The Epistle on *Tasyīr* and the projection of rays by Abū Marwān al-Istijī

Julio Samsó and Hamid Berrani

1 Introduction[1]

1.1 *The author*

Abū Marwān ᶜAbd Allāh ibn Khalaf al-Istijī was an astronomer and astrologer who flourished in Toledo and Cuenca in the second half of the eleventh century.[2] We have no precise dates for his birth and death but his family must have originated in Ecija (Lat. Astigi, Ar. Istija), near Cordova, and an approximate chronology of his life may be established from the fact that *qāḍī* Ṣāᶜid of Toledo (420/1029 - 462/1070) mentions him twice in his *Ṭabaqāt*:[3] as one of the young astronomers who worked in Toledo at the time of the completion of the *Ṭabaqāt* (460/1068) and as an expert in astrology who had written an excellent *Risāla fī 'l-tasyīrāt*

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[2] See Samsó & Berrani, 1999; Samsó, 2004a.

[3] Ṣāᶜid, *Ṭabaqāt*, ed. Bū ᶜAlwān, págs. 180, 199-200; tr. Blachère pp. 139, 153-154.

wa-maṭāriḥ al-shuᶜāᶜat wa taᶜlīl baᶜḍ uṣūl al-ṣināᶜa ("On progression and projection of rays, with a verification of some foundations of this technique") which he sent to him from Cuenca. We present here an edition, translation and commentary of this work.

It seems clear that al-Istijī was one of the astronomers who collaborated with Ṣāᶜid for, in the aforementioned *Risāla* ([2]), he refers (see below § 1.2.2) to their joint work which gave satisfactory results in the study of the irregularities in the motion of planets and fixed stars (*ikhtilāf ḥarakāt al-kawākib al-sayyāra wa 'l-thābita*). It is also clear that al-Istijī was one of the members of the "Toledan team" (*al-jamāᶜa al-ṭulayṭuliyya*) who were in charge of the "Toledan observations" (*al-arṣād al-ṭulayṭuliyya*) led by *qāḍī* Ṣāᶜid: these two expressions were coined by Ibn al-Hā'im al-Ishbīlī (fl. 601/ 1204-05) in his *al-Zīj al-Kāmil fī'l-taᶜālīm*.[4]

When al-Istijī was still a young man, he left Toledo and continued his work in Cuenca. We do not know the reasons for this change of residence and, in the introduction of his *Risāla* ([1] & [2]), he complains that he has been separated from his master Ṣāᶜid and is compelled, as a result, to change his field of research from computational astronomy to astrology. Does this mean that, in Cuenca, he did not have the equipment necessary to continue with the observational activity in which he had been engaged in Toledo? Alternatively he may not have had enough self-confidence to continue with a task for which he needed the help of his master and decided to concentrate his intellectual activity on a kind of research which he considered easier, for it was mainly based on the astrological culture that he had acquired by reading many Eastern sources. In any case, Cuenca was also ruled by the Banū Dhī'l-Nūn, the dynasty in power in Toledo, and it is possible that al-Istijī had been appointed to an important position in that city, for the Moroccan astrologer Abū ᶜAbd Allāh al-Baqqār, who quotes a long passage of the *Risāla* in his *Kitāb al-adwār fī tasyīr al-anwār* (written in 821/1418), calls him *wazīr*.[5] We will see later that al-Baqqār was probably the copyist of MS Escorial 939 which contains the only extant text of al-Istijī's *Risāla*.

ᶜAbd (or ᶜUbayd) Allāh al-Istijī was identified by Millás (1940) as the

[4] Calvo, 1998, pp. 53, 55, 86; Comes, 2001, pp. 367, 318-322. On this author see also Puig, 2000.

[5] Ms. Rabat Ḥasaniyya 826, fol. 91v; Ms. Escorial 916, fol. 242r. We owe this information to Montse Díaz Fajardo. On the *Kitāb al-anwār* see Díaz Fajardo (2001).

mysterious *Oueidalla el sabio* who seems to be the author of the 11th century version of the Alfonsine *Libro de las Cruzes*.[6] This identification has been disproved by the new information gathered by Castells (1992): the author of the Arabic original was an otherwise unknown ᶜAbd Allāh b. Aḥmad al-Ṭulayṭulī.

1.2 *Al-Istijī's works*

Apart from the *Risāla fī 'l-tasyīrāt* which we present here and which seems to be al-Istijī's only extant work, we also know of the following:

1.2.1 *Risālat al-iqbal wa 'l-idbār* ("On accession and recession"). Ibn al-Hā'im al-Ishbīlī states, in the aforementioned *al-Zīj al-Kāmil,* that al-Istijī wrote a work on this topic, dealing with the theory of trepidation, apparently one of the main subjects of the research of the Toledan team.[7] On the other hand, the *Risāla fī 'l-tasyīrat* (see [19]) refers to a motion of this kind which affects the sphere of fixed stars. Ibn al-Hā'im gives a few numerical parameters which he takes from the *Risālat al-iqbāl* (values of the mean position of the Head of Aries and of the equation of trepidation for the times of Hipparchus and Ptolemy). These values have been exhaustively analysed by Comes[8] who has shown that they cannot be computed with the *Toledan Tables* and that they do not correspond to those used by Ibn al-Zarqālluh in his "Treatise on the motion of the Fixed Stars". On the other hand, Ibn al-Hā'im gives a literal quotation from the *Risālat al-iqbāl*, in which al-Istijī deals with a topic apparently unrelated to the theory of trepidation: a solar model of the Zarqāllian type, with variable eccentricity[9] which implies that, after a certain number of years, the solar eccentricity has changed and the table of the solar equation can no longer be used. Ibn al-Hā'im also remarks that al-Istijī had found, for his time, the same [maximum] solar equation as the Syrian astronomer of the 9th c. al-Battānī (1;59,10º), while his contemporaries Ibn al-Zarqālluh and Abū ᶜAbd Allāh b. Bargūth had established, by observation, that it

[6] See Kasten & Kiddle, 1961.

[7] Samsó, 1994a.

[8] Comes (2001), pp. 318-322 and 367.

[9] Samsó, 1992, pp. 207-218; Samsó & Millás, 1994.

was very different (1;52,42° according to Ibn al-Zarqālluh). This small set of scattered information allows us to say that al-Istijī was a competent astronomer who shared theoretical interests and geometrical models with the other members of the Toledan school, although he had independent criteria that allowed him to give his own solutions to the problems in vogue in his time.

1.2.2 A *zīj* without title: the existence of such a work is based in the evidence given by Ibn al-Hā'im (flourished around 601/1204-05) who states[10] that an anonymous author who was his contemporary compiled the *al-Zīj al-Muntakhab* in which he used the mean motions established by al-Istijī together with al-Battānī's equations. Mean [planetary] motions are usually found in a *zīj* and this has led Comes to talk about al-Istijī's *Zīj* and to suggest that this could be "our corrected *zīj*" (*Zīju-na al-muṣaḥḥaḥ*) mentioned by our author in his *Risāla fī'l-tasyīrāt*. Apparently this *zīj* allowed the Toledan astronomers to reach "a satisfactory and correct result" and to obtain what they were looking for "concerning the irregularities [*ikhtilāf*] in the motion of planets and fixed stars" ([2], [33]). Al-Istijī repeats his criticism of other *zīj*es which are basically incorrect and cause errors in astrological predictions ([29], [33], [35], [38]). Only the *Muṣaḥḥaḥ Zīj* gives accurate positions of planets and good results for lunar longitudes, due to the correctness of the lunar equation: as a result of this, it is the only *zīj* with which the results of the two animodars (calculated following the techniques of Ptolemy and Hermes) coincide ([34]). As he says towards the end of his *risāla* ([38]): "in the animodar and *tasyīr*, there are indications that confirm the correctness of the *zīj* we are using. Even those who are ignorant of the science of cosmology, of the motions of planets and of the fundamentals of demonstration leading to its verification, have elements which confirm its validity [i.e. of the *zīj*] and clarifies its veracity for them."

The identification of the *Muṣaḥḥaḥ Zīj* is problematic. In our previous article (1999) we argued that it should be identified with the *Toledan Tables* and that this had implications for the chronology of this latter work: Toomer (1968) and Pedersen (2002) have established that very little of the *Toledan Tables* was original and that only the solar mean motion tables appear to be based on fresh observations; on the other hand Richter-

[10] Comes, 2001, pp. 309 and 367.

Bernburg[11] remarked that the *Toledan Tables* were not mentioned by Ṣāᶜid in his *Ṭabaqat*, in spite of his own personal involvement in the compilation of the *zīj*. As a result of this, Richter-Bernburg concluded that the *Toledan Tables* were a hasty job done between the completion of the *Ṭabaqāt* (1068) and Ṣāᶜid's death (1070). This was at variance with the identification of the *Muṣaḥḥaḥ Zīj* with the *Toledan Tables* for it implied that the Toledan *zīj* had been compiled earlier than 1068 and before the unknown date when al-Istijī left Toledo and settled in Cuenca.

In favour of Comes' hypothesis (*Muṣaḥḥaḥ Zīj* = al-Istijī's unnamed *Zīj*) we have her argument that the values for trepidation ascribed by Ibn al-Hā'im to al-Istijī cannot be calculated using the trepidation tables of the *Toledan Tables*. The evidence furnished by Ibn al-Hā'im poses a problem on the chronology of al-Istijī's *Zīj*, for he says that the author of the *Muntakhab Zīj* compiled this work about one hundred and fifty years after al-Istijī. As the date of Ibn al-Hā'im's *Kāmil Zīj* is well established (ca. 1205), al-Istijī's *Zīj* must have been compiled about 1055 and one wonders why Ṣāᶜid fails to mention it (just as he fails to mention the *Toledan Tables*). In any case we may also say, reinforcing Comes' hypothesis (see below the commentary on [17]) that the periods al-Istijī mentions for small and middle conjunctions of Jupiter and Saturn do not fit the *Toledan Tables*.

It is impossible, with the evidence we have, to reach any clear conclusion on the identification of the *Muṣaḥḥaḥ Zīj*. Both hypotheses (*Muṣaḥḥaḥ* = al-Istijī's *Zīj*, or *Muṣaḥḥaḥ* = *Toledan Tables*) are problematic. As a matter of fact, not even the existence of al-Istijī's *Zīj* has been proved: mean planetary motions are usually found within a *zīj* but it also seems that al-Istijī's *Risālat al-iqbāl* contained *zīj* materials for the computation of the solar equation. On the other hand, the fact that al-Istijī refers to "*our* corrected *zīj*" (*Zīju*-nā *al-muṣaḥḥaḥ*) in a *risāla* dedicated to *qāḍī* Ṣāᶜid seems to point to a work in which these two characters, at least, had participated. This argument is not, by any means, conclusive: a detailed analysis of al-Istijī's *risāla* shows that he often tends to use the first person plural. The question should, then, remain open.

1.2.3 The text of the *risāla* contains ([34]) a reference to the fact that al-Istijī also wrote an epistle on the animodar, a topic which interested him and about which we only know that Ibn al-Kammād also wrote (see below

[11] Richter-Bernburg (1987), pp. 375-377 and 385-390.

the description of the contents of the Escorial MS).

1.3 *The Epistle on Tasyīr and the Projection of Rays*

This *risāla* is one of the very rare Andalusī works on world astrology. Interest in the kind of universal predictions with which it is concerned appears already in the tenth century, as we can see in the Latin translation, by John of Seville, of a short text by ᶜUmar b. Farrukhān al-Ṭabarī in which the author deals with the astrological periods called *fardār*s (see below [20]). One of the "mighty *fardār*s" began in 940 and John of Seville's Latin text preserves the reference to an horoscope, cast for the spring equinox (21.3) of that year and for the latitude of Cordova, using al-Khwārizmī's *Zīj* in Maslama al-Majrīṭī's recension.[12] This agrees with other evidence we have of the fact that, towards the beginning of the eleventh century, Cordovan astrologers (Maslama among them) made predictions based on Saturn-Jupiter conjunctions: historical chronicles bear witness to the fear caused by the Saturn-Jupiter conjunction (with change of triplicity) which took place at, approximately, 159° on 20.11.1007, and which was believed to announce the end of the Caliphate.[13] Conjunctions of Saturn and Jupiter were used by Abraham bar Ḥiyya (fl. 1120-1145) in his *Megillat ha-megalleh*,[14] as the basis of his astrological history of Israel and of the Jewish people.

Al-Istijī's interest in world astrology appears clearly in his detailed treatment of astrological periods: *intihā'āt* which last 1000, 100, 10 or 1 years, which he seems to prefer (cf. [19]) to Saturn-Jupiter conjunctions of different categories (see [9]-[22]). It seems that al-Istijī studied historical horoscopes and checked the corresponding predictions against the well-known historical reality. This seems to be implied in his remark ([33]): "We have studied them for the different kinds of astrological predictions - I mean the *tasyīr*s for states, religions, horoscopes (*ṭawāliᶜ*) of the accession to power of kings and anniversaries - obtaining out of all this a set of very clear results which are wonderful and an extraordinary science."

Al-Istijī is also interested in another kind of individual astrology

[12] See Pingree, 1977.

[13] See Samsó, 2004b, pp. 488-496.

[14] Cf. Millàs, 1929, pp. 183-252.

dealing with nativities, anniversaries, interrogations and elections, and in the calculation of the length of life of an individual (see [15], [18], [20], [22], [32]). He seems sceptical about the precision that can be attained with the direct computations of the ascendent of a nativity and prefers the technique of the animodar which he uses in its two variants: one of them is described in Ptolemy's *Tetrabiblos*, while the other is attributed to Hermes (see [34]-[35]). He has checked the ascendent calculated with the animodar against the ascendent determined when a nativity horoscope has been reliably "observed" by him or by other astrologers and has been able, therefore, to establish its accuracy. He has, then, applied this technique to nativity horoscopes in which the computation of the ascendent was not reliable.

Like his contemporary Ibn Muᶜādh, al-Istijī is very critical of the work of other astrologers of his time. One of the reasons for this criticism is that our author favours the direct computation of both *tasyīr* and the projection of rays on the *ecliptic* ([14], [23] - [27], [31], [32], [37]), while other astrologers make projections on the *equator*, using right or oblique ascensions. Such direct computation seems to be one of the characteristics of Maghribī astrology and al-Istijī defends it ([32]) on the basis that everyone agrees in looking to the eighth sphere (the "sphere of the signs", and consequently of the ecliptic) for indications (*dalā'il*) which allow astrological predictions, while the ninth sphere (the sphere that transmits the daily motion to the inner spheres) is only used to measure time, a variable needed for the computation of the ascendent. Those who calculate both *tasyīr* and the projection of rays on the equator consider that the result (*natīja*) is a premise (*muqaddima*). Indications furnished by the eighth sphere have an absolute character and, thus, are independent from the local latitude. This is why our author believes that if, for some reason, an astrologer believes he has to use equatorial ascensions, right ascensions should be preferred to oblique ones ([27], [30]).

There are other reasons for al-Istijī's criticism of the work of his colleagues: not only do they not use ecliptic longitudes for the direct computation of the *tasyīr* and the projection of rays, but they are also unaware of how to compute accurately planetary positions ([38]). There are two possible reasons. One is not stated explicitly in the text and may be due to the diffusion of techniques (perpetual almanacs, equatoria) which allow calculation of approximate planetary longitudes; along similar lines one may imagine the possible diffusion of the type of popular and simple astrology represented by the Alfonsine *Libro de las Cruzes*, in which predictions are based on mean (not true) planetary positions. The

other reason is the incorrectness (*fasād*) of the *zījes* in use at that time when they are compared to the precision of the *Muṣaḥḥaḥ Zīj* (see § 1.2.2). Finally, other astrologers do not use the animodar and do not calculate correctly the Lot of Fortune ([36]).

Astrology is a kind of knowledge which should be restricted "to men having an equitable intellect and... to outstanding scholars whose souls are free of hatred and whose hearts have not been led astray" ([3]). This may be due to the esoteric character of the discipline but also to the need to be discreet about a profession which, even in the liberal atmosphere of the Toledan *ṭā'ifa* period, could be considered unorthodox. As a scientific discipline, it is based on both the mathematical and physical sciences ([3], [4], [5], [9], [22], [30], [38]). Al-Istijī insists on Physics and the "laws of nature" in a way that reminds us of Abū Maᶜshar's indirect introduction of Aristotelian Physics in the Islamic world, but there are certain references in the *risāla* ([19], [30]) which make us think on the possible influence of Neoplatonic thought. On the other hand, *qiyās* (analogy) and *tajriba* (experience) (see [3]) are the tools to be used in order to define the main astrological laws. Our author insists throughout the *risāla* on the experimental character of astrology and on the need to control the actual results of a prediction (see [35]), and criticises other astrologers for testing their predictions related to interrogations, partial elections or nativities but not anniversaries ([29]). As for al-Istijī's insistence on the use of *qiyās*, frequently in relation to the application of "the laws of nature", it is easy to see ([5]-[8]) that all his attempts to justify the natural and logical character of the division of the sphere into twelve equal parts or of the astrological periods into groups of 1, 10, 100, 1000 years are mere numerological speculations.

Ṣāᶜid said that al-Istijī was "one of those who have a sound knowledge of astrology and who has read the books on this subject of both ancient and modern authors".[15] This remark is probably accurate, as we can see by an analysis of the sources quoted in the text, most of which are also mentioned by Ṣāᶜid himself. They include Ptolemy's *Tetrabiblos* ([23]), Hermes ([25]), a problematic *Kitāb al-amthāl li' l-Furs* ([18]). These are the ancient authorities and it is interesting to read that he complains of the mistakes made by translators which might be the cause of the errors of practising astrologers ([37]). Once in the Islamic period, we find Kankah al-Hindī (fl. Baghdad ca. 775-820) ([14]), Abū Maᶜshar (d. 886) (*Kitāb*

[15] Ṣāᶜid, *Ṭabaqāt*, ed. Bū ᶜAlwān pp. 199-200; tr. Blachère pp. 153-154.

al-milal wa 'l-duwal, *Kitāb al-qirānāt*, the *Mudhākarāt*, and the *al-Madkhal al-kabīr*) ([14], [16, [36]), Al-Khaṣībī (probably al-Ḥusayn/ al-Ḥasan b. al-Khaṣīb, fl. 844) ([18], [37]), Aḥmad b. Yūsuf al-Kātib (d. 941) ([37]), al-Ḥasan b. Aḥmad b. Yaᶜqūb al-Hamdānī (d. 946) ([18]), al-Battānī (d. 929) ([26], [28]), and the *Rasā'il ikhwān al-ṣafa'* ([15]). Of the aforementioned list only the *Kitāb al-amthāl li' l-Furs* was, apparently, unknown to Ṣāᶜid, who seems also to be unaware of a book on astrological predictions by al-Kindī (d. ca. 870), entitled *al-Madkhal al-awsaṭ* ([18]).

1.4 *The manuscript and the edition*

Al-Istijī's *Risāla fī 'l-tasyīrāt* is extant, apparently in a single manuscript (Escorial 939, fols. 9v-16r). The contents of the whole *majmūᶜa* have been described by Renaud[16] and they have a certain interest for the study of the kind of astrological works that were circulating in the Maghrib in the first half of the fifteenth century for, as we will see, at least the first five texts of the manuscript were copied around 1411. The date fits well with the period in which the Moroccan astrologer Abū ᶜAbd Allāh al-Baqqār lived: one of his two extant works, the *Kitāb al-adwār fī tasyīr al-anwār*, was written in 821/1418 and the author made, in this year, an observation of the solar altitude in Fez, after he had carefully determined the latitude of the city.[17] We make this remark because Renaud stated that the copyist of the *Kitāb Zarādusht ḥakīm al-Furs fī'l-mawālīd* (see below item 4) was a certain Muḥammad b. ᶜAlī al-Baqqār[18] and that he could be the Abū ᶜAbd Allāh al-Baqqār who wrote the *Kitāb al-adwār* and the *Kitāb al-amṭār*, both extant in MS Escorial 916. If this identification is correct, it seems that we have in MS Escorial 939 a set of astrological works copied by al-Baqqār himself, because there seems to be no doubt that, at least, items 1-5 described below (item 6 is written in a different hand) were copied by the same hand and approximately at the same stage of his

[16] Derenbourg & Renaud, 1941, pp. 54-57.

[17] See Díaz Fajardo, 2001; Guesmi, 2005.

[18] In fol. 1r we find an index of the contents of the manuscript which includes items 1-4 and 6 as well as the name of the copyist Muḥammad b. ᶜAlī al-Baqqār.

life.[19]

The manuscript contains the following titles:

1.4.1 *Kalām fī'l-nīmūdār li taṣḥīḥ ṭawāliᶜ al-mawālīd li Abī 'l-ᶜAbbās ibn al-Kammād min Kitāb mafātīḥ al-asrār*: This title appears in the title page of the manuscript (fol. 1r). This is a fragment of a book entitled *Kitāb miftāḥ al-asrār* by Abū 'l-ᶜAbbās Aḥmad b. Yūsuf ibn al-Kammād (fl. Cordova 1116).[20] A preliminary survey of the contents of this work was given by our master Vernet (1949). It was divided into 15 *fuṣūl* of which only *faṣl*s 10-15 have been preserved on fols. 1v-8v. Between *faṣl*s 14 and 15 we find a page (5r) with a quotation by Ibn Hilāl[21] on animodar, followed by a set of tables (5v-7r) for the computation of the duration of pregnancy. Fol. 8v ends with an astrological note on hunting and fishing. It is interesting to note that animodar is one of the important topics dealt with in al-Istijī's *Risāla*.

1.4.2 Al-Istijī's *Risāla* (fols. 9v-16r).

1.4.3 *Fuṣūl li-ᶜUṭārid al-Ḥāsib fī'l-asrār al-samāwiyya* (fols. 16v - 17v): the author is ᶜUṭārid ibn Muḥammad al-Ḥāsib, also called al-Munajjim and al-Bābilī, an astronomer and astrologer of the 9th c., among whose works we find a *zīj*.[22] The text contains 65 *fuṣūl* or aphorisms dealing with astrology or talismanic magic: 64 of these aphorisms appear, with their corresponding number, in the main text, while one is a marginal addition on fol. 17r. These aphorisms are apparently only known from

[19] An analogous instance can be found in MS Escorial 918 which contains a series of astrological texts apparently copied from another manuscript written in the hand of the famous mathematician Ibn al-Bannā' (1256-1321). See Aḥmad Jabbār and Muḥammad Aballāgh, *Ḥayāt wa-mu'allafāt Ibn al-Bannā al-Murrākushī* [sic] *maᶜa nuṣūṣ ghayr manshūra*. Manshūrāt Kulliyyat al-Ādāb wa l-ᶜUlūm al-Insāniyya bi l-Ribāṭ. Silsilat Buḥūth wa-Dirāsāt, raqm 29. Rabat, 2001, pp. 160-184. See also the review of this book by J. Samsó in *Suhayl* 3 (2002-03), 251-256.

[20] Chabás & Goldstein, 1994; Mestres, 1996, p. 404.

[21] This is probably Muḥammad ibn Hilāl al-Sabtī, an astronomer who lived in Ceuta in the first half of the 14th c.: see King, 1988, pp. 131-132; Lamrabet, 1994, p. 98, no. 393.

[22] *G.A.S.* V, 254; VI, 161; VII, 137; Kennedy, 1956, p. 14, no. 103.

this manuscript, but 43 of them (together with two new ones numbered 2 and 3) are quoted in the *Ghāyat al-ḥakīm/ Picatrix*[23] where it is said (p. 319) that the title of the *Fuṣūl* given by the author was *Sirr al-asrār*.

1.4.4 *Kitāb Zaradusht ḥakīm al-Furs fī'l-mawālīd* (fols. 18v-34r): this text is preceded (fol. 18r) by an introductory note, written in a different hand, on the figure of Zarādusht, for which the source used is the *Muntahā al-Madārik* by Saᶜd al-Dīn al-Farghānī (d. 1299).[24] The complete title of this work is *Kitāb Zarādusht fī'l-nujūm wa ta'thīrāti-hā wa'l-ḥukm ᶜalā'l-mawālīd*, also called *Kitāb Wakhshūz Zarādusht*, *Kitāb Dalālat Zarādusht* or *Sirr ᶜilm Zarādusht* and it is extant in several manuscripts.[25] This text seems to have circulated in the Maghrib at a fairly early date for it is quoted in Ibn Abī'l-Rijāl's *Bāriᶜ*.[26]

MS Escorial 939 apparently only contains the part of the book which is related to nativities[27] and it should correspond to a fragment of book 5 (*Kitāb al-mawālīd wa'l-kusūfāt wa taḥwīl sinī al-ᶜālam wa tasyīr qismat al-dunyā wa taḥāwīl sinī al-mawālīd wa'l-masā'il*): in fact we read at the beginning (fol. 18v, line 11): "this book follows the first book in which the spheres (*al-aflāk*) are described". This corresponds to the title of the first book in Zarādusht's compilation (*K. hay'at al-falak*). The techniques for prediction used show clearly a Greek influence, and this agrees with the analysis of Pingree (1975, p. 7) who has established that this book is heavily dependent on the work of Dorotheus of Sidon (second half of the first century A.D.): Dorotheus is actually quoted on fol. 19r where he is called "king of Egypt".

Although the important introduction to this work is not extant in the

[23] Ritter, 1933, pp. 319-323.

[24] Brockelmann, *G.A.L.S. I*, 812.

[25] Sezgin, *G.A.S.* VII, 81-86. Only the chapter on the fixed stars has been edited and studied in Kunitzsch, 1993.

[26] See the series of eleven horoscopes mentioned by Ibn Abī'l-Rijāl (Hilty, 1954, p. 177) which derive clearly from the analogous set in MS Escorial fols. 29v-30r.

[27] Although we find references to the *masā'il* in fol. 32v-33r. See the complete list of contents of the book in Sezgin's *GAS* VII, 85.

Escorial MS,[28] the text contains references to the translation made by Māhānkard ibn Mahrabān [ibn Mihrziyār] from the prestigious language (*al-lisān al-fāḍil*) which Zarādusht spoke [into another kind of Persian], for the *marzbān* Māhūyah, in the year of the Arab conquest. Māhūyah has been identified with the *marzbān* of Marw Māhôê who betrayed Yazdijird III about 642.[29] This Persian translation was retranslated into Arabic, towards the middle of the 8th c., by Saʿīd b. Khurāsānkhurra[30] for the *iṣbahbad* Sinbād, under the government (*dawla*) of Abū Muslim al-Khurasānī (746-755),[31] who is here called *al-amīr* ʿAbd Allāh b. Muslim. The text is full of references to the original work attributed to Zarādusht (*Qāla Zarādusht...*), but it also contains quotations of passages ascribed to Māhānkard and to Saʿīd and we find references to events that took place in Islamic times: thus, we read, for example, that al-Shiʿrā al-Yamāniyya was in the ninth house in the horoscope of the birth of the Prophet, a piece of information derived from a commentary on the *Kitāb al-qirānāt* (fol. 25r). If this *K. al-qirānāt* is the famous book by Abū Maʿshar (787-886)[32], this obviously implies that the text in the Escorial MS contains interpolations which are later than the Arabic translation. In other instances the interpolations are due to Saʿīd himself, although a later author is also involved: thus on fol. 34r we find a reference to Ptolemaic precession (1° per century) and a final note states that the stellar positions correspond to the time of Saʿīd b. Khurāsānkhurra, who is the author of the examples mentioned. The author of the text has made a summary of Saʿīd's work and has only given the examples which correspond to the two stars (*Qalb al-Ḥamal* and *al-Shiʿrā*) mentioned in the text (**واختصرنا واقتصرنا على هذين الكوكبين**).

Fol. 34r shows the date when, at least, item 4 was copied. This date was misread by Casiri (the years are written in Fāsī ciphers) and his error was transmitted by Renaud to many other scholars. According to Casiri,

[28] See Pingree, 1975 and 1989; Gutas, 1998, pp. 37-38.

[29] Pingree, 1975, p. 7.

[30] See Sezgin, *GAS* VII, 83.

[31] See S. Moscati, "Abū Muslim", in *Encyclopédie de l'Islam* I (Leiden-Paris, 1960), p. 145.

[32] See Yamamoto & Burnett, 2000.

the year in which the text was copied was 511/1117-18. As we established in 1999, we read in the MS that the copy ended in "Sunday or, better, Monday (في يوم الاحد بل الاثنين) 19 Dhū'l-Ḥijja of year 813 H [Tuesday 14th April 1411] which corresponds to the 13th April of year 1722 of Alexander [= 1411]".[33]

1.4.5 Two short texts on fol. 34v bear the titles: "Division of al-Andalus between the signs of the ecliptic" (قسمة الاندلس على بروج الفلك) and "Division of al-Andalus between the planets (قسمة الاندلس على الدراري). It is interesting to remark that an analogous division of al-Andalus can be found in the Alfonsine *Libro de las Cruzes*.[34] While the two sources are independent, they apparently share a common ancestor.

1.4.6 Fol. 35r is blank. Fols. 35v-74r contain an anonymous work entitled *Kitāb fī'l-aḥkām al-nujūmiyya* which deals with nativities and elections (fols. 45r-50v, 51v-54r, 55v-56r; fols. 51r and 55r are blank). This part is preceded by a long introduction to astrology (fols.35v-45r) which the author has written because the books written by the ancients are difficult to understand. The text contains references to the fourth climate (fol. 37r). Between fols. 56r and 74r we have a series of chapters dealing with the ascendent (fol. 56r), the Lot of Fortune (fol. 56v), the houses III-VI (fols. 58r-61r), relations of the new born with his wives and female slaves (fol. 62r), houses VIII-XII (fols. 63r-70v), anniversary horoscopes (fol. 71r) and the lord of the year (fol. 73v).

Our edition closely follows Escorial MS 939, fols. 9v-16r. The spelling of the *hamza* has been normalised according to the standard rules, but very few other corrections have been introduced and all of them have been indicated in the corresponding footnote. The text has been divided into passages marked by a number between square brackets (*e.g.* [1], [2]...) to facilitate reference. The same numbers appear in the English translation and most of the corresponding passages are followed by a commentary, which is indented and printed in a smaller font in order to distinguish clearly the text translated from the Arabic from our own

[33] This was our interpretation of the date but we obtained independent confirmation from Rosa Comes (she did not know about our reading) who has become an expert in ciphers of this kind: see Rosa Comes (2002-03).

[34] Kasten & Kiddle, 1961, chapter 59, pp. 160-161.

remarks and interpretations.

2. Translation and Commentary

/Fol. 9v/ In the name of God, the Compassionate, the Merciful. May God bless and protect our Lord Muḥammad, his Family and his Companions.

[I. *Dedication and prologue*]

[1] Let God give a long life to the honourable minister [*wazīr*] and judge Abū l-Qāsim, my lord, the most sublime of my friends, the most precious and everlasting of my treasures, and the most elevated [person] my hand ever reached, whom I succeeded in keeping for my present and my future. Let [God] be generous with the portion of science that was offered to him and may He increase greatly his intelligence and understanding, make the different aspects of his way [of life] prosperous, and let him attain his utmost desires and expectations.

Now, God, blessed be His name and let Him protect you, knows that I blame a Destiny that has ordained that I lose my personal contact with you and that I could benefit from your understanding and be illuminated with the light of your science. Though my body is far away from you, you are always present in my thoughts and in my soul. When God, with His well doing, allows me to be near you and will give me the grace of meeting you and stay with you for a long time, He will make perfect what is now just ordinary in me.

This is the beginning of a rhetorical prologue, parts of which are written in *sajᶜ* (rhymed prose), something which can be appreciated in the translation by the frequent use of binary arguments: couples of synonymic parallel sentences.

L. Richter-Bernburg[35] identified this Abū l-Qāsim, the dedicatee of the *risāla*, as the famous Abū l-Qāsim Ṣāᶜid al-Andalusī (1029-1070), and noticed that Ṣāᶜid, being a *Qāḍī* in Toledo, was entitled to be called *wazīr*. In his *Ṭabaqāt al-Umam*, completed in 1068, Ṣāᶜid mentions al-Istijī as a man who had a sound knowledge in astrology and had written an excellent *Risāla fī 'l-tasyīrāt wa-maṭāriḥ al-shuᶜāᶜāt wa-taᶜlīl baᶜḍ uṣūl al-ṣināᶜa* ("On progressions, projections of rays and justification of some foundations of this technique") which he had dedicated to him [*kataba bi-hā ilayya*] from a place which, in the manuscripts of the *Ṭabaqāt* appears as *Fūnkah* or *Qūnkah* and which was identified by Blachère as Cuenca. This is the reason for the separation between Ṣāᶜid and al-Istijī.

[35] Richter-Bernburg, 1987, p. 377.

[2] In spite of this, my lord, although what I have just mentioned has been forbidden to me and I have been prevented from doing what I have described, namely to be satisfied and happy with you, I have decided to replace conversation with the exchange of letters and oral discussion by correspondence. What I mean is: since I left you and was separated from you at a time in which we had reached a satisfactory and correct result and we had obtained the fruit we were looking for concerning the irregularities [*ikhtilāf*] in the motion of planets and fixed stars - as, being far away from you, I could not rely on your collaboration and help in this matter, I decided to begin a new research of a different kind: that of the different opinions of the Ancients concerning the projection of rays, progressions [*tasyīrāt*] and the long or short periods of time which correspond to the different kinds of astrological predictions, according to the prescriptions of physical law [*al-qānūn al-ṭabīʿī*] for each kind of them.

The reference to the "satisfactory results" obtained by the two authors in their analysis of the irregularities in the motion of the planets and fixed stars [*ikhtilāf ḥarakāt al-kawākib al-sayyāra wa 'l-thābita*] seems to be an allusion to the problem posed by the recension of al-Khwārizmī's *zīj* prepared by Maslama al-Majrīṭī (d. 1007)[36]: this *zīj* allowed the user to compute sidereal longitudes, but it did not explain how to obtain tropical longitudes which take into account the precession of the equinoxes. In his *Ṭabaqāt*, Ṣaʿid insisted that Maslama perpetuated the errors of al-Khwārizmī's *zīj*, as he himself had established in his book on the *Iṣlāḥ ḥarakāt al-kawākib/al-nujum wa-l-taʿrīf bi khaṭa' al-rāṣidīn* ("Correction of the motion of stars and information about the errors of observers")[37]. Al-Istijī, then, bears witness to the fact that Ṣāʿid and his group were dedicated to astronomical research, the main result of which were the famous *Toledan Tables* which included a set of tables based on the theory of trepidation[38]. This may also be related to the fact that al-Istijī, as we have already seen (cf. § 1.2.1) also wrote an epistle on accession and recession. It is interesting, however, to remark that al-Istijī

[36] On this *zīj* see the recent survey by van Dalen, 1996.

[37] Ṣāʿid ed. Bū ʿAlwān pp. 146-147 and 169; tr. Blachère pp. 114 and 130.

[38] See Pedersen, 2002, IV, p. 1545. Pedersen's edition has shown that, of the three sets of Latin canons of the *Toledan Tables* extant, only Cb and Cc (Pedersen, 2002, II, pp. 478-79, 686-687) - both derived from the same Arabic exemplar, which follows a version of al-Khwārizmī's *zīj* independent of Maslama's revision, although it is also strongly influenced by al-Battānī - deal with trepidation, while Ca (based on al-Battānī) refers neither to trepidation nor to precession.

does not have the confidence to continue this kind of research without the assistance of his master Ṣāᶜid and decides to turn his attention to a different kind of topic which requires mainly a scholarly knowledge of the opinions of the Ancients. The identification of the sources quoted by al-Istijī will show that al-Istijī apparently had this kind of knowledge and this agrees with Ṣāᶜid's words when he describes our author as "one of those who have a sound knowledge of astrology and who have read the books on this subject of both ancient and modern authors. I do not know of anybody in al-Andalus either in our time or before it who has obtained such results concerning the secrets and peculiarities of this art".[39] Ṣāᶜid is also apparently right when he says that al-Istijī's study of progressions and projection of rays has no precedent in al-Andalus. The reference to the prescriptions of physical law [*al-qānūn al-ṭabīᶜī*] reminds us of Abū Maᶜshar's attempts to justify astrology using Aristotle's natural philosophy (see below [3], [4], [5], [9], [22], [30], [38]),[40] although it seems that al-Istijī was also aware of Neoplatonic ideas ([19]).

[3] This chapter is one of these fundamental things [*al-uṣūl*] which, when ignored, invalidate for us a great part of judicial astrology, for it is like the root [of the tree] [*al-aṣl*], while the rest of the indications related to transfers [from a period of time to another] [*al-istidlālāt al-taḥwīliyya*] are like the branches [*al-farᶜ*]. Concerning this subject I have made a stop in the collection of materials with what can be found in this work so that you might consider it and judge if its contents are in agreement with the laws of science [*qānūn al-ᶜilm*] and is adequate both to Physics and Mathematics. For you already know /Fol. 10 r/ that deduction [*qiyās*] in Physics is always proved and correct when it obtains the support of experience [*tajriba*]. When we meet, with God's help, I will show you the astrological horoscopes [*al-naṣb al-falakiyya*] I have collected as examples and you will see something extraordinary and astonishing. God, who is able to see secrets from above and is aware of hidden things, knows that I - who would be happy to be your rescue - would only give such a present to a person like you. [God] has increased my fortune in this respect by allowing me to coincide with you and show you [what I have collected] so that you may look at it with eyes of understanding, research and experience. You might be able to discover mistakes in the classification [of materials] or weaknesses in some interpretations and, being rightly aware of it, you will be able to add what is missing and criticize what you consider invalid. I appeal to you, by God's honour, by all your manly and human virtues and by all those rational things in which

[39] Ṣāᶜid, *Ṭabaqāt*, ed. Būᶜ Alwān pp. 199-200; tr. Blachère pp. 153-154.

[40] Lemay, 1962, pp. 41 ff.

you believe, not to show this work of mine to anybody until we have reached our goal and we have reached an agreement. Only then you will be able to allow its reading to men having an equitable intellect and give it to outstanding scholars whose souls are free of hatred and whose hearts have not been led astray.

Al-Istijī considers the study of progressions and projection of rays, as well as the corresponding astrological periods, as the foundation [*aṣl*] of the art, while the rest of the indications related to transfers [*al-istidlālāt al-taḥwīliyya*] (anniversaries) are like the branches [*al-farᶜ*]. Although the opposition *uṣūl/furūᶜ* is applied to other fields of knowledge, we believe our author is using a terminology extracted from *fiqh* (religious law) something which would be in keeping, at least, with the profession of Ṣāᶜid as *qāḍī*[41]. As in [2] he insists on the importance of physical laws and on the fact that astrology must be in agreement with Physics and Mathematics, as well as the need for experimentation [*tajriba*] (see [5], [21], [29], [32], [33], [35], [38]). This, together with *qiyās* (analogy), seems to be an astrological commonplace: we find it in the *Madkhal* of Kushyār b. Labbān (fl. c. 1000)[42]. Abū Maᶜshar (787-886) dedicates a chapter of his *Madkhal Kabīr* to refute the opinion of those who reject astrology, among whom we find scholars who state that this discipline cannot be proved by experience. Against this opinion he says that astrological knowledge has been obtained by *qiyās* and using the experience recorded by astrologers of previous generations[43]. In the Maghribī tradition, Ibn Abī 'l-Rijāl (first half of the 11th c.) has a chapter on *tasyīr* in which he gives a series of examples of what he claims to be authentic nativity horoscopes, although, as we have seen (see above § 1.4), this collection seems to have been copied from a book ascribed to Zarādusht. Al-Istijī himself mentions a similar collection (see [35]). Ibn Abī'l-Rijāl is also the author of a lost *zīj* which, according to him, is based on observations and used by him to justify his astrological predictions.[44] Ibn al-Kammād (fl. first half of the 12th c.) wrote a treatise on "astrological obstetrics" which contains references to experimental astrology[45]. In the 14th c. Ibn ᶜAzzūz al-Qusanṭīnī designs

[41] See N. Calder, "Uṣūl al-fiqh" in *Encyclopédie de l'Islam* X (Leiden, 2002), pp. 1005-1008.

[42] Yano, 1997, pp. 6-7.

[43] Ed. Lemay: Abū Maᶜshar, *Madkhal Kabīr* II, pp. 39-41. See also Charles Burnett, "The certitude of astrology: the scientific methodology of al-Qabīṣī and Abū Maᶜšar", *Early Science and Medicine* 7 (2002), 198-213.

[44] Hilty, 1954, p. 177: "e esto auemos-lo prouado en las nuestras tablas que nos endereçamos con nuestros catamientos".

[45] Vernet, 1949.

an experimental method to correct astronomical tables by using astrological evidence[46] and, towards the beginning of the 15th c., al-Baqqār frequently refers to experience in his *Kitāb al-asᶜār wa'l-amṭār*.

A last remark related to this passage is concerned with the secret character of astrology. Only God "is able to see secrets from above and is aware of hidden things" and only a scientist like Ṣāᶜid deserves the communication of such secrets which should not be divulged until Ṣāᶜid has made a serious revision of the text of the *risāla*. When such a task has been fulfilled, al-Istijī's work will only be made accessible "to men having an equitable intellect and... to outstanding scholars whose souls are free of hatred and whose hearts have not been led astray". The esoteric character of astrological knowledge is an idea which appears, about one century later, in Hermann of Carinthia's *De essentiis*[47], but we may also think that al-Istijī is afraid of men of religion who might consider this discipline as unorthodox.

[4] All I have written in it, making a selection of [the knowledge] I have gathered in this art, can be found in the books of the Ancients who preceded [us] and is written in the works of the philosophers of the past, of which only traces of their science are extant. God, with His grace, has allowed us to clarify what has been obliterated of this secret science, which is the result of Philosophy, as, for the Ancients, it had the same category as Metaphysics [*al-ᶜilm al-ilāhī*], according to what they said and obtained from the scientists. This is clear from the position it [i.e. astrology] occupies, for both Mathematics [*al-ᶜilm al-handasī*] and Physics are prolegomena and introductions to it, in the same way as they are prolegomena and introductions to Metaphysics. Therefore it has the same category and is equivalent to it.

[II. *Numerological speculation: the twelve parts of the sphere and the four categories of numbers*]

[5] We should now begin by mentioning our purpose, with God's help. I now say that the first thing we should explain is the meaning of the word *tasyīr* and what is its purpose. For people in ancient times disagreed on this and not one of them explained what they intended with it or wrote a scientific introduction, in agreement with the laws of nature, from which one could deduce what they meant. Therefore we should either establish what they intended in such a way that their differences disappear or each one of them had his own argument which justified his opinion and was the

[46] Samsó, 1997 and 1999.

[47] Burnett, 1982, pp. 70-73; Burnett, 1992, p. 1044.

cause of what he intended. Thus, concerning the meaning of this word, we must first write a scientific introduction which will be the basis of our opinion as well as the foundation of the meaning a school of the ancients attached to this word, as can be deduced from their intentions related to this topic. I therefore say that the sphere is necessarily divided into twelve parts and this is something on which both natural philosophers [*ṭabī'iyyūn*] and mathematicians [*muhandisūn*] agree. That is to say that the ecliptic is divided into four parts, each one of which has an influence [*ta'thīr*] which is clear to the senses: these are the two solstices and the two equinoxes. Then, there is no doubt that each part has a beginning, a middle and an end. Each one of the aforementioned four parts is, therefore, divided into three and the divisions of the sphere /Fol. 10 v/ become, in this way, twelve. No one can pretend to divide the sphere, in a meaningful way, otherwise. One should not divide further these twelve parts, because their beginnings have a clear meaning neither in natural philosophy nor in mathematics. If we consider these divisions from the point of view of analysis [*istiqrā'*] and experience [*tajriba*], we will discover in them influences [*ta'thīr*], forces [*quwā*] and effects [*af'āl*] that will confirm the validity of [our] opinion and we will also dispel any kind of doubt or confusion that might arise about its structure. For these twelve parts were divided among the seven planets in accordance to the opinion of the ancients and not a single nation of the past disagreed with this division. Their agreement in this respect is the reason why the meaning of science should be trusted.

On *tajriba* see above [3]. Al-Istijī's justification of the division of the ecliptic into twelve equal parts (the zodiacal signs) by its agreement with "the laws of nature" is, in fact, mere numerological speculation. On the other hand (see [7]) he considers that the division of each sign into thirty degrees is arbitrary. See however the quotation from al-Hamdānī's *Sarā'ir al-ḥikma* below ([6]).

[6] When we cast the horoscope (*naṣba*) of a human nativity, we find that the distance, expressed in "parts" (*ajzā'*), of one of the cusps from the beginning of its sign is the same as the distance, also from the beginning of the corresponding sign, of the planet which dominates (*al-mustawlī*) the sign of the conjunction or opposition which took place before the nativity, the corresponding "parts" being the result of the system of division adopted. This takes place necessarily in all cases and it cannot happen by accident: it has always been so through the passage of time. We can establish from this, therefore, the validity of two fundamental astrological principles: that the aforementioned division is correct and the same can be

said of the ascription of the planets to the signs and of the existence of an affinity between these planets and the divisions related to them.[48]

The first part of al-Istijī's argument derives ultimately from the *Tetrabiblos* III.2[49] in which Ptolemy underlines the difficulty of establishing accurately the exact time of birth and explains the technique which was later called *animodar* (see [34] and [35]). As it is easy to establish the sign (if not the degree) of the ascendent in the horoscope of a nativity, we should calculate the degree of the nearest conjunction or opposition of the Sun and the Moon which took place before the birth of the subject of the horoscope. We next observe which planet dominates the place of the aforementioned syzygy and which is the distance between this planet and the beginning of its sign. We shall then conclude that the same degree of the sign of the ascendent will be the precise ascendent at the moment of the birth of the child. If, however, the ruling planet is nearer to midheaven than to the ascendent, the procedure will be used to find the degree of midheaven and the position of the ascendent will be calculated from it.[50] The same technique is described in Arabic sources (al-Qabīṣī,[51] Bīrūnī,[52] Kūshyār[53]) and both al-Bīrūnī and Kūshyār (like al-Istijī) apply the technique to the cusp which is nearer the planet (not only the ascendent and midheaven).

[7] Concerning the division of the sphere into degrees, minutes and the other fractions, it is a conventional division as well as the result of a free election. If anybody wanted to divide it into three hundred, six hundred, three thousand, or any other number of parts, he could do it and not a single scientist could use serious arguments to establish its invalidity.

See above [5].

[48] In the margin of the manuscript we read the following words: "I say: al-Hamdānī mentions, in the second chapter of the first *maqāla* of his book *Sarā'ir al-ḥikma* that the division of the sphere in three hundred [*sic*] degrees (*juz'*) and the division of each degree in sixty minutes, and so on in the successive orders, is a natural (*ṭabī'iyya*) division: he has reached this conclusion using arguments (*ḥujaj*) and demonstrations (*barāhīn*)". On al-Hamdānī and his *Sarā'ir al-ḥikma* cf. [18].

[49] Robbins, 1940, pp. 228-235.

[50] See also Bouché-Leclercq, 1899, pp. 387-390.

[51] Ed. Burnett, Yamamoto and Yano, 2004, pp. 108-111.

[52] Wright, 1934, pp. 328-329.

[53] Ed. Yano, 1997, pp. 160-163.

[8] As we have already established that the sphere is divided into twelve parts, let us now mention the classifications of numbers which seem fit and correspond to such division. I say that there are four categories of numbers - units, tens, hundreds and thousands - which correspond to the four main divisions of the sphere, which are the two equinoxes and the two solstices. There are also twelve specific names for numbers which are from one to nine, called units, then the ten, which is the tenth from which numbers are composed and formed. Then we have the hundred, which is the eleventh name, and the thousand, the twelfth name. There are no other names for numbers except those I have mentioned, because all of them are the result of the repetition of the aforementioned names, without any other addition.

The four categories of numbers (1, 10, 100, 1000) correspond to the four kinds of *qisma* mentioned by Abū Maᶜshar in his *Kitāb al-Ulūf*.[54], in which the motion of the *tasyīr* takes place on the equator. They also correspond to the four kinds of *intihā'* (see below [9]-[12]), where the displacement takes place on the ecliptic. The same four cycles appear in Mūsā b. Nawbakht's *Kitāb al-azmina wa'l-duhūr*.[55]

[III. *Astrological periods and Saturn-Jupiter conjunctions: their agreement with the four categories of numbers*]

[9] The purpose of philosophy is to find the adequacy, correspondence and conformity of things between themselves. Because of this, the sphere is, for the natural philosopher, like the genus, while its divisions are similar to the species of the [different] kinds of the number which is one of the categories of the quantity which exists in the body. I also /Fol. 11r/ say that there are four kinds of changes that take place in the world: those which affect the whole world, about which one can say that the world is based upon them. I mean the great changes like the floods and the periods of drought which produce serious harm and destruction to certain regions, as well as the periods of anarchy, wars, deposition of kings, and those events that affect rules and laws and those in charge of dictating them, such as prophets or kings according to whether such laws are prophetic or royal. All these things are related specifically to the indications given by the twelve zodiacal signs and the periods of time related to them are

[54] Pingree, 1968, p. 59.

[55] See Labarta & Mestres, 2005, pp. 0.44-0.45.

in the category of the thousands. Therefore the world falls during one thousand years under the domination of one sign.

Here our author refers to the cycles usually called, in Eastern sources, *intihā'āt*, although he does not use this term. Their motion takes place on the ecliptic (Kennedy, 1962, p. 356) and the longest of these periods is the mighty world-*intihā'*, related to great events in the history of the world. It moves through a zodiacal sign in 1000 years.

[10] Similarly those events that take place during these [long periods] can be considered like the [second] category. They are those which affect the changes in the situation of religions and their great personalities, the transfer of power from one nation to another and from a dynasty to another within the same country or the good or bad fortune that favours or harms a particular part of the earth. These things are related to the indications furnished by the twelve zodiacal signs and the periods of time related to them are in the category of the hundreds. In this way each country and each nation is submitted to the power of each sign during a hundred years. This kind of *tasyīr*, calculated from the ascendent of its beginning, affects the events we have already mentioned. The hundreds also have a share in some kinds of events to which we have referred *supra* ([9]) because the hundreds are like a part of the thousands to which they are associated and related.

Al-Istijī refers here to the big world-*intihā'* which moves through a zodiacal sign in 100 years. The corresponding *tasyīr* advances 0;18° per year (= 360°/ 1200).

[11] The third category affects each individual of the human race: to the changes [in his life], in his well-being and in his freedom of election in all the events which affect him. These are specifically related to indications furnished by the twelve signs and the corresponding period of time is in the category of the tens. Thus, a man is submitted to the power of each sign during ten years. The cycle of the signs ends when a man finishes the period of his natural life, which is a hundred and twenty years.

We have here the middle world-*intihā'* which moves through a zodiacal sign in 10 years. It affects individuals because its period is 120 years which is the natural (*ṭabī'ī*) duration of human life.

[12] There is also a fourth category which corresponds to the anniversaries (*taḥāwīl al-sinīn*). These are the divisions (*ajzā'*) of all the

aforementioned kinds. [The periods of time] related to them are in the range of the units because [this *tasyīr* moves] one sign per year.

As the units are common to the four categories of numbers, because we use them to count the other orders and all numbers are based on them, the whole world is necessarily submitted to the influence of one sign per year. This is called the sign of the cycle (*burj al-dawr*) and it is the sign of the limit (*burj al-muntahā*). This sign will give detailed information about the [general] indications (*dalāla*) furnished by the first principles (*al-mabādi' al-ūlā*) as well as about the partial changes (*al-taghāyīr al-juz'iyya*) which take place within the different kinds of influences. Similarly the sign of the limit participates, year after year, in the period of the second category, which corresponds to the hundreds. Men will be submitted, in this way, to the influence of each sign during one year, and this will be the sign of the revolution and of the limit (*al-intihā'*).

Interrogations (*masā'il*) and elections (*ikhtiyārāt*) [also] fall under this fourth division, which corresponds to units and anniversaries /Fol. 11 v/ because [human] thought does not consider periods longer than one year when it deals with this kind of topics, as they consist in asking whether something will happen or not, this being the end of the mental process. The *tasyīr* or the indicators (*adilla*) of this kind is like the *tasyīr* of the indicators for one year. Interrogations of a general kind are made by people, in their own interest, instead of casting a nativity horoscope and they enter the kind of these latter horoscopes. Their *tasyīr* is like the *tasyīr* of nativities.

> This kind of *tasyīr* corresponds to [the small world-*intihā'*] (one zodiacal sign per year). It corresponds to the category of anniversaries or year-transfers (*taḥāwīl al-sinīn*). It offers details when calculating a *tasyīr* of a more general kind and it is also used to predict the future of individual men. This is the kind of period that affects the horoscopes of nativities (cast on the occasion of the birth of a child), anniversaries (cast on the birthday of a person), interrogations (cast to answer a specific question) and elections (cast to choose the propitious moment to undertake an activity). The *tasyīr* progresses 2;30° per month or 1° per 12 days and 1/6 of a day ([18]). Ibn Abī'l-Rijāl refers to this cycle in his *Kitāb al-Bārī*ᶜ.[56]

[13] Let us also remember the occult principles and their similarity to the aforementioned four periods. The first is the period of the great conjunction (*al-qirān al-aᶜẓam*) corresponding to the time required for a shift through the four triplicities and a return of the conjunction to the

[56] See Yamamoto & Burnett, 2000, I, pp. 559-563.

same triplicity where it began. This is a period of about one thousand years and, therefore, it is similar to the category of the thousands and it gives similar indications corresponding to the same order. Then comes the middle conjunction (*al-qirān al-awsaṭ*), which is the time that corresponds to twelve conjunctions, measured in mean motion (*ᶜalā 'l-amr al-awsaṭ*), and it is the equivalent of the range of the hundreds. Then the small conjunction (*al-qirān al-aṣgar*) which is the period of time between two Saturn-Jupiter conjunctions in that triplicity. It corresponds to the category of the tens. After this we have the units, which are the anniversaries (*taḥāwīl al-sinīn*): they are parts of the whole, in which they participate as well as in its future consequences; the same happens with the anniversaries. The sign of the limit (*burj al-muntahā*) gives details about all primary questions, and defines their essence as well as the exact times in which the events will take place.

Al-Istijī establishes a correspondence between the four world-*intihā'āt* periods and the theory of Saturn-Jupiter conjunctions. For that purpose it is important to bear in mind the standard classification of the zodiacal signs into four triplicities, which are related to the four elements: Fire (Aries-Leo-Sagittarius), Earth (Taurus-Virgo-Capricorn), Air (Gemini-Libra-Aquarius), Water (Cancer-Scorpio-Pisces). A conjunction of Saturn and Jupiter takes place approximately every twenty years, two thirds of a revolution (eight zodiacal signs) further along from the previous one. This is why these conjunctions tend to stay in the same triplicity. There is, however, a small advance in the position of every third conjunction, which make take it out of the former triplicity and into the next. Abū Maᶜshar - one of the sources quoted by al-Istijī - establishes[57] that the average time between two Saturn-Jupiter conjunctions amounts to 19.848 sidereal years and that the advance in the triplicity is 2;25,17,10,6°. A change of triplicity will, therefore, require:

$$30^\circ / 2;25,17,10,6^\circ \approx 12.39 \text{ conjunctions}$$

and

$$12.39 \times 19.848 \approx 246 \text{ sidereal years}$$

Consequently, according to Abu Maᶜshar, the conjunction will have shifted through the four triplicities in:

$$246 \times 4 = 984 \text{ sidereal years.}$$

On this basis, al-Istijī refers to the great conjunction (return of the conjunction to the same triplicity where the cycle began), which corresponds to the range of the thousands (984 sidereal years according to Abū Maᶜshar); the middle conjunction, which implies a shift in the triplicity, and belongs to the category of the hundreds (246 sidereal years in Abū Maᶜshar's system); the small conjunction, the period of time between two Saturn-Jupiter conjunctions in the same triplicity. It corresponds to the category of the tens (19.848 sidereal years).

Finally, as al-Istijī seeks to emphasise the similarity between the two kinds of

[57] Ed. Yamamoto and Burnett, 2000, I, pp. 12-19, see also I, 582 ff.; Kennedy, 1962, pp. 358-359.

periods (*intihā'āt* and Saturn-Jupiter conjunctions) he needs something here to fill the gap corresponding to the small world-*intihā'* (one year periods) and, as there is nothing of the sort related to conjunctions, he puts the anniversaries in the fourth place, and in the category of the units.

[14] All these principles (*mabādi'*) - I mean the conjunctions - are mentioned in the book of Kankah al-Hindī, in Abū Maᶜshar's *Kitāb al-milal wa'l-duwal* and in his *Kitāb al-qirānāt*, as well as in many other books of ancient and modern scientists. They explain the origins, extinctions and events which concern states. We have discovered that all those who prorogated (*sayyara*) the principles (*mabādi'*) according to the different ranges of numbers and the periods of the conjunctions did so in ecliptical degrees (*daraj al-sawā'*) and did not use right ascensions for that purpose, not even in the prorogation of the sign of the limit (*burj al-muntahā*). In the same way those who refer to the influence of the twelve zodiacal signs on mankind did not use right ascensions for this purpose. It is clear from the meaning and purpose of their words that, in their prorogations (*tasyīr*), they divide the sphere according to the periods which correspond, in a natural way, to the kind [of *tasyīr*] implied. Each one [of these kinds] is submitted to the influence of the twelve signs, which constitute all the parts of the sphere, until the corresponding period of time ends.

Here begin al-Istijī's references to Eastern Islamic sources, among which we find Kankah al-Hindī (fl. Baghdad ca. 775-820)[58], who is quoted probably indirectly both in this text and in Ṣāᶜid's *Ṭabaqāt*[59]: their information on this author probably reached them through the works of Abū Maᶜshar (d. 886), which they seem to know well. This latter author is, no doubt, the most important authority used by al-Istijī, who mentions his *Kitāb al-milal wa 'l-duwal*, as if it was a different work from the *Kitāb al-*

[58] See D. Pingree, "Kanaka". in *Dictionary of Scientific Biography* VII (New York. 1973), 222-224, and *G.A.S.* VII, pp. 95-96. See also Yamamoto and Burnett, 2000, I, pp. 589-592. A long quotation from Kankah al-Hindī appears in ᶜUmar b. Farrukhān's book on nativities and this text apparently circulated in Cordova in the second half of the tenth century: see Pingree, 1977; a new edition of the text has been published in Yamamoto & Burnett, 2000, II, pp. 342-344.

[59] Ṣāᶜid, *Ṭabaqāt*, ed. Bū ᶜAlwān p. 59; tr. Blachère p. 48.

qirānāt.[60] He also quotes Abū Maᶜshar's *Mudhākarāt* (cf. [16]), written by his disciple Shādhān,[61] and his *al-Madkhal al-kabīr*[62] (cf. [36]): all these books are also quoted by Ṣāᶜid in the *Ṭabaqāt*[63].

This passage contains an interesting piece of information concerning the method used for calculating the *tasyīr*, understood as the astrological technique which has the purpose of establishing the date of a future event. It seems clear that al-Istijī uses simple progressions on the ecliptic and not on the equator: in his classification of the different methods used, Hogendijk[64] states that the "simple ecliptical method" is used for the projection of rays but not for the *tasyīr*. However, we have found evidence for the use of this method in the work of the fourteenth century Maghribī astronomer and astrologer Ibn ᶜAzzūz al-Qusanṭīnī (d. Constantina 1354)[65] and it also appears in the commentary to the *urjūza* of Ibn Abī'l-Rijāl by Ibn Qunfudh al-Qusanṭīnī (1339-1407)[66] and in the work of the Moroccan astrologer Abū ᶜAbd Allāh al-Baqqār (fl. Fez 1418)[67]. We may wonder, in this context, whether we are dealing here with a technique which is characteristic of Maghribī astrology. Al-Istijī's words seem to point towards its use in earlier Classical and Eastern sources ("We have discovered that all those who prorogate the principles according to the different ranges of numbers and the periods of the conjunctions did so in ecliptical degrees and did not use right ascensions for that purpose, not even in the prorogation of the sign of the limit").

[15] This introduction gives us information on the meaning of the word *tasyīr* and on its periods of time corresponding to all species of animals and plants. The author of the *Epistles of the Brethren of Purity* mentioned, in some of these epistles, the natural period of life that corresponds to many species of animals. When such a period is exceeded or not attained,

60 Ed. Yamamoto & Burnett, 2000: on the problem of the title see I, pp. XX-XXII and 611-612.

61 On the diffusion of this work in the Iberian Peninsula in the twelfth century see Burnett, 2003.

62 See the edition and study by Lemay, 1995-96.

63 Ṣāᶜid, *Ṭabaqāt*, ed. Bū ᶜAlwān pp. 142, 144-145; tr. Blachère pp. 111, 112-113. See *G.A.S.* VII, pp. 139-151.

64 Hogendijk, 1998. See also Nallino 1903, 309-313; Calvo, 1998b.

65 Samsó, 1997 & 1999.

66 Samsó, 2005.

67 Díaz Fajardo, 2001, p. 84.

this is due to the influence of the malefics (*nuḥūs*), to their aspects, association and the interruption (*qaṭ*ᶜ) they produce before things reach their completeness. It is, therefore, clear from the strength of his words on this topic what the meaning of *tasyīr* is, as well as its purpose.

The *Rasā'il ikhwān al-ṣafa'*, a work introduced in the Iberian Peninsula by al-Kirmānī (d. 1066) were also known by Ṣāᶜid[68]. It is interesting to remark that al-Istijī considers it to be the work of a single author. Here al-Istijī refers (as in [14]) to the use of *tasyīr* for the calculation of the length of the life of an individual which, apparently, was his main concern. This is done by establishing the length of the arc between two points of the ecliptic: one of them (called *al-mutaqaddim* or *al-haylāj*) is often the ascendent in the horoscope, while the second (*al-thānī* or *al-qāṭi*ᶜ) can be a planet, a star, a house in the horoscope or one of the astrological lots which exert a bad influence on the individual and cause his death.[69] The length of the life is established by giving an equivalence in time to each degree between the two aforementioned points.

[16] The kinds of *tasyīr* which concern men are the categories of the tens and the units, while those related to religions and states (*al-milal wa'l-duwal*) are the categories of the hundreds and the units. [Finally] the events of /Fol. 12 r/ the whole world [are regulated] by the categories of the thousands and the units. This kind of *tasyīr*, I mean the *tasyīr* which attributes a thousand [years] to each sign, is mentioned in the *Kitāb al-Mudhākarāt* where it receives the name of *Jānbakhtariyya* of the world. This work deals also with other kinds of *tasyīr* related to religions and states, which are associated to the other aforementioned *tasyīr*s, like the period of the great conjunction (*al-qirān al-aᶜẓam*); the other *tasyīr*, which is specific for dynasties and for the transfer of religions and states from one nation to another and from one dynasty to another, is the aforementioned period of the middle conjunction (*al-qirān al-awsaṭ*). In the same way, the period of the small conjunction (*al-qirān al-aṣgar*) gives specific indications for each one of the kings.

Here al-Istijī summarises information already given in [9]-[14]. Abū Maᶜshar's *Mudhākarāt* has already been mentioned in the commentary to [14]. Al-Bīrūnī, in the *Tafhīm*,[70] mentions the *jānbakhtār*, which he also calls *al-qāsim*, in relation to nativity anniversary horoscopes (*taḥāwīl sinī al-mawālīd*): it is the divisor or distributor of the

[68] Ṣāᶜid, *Ṭabaqāt*, ed. Bū ᶜAlwān p. 172; tr. Blachère p. 132.

[69] Schirmer, 1934, Viladrich & Martí, 1983, Yano & Viladrich, 1991.

[70] Wright, 1934, p. 521.

fortunes of life. In al-Sijzī's *Kitāb al-qirānāt wa taḥāwīl sinī al-ᶜālam*[71] this term appears as the participant with the lord of the year (*sālkhudāh*) in a year anniversary (*taḥwīl sinī al-ᶜālam*)[72].

[17] The portion (*ḥiṣṣa*) which corresponds to one year in the *tasyīr* [of the small conjunction] is in the order of 18;29° approximately. This period is associated to the sign of the cycle (*burj al-dawr*). The *tasyīr* corresponding to the period of the middle conjunction has a portion for each year of 1;29,4°, while the yearly portion for the *tasyīr* of the great conjunction amounts to 0;22,16,5°.

Here al-Istijī states that the portions (*ḥiṣṣa*) which correspond to one year in the *tasyīr*s of the three kinds of Saturn-Jupiter conjunctions are the following ones:

small conjunction: 18;29°,
middle conjunction: 1;29,4°
great conjunction: 0;22,16,5°.

These values allow us to compute the length of the three periods which will be:

360°/ 18;29° = 19.477 years (small conjunction)
360°/ 1;29,4° = 242.515 years (middle conjunction)
360°/ 0;22,16,5° = 969.999 years (great conjunction)

The period of the middle conjunction is confirmed explicitly by the text ([22]) which mentions a rounded value of 242.5 years (20 years for the small conjunction).

One can easily check (see [13]) that these parameters do not coincide with those used by Abū Maᶜshar or by any other known source dealing with Saturn-Jupiter conjunctions. We should try to establish whether these parameters derive from the *Toledan Tables* or from al-Khwārizmī's *zīj* and the answer seems to be negative in both cases. First of all the values given by al-Istijī do not agree with the mean motion parameters for Saturn and Jupiter squeezed by Toomer[73] and confirmed by F. Pedersen[74]:

Saturn: 0;2,0,26,35,17°
Jupiter: 0;4,59,7,37,19°
Difference: 0;2,58,21,2,2°

and 360°/0;2,58,21,2,2° gives a number of days equivalent to 19;51,26 or 19.857 sidereal years of 365;15,24 days (the parameter used by Ibn al-Zarqālluh).

[71] Pingree, 1968, p. 74.

[72] See also Bausani, 1977, p. 224.

[73] Toomer, 1968, p. 44.

[74] Pedersen, 2002, vol. III, pp. 1139 ff.

The same technique can be applied to the corresponding parameters in al-Khwārizmī's *zīj*[75]:

Saturn: 0;2,0,22,57°

Jupiter: 0;4,59,9,8°

Difference: 0;2,58,46,11°

and 360°/ 0;2,58,46,11° gives a number of days equivalent to 19;50,52 or 19.847 sidereal years of 365;15,30,25,57 days.

Another possibility, which also gives negative results, is to suppose that al-Istijī had in mind two true conjunctions of Saturn and Jupiter and established the parameter from the period of time elapsed between them. This obviously implies that al-Istijī's parameter will only be valid for a period of about twenty years and that he will have to change it for later periods. This is, however, the technique used by Abū ᶜAbd Allāh al-Baqqār (fl. Fez, beginning of the 15th c.)[76] and we suspect that it was also used by other Andalusī and Maghribī astrologers. Starting from the true conjunction in Virgo which took place in 1007 and implied a shift to the triplicity of water[77], we have calculated the conjunctions in 1027, 1047 and 1067, as well as the conjunction in Libra in 1246 (shift to the triplicity of air). These conjunctions have been calculated using computer programmes based on the parameters of the *Toledan Tables* and of al-Khwārizmī's *zīj*[78]:

[75] Neugebauer, 1962, p. 93.

[76] In his *Kitāb al-adwār fī tasyīr al-anwār*. We owe this information to Montse Díaz Fajardo who is preparing the edition of the astrological part of this work. On the astronomical part see Díaz Fajardo, 2001.

[77] This conjunction attracted the attention of Cordovan astrologers because they considered that it announced the fall of the Umayyad Caliphate and the beginning of the *fitna*. See Samsó, 2004b.

[78] The skeleton of both computer programmes was designed by Prof. E.S. Kennedy during one of his stays in Barcelona and later improved by Dr. Honorino Mielgo.

TOLEDAN TABLES

YEAR	DATE OF CONJUNCTION	LONGITUDE	PERIOD BETWEEN CONJUNCTIONS
1007	26.10	162;3°	
1027	7.4	23;8°	19;26,47 or 19.446 sid. yrs
1047	2.11	272;51°	20;34,19 or 20.57 sid. yrs
1067	2.9	168;49°	19;49,57 or 19.83 sid. yrs
1246	21.8	198;32°	238;48,56 or 238.215 sid. yrs since the conj. of 1007

AL-KHWĀRIZMĪ'S *ZĪJ*

YEAR	DATE OF CONJUNCTION	LONGITUDE	PERIOD BETWEEN CONJUNCTIONS
1007	20.11	158;45°	
1027	31.3	14;13°	19;26,38 or 19.444 sid. yrs
1047	21.10	263;46°	20;33,29 or 20.558 sid. yrs
1067	18.9	164;58°	19;54,33 or 19.909 sid. yrs
1246	25.8	185;16°	238;50,30 or 238.8419 sid. yrs since the conj. of 1007

Al-Istijī's parameters do not seem to derive from the *Toledan Tables* or from al-

Khwārizmī's *zīj*.[79] On the possible consequences of this statement see above § 1.2.2.

[18] The monthly portion resulting from the division of the sign of the limit (*burj al-muntahā*) by [the number of months] is 2;30°. This *tasyīr* is mentioned at the end of the book on nativity year transfers (*Kitāb taḥāwil sinī al-mawālid*) by al-Khaṣībī in a passage in which he says: "Consider the degree of the sign of the limit and its distance from the lights and bodies of planets and stars (*kawākib*). Then give to each degree a period of twelve days and one sixth". Abū Yūsuf Yaʿqūb b. Isḥāq al-Kindī also mentioned this kind of *tasyīr* in his book on judicial astrology (*fī'l-aḥkām*) which he named the *Middle Introduction* (*al-Madkhal al-Awsaṭ*). Similarly, the daily portion of the *tasyīr* counted from the ascendent of the year until its end is 59;8', the same as the [daily] mean motion of the sun, because it is the result of the division of the degrees of the sphere by the [number of] days of the [solar] year. There is a reference to this *tasyīr* in the *Book of Proverbs of the Persians* (*Kitāb al-amthāl li'l- Furs*) where it is said: "If you want to know, day after day, what will happen to a man, prorogate the year indicator (*dalīl al-sana*), according one degree for each day, until the end of the year".[80]

As for the portions of the *tasyīr*s related to the categories of the

[79] We transcribe here a John North's judicious remark made after his reading a previous draft of this paper: "It is not at all obvious that you can rule out a derivation of parameters from a few calculations of actual conjunctions. I am not suggesting that he did so, but merely drawing attention to the enormous difficulty of getting two calculators to agree on the precise time of a conjunction, which is mathematically extremely sensitive to techniques of approximation and minor error."

[80] In the margin of the manuscript we read the following text: "I have found in both margins of the manuscript a text which does not appear in the Eastern copy of the *Amthāl li'l-Furs*. In order to know the events of nativities day after day, we should prorogate the lord of the sign of the limit of the year (*ṣāḥib burj muntahā 'l-sana*), term after term (*ḥaddᵃⁿ ḥaddᵃⁿ*). When the progression meets a benefic (*saʿd*) or enters a benefic term, the new born will find favour and health on that day. Otherwise, the prediction should be the opposite. If it is separated (*inṣarafa*) from a superior planet and enters in application (*yattaṣil*) with an inferior planet, like... [we have been unable to read the following line of this gloss which ends with "inferior planets" and continues] it applies to an inferior or a descending (*hābiṭ*) planet, [the prediction] will be bad in the beginning, especially if this beginning affects caliphs or kings. In the case of war, however, there is an indication of victory if the object of application (*al-muttaṣal bi-hi*) is an inferior ascending planet: ascending means that it rises towards the apogee". On terms (*ḥadd*, pl. *ḥudūd*) see Bīrūnī, *Tafhīm* in Wright, 1934, pp. 265-266.

numbers: the yearly portion in the *tasyīr* for the natural length of human life is three degrees. This *tasyīr* is mentioned in al-Hamdānī's *Book on the Secrets of Philosophy* (*Kitāb Sarā'ir al-Ḥikma*) where he says that the sign which dominates man until the end of his life agrees with what the ancients established when they divided the years of the *fardārāt*. It is clear from this *tasyīr* that the [real] length of human life is comprised between sixty and seventy [years], because the prorogation of the ascendent reaches the degree of the descendent and that of the house of death, both of which correspond to the nature of life. If the malefics are in aspect in the radical horoscope and in the horoscope of the anniversary and if the indicators of the new born are weak, the interruption (*qaṭ*ᶜ) will take place.

Similarly the yearly portion of the *tasyīr* in the category of the hundreds - for the events which refer to religions, states, dynasties, tribes and atmospheric events related to these [cycles] - is eighteen minutes. The yearly portion /Fol. 12 v/ for the category of the thousands, useful to know events affecting the whole world, is 1;48°.[81]

The sources quoted in this passage begin with Al-Khaṣībī, who wrote a *Kitab taḥāwīl sinī al-mawālīd* and who is probably al-Ḥusayn/ al-Ḥasan b. al-Khaṣīb (fl. 844), praised by Ṣāᶜid as the author of a *zīj* and of a good book on nativities (*mawālīd*)[82]. We also find a book on astrological predictions by al-Kindī (d. ca. 870), entitled *al-Madkhal al-awsaṭ*[83]. This is, apparently, the only source quoted by al-Istijī which was unknown to Ṣāᶜid. Far more problematic is the identification of a *Kitāb al-amthāl li' l-Furs*: this source might be related to another mysterious *Kitāb al-amthāl* quoted by the Moroccan astronomer Abū ᶜAbd Allāh al-Baqqār in his *Kitāb al-amṭār wa'l-asᶜār*.[84] Finally, al-Istijī also quotes al-Ḥasan b. Aḥmad b. Yaᶜqūb al-Hamdānī (d. 946) and his book entitled *Sarā'ir al-ḥikma* (also quoted in a marginal note on fol. 10 v, cf. [6]). This author appears to have been well known in al-Andalus from the time of al-Ḥakam II

[81] 1;48,20° in the manuscript. The 20" are a clear mistake.

[82] Ṣāᶜid, *Ṭabaqāt*, ed. Bū ᶜAlwān pp. 145-146; tr. Blachère p. 113. See Suter, 1900, no. 62 (p. 32) and *G.A.S.* VII, pp. 122-124.

[83] See *G.A.S.* VII, pp. 130-134. We wonder whether this work should be identified with al-Kindī's "Forty Chapters" (*al-Arbaᶜūna Bāban*), described in the introduction as *Madkhal ilā ᶜilm al-nujūm*. Ibn Abī 'l-Rijāl, who uses this work extensively, also mentions a book in two parts (*faṣlānī*) of only eight folios in length (this would be the small introduction), and a third book which he calls *kitābu-hu 'l-aᶜẓam* (i.e. the great introduction). See Burnett (1993), pp. 78-79, 88-92.

[84] See the edition presented by Chadly Guesmi as a Ph.D. dissertation at the University of Barcelona in 2005.

(961-976) and he is frequently mentioned by Ṣāᶜid both as a historian and as an astrologer.[85]

The numerical parameters quoted here are obvious: a monthly portion of 2;30° corresponds to the small world *intihā'* (*qismat burj al-muntahā*) (cf. [12]), which progresses one sign per year. This agrees with the number quoted by al-Khaṣībī who states the correspondence between 12 days and 1/6 and 1°, because:

12 1/6 x 30 = 365

The *tasyīr* of the ascendent of the year is considered to be equal to the daily motion of the sun (0;59,8°), rounded to 1° per day in the *Kitāb amthāl li'l-Furs*. 3° per year corresponds to the middle world *intihā'* (cf. [11]) which progresses one sign per 10 years or one revolution in 120 years. According to al-Hamdānī, however, the [standard] duration of human life is between 60 and 70 years. The reason is clear: if one uses as *haylaj* or *mutaqaddim* the ascendent of the horoscope cast at the moment of the birth of the subject, a *tasyīr* of 3° per year will result in an arc of 180° in 60 years or 210° in 70 years, which implies that the *tasyīr* has reached the descendent (house VII) or the house of death (VIII, assuming a mean length of 30° for each house) of the same horoscope. Both are most unhappy places which act as *thānī* or *qāṭiᶜ* and produce death. On the periods called *fardār*s see below [20]. The passage continues with the big world *intihā'* (one zodiacal sign per 100 years, cf. [10]) for which the yearly portion is 0;18° (= 30°/100) and ends with the mighty world *intihā'* (one sign per 1000 years, cf. [9]) whose yearly portion is 0;1,48° (= 360°/ 12000).

[19] We should now explain which of the *tasyīr*s offers stronger indications and more evident influences: I say that when the *tasyīr*s we use correspond to the categories of the four [orders] of numbers and to the division of degrees of the supreme sphere, these should be considered the first and the main ones whose indications are the clearest, strongest and most evident. When such indications derive from conjunctions - which are the result of the motions of the planetary bodies, that can be considered as [angular] seconds (*ka'l-thawānī*) in relation to the category of the supreme sphere, for they are below it and follow it, moving with its motion and imitating it (*muḥādhiyan la-hu*), and their motion agrees with its [the supreme sphere's] perfection and inclination and is submitted to the influence of its [the supreme sphere's] own necessary motion, from East to West, and by the motion we find in it [the supreme sphere?], which is the motion of accession and recession (*al-iqbāl wa'l-idbār*) - we must assume that the indications derived from conjunctions are like the seconds (*ka'l-thawānī*) in relation to the indications of the signs which

[85] Ṣāᶜid, *Ṭabaqāt*, ed. Bū ᶜAlwān pp. 66, 113, 118, 121, 147-149, 151; tr. Blachère pp. 53, 89-90, 93, 95, 114-116, 117. See *G.A.S.* VII, pp. 164-165 and King, 1983, pp. 19-20; King, 1986, p. 39 (B41).

preserve the species (*al-ḥāfiẓa li-anwāᶜ*)[86].

Al-Istijī considers that the *tasyīr*s which correspond to the world *intihā'*s and, consequently, to the periods of 1000, 100, 10 and 1 years are those which offer stronger and more evident indications because they are related to the sphere of the signs. It seems that this is the eighth sphere, because it has two different motions: one is the daily motion, from East to West, which produces a revolution every twenty-four hours; the second is the precession of the equinoxes, interpreted here in the context of the theory of trepidation (motion of accession and recession). These *tasyīr*s are more significant than those related to Saturn-Jupiter conjunctions, which take place in the seventh and sixth spheres corresponding to these two planets. It is interesting that al-Istijī is introducing here an idea which seems to derive from Neoplatonic cosmology: the inner spheres follow the motion of the supreme one and imitate it, being submitted to its daily and precessional motions. Such ideas were developed, in the Islamic East, by philosophers like Abū'l-Barakāt al-Baghdādī (11th-12th c.) and, in the West, by Ibn Rushd (1126-1198) and al-Biṭrūjī (fl. after 1185).[87]

[20] The same thing may be said in relation to the *fardārāt* of the seven planets and of the [Moon's] ascending and descending nodes, which is seventy-five years, an amount which corresponds also to the natural length of human life. We have assigned this period to the human species because we have discovered that the ancients divided a part of human life according to the *fardārāt* of the planets. This is the period in which man can lead an active life and take care of things: when he surpasses it, his activity becomes weaker. They talked about human nature according to its sharing of the nature of each one of the planets which divide the years of its [i.e. man's] *fardāriyya*. They considered this division as the best suited for the knowledge of events which affect him, although they interpreted anniversaries as the furthest [limit one can reach] in the division of each one of the *fardār*s. They also mentioned these *fardār*s in the anniversaries of nativities. This is one of the periods which govern man and the portion which corresponds to one year, when we prorogate on it the indicators of the new born, is four degrees and four fifths of one degree.

Al-Istijī refers here, and in [18], to the periods called *fardār*, and, more specifically, to the small *fardār*, which lasts 75 years, distributed unequally between the planets and the nodes: Sun (10 yrs), Moon (9), ascending node (3), Jupiter (12), Mercury (13), Saturn (11), descending node (2), Mars (7), Venus (8). These 75 years are also said to

[86] Something seems to be missing in the text here.

[87] See Samsó, 1994b, pp. 9-11.

correspond to the natural length of human life (see also [11] and [18]). The corresponding *ḥiṣṣa* per year amounts to 4;48° (= 360°/75).[88]

[21] We have checked experimentally (*jarrabnā*) this kind of *tasyīr* and we have discovered that it gives clear, plain and precise indications on fortune and misfortune. We have also discovered that the period of return of the conjunction to its original location in the same triplicity in which it was [originally] - a period of sixty years - offers clear indications on changes in the events that affect kings and in these happy or unhappy things which are related to every king in his country. This is one of the best natural periods which can be used to cast the horoscopes (*ṭawālīᶜ*) of the government of kings. The yearly portion in the *tasyīr* of this period is six degrees.

On astrological experimentation see above [3]. After sixty years the conjunction of Saturn and Jupiter returns to the same zodiacal sign in which it began. A *ḥiṣṣa* of 6° per year corresponds to 360°/60.

[22] All this is the result of the laws of nature concerning the signification of the *tasyīr*s. Indications on all these principles can be found in the books of the ancients and any clever person having good scientific criteria will be aware of them. There are three categories (*marātib*) which affect every *tasyīr* of the aforementioned four groups. The natural periods of time affecting the events of the whole world and on which one should prorogate are, [first] the longest period, which corresponds to twelve thousand years. [It is useful to remark that] the period of /Fol. 13 r/ the great conjunction corresponds to the thousand year period per zodiacal sign. The indication of the thousand has, therefore, a double strength because it has a share in two natural periods. One should add to this the indication furnished by the sign of the limit: we have, thus, three *tasyīr*s for this category if we include the sign of the limit.

There are also three *tasyīr*s related to the events which affect religions and states. The longest period is one thousand two hundred years, near also to the thousand year period. The *tasyīr* according to this period corresponds to this kind [of events] as well as the *tasyīr* of the period of the middle conjunction, which is approximately two hundred and forty two and a half years. The same can be said of the *tasyīr* of the period of the sign of the cycle (*burj al-dawr*).

[88] See Kennedy, 1962, pp. 356-358; Yamamoto & Burnett, 2000, I, pp. 592-593.

As for the human species, it is affected by different kinds of *tasyīr*s: the *tasyīr* related to the length of natural life, which is one hundred and twenty years, the *tasyīr* according to the period of the years of the *fardārāt*, which is seventy-five years, and also the *tasyīr* related to the sign of the cycle (*burj al-dawr*). All this makes three *tasyīr*s.

The fourth category is similar to the [aforementioned] cycles (*adwār*), but it is related to the accidents (*aʿrāḍ*) that affect the human species and its normal activities. It is a partial variety (*nawʿ juz'ī*) on which indications are provided by partial conjunctions (*qirānāt juz'iyya*) which imply neither a shift [in the triplicity] nor a period of time in which a complete return [of the conjunction to its original location in the same triplicity in which it was originally] takes place. This corresponds to the horoscopes (*ṭawāliʿ*) of the reign of kings and of the accession of each one of them to the throne of their kingdom as well as of the indications which are specific to them. This kind of event is characterized by three *tasyīr*s: the first one is the period of return of the conjunction to its original location, which is sixty years, the period of time between two conjunctions of Saturn and Jupiter, which is twenty years, and also the period of the sign of the cycle (*burj al-dawr*).

From this classification we can deduce the existence of a clear correspondence and similarity between the different kinds of events that affect the world. The *tasyīr*s are [always] three for [each one of] the four categories, in analogy to the division of the supreme sphere into four great parts and the subdivision of each one into three [smaller] parts: this makes twelve parts.

Al-Istijī formulates here a doctrine, later followed by other authors like al-Baqqār:[89] three different *tasyīr*s, using different periods of time, are prorogated for each one of the four different categories (*marātib*) of events, the *tasyīr* of the sign of the limit (*burj al-muntahā*) or the sign of the cycle (*burj al-dawr*) being common to all of them. This leads him, at the end of the passage, to establish a correspondence between the twelve kinds of *tasyīr* used (4 x 3) and his previous numerological speculation ([5], [8]) about the four 90° arcs of the sphere and the division of each one of them into three parts, which makes a total of 12 signs. The categories of events and the corresponding *tasyīr*s are:

1) Events of the whole world: *tasyīr*s according to periods of 12000 years (mighty

[89] Here we are using information derived from the Ph.D. thesis which is now being prepared by Montse Díaz Fajardo and which will include editions of unpublished Maghribī texts on *tasyīr* and projection of rays by Ibn Abī 'l-Rijāl (11th c.), Ibn ʿAzzūz al-Qusanṭīnī (14th c.) and al-Baqqār (beginning of the 15th c.).

world *intihā'*, [9]), equivalent to a zodiacal sign every 1000 years; the same order of units corresponds to the big world *intihā'*, which is a period of 1200 years ([10]); finally, the sign of the limit (small world *intihā'*, a period of 12 years, [12], [18]).

2) Events which affect religions and states: 1200 years (big world *intihā'*, [10]), period of the middle conjunction (242,5 years, [13], [16], [17]) and sign of the cycle or the limit ([12], [18]).

3) Events which affect human life: length of natural life (120 yrs, middle world *intihā'*, [11], [18]), years of the *fardārāt* (75 yrs, small *fardār* [18], [20]), and sign of the cycle ([12], [18]).

4) Events which affect the reign of kings: return of the conjunction to the original sign (60 yrs, [21]), small conjunction (20 yrs, [13], [17]), and sign of the cycle ([12], [18]).

[IV. *Techniques for the computation of tasyīr and projection of rays: ecliptical and equatorial methods*]

[23] Having finished explaining our purpose, we shall turn now to the disagreements between the ancients, their confusions on this topic and the solutions they adopted. I say that I do not believe that those who projected the rays of the stars on the plane of the equator had any clear argument or any essential or probable pretension. In spite of this, they disagreed on this topic. Thus, Ptolemy, author of the *Tetrabiblos*, prorogated the indicators in the western quadrant of the sphere in the direction opposite to the succession of the zodiacal signs and made his *tasyīr*s, in that quadrant, and his projections of the rays of stars using oblique ascensions in the eastern horizon.

After a first allusion to the topic in [14], al-Istijī now begins his discussion of the different mathematical methods used for the *tasyīr* and the projection of rays, two astrological techniques which share common methods with the division of the houses of the horoscope. This latter topic has been studied by North and Kennedy,[90] while the methods used for the *tasyīr* and the projection of rays have been the object of two general studies by Calvo and Hogendijk[91]. The problem of the projection of rays had attracted the attention of Andalusian mathematicians towards the end of the tenth

[90] North, 1986, and Kennedy, 1994 & 1996.

[91] Calvo, 1998b, and Hogendijk, 1998. I am using a photocopy of the typewritten paper of Hogendijk, 1998, because it was not published in the proceedings of the conference in which it was presented: see J.P. Hogendijk and A.I. Sabra (eds.), *The Enterprise of Science in Islam. New Perspectives*. Cambridge, Mass. and London, England, 2003. See also Nallino, 1903, 309-313; Viladrich & Martí, 1983; Yano & Viladrich, 1991.

century,[92] and, in the eleventh century, Ibn Muᶜādh al-Jayyānī (d. 1093) had also studied it in a highly technical way[93]. Al-Istijī was a contemporary of Ibn Muᶜādh and he was obviously interested in the topic although his approach to it does not have the same technical character. The information he gives, even though it is not original, has a certain interest, as it contains certain developments for which al-Istijjī seems to be one of the oldest known sources.

Ptolemy, author of the *Tetrabiblos*, made progressions of the indicators (*sayyara al-adillā'*) in the Western quadrant of the sphere, in the direction opposite to that of increasing longitudes. This seems to refer to Ptolemy's *Tetrabiblos* III, 10:[94] "When the prorogator has been distinguished, we must still further adopt two methods of prorogation. The one, that which follows the order of the following signs, must be used only in the case of what is called the projection of rays, when the prorogator is in the orient, that is, between mid-heaven and the horoscope. We must use not only the method that follows the order of following signs, but also that which follows the order of leading signs, in the so-called *horimaea*, when the prorogator is in places that decline from mid-heaven". Therefore, according to Robbins' interpretation, when the prorogator (*haylaj*, significator) is placed between mid-heaven and the descendent, the *tasyīr* should be calculated in both directions. Al-Istijī's interpretation apparently coincides with that of Ibn Abī 'l-Rijal in his *Kitāb al-barīᶜ fī aḥkām al-nujūm*:[95] "E la oppinion de Tolomeo e de los que con el se atorgan es que quando fuere en la .IX.ª casa e en la .VIII.ª, so atacir es contrario otrossi contra la orden de los signos. Mas los otros sabios non se atorgan en esto, si non que lo fazen derecho".

Al-Istijī also states that both Ptolemy's progressions (*tasyīrāt*) and projection of rays were made using oblique ascensions in the eastern horizon when the indicator is in the western quadrant of the sphere: near the western horizon the standard technique, in Maghribī astrology, is to use oblique descensions (equivalent to the oblique ascension of the opposite point). The oblique ascension method for the *tasyīr* is mentioned by Ptolemy in the *Tetrabiblos* III.10:[96] he says that it is the usual system but that it is correct only if the celestial body or the point of the ecliptic is on the Eastern horizon. The same method for the projection of rays is not mentioned by Ptolemy: Hogendijk (1998) has found it described in an appendix (probably a later interpolation) to the treatise on the use of the astrolabe by al-Khwārizmī (fl. ca. 830) and Casulleras (private communication) has discovered a possible reference to it in the *al-Qānūn al-Masᶜūdī* of al-Bīrūnī.

92 Kennedy & Krikorian-Preisler, 1972; Hogendijk, 1989.

93 Kennedy, 1994. There are two very recent papers on this topic: one, by Hogendijk (2005) deals with the exact mathematical method used by Ibn Muᶜādh; the second, by Josep Casulleras (2004) studies Ibn Muᶜādh's approximate method.

94 See Robbins, 1940, pp. 278-281.

95 Ed. Hilty, 1954, p. 175 a.

96 Ed. Robbins, 1940, pp. 286-287.

[24] Some of the Persians (*ṭā'ifat min al-furs*), however, used right ascensions in their projections of rays and *tasyīr*s.

The school of the Persians (*ṭā'ifa min al-Furs*) made their projection of rays and their *tasyīr*s using right ascensions ([24]). Nallino[97] considers that this probably means that, according to the Persian method for the projection of rays, one should obtain the right ascension of the planet or star, add to it or subtract from it the aspect (60°, 120°) and, then, obtain the inverse right ascension of that equatorial arc in order to determine the point of the ecliptic in which the rays will be projected. In [30], al-Istijī adds that if the rays of the planets are projected on the plane of the equator, right ascensions are preferable to oblique ascensions.

Hogendijk (1998) documents this method (for the projection of rays) in Andalusī sources, which ascribe it to the Persians: Ibn al-Zarqālluh (d. 1100) and Ibn Bāṣo (d. 1316)[98]. Casulleras, again, has found a possible allusion in al-Bīrūnī's *Qānūn*. As for the *tasyīr*, the right ascension method has been found by Hogendijk (1998) in a treatise on the astrolabe by Abraham b. ᶜEzra (ca. 1090-1167). Ptolemy[99] accepts it only when the significator is on the meridian.

[25] A third group (*ṭā'ifa*), composed by mathematicians (*muhandisūn*), once they understood from /Fol. 13 v/ their objectives (*aghrāḍ*) that their school (*madhhabu-hum*) converted the rays of the stars into arcs of the equator, did the same with the arcs of the *tasyīr*s, and identified this with a doctrine (*madhhab*) attributed to one of the Hermes. They wrote mathematical books on this topic which they published without giving any kind of proof or explaining why it is necessary to convert the star rays or the arcs of the *tasyīr*s into arcs of the equator.

This passage deserves a few comments: first of all the "objectives" (*aghrāḍ*) of the mathematicians might be - following what Ibn Muᶜādh al-Jayyānī states in his treatise on the projection of rays[100] - to establish a relationship between the division of the houses of the horoscope, the projection of rays and the *tasyīr*, on the one hand, and the daily motion which takes place on the plane of the equator, on the other[101]. A certain

97 Nallino, 1903, p. 312.

98 Puig, 1987, p. 82 for Ibn al-Zarqālluh; as for Ibn Bāṣo, see Calvo, 1993, pp. 199 (tr.) and 174 (Ar. text): the source of this passage seems to be the aforementioned text of Ibn al-Zarqālluh. See also pp. 92-93.

99 *Tetrabiblos*, ed. Robbins, 1940, pp. 288-289.

100 See Kennedy, 1994; Hogendijk, 2005(?); Casulleras, 2004.

101 This remark was made to us by Josep Casulleras.

confirmation of this hypothesis may be found in al-Istijī's own remark that the only reason for the projection on the equator was that the daily motion takes place around its poles ([30]). On the other hand, although the text does not explain which method is used by these mathematicians (the reference to the transformation of an ecliptic arc into an equatorial arc is too vague), the statement that it is a procedure ascribed to one of the Hermes leads us to conjecture an identification with a method which uses position circles or semicircles.[102] A position circle, called *al-ufq al-ḥādith* ("incident horizon") in Eastern sources (apparently the term was coined by Muḥyī al-Dīn al-Maghribī)[103] is a great circle which passes through the North and South Points of the horizon and through another astrologically significant point on the celestial sphere. The use of position circles coincides with the attribution to Hermes of methods or techniques based in them on Andalusian sources such as Ibn al-Zarqalluh and Ibn Bāṣo[104]. On the other hand, Hogendijk[105] has reminded us of the existence of an interesting astrolabe, made in Toledo in 1029-30, which includes two plates for the projection of rays for latitudes 38;30° (Cordova) and 42° (Saragossa?) with position circles which intersect the equator at 6° intervals[106]. To this one should add the use, by Maslama al-Majrīṭī, of the four position circles method for the approximate computation of tables for casting the rays in his revision of al-Khwārizmī's *zīj*:[107] the same method was presented by Ibn Muᶜādh al-Jayyānī. Furthermore, Maslama's disciple, Ibn al-Samḥ, used position circles intersecting equal 30° divisions of the prime vertical for the computation of the houses, though not, apparently, for the *tasyīr* and the projection of rays. These latter references account for al-Istijī's allusion to the mathematicians in the Andalusian context.

[26] As for Muḥammad b. Jābir al-Battānī, he saw the errors of that school concerning the projection of rays. [This is why] he ignored it and did not pay any attention to it. Instead of this he followed, in this topic, the rules of demonstrative law (*al-qānūn al-burhānī*) and operated with ecliptic degrees (*daraj al-sawā'*) in the projection of rays when the planets and the stars (*al-kawākib*) did not have any ecliptic latitude. When the

[102] Hogendijk, 1998, § 6.1.

[103] See Kennedy, 1996, pp. 555-556 and Dorce, 2002-03, pp. 63-76.

[104] Puig, 1987, pp. 85-86; Calvo, 1993, pp. 90-93, 201-202 (tr.), 178-181 (Ar.).

[105] Hogendijk, 1998, § 3.1.3.

[106] Woepcke, 1858. Position circles passing through the endpoints of 30° divisions of the equator in an astrolabe plate designed for the equalization of the houses, *tasyīr* and projection of rays are described by al-Bīrūnī and by the *Libro del Ataçir* of the Alfonsine *Libros del Saber de Astronomía*: cf. Viladrich & Martí, 1983 and Samsó (1996) pp. 591-594.

[107] Hogendijk, 1989 and 1998, § 4.6.

celestial body has latitude, then the two trines and the two sextiles diverge on the ecliptic. In that case, he explained a method of computation which allowed him to know the sextile and the trine on the ecliptic when the star or the planet has ecliptic latitude. This chapter of his book is one of the most brilliant and extraordinary things.

Al-Istijī refers here to chapter 54 (projection of rays) of the *zīj* of al-Battānī (d. 929).[108] This is the first passage in which he quotes this *zīj* (see also [28] and [31]) - a work which had circulated in al-Andalus since the time of Maslama al-Majrīṭī and which had been used for the compilation of the *Toledan Tables*[109]. The method used by the Eastern astronomer for the projection of rays of a planet with no latitude is the simple ecliptical method. If the planet has latitude but we want to project its rays in a right or left quadrature, the projection will always be 90°. In the case of the trine or the sextile, the procedure used is a refinement of the simple ecliptical one and it appears in other Eastern astronomical sources:[110] the planet is one of the vertices of a spherical right-angled triangle in which the hypotenuse is an arc of a great circle the length of which equals the aspect (60° for the sextile, 120° for the trine) and which unites the planet with the ecliptic, while the two other sides are the latitude of the planet and the length (on the ecliptic) of the projection which we want to know. Two sides being known, the third one can be determined.[111]

[27] As for me, I feel somewhat surprised by those who ascribe to the rays of stars and planets twists and deviations on the sphere due to the inclinations of the horizons and consider that such inclinations cause an effect on the configurations (*ashkāl*) of celestial bodies on the sphere, that is on their mutual positions. These are people who ignore the category (*martaba*) of the sphere and its natural conditions (*aḥwāl*), as well as the motion [of such conditions] following their own natural objective, the position some of them occupy in respect of the others, and the fact that the changes they produce in this world are not due to their own intentions but to the effect of their motions and the different configurations they

[108] Nallino, 1899, p. 197; Nallino, 1903, pp. 131, 307-309.

[109] Ṣāᶜid, *Ṭabaqāt*, ed. Bū ᶜAlwān pp. 142-143; tr. Blachère p. 111-112.

[110] Kennedy & Krikorian-Preisler, 1972, pp. 375-376; Hogendijk, 1998, § 4.1.

[111] Al-Battānī's Arabic text seems corrupt and Nallino has made a very reasonable attempt to correct it, based on the assumption that al-Battānī is using the same procedure as in chapter 26 of his *zīj* (how to find the distance between two stars or planets, one of them on the ecliptic, while the other has latitude). Here the distance (60° or 120°) is known and we must find the difference of longitudes.

present due to their mutual positions.

In agreement with what al-Istijī says in [30] (right ascensions being preferable to oblique ones), he seems here to criticise the use of oblique ascensions for the computation of the *tasyīr*. The influences of the heavenly sphere do not depend on the local latitude. Stars and planets adopt certain *ashkāl* (figures, configurations, aspects) due to their relative positions on the sphere and such *ashkāl* bear no relation to the inclination of the local horizon.

[28] In this respect, Muḥammad b. Jābir al-Battānī also followed the opinion of those people on the *tasyīr* and operated with it (*ṣannafa-hu*) in an approximate way. The cause of his [error] was his lack of knowledge of the meaning of *tasyīr* and the fact that he had done little research into its causes and objectives.

Al-Istijī refers here to chapter 55 (*tasyīr*) of al-Battānī's *zīj*[112] in which the Eastern astronomer uses, for the *tasyīr*, the hour line method, which Ptolemy (*Tetrabiblos* III, 10,)[113] considered an approximation to the position semicircle method, and calculates an arc on the equator and not - as in the case of the projection of rays - on the ecliptic. These two facts agree with al-Istijī's words which point to the approximate character of al-Battānī's method (approximate in relation to the exact computation according to the position semicircle method). Al-Istijī's harsh criticism of al-Battānī, compared to his praise ([26]) of his method for the projection of rays, shows that he favours the computation of both *tasyīr* and projection of rays on the ecliptic: the use of the equator is considered an error. As Hogendijk[114] has remarked, Ibn Bāṣo[115] attributes to al-Battānī a method for the computation of the *tasyīr* which is a simple variant of the one he uses for the projection of rays and we may wonder whether there was an Andalusian tradition which, in agreement with al-Istijī's view of the problem, ascribed to al-Battānī a method for the *tasyīr* which was extrapolated from his procedure for casting the rays.

[29] This, in spite of the fact that all ancient authors, in olden times, had established the fundamentals of astrology and fixed the mutual configurations of planets, because they concur in their indications on the existence of a particular effect. This takes place when they present one of

[112] Nallino, 1899, pp. 198-203; Nallino, 1903, pp. 131-134, 313-317. See also Yano & Viladrich, 1991, p. 7.

[113] Ed. Robbins, 1940, pp. 291-305.

[114] Hogendijk, 1998, § 3.1.5.

[115] Calvo, 1993, pp. 199 (tr.) and 174 (Ar.).

the aforementioned configurations which are the conjunction, the two quartiles, the two trines and the two sextiles. They declared their judgement, based on this [the aforementioned configurations], in interrogations (*masā'il*), particular elections (*ikhtiyārāt*)[116], and [also] on the application (*ittiṣāl*) of the Moon to the planets, and discovered indications which are always true. All this in spite of the fact that I say that there is no evidence that a single [astrologer] - about whom we have information or know the methods he used for casting his predictions - has used an experiment (*tajriba*) to justify and verify his predictions with the exception of interrogations, elections and the general conditions of nativity horoscopes (*naṣb*) which have been observed (*marṣūda*). All other things are corrupt (*fāsid*) due to the bad quality (*fasād*) of the *zīj*es. Among these [corrupt predictions] we find all kinds of anniversary horoscopes, the measurement of applications (*maqādīr al-ittiṣālāt*) due to the variation in the [mutual] distances of the planets, because they calculated them in inaccurate positions, especially in several kinds of applications which give an indication on a nativity or another kind [of prediction], related to the slow [motion of a planet], as well as many other things /Fol. 14 r/ concerned with the knowledge of astrological lots (*sihām*). They state, in nativity horoscopes, that the Moon is in quartile or trine aspect with such and such a planet, that every planet presents such and such a configuration being in aspect with another one, and that the result of all this is fortune or misfortune.

Ancient astrologers agree on the general consequences of the *ashkāl* (here clearly identified with aspects) for interrogations and elections. These kinds of astrological predictions, together with nativity horoscopes, are the only ones which have been studied from the point of view of "experience" (see [3]). The reference to *observed* nativity horoscopes seems to be related to the determination of the exact moment of birth by astronomical observation: we will see later ([34]-[35]) that al-Istijī is particularly interested in nativity horoscopes based on the technique of the *animodar* (computation of the moment of the conception of the newborn). This kind of horoscope can be considered to be generally reliable if the *zīj* used was sufficiently precise, which is not the case in most instances. Astrological predictions cannot be accurate if the planetary positions and the division of the houses of the horoscope have not been computed with an adequate *zīj*. The situation may be particularly delicate when the motion of a planet is slow. On this topic (*zīj*es and the possible references of al-Istijī to the *Toledan Tables*) see above § 1.2.2.

[116] In distinction to "general" elections, and refering to chosing the best times for particular activities.

[30] Their prediction is considered to be true. If they had considered those configurations having in mind the projection of rays according to their school, their mutual relations [of the planets] would not justify their predictions, both the corrupt and the adequate ones. We should also consider that, if the rays of the planets were projected on the equator, the projection of rays should not be counted in degrees of oblique ascension, but in degrees of ascension in the horizon of the equator, no matter whether the rays are deviated towards the north or the south, for in the case of such deviation, the rays will be projected on a circle parallel to the equator. In fact, we should say that this school has no argument to maintain this pretension other than their remark that the motion of revolution in right [ascension] (*al-ḥaraka al-dawriyya al-mustaqīma*) takes place around the two poles of the equator and that the sphere of the equator is the one that transmits this equal motion to all the other [spheres], this being the reason for the projection of rays on the zone (*minṭaqa*) of the equator and according to its rotation. The result of such ideas is what I have already mentioned: the rays, which are on the sphere [of the signs] and the dimensions of their arcs measured on the ecliptic, [are projected] according to the ascensions of the signs for the horizon of the equator. One could ask these people how should we operate when we want to project the rays of a celestial body in latitude. In their opinion they consider that a star or planet projects its rays in latitude on only one circle, either on the zone (*minṭaqa*) of the right sphere, if the celestial body is on it, or on a circle parallel to [the equator]. Then the ray is reflected (*yanᶜaṭif*) from this line [the parallel circle?] towards the zone [*minṭaqa*, i.e. the plane of the equator] and towards the plane of the ecliptic, right and left. Nobody with a knowledge of mathematics or physics can imagine how the configurations (*ashkāl*) affecting the rays of stars and planets can agree with their opinion and produce angles and changes in the direction. All this is pure nonsense and error.

On the use of right ascensions instead of oblique ascensions see above [27]. As in [32] below. Al-Istijī seems here to argue on cosmological grounds: in [19] he ascribed to the same sphere the daily motion of 360° from East to West and the motion in accession and recession. He speaks here (according to those who favour the projection of rays and *tasyīr* in the plane of the equator) of a "sphere of the equator" (ninth sphere?), also mentioned in [32] together with a "sphere of the ecliptic" (eighth sphere?), the former being responsible for the daily motion of the universe, transmitted to the inner spheres. On the projection of rays of a celestial body having latitude, one should bear in mind that the systems for such projection used both by al-Khwārizmī and Maslama al-Majrīṭī (the same could be said of Ibn Muᶜādh) only consider celestial bodies with zero latitude. As for the projection of rays of a body with latitude on a circle parallel to the equator,

al-Istijī's allusion reminds us of the procedure for the *tasyīr* explained by Ibn Abī 'l-Rijāl in the *Kitāb al-Bārīᶜ*,[117] in the Hyderabad recension of Ibn Isḥāq's *zīj*,[118] as well as in Abū ᶜAbd Allāh al-Baqqār: an approximate value for the declination of the star or planet is found by adding algebraically the latitude of the celestial body to the declination of its ecliptic degree of longitude ($\delta_g + \beta$). Then we find the ecliptic degree whose declination equals $\delta_g + \beta$. This determines the point of the ecliptic which we should use as the second indicator when *tasyīr* is involved, because it rotates on the same *majrā* as the star or planet.

[31] The correct projection of rays consists in imagining the body of the planet or star on the surface of the sphere and tracing on it a great circle which passes through the centre of the body of the planet and divides the sphere in two halves. Then we divide this circle into an arbitrary number of parts and take the sixth part of this number or the sixth part of that circle, the result being the sextile of that planet, in any of the directions of the sphere. The same technique can be applied to the trine, taking a third part of the circle, or to the quartile, with the fourth part of the circle. The figure of the quartile will be formed by great circles because it is the half of the opposition, which divides the sphere into two halves. Only this opinion can be accepted by imagination and intelligence and this is what we have found to be influential both in partial and in general predictions.

This description of the "correct method" for the projection of rays is too vague: an infinite number of great circles will pass through the centre of the body of the planet or star. Al-Istijī seems to refer to the method used by al-Battānī ([26]): when the planet or star has no latitude (i.e. it is placed on the ecliptic), the great circle in question will be the ecliptic itself on which we will take the arcs of 60°, 90° or 120° corresponding to the *tasdīs*, *tarbīᶜ* and *tathlīth*. When the planet or star has latitude, the point in which the rays are projected must be on the ecliptic. As we know the longitude and latitude of the star or planet and the distance between it and the point of the ecliptic in which the rays will be projected (60° or 120°) the problem is to find the longitude of that point. The method used by al-Battānī is equivalent to a simple application of the cosine law which appears in Bīrūnī's *Maqālīd*[119] (attributed to al-Battānī and al-Ṣūfī) and in chapter 52

[117] Sp. translation ed. by G. Hilty (1954), pp. 175-176.

[118] Mestres (1996), p. 404. We are also using A. Mestres' unpublished Ph.D. dissertation which includes an edition of the Arabic text and a detailed commentary of the canons of this recension.

[119] Debarnot, 1980, pp. 268-269.

of the Alfonsine *Libro de las taulas*[120] (attributed to al-Battānī also). Canons Cb and Cc of the *Toledan Tables*[121] follow the tradition of al-Khwārizmī-Maslama, which uses projections onto the equator and does not consider a planet or star with latitude.[122]

[32] As for those who obtain the arc of *tasyīr* from an arc of the equator they are people who drop from this science the indications furnished by the ecliptic and do not ascribe to it any power or influence. All philosophers ascribe such indications to it [i.e. the sphere of the signs]. This is the most clear and obvious idea we can obtain and it derives from the strength of what we have already said in this book of ours. We will not find in any of /Fol. 14 v/ the outstanding philosophers any attribution of indications - about changes which take place in persons (*ashkhāṣ*) and other kinds (*anwāᶜ*) [of beings] - to the sphere of the equator. The only purpose of the calculation of ascensions is to know the times of night and day in any place and the amount of rotation of the sphere since a given moment in order to obtain the ascending degree of the ecliptic - which is the result and the application they seek if they are clever enough to understand it - and to establish also the tenth and fourth cusps. These people, however, considered that the result (*natīja*) was a premise (*muqaddima*), they inverted the idea, went astray (*ḍallū*) and led other people astray from the right path (*aḍallū ᶜan al-sabīl*). They also measured the times in all kinds of predictions ascribing one year to each degree and proceeded along this line against the requirements of the laws of nature (*qānūn ṭabīᶜī*) and scientific reasoning (*qiyās ᶜilmī*). They also established that the portion (*ḥiṣṣa*) [of time] which corresponds to one degree in the *tasyīr* of the ascendent of an anniversary is one month. It is obvious that, in this [equivalence], there is limitation, error and ignorance, for the *tasyīr* of the ascendent of the newborn will not reach the fourth cusp in most cases and the [*tasyīr* of the] ascendent of the anniversary will not exceed, according to their pretension, twelve degrees. Let us forget this absurdity that does not have any meaning and is not supported by any experience (*tajriba*).

See above [14], where he has begun his defence of the computation of the *tasyīr* on the

[120] Chabás & Goldstein, 2003, pp. 91-92, 222.

[121] Ed. F.S. Pedersen, 2002, pp. 474-475, 676-677.

[122] Cf. Kennedy & Krikorian-Preisler, 1972; Hogendijk, 1989.

plane of the ecliptic. On *tajriba* see [3]. As in [30], our author argues on cosmological grounds: the sphere of the ecliptic is, probably, the eighth sphere, the sphere of the fixed stars, on which sidereal longitudes are computed, and one must bear in mind that the astrological tradition which predominated in al-Andalus and the Maghrib was based on sidereal astrology. The sphere of the equator is, also probably, the ninth sphere, which is starless, on which tropical longitudes are calculated and which has no significance for Maghribī astrologers. Regardless of the fact that *tasyīr* techniques intend to calculate time, and that time is computed on the basis of rotations on the plane of the equator, al-Istijī considers that such rotations are only important when fixing the time for the calculation of the ascendent and the division of the houses. His criticism of the computation of the *tasyīr* on the plane of the equator is particularly harsh due to the Qur'ānic expressions he uses: "led other people astray from the right path" (*aḍallū ᶜan al-sabīl*).See *Qur'ān* 4:44; 5:12,60,77; 6:116,117; 10:88; 14:30; 22:9; 25:17,34,42,44; 33:67; 38:26; 39:8; 53:30; 60:1; 68:7. He is also critical of the units used for the calculation of time (1° per year and 1° per month)[123]: in a nativity horoscope, if we consider 90° as an approximate distance between the ascendent and the fourth house, a *tasyīr* of the ascendent of 1° per year will require 90 years to reach house IV and this exceeds the mean length of human life; on the other hand, in an anniversary horoscope, the *tasyīr* of the ascendent based on a time equivalence of 1° per month will only reach 12° from the ascendent in one year. Besides, these velocities for the *tasyīr* do not agree with the standard equivalences used in the different *tasyīr* periods he has mentioned (see, for example, [22] for events which affect human life).

[33] I say that the reason behind their disagreements and changes of opinion, both correct and incorrect, is due to the fact that they discovered influences which contradicted what they themselves had established in their principles. Then they imagined what we have mentioned as a result of things which became true as a result of sheer coincidence and they based themselves on this. Then they changed from one school into another and this increased their discord and divergences. They found that influences contradicted their principles due to the errors of their *zījes* and the fact that the positions of planets did not agree with the hidden places they actually occupied.

Now, thanks to God, we have finally perfected our knowledge of the reasons (*ᶜilal*) behind the motions of heavenly bodies and we know the causes which lead to their irregularities (*ikhtilāf*). We have thus acquired an authentic knowledge which our predecessors - about whom we have information and whose reputation has reached us - did not have. We have checked their *tasyīr*s and projection of rays according to their opinions

[123] Ibn Abī'l-Rijāl (ed. Hilty, 1954, p. 175) mentions 1° per year for the *tasyīr* of the ascendant for the computation of the length of the life of the newborn, and 30° per year for the "revolutions" (*taḥāwīl al-sinīn*).

and schools without finding any significant changes. We have found that the *tasyīr* for the periods of time mentioned in this book of ours and using the method we have described - I mean with ecliptic degrees - gives the most reliable, clear and evident indications. We have studied them for the different kinds of astrological predictions - I mean the *tasyīr*s for states, religions, horoscopes (*ṭawāli*^{c}) of the accession to power of kings and anniversaries - obtaining out of all this a set of very clear results which are wonderful and an extraordinary science.

On the good results obtained by the Toledan team in their analysis of the irregularities in the motion of planets see above [2] and § 1.2.2 (on the *Muṣaḥḥaḥ Zīj* and its problematic identification). Al-Istijī insists here on the importance of astrological experience (see [3]) and states that he has checked his doctrine on *tasyīr*s and projection of rays against known historical results related to states, religions, horoscopes of the accession to power of kings and anniversaries. This list complements another given in [29]: ancient astrologers have checked their results in interrogations, elections and "observed" nativity horoscopes (not animodar, on which see below [34]- [35], or in anniversary horoscopes).

[V. *Use of the animodar for the computation of the ascendent of a nativity horoscope*]

[34] Glory and gratitude to God for the precious and marvellous benefits he has given us and because he has bestowed upon us the inspiration which has led us to perform research on the animodar which allows an accurate computation of the degree of the ascendent of the newborn which is the basis (*al-aṣl*) and the most obvious *haylāj* (*al-haylāj al-qā'im*). The *tasyīr* derived from it is called *al-jānbakhtār*. The lots (*sihām*) are projected from it and their precise positions are known from it, as well as the configurations (*ashkāl*) of the heavenly bodies. The horoscope (*ṣūra*) of the animodar for us, as we have already said in this book, is based on the fact that one of the cusps of the nativity horoscope is equal to the degree of the planet which dominates (*al-mustawlī*) the conjunction or opposition which took place before the nativity. We record this /Fol. 15 r/ together with the animodar of the falling of the drop [of sperm] (*masqaṭ al-nutfa*) in case we have been unable to determine, by observation, the ascendent of the nativity or if the birth has taken place during the night and the cusps have a number of degrees which is very similar as it happens to the signs and degrees near to the two equinoxes when they are ascending. There is sometimes a delay in the observation, the cusps are similar; one cannot determine, then, the degree of the ascendent correctly

by observation and it is necessary to use the procedure of the animodar of the fall of the drop [of sperm]. We have written a clear epistle on this topic. These two animodars do not coincide when they are computed with any of the extant *zīj*es, with the only exception of our corrected *zīj* (*zījunā al-muṣaḥḥaḥ*). This is due to the precision with which it calculates the position of planets, the correct results obtained for the lunar longitude and the correctness of its equation.

Here al-Istijī refers to another astrological technique: the calculation of the animodar, on the subject of which he states that he has written an epistle. Its purpose is to obtain the ascendent at the moment of a nativity, the main difficulty being that of determining the hour of birth which can be established, in daytime, using a sundial, although Ptolemy (*Tetrabiblos* III,2)[124] emphasises the errors in which practitioners of astrology might incur when they use solar instruments (such as sundials) or water clocks. The difficulty increases during the night. The allusions of our text to observational techniques used to establish the position of the cusps seem doubtful, for the longitude of the cusps was normally obtained by calculation, using a *zīj*, and knowing both the latitude of the place and the hour of the day or night.[125] If the ascendent coincides with one of the equinoxes, the arcs between the cusps amount to 90° and each house of the horoscope will have a length of 30° in most techniques of domification. This explains al-Istijī's remark ("the cusps have a number of degrees which is very similar as it happens with the signs and degrees near to the two equinoxes when they are ascending"), although we do not understand the reference to the difficulty of observing the positions of the cusps. All this explains the use of indirect techniques for establishing the longitude of the ascendent such as the animodar. In [6] he has already mentioned Ptolemy's method (*Tetrabiblos* III.2)[126]: the distance of the ascendent (one of the cusps according to al-Istijī, and other Arabic astrologers) from the beginning of its sign (it is easy to observe the ascending sign during the night) equals the distance, also from the beginning of its sign, of the planet which dominates the horoscope of the conjunction or opposition of the Sun and Moon which took place before the nativity. His reference to the animodar of the fall of the drop (of sperm) seems to be related to a second technique, ascribed to Hermes, for the calculation of the animodar: the lunar longitude at the instant of birth is the ascendent at the instant of conception; conversely, the lunar longitude at conception is the ascendent of the nativity. Thus, if the moment of birth is known approximately and the duration of pregnancy can be established[127], the astrologer can easily calculate the lunar longitude at the moment of conception and, consequently, he

[124] Ed. Robbins, 1940, pp. 229-235; see Kennedy, 1990, pp. 139-144.

[125] On the problem of the determination of the ascendent see Kennedy, 1990.

[126] Ed. Robbins, 1940, pp. 228-235.

[127] The problem of the duration of pregnancy is studied thoroughly by Ibn al-Kammad (fl. Cordova, 1116): see Vernet, 1949.

will also know the ascendent of the nativity. This procedure takes advantage of the fact that the daily rotation of the earth, which determines the longitude of the ascendent, is much faster than the motion of the Moon.[128] Al-Istijī has apparently used the two animodar techniques and he has only obtained the same results when using the mysterious "corrected *zīj*" (see § 1.2.2). This is one of the arguments he will employ to validate this work. On the *janbakhtār* see [16].

[35] We have experimented on this with many nativities observed [by us] and with other, useful, nativities which had been observed [by others]. This practice of ours met with an abiding success. Then, we used this technique with other nativities whose data were not reliable (*mukhammana al-ḥirz*), we applied the *tasyīr* and we obtained the most exact and evident indications as well as the clearest influences. In many nativities we found important differences between the degrees of the ascendents found [in the horoscopes] and the correct degrees of the ascendents. We obtained with this many results which would take too long to comment on and explain here. To prove that our method is correct [seems unnecessary] because its validity is shown by things which happen necessarily. I do not consider correct[129] most of the nativities computed by several astrologers. This is one of the reasons for the introduction of errors in their method, but they pronounce judgements based on them. I have only found a few among them who come near to the truth. In others, I have discovered errors of almost a sign or amounts of this order. This is why the ancients fall short of the truth when they evaluated the validity of this animodar and its agreement with the animodar of the [planet] which governs the aforementioned conjunction or opposition. [Add to this] what has already been said about the errors and wrongness of *zīj*es and the curious ignorance of many professional astrologers about the lot of Fortune (*sahm al-saᶜāda*).

This passage underlies what seems to have been al-Istijī's main interest: the use of the technique of animodar to compute the ascendent of a nativity. His critical approach to astrology has led him to analyse horoscopes cast by other astrologers and to compare the ascendent calculated directly with the ascendent he obtains with the two animodars. On the other hand he has "experimented" with this technique, which probably means that he has checked his predictions against the real events in the life of the subjects of his

[128] Kennedy, 1990, pp. 140-141.

[129] *Ṣaḥīḥat al-dihān* in the MS which does not seem to make much sense. This is why we have corrected it to *ṣaḥīḥat al-burhān*.

horoscopes. He finally insists on the errors of *zījes*. On the Lot of Fortune see below [36].

[36] Abū Maᶜshar, in his book *Great Introduction to Astrology*, mentioned this when he said: "The lot of Fortune is the ascendent of the Moon. This means that when you multiply the number of hours elapsed of the day by the time-degrees of one hour and subtract this amount from the position of the Moon, the resulting number will intersect the position of the lot". Abū Maᶜshar al-Balkhī [also] said on this: "I have checked (*jarrabtu*) this and I have found results which are near to what they [= the ancients] said" although if the control was made (*law jurriba*) in some places of the ecliptic when they are ascending, the results obtained would be very different. On this topic I wrote in a margin of his book: "If you had done this with ecliptic degrees[130], you would have obtained a correct and truthful result". To explain this: if you take the distance in ecliptic degrees between the Sun and the degree of the ascendent and subtract the amount from the position of the Moon, on the ecliptic also, the resulting number would correspond to the position of the lot of Fortune. There are some who do not realize that if the Sun is in midheaven and the Moon is in the eleventh house, if you take the arc comprised between the position of the two and add it to the position of the ascendent, the distance of the Sun from the ascendent is equivalent to the distance of the Moon from the end of this arc which is the arc of the lot of Fortune. All the lots are calculated in a similar way and this is something so obvious that nobody having intelligence and capacity for comprehension can ignore it.

The passage from Abū Maᶜshar's *Madkhal Kabīr*, quoted non-literally here, can be found in a footnote to the edition of al-Istijī's *Risāla*.[131] Actually Abū Maᶜshar gives this procedure for the computation of the Lot of Fortune, as something he ascribes to other unknown astrologers, probably "the ancients", although he has checked it and established that it gives results which are, sometimes, near the actual position of the Lot (*wa rubbamā waqaᶜa qarīban min dhālika 'l-makān*). The method establishes that one should subtract the time-degrees corresponding to the number of hours elapsed since sunrise directly from the lunar longitude (Abū Maᶜshar states, and this has been omitted by al-Istijī, *bi 'l-daraj al-sawā'*, in ecliptic degrees). The expression "ascendent of the

[130] *bi-daraj al-sawā'* usually means, in Maghribī astronomy, "in ecliptic degrees", although here it would make more sense to interpret "equatorial degrees".

[131] Lemay, 1995-96, III, 620.

Moon" appears in Ptolemy's *Tetrabiblos* (III, 10)[132] where it is explained by the fact that the Moon is distant from the Lot of Fortune by the same number of ecliptic degrees as the Sun from the ascendent. The same explanation is given here by al-Istijī. The standard procedure, in the simple expression appearing in the *Tetrabiblos* (III, 10)[133], is explained by al-Bīrūnī:[134] *s* being the longitude of the Sun, *m* that of the Moon and *h* the longitude of the ascendent, the Lot of Fortune (*Lf*) will be:

$$Lf = h + (m - s)$$

which is equivalent to al-Istijī's formulation (*m - (s - h)*). Al-Bīrūnī also mentions Abū Maᶜshar's second procedure, which can be formulated as:

$$Lf = m - d$$

in which *d* corresponds to the rotation of the sphere since sunrise expressed in time degrees. The logic of this expression is based on the assumption that:

$$d = s - h$$

which would be true if *h* and *s* were measured on the equator instead of being ecliptic longitudes. Ecliptic points cross the horizon at variable rates and this explains both Abū Maᶜshar's remark "I have found results which are near to what they said" (in some instances the approximation might be good enough) and al-Istijī's criticism: "if the control was made in some places of the ecliptic, when they are ascending, the results obtained would be very different".

[VI. *The author insists on the need to compute the* tasyīr *on the ecliptic*]

[37] I see that they require [the use of] the ascensions of the signs which are /Fol. 15 v/ the periods of time determined by rotation, in their displacement, and make serious efforts in this regard, even in the most obvious things. One is led to believe that, in these situations, the errors are due, in most of the cases, to the translators who have been unable to write a single correct sentence. Maybe the ancients mentioned the rotation of the sphere, in their own language, meaning the sphere to which [astrological] judgements are referred, which is the ecliptic, but the translators translated this as the rotation of the equator. This is also mentioned by Aḥmad b. Yūsuf al-Kātib when he deals with proportion (*nisba*) and proportionality (*tanāsub*) and, concerning proportion, states that the errors introduced in that concept were the responsibility of

[132] Ed. Robbins, 1940, pp. 276-277.

[133] Ed. Robbins, 1940, pp. 275-277. Abū Maᶜshar (Lemay, 1995-96, III, 619) gives a more elaborate definition of the Lot of Fortune, making it depend on whether the horoscope is cast by day or by night. The same procedure is explained in other sources such as Kūshyār b. Labbān (see ed. Yano, 1997, pp. 62-63) and al-Bīrūnī himself.

[134] Haddad, Pingree & Kennedy, 1990, pp. 18-23, 43-45.

translators. The same can be said about the sign of the limit (*burj al-muntahā*): [the astrologers] neither explained how to use it nor considered the degree of the limit (*darajat al-muntahā*) and its *tasyīr* for the rest of the year, with the sole exception of al-Khaṣībī. They used the sign of the limit instead of the ascendent of the anniversary, without paying attention to the moment in which it reaches the lights of the celestial bodies, both in the radical and in the anniversary horoscope, and to which planet belongs the term (*ḥadd*) reached by its *tasyīr*, I mean the *tasyīr* of the degree of the limit. They did not ask themselves how to calculate this *tasyīr*, why the degrees of the ascensions are not used for it, what is the difference between the *tasyīr* of the sign of the limit, in ecliptic degrees, and the *tasyīr* of the ascendent and of the *haylāj*, in ascensional degrees, and why one method is used in one case and another method, of a different kind, in the other. According to them, these are some of the strong similarities from which they obtain indications about the arrival of the *haylāj* to the lights and bodies [of the planets] and which they use as the most solid foundation for the different kinds of predictions.

Here al-Istijī insists, once more, on the use of simple prorogations on the ecliptic, instead of finding the corresponding equatorial ascensions and working with them (see above [14], [23]-[28], [30]-[32]). The reference to equatorial prorogations in ancient sources may be due to errors of the translators. A similar remark can be found in an earlier Andalusian source: the *Taṣrīf*, the great medical encyclopedia written by Abū 'l-Qāsim al-Zahrāwī (d. ca. 1013), who complains of the incomprehensible works of the Ancients.[135] Aḥmad b. Yūsuf al-Kātib (d. 941) alludes to the errors of translators in his book "On proportion and proportionality" (*Fī 'l-nisba wa 'l-tanāsub*). This work is quoted both by al-Istijī and by Ṣā^{c}id[136]. Our author also complains of the fact that astrologers only consider the "sign of the limit" and do not give due consideration to the "degree of the limit": as he has already said in [18], only al-Khaṣībī (quoted above in [18]) has been careful in this respect. As we have seen in [12]-[14], [18] and [22], the "sign of the limit" or "sign of the cycle" (*burj al-dawr*) is a period which progresses one sign per year and it corresponds to the "small world *intihā'*" of Eastern astrologers. Finally al-Istijī refers to the inconsistency of prorogating this "sign of the limit" (like the rest of the *intihā'*s, see above [9]) on the ecliptic, while using equatorial methods for the *tasyīr* of the ascendent (see [18]) or of other *haylāj*s.

[38] I do not know whether they have any argument which makes them

[135] Hamarneh & Sonnedecker, 1963, p. 37.

[136] Ṣā^{c}id, *Ṭabaqāt*, ed. Bū ^{c}Alwān p. 146; tr. Blachère p. 113. See Suter, 1900, no. 78 (pp. 42-43). See *G.A.S.* V, pp. 288-290; VII, p. 157.

abandon this pretension. I am always astonished by the kind of confusion I find in their books. The cause for all this is the ignorance of those who practise astrology and of the authors of books dealing with this subject, for those who have a penetrating intelligence and outstanding brains were interested, in past times, in the art of computation (*taqwīm*) which deals with the exact calculation (*taᶜdīl*) and the knowledge of the exact positions of planets. When they discovered errors in this, they abandoned this practice and were no longer interested in it. They lacked therefore the necessary instruments with which they could check those things required by physical theory (*al-naẓar al-ṭabiᶜī*) and philosophical analogy (*al-qiyās al-falsafī*). In the same way God structured (*hayya'a*) [the universe] placing planets in their correct positions, which teach us, first, the animodar, verify it for us, give us true values for the *tasyīr*s, guide us towards them and identify the experiences (*tajārib*), confirming some of them and rejecting others, it is convenient to establish that, in these animodar and *tasyīr*, there are indications that confirm the correctness of the *zīj* we are using. Even those who are ignorant of the science of cosmology (*ᶜilm al-hay'a*), of the motions of planets (*ḥarakāt al-kawākib*) and of the fundamentals of demonstration leading to its verification, have elements which confirm its validity and clarifies its veracity for them.

Al-Istijī implies here that the astrologers of his time seem to have lost interest in the scientific aspects of their discipline, the main one being the precise computation of the planetary positions. A similar remark can be found in the treatise on the projection of rays by Ibn Muᶜādh al-Jayyānī,[137] although the latter insists mainly on the mathematical problems involved in the division of the houses and calculation of the *tasyīr* and the projection of rays. Here al-Istijī could be referring to the astrologers' use of approximate methods for the computation of planetary longitudes based on perpetual almanachs[138] or on equatoria[139]. These methods do not offer anything like the precision that can be obtained with his *zīj* (see above § 1.2.2). We also find, once more, a reference to the importance of experience in astrology ([3]).

[VII. ***Conclusion***]

[39] Thus, if a nativity is observed and its horoscope is cast using the

[137] See Casulleras, 2004, and Hogendijk, 2005.

[138] Samsó, 1992, pp. 166-171.

[139] Comes, 1991.

aforementioned *zīj*, and the period of pregnancy (*makth*) is determined and the animodar of the falling of the drop [of sperm] is calculated and compared to the animodar produced by the [planet] which rules the degree of the conjunction or opposition [of the Sun and the Moon] which took place before the birth, you will be able to see marvellous magic and [will feel] an enthusiastic joy due to the ignorance of the [astrologer] who follows uncritically the opinion of others, because he is unable to distinguish what is false from what is true in all this. In the same way, if you prorogate the degree of the ascendent of a nativity at a later date of the life of the subject, and you prorogate its *haylāj* /Fol. 16 r/, the Lot of Fortune, or some degrees of the houses [of his horoscope] and their corresponding lots, according to the aforementioned sequence, you will obtain general and most probable information about his years of distress and happiness. You can, then, warn him of what you see will happen to him in the near future. This will be the end of the pretensions of those who persist in their obstinacy and ignorance.

Conclusion: everybody should prorogate using this *tasyīr* for long periods of time; in order to correct the degree of the ascendent one should use the two aforementioned animodars; the exact positions of planets should be computed using the *zīj* already mentioned. God willing, you will, then, attain a correct result.

We implore from Him who has in his hands good and favour to increase his grace on us and on you, to make both reach a degree [of perfection] that allows us to approach Him and come nearer to Him. H e is most good and generous.

This is the end of the epistle of Abū Marwān al-Istijī. Glory to God to Whom it belongs. Blessings and peace on Muḥammad, his Prophet and Messenger, as well as on all his prophets.

This final passage does not offer anything new except a confirmation of the fact that al-Istijī seems to be mainly interested in casting horoscopes related to the life of individuals. On the other hand he insists, once more, on a critical approach to astrology. He seems to mistrust the direct computation of the ascendent and favours the technique of animodar, by comparing the results obtained with the two different methods in use. He also wants to check the actual events in the life of the subjects of his predictions against his astrological judgements and insists on the use of the *zīj* he has been talking about.

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3 Edition of the Arabic text

\ و. ٩ ظ.\ بسم الله الرحمان الرحيم ـ صلّى الله على سيّدنا محمّد وعلى آله وصحبه وسلّم

[1] أطال الله بقاء الوزير الجليل القاضي أبي القاسم سيّدي وأعلى عددي وأنفس ذخائري لأبدي وأسمى من وصلت به يدي وادّخرته ليومي وغدي وأجزل فيما وهب له من جزيل الحظّ في العلم وزاده بسطة في النباهة والفهم وقرن سعيه بالغبطة في جميع أحواله وبلّغه منتهى أراجيه وآماله.

وبعد أعزّك الله فيعلم الله تبارك اسمه أنّي لائم لزمن أوجب فقد الأنس بك والاستمداد من مادّة فهمك والاستيضاء بنور علمك وأنّي وإن كنت نائيا عنك بجسمي فإنّك الممثل في خاطري ونفسي. والله بجميل صنعه يكمّل العادي عندي بقربك ويمنّ بالاجتماع بك وطول البقاء بحضرتك بمنّه.

[2] ومع هذا ياسيّدي فإنّي وإن كنت مُنعت ما ذكرته وحُرمت ما وصفته من التشفّي بك والارتياض معك فإنّي أردت أن أقيم المخاطبة مقام المكالمة والمراسلة بدل المناظرة. وشرح معنى هذا فإنّي منذ فارقتك وانفصلت عنك ونحن قد بلغنا من الوقوف على اختلاف حركات الكواكب السيّارة والثابتة إلى ما فيه مقنع وسداد وتوصيل إلى الثمرة المطلوبة، وعدمت بعدك المشاركة في ذلك والعون عليه فجعلت أبحث عن نوع آخر وهو اختلاف الأوائل في مطارح الشعاعات والتسييرات وما يخصّها من الأزمان والمُدد في جميع أنواع الأحكام بحسب ما يوجبه القانون الطبيعي اللازم لذلك النوع.

[3] ولأنّ هذا الباب من الأصول التي متى جُهلت بطلت لدينا كثير من صناعة الأحكام، إذ هي لها كالأصل وسائر الاستدلالات التحويلية كالفرع. فوقفت من ذلك على ما جمعته في كتابي هذا لتقف على ذلك وتنظر ما تهيّأ فيه من القول الموافق لقانون العلم وتناسبه الطبيعي

والهندسي. وقد علمت \و. ١٠ و.\ أن القياس الطبيعي إذا عضدته التجربة تبرهن وصحّ. وعند اجتماعي بك بحول الله سأريك ما جمعت من النصب الفلكيّة على طريق الاعتبار فترى شيئا عجيبا معجبا. ويعلم الله المطّلع على السرائر وعالم الخفيّات أن نفسي، فاديتك، لا آتية[1] عن بذل مثل هذا إلاّ لمثلك، الذي أكثر حظّي من ذلك بالاتّفاق فيها معك وعرضها عليك لتنظر فيها بعين البصيرة والبحث والاختبار. فربّما ظهر إليك خلل في نفس الترتيب وفساد في بعض التأويل فنبّهت على وجه الصواب وزدت فيما نقص كلامه وزيّفت ما ظهر بطلانه. وأنا أقسم عليك بحرم الله وبما تدين من المروءة والانسانيّة وتعتقده من المعقول أن أريت كتابي هذا أحدا حتّى يكمل مرادنا وتتّفق آراؤنا. وبعد هذا تسمح به للمنصفين وتبذله للفضلاء المحقّقين الذين سلمت نفوسهم من الحقد وبعدت قلوبهم عن الزيغ.

[4] وجميع ما أتيت به مما جمعته من هذا الفنّ فإنّه موجود في كتب الأوائل المتقدّمين ومنصوص في تواليف الفلاسفة الغابرين فلم يبق من العلم إلا رسومه والله بمنّه قد أذن تبيين ما قد درس من هذا العلم السرّي الذي هو نتيجة علم الفلسفة، إذ مرتبته عند الأوائل مرتبة العلم الإلاهي حسبما ذكرته القدماء ونقلته عن العلماء وتبيّن ذلك من مرتبته لأنّ العلم الهندسي والطبيعي مقدّمتان له ومدخلان إليه وكذلك نجدهما مقدمتين و مدخلين إلى العلم الالاهي، فهو في مرتبته وعديل له.

[5] و الآن ينبغي أن نبدأ بذكر غرضنا و بالله التوفيق. فأقول الآن أنّ أوّل ما ينبغي أن نبيّن <هو> معنى التسيير و الغرض المقصود إليه منه. و ذلك أن الناس على قديم الدهر قد اختلفوا فيه ولم يبيّن أحد منهم غرض هذا المعنى، و لاقدّم له مقدّمة علميّة على حسب القانون الطبيعي تنتج ما ذهبوا إليه. فإما أن نثتب لهم ما أنتجوه و نسقط الاختلاف أو يكون لكلّ واحد منهم حجّة توجب ما ذهبوا إليه فتحقّق دعواهم. ونحن لا بدّ لنا في هذا المعنى من تقديم مقدّمات توجب رأينا وإيراد ما ذهب إليه طائفة من الأوائل في هذا المعنى بحسب ما ظهر من

[1] في المخطوط لاتية.

مقصدهم في ذلك. فأقول أنّ الأقسام الإضطراريّة التي انقسم الفلك إليها <هي> اثنى عشر قسما لا اختلاف فيها بين الطبيعيّين و المهندسين . وذلك أنّ لفلك البروج أربعة أقسام يظهر لكل قسم منها تأثير بيّن للحس؛ و هي الانقلابان والاعتدالان. ثم أنّه لابدّ لكل قسم من ابتداء و وسط ونهاية. فانقسم كلّ قسم من تلك الأقسام الأربعة بثلاثة أقسام، فصارت أقسام الفلك على\و. ١٠ ظ.\ هذا النّحو اثنى عشر قسما. ولا يمكن لمدّع أن يقسم الفلك بأقسام معنوية غير هذه و لكن كل واحد من تلك الأقسام الإثنى عشر لأنّه ليست لأوائلها معنى ظاهر في العلم الطبيعي ولا الهندسي. وإن نحن نظرنا في هذه الأقسام من جهة الاستقراء و التجربة، وجدنا لها من التأثير و القوى والأبعاد ما يصحّ الرأي فيها و نزيل الريب و الالتباس عن نظام ترتيبها. و ذلك أنّه قسّمت هذه الأجزاء الاثنى عشر على الكواكب السبعة بحسب ما ذكرته الأوائل ولم يختلف في قسمتها أحد من سائر الأمم السالفة. وإنّ اتّفاقهم في ذلك لمن الأشياء الموثوق بها في معنى العلم.

[6] ونحن إذا أردنا نصبة مولد من المواليد الإنسانيّة فإنّا نجد أحد الأوتاد مساويا في عدد أجزائه من برجه لعدد أجزاء الكوكب المستولي على برج الاجتماع أو الاستقبال الكائن قبل الولادة من برجه بحسب ما قسم لكلّ واحد منها.ويوجد ذلك مطردا لا يمكن أن يقع بالإتّفاق بل وجودا اضطراريّا على ممرّ الدهور. فيصحّ لنا بهذا المعنى أصلان جليلان من علم أحكام النجوم: منها صحّة القسمة المتقدّمة و صحّة قسمة البروج على الكواكب و مشاكلتها لتلك الكواكب المقسوم عليها تلك الأجزاء.[2]

[7] وأمّا قسمة الفلك إلى الدرج والدقائق و سائر الكسور فإنّ ذلك مقسوم قسمة اتّفاق واختيار ولو ذهب إلى قسمة الفلك بثلاثمائة جزء أو ستّمائة جزءا أو ثلاثة آلاف جزءا أو <لا> شيء من ذلك لأمكن ولم

[2] وردت العبارة التالية على هامش المخطوط: "قلت: ذكر الهمداني في الباب الثاني من المقالة الأولى من كتاب سرائر الحكمة أن قسمة الفلك على ثلاثمائة جزء وقسمة الجزء على ستين دقيقة إلى غير ذلك من المراتب إنما هي قسمة طبيعية، وأتى على ذلك بحجج وبراهين".

يحتج أحد على بطلان ذلك من أهل العلم.

[8] و إذ قدّمنا بأنّ الفلك مقسوم باثنى عشر قسما فلنذكر ما يجانس هذه القسمة و يطابقها على حسب ترتيب العدد. فأقول أن مراتب العدد كلّه أربع، و هي الآحاد و العشرات و المئون و الآلاف و هي نظائر الأربعة الأجزاء الكبار من الفلك التي هي العتدالان والانقلابان. وكذلك أيضا فإن الذي يخصّ العدد من الأسماء، اثنى عشر اسما. و هي من واحد إلى تسعة و تسمى الآحاد ثم العشرة و هي اسم عاشر يتكوّن ويتركب منه العدد ثم المائة و هي اسم حادي عشر ثم الألف و هي اسم الثاني عشر. و <لا> يوجد في العدد اسم آخر سوى ما ذكرت لأنّه كله من تكرار الاثنى عشر اسما لا نزيد عليها.

[9] والفلسفة إنّما معناها وجود اتّفاق الأشياء ومناسبتها و مشاكلتها بعضها لبعض. وذلك لانّ الفلك لعالم الطبيعة كالجنس فصارت أقسامه شبيهة بمراتب أجناس العدد و الذي هو من أنواع الكميّة الواقعة على الجسم. و كذلك \و. ١١ و.\ أقول أن معاني التغاييير الموجودة في العالم أربعة، و هي أحوال العالم الكلّيّة التي يقال أنّ العالم موجود عليها كالذي يوجد فيه من التغاييير العظام كالطوفانات والجذب المؤدّيين إلى خراب بعض البقاع و كذلك الفتن والحروب وتوطئة الملوك و حدوث السنّن والشرائع، و من يتولّى القيام بها <إمّا> الأنبياء <و إمّا> الملوك أم تكون السنن نبويّة أو ملكيّة. فإن هذه كلّها إنّما تختصّ بالدلالة عليها البروج الاثنى عشر و يخصّها من الأزمان مرتبة الآلاف فيكون العالم في تدبير كل برج ألف سنة.

[10] و كذلك الأحداث الواقعة تحت هذه التي هي لها كالنوع وهي اختلاف أحوال الملل و أشخاصها و انتقال الملك من أمّة إلى أمّة و من بيت إلى بيت في قوم ما و سعادة تلحق ناحية من الأرض أو ضدّ ذلك. و تختصّ بالدلالة على ذلك البروج الاثنى عشر و تخصّها من الأزمان مرتبة المئين. فتكون كلّ طائفة من الطوائف و أمّة من الأمم في تدبير كل برج مائة سنة. و يدل هذا النوع من التسيير من طالع مبدئهم على ما ذكرنا من الأحداث الكائنة فيهم. و تشترك المئون في الدلالة على بعض الأنواع المذكورة فوق هذا لأنّ للمئين كالأجزاء للألف، فهي مشتركة معها

و متصلّة.

[11] وأما النوع الثالث فهو ما يخصّ كلّ واحد من النوع الإنسي من التغيّر و الصلاح و التصرف في جميع أحواله اللائقة به، و تختصّ بالدلالة على أحواله البروج الاثنى عشر و يخصّها من الأزمان مرتبة العشرات فيكون الإنسان في تدبير كل برج عشر سنين. و تتم مرتبة البروج بتمام مدة الإنسان و عمره الطبيعي الموجود له و ذلك مائة و عشرون سنة.

[12] وأما النوع الرابع الموجود أيضا فمرتبة تحاويل السنين التي هي كالأجزاء لجميع الأنواع المتقدّمة و يخصّها مرتبة الآحاد فيكون لكلّ برج سنة. ولمّا كانت الآحاد مشتركة لجميع الأعداد الأربعة و هي تعدّها و منها قام جميع العدد، وجب من ذلك أن يكون العالم في تدبير كلّ برج سنة ويُسمّى برج الدور و هو برج المُنتهى، ويدلّ على تفصيل تلك الدلالة التي دلّت عليها المبادئ الأولى و على التغاييز الجزئيّة في جميع أنواع التأثير و كذلك المرتبة الثانية من المدّة التي تخصّها المئون فإنّ برج المنتهى تشترك فيها بالإدارة سنة سنة. و كذلك الإنسان فإنّه يكون في كل برج سنة و هو برج الدور و الانتهاء.

و أما المسائل والاختيارات فإنهّا واقعة تحت القسمة الرابعة التي هي الآحاد و تحاويل السنين \و. ١١ ظ.\ لأنّ الفكر لا يتجاوز في مدّة الاشتغال بها أكثر من سنة لأنّ ذلك إنّما هو سؤال عن شيء: هل يكون أم لا يكون، ثمّ ينقضي الفكر فيه. فتسيير أدلاء هذا النوع كتسيير أدلاء السنة. وما كان من المسائل الجمليّة التي يأخذها الناس ليقيموها لأنفسهم مقام الموالد فإنها داخلة في قسم الموالد و تسييرها كتسيير الموالد.

[13] و كذلك فلنذكر أيضا المبادئ الخفيّة و مشاكلتها للمدد الأربع المذكورة؛ فأوّلها مدّة القران الأعظم الذي هو زمان أربع انتقالات في مثلّثات الفلك الأربع و عودة القران إلى المثلّثة الذي بدأ منها و هو قريب من ألف سنة و مشاكل لمرتبة الألوف و دلالتها شبيهة بدلالتهاو في مرتبتها. ثمّ القران الأوسط الذي هو مدّة اثنى عشر قرانا على الأمر الأوسط و هو نظير لزمان المئين. ثمّ القران الأصغر و هو مدّة ما بين

اقتران زحل و المُشتري في تلك المثلّثة و هو نظير لمرتبة العشرات. ثمّ الآحاد التي هي تحاويل السنين، فإنّها أجزاء للكلّ و هي مشتركة فيه و بعده و كذلك تحاويل السنين. و برج المنتهى يفصل جميع القضايا الأولى و يحدّ على كُنهها و أوقات حدوثها.

[14] و هذه المبادئ أعني القرانات مشار إليها في كتاب كنكة الهندي،و كتاب الملل و الدول لأبي معشر و كتاب القرانات له و في كتب كثيرة للقدماء و المحدثين و إنها دالّة على مبادئ الدول وأواخرها و أحوالها. وكذلك جميع من سيّر المبادئ على مراتب الأعداد وأزمان القرانات فإنّما وجدناهم قد سيّروها بدرج السّواء و لم يستعملوا فيها مطالع الفلك المستقيم و لا في تسيير برج المنتهى. و كذلك الذين ذكروا تدبير البروج الإثنى عشر للإنسان لم يستعملوا فيها المطالع، و الّذي بان من فحوى كلامهم و مقصدهم أنّهم يذهبون في التسيير إلى قسمة الفلك على المدّة الطبيعية لذلك النوع المستدلّ عليه فيكون في تدبير البروج الاثنى عشر التي هي جميع أجزاء الفلك إلى انقضاء مدّته.

[15] وهذه المقدّمة تعطي معنى التسيير وما يخصّه من المُدد لكلّ نوع من أنواع الحيوان والنبات. وقد لوّح صاحب رسائل إخوان الصفاء في بعض رسائله بكميّة المُدد الطبيعية لكثير من أنواع الحيوان. وإن زادت المدّة أو نقصت فإنّ ذلك من تدبير النحوس و نظرها و اشتراكها و قطعها عن التمام. و من قوّة كلامه أيضا في هذا المعنى يتبيّن معنى التسيير و الغرض المقصود منه.

[16] فأمّا ما يخصّ الإنسان من أنواع التسيير فمرتبة العشرات والآحاد، ويخصّ الملل والدول مرتبة المئين والآحاد ويخصّ أحوال \و. ١٢ و.\ العالم الكلّيّة مرتبة الآلاف والآحاد. وذكر هذا التسيير أعني تسيير الألف لكلّ برج فإنه وقع ذكره في كتاب المذكرات وسمّي جان بختارية الدّنيا و كذلك تم تسييرات أخرى للملل و الدول تشترك مع التسييرات الأخرى المذكورة قبل وهي مدة القران الأعظم وتسيير آخر يخصّ أهل البيوتات وانتقال الملل والدول من أمة إلى أمة و من بيت إلى بيت وهي مدة القران الأوسط المذكورة. وكذلك زمان القران الأصغر فإنّه يختصّ بالدلالة على كلّ واحد من الملوك.

[17] وحصّة السنة الواحدة في التسيير على مرتبة ثمان عشر درجة و تسع و عشرين دقيقة بالتقريب و يشترك مع هذه المدّة برج الدور. وأمّا التسيير على مدّة القران الأوسط فإنّ حصّة السنة الواحدة [هي] درجة وتسع وعشرون دقيقة و أربع ثوان. وحصة التسيير في السنة الواحدة على مدّة القران الأعظم اثنان وعشرون دقيقة وستّ عشرة ثانية وخمس ثوالث.

[18] وحصة الشهر الواحد من قسمة برج المنتهى على الشهور درجان ونصف. ووقع هذا التسيير في آخر كتاب تحاويل سني المواليد للخصيبي حيث قال: أنظر إلى درجة برج المنتهى وكم بينها وبين أنوار الكواكب وأجسادها فالحظ لكلّ درجة اثنى عشر يوما وسدُسا. وكذلك ذكر هذا النوع من التسيير أبو يوسف يعقوب بن اسحاق الكندي في كتابه في الأحكام و هو الذي سمّاه بالمدخل الأوسط. و كذلك حصة اليوم الواحد من التسيير من طالع السنة إلى انقضائه 59,8 مثل حركة الشمس الوسطى لأنّه من قسمة درج الفلك على أيّام السنة. ووقع هذا التسيير في كتاب الأمثال للفرس حيث قيل فيه: "إذا أردت أن تعلم ما يصيب الانسان يوما بيوم فسيّر دليل السنة لكلّ يوم درجة إلى آخرها".[3]

فأمّا حصص التسييرات في مراتب الأعداد فإن حصّة السنة الواحدة في التسيير للإنسان على العمر الطبيعي ثلث درج. ووقع هذا التسيير في كتاب سرائر الحكمة للهمداني حين ذكر ما يتولّى تدبير الإنسان من البروج إلى انقضاء عمره على حسب ما فعلت الأوائل في قسمة سني الفردارات. ومن هذا التسيير يتبيّن كم كان العمر للإنسان فيما بين الستّين إلى السبعين لبلوغ تسيير الطالع إلى درجة الغارب

[3] ورد النص التالي على هامش المخطوط: "وجدت في الأصل في طرف النسخة نصّا [نصّ في م.] ما وجد في نسخة شرقية من أمثال الفرس: "إذا أردت أن تعلم احداث الموالد يوما بيوم فإنا نسيّر صاحب برج منتهى السنة حدّا حدّا. فمتى لقي سعدا أو دخل حدّ سعد أصاب المولود في ذلك اليوم خير وصحّة. فإذا كان على خلاف ذلك فاعكس القول. إذا انصرف عن الكواكب العلويّة واتّصل بكواكب سفليّة مثل [يتعذّر علينا قراءة السطر بأكمله نظرا للفراغ الموجود والذي ينتهي بنفس العبارة السابقة: "الكواكب السفلية"]اتّصل بكوكب سفليّ او بكوكب هابط فإنّه رديء في الابتداءات سيّما الابتداءات التي تكون للخلفاء والملوك ولكن [لاكن في م.] في الحرب ممّا دلّت على الظفر إذا كان المتّصل به سفليّا وهو صاعد والصاعد في الاوج".

المغرب ودرجة بيت الموت اللّذين هما من طبيعة الحياة. فإذا نظرت النحوس في الأصل والتحويل وضعفت أدلاء المولود كان القطع. وكذلك حصّة التسيير في السنة الواحدة على قدر المئين لأحوال الملل والدول وأهل البيوتات والقبائل وما يتبع ذلك من أحداث الجو ثماني عشر دقيقة وحصّة السنة الواحدة \و. ١٢ ظ.\ في مراتب الآلاف لمعرفة أحوال العالم الكلّية ا مح (1;48)[4].

[19] والآن ينبغي أن نبيّن أي التسييرات أقوى دلالة و أظهر تأثيرا؛ فأقول أنه لمّا كانت التسييرات المأخوذة من مراتب الأعداد الأربعة و من قسمة أجزاء الفلك الأعظم كانت كالأوائل و الرؤوس وجب أن تكون دلائلها أبين و أقوى و أظهر و لمّا كانت دلائل القرانات إنّما هي عن حركات أجرام الكواكب التي هي كالثواني لمرتبة الفلك الأعظم و لأنّها دونه في المرتبة و متحرّكة بحركته و محاذية له و على تأريبه وانحرافه تتحرّك ومنفعلة بحركته اللازمة له من المشرق إلى المغرب والحركة الموجودة له التي هي حركة الاقبال والإدبار وجب أن تكون دلائل القرانات كالثواني لدلائل البروج الحافظة لأنواع.

[20] وكذلك زمان فردارات الكواكب السبعة والرأس والذنب الذي هو خمس وسبعون سنة وهو كالمدّة الطبيعية للانسان أيضا. وإنّما خصصنا النوع الانسي بهذه المدّة لأنّا وجدنا الأوائل قد قسّموا بعض عمر الإنسان على فردارات الكواكب، وهي المدّة التي يمكن أن يتناول فيها الإنسان الأعمال ويحاول الأمور وإن تجاوز ضعُف عن التصرّف. وتكلّموا على طبيعة الإنسان بحسب ما يشارك طبيعة كلّ كوكب من الكواكب القاسمة في سني فرداريته، وجعلوا هذه القسمة من أوجب الأشياء لمعرفة أحواله ولم يطلقوا الحكم عليه بشيء من الأشياء وإن أوّلوا تحاويل السنين الأبعد المعرفة في قسمة أي فردار هو. وكذلك ذكروا هذه الفردارات في تحاويل السنين للموالد. وهذه المدّة من إحدى المُدد المديرة للإنسان وحصّة السنة الواحدة إذا تسيّرت أدلاء المولود عليها [هي] أربع درجات وأربعة أخماس درجة.

[4] ا مح ك (1;48,20) في المخطوط

[21] وقد جرّبنا هذا النوع من التسيير فوجدنا له دلالة ظاهرة بيّنة معيّنة على السعادة والمنحسة. وكذلك وجدنا لزمان عودة القران إلى موضعه الأصلي في نفس المثلّثة التي هو فيها وذلك في كلّ ستّين سنة دلالة ظاهرة في تغاييرأحوال الملوك وما يلحق كلّ ملك في دولته من السعادة وضدّ ذلك. وهو من أجود المـُدد الطبيعية لطوالع ولايات الملوك. وحصّة السنة الواحدة في التسيير على هذه المدّة ستّ درجات.

[22] فهذا ما يوجبه القانون الطبيعي في معنى التسييرات. وجميع هذه المبادئ موجودة في كتب الأوائل مـُشار إليها، يتنبّه لها ذو الفطنة والنظر الصحيح العلمي. فالّذي يحصل لكلّ نوع من المراتب الأربع التي تقدّم ذكرها من أنواع التسييرات ثلاث مراتب. فالّذي يخصّ أحوال العالم الكلّية من المـُدد الطبيعية التي ينبغي أن تـُسيـَّر عليها المدّة العظمى التي هي اثنى عشر ألف سنة وكذلك تند غم مدّة القران \و. ١٣ و.\ الأعظم في مدّة الألف سنة الواجب لكلّ برج فتكون دلالة الألف مضاعفة القوّة في الدلالة لاشتراكها في مدّتين طبيعيتين ثمّ دلالة برج المنتهى فيكون لها على هذا النحو ثلاث تسييرات مع برج المنتهى.

والذي يخصّ أحوال الملل والدول من أحوال التسييرات ثلاثة أيضا: ومدّتها العظمى ألف سنة ومائتا سنة وهو قريب من الألف سنة أيضا والتسيير على هذه المدّة لذلك النوع والتسيير على مدّة القران الأوسط وهو مائتا سنة واثنان وأربعون سنة ونصف بالتقريب. والتسيير على مدّة برج الدور أيضا.

والذي يحصل للنوع الانسي من أنواع التسييرات فالتسيير على مدّة العمر الطبيعي وذلك مائة وعشرون سنة والتسيير على مدّة سني الفردارات وهو خمس وسبعون سنة والتسيير على برج الدور أيضا فيكون له ثلاث تسييرات.

وأمّا المرتبة الرابعة التي هي كالأدوار وهي من الأعراض اللائقة للنوع الانسي وأفعاله المتصرّفة وهو نوع جزئي تدلّ عليه القرانات الجزئية التي ليست بانتقال ولا أزمانها تمام عودة كاملة وهي طوالع ولايات الملوك وجلوس كلّ واحد منهم في مقعد رئاسته وما يخصّه من الدلائل

الخاصّية. ويخصّ هذا النوع ثلاثة تسييرات، أوّلها زمان عودة القران إلى موضعه الأصلي الذي هو ستّون سنة وزمان ما بين اقتران زحل والمشتري وذلك عشرون سنة ومدّة برج الدور أيضا.

فقد استبان من هذا الترتيب تناسب أحوال العالم وتشابهه وصارت التسييرات ثلاثة في أربع مراتب فتشابهت أقسام الفلك الأعظم في انقسامه إلى أربعة أجزاء كبار وانقسام كلّ جزء منها إلى ثلاثة أجزاء فصارت اثنى عشر جزءا.

[23] وإذ قد فرغنا من إيراد غرضنا فلنذكر الآن اختلاف الأوائل وتخليطاتهم في هذا المعنى وما ذهبوا إليه. فأقول: إن الذين ذهبوا في مطارح الشعاعات للكواكب إلى ردّها إلى منطقة معدّل النهار فلم أر على ذلك حجّة واضحة ولا دعوى مُلخَّصة ولا مشبهة ثم مع هذا فإنّهم قد اختلفوا في ذلك.

فأمّا بطلميوس صاحب كتاب الأربع مقالات فإنّه سيّر الأدلاء في الربع الغربي من الفلك إلى خلاف توالي فلك البروج وعمل تسييراته في هذا الربع ومطارح شعاعات الكواكب بمطالع البروج في الأفق الشرقي.

[24] وأمّا طائفة من الفرس فإنّها صنّفت مطارح الشعاعات و التسييرات بمطالع البروج في أفق معدّل النهار.

[25] وأمّا طائفة ثالثة من المهندسين فإنّهم لمّا فهموا من \و. ١٣ ظ.\ أغراضهم أنّ مذهبهم ردّ شعاعات الكواكب إلى قوس معدّل النهار وكذلك قسي التسييرات ورأوا في ذلك مذهبا منسوبا إلى بعض الهرامسة وضعوا في ذلك كتبا هندسيّة واستخرجوها دون أن يبيّنوا العلّة في ذلك ولِمَ وجب أن تردّ شعاعات الكواكب [أو] قسي[5] التسييرات إلى منطقة معدّل النهار.

[26] فأمّا محمّد بن جابر البتّاني فإنّه بان له فساد مذهبهم في مطرح الشعاعات فلم يعبأ بذلك ولا التفت إليه واتّبع في ذلك ما يوجبه القانون البرهاني، وعمل على مطارح الشعاعات بدرج السواء إذا لم يكن للكوكب عرض عن المنطقة أعني منطقة فلك البروج. فإن كان له عرض فإنّ

[5] سني في م.

التثليثين والتسديسين يختلفان في منطقة فلك البروج. فعمل في ذلك حسابا يوصل إلى معرفة التسديس والتثليث في المنطقة إذا كان للكوكب عرض عن منطقة فلك البروج. وإنّ هذا الباب في كتابه لمن النوادر الجليلة والنكت الفخمة.

[27] ولأنّي لأعجب ممّن يوجب لشعاعات الكواكب اعوجاجا واختلافا في الفلك من أجل انحراف الآفاق ويجعل الانحراف فاعلا في أشكال الكواكب في الفلك بعضها من بعض. وهؤلاء قوم جهلوا مرتبة الفلك وأحواله الطبيعية وجريها على قصدها الطبيعي ووضع بعضها من بعض وأن الذي يحدث عنها من التغيير في هذا العالم ليس من قصد منها بل لانفعال من حركاتها وأشكال بعضها من بعض.

[28] وكذلك محمد بن جابر البتّاني فإنّه تابع آراء هؤلاء في التسيير وصنّفه على التقريب. والذي أوقعه في ذلك مجهله[6] بمعنى التسيير وقلّة بحثه عن علله والغرض المقصود منه

[29] على أنّ جميع الأوائل على قدم الدهر قد وضعوا المداخل إلى صناعة الأحكام ووضعوا فيها أشكال الكواكب بعضها من بعض عند اتّفاقها في الدلالة على كون شيء من الأشياء وذلك عند كون بعضها من بعض على الأشكال المذكورة التي هي المقارنة والتربيعان والتثليثان والتسديسان، وقضوا على ذلك في المسائل والاختيارات الجزئية واتصّال القمر بالكواكب ووجدوا دلالة تَصدُق في كلّ حين على أنّي أقول أنّه ليس عند من اتصّل بنا خبره وعلمنا طريقته في الأحكام شيء يظهر لديهم به تجربة الأحكام وتصدقها إلاّ المسائل والاختيارات وجملة الحال في نصب المواليد المرصودة وسائر ذلك كلّه فاسد لفساد الزيجات، فمنها طوالع التحاويل في كلّ نوع ومنها مقادير الاتّصالات لاختلاف أبعاد الكواكب، من أجل عدّهم لها في غير مواضعها ولاسيّما فيما كان بتنوّع الاتّصال فيه دلالة بطيئة على المواليد وغيرها وأشياء كثيرة \و. ١٤ و.\ من معرفة السهام. وهم يقصّون في المواليد أنّ القمر في تربيع كوكب كذا وتثليثه وكلّ كوكب في شكل كذا من كوكب كذا،

[6] مجمله في م.

ويوجبون السعادة والمنحسة من أجل ذلك.

[30] ويصدق الحكم عليه. ولو راعوا هذه الأشكال بمطارح الشعاعات على مذهبهم لَمـَا كان بعضها من بعض على ما حكموا به من فسادها وصلاحها. وأيضا فلو كانت شعاعات الكواكب مصروفة إلى منطقة معدّل النهار لكان الواجب ألاّ يـُعدَّد مطرح الشعاع بدرج مطالع الآفاق بل بمطالع الدرج في أفق معدّل النهار وإمـّا مائلا عنها إلى جهتي الشمال والجنوب. وإذا كان مائلا عنها فإنّ شعاعه في دائرة موازية لدائرة معدّل النهار. وذلك أن هذه الطائفة ليس عندها من الحجـّة في تحفـّظها أكثر من قولها أنّ الحركة الدورية المستقيمة إنـّما هي على قطبي معدّل النهار وفلك معدّل النهار هو المدير للكلّ إدارة مستوية، والشعاعات إنـّما تكون على حسب منطقته ودورانه فينتج من آرائهم ما ذكرت من كون الشعاعات التي في الفلك ومقادير قسيـّها في فلك البروج إنـّما هي بحسب مطالع البروج في أفق معدّل النهار. ويقال لهؤلاء أنـّا إذا أردنا أن نعلم مطرح شعاع الكوكب في العرض كيف يعلم ذلك. وعلى رأي هؤلاء فإنـّهم[7] لا يوجبون للكوكب مطرح شعاع في العرض إلاّ في دائرة واحدة، إمـّا منطقة الفلك المستقيم إذا كان الكوكب فيها أو في دائرة موازية لها ثمّ ينعطف الشعاع من ذلك الخط إلى المنطقة وإلى منطقة فلك البروج يمنة ويسرة. ولا يتوهـّم ذو علم هندسي ولا ذو معرفة بالأمور الطبيعيـّة كيف تتـّفق تلك الأشكال الحادثة لشعاعات الكواكب على رأيهم بل تحدث[8] فيها زوايا وعطوفات وهذا كلـّه تخليط وخـَباط.

[31] فمطرح الشعاع الصحيح إنـّما هو أن يتوهـّم جرم الكوكب في كرة الفلك وتفرض فيه دائرة عظمى تمرّ بمركز جرم الكوكب وتـُقسم الكرة بنصفين ثمّ نقسم تلك الدائرة بأيّ عدد شئنا ونأخذ سدس ذلك العدد أو سدس تلك الدائرة فما كان فهو تسديس ذلك الكوكب في كلّ جهة من

[7] وإنهم في م.

[8] فلتحدث في م.

جهة الفلك، وكذلك التثليث فإنّا نأخذ ثلث الدائرة والتربيع ربع الدائرة فيكون شكل التربيع من الدوائر العظام لأنّه نصف المقابلة وتقسم الكرة بنصفين. ولا يقوم في الوهم والعقل غير هذا الوضع وهو الذي وجدنا تأثيره ظاهرا في الجزئيات والكليات.

[32] وأمّا الذين ذهبوا إلى استخراج قوس التسيير من قوس معدّل النهار فإنّ هؤلاء قوم قد أسقطوا دلالة فلك البروج من هذا العلم ولم يوجبوا[9] له ولاية ولا تأثيرا. وجميع الفلاسفة إنّما تنسب الدلالة إليه، وهذا أبين وأشهر من أن نستمدّ به[10] وهو خارج من قوّة كلامنا فيما تقدّم في كتابنا هذا ولم يوجد لأحد من \و. ١٤ ظ.\ الفلاسفة المبرزين قول[11] تنسب به الدلالة على التغاييز الكائنة في الأشخاص والأنواع إلى فلك معدّل النهار. وليس الغرض في استخراج المطالع إلاّ معرفة أزمان الليل والنهار في كلّ بلد وما دار الفلك منذ وقت ما ليوصل به إلى معرفة الدرجة الطالعة من فلك البروج التي هي النتيجة والفائدة لو عقلوها ولمعرفة الوتد العاشر والرابع أيضا. فهؤلاء جعلوا النتيجة مقدّمة وعكسوا بالظن فضلّوا وأضلّوا عن السبيل. وكذلك جعلوا مقادير الأزمان في كلّ نوع من أنواع الأحكام لكلّ درجة سنة وأتوا في هذا بما لا يوجبه قانون طبيعي ولا قياس علمي وجعلوا حصّة الدرجة الواحدة في تسيير طالع التحويل شهرا، وليس يخفى ما في هذا من التقصير والخباط والجهل، فتسيير طالع المولود لا يبلغ إلى الوتد الرابع في أكثر الأحوال وطالع التحويل لا يتجاوز اثنى عشرة درجة بزعمهم. فليترك هذا الخباط الذي لا يؤدّي [إلى] معنى ولا تعضده تجربة.

[33] وأقول أنّ السبب المؤدّي لاختلافهم ونقل هذه الآراء كلّها صحيحها وسقيمها إنّما كان أصله وجودهم التأثير مخالفا لما بنوا عليه في أصولهم فتوهّموا ما ذكرنا ممّا وقع لهم صوابه من جهة الاتّفاق بنوا

[9] يجبوا في م.

[10] من أن نستمدّ به (كذا في م.).ولعلّ الصواب: لنستمدّ به.

[11] قولا في م.

عليه، ثمّ انتقلوا من مذهب إلى مذهب حتّى كثُر الشغب والاختلاف. وإنّما وجدوا التأثير مخالفا لما بنوا عليه لخطأ الزيجات واختلاف مواضع الكواكب السيّارة من مواضعها الخفية.

والآن بحمد اللّه قد كمل لدينا من معرفة علل حركات الكواكب وعلمنا السبب المؤدّي الاختلافها فصحّ عندنا من ذلك ما لا يعلمه أحد ممّن بلغ إلينا خبره واتّصل بنا ذكره، وخبرنا تسييراتهم ومطارح شعاعاتهم على حسب آرائهم ومذاهبهم فلم يدلّ على شيء من التغاييير. ووجدنا التسيير على المَدد المذكورة في كتابنا هذا على الطريقة الموصوفة أعني بدرج السواء على أصحّ ما يمكن من الدلالة الظاهرة البيّنة واعتبرناها في أنواع الأحكام، أعني تسييرات الدول والملل وطوالع ولايات الملوك وتحاويل السنين فظهر إلينا من ذلك أمر عجيب وعلم غريب.

[34] فللّه الحمد والشكر على جزيل ما أعطى وجميل ما أولى من نعم اللّه الجزيلة وامتنانه علينا ما ألهمنا إليه من البحث على النمودر الذي به تصحّ درجة الطالع للمولود التي هي الأصل، والهيلاج القائم والتسيير منها يسمّى الجانبختار[12] ومنها تُطرح السهام ومنها تُعرف مواضعها على الصحّة، وأشكال الكواكب منها وصورة النمودر عندنا بحسب ما قدّمنا في كتابنا هذا من كون أحد أوتاد المولد مثل درجة المستولي على الاجتماع أو الاستقبال الكائن قبل الولادة ، ونُقيّد ذلك \و. ١٥ و.\ بنمودار مسقط النطفة إذا لم نشاهد رصد طالع الولادة أو تكون الولادة بالليل وتشابه الأوتاد في تقارب درجها في العدد كالبروج القريبة والدرج القريبة أيضا من الاعتدالين إذا كانت طالعة فربّما وقع في الرصد فاشتبهت الأوتاد فليس يوصل إلى معرفة درجة الطالع حينئذ على صحّة الرصد إلاّ بنمودار مسقط النطفة. ولنا في ذلك رسالة بيّنة وليس يتّفق هذان النموداران[13] بزيج من الزيجات إلاّ بزيجنا المصحّح وذلك لصحّة مواضع الكواكب فيه وصحّة موضع القمر وتعديله الصحيح.

[12] الجازبختار في م.

[13] وليس يتّفق غير هذان النموداران في م.

[35] وقد جرّبنا ذلك في موالد كثيرة مرصودة وموالد مفيدة كانت مرصودة فاطّرد لنا عملنا اطّرادا اضطراريّا وعملنا به موالد كانت مخمّنة الحزر وسيّرناها فوجدنا دلائلها على أصحّ شيء وأبينه دلالة وأظهره تأثيرا. ووجدنا في موالد كثيرة بوُنا كثيرا بين ما وضع لها من درجات الطوالع وبين درجاتها الطوالع الصحاح. وعرض لنا في ذلك أمورا يطول شرحها وإيرادها وإخراج عملنا إلى الصحّة[14] التي شهدت الأمور الإضطرارية بصحّتها. وأكثر الموالد التي عدّها بعض المنجّمين فإنّي لم أجدها صحيحة البرهان[15]. وهذا أيضا ممّا يدخل الفساد في عملهم وهم يقضون عليها، وما وجدت منها قريبا من الحقّيّة إلاّ القليل جدّا، ووجدت في بعضها خللا نحو برج وما يقرب من هذا. والذي أوجب تقصير الأوائل أيضا على تقصير حقيقة هذا النمودار واتفاقه مع نمودار المستولي على جزء الاجتماع أو الاستقبال المذكور . فما ذكرت من خلل الزيجات وفسادها ومن طرائف[16] جهل كثير من المنتحلين لصناعة الأحكام في سهم السعادة.

[36] وذكر ذلك أبو معشر في كتابه في المدخل الكبير إلى صناعة الأحكام حيث قال: "إنّ سهم السعادة هو طالع القمر وذلك إذا ضرب ما مرّ للنهار من ساعة في زمان ساعة واحدة وألقي من موضع القمر انقطع العدد في موضع السهم". وقال أبو معشر البلخي في ذلك "وقد جرّبته فوجدته قريبا ممّا ذكروا على أنّه لو جُرِّب ذلك في بعض المواضع من فلك البروج إذا كانت طالعة لَبعُد جدا"[17]. فكتبت له في طُرّة كتابه: "لو صنعت ذلك بدرج السواء لأصبت الصواب والحقيقة". وتفسير ذلك أنّه

[14] وإخراجنا عملنا إلى الصحّة في م.

[15] الدهان في م.

[16] طريف في م.

[17] ابو معشر،المدخل الكبير، تح. لماي، مج. ٣ ص. ٦٢٠: وهذا السهم يقال له سهم القمر وطالعه وإنّما صار طالع القمر وسهمه لأنّهم زعموا أنّهم متى ضُرب ما مضى من ساعات النهار في أجزاء ساعاته ثمّ طُرح ذلك من موضع القمر بالدرج السواء فإنّه يقع في موضع سهم السعادة وقد جرّبناه فوجدناه وربّما وقع قريبا من ذلك المكان.

لو أخذ ما بين الشمس وبين درجة الطالع بدرج السواء وطرحه من موضع القمر بدرج السواء لانقطع العدد في موضع سهم السعادة[18]. ومن لا يفكر أنّ الشمس إذا كانت في وسط السماء والقمر في الحادي عشر وأخذت القوس الذي بين الشمس والقمر وزدت[19] على درجة الطالع فإنّ بعد الشمس من الطالع كبعد القمر من طرف تلك القوس التي هي قوس سهم السعادة. فأيّ سهم ينسب إلى مثل هؤلاء وهذا أبين من أن يخفى على ذي حس وفهم.

[37] وإنّي أراهم يطالبون مطالع البروج التي هي\و. ١٥ ظ.\ الأزمان الدائرة بزحل، ويريدون أن يجاهدوا فيها حتّى في الشيء الظاهر. والذي يوجبه الظنّ أنّ هذه الأحوال إنّما أتى خللها في أكثر الأحوال من جهة المترجمين، فلم يعبّروا عبارة حسنة أو لعلّ الأوائل قد ذكرت دور الفلك بكلامهم فهم يعنون الفلك الذي يُنسَب إليه القضاء و[هو] فلك البروج فترجمه[20] التراجمة بدور معدّل النهار كما ذكر أيضا أحمد بن يوسف الكاتب في ذكر النسبة والتناسب حين ذكر النسبة ومن حيث دخل الخلل فيها وأنّه من قبل المترجمين. وكذلك برج المنتهى فإنّهم لم يفسّروا جهة استعماله ولا رعوا درجة المنتهى وتسييرها في سائر السنة إلاّ الخصيبي وحده، وأقاموا برج المنتهى مقام طالع التحويل ولم ينظروا إلى بلوغه إلى أنوار الكواكب الأصلية والتحويليّة وفي حدّ أيّ كوكب كان[21] تسييرها أعني درجة المنتهى ولا طالبوا أنفسهم في كيفية تسييرها، ولِم لا تسيَّر[22] بدرج المطالع، وما الفرق بين تسيير برج المنتهى بدرج السواء وتسيير الطالع والهيلاج بدرج المطالع، ولِم خصّ هذا بهذا وذلك بذلك النوع الآخر وهو عندهم من الشبهات القويّة التي

18 في م. : في موضع السهم سهم السعادة.

19 زيدت في م.

20 وفترجمه في م.

21 هو في م.

22 تصيَّر في م.

يستدلّون بها على بلوغ الهيلاج إلى الأنوار والأجساد، وجعلوا ذلك من أوكد ما يستعمل في أنواع الأحكام.

[38] وما أدري لهم حجّة تخرجهم[23] عن هذه المطالبة، وإنّي لأعجب في كلّ وقت من طريق ما أجده من التخليط في كتبهم. والذي أوجب ذلك جهل المنتحلين لصناعة الأحكام والمؤلّفين لكتبها لأنّ ذوي الأذهان النافذة والعقول البارعة كانوا ينظرون على قديم الدهر إلى صناعة التقويم الذي هو التعديل ومعرفة مواضع الكواكب. فلمّا كانوا يرونه من الاختلال في ذلك كانوا يضربون عنها ولم يعنوا بها ولا كانت لهم أداة يظهر بها تحقيق ما يوجبه النظر الطبيعي والقياس الفلسفي. كما هيّأ الله لنا من صحّة مواضع الكواكب التي علّمتنا أولا النمودار وحقّقته عندنا وصحّحت التسييرات وهدتنا إليها ووحّدت التجارب عاضدة لها ومبطلة لسواها. وكذلك ينبغي أن يعلم أنّ في هذا النمودار والتسيير من الدلائل الدالّة على صحّة الزيج الذي هو لدينا عند ذوي الجهل بعلم الهيئة وحركات الكواكب وموادّ البرهان المؤدّية إلى تصحيحه ما يثبت لديهم صحّته ويبيّن لديهم حقيقته.

[39] وذلك متى رصدت ولادة وعُدّلت نصبتها[24] بالزيج المذكور واستخرج المكث وقُوّم النمودار من مسقط النطفة وقوبل ذلك بالنمودار الذي يوجبه المستولي على جزء الاجتماع أو الاستقبال الكائن قبل الولادة رأيت سحرا معجبا وسرورا مطربا لجهل المقلّد لما لا يعلم كذبه من صدقه. وكذلك إذا سيّرت درجة طالع المولود وقد مضى من عمره مدّة صالحة، وسيّرت هيلاجه \و. ١٦ و.\ وسهم سعادته، أو بعض درجات بيوته وسهامها على الترتيب المذكور أُخبِرتَ بسني نكباته وسعادته[25] على الأمر الأعمّ والأغلب وأنذرته بما ترى أنّه قريب من اللحاق به فحينئذ تنقطع دعوى المتخبّط في عناده وجهله.

[23] يخرجهم في م.

[24] عدل نصبتها في م.

[25] سعاداته في م.

وجملة الأمر فإنّه لينبغي لكل واحد[26] أن يسيّر بهذا التسيير الأبعد لتصحيح[27] درجة الطالع بالنمودارين المذكورين وتعديل الكواكب[28] بالزيج المذكور فحينئذ تقف على الصحّة إن شاء الله.

فنسأل من بيده الخير والفضل أن يزيدنا وإيّاك من أفضاله وأن يبلّغنا وإيّاك إلى درجة تدنى منه وتقرّب لديه. إنّه جواد كريم.

كملت رسالة أبي مروان الإستيجي والحمد للّه حق حمده والصلاة على محمّد نبيّه ورسوله وعلى جميع أنبيائه وسلّم.

[26] لا ينبغي لأحد في م.

[27] تصحيح في م.

[28] يعديل الكواكب في م.