al-bārī* of 'Alī ibn Abī al-Rijāl, which was translated into Latin by Aegidius de Thebaldis in ca. 1256. Thence it came to the notice of Nalino ("Tracce," 354–55).

<sup>45</sup> For this horoscope:

Planets	Text	1 November 629
Saturn		Scorpio 2°
Jupiter	Libra	Libra 16°
Mars	Libra	Libra 5°
Sun		Scorpio 12°
Venus	Libra	Libra 0°
Mercury	Libra	Sagittarius 0°
Moon		Pisces 12°
Ascendent	Libra 8°	ca. 5 A.M.

<sup>46</sup> For this horoscope:

Planets	Text	1 August 487
Saturn	Sagittarius 25°	Sagittarius 20°
Jupiter	Libra 15°	Libra 3°

with the result that Māhānkard would have been 150 years old in 637. I can only hope that he claimed contemporaneity with the nameless native of Fahraj out of either ignorance or senility; or, better yet, that the horoscope was inserted into the text by the redactor in the time of Khusro Anūshirwān who added the horoscope of 549 and the references to the Pahlavī book of Hermes on the desert stars. The association of the horoscope of 487 with Māhānkard, on this hypothesis, would be due to the Arab translator's confusion.

Zaradusht's *Kitāb al-mawālīd*, then, represents a genuine Sassanian work, and shares with the few other pieces of Sassanian astrology that we have the characteristics of: an overwhelming dependency on Classical Greek astrology, of which only the material from Dorotheus, Valens, and Hermes has been as yet identified; a smattering of Indian concepts and technical terms; an emphasis on continuous horoscopy, developed in Iran from the theories of Dorotheus and Valens; and an intense interest in political astrology, a subject banned in the Roman Empire and therefore poorly represented in our Greek and Latin texts, but one that flourished exuberantly in Sassanian Iran and in the Arabic, Byzantine, and other astrological traditions that were influenced by Iran.

The *Kitāb al-mawālīd* also shows some connections with Ḥarrān, the center of Neo-Platonic paganism in early Islam. The pretended autobiography that Zaradusht gives toward the end of the work claims that the prophet studied astrology and magic under the wise Iliyūs in that city.<sup>47</sup> And at the very end of the *Kitāb al-mawālīd* is to be found the horoscope of a man born in Ḥarrān; this horoscope can be dated 9 April 232.<sup>48</sup> It is tempting to conjecture, then, that the core of pseudo-Zoroaster was a Pahlavī translation from the Greek

of a third-century astrological text composed by this native of Ḥarrān, perhaps bearing the name of Zaradusht's pretended master, Aelius. The translation would have been made contemporaneously with those of Dorotheus and Valens; and like them the text was revised and added to in the sixth century, with a final revision taking place in 637, shortly before the downfall of the Sassanian Empire.

The one Persian astrologer of the Sassanian period besides Buzurjmīhr to whom Arabic authors frequently refer—they, of course, thought Zaradusht and Jamasp were much earlier—was al-Andarzaghār, that is, the advisor (from Pahlavī *handarzaghar*), a scholar named Zādānfarrūkh.<sup>49</sup> He is said by Ibn al-Qiftī and Ṣā'id al-Andalusī to have greatly admired the ten books of the *Bizīdaj* of Valens. The largest section from al-Andarzaghār's work that we have in Arabic is found in the *Majmū' aqāwīl al-ḥukamā'* compiled by al-Dāmaghānī in the early twelfth century.<sup>50</sup> This is devoted to the topics of continuous horoscopy: the revolution of the years of nativities, the chronocrators, and the periods and sub-periods of the native's life dominated by each of the planets. These methods of astrology have their roots in the Classical texts of Dorotheus and Valens, but the Sassanian author presents a far more elaborate system that differs in detail from those of the extant Greek authors. Almost all of the numerous citations from al-Andarzaghār that can be gleaned from al-Dāmaghānī correspond, when rearranged, to much of Book IV of Hugo's *Liber Aristotelis*; the name al-Andarzaghār, in fact, seems to lie behind the name, Alafragar, of the author whose exposition Hugo promises to follow. We can, then, by following the arrangement of our Latin text, restore a substantial part of the Arabic translation of al-Andarzaghār's Pahlavī treatise to its original order.

But other fragments of al-Andarzaghār's *Kitāb al-mawālīd* that are cited by Arabic astrologers correspond to passages in Book III of the *Liber Aristotelis*. One of these fragments is preserved in yet another work entitled *Kitāb al-mawālīd*, this one composed by yet another Jewish scholar, Sahl ibn Bishr.<sup>51</sup> Sahl had worked for Ṭāhir ibn al-Ḥusayn

Mars	Capricorn	Capricorn 1°
Sun	Leo 18°	Leo 10°
Venus	Cancer	Cancer 0°
Mercury	Leo	Cancer 29°
Moon	Gemini	Gemini 23°
Ascendent	Leo 15°	ca. 5 A.M.

<sup>47</sup>This story was read by al-Bīrūnī and is reported by him in his *Kitāb al-āthār al-bāqīya*; see J. Fück, "Sechs Ergänzungen zu Sachaus Ausgabe von al-Bīrūnīs 'Chronologie Orientalischer Völker'." *Documenta Islamica Inedita* (Berlin, 1952), 69–98, esp. 75, last line.

<sup>48</sup>For this horoscope:

<i>Planets</i>	<i>Text</i>	<i>9 April 232</i>
Saturn	Aries 23°	Aries 19°
Jupiter	Aries 22°	Aries 6°
Mars	Aries	Taurus 2°
Sun	Aries	Aries 19°

Venus	Aries 24°	Aries 20°
Mercury		Aries 26°
Moon	Taurus 3°	Taurus 6°
Ascendent	Virgo	ca. 4 P.M.

<sup>49</sup>Sezgin, *GAS*, 80–81.

<sup>50</sup>See the important article to be published by C. Burnett.

<sup>51</sup>Sezgin, *GAS*, 125–28.

when he governed Khurāsān from 820 to 822, and later for al-Ḥasan ibn Sahl, who served as wazīr to al-Ma'mūn, the caliph from 813 to 833.

One of Sahl's favorite authorities in all his works was Māshā'allāh; in the *Kitāb al-mawālīd*, for instance, he quotes *in extenso* several chapters of the Baṣran's *Kitāb al-mawālīd al-kabīr*, allowing us an opportunity to compare Hugo's Latin translation with the Arabic original. He performs the same service for Book III of the *Liber Aristotelis*, for he cites a high percentage of Māshā'allāh's conflation of Buzurjmihr's *Bizīdaj* with Rhetorius' compendium. Where Hugo's Latin presents a patchwork of sentences drawn from Dorotheus, Valens, and Rhetorius, Sahl's Arabic preserves the same patchwork. Unfortunately, both of the extant manuscripts of Sahl's *Kitāb al-mawālīd*, that in the Escorial (Arab 1636, fols. 1–99) and that in Tehran (Majlis 6484, fols. 61–142) are defective at the beginning, so that we do not have the preface in which Sahl would have named his sources—presumably including Māshā'allāh—nor do we have his compilation for the first astrological place and for most of the second. But the rest allows us to recover the Arabic originals of Māshā'allāh's translations from Pahlavī and from Greek, and resolves many of the puzzles occasioned by the obscurities of Hugo's Latin.

One of the other Arabic astrologers who quotes from the lost work of al-Andarzaghar is the Christian scholar named Ibn Hibintā, whom we mentioned earlier as having composed a *Kitāb al-mughnī fī aḥkām al-nujūm* at Baghdād in about 950. The *Kitāb al-mughnī* is probably—I haven't yet been able to check the manuscript in the Zahariye Library in Damascus—the original of the authority named Μούγγης in a Byzantine translation from the Arabic preserved in Vaticanus graecus 1056.<sup>52</sup> This text contains an interrogation concerning Muḥammad and his career that reminds us of the similar one falsely ascribed to Stephanus of Alexandria, but which may be by Stephanus the Philosopher, whose importance will soon become apparent. The interrogation concerning Muḥammad in Μούγγης is addressed by the king of the Persians to Valens. The attribution is obviously false, but it does indicate the fame which Valens enjoyed as a Sassanian astrologer. The horoscope of this interrogation can be dated 7 November 939,<sup>53</sup> so that it was cast only a few years before Ibn

Hibintā compiled his *Kitāb al-mughnī*. In Μούγγης this bit of fakery is followed by a series of short astrological dicta ascribed to the Sassanian favorites Dorotheus and Valens as well as to Pythagoras, but also to the nations who appear as the heirs of antediluvian astrology in the historical myth of Abū Ma'shar: the Babylonians, the Egyptians, the Greeks, the Indians, and the Persians. Indeed, Abū Ma'shar himself is quoted to warn us that this is the product of an Arab's imagination, not a Sassanian's.

We must now use our imaginations to answer two final questions: how did Rhetorius travel from Egypt to Baghdād, and how were Greek astronomy and astrology restored to Byzantium after the disasters of the seventh and eighth centuries? The key to the answers to both questions is held by a Syrian Maronite Christian born in Edessa in about 695, Theophilus the Philosopher, the son of Thomas, whose name is commonly corrupted into Nūfil in Arabic texts and their Latin descendants.<sup>54</sup> Theophilus provides what some may regard as the only truly Classical note in this paper; for he translated the *Iliad* and the *Odyssey* into Syriac. But his major works are four substantial treatises on astrology composed in Greek. In composing them he demonstrates an ability to use Sassanian material, whether he read it in the original Pahlavī or in Arabic, Syriac, or Greek translations. For his work on military astrology, the Πόνοι περι καταρχών πολεμικῶν, depends heavily on the Sanskrit *Brhadyaṭrā* composed by Varāhamihira at Ujjayinī in about 550, which could only have reached him through a Sassanian intermediary. He also summarizes chapters on war and on receiving letters ascribed to Zoroaster that he presumably derived from a Sassanian source. These were later incorporated by Eleutherius Elias into his pseudo-Palchus, and thence made their way into Bidez and Cumont's *Les mages hellénisés*.<sup>55</sup> Thus they are perfect examples of one of the themes of this paper. For the astrology they represent originated in the Hellenistic period, was transmitted to Iran, and returned via Baghdād and Syria to Byzantium. The main problem with the historical reconstruction offered by Bidez and Cumont is that they mistook the fourteenth-century form of the text for one of the early sixth century reflecting one of the Hellenistic

<sup>52</sup> Edited partially in CCAG 5,3, pp. 110–21; it will be reedited with annotations in the volume of early Arabic astrological texts.

<sup>53</sup> Pingree, "The Horoscope of Constantinople," 314.

<sup>54</sup> An edition of all of Theophilus' surviving Greek works is in preparation. Concerning Theophilus' Πόνοι see D. Pingree, *The Yavanajātaka of Sphujidhvaja*, Harvard Oriental Series 48, 2 vols. (Cambridge, Mass., 1978), II, 389.

<sup>55</sup> Fragments 0 79 and 0 81 in J. Bidez and F. Cumont, *Les mages hellénisés*, 2 vols. (Paris, 1938), II, 208–19 and 225–26.

period. Therefore they failed to recognize why and when these texts were ascribed to Zoroaster. Other alleged fragments of Zoroaster preserved in Cassianus Bassus' *Geoponica* may have followed this same route from Iran via Syria to Byzantium.<sup>56</sup>

But Theophilus' sources included much more than material derived from the Pahlavī texts of Sassanian Iran. The incomplete copies that we have of his *Περὶ καταρχῶν διαφόρων* show that he had read some form of the poem of Dorotheus, but also the *Ἀποτελεσματικά* of Hephaestio of Thebes. And substantial extracts from Rhetorius appear both in Theophilus' work on military astrology and in that on general prognostications. Into the former he has copied out the three chapters on war that are found in Rhetorius' summary, in his Book VI, of Julianus of Laodicea's lost *Περὶ καταρχῶν ἐκλογαῖ χρήσιμοι*; and, in the latter, three chapters—on the dodecatemoria, on madmen and epileptics, and on the lot of death—summarize chapters in Book V of Rhetorius. In this same work Theophilus also copies Rhetorius' version of Hermes' treatise on the desert stars, but he corrects the longitudes of those stars so that they correspond to their Ptolemaic longitudes in 768. We can conclude, then, that by the 760s Theophilus had a copy in Greek of Rhetorius; the question arises of where he and that manuscript were.

We know that he served as military advisor to al-Mahdī, the caliph from 775 to 785, and that he predeceased his master by twenty days, that is, he died on 15 or 16 July in 785. In the first preface to his *Πόνοι περὶ καταρχῶν πολεμικῶν* he relates that he accompanied οἱ τηνικαῦτα κρατοῦντες on an expedition to the East, to Μαργιανή—that is, Khurāsān—during which he suffered from the cold. This may have been the expedition that al-Mahdī, then just the son of the ruling caliph, al-Manṣūr, led against the rebellious governor of Khurāsān, 'Abd al-Jabbār, in the winter of 758–759. If this identification is correct, Theophilus was serving the 'Abbāsids at Hāshimīya near al-Kūfah already before al-Manṣūr founded Baghdād in 762. Since Māshā'allāh was also in the caliph's employ at this time, it is more than likely that he knew Theophilus; and thus the link is established that brings Rhetorius and Māshā'allāh together in Baghdād.

Theophilus locates himself in Baghdād in his *Ἐπισυναγωγή περὶ κοσμικῶν καταρχῶν*, which deals with general and political astrology. He begins by indicating the year-beginnings of various

peoples: the Egyptians, he says, use the heliacal rising of Sirius, the Greek μαθηματικοί, he claims, use the New Moon preceding the Sun's entry into Aries, that is, 1 Nīsān; and Ptolemy, he reports with reference to the *Tetrabiblos*, divides the year into four seasons, each of which begins at its own τροπή. But, he continues, the Persians throughout the whole of the Orient, being lovers of wisdom, have translated the Greek books into their own language; and they use the entry of the Sun into Aries as do Critodemus, Valens, Dorotheus, and Timocharis. Valens and Dorotheus, of course, Theophilus would associate with the Persians because he knows that their works existed in Pahlavī; Critodemus is cited by Valens; and Timocharis by Ptolemy in the *Almagest*, which also existed in a Pahlavī version. Theophilus, therefore, is historically correct in implying that these four names were known in Iran though wrong in identifying a common epoch for them. He goes on to say that he will use as epoch for his own annual meteorological and political predictions the local time at which the Sun enters Aries "at the capital city," he explains, "of the Saracens, where I have made my calculations, which is East of Babylon and is called Εἰρηνόπολις (i.e., in Arabic, Dār al-salām), but in the dialect of the Syrians Baghdād."

We now must address the question of how an interest in scientific texts, and particularly in astronomy and astrology, came to be implanted in Byzantium. Lemerle<sup>57</sup> regards the primary mover to have been Leo the Mathematician who allegedly was wooed by al-Ma'mūn to come to Baghdād in the period between 829 and 833 because of his expertise in Euclidean geometry. One version even claims that Leo's appointment to the archbishopric of Thessalonica in 841 was a reward for his resistance to the Arab's blandishments. In fact, of course, al-Ma'mūn had many excellent scientists in Baghdād, including geometers; and what little we have from Leo's hand—mostly astrological bits, though also one scholium on multiplying fractions—indicates that he was not in any way a distinguished or even a very competent mathematician.<sup>58</sup> His library would have been of greater interest to al-Ma'mūn than his largely self-acquired mathematical talent.

Leo's astrological writings are based on the anonymous commentator on Ptolemy's *Tetrabiblos*, on Paul of Alexandria, on Hephaestio of Thebes,

<sup>57</sup> *Le premier humanisme byzantin*, 148–76.

<sup>58</sup> D. Pingree, article on Leo the Mathematician in *Dictionary of Scientific Biography*, 8 (New York, 1973), 190–92.

<sup>56</sup> Fragments 0 37–0 52 in Bidez and Cumont, II, 173–97.

and on John Lydus, and on a non-Classical tradition of political astrology. All of the material that he shows a knowledge of, in fact, is found in Laurentianus 28,34, which contains some of Leo's own treatises and a reference to the exile of Patriarch Photius in 867; this manuscript, then, may be descended from one or more of Leo's. The political astrology that it contains is the adaptation of Sassanian theories produced by Theophilus, and it is this type of astrology, though not necessarily directly from Theophilus, that Leo was imitating.

Another scholar who wrote on political astrology in Greek between the time of Theophilus and Leo was Stephanus the Philosopher.<sup>59</sup> He was well known in Baghdād in the ninth century since Shādhān has Abū Ma'shar refer to him frequently, and his sayings are quoted by others in this period;<sup>60</sup> but he is clearly represented as a figure from the early days of Arabic astrology, from the decades immediately preceding 800, and is associated by Ibn Abi al-Rijāl with Theophilus. I have already mentioned that Stephanus may be the man who wrote in Greek, during the reign of al-Mahdī, a history of the Caliphate based on the horoscope of the year in which the Hijra occurred. The true authorship of this interesting work is concealed by a fake preface in which Stephanus of Alexandria is represented as receiving the news about Muḥammad from Epiphanius, a merchant who arrived in Constantinople from the Yemen on 1 September 621.<sup>61</sup> The forger is well informed both about Stephanus' role as commentator on the *Handy Tables* in the early 620s, and about the methodology of Sassanian political astrology based on a year-beginning, as was Theophilus' Ἐπισημῶν ἀγωγή. But pseudo-Stephanus of Alexandria chose none of the epochs for the year mentioned by Theophilus, but rather the year-beginning of the Byzantine calendar.<sup>62</sup> There is only one set of Greek astronomical tables that I know of before Isaac Argyrus' *New Tables* of 1367 that used the Byzantine calendar, and that is the lost set computed and described by Stephanus the Philosopher. He is also one of the few men of the period of al-Mahdī's reign (775–785) who had the knowledge of both Greek and Oriental astronomy, as-

trology, and history to forge the astrological history of pseudo-Stephanus of Alexandria.

Indeed, what we have of his, aside from the citations from his Arabic works in Abū Ma'shar and others, and from his Greek works in Eleutherius Elias' pseudo-Aḥmad the Persian, is a short defense of astrology as a Christian science, a defense similar to, but by no means dependent on, that offered by Theophilus in the preface to his second edition of the Πόνοι. Stephanus' work in its purer form is preserved in Vaticanus graecus 1056, like so much else that I have discussed in this paper.

In the Περὶ τῆς μαθηματικῆς τέχνης Stephanus states that he has come from Persia—presumably he means by this Baghdād—to this happy (εὐδαίμων) city only to discover that the astronomical and astrological parts of philosophy have been snuffed out in it. That he speaks of Constantinople is clear from the fact that he places it in the fifth clima. He notes that people find it difficult to use the tables of Ptolemy and Ammonius because their calculations err with respect to the Sun by 5°. This is not, as Boll thought,<sup>63</sup> a reference to precession, but rather to the fact that people might forget to include in a year's motion of the Sun the five epagomenal days of the Egyptian calendar. That that is Stephanus' concern is shown by his succeeding remark that learners find it difficult to deal with calendars they are not used to; and Stephanus refers then to Ptolemy's use of the years of Ναβουχοδόνσοο and the Egyptian months; to Theon's, Heraclius', and Ammonius' use of the years of Philip and the Egyptian months; and to the use by οἱ νεώτεροι of the years of the Persian kings or of the Saracens. In consideration of these difficulties, Stephanus says that he has computed tables for the longitude and latitude of this happy city, and based them on the Byzantine calendar.

The tables of οἱ νεώτεροι to which Stephanus refers are of some importance in determining more precisely the date of this treatise. Among the earliest Arabic uses of tables based on the Sassanian calendar with the first year of a Sassanian emperor as the epoch, as was characteristic of the Pahlavī *Zīk-i Shahriyārāns*, was Māshā'allāh's use of Khusro Anūshirwān's;<sup>64</sup> it is not coincidental, then, that this *Zīj* is cited in the *Liber Aristotelis*. But the Persian *Royal Canons* had probably been used earlier in Islam, perhaps even in the historical horoscopes of the early period of Islam computed shortly after

<sup>59</sup>The Greek fragments of his works will be published elsewhere. See, for now, F. Cumont in *CCAG* 2, pp. 181–86; and D. Pingree, "Historical Horoscopes," *JAOS* 82 (1962), 487–502.

<sup>60</sup>Sezgin, *GAS*, 48–49.

<sup>61</sup>This was edited by H. Usener, *De Stephano Alexandrino* (Bonn, 1880), 17–32.

<sup>62</sup>For his horoscope, cast for 1 September 621, see O. Neugebauer and H. B. Van Hoesen, *Greek Horoscopes* (Philadelphia, 1959), 158–60.

<sup>63</sup>*CCAG* 2, p. 181.

<sup>64</sup>See F. I. Haddad, E. S. Kennedy, and D. Pingree, *The Book of the Reasons behind Astronomical Tables* (Delmar, N. Y., 1981), passim.

679.<sup>65</sup> But it was only in about 790 that al-Fazārī computed the first set of tables to use the Muslim calendar.<sup>66</sup> So Stephanus wrote his Christian apology for astrology probably in the 790s, though his Byzantine tables were earlier—probably early enough to have been used in forging the pseudo-Stephanus of Alexandria text in about 780.

That Theophilus' work was known in Byzantium in the 790s, presumably through Stephanus' intervention, is indicated by an incident recorded in Theophanes' *Chronographia* under the year 6284 (A.D. 792).<sup>67</sup> In July of that year the emperor, Constantine VI, marched against the Bulgars. He built a fortress, Marcellae, on the border. On the twentieth of the month Kardam, the Bulgarian ruler, led his army across the frontier up to the fortifications. The emperor, being advised by his "pseudoprophet and astrologer," Pancratius, that victory would be his, sallied forth to ignominious defeat. Theophanes does not describe the astrological technique used by Pancratius, but it can be guessed at from chapter 20 of Theophilus' Πόνοι,<sup>68</sup> where

<sup>65</sup> Pingree, *The Thousands*, 114–21.

<sup>66</sup> D. Pingree, "The Fragments of the Works of al-Fazārī," *JNES* 29 (1970), 103–23.

<sup>67</sup> *Theophanis Chronographia*, ed. C. de Boor, I (Leipzig, 1883), 467–68.

<sup>68</sup> Edited by C. O. Zuretti in *CCAG* 11, 1, p. 206. Further Byzantine horoscopes interpreted in accordance with Theophilus' methods can be found, e.g., among those published by D. Pingree, "The Astrological School of John Abramius," *DOP* 25 (1971), 189–215.

we read: "The Moon in Gemini with the aspect of the benefics indicates the unsuccessful withdrawal of the besieging troops" (Constantine was within the fortress, which was surrounded by the Bulgars). At about noon on 20 July 792 the Moon was in the twentieth degree of Gemini aspected in sextile by the benefic planet, Venus, which was in the twentieth degree of Leo.

With Stephanus, then, we have astrology and astronomy restored to Byzantium, historical astrology introduced from the East, and the mathematical art so stoutly defended as a Christian science that even the archbishop of Thessalonica felt free to follow it. As Stephanus says in the second chapter of his little work, in a Christian version of the late eighth-century history of astrology that I quoted at the beginning of this paper in its developed form as concocted by Abū Ma'shar:

Seth, as we have read, was the first to use this art. The Chaldaeans received it from him; then it went from them to the Persians, and from them to the Greeks, from whom it was transferred to the Egyptians, from whom the Romans (i.e., Byzantines) were also initiated. Then finally the Arabs got it. And all the nations that have been mentioned had almost cosmocratic and victorious dynasties as long as they used it. Therefore I thought it necessary to renew this useful science among the Romans (i.e., Byzantines) and to implant it among the Christians so that they might be deprived of it nevermore.

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<sup>30</sup> **Antiochus and Rhetorius**

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<sup>32</sup> **Political Horoscopes from the Reign of Zeno**

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