

The Early Development of Astrology in al-Andalus

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AL-MAQQARĪ QUOTES A LONG SERIES of remarks by Ibn Saʿīd al-Maghribī (1213-1286) on the development of the different branches of knowledge in Muslim Spain. Among them we find the following:

All sciences are well considered and studied in al-Andalus, except philosophy and astrology (*tanjīm*), but these two sciences deeply interest aristocrats who do not show towards them the same fear plebeians seem to feel. For whenever people say about a man, "So and so reads philosophy", or "he works in astrology", he will be considered a heretic (*zindīq*), his spirit will be chained, and if he makes a mistake he will be stoned to death or burnt before news about him reaches the sultan, or it will be perhaps the sultan himself who orders him to be killed so as to gain the favour of the mob. Quite often their kings are the ones who ordain the burning of books concerning these subjects when they find them and this is the way al-Manṣūr b. Abī ʿĀmir [976-981]¹ tried to get near to the hearts of his subjects when he started to promote himself although in secret he still cultivated these sciences, according to al-Ḥijārī, but God knows best.²

Ibn Saʿīd's words summarize clearly what we could pompously call "the place of astrology in Andalusian society until the end of the Caliphate" (1031), thus covering the period I am mainly concerned with in this paper. The importance of professional astrologers among the governing classes seems a well established fact. The Umayyad sovereigns had an official astrologer appointed to their court since the times of al-Ḥakam I (796-822).³ An anecdote, also preserved by al-Maqqarī,⁴ shows the credit enjoyed by the astrologer al-Ḍabbī with such an orthodox amir as Hishām I (788-796), who summoned him to his court immediately after his accession to the throne. Al-Ḍabbī came to Cordova from Algeciras and the dialogue between these two characters is quite interesting because it shows Hishām's efforts to make his religious beliefs consistent with his curiosity to know al-Ḍabbī's prediction of the future of his reign; he, of course, asserts that, in spite of his questions to the astrologer, he does

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1. This is a reference to the partial burning of the library of al-Ḥakam II by al-Manṣūr b. Abī ʿĀmir.

2. Al-Maqqarī, *Nafh al-ṭib*, ed. R. Dozy (Leiden, 1855-1861), vol. I, p. 136; ed. Muḥammad Muḥyi al-Dīn ʿAbd al-Ḥamīd (Cairo, 1367/1949), vol. I, pp. 205-206.

3. E. Lévi-Provençal, *Espana Musulmana hasta la caída del Califato de Cordoba* (711-1031 de J.C.). In *Historia de Espana*, ed. by Ramon Menéndez Pidal, vol. IV (Madrid, 1957), p. 93.

4. Maqqarī, *Nafh*, ed. Dozy, vol. I, p. 216; ed. ʿAbd al-Ḥamīd, vol. I, p. 314.

not trust his answer because it will concern occult things which only God knows (*idh kāna min ghayb Allāh alladhi ista'thara bihi*).⁵ Nevertheless when al-Ḍabbī tells the amir that his reign will be lucky but that it will only last about eight years — quite a successful guess — Hishām accepts his prediction and consecrates the rest of his life to God's worship and good deeds because he has had a warning, undoubtedly coming from God, in al-Ḍabbī's words (*al-nadhīr kallamanī bi lisānika*). Another anecdote, studied by Terés,⁶ reflects again the atmosphere of court astrology and it has the interest of having been found, much later, in the East. The amir, ʿAbd al-Raḥmān II (822-852), talks to his poet-astrologer Ibn al-Shamir in one of the rooms of his palace and asks him through which of its doors he will go out. The astrologer casts the horoscope and writes down his conclusions inside an envelope which he seals afterwards. Then ʿAbd al-Raḥmān orders a new door to be opened in the western wall of the room and he goes out through it; in his report Ibn al-Shamir had written exactly what the amir was going to do. Much later Nizāmī ʿArūḍī Samarqandī tells the same story, but the characters involved are al-Bīrūnī and Maḥmūd of Ghazna.⁷

Celestial phenomena and catastrophical events attracted quite often the attention of both historians and astrologers who, thus, seem to play a prominent role in society not restricted, as in the examples previously considered, to the court. Thus, if an historian such as Ibn Ḥayyān is interested in a total lunar eclipse which took place on Monday, 14th Dhū-l-ḥijja 362 (15th September 973)⁸ or by the apparition of a great and very bright star moving towards the north on Wednesday, 21 Ramaḍān 362 (25 July 973),⁹ one may easily imagine the concern of professional astrologers with a conjunction of Saturn and Jupiter¹⁰ which took place in 397/1006-07 and which implied a

5. This is a classical argument against astrology. The Moroccan astrologer of the 15th century Abū ʿAbd Allāh al-Baqqār, who compiled an anthology of the *Libro de las Cruces* which is preserved in manuscript 916 of the Library of El Escorial, refutes the argument. He says that astrology does not pretend to have a knowledge of occult things (*al-ghayb*) because ʿilm al-ghayb is the knowledge of the future without any clues, causes, or reasons, thus being reserved to God. See the aforementioned Escorial manuscript, f. 188r. On al-Baqqār and his anthology see Juan Vernet, "Tradición e innovación en la ciencia medieval", *Oriente e Occidente nel Medioevo: Filosofia e Scienze*. Accademia Nazionale dei Lincei (Roma, 1971), pp. 741-757.

6. Elias Terés, "Ibn al-Samir, poeta-astrologo en la corte de ʿAbd al-Raḥmān II", *Al-Andalus*, 24 (1959), 449-463.

7. Nizāmī ʿArūḍī Samarqandī, *Chahār Maqāla*. Arabic translation by ʿAbd al-Wahhāb ʿAzzām and Yaḥyā al-Khashshāb; notes by Muḥammad b. ʿAbd al-Wahhāb al-Qazwīnī (Cairo, 1949), pp. 64-65.

8. Ibn Ḥayyān, *Al-Muqtabis fī akhbār balad al-Andalus*. ed. ʿAbd al-Raḥmān ʿAlī al-Ḥajjī (Beirut, 1965), p. 138; see the Spanish translation by Emilio García Gómez, *El Califato de Cordoba en el "Muqtabis" de Ibn Ḥayyān*. *Anales Palatinos del Califa de Cordoba al-Ḥakam II, por ʿIsā ibn Aḥmad al-Rāzī* (Madrid, 1967), p. 172.

9. Ibn Ḥayyān, *Muqtabis*, ed. al-Ḥajjī, p. 118; translation by García Gómez, p. 151.

10. Ibn ʿIdhārī pretends that it was a conjunction of the seven planets. See note 12.

change of triplicity because it started in Leo (a sign of fire) and continued in Virgo (a sign of earth).¹¹ This last fact leads the historian Ibn 'Idhārī¹² to remind us that the sign of Virgo was the lord (*ṣāhib*) of Cordova and that the old sages of the city had placed a statue or some other kind of image (*ṣūra*) representing this zodiacal sign on top of the southern door of the city, called *Bāb al-Qanṭara* (door of the bridge).¹³ We have several astrological interpretations of this conjunction and they all agree in considering it as the warning sign of the end of the Caliphate and the beginning of the *fitna*; one of them is ascribed to the great astronomer Maslama al-Majrīṭī¹⁴ who foretold a change of dynasty, ruin, slaughter and famine; another interpretation can be read in the Alphonsine *Libro de las Cruces* which states that this celestial warning implied the end of the leadership of the Arabs in Spain and the moment at which their role started to be played by Western people, Berbers and Christians.¹⁵ In any case the evidence furnished by historians shows in this case the existence of a number of astrologers in Cordova who discuss the event and its consequences.¹⁶ In the same way another anecdote told by Ibn 'Abd Rabbihi (860-940) describes the meeting of a group of astrologers who cast the horoscope and make calculations which predict — unsuccessfully — that there will be no rain for a month's time.¹⁷

The important role played by astrologers in the court of the Banū Umayya in Cordova attracted the envy of both pious *fuqahā'* and court poets, who feared their influence in high official circles. Thus the *faqīh* Yaḥyā b. Yaḥyā (d.849)¹⁸ often attacked the poet-astrologers who surrounded 'Abd al-Raḥmān II.

11. On this conjunction see Juan Vernet, "Astrología y política en la Córdoba del siglo X", *Revista del Instituto de Estudios Islámicos en Madrid*, 15 (1970), 91-100 (cf. especially p.93); *La cultura hispano-árabe en Oriente y Occidente* (Barcelona, 1978), p. 37.

12. Ibn 'Idhārī al-Marrākushī, *Al-Bayān al-Mughrib*, ed. E. Lévi-Provençal, (Paris, 1930), vol. III, 1, pp. 14-15.

13. On this door see Manuel Ocaña Jiménez, "Las puertas de la medina de Córdoba", *Al-Andalus*, 3 (1935), 143-151 (cf. specially p.144); Leopoldo Torres Balbas, *Ciudades hispano-musulmanas* (Madrid, n.d.), vol. 2, p. 651; E. Lévi-Provençal, *Espana Musulmana hasta la caída del Califato de Córdoba (711-1031 de J.C.)*, *Instituciones y vida social e intelectual*, in "Historia de España", ed. by R. Menéndez Pidal, (Madrid, 1957), vol. V, p. 236. It seems that the aforementioned statue represented an ancient goddess who may have been identified by the Muslim population with the Virgin Mary.

14. Quoted by Ibn 'Idhārī (see above n. 12). On Maslama cf. J. Vernet and A. Catalá "Las obras matemáticas de Maslama de Madrid", *Al-Andalus*, 30 (1965), 15-45. Another interpretation of this conjunction in Ibn al-Khaṭīb, *Kitāb al-māl al-a'lām*, ed. E. Lévi-Provençal, (Rabat, 1934), pp. 148-149; on this text see the works by J. Vernet quoted in n. 11.

15. Alfonso el Sabio, *Libro de las Cruces*, ed. Lloyd A. Kasten and Lawrence B. Kiddle, (Madrid-Madison, 1961), pp. 9-10.

16. Ibn 'Idhārī (see above n. 12) is positive about this: *Wa kathura kalām al-munajjimīn fīhi wa andharū bi-ashyā' 'aẓīma kāna al-nās 'an-hā fī ghafla*.

17. Ibn Marzūq, *El Musnad: hechos memorables de Abū-l-Ḥasan, sultan de los benimerines*. Estudio, traducción, anotación, índices anotados por María J. Viguera, (Madrid, 1977), pp. 365-366.

18. Lévi-Provençal, *Espana Musulmana hasta la caída del Califato*, vol. IV, p. 175.

He was satirized by one of them, Yaḥyā al-Ghazāl (ca.773-864).¹⁹ In the 10th century the poet Ibn 'Abd Rabbihi is the author of a certain number of poems attacking astrological beliefs which show that, often at that time, an anti-astrological attitude was associated with an unscientific one. For example, when he addresses a certain number of reproaches to the astronomer Abū 'Ubayda Muslim b. Aḥmad al-Balansī he not only censures his belief in the influence of the planets on the earth, but he also seems to attack the sphericity of the universe and that of the earth, the fact that the latter can be considered as a point in the middle of space, and that the summer in the southern hemisphere corresponds to the winter in the northern one and vice versa.²⁰ The same kind of arguments will be used in the 13th century by the religious polemicist al-Sakūnī²¹ who, in two of his works, *'Uyūn al-munāẓarāt*²² and *Laḥn al-'awāmm fīmā yata'allaq bi-'ilm al-kalām*²³ considers contrary to the Muslim creed predictions based on planetary conjunctions,²⁴ on nativities,²⁵ and even the humble meteorological predictions based on the system of the *anwā'*²⁶ which he regards as astrological. Nothing, of course, can be argued from the point of view of strict orthodoxy, but it seems rather surprising to find al-Sakūnī saying, on the basis of *Qur'ān* 13,3 (*Madda al-arḍ*, "He extended the Earth") that the earth is flat.²⁷

Confusion between astrology and astronomy is also evident in the following verses of Ibn 'Abd Rabbihi where he regards as astrological works what seems mainly to be a list of astronomical tables:

أين الزيج والقانون * والاركن والكمة
وأي السندهند البطل * والجدول هل ثمة
سوى الافك على الله تعا * لي منشئ الرمة

19. On al-Ghazāl astrologer, cf. Juan Vernet, "La maldición de Perfecto", *Prismata. Naturwissenschaftsgeschichtliche Studien. Festschrift für Willy Hartner* (Wiesbaden, 1977), 417-418.

20. Šā'id al-Andalusī, *Kitāb Ṭabakāt al-Umam* (*Livre des Catégories des Nations*), French translation by Régis Blachère, (Paris, 1935), pp. 123-124. At least three of these topics are extensively treated in the first book of Ptolemy's *Almagest*: spherical motion of the heavens (I,2), the earth has a spherical form (I,3), and the earth is like a point in relation to celestial space (I,5). It seems that the *Almagest* was known to Maslama al-Majrīṭī: cf. Šā'id, *Ṭabakāt*, tr. Blachère p. 129.

21. Abū 'Alī 'Umar b. Muḥammad al-Sakūnī, an author of Andalusian descent who lived in Tunis in the second half of the 13th century. See notes 22 and 23.

22. Abū 'Alī 'Umar al-Sakūnī, *Laḥn al-'awāmm fīmā yata'allaq bi-'ilm al-kalām*, ed. Sa'd Ghurāb in 22. Abū 'Alī 'Umar al-Sakūnī, *'Uyūn al-munāẓarāt*, ed. Sa'd Ghurāb, (Tunis, 1976).

Ḥawliyyāt al-Jāmi'a al-Tūnisiyya, 12 (1975), 109-255. Cf. on this book J. D. Latham, "The content of the *Laḥn al-'awāmm* (ms. 2229, al-Maktaba al-'abdaliyya al-tūnisiyya, Tunis) of Abū 'Alī 'Umar Muḥammad b. Khalīl al-Sakūnī al-Ishbīlī". *I Congreso de Estudios Árabes e Islámicos* (Madrid, 1964), 293-307.

23. Sakūnī, *Laḥn*, p. 177.

24. Sakūnī, *Laḥn*, p. 177; *'Uyūn*, pp. 222-223.

25. Sakūnī, *Laḥn*, pp. 178, 179, 182-184.

26. Sakūnī, *'Uyūn*, pp. 300-301 (cf. also 247-248, and *Laḥn* p. 183).

Where are the *Zij*, the *Qānūn*, the *Arkand* and the *Kimma*
And where the false *Sindhind* and the *Jadwal*? is there in them
Anything but a lie against God — let Him be exalted — Who resurrects the dead?²⁸

With these verses we must face the problem of the circulation of certain astrological and astronomical works in Muslim Spain in the first half of the 10th century. There is no problem, of course, concerning the *Sindhind*,²⁹ but it is doubtful whether the *Arkand*³⁰ was really known in al-Andalus at this time if we bear in mind that, one century later, a serious astronomer such as Šā'id of Toledo (1029-1070) seems to speak about it only on a secondhand basis.³¹ *Zij*, *Qānūn*, and *Jadwal* are difficult terms to interpret exactly; the three of them might be synonymous and have the general meaning of astronomical table, or refer to more specific significations. One might also consider whether, following Destombes' opinion, *zij* is the table itself whilst *qānūn* is the set of instructions which indicate how to use the *zij*, having thus the same meaning as the Latin *canones*.³² On the other hand it could be convenient to remember that both Ibn Juljul and Šā'id use the term *Qānūn* when speaking about Ptolemy's *Tables*³³ whilst Šā'id also designates with the same word the *Tables* of Theon of Alexandria;³⁴ therefore it is possible to conjecture that *qānūn* might refer to a set of Hellenistic tables, whilst *zij* might be the term used to designate tables of Indian, Persian, or Arab descent. It seems impossible to be more accurate, although we should think that the only set of tables whose knowledge is documented in al-Andalus in the 10th century is, apart from the *Sindhind*, al-Battānī's *Zij al-Šābi*,³⁵ the original title of which was, probably, that indicated by Ibn al-Nadīm and Ibn al-Qifṭī, *Kitāb al-zij* or just *al-Zij*.³⁶ To end these remarks on Ibn 'Abd Rabbihi's verses, I would

28. Ibn Marzuq, *Musnad*, tr. Viguera p.364. I have been able to quote the Arabic text thanks to M. J. Viguera's generosity; she has provided me with photocopies of the proofs of her edition of the *Musnad* which is now being printed in Algiers; it is Miss Viguera herself who has suggested an improvement of her translation which I use here in my version of these three verses.

29. It was introduced in al-Andalus in the 9th c. either by 'Abbās b. Firnās (see Elías Terés, "'Abbās b. Firnās", *Al-Andalus*, 25 (1960), 239-249) or by 'Abbās b. Nāsiḥ (cf. E. Terés, "'Abbās b. Nāsiḥ poeta y qāḍī de Algeciras", *Etudes d'Orientalisme dédiées à la mémoire de Lévi-Provençal* (Paris, 1962), vol. I, pp. 339-358). Its history in Spain from the 10th c. onwards is fairly well known.

30. Brahmagupta's *Khandakhadyaka*, see David Pingree, "Brahmagupta", *Dictionary of Scientific Biography* (New York, 1970), vol. II, pp. 416-418; cf. also E. S. Kennedy, *The Exhaustive Treatise on Shadows by Abū'l-Rayḥān Muḥammad b. Aḥmad al-Bīrūnī* (Aleppo, 1976), vol. I, pp. 181, 200; vol. II, p. 27.

31. Šā'id, *Ṭabakāt*, tr. Blachère, p. 47.

32. See M. Destombes review of Kennedy's *Survey of Islamic Astronomical Tables* in *Isis*, 50 (1959), 273.

33. Ibn Juljul, *Ṭabaqāt al-aṭibbā' wa-l-ḥukamā'*, ed. Fu'ād Sayyid (Cairo, 1955), pp. 35-36; Šā'id, *Ṭabakāt*, tr. Blachère, pp. 72-73.

34. Šā'id, *Ṭabakāt*, tr. Blachère p. 86.

35. Cf. J. Vernet's review of Ch. Pellat, *Le Calendrier de Cordoue en Oriens*, 17 (1964), 284-286.

36. W. Hartner, "Al-Battānī", *Dictionary of Scientific Biography*, (hereafter *DSB*) (New York, 1970), vol. I, p. 508.

like to mention that *jadwal* might refer to magic squares instead of astronomical tables,³⁷ and that I know nothing about the meaning of *al-Kimma*.

The conclusions I have been able to draw from the new evidence furnished by Ibn 'Abd Rabbihi are, therefore, rather scanty. The main literary sources to study the diffusion of astronomical and astrological literature are, still, Ibn Juljul for the 10th century and Šā'id for the 11th. In this way we can be sure that both authors bear witness to the knowledge, in Spain, of Abū Ma'shar's *Kitāb al-Ulūf*,³⁸ and that Šā'id also knew Shādhān's *Mudhakarāt*,³⁹ and probably Vettius Valens' *Anthology*.⁴⁰ But these were not the first astrological works to be read and used in Muslim Spain. In a recent paper, Juan Vernet has described an Arabic manuscript from El Escorial which contains a collection of excerpts of the Arabic original of the Alphonsine *Libro de las Cruces*.⁴¹ Rafael Munoz has also found three new chapters of the same work in another manuscript of the same library.⁴² On the other hand, Vernet has proved that the aforementioned Arabic text is based on the translation of a Latin astrological work which was known in Al-Andalus towards the end of the 8th or beginning of the 9th century,⁴³ therefore being one more item in the long series of contacts between Isidorian-Latin and Arabic culture in Muslim Spain. One must remember that astrology was very much alive in the time of Isidore of Seville.⁴⁴ It may be interesting to compare the Arabic and Castilian texts of a short passage taken from the first chapter of the work where the author clearly establishes that the system he uses to forecast future events is the one employed by ancient astrologers of Northern Africa and Spain who did not use the subtleties of Hellenistic and Oriental astrology:

et estos son los iudicios generales et antiguos, et son los iudizios que usauan los de las partidas de occidente del tempo antigo, et los de tierra de Affrica, et los de Barbaria et una partida de los romanos de Espanna; todos estos solian iudgar por estas costellaciones generales.

Mas los persios et los griegos auian muchas sotilezas en esta ciencia, et en departir las razones della, et en sosacar las sus significaciones, et de que guysa ligan et parecen sus fechos et sus acciden-

اعلم ان هذه الطريقة في الاحكام هي طريقة اهل المغرب في الزمان القديم اعني اهل افريقية والبرابر وطائفة من العجم بالاندلس اذ لم يكن عندها ما كان عند الفرس واليونانيين

37. H. P. J. Rénaud, "L'origine du mot 'almanach'", *Isis*, 37 (1947), 45.

38. Ibn Juljul, *Ṭabaqāt*, ed. F. Sayyid, pp. 2,5-6,9; Šā'id, *Ṭabakāt*, tr. Blachère, p. 53. On the knowledge of the *Kitāb al-Ulūf* in the West, cf. David Pingree, *The Thousands of Abū Ma'shar* (London, 1968), and Charles S. F. Burnett, "The Legend of the Three Hermes and Abū Ma'shar's *Kitāb al-Ulūf* in the Latin Middle Ages", *Journal of the Warburg and Courtauld Institutes*, 39 (1976), 231-234.

39. Šā'id, *Ṭabakāt*, tr. Blachère, pp. 81, 111.

40. Šā'id, *Ṭabakāt*, tr. Blachère, p. 87. In any case Vettius Valens' *Anthology* was well known in the Maghrib in the 11th c.: it is often quoted by Ibn Abī-l-Rijāl in his *Kitāb al-bārī fī aḥkām al-nujūm*, cf. C. Nallino, *Ilm al-Falak. Ta'rikhu-hu 'inda-l-'arab fī-l-qur'ān al-wustā* (Rome, 1911), p. 195.

41. J. Vernet, "Tradición e innovación" (cf. n. 6), pp. 745-747.

42. R. Muñoz has discovered the Arabic text of Chapters 60, 61, and 62 of the *Libro de las Cruces* in ms. Escorial 918 f. 12v-13r. I would like to thank him here, for I am using his unpublished edition and translation of this text.

43. Vernet, "Tradición e innovación", p. 747.

44. J. Fontaine, "Isidore de Seville et l'astrologie", *Révue des Etudes Latines*, 31 (1953), 271-300.

tes en los cuerpos del mundo de generation et corruption, et auian significaciones por sosacar los tempos en que compeçauan aquellos accidentes, et quanto durauan, et los tempos en que finauan; et sosacauan los tempos de las malas ocasiones, et los tempos de las fortunas et de los buenos accidentes. Et esto todo departyan lo por grandes sotylezas et de muchas carreras desta scientia de cuemo dan las planetas las fuerzas unas a otras, et de cuemo las reciben unas e otras, et como reciben unas a otras, et de las otras cosas et de las otras carreras que se tyenen con estas, et de los estados de las planetas, et de sus accidentes segund que todo esto es departido en los libros de los sabios orientales, et los de Babilonia, et de los egipcios, et de los persios et de los griegos, que todos estos sonsacauan los iudizios et las significaciones desta scientia de todas estas carreras sobredichas.⁴⁶

من دقائق هذا العلم وتصرف
احواله في الاستدلال على جميع
الموجودات في عالم الكون والفساد
ومعرفة البداي لها والانتهاءات
واوقات السعادات وضدها على التحرير
وكيف يرفع التدبير بعضها
الى بعض ويقل بعضها بعضاً
مع ما يضاف الى ذلك من
جميع احواله الموصوفة في
كتب المشرقيين والبابليين
والمصريين واهل الهند⁴⁶

It seems clear that there is a close correspondence between the Arabic and Castilian texts, although the latter seems more an amplification than a translation of the former. My purpose, in the rest of this paper, will be to try to establish the main lines of the history of this *Libro de las Cruces*, which has the enormous interest of being the first astrological work to be used in al-Andalus. I think one should distinguish three main stages in the development of this work:

1. *Latin original entirely unknown.*

2. *First Arabic version of the whole or part of the present text which should be dated towards the end of the 8th century.* We have a good example of this stage in 39 verses taken from the final part of an *urjūza* written by the astrologer 'Abd al-Wahīd b. Ishāq al-Dabbī — whom I have already mentioned — in the time of al-Hakam I.⁴⁷ This fragment is a versification of Chapter 57 of the Alphonsine translation, and we also have an Arabic prose version of the same chapter.⁴⁸ Chapter 57 is narrowly related to Chapters 60 and 61 (the Arabic text of MS Escorial 916 amalgamates elements taken from both),⁴⁹ and also to Chapter 62.⁵⁰ All these chapters deal with the forecast of rain and drought, and their consequences: prices, agriculture, vegetation, illness, etc. The technique used for forecasting is extremely simple and it fits well a very primitive astrological system: only the position of Saturn and Jupiter in the four triplicities (air, water, earth, and fire) is considered, and the aforementioned chapters develop the possibilities of the system and study the presence of these two planets in the same or different triplicity. The same technique

45. MS Escorial 916 f. 190r and v.

46. *Libro de las Cruces*, p.5. The underlined passages translate the Arabic text.

47. MS Escorial 916, f.195r and v, 196r.

48. *Libro de las Cruces*, pp.159-160; MS Escorial 916, f.191v-192r.

49. *Libro de las Cruces*, pp. 162-163; MS Escorial 916, f.192v; MS Escorial 918 f. 12v - 13r.

50. *Libro de las Cruces*, pp.163-164; MS Escorial 918, f. 13r; MS Escorial 916 f. 192r - 192v.

is again used in Chapter 63⁵¹ where the "planets"⁵² considered are Saturn and the ascending node, and in part of Chapter 64 where the author studies the consequences of a solar or lunar eclipse in the triplicities of water or earth.⁵³

So far the author of *El Libro de las Cruces* has only taken into consideration zodiacal signs and triplicities, but not astrological houses and aspects which are generally used in the rest of the book and which imply a higher degree of sophistication in the technique of forecasting. We can also find a number of chapters in which both systems are combined and other planets, besides Jupiter and Saturn, are considered; such is the case with Chapters 25,⁵⁴ 26,⁵⁵ 45,⁵⁶ and 65⁵⁷ (triplicities and aspects), part of Chapter 39⁵⁸ (signs and domicilia), Chapter 28⁵⁹ and part of Chapter 31⁶⁰ (houses and triplicities). Finally it seems interesting to comment that, in another set of chapters,⁶¹ houses seem to be identified with zodiacal signs in such a way that we might suppose that one of the simplifications introduced by *El Libro de las Cruces* — when compared to Hellenistic and Oriental astrology — would be to consider that the beginnings of houses coincide necessarily with the beginnings of zodiacal signs.⁶²

It seems to me that if we try to establish the chronology of this book, the first group of chapters considered (57, 60-4) seems to be the more primitive one, and some signs of this primitivism can perhaps be observed in other chapters in which zodiacal signs, instead of houses or combined with them, are still used. If we observe that the totality of the oldest material, as well as all the chapters the Arabic text of which remains, deal with meteorological (rain, drought) and economic (prices) predictions, we might be tempted to say that

51. *Libro de las Cruces*, p.164; MS Escorial 916, f. 192v.

52. We can find in the *Libro de las Cruces* an echo of the ancient belief in the planetary character of the lunar nodes. See for example, p. 68, where the author considers it necessary to remark that the ascending node does not have an apparent diameter like the other planets ("Mas la Cabeça non a lumbre porque non a diametro"). In an obscure passage on the same page we also find a reference to the retrograde movements of the lunar nodes. On the planetary character of the lunar nodes, see W. Hartner. "Le problème de la planète Kaïd", *Oriens-Occident* (Hildesheim, 1968), 268-286, and "The Pseudoplanetary Nodes of the Moon's Orbit in Hindu and Islamic Iconographies", *ibid.* pp. 349-404.

53. *Libro de las Cruces*, pp. 164-165; MS Escorial 916, f. 193r.

54. *Libro de las Cruces*, pp. 97-117.

55. *Libro de las Cruces*, pp. 117-118.

56. *Libro de las Cruces*, pp. 149-151.

57. *Libro de las Cruces*, pp. 165-167; MS Escorial 916, f. 194r and v.

58. *Libro de las Cruces* pp. 145-146.

59. *Libro de las Cruces* pp. 118-119.

60. *Libro de las Cruces* pp. 122-123.

61. Cf. *Libro de las Cruces*, Chapter 15 (pp. 76-80); 23 (pp.92-95), 24 (pp. 95-97); 33 (pp. 125-126); 34 (pp. 126-127); 35 (pp. 127-128); 36 (pp. 128-144), 48 (pp. 152-153).

62. On the division of the houses in Greek astrology cf. A. Bouché-Leclercq, *L'Astrologie Grecque* (Bruxelles, 1963 = Paris, 1899), pp. 276-288, 170-178. The identification between the beginnings of the houses and those of the zodiacal signs was also known by Arab astrologers: cf. E. S. Kennedy and D. Pingree, *The Astrological History of Māshā'allāh* (Cambridge, Mass., 1971), p. 92.

the primitive version of this text was a sort of *Kitāb al-amṭār wa-l-as'ār* ("Book on Rains and Prices"), the title given by the Moroccan astrologer of the 15th century al-Baqqār to his anthology of the Arabic *Libro de las Cruces*.⁶³ Nevertheless we should bear in mind that al-Baqqār himself, when writing on al-Dabbī's *urjūza*, says:

نظم رجزاً في الاحكام على احداث الجو واحوال الملوك على طريقة الاحكام القديمة الجارية في المغرب
اعني احكام الصلوب في زمن الحكم رضي الله عنه⁶⁴

He composed an *urjūza* in order to predict atmospheric conditions and vicissitudes of kings according to the ancient judiciary system often used in the Maghrib, that is the system of the crosses, in the time of al-Ḥakam [I], may God be pleased with him.

Therefore it is possible that the oldest version of the book also dealt with the problems of political astrology which form the bulk of the Alphonsine version; it may have contained much more than the group of chapters which I consider the more primitive ones, perhaps because these have kept their old structure fairly well.

A few remarks should be added concerning the more sophisticated astrological techniques used in the rest of the chapters which I have not considered so far. Horoscopes are established according to the position of the "planetas altas" (*al-kawākib al-ʿulwiyya*, the "higher planets")⁶⁵ or the "planetas pesadas" (*al-darārī al-thiqāl*, the "heavy planets")⁶⁶ which are the outer planets (Saturn, Jupiter, Mars) and the Sun. Consideration is sometimes also given to the ascending and descending nodes as well as Mercury⁶⁷ and the Moon. The latter "planet" is also used to establish the exact moment at which a given event is going to take place, and it plays an important role in the choice of the auspicious time for starting a military expedition.⁶⁸ The rules established by *El Libro de las Cruces* may have been applied by the court astrologers of al-Manṣūr b. Abī ʿĀmir,⁶⁹ and they also may have been remem-

63. MS Escorial 916, f. 187v. The beginning of the Arabic text discovered by R. Muñoz is similar: *Bāb al-as'ār wa-l-amṭār ʿalā ra'y ahl al-ṣulūb* (MS Escorial 918, f. 12v). The concern for this kind of topic acquires a full sense in 8th century Spain; my friend Miquel Barceló has pointed out to me that long periods of dryness were common in the 8th century in the Iberian Peninsula. Cf. Miquel Barceló, "Les plaques de l'agost a la Carpetània, 578-649..", in *Estudis d'història agrària* 1 (1978), 67-84 (see specially p. 68).

64. MS Escorial 916, f. 195r.

65. MS Escorial 916, f. 190v; *Libro de las Cruces*, p. 5.

66. MS Escorial 916, f. 13r; MS Escorial 916, f. 193r and v; *Libro de las Cruces*, p. 145.

67. Cf., for example, *Libro de las Cruces*, pp. 146 and 149 (predictions based on the colour adopted by Mercury).

68. *Libro de las Cruces*, pp. 145-146.

69. *Libro de las Cruces*, p. 145 says that the moon should be in Taurus, Leo, Scorpio, or Aquarius when a military expedition starts moving to fight an enemy. Vernet ("Tradición e innovación",

bered for a long time in Northern Africa.⁷⁰ The aspects considered are the usual ones in Hellenistic astrology (conjunction, opposition, quartile, and trine) — which had not been forgotten by the Isidorian tradition⁷¹ — but a new one seems to have been added, the "quemazon" (*iḥtirāq* "combustion") which is defined both in the Arabic and Castilian texts:

Et los quemantes dizen ellos por las planetas quando fueren darramadas o quando fueren aiuntadas; et que sean todas o las mas dellas en los signos erechos, que son los signos igneos et los aereos; que sean todas o las mas dellas en los signos iazentes, que son los signos aqueos et los terreos, ca quando las planetas todas o las mas dellas fueren en una partida destas, quier sean aiuntadas, quier darramadas, a esta tal constellation dizen ellos quemantes.⁷²

والمحترقة هي الكواكب التي تكون اما مجتمعة او مفترقة اما في البروج القائمة التي هي النارية او الهوائية او تكون كلها او اكثرها في البروج الساقطة وهي الترابية والمائية فاذا مالت كلها او اكثرها الى جهة ما مجتمعة كانت او مفترقة فانها تسمى محترقة اما في القائمة او الساقطة⁷²

It seems evident from the previous quotation that *iḥtirāq* does not have here its normal astrological meaning:⁷⁴ there is combustion when all the planets considered, or the majority of them, are either in the fiery or airy triplicities or in the watery or earthly triplicities. Another passage, however, gives a more restrictive meaning of "quemazon" (the four "higher planets" are together in the same sign or scattered in the same triplicity):

فتي احترقت هذه [يعني زحل
والبرجيس والمريخ والشمس]
بحسب ما فسرته في صدر الكتاب

Et es quando todas las quatro planetas sobredichas [Saturn, Jupiter, Mars and the Sun] fueren en una triplicitat; et esto

p. 754) has established the position of the planets, according to al-Khwārizmī's *Zīj*, for the dates 2-V-979 and 31-V-978 at 1 p.m.; these are the dates on which al-Manṣūr b. Abī ʿĀmir commenced two of his expeditions. In the first of these two horoscopes the moon has a longitude of 61;20 (the beginning of Gemini; it is easy to suppose a small error that would place the moon in Taurus), and in the second its longitude is 312;430 (Aquarius).

70. Al-Sakūnī, *Uyūn*, p. 165, and "Laḥn", pp. 178-179 tells an anecdote involving ʿUmar b. al-Khaṭṭāb who, being ready to depart for a *ghazwa*, is told by an astrologer, "Ya amīr al-mu'minin, aṣbir ḥatta yaṣla lanā-l-qamar".

71. The manuscripts of Isidore's *Etymologies* which belong to the "Spanish family" (according to Lindsay's terminology) contain an interpolation on "astrological geometry" which is indubitably Spanish, and was written before the Muslim invasion. Its drawings represent graphically conjunction, sextile, trine, quartile, and opposition. Cf. Jacques Fontaine, *Isidore de Séville et la culture classique dans l'Espagne Wisigothique* (Paris, 1959), vol. I, pp. 393-407.

72. MS Escorial 916, f. 190v.

73. *Libro de las Cruces*, p. 11.

74. Cf. al-Bīrūnī's definition in *The Book of Instruction in the Elements of the Art of Astrology*, translation by R. Ramsay Wright (London, 1934), p. 296: "If the superior planets and the inferior ones in the middle of the retrograde course exceed the minutes [16'] of *taṣmīm* all are said to be *'muḥtariq'*, combust, until their distance from the sun is 60".

من صورة الاحتراق على رأي هؤلاء وهي ان
 quemazon de las planetas.⁷⁶ تكون كلها في مثلثة واحدة فتلك علامة القحط⁷⁵

3. *A new edition of the Arabic text towards the end of the 11th century.* The Alphonsine translation considers that the author of the book is a certain "Oueydalla et sabio"⁷⁷ whom Millas⁷⁸ identified as Abū Marwān 'Ubayd Allāh b. Khalaf al-Istijī who lived in the time of qādī Šā'id of Toledo (1029-1070) and corresponded with him.⁷⁹ Vernet has confirmed this identification.⁸⁰ The chronological limits of the work and of its author are, on one side, the conjunction of 459/1066-67 which is mentioned in the Alphonsine text,⁸¹ and, on the other, 1259, the date of the Alphonsine translation made by Yehudah b. Mosheh ha-Kohen and Johan Daspa.⁸² A careful reading of the book establishes clearly its Maghrebine, and probably Andalusian, character and this can be confirmed if we compare two passages of the Arabic and Castilian versions:

Et propriament quando esta quemazon
 fuere en el signo de Gemini.⁸⁴ وإذا رأيت المقاتل في بيت الحياة وهو برج
 الجوزاء لاهل الاندلس⁸³

and again:

Et quando fuere Saturno en Scorpio et el
 Sol en Leon, et Jupiter en Aries, et la Ca
 beça en Gemini [...].⁸⁶ وإذا رأيت المقاتل في بيت المرض وهو العقرب
 وكانت الشمس في بيت الاخوة وهو الاسد
 والمشتري في بيت السعادة وهو الكبش والتنين
 في بيت الحياة وهو التومنان⁸⁵

The explicit reference to al-Andalus in the first Arabic quotation is confirmed by the distribution of the houses which appear in the Arabic, but not

75. MS Escorial 916, f. 193r and v.

76. *Libro de las Cruces*, p.165. Chapter XI (p.68) contains a definition of *quemadas* which resembles the standard one, (a planet is *quemada* when it is placed in the same sign as the Sun), but this chapter seems an addition by the 11th c. editor 'Ubayd Allāh. See also below, n. 100.

77. *Libro de las Cruces*, pp. 1 and 5.

78. José M. Millás Vallicrosa, "Sobre el autor del 'Libro de las Cruces'", *Al-Andalus*, 5 (1940), 230-234; see also *Isis*, 19 (1933), 530.

79. Šā'id, *Ṭabakāt*, tr. Blachère, pp. 153-154. See also p. 139, where he appears as 'Abd Allāh instead of 'Ubayd Allāh.

80. Vernet, "Tradición e innovación", pp. 745-746.

81. *Libro de las Cruces*, p.10.

82. *Libro de las Cruces*, p.168. On Yehudah b. Mosheh cf. A. R. Nykl, "Libro Conplido en los Juizios de las Estrellas", *Speculum*, 29 (1954), 85-99; G. Hilty, "El libro conplido en los iudizios de las estrellas", *Al-Andalus*, 20 (1955), 1-74.

83. MS Escorial 916, f. 193v.

84. *Libro de las Cruces*, p. 166.

85. MS Escorial 916, f. 194v.

86. *Libro de las Cruces*, p. 167.

in the Castilian, version if we accept that the beginning of the houses corresponds to the beginning of zodiacal signs. Thus, according to the *dodekatopos*,⁸⁷ which is used in the *Libro de las Cruces*.⁸⁸

Bayt al-ḥayā(t) ("house of life, "casa de la vida") = Ascendant
 = Gemini

Bayt al-ikhwa ("house of brothers", "casa de los hermanos")
 = III = Leo

Bayt al-maraḍ ("house of illness", "casa de la enfermedad") = VI
 = Scorpio

Bayt al-sa'āda ("house of happiness", "casa de los amigos") = XI
 = Aries

All this comes quite well into line with the chapter on astrological geography which, being probably an Alphonsine addition to the *Libro de las Cruces*, establishes that the "sign of Spain" (i. e. its ascendant) is Gemini, according to Spanish and Egyptian astrologers, as well as Hermes.⁸⁹

Therefore the author of the revision was probably an Andalusian astrologer of the second half of the 11th century or the first half of the 12th. This confirms the plausibility of Millas' identification of "Oueydalla el sabio". In this sense it is interesting to remark that Oueydalla's classification of peoples in Chapter II of the *Libro de las Cruces*⁹⁰ presents a number of similarities with the similar classification established by Šā'id in his *Ṭabaqāt al-umam*,⁹¹ which leads me to think that the latter work was one of Oueydalla's sources for that chapter. This would agree very well with 'Ubayd Allāh al-Istijī, who sent to Šā'id, from Cuenca, his work on "the projection of rays" (*maṭārīḥ al-shu'ā'āt*).⁹² He might have received in exchange the latter's *Ṭabaqāt al-umam*.

What did 'Ubayd Allah do to the primitive version of the *Libro de las Cruces*? The Alphonsine translation calls him "el esplanador", who found the original text, explained it, and rewrote it in its present shape.⁹³ The main

87. Bouché-Leclercq, *L'Astrologie Grecque*, p.280.

88. *Libro de las Cruces*, p. 7.

89. *Libro de las Cruces*, pp. 161-162. Cf. José A. Sánchez Pérez, "El Libro de las Cruces", *Isis*, 14 (1930), 77-132, who established (pp. 124-125) the Alphonsine character of this chapter.

90. *Libro de las Cruces*, pp. 6-9.

91. Šā'id, *Ṭabakāt*, tr. Blachère, pp. 31-41.

92. *Risāla fi-l-tafsīrāt wa-maṭārīḥ al-shu'ā'āt*, MS Escorial 939 (f. 9v-16v). The incipit establishes that the work is dedicated to an unidentified *wazīr* and qādī Abū'l-Qāsim. Cf. H. P. J. Rénaud, *Catalogue*, vol. II, fasc. 3, pp. 54-57; Vernet, "Tradición e innovación", p. 746.

93. *Libro de las Cruces*, p. 1: "Onde este nostro sennor sobredicho [i.e. King Alphonse] (...) fallo el Libro de las Cruces que fizieron los sabios antigos, que esplanó Oueydalla el sabio...". Id. pp.167-168: "Dixo el esplanador deste libro: Aquí es la fin de lo que fallamos deste Libro de las Cruces, et todo lo esplanamos et lo departimos segund el nostro entendemento lo meior que pudimos".

characteristic of the system of the crosses is, according to 'Ubayd Allāh himself, that it considers planetary positions at a given moment, and does not refer to a previous date which could be, in the case of world astrology, the *radix* date of the great primitive conjunction or, in the case of a nativity horoscope, the date and hour of the subject's birth.⁹⁴ The system is sound, although 'Ubayd Allāh considers that predictions based on it should be confirmed by the use of "eastern" methods.⁹⁵ It also seems that one of the modifications introduced by 'Ubayd Allāh in the primitive version of the book was a systematic elucidation of ambiguous presages.⁹⁶ The Alphonsine text establishes clearly, in the majority of cases, the king, people, or country affected by a given forecast,⁹⁷ and this — according to 'Ubayd Allāh — did not appear in the first recension of the book. Another important passage of 'Ubayd Allāh's prologue may give us a hint as to the methods used by the first Andalusian astrologers to calculate planetary positions before Eastern astronomical tables were introduced in Spain.⁹⁸ Thus, when he has commented on the conjunctions of 397/1006-07 and 459/1066-67, he adds:

Et estas coniunctiones sobredichas fueron fechas et endreçadas segund las equationes uerdaderas, endreçando todos los mouementos de los cielos et endreçando todas las maneras de las equationes et de los mouementos, que estas coniunctiones non fueron fechas segund fazen los que non saben uerifcamento de los fechos et de los poderes de las estrellas, de que manera parecen en el mundo de

94. *Libro de las Cruces*, p. 5: "Et yo [= Oueydalla] falle este libro que fabla de las cruces desta manera simple ment por si en las costellaciones de las cruces apartada ment, non tomando rayzes de coniunction ninguna, nin de reuolution, si non por si apartada ment". This is often corrected by 'Ubayd Allāh in his revision of the text as, in order to establish clearly who is the king or country affected by a given presage, he frequently refers to the nativity horoscope of the king or the horoscope of his accession to the throne; see notes 96 and 97 below.

95. *Libro de las Cruces*, p. 5: "Mas estas costellaciones de que en este libro fablamos, et son de lo que obrauan las yentes que nombramos antes destas ["estas" means Eastern astrologers] son mucho apoderadas significationes, por que son puestas sobre grandes rayzes et fuertes cymientos. Et el qui estas constellaciones pusiere en lugar de rayzes et de cymientos en los accidentes del mundo, et de pos desto se ajudare de las sotilezas et de los departimientos que son manifestos en los libros destos otros sabios, puede llegar a lo que quiere".

96. *Libro de las Cruces*, p. 6: "Et yo [= Oueydalla] pare mientes en los indicios desta yente que iudgaban con estas figuras, et ui que en unas constellaciones dizian que significauan destruction de rey, et en otras constellaciones dizian que significauan destruction de los aduersarios del rey. Et ui que haçia desto grande dubda, que manifesta cosa es que qual rey quier que sea en qual quier partidad e la tierra, que a otro rey por aduersario en otra partida de la tierra. Et si el iudicio fuesse tomado generalment, caeremos en grande dubda. Et por esto estudie en sus dichos et entendi dellos razones por sallir desta dubda; et quiero lo esplanar en este lugar et mostrar la carrera de come se deuen tomar estos iudizios et estas significationes segunde les perteneçe, et de que manera se deuen poner en las constellaciones de los compeçamentos".

97. In some cases (cf. for example *Libro de las Cruces*, Chapter X, pp. 50-55) 'Ubayd Allāh seems to have omitted this kind of precision, but the Alphonsine text introduces an explanatory note which is often ascribed to "el traductor", that is to Yehudah b. Mosheh (see p. 53).

98. It seems that some kind of astronomical tables were known in al-Andalus in the first half of the 9th century, as they were used by Ibn al-Shamir and by Yaḥyā al-Ghazāl, cf. Vernet, "La maldición de Perfecto", p. 418.

generation et de corruption, que fazen las coniunctiones por los meyo cursos non mas, et non parantes a al. Et los fechos de las planetas non parecen si non segunde sus equationes et segunde sos logares endreçados con todas sus equationes, et con todas sus diuersidades, et guardando el mouemento tãrdio, que es el mouemento de la ochava espera el que por el su mouemento se camyan todos los otros mouimentos, que muchos de los que compusieron las tablas oluidaron este mouimento, et nol guardaron, et fizieron las coniunctiones grossament, et muchos dellos que las fazen por los meyo cursos no mas. Et assi como son de guardar estas cosas sobredichas en las coniunctiones de las planetas, assi son de aguardar en las coniunctiones et en las oppositiones de las luminarias; ca si assi no fueren endreçadas, non se ueriguaran los sus fechos et erraran los iudizios et las significationes que dellas salen.⁹⁹

The previous quotation establishes that astrological predictions should be based on true planetary positions and should also consider the precession of equinoxes.¹⁰⁰ It also includes a reference to astrologers who established these positions according to the mean motions of the planets, and this makes me wonder whether these astrologers were al-Ḍabbī and his contemporaries who, in order to calculate planetary positions in their horoscopes, may have used rules similar to those of Vettius Valens by which means mean positions of the outer planets could be obtained.¹⁰¹

Finally, another quotation of the Alphonsine text may be of some use to establish 'Ubayd Allāh's role in his edition of the *Libro de las Cruces*:

Et bien auemos hata aqui esplanado et departido esta razon desta yente, maguer que ellos la digan muy bref et muy encerrada. Et desto se pueden entender todos sus dichos deste libro, ca ellos los dizen muy bref que non y fazen si non las figuras de las cruces non mas.¹⁰²

This passage is clear to the reader of the book who can easily observe that the majority of the chapters contain a general rule (with the corresponding astrological forecast) and a development of it which, following apparently the principles of an *ars combinatoria*, establishes all possible cases to which the preceding rule can be applied. These developments occupy a considerable number of pages in the book as they amount — in the present state of the Alphonsine version — to 3505 combinations (called "constellaciones" or "figuras" in the Castillian translation), if I am not mistaken. An idea about the primitive version of the text can be obtained by studying the Arabic text of Chapter VI of the *Libro de las Cruces*,¹⁰³ in which the general rule is followed by only a short number of twenty examples in which the four "planets" consi-

99. *Libro de las Cruces*, p. 10.

100. Obscure references to the precession of the equinoxes appear in Chapter XI (p. 68) of the *Libro de las Cruces*, the author of which seems to be 'Ubayd Allāh, although there are observations by "el traductor" (i.e. Yehudah b. Mosheh). The passage in question is not clear and precession seems often to be confused with allusions to combustion (*quemazon*, *iḥtirāq*) used here in its standard meaning (see above, n. 75).

101. O. Neugebauer, *A History of Ancient Mathematical Astronomy* (hereafter HAMA), (Berlin-Heidelberg-New York, 1975), pp. 793 ff.

102. *Libro de las Cruces*, p. 12.

103. MS Escorial 916 f. 191r.

dered (Saturn, Jupiter, Mars, and the Sun) are represented graphically in the characteristic horoscopes of the *Libro de las Cruces*.¹⁰⁴ A comparison between this Arabic text and the much more developed Castilian translation (576 "figuras")¹⁰⁵ suggests the possibility that, in some cases, the former might represent the pre-ʿUbayd Allāh version of the work.

A summary of what I have said so far should emphasize the fact that an analysis of this book might establish clearly which were the astrological techniques used by ancient astrologers of Northern Africa and Spain who did not use the subtleties of Hellenistic and Oriental astrology. I have already said that the most primitive group of predictions seems to correspond to a set of chapters in which a presage is based on the position of Saturn and Jupiter in the different triplicities. Thus, according to what we know of al-Ḍabbī's *urjūza*, there was no need — for that kind of prediction — to establish the ascendant or the astrological houses. When this need appears, in chapters which bear witness to a more developed technique, I have the suspicion that the identification between zodiacal signs and houses is reminiscent of a stage in which the beginning of the ascendant and that of the other houses was made to coincide with the beginnings of the zodiacal signs. The position of the planets is never fixed with the least degree of precision, and when this kind of requirement appears in the book, it is probably because we are dealing with an Alphonsine addition.¹⁰⁶ To cast a horoscope according to the rules fixed by the *Libro de las Cruces* we only need to know in which sign we can find Saturn, Jupiter, Mars, the Moon, and sometimes the ascending or descending nodes. All this makes one wonder whether late Visigothic and early Muslim Spain knew planetary tables — similar to those known through Greek and Demotic texts of the Roman imperial period — which allowed one to determine at a glance the sign in which a planet was located at a given moment.¹⁰⁷ On the other hand a critical remark by ʿUbayd Allāh on astrologers who calculated conjunctions according to the mean positions of the planets reminds one of the rules given by Vettius Valens for that purpose. It is a fact that astronomical tables were used in the first half of the 9th century by astrologers such as Ibn al-Shamir but we do not know which they were and if astronomical knowledge in that early period in al-Andalus was sufficient to apply them correctly. This seems to be the kind of situation ʿUbayd Allāh had to face when he rewrote the

104. As described in *Libro de las Cruces*, pp. 6-7 and in MS Escorial 916 f. 190v. The horoscope is represented by means of three straight lines which intersect at the same point, thus forming three crosses. Odd numbered houses (I, III, V, VII, IX, XI) correspond to the ends of the lines (called *awṭād*, "estacas"), while even houses (II, IV, VI, VIII, X, XII) are represented in the angles between the lines (*zawāyā*, "ángulos").

105. *Libro de las Cruces*, pp. 12-18.

106. Cf. for example *Libro de las Cruces*, pp. 160-161 and Sánchez Pérez's analysis of this passage in *Isis*, 14 (1930), 124-127.

107. Neugebauer, *H.M.A.*, vol. II, p. 785 ff.

Libro de las Cruces at a time when Muslim Spain had reached its golden century, not only in astronomy but in most other branches of culture as well. Undoubtedly he improved the book, explained obscure passages which were ambiguous or too condensed, and introduced quotations of authors inaccessible to Andalusian astrologers of the past, such as Ptolemy,¹⁰⁸ Hermes,¹⁰⁹ and Abū Maʿshar.¹¹⁰

108. Ptolemy's *Tetrabiblos* is quoted in the *Libro de las Cruces*, p. 161, but this chapter (LIX), as we have seen, seems to be an Alphonsine addition; there is a reference to the *Karpos* (*Kitāb al-thamara*) in MS Escorial 916 f. 189r.

109. MS Escorial 916 f. 192v and 193r. These two quotations do not appear in the Alphonsine text. The latter (and probably the former too) corresponds to Hermes' *Kitāb al-ʿarḍ fī l-asʿār*.

110. *Libro de las Cruces*, p. 9, where Abū Maʿshar's *Kitāb al-qirānāt* is quoted.