8

ISLAMIC GEOMANCY AND A THIRTEENTH-CENTURY DIVINATORY DEVICE: ANOTHER LOOK

Emilie Savage-Smith and Marion B. Smith

THE FOCUS OF THIS STUDY is an Islamic metal tablet from the thirteenth century AD in the possession of the British Museum (Department of Oriental Antiquities, Inv. No. 188.5-26.1).[1] The analysis of this unique device attempts to place it within the context of Islamic geomantic theory, practice, and historical development. The authors gratefully acknowledge the support of the G.E. von Grunebaum Center for Near Eastern Studies at the University of California, Los Angeles, both for the initial study and publication and for this opportunity to reprint major portions of the original monograph with corrections and updating to incorporate material published in the intervening years.[2]

I. Survey of Islamic Sources and Traditions of Geomancy

The art of divination known in the West as geomancy appears to be a distinctly Islamic development which later reached the Byzantine and Latin worlds. The term 'geomancy' comes from the Latin word *geomantia*,[3] possibly first used by

---

[1] For a complete list of earlier illustrations and discussions of this device, see our monograph, E. Savage-Smith and M.B. Smith, *Islamic Geomancy and a Thirteenth-Century Divinatory Device* [Studies in Near Eastern Culture and Society, 2] (Malibu, CA 1980), vii, notes 1 and 2. It was also exhibited in Paris in 2001–2; see *l'Orient de Saladin l'art des Ayyoubides: Exposition présentée à l'Institut du monde arabe, Paris du 23 octobre 2001 au 10 mars 2002* (Paris, 2001), 210 item 222.

[2] The authors wish to thank those who have contributed corrections and suggestions following the initial publication. These include Lawrence I. Conrad, Toufic Fahd, Helmut Gätje, Bernard Goldstein, Bruce Inksetter, David King, Paul Kunitzsch, and Josef van Ess.

[3] Isidore of Seville (d. AD 636) used the term *geomantia* in his *Etymologiarum*, Lib. VIII, ix, 12–13, where he cites the Roman scholar Varro (d. 27 BC) as saying that divination was divided into four categories corresponding to the four elements: earth, water, air, and fire: *Varro dicit divinationis quattuor esse genera, terram, equam, aerem et ignem. Hinc geomantiam, hydromantiam, aeromantiam, pyromantiam dictam.* Of these four divinatory arts, only hydromancy, however, is actually described by Isidore, the other three – geomantia, aeromantia, and pyromantia – being coined to complete the parallel. In any case, the use of the term *geomantia* in this context, sometimes interpreted as divination from earthquakes or other geological phenomena, has no connection with and seems to have had no influence upon the history of the Islamic divinatory art *'ilm al-raml*.

Hugo Sanctallensis (Hugh of Santella), working at Tarazona in Aragon in the twelfth century,[4] as a translation of the Arabic term *'ilm al-raml* 'the science of the sand,' the most common name in Islam for this art.[5] The origins of this system of divination prior to the Islamic era are shrouded in various traditions. The most common traditional account places the origin of the art with the archangel Gabriel (Jabrā'il) who taught the practice to Idrīs.[6] The latter was a common name to which to attribute authority in occult and divinatory subjects, and Idrīs is frequently cited as an authority on geomancy.[7] Idrīs is then said to have taught Ṭumṭum al-Hindī, another legendary figure very frequently cited by geomantic authors.[8] Other legendary and quasi-legendary figures, such as Hermes and the prophet Daniel, are also occasionally cited as geomantic authorities.[9]

---

[4] For a survey of extant Latin treatises, see Thérèse Charmasson, *Recherches sur une technique divinatoire: la géomancie dans l'occident medieval* [Hautes Études Médiévales et Modernes, 44] (Paris, 1980). See also Laurel Means, 'A Translation of Martin of Spain's *De geomancia*' in *Popular and Practical Science of Medieval England*, ed. Lister M. Matheson [Medieval Texts and Studies, 11] (East Lansing MI, 1994), 61-121.

[5] Other Arabic terms were occasionally employed as well, such as *ḍarb al-raml* 'the striking of sand' or *khaṭṭ al-raml* 'the line of sand'.

[6] For the importance in Islamic thought of the archangel Gabriel, who is the bearer of revelations, appearing in the form of an ordinary man to all but the Prophet, see J.Pedersen, 'Djabrā'il' in *The Encyclopaedia of Islam*, 2nd ed., 11 vols. [hereafter *EI²*] (Leiden, 1960-2002), II, 362-4. The name Idrīs is probably to be identified with the Biblical Enoch rather than with Hermes Trismegistus; see G. Vadja, 'Idrīs' in *EI²*, III, 1030-1. For the legend of Idrīs and Gabriel and the origin of geomancy, see 'Abd al-Raḥīm al-Jawbarī, *Kitāb al-Mukhtār fī kashf al-asrār* (Cairo, n.d. [1918]).

[7] For example, Oxford, Bodleian Library, Oriental Collections, MS Arab.f.36 and MS Marsh 216; Berlin, Staatsbibliothek, MS Mq. 49, fols. 68b-213b (Ahlwardt no. 4201), and Paris, Bibliothèque nationale de France, MSS arabe 2631 and arabe 2632.

[8] Alchemical, lapidary, and talismanic Arabic treatises are also attributed to this figure. See A. Hauber, 'Ṭomṭom (Ṭimṭim) = Δανδαμίς = Dindymus?', *Zeitschrift der Deutschen Morgenländischen Gesellschaft* 63 (1909), 457-72; and I. Goldziher, 'Ṭumṭum al-Hindī', *Orientalistische Literaturzeitung* 13 (1910), cols. 59-61. For a suggestion of a possible confusion between Hindī and *hindasī* (geometer), see Carra de Vaux, 'La géomancie chez les arabes' in Paul Tannery, *Mémoires Scientifiques*, 4 vols. (Paris, 1920), IV, 299-318, esp. 303. See also F. Sezgin, *Geschichte des arabischen Schrifttums, IV: Alchemie-Chemie-Botanik-Agrikultur bis ca 430 H.* (Leiden, 1971), 118-9; and M. Ullmann, *Die Natur- und Geheimwissenschaften im Islam* [Handbuch der Orientalistik, I, vi, 2] (Leiden, 1972), 298-9. Willy Hartner in a book review suggests that Ṭumṭum may be identified as Kanakah, see *Der Islam* 43 (1967), 174-80.

[9] For Hermes as an authority, see *Lectura Geomantia*, ed. Thérèse Charmasson in *Hermetis Trismegisti Astrologica et Divinatoria*, ed. G. Bos, C. Burnett, T. Charmasson, P. Kunitzsch, F. Lelli, and P. Lucentini [Corpus Christianorum, Continuatio Mediaeualis, 144C, Hermes Latinus, 4.4] (Turnhout, 2001), 349–97; Hermes is also cited in Paris, BnF, MS arabe 2697, item 1. Ptolemy is cited in London, British Library, OIOC, MS Or. Sloane 2650, and Daniel in Los Angeles, UCLA Near Eastern Coll. 898, MS 88. In the case of Daniel, entire treatises are sometimes ascribed to him, such as Vatican, Biblioteca Apostolica, MS arab. 1106 item 3; Vienna, Nationalbibliothek, MS arab. 1814 (Cod. Vind. Palat. A.F. 554); British Library, OIOC MS Or. Add. 9702; and Berlin, Staatsbibliothek, MS Turk. 157 item 7.

A certain Khalaf al-Barbarī the Elder is said to have been a contemporary of the Prophet Muḥammad and to have travelled to India where he lived for 120 years, studying thoroughly the works of Ṭumṭum al-Hindī. He is supposed to have given, when he died in AD 634 (13 AH) at the age of 186, the book of Ṭumṭum to his pupil, a shaykh Nāṣir al-Dīn al-Barbarī the Younger.

From the latter a series of masters and pupils is traced[10] until reaching Abū Sa'īd al-Ṭarābulsī[11] who in turn was the teacher of the acknowledged master of geomancy, Abū 'Abd Allāh Muḥammad ibn 'Uthmān al-Zanātī. Nothing is known of the latter's life, but his name would seem to indicate that he was from the North African Berber tribe of Zanāta. It is certain, however, that he lived before 1230 (629 AH), for he is cited as an authority on geomancy by 'Abd al-Raḥīm al-Jawbarī. The latter, at the request of al-Malik al-Mas'ūd of the Artuqid dynasty which ruled parts of Diyār Bakr, the upper basin of the Tigris, from 1222 to 1231 (619–29 AH), wrote a treatise on all the frauds, deceptions, and charlatans he had encountered while travelling throughout the Islamic lands.[12] In this treatise he cited al-Zanātī as an authority on geomancy after Ṭumṭum. Shaykh al-Zanātī is cited extensively by almost all later geomantic authors, and treatises under his name have been printed in Cairo under various titles.[13]

---

[10] For some accounts of the early masters, see F. Klein-Franke, 'The Geomancy of Aḥmad b. 'Alī Zunbul: A Study of the Arabic Corpus Hermeticus', *Ambix* 20 (1973), 26-35; and Carra de Vaux 'La géomancie' (above note 8), 301-2.

[11] He is an author frequently quoted in the geomantic treatises. A treatise entitled *Thamart al-fu'ād al-muḥaddith 'an al-murād fī l-bawāṭin wa-l-akbād* is extant in Paris, BnF, MS arabe 5834, fols. 110a-119b. Paris, BnF, MS arabe 2716, fols. 112a-113b, contains a didactic poem (*urjūza*) under his name, while Escorial, Bibl. Monasterio de San Lorenzo el Real, MS arab. 924, fols. 9a-13b contains a chapter (*faṣl*) from a geomantic tract by al-Ṭarābulsī. Algers, Bibliothèque Nationale, MS 1531, consists of a tract by al-Ṭarābulsī redone by Abū 'Abd Allāh ibn Hārūn al-Sūsī. Several manuscripts are extant of a Latin geomantic tract by one Alatrabulucus apparently derived from an Arabic original; see P. Tannery, 'La Rabolion' in P. Tannery, *Mémoires scientifiques* (note 8), IV, 324-8, 339-44, and 373-403.

[12] *Kitāb al-Mukhtar fī kashf al-asrār* (note 6), 3. See also M.J. de Goeje, 'Ğaubarī's "entdeckte Geheimnisse",' *Zeitschrift der Deutschen Morgenländischen Gesellschaft* 20 (1886), 485-9. The treatise by al-Jawbarī does not present a detailed discussion of the method of geomancy, although it does given an account of the legendary origins of the art.

[13] These texts are rare in Western libraries. There are two printed treatises attributed to al-Zanātī, one of which is entitled *al-Aqwāl al-mardiya fī l-aḥkām al-ramliya li-l-shaykh al-Zanāti fī 'ilm al-raml* ('Pleasing Statements on the Geomantic Principles of Shaykh al-Zanātī concerning the Art of Geomancy'); a copy printed in Cairo in 1908 (1328 H) is now at the New York Public Library. The second treatise is titled *Kitāb al-Faṣl fī uṣūl 'ilm al-raml 'alá ḥukm al-qawā'id al-aṣliya al-idrīsiya* ('The Chapter on the Principles of the Art of Geomancy Based on the Authority of the Original Idrisian Principles') and was printed several times with slight variations; one copy dated 1280 AH (1863) is at the New York Public Library, another dated 1345 AH (1926) was at the École Nationale des Langues Orientales Vivantes in Paris but is now lost, and a third undated printing is in the Princeton University Library. For a summary of a printed text with the same title as the second work, but with remarkably different contents, see Aboubekr Abdesselam Ben Choaib, 'Le bonne aventure chez les musulmans du Moghrib', *La Revue Africaine* 1 (1906), 62-71. Yet

There are intimations in the names of these legendary and quasi-legendary figures of a possible Hindu or Berber origin of the art. The legendary Ṭumṭum al-Hindī implies an early connection with India, a symbol of antiquity and hence authority. The names Khalaf al-Barbarī, Nāṣir al-Dīn al-Barbarī, al-Zanātī, and presumably also Abū Sa'īd al-Ṭarābulsī, suggest Berber connections. Moreover, in several extant treatises there are purported Berber names given along with the Arabic names for the basic geomantic figures. These terms, however, appear to be more frequently incorrect or simply unintelligible Arabic than actual Berber.[14] The peoples of North Africa were well known for their mastery of various occult and divinatory practices. The Zanāta tribe, for example, practised prognostication by the inspection of shoulder blades (scapulimancy, *'ilm al-katif*).[15] It is not outside the realm of possibility that some North African peoples did in fact develop such a system of divination as geomancy, but on the other hand the Maghrib might be a reasonable area to which to attribute the development of an art whose origins had become obscure by the time it was committed to writing and which may in fact have originated in the pre-Islamic Near East or India.[16]

Somewhat outside the above traditions is the attribution of a geomantic treatise to the Imām Ja'far al-Ṣādiq who died in 765 (148 AH), the last Imām

---

surprisingly few manuscripts are preserved of a geomantic treatise attributed to al-Zanātī. An edition of the available manuscripts is being undertaken by Anne Regourd; see her preliminary study, 'Au sujet des sources manuscrites de l'ouvrage imprimé au Caire sous le titre d'*Al-faṣl fī uṣūl 'ilm al-raml* d'Al-Zanātī', *Annales islamologiques* 35 (2001), 393-407. See also P. Kunitzsch, 'Die "Unwettersterne" und die "Geomantie" des Zanātī', *Byzantinische Zeitschrift* 60 (1967), 309-317 (repr. P. Kunitzsch, *The Arabs and the Stars* [Variorum CS 307], Northampton, 1989, item XV).

[14] See Carra de Vaux, 'Le géomancie' (note 8), 306-8 and 311-14. Thomas Penchoen, Professor of Berber at UCLA, kindly studied the so-called Berber terms employed in some of the treatises. To date only one of the *barbarī* names can with certainty said to be Berber: *ābrid* 'path' used for the Arabic *ṭarīq* which has the same meaning. An additional term may possibly be from a Berber root.

[15] E. Doutté, *Magie et religion dans l'Afrique du Nord: La societé musulmane du maghrib* (Algiers, 1909); R. Pottier, *Initiation à la médecine et à la magie en Islam* (Paris, 1939), 85; D.S. Margoliouth, 'Divination (Muslim)' in *Encyclopaedia of Religion and Ethics*, ed. J. Hastings and J.A. Selbie, vol. 4 (New York, 1912), 816–8. On the other hand, al-Mas'ūdī (d. 956/345) speaks of *wujūd al-nuqaṭ* ('the finding of points') being associated with the Berbers, while scapulimancy (*al-nazar fī al-katif*) he says is something all peoples engaged in; see al-Mas'ūdī, *Kitāb Murūj al-dhahab wa-ma'ādin al-jawhar*, ed. Barbier de Meynard and Pavet de Courteille, rev. by Ch. Pellat, 5 vols. (Beirut, 1966–79), II, 203.

[16] It is uncertain whether *wujūd al-nuqaṭ* mentioned by al-Mas'ūdī (see above note) refers to what came to be called *ilm al-raml* or geomancy. The word *rammāl*, possibly though not necessarily meaning 'diviner in sand', occurs as a personal name, either as a *nisba*, derived from his trade, or preceded by *ibn* – that is, part of the *nasab* or list of ancestors – in sixteen pre-Islamic Safaitic inscriptions. Safaitic graffiti in North Arabian dialect have been found in Ṣafā, Ḥarra, and Lejā east of Damascus and date from the third to sixth centuries AD. See G. Lankester Harding, *An Index and Concordance of pre-Islamic Arabian Names and Inscriptions* (Toronto, 1971), 287.

recognized by both Twelvers and Isma'īlī Shī'ites.[17] Many treatises on divination, magic, and astrology have been, perhaps incorrectly, attributed to him, and he is considered the teacher of the alchemical author Jabīr ibn Ḥayyān known in Europe as Geber.[18] The tradition of ascribing the origins of geomancy to Ja'far al-Ṣādiq was still prevalent in nineteenth-century East Africa from the following statement of Richard F. Burton: 'The Arabs call it El Raml, and ascribe its present form to the Imam Jaafar al-Sadik; amongst them it is a ponderous study connected as usual with astrology'.[19]

Although the preserved geomantic tract ascribed to him may not be genuine and his name is seldom cited in later geomantic treatises, the attribution does raise the possibility of there having been some relations between geomancy and the Ikhwān al-Ṣafā' (the Brethren of Purity), a sect of the Ismā'īlī who were instrumental in the early propagation of astrology and numerology in the Islamic world.[20] A treatise attributed to Ja'far al-Ṣādiq on the divinatory practice of *jafr* is included in some of the modern printings of one of the Zanātī texts mentioned earlier.[21]

In addition to the writings of the authorities mentioned above, there were other sources of knowledge concerning geomancy that were available in the Islamic world by the middle of the thirteenth century. One of the great codifiers of geomancy was 'Abd Allāh ibn Maḥfūf *al-munajjim* ('the astronomer') who lived before 1265 (664 AH).[22] His treatise, which is quite extensive and

---

[17] An incomplete manuscript of five folios is at the Princeton University Library, Garrett Coll. MS 929 (547 AH), while Gotha, Forschungsbibliothek, MS arab. 74, fol. 24b, contains a short discussion of geomancy attributed to Ja'far.

[18] See J. Ruska, *Arabische Alchemisten* II: *Ğafar al-Ṣādiq der secheste Imām* (Heidelberg, 1924; repr. Wiesbaden, 1967), 28-9, and M.G.S. Hodgson, 'Dja'far al-Ṣādiḳ' in *EI²* (note 6), II, 374-5. The best-known and most authoritative treatise on *ja'l-nama*, a type of sortilege practiced in the Middle East, is that which goes under the name of the Imām Ja'far al-Ṣādiq; see H. Massé, 'Fāl-nāma' in *EI²*, II, 760-1. See also, R.Y. Ebied and M.J.L.Young, 'A Treatise on Hemerology ascribed to Ğafar al-Ṣādiq', *Arabica* 23 (1976), 296-307.

[19] Richard F. Burton, *First Footsteps in East Africa or, Exploration of Harar* (London, 1856), 55-6.

[20] V. Marquet, 'Ikhwān al-Ṣafā'' in *EI²* (note 6), III, 1071-6; and S.H. Nasr, *An Introduction to Islamic Cosmological Doctrines* (Cambridge MA, 1964), 25-106.

[21] al-Zanātī, *Kitāb al-Faṣl fī uṣūl 'ilm al-raml* (note 13) in the 1863/1280 printing. See also, T. Fahd, 'Djafr' in *EI²* (note 6), II, 375-7.

[22] In the colophons of two Istanbul manuscripts (Esat. Ef. MS 1988 and Rāġip Pāṣā MS 964) the scribes state that both copies were made from a copy dated 664 AH (= AD 1265-6); see T. Fahd, *La divination arabe. etudes religieuses, sociologiques et folkloriques sur le milieu natif de l'Islam* (Leiden, 1966), 201 nt. 4. In addition, Birmingham, Selly Oaks, Mingana Coll. MS 911 was copied in 1300 [= 1883] from a copy made in 1159 [= 1746] from one made in 664 [= 1265-6]. The author's name is clearly written in all recorded copies as 'Abd Allāh (ibn Abī/'Alī) ibn Maḥfūf, often prefaced by *al-Mamlūk*, and it is unlikely that he is to be identified with the astronomer Jamāl al-Dīn Abū al-Qāsim ibn Maḥfūẓ al-Baghdādī, whose *zīj* was completed in 1285; for Ibn Maḥfūẓ, see C. Jensen, 'The Lunar Theories of al-Baghdādī', *Archive for History of Exact Sciences* 8 (1972), 321-8.

detailed, is extant in several Arabic manuscripts.[23] The title of his treatise is often given simply as *Kitāb fī 'ilm al-raml* ('Book on the Art of Geomancy'), but, according to some manuscript copies and the Ottoman historian Kātib Çelebi (Ḥajjī Khalīfa), the title should be *Kitāb al-Muthallath fī 'ilm al-raml* ('The Book of Triplets in the Art of Geomancy').[24]

The great astronomer, mathematician, and philosopher Naṣīr al-Dīn al-Ṭūsī (d. 1275/672AH), also wrote on the art of geomancy. A small Arabic tract under his name entitled *al-Risāla al-Sulṭānīya fī khaṭṭ al-raml* ('The Royal Epistle on Geomancy') as well as a lengthy treatise on the same subject entitled simply *Kitāb fī 'ilm al-raml* ('Book on the Art of Geomancy') are extant.[25] Furthermore, several Persian treatises or parts of treatises on geomancy by Naṣīr al-Dīn al-Ṭūsī, as well as a Turkish version, are also found in libraries today,[26] and he is occasionally cited as an authority on the subject in later compilations.

A knowledge of geomancy is also to be found in the writings of one of the most celebrated theologians of Islam, Fakhr al-Dīn al-Rāzī who was born in 1149 (543 AH) at Rayy near modern Tehran.[27] In 1178 (574 AH) he composed

---

[23] In addition to the three mentioned in the previous note, there are Los Angeles, UCLA Near Eastern Coll. 898, MS 129; Oxford, Bodleian, MSS Arab.f.36 and Marsh 216; Manchester, John Rylands Library, Arabic MS 373; Dublin, Chester Beatty Library, Arabic MS 5273; Berlin, Staatsbibliothek, MSS Mq. 49, fols. 12a-63b (Ahlwardt 4200) and Or. qu. 1734, fols. 1-59b; Patna (Bankipore), Khuda Bakhsh Oriental Public Library, Arabic MS H.L. 2077 (cat. 2487); and Cairo, Dār al-Kutub, MSS *ḥurūf* 42, *ḥurūf* 43, and *ḥurūf mim* 70 (fragments); Damascus, Maktabat al-Asad al-Waṭanīya MS 6226; and Princeton, Garrett Coll., Yehuda Arabic MS 4216, fols. 40b-80a.

[24] Manchester, John Rylands, Arabic MS 373 and Oxford, Bodleian, MS Arab.f.36; Ḥajjī Khalīfa, *Kashf al-ẓunūn: Lexicon bibliographicum et encyclopedicum*, ed. G. Flügel , 7 vols. (Leipzig, 1835-8), V, 373, no. 11365. Note that Oxford, Bodleian, MS Marsh 216 bears the title *Kitāb Bughyat al-āmāl fī ṣinā'at al-raml wa-taqwīm taḍayyuf al-ashkāl wa-l-'alāma* ('The Desire of Hopes concerning the Art of Geomancy and the Schema of Figures and Attributions of Meanings') with the author given as Abū Naṣr ibn Ṭarhān al-Farābī. This attribution is certainly incorrect, for the manuscript is clearly an incomplete copy of the treatise by Ibn Maḥfūf.

[25] Algiers, Bibliothèque Nationale, MS 1530, fols. 25b-27a, and Princeton, Garrett Coll., Yehuda Arabic MS 2748, fols. 38b-39b, contain the shorter tract whereas Munich, Bayerische Staatsbibliothek, MS arab. 880, presents the more extensive work in 90 folios. See Muḥammad Taqī Mudarris Razavī, *Khvājah Ṭūsī* (Tehran, 1956/1335 *sh*), 57-8; and S.H. Nasr, 'al-Ṭūsī' in *Dictionary of National Biography*, ed. C.C. Gillispie (hereafter *DSB*), 14 vols. (New York, 1970-6), XIII, 508-14.

[26] For example, Oxford, Bodleian, MS Laud. Or. 313, fols. 75b-77b and MS Walker 55, fols. 41b-47b; Patna (Bankipore), Khuda Bakhsh Oriental Public Library, Persian MS 1066; and Madras, Government Oriental Manuscript Library, Persian MS 509. An Arabic translation by 'Abd al-Muḥsin Aḥmad ibn al-Mahdī of part of a Persian tract is in Paris, BnF, MS arabe 2716, fols. 113b-118b. A Turkish translation (from Arabic or Persian ?) of a lengthy treatise by Naṣīr al-Dīn al-Ṭūsī on geomancy is now at Hamburg, Stadtbibliothek, MS Orient. 253 (cxlii), fols. 41b-163b.

[27] For his life and writings, see G.C. Anawati, 'Fakhr al-Dīn al-Rāzī' in *EI²* (note 6), II, 751-5. A treatise on geomancy is also attributed to the theologian and philosopher Abū Ḥāmid al-Ghazzālī who died in 1111 (505 AH); the treatise is extant in Berlin, Staatsbibliothek, MS We. 1218, fols. 1a-11b (Ahlwardt 4204). If this is a valid attribution (which is unlikely), it would be

in Persian an encyclopaedia of Muslim science, *Jāmi' al-'ulūm*, that contains a section on the science of geomancy.[28] In addition, an extant Arabic manuscript concerned in part with geomancy and, in another manuscript, a didactic poem (*urjūza*) on the same subject are both attributed to al-Rāzī.[29]

There is a small text containing some geomantic material which has been printed several times in this century and which bears the name of the well-known ninth-century astrologer Abū Ma'shar al-Balkhī, known to the West as Albumasar (d. 886/272 AH). The booklet is entitled 'Book of the Meticulous Investigator, the Greek Philosopher known as Abū Ma'shar the Astronomer' (*Kitāb al-Muḥaqqiq al-mudaqqiq al-Yūnānī al-faylasūf al-shahīr bi-Abī Ma'shar al-Falakī*).[30] No treatise of such a title is attributed to Abū Ma'shar in the medieval biographical dictionaries.[31] The approach to geomancy in this work is an unusual one in the Islamic world in that the sixteen geomantic figures are discussed exclusively in relation to the twelve zodiacal houses without any use of the customary geomantic tableau. The printed text appears to be identical with Abū Ma'shar's tract 'On the Nativities of Men and Women' (*Kitāb Ṭāli' al-mawlūd li-l-rijāl wa-l-nisā'*) in which each zodiacal sign is discussed along with its three decans (*wujūh*), with one important exception. The printed booklet has an additional paragraph on a related geomantic figure following the discussion of each zodiacal house in the section on the nativities of men, and these extra paragraphs are not to be found in the manuscript copy of *Kitāb Ṭāli' al-mawlūd li-l-rijāl wa-l-nisā'* which the present authors have examined.[32] The author of these paragraphs was clearly well acquainted with the sixteen geomantic figures and the various meanings and attributes attached to them, although the details

---

one of the earliest confirmed dates for a geomantic treatise. Al-Ghazzālī has had attributed to him some writings on number symbolism and magic squares as well as some clearly spurious alchemical tracts. See Ullmann, *Natur* (note 8), 227 and 274; W. Ahrens, 'Studien über die "magischen quadrate" der Araber', *Der Islam* (1917), 186-219 esp. 203-5; and Abū Ḥāmid Muḥammad al-Ghazzālī (spurious ?), *al-Awfāq*, ed. Maḥmūd Ḥamdī (Cairo, n.d., *c.* 1973]).

[28] Fakhr al-Dīn al-Rāzī, *Jāmi' al-'ulūm* (Bombay, 1323/1905), 187-9. Compare Ḥajjī Khalīfa, *Kashf al-ẓunūn* (note24), II, 560 entry no. 3923.

[29] Florence, Biblioteca Laurentiana, MS Or. 329 and an *urjūza* in Vatican, Biblioteca Apostolica, MS arab. 1106, fols. 131a-136b.

[30] Printed in Cairo several times, including 1905 (1323 H) and 1910 (1328 H), and in Beirut in 1982. See also J.-M. Faddegon, 'Notice sur un petit traité d'astrologie attribué à Albumasar (Abū Ma'šar)', *Journal Asiatique* 213 (1928), 150-8, who does not, however, mention its geomantic contents.

[31] Ibn al-Nadīm, *Kitāb al-Fihrist*, ed. G. Flügel, 2 vols. (Leipzig, 1871), I, 277 and *The Fihrist of al-Nadīm. A Tenth-Century Survey of Muslim Culture*, trns. Bayard Dodge, 2 vols. (New York, 1970), II, 656-8; Ibn al-Qifṭī, *Ta'rikh al-ḥukamā'*, ed. J. Lippert (Leipzig, 1903), 154. See also D. Pingree, 'Abū Ma'shar' in *DSB* (note 25), II, 32-39, esp. 38, who aligned the printed tract with a work entitled *Kitāb al-Mawālid al-ṣaghīr* ('The Small Book of Nativities') which is not extant today in manuscripts of that title.

[32] Los Angeles, UCLA Near Eastern Coll. 898, MS 60.

of the procedures for forming a geomantic figure or casting a tableau are lacking in the treatise. Since the tradition of the text of *Kitāb Ṭāli' al-mawlūd li-l-rijāl wa-l-nisā'* apparently varies considerably in some of the extant manuscript copies,[33] the text and its relation to the printed pamphlet deserve further study, while the manuscript versions of other treatises by Abū Ma'shar should be searched for geomantic references.

There are only three known references in the geomantic literature to Abū Ma'shar as an authority.[34] All of these citations occur within discussions of strictly astrological material and relate to his mastery of astrology rather than to any geomantic wisdom. At this point, then, it seems that the geomantic references in the printed text are interpolations by the modern editor and inventor of the fanciful title, and that Abū Ma'shar may not have been a possible source for geomancers. Consequently, a final assessment of Abū Ma'shar's role in the diffusion of geomancy must await further investigation.

Of the writings just discussed, some are not very detailed in their information regarding *'ilm al-raml*, and some, such as those by Naṣīr al-Dīn al-Ṭūsī, might not have been available in Mosul opposite the site of ancient Nineveh on the upper Tigris River in the fourth decade of the thirteenth century, when the geomantic device which is the object of this study was executed. No doubt, in the first part of the thirteenth century there were additional sources for the knowledge of geomancy, whose titles and authors are not known to us today.

Lot-books that employ geomantic figures were apparently known in the thirteenth century, but they have not been included in the summary just presented, for they represent a very different form of geomancy and were not at all likely to have influenced the maker of this device. The geomantic lot-books are geomantic in name only, for the basic procedures are different. The methods employed in the lot-books do not make use of tableaux and sometimes not even of geomantic figures. In some of these methods, dots were made at random and then the number divided by twelve with the remainder giving the page and line where the answer to the inquiry would be given for any one of a list of 144 questions.[35] There is considerable confusion in much of the

---

[33] Ullmann, *Natur* (note 8), 322 nt. 4.

[34] One reference is in Paris, BnF, MS arabe 2730; see Carra de Vaux, 'La géomancie' (note 8), 302 nt. 1. An Arabic geomantic treatise by Abū 'Abd Allāh ibn Ḥasan 'Alī ibn Muḥammad al-Lakhmī al-Andalusī, written in 1875 (1292 AH), also cites Abū Ma'shar as an authority (Los Angeles, UCLA Near Eastern Coll. 898, MS 618, fol. 2a), and he is cited as well in a Provençal geomantic treatise written about AD 1330 (P. Meyer, 'Traités en vers provençaux sur l'astrologie et la géomancie', *Romania* 26 (1897), 225-75, esp. 262).

[35] Three Turkish manuscripts are extant of geomantic lot-books supposedly written by 'Abd Allāh ibn Anīs (or Anī) for the eighth-century caliph Hārūn al-Rashīd (London, British Library, OIOC MS Harl. 262 and MS Harl. 5522 as well as Vienna, Nationalbibliothek, Turkish MS 1509).

literature, both primary and secondary, between the counting of points any time they have been put down at random and what one might call the classical type of *'ilm al-raml*, consisting of the sixteen possible geomantic figures with the production of a tableau from them according to precise rules.[36]

To add to the confusion, in Persian treatises the term *raml* is applied to two types of divination: the traditional form of geomancy – the type employed on this device – and the throwing of brass dice strung together in groups of four. Although these are commonly called 'geomantic dice', their markings do not produce a geomantic figure, and divination using such dice is a form of lot-casting related to the *sortes* of classical antiquity rather than true geomancy.[37]

The author is possibly to be identified with 'Abd Allāh al-Asnī (or al-Ansī) named in Arabic lot-books, which are not, however, geomantic; see P. Kunitzsch 'Zum *Liber Alfadhol* ein Nachlese', *Zeitschrift der Deutschen Morgenländischen Gesellschaft* 118 (1968), 297-314, and 'Der *Liber Alfadhol* ein arabischen Losbuch und seine Schicksale im Morgen- und Abandland', *Zeitschrift der Deutschen Morgenländischen Gesellschaft*, Suppl. I, 2 (1969), 667-72. Kunitzsch argues that the Arabic (non-geomantic) lot-books, related to the 'Liber Alfadhol' of the Latin tradition, do not predate the twelfth century. For further discussion of Latin geomantic lot-books going under the name of Alfodhol or Alfadhol, see Lynn Thorndike's articles, '*Alfodhol* and *Almadel*. Hitherto Unnoted Medieval Books of Magic in Florentine Manuscripts', *Speculum* 2 (1927), 326-331, 'Alfodhol de merengi again', *Speculum* 4 (1929), 90, and 'Alfodhol and Almadel once more', *Speculum* 20 (1945), 88-91. Gerhard Eis has edited a medieval German lot-book in which one of the sixteen geomantic figures is produced to determine the answer (G. Eis, *Wahrsagetexte des spätmittelalters aus Handschriften und Inkunabeln* [Texte des späten Mittelalters, 1], Berlin, 1956).

[36] Also in the class of lot-books there should be placed the so-called 'manual of geomancy' entitled *Experimentarius* written or translated by Bernard Silvester of Tours written in the twelfth century. This treatise does not cast a geomantic tableau or even one geomantic figure, but rather describes a procedure for setting down points at random, dividing by 7, and using the remainder to determine the answer selected from the lot book. See M.B. Savorelli, 'Un Manuale di Geomanzie presentato da Bernardo Silvestre da Tours (XII Secolo): L'*Experimentarius*', *Rivista Critica di Storia della Filosofia* 14 (1959), 283-342, and C.S.F. Burnett, 'What is the *Experimentarius* of Bernardus Silvestris? A preliminary survey of the material', *Archives d'Histoire Doctrinale et Littéraire du Moyen Age* 44 (1977), 79-125. The Oxford, Bodleian Library, Western Manuscripts, MS Digby 46, a fourteenth-century copy of the *Experimentarius*, has set into the inside front cover of the volume two interlocking wooden cogged wheels with twenty-eight and thirteen teeth, by which one can find a random number, rather than by counting random points. This rather mechanical way of obtaining a number is very different in principle from the determination of the geomantic figures on the device by Muḥammad ibn Khutlukh al-Mawṣilī now at the British Museum.

[37] For a study of so-called 'geomantic dice', see E. Savage-Smith, 'Divination' in F.R. Maddison and E. Savage-Smith, *Science, Tools & Magic* [The Nasser D. Khalili Coll. of Islamic Art, 12], 2 vols. (London/Oxford, 1997), I, 148-57. Confusion in the use of the term *raml* for geomancy and for a form of sortilege employing dice has caused such errors as that of Nasr, who labels a photograph of two sets of such dice as 'Instruments used in geomancy'; see S. Nasr, *Islamic Science. An Illustrated Study* (London, 1976), 207. Furthermore, the circular plate pictured by Nasr in the same photograph as another geomantic instrument is in reality unrelated to *raml* in either sense, but rather is a plate closely resembling the back of a compass used for finding the *qibla*, the direction towards Mecca. That is, the plate gives the names of 34 cities and their corresponding directions and *inḥirāf*, which is the angle that determines the direction toward Mecca. Such a plate is used neither in *'ilm al-raml* (geomancy) nor in sortilege with dice.

The device studied here contains some features apparently not found in extant Arabic, Persian, or Turkish writings on geomancy dating from before the middle of the thirteenth century. It seems clear that the designer of the instrument was quite familiar with written treatises on the subject, for in one inscription he has the device say of itself: 'from my intricacies there comes about insight superior to books concerned with the study of the art.'

In view of the confused and not overly large corpus of geomantic writings prior to the fourteenth century, this intricate device proves to be of considerable importance for the history of the occult sciences, complementing its value as a fine example of thirteenth-century Islamic metalwork. In addition, the tablet itself is a unique concept in the history of geomancy, since there seem to be no writings before or after this device containing any mention of a mechanical contrivance for establishing a geomantic reading and supplying information necessary for its interpretation. There is no other known geomantic device from any culture remotely similar to it.

It does seem likely that a dust board was employed by some geomancers, for the word *takht* occurs frequently in geomantic treatises where it could mean either the abstract sixteen-place tableau or a dust board on which the tableaux of geomantic figures were produced.[38] The word *takht* occurs in medieval Arabic mathematical writings as a term for a small board lightly covered with sand on which one could mark down numerals and then erase them by smoothing over the sand or dust or by covering it with additional dust.[39] It is entirely likely that such a board would have been used for marking down the geomantic figures until paper and pen later became sufficiently available to replace it. The several references in *Alf layla wa-layla* ('The Thousand and One Nights') to a geomantic tablet used with a stylus of brass to form the figures is probably evidence of the early use of a dust board or tablet, although it is possible the references are later interpolations into the stories.[40] Such a tablet or

---

[38] For example, Los Angeles, UCLA Near Eastern Coll. 898, MS 88, p. 31, uses the term *takht* for the surface which you mark with a stylus, *mīl*, once calling it *takht lawḥ* 'dustboard'. In one of the printed texts attributed to al-Zanātī the word is more frequently used for the completed sixteen-place tableau of geomantic figures from which the reading is derived, but it is also used as a tablet of sand (*takht min al-raml*) on which you mark with a stylus, *qalam*, the row of dots and form the first four figures; see al-Zanātī, *Kitāb al-Faṣl fī uṣūl 'ilm al-raml* (note 13, copy dated 1280 AH), 18, 24-5, *et passim*.

[39] Kūshyār ibn Labbān, *Principles of Hindu Reckoning. Kitāb fī uṣūl ḥisāb al-hind*, ed. and trns. Martin Levey and Marvin Petruck (Madison, WI, 1965), 5-6 *et passim*; A.S. Saidan, 'The Comprehensive Work on Computation with Board and Dust by Naṣīr al-Dīn al-Ṭūsī', *al-Abḥāth* 20 (1967), 91-163 and 213-92. See also M. Souissi, 'Ḥisāb al-ghubār' in *EI*[2] (note 6), III, 468-9, who suggests that the tablet may not necessarily have been covered with dust but rather covered with clay in which figures could have been marked and erased by a stylus.

[40] A collection of Arabic stories comprising *The Thousand and One Nights* appears to have formed about a Persian framework and to have developed with many additions from various

dust board is quite different, however, from a device designed to generate the geomantic figures mechanically, which is the nature of the instrument we are here discussing.[41]

II. Principle Method of Casting a Tableau

In Islamic geomancy, divination is accomplished by forming and then interpreting a design consisting of sixteen positions, each of which is occupied by some geomantic figure. This design is referred to as the geomantic tableau. The figures that occupy the first four positions are of primary importance in constructing the tableau, for they determine the occupants of the other twelve places. Consequently, the formation of these first four figures, called the Mothers (*ummahāt*), is of great significance. Ordinarily each of the Mothers is made by marking in the dust or sand or on a piece of paper four horizontal lines of dots, one row below another (see Fig. 1). Among some practitioners of geomancy these rows of dots are made by the person seeking advice or the answer to some question, whereas in other practices the diviner or geomancer being consulted puts down the marks. It is always stressed that the dots should not be counted as they are made, but rather the hand should make the marks while the conscious mind is totally absorbed in reflection on the question or problem.

Since there are four Mothers to be formed, sixteen rows of dots must be made in all (see Fig. 1). After this has been done, each row is examined in turn and the dots are grouped in pairs so as to find whether the row has an even or

---

locations from the ninth and tenth centuries AD, taking final shape in the thirteenth century (see E. Littmann, 'Alf layla wa-layla' in *EI*[2] (note 6), I, 358-64). A tablet of sand (*takht raml* or *takht al-raml*) and a stylus of brass (*qalam min nuḥās*) figure prominently in the story of 'Alī Shār and Zumurrud (the 320th to 326th night), while a gift of a geomantic sand board of gold (*takht raml min dhahab*) is mentioned in the tale of Qamar al-Zamān (the 202nd night); see *Kitāb Alf layla wa-layla*, 4 vols. (Būlāq, 1862/1279AH), II, 18-19, 196-8, and 200-3; *The Book of the Thousand Nights and a Night*, trns. Richard F. Burton, 6 vols. (London, 1885; rpr New York, 1962), 1117-8, and 1464-74; and Husain Haddawy, *The Arabian Nights II: Sindbad and Other Popular Stories* (New York, 1995), 197. The tales of Jawda the Fisherman, Shīmās and Jali'ād, Gharīb and his brother Ajīb, and Delīlah the Crafty also mentioned a geomantic dustboard or tablet; see O. Rescher, 'Studien über der Inhalt von 1001 Nacht', *Der Islam* 9 (1919), 1-94, esp. 36-8. The practice of geomancy with a square box of sand plays an important role in the story of Aladdin and the Wonderful Lamp, which is not usually grouped as one of the Thousand and One Nights; see H. Zotenberg, *Histoire d'Alā al-Dīn ou la lampe merveilleuse* (Paris, 1888), 11, 62-3, and 76; R.F. Burton, *Supplemental Nights to the Book of the Thousand Nights and a Night*, Bossaorah Edition, 3 vols. (London, n.d.), III, 68, 156-7 and 179-80; and Haddawy, *The Arabian Nights II: Sindbad*, 81-163.

[41] Also very different from the present device is the thin brass astrological/geomantic plate from a late Safavid workshop, now in the Khalili Collection, Acc. no. SCI33. It is engraved on both sides with numerous Persian inscriptions, laid out in concentric circles, presenting a gazetteer as well as astrological alignments and an arrangement of geomantic figures. See Savage-Smith, 'Divination' (note 37), I, 158-9.

an odd number of dots. If the number of dots in the row is even, then that row is represented by a pair of dots; if the number is odd, then by only one dot. In this way there is obtained, for each Mother, a vertical column of four marks, each of which is one or two dots.

Fig. 1. The formation of the first four figures of a geomantic tableau.

The four geomantic figures thus formed are then placed side by side, with the first one on the right, the second one immediately to the left of it, and so on. From these four Mothers occupying positions I through IV in the tableau,

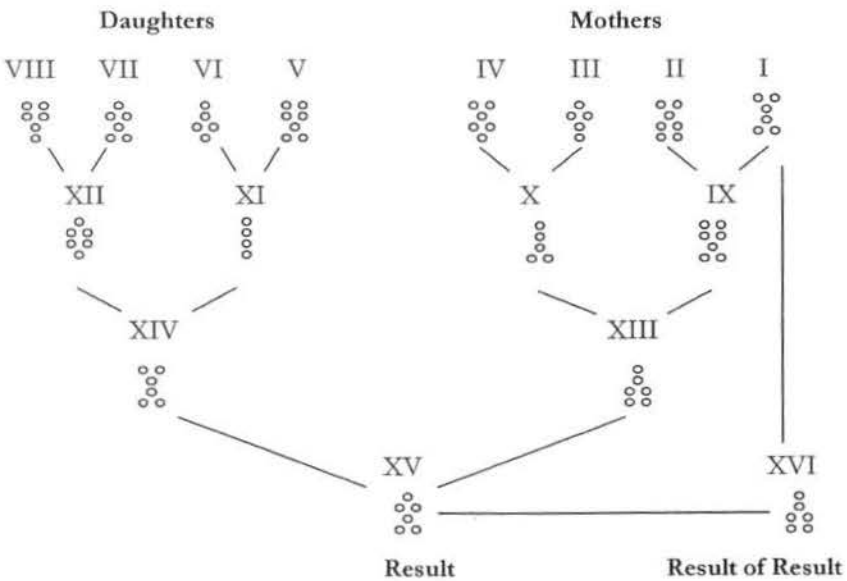


Fig. 2. An example of a complete geomantic tableau, with Roman numerals marking the number of the position or 'house'.

the remaining figures in the tableau are produced as shown in Fig. 2.

The figure for position V is formed by taking the top row of marks in the Mothers from right to left and writing them as a column from top to bottom. The ones for positions VI, VII, and VIII are obtained similarly by taking the second, third, and fourth rows respectively, in the Mothers, always going from right to left, and turning them into columns. The figures thus produced and placed in positions V through VII are commonly known as the Daughters (*banāt*).

For position IX a figure is produced in an entirely different way, for here only the first and second Mothers are used, and they are in a sense 'added' together. Starting with the top row, the marks of the two figures are combined. If the sum is even, then two dots are placed in the top row of the new figure; if the sum is odd, only one dot is put there. By adding in this way the dots in the second row of the two Mothers, the number of dots for the second row of the new figure is determined, and likewise the number of dots for rows three and four. All the remaining figures are formed by combining a previously determined pair of figures: for example, by adding figures in positions III and IV we find the figure for position X, the figure V 'plus' the figure in VI yields the figure for XI, and so forth. Finally, when one has obtained the figure for position XV from those occupying positions XIII and XIV, the final figure, the one in position XVI, is found by combining in this same manner the figures in positions XV and I, and this completes the formation of the geomantic tableau.

The device that we are examining was designed so that it was unnecessary to put down the sixteen rows of dots as the first step in finding the four Mothers. Instead it is clear that these four figures are obtained by moving the four curved slides which are located in the upper right-hand portion of the face of the device (see Pl. 1).

Since each geomantic figure consists of four marks, and each mark consists of either one or two dots, there is a total of sixteen (i.e., 2^4) possible figures. Each figure has a name and various meanings. Furthermore, the geomantic treatises give numerous alignments between the figures and such items as the planets, the zodiacal signs, the four classical elements, parts of the human body, and so forth. These alignments play a role in the interpretation of a particular tableau, but the alignments and interpretive methods vary considerably from author to author. The sixteen figures are described in the next section, where the name of each and the unique alignment of the figures found on the device under consideration are discussed.

There are sixteen positions or 'houses' (*buyūt*; sing. *bayt*) in the complete tableau. Although there are also sixteen different geomantic figures, it can be proved that it is impossible for all sixteen figures to appear in a tableau. In other words, in a properly drawn tableau some figure must be in more than one

house. Another feature of every correct tableau is that the geomantic figure in position XV is an even figure – that is, the figure must have an even number of dots. Observation of this property of the tableaux was stated by Arabic geomantic writers as early as the thirteenth century, and, furthermore, they gave arguments explaining the reason for this characteristic.[42]

Because of the method of combining geomantic figures as used in the production of figures to occupy houses IX through XVI, described above, Islamic geomancy has a pronounced mathematical structure. In fact, the set of all sixteen geomantic figures forms, under the 'addition' process, an algebraic structure known as a finite commutative group. Although the topic has been relatively ignored by historians of science, some attention has recently been given to it by ethnologists, and there has been an attempt at a structural analysis. It would seem, however, that there is still a considerable amount of research to be done before much of a definitive nature can be said regarding the structures underlying the practice of geomancy.[43]

III. Detailed Description of the Geomantic Tablet

The Islamic geomantic device now in the possession of the Department of Oriental Antiquities of the British Museum is signed by Muḥammad ibn Khutlukh al-Mawṣilī and dated 639 AH (= AD 1241-2). From the maker's *nisba* (the part of the name derived from the location or trade) one might infer that he was born in Mosul and very likely connected in some manner with the prominent metalworking centre, especially renowned for its inlaid brass vessels,[44] which flourished there during the first half of the thirteenth century. The fact that the maker's *nisba* is al-Mawṣilī is not, however, conclusive evidence that he resided and worked in Mosul, for there were artisans from that locality who worked in Cairo, Damascus, and elsewhere in the thirteenth century.[45]

A second piece of metalwork also signed by Muḥammad ibn Khutlukh al-Mawṣilī has recently been discovered – an undated incense-burner that is stated

---

[42] For readers interested in mathematical proofs of these properties, see R. Jaulin, *La Géomancie: analyse formelle* [École Pratique des Hautes Études, Sorbonne, Cahiers de l'Homme, n.s., 4] (Paris, 1966), 20-3 and 27.

[43] See M. Pedrazzi, 'Le Figure della Geomanzia: Un Gruppo Finito Abeliano', *Physis* 14/2 (1972), 146-61; M. Ascher, 'Malagasy *Sikidy*: A Case in Ethnomathematics', *Historia Mathematica* 24 (1997), 376-95; and the monograph by the French structural anthropologist Robert Jaulin, *La Géomancie* (note 42). For a critical study of the latter work, see M.B. Smith, 'The Nature of Islamic Geomancy with a Critique of a Structuralist's Approach', *Studia Islamica* 49 (1979), 5-38.

[44] D.S. Rice, 'Inlaid Brasses from the Workshops of Aḥmad al-Dhakī al-Mawṣilī', *Ars Orientalis* 2 (1957), 282-326.

[45] R. Harari, 'Metalwork after the Early Islamic Period' in A.U. Pope, *A Survey of Persian Art*, 6 vols.(Oxford, 1938-9), V, sec. xii, 2466-2539 esp. 2495 and VI, plates 1276-1396.

to have been produced in Damascus, possibly made a few years before the geomantic device.[46] It is unusual amongst incense-burners because of the architectural nature of its design, and it possibly reflects Sasanian influences on craftsmen working in Greater Syria in the early thirteenth century. No other examples of his work are recorded and no information on him is available except what can be gleaned from the objects themselves.

From the standpoint of design and metallurgical craftsmanship, the geomantic tablet is very similar to the incense-burner bearing his name and compares favourably with some twenty-five pieces of metalwork associated with Mosul, including a celestial globe made by Muḥammad ibn Hilāl al-Munajjim al-Mawṣilī in 1275-6 (674 AH) that was produced after the centre of metalwork began to decline following the sack of the city by the Mongol Hūlāgu in 1260.[47] A comparison might also be made with some of the outstanding and roughly contemporary examples of Syrian-Egyptian scientific instruments, such as the celestial globe[48] made by the Egyptian architect and mathematician Qayṣar ibn Abī l-Qāsim ibn Musāfir al-Ashrafī al-Ḥanafī in 1225–6 (622 AH) for the Ayyūbid ruler of Egypt al-Malik al-Kāmil, the nephew of Ṣalāḥ al-Dīn (Saladin). Even more fruitful is a comparison with the fine astrolabes made by ʿAbd al-Karīm al-Miṣrī who worked for the last Ayyūbid and the first Mamlūk ruler of Egypt, which display similar decorative bands.[49]

It is not the purpose of the present study to elaborate upon the importance of this tablet to the history of the minor arts and metallurgy, but it is evident that this geomantic tablet is an exceptionally fine example of the inlaid metalwork produced by the craftsmen of thirteenth-century Greater Syria, Egypt and Iraq. The device is of a brass alloy having a rich reddish colour and is in three basic pieces – front plate with attached dials, back plate, and the frame enclosing them. The device is amply covered with inscriptions, decorative devices, and arabesque inlaid in gold and silver. The instrument measures 33.7 cm in length and 19.6 cm in height, not including the 5.4 cm

---

[46] James Allan, 'Muḥammad ibn Khutlukh and the History of Early Islamic Incense-burners' in James W. Allan, *Metalwork of the Islamic World: The Aron Collection* (London, 1986), 25-34 and 66-9.

[47] British Museum, Dept. of Oriental Antiquities, Inv. no. 71.3.1. See R.H. Pinder-Wilson, 'The Malcolm Celestial Globe' in *The British Museum Handbook*. Vol. I: *The Classical Tradition* (London, 1976), 83-101; and E. Savage-Smith, *Islamicate Celestial Globes: Their History, Construction, and Use* (Smithsonian Studies in History and Technology, 46] (Washington, D.C., 1985), 219-20 no. 4.

[48] Museo Nazionale, Naples; see Savage-Smith, *Celestial Globes* (note 47), 218-9 no. 3.

[49] Two such astrolabes are extant, one dated 625 AH (= 1227-8) and the other 633 AH (=1235-6). The former is now at the Museum of the History of Science, Oxford, and the latter in the Department of Oriental Antiquities of the British Museum. Unfortunately the inscription on the latter has been reworked and hence is unreliable. See L.A. Mayer, *Islamic Astrolabists and Their Works* (Geneva, 1956), 29-30 and pl. xiib; and Allan, 'Muḥammad ibn Khutlukh' (note 46), 33.

high projection by which it can be suspended (see Pl. 1 for an overall view of the front of the device).

The front plate has nineteen small circles, each of a diameter of 3 cm surmounted by a window exposing a sector of a small dial that rotates beneath the plate (see Pls. 1 and 3). A large dial near the centre rotates beneath a semi-circular window of diameter 8 cm (see Pls. 1, 5, and 6). Four sliding arcs are nested at the right of the front plate behind openings in the front plate, the largest of radius 8 cm (see Pls. 1 and 4). The numerous inscriptions are inlaid in either gold or silver wire.

The front plate of the tablet, with dials attached to it from behind (see Pl. 2), is recessed in a metal frame which holds it in the manner of a picture frame. To the top of the frame is attached a device for hanging the tablet, and on the four sides of the frame there is a poem engraved and inlaid in silver against a background of arabesque (see Pls. 8–11). The front edge of the frame is decorated with a silver inlaid band formed of a trefoil alternately upside down between pairs of interlaced stems, and the narrow margin nearest the front plate is engraved in a chain pattern with centres inlaid with silver (see Pl. 1).

The manner in which the geomantic tablet was designed to be suspended closely resembles that common in astrolabes.[50] The decorative triangular projection attached to the top edge of the frame (Pl. 1) is like the *kursī* ('throne') projecting from the upper part of an astrolabe. It is 5.4 cm in height and 13.5 at the base, and the edges are engraved and inlaid in arabesque (see Pl. 11). The *'urwa* ('handle') consists of a nearly closed circular arc whose ends are joined by a straight pin passing through the upper part of the *kursī*, thus allowing the tablet to swing on this pin. The *'urwa* or handle then receives the *ḥalqa* ('ring') of diameter 3.4 cm. Both the ring and the handle are decoratively engraved. To this ring would probably have been attached a cord, *'ilāqa*, as was done with astrolabes.

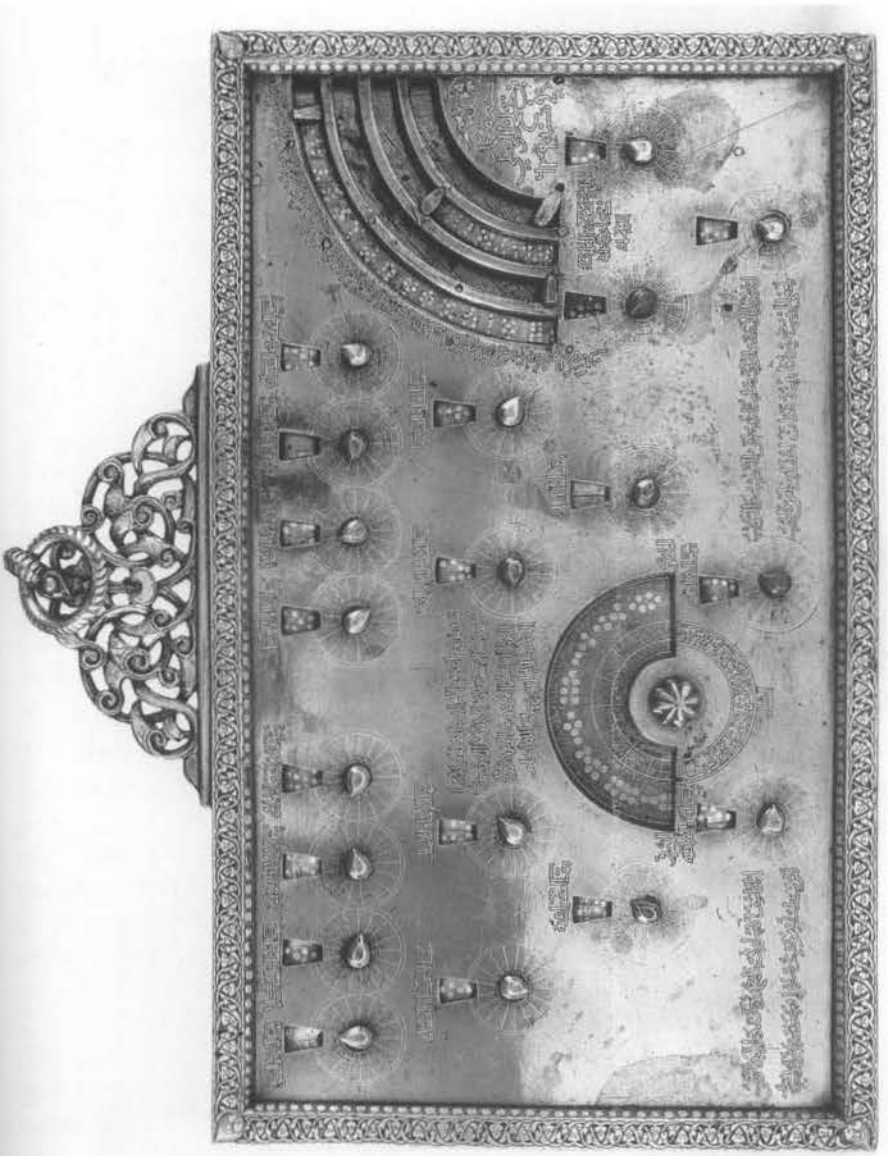
The suspensory device is somewhat reminiscent of the *kursī* found on a thirteenth-century Persian astrolabe with geared calendar movement made by Muḥammad ibn Abī Bakr ibn Muḥammad al-Rāshidī al-Ibarī al-Iṣfahānī in 1221 (618 AH).[51] There is also similarity with an enormous suspensory device of *kursī* form whose purpose is unknown but which was made by one Shākir ibn Aḥmad in Mosul or Damascus about the same time as this device.[52] There

---

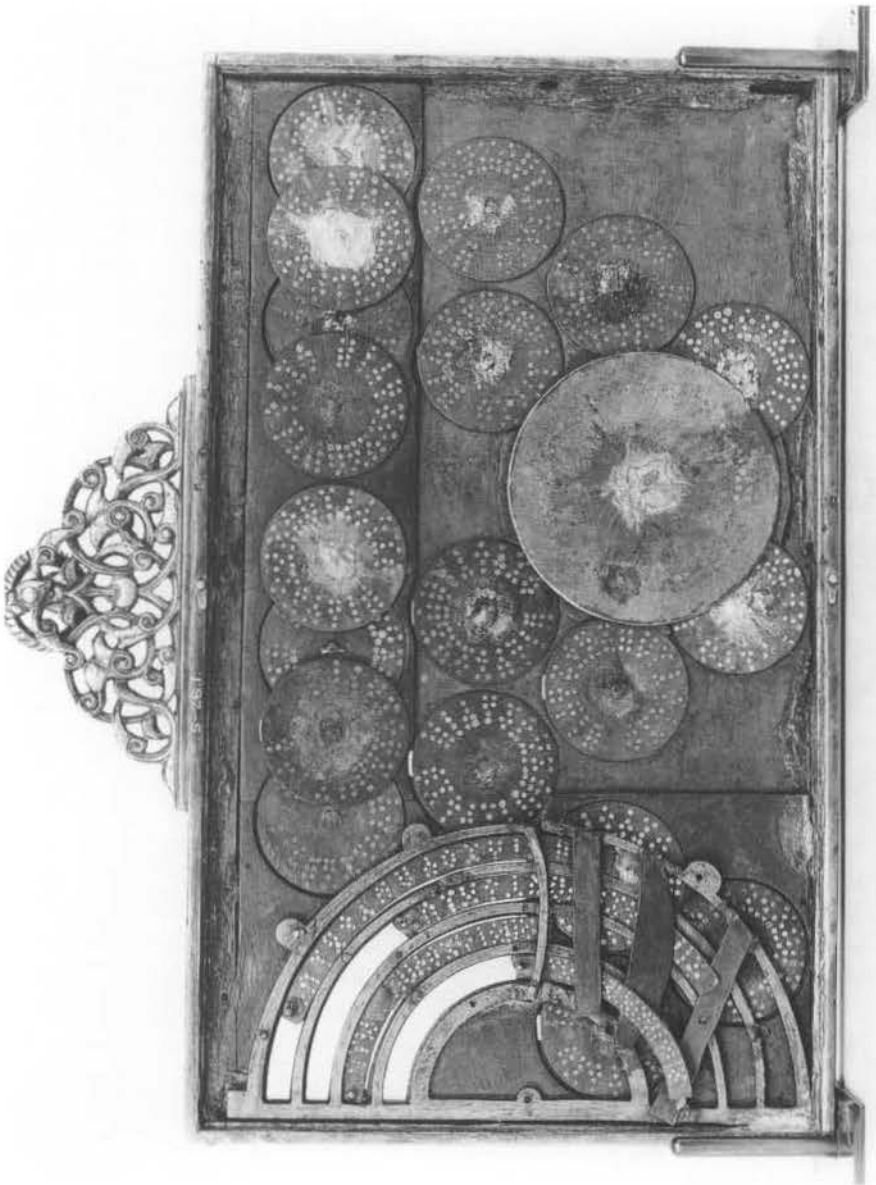
[50] See W. Hartner, 'The Principle and Uses of the Astrolabe' in Pope, *Survey* (note 45), III, 2539–54 and VI, plates 1397–1404; reprinted with additions in W. Hartner, *Oriens–Occidens. Ausgewählte Schriften zur Wissenschafts- und Kulturgeschichte Festschrift zum. 60 Geburtstag* [Collectanea 3] (Hildesheim, 1968), 287–311, esp. 292.

[51] Oxford, Museum of the History of Science, Inv. no. IC 5.

[52] London, Khalili Coll., Acc. no. MTW825; see Maddison and Savage-Smith, *Science, Tools & Magic* (note 37), I, 206–9; and *l'Orient de Saladin* (note 1), 209 no. 221.



Pl. 1. Front view of geomantic device. [Brit. Mus. Neg. no. 015009]



Pl. 2. View of inside of geomantic device, with back removed. [Brit. Mus. Neg. no. XXXII 9]

seems, consequently, a strong possibility that the metalworker who executed this geomantic tablet – Muḥammad ibn Khutlukh al-Mawṣilī – was also an astrolabe maker, though no astrolabes bearing his name are known to be extant. An association with the astrolabe industry is further borne out by the fact that the incense-burner that he is known to have made also has decoration similar to that on astrolabes.[53]

To the back of the front plate are attached nineteen small independent dials of diameter 4.4 cm (see Pl. 2). The dials are not cogged nor interrelated in any way. One larger dial of diameter 8.7 cm is also attached to the front plate. The significance of these rotating dials becomes evident in the following discussion. Four semicircular channels contain four 90° sliding arcs, the largest having a radius of 8 cm. On the back of the front plate, four metal strips have been placed across the channels to keep the sliding arcs within the channels.

The back plate (Pl. 12) sits within the back of the frame and is held in place by two small pins, one in the middle of each of the long sides, which can be turned over the edge of the back plate to retain it in the frame. The back plate is bordered by a rectangular inscription, the background of which is filled with arabesque and some letters terminating in arabesque; it is inlaid with silver, with decorative devices placed at the four corners and at the centre of the two longer sides. In the middle of the back is a diamond-shaped band containing a second inscription inlaid in silver against a background of engraved and inlaid arabesque. This band is intertwined by two other bands which are filled with spiralling vines of inlaid silver. These bands form within the lozenge a central circle containing a short engraved inscription.

THE MAKER AND AN OWNER

Nothing is known of the maker of this elaborate device except his name which is inscribed in Naskh script, inlaid in silver, on the front of the device beneath the four sliding arcs in the upper right-hand corner (see Pls. 1 and 4; for a transcription, see Appendix, item 1):

> The work of Muḥammad
> ibn Khutlukh al-Mawṣilī
> in the year 639 [= 1241-2].

The equivalent of the Latin *opus* in the signature is the noun *ṣana'a(t)*, written with diacritical dots over the *tā' marbūṭa*, which occurs frequently on scientific instruments.[54] On the incense-burner also made by him, the signature is

[53] Allan, 'Muḥammad ibn Khutlukh' (note 46), 33.

[54] *Ṣana'a(t)* is clearly the most frequently employed term on Islamic celestial globes, while the noun *'amal* occurs only twice on globes before the sixteenth century; see Savage-Smith, *Celestial*

virtually identical, except that the first word can be read as the verb *ṣana'ahu* ('made it') rather than as a noun since it lacks dots over the *tā' marbūṭa*.[55]

Whether or not Muḥammad ibn Khutlukh al-Mawṣilī was also the designer of this unusual concept for producing a geomantic reading, and hence was well read in the geomantic literature and a practicing geomancer himself, is an open question. His name is not mentioned in any of the geomantic literature surveyed. From the employment and design of a suspensory apparatus resembling that of an astrolabe – a feature not required for the functioning of the geomantic tablet as it is for an astrolabe – it seems quite possible that the designer and/or maker was an astrolabe maker. There is evidence that some astronomers (defined broadly in the sense of all concerned with timekeeping) were also metalworkers who made their own astronomical instruments such as astrolabes as well as some other metal objects having nothing to do with astronomy.[56] Hence there is some possibility that Muḥammad ibn Khutlukh al-Mawṣilī could have been an astrolabe maker and even possibly an astronomer-astrologer and a geomancer.

A second personal name appears in an inscription engraved in Naskh script on the back of the device in the centre circle formed by the intertwining bands of arabesque (see Pl. 12 and Appendix, item 2). This inscription, which is the only one on the entire device not inlaid in gold or silver, reads as follows:

In the possession of [*fī nawbat*] Muḥammad al-Muḥtasib al-Bukhārī

The entire inscription is written without any diacritical dots and hence can be read in several ways, but this interpretation appears the most reasonable.[57] Since there is no date given in this inscription we cannot know with certainty whether it was in his possession immediately after its execution or whether it came into his possession sometime later during the intervening six centuries before it came into the collection of the British Museum. Since it is the sole inscription on the tablet which is engraved only, not inlaid in gold or silver, and it employs a slightly different style of calligraphy from the rest of the device, it is likely that it was added later.

Of this Muḥammad al-Muḥtasib al-Bukhārī we know only what can be gleaned from his name. It can be assumed he had some association with Bukhārā, a city on the lower course of the Zarafshān river in present-day Uzbekistān. From the name al-Muḥtasib we could surmise that he was an

---

Globes (note 47), 214. L.A. Mayer, however, asserts that the noun *ṣana'a* rarely occurs on astrolabes; Mayer, *Islamic Astrolabists* (note 49), 13 nt. 1.

[55] Allan, 'Muḥammad ibn Khutlukh' (note 46), 33 and 66-8.

[56] For example, see Mayer, *Islamic Astrolabists* (note 49), 13-14 and 21.

[57] The name could also be read as Muḥammad al-Mukhlis al-Bukhārī, since the final *bā'* of *muḥtasib* is not well formed.

inspector of the markets and weights and measures – that is, an official of that branch of the legal system referred to as the *ḥisba* system.[58] If indeed he was the person for whom this geomantic device was actually designed and executed, the high quality of the metalwork and a reference to the owner being superior to the rest of mankind in an inscription on the edge of the frame would indicate that he was a very wealthy and important person.

THE SMALL DIALS

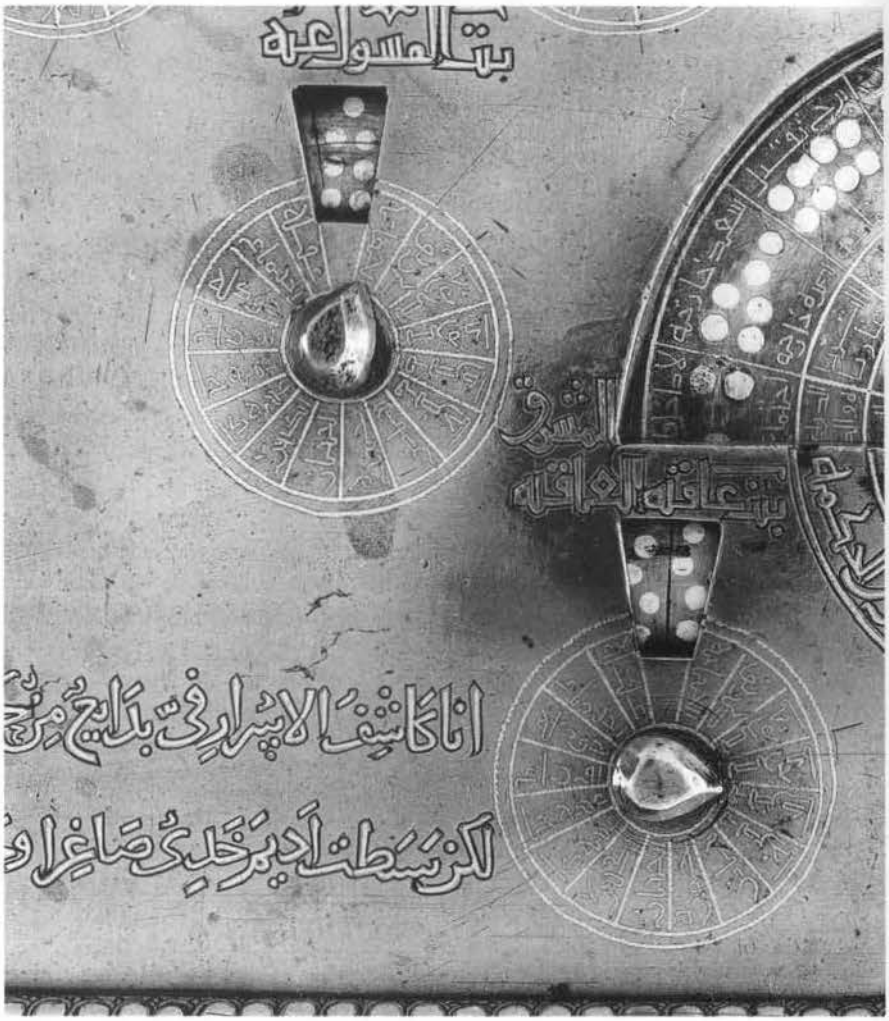
On the front of the tablet there are nineteen small circular regions. The border of each region is represented by two finely drawn concentric circles of inlaid silver wire. In the centre of each circle is a small knob which serves as a pointer and rotates a dial behind the engraved circle, causing individual geomantic figures to appear in the open window. Each engraved circle is divided by inlaid silver wire into sixteen sectors, in addition to the open window. In these sixteen sectors are inscribed in gold inlaid wire in Kufic script the names of the sixteen geomantic figures, while on the plate beneath, each figure is represented by configurations of inlaid silver dots. Since the order of the figures on the plate is the same as that which occurs on the dial beneath, it seems that the purpose of the pointer was to indicate the name of the figure visible in the window. Considerable care was obviously taken in the design and placement of these small plates so that none of the sixteen figures on a plate would appear in the window when the pointer was aligned with the open window itself. The device seems, however, to have been repaired many times, the circular plate being re-soldered onto the pointer – obviously at times by people unfamiliar with the principle of the device, for many of the dials are no longer in proper alignment with their pointer.

All of the nineteen dials have the same inscriptions with the same spellings presented in the same order (see Pl. 3 and Appendix, item 3). All of these names for the sixteen figures are found extensively in the geomantic literature, and, with two exceptions, they seem to be the most frequently used terms. The meaning of some of the names is a bit obscure, and it is difficult to give precise English equivalents of them For a few figures, such as that having the name *al-ṭarīq* meaning 'path', the name might be explained by the very form of the figure itself. However, to approach the meanings of most of the names in this manner seems to lead to highly questionable interpretations.[59]

---

[58] See C. Cahen, 'Ḥisba' in *EI*² (note 6), III, 485-93.

[59] For such a discussion, see J.C. Hébert, 'Analyse structurale des géomancies comoriennes, malgaches, et africaines', *Journal de la Société des Africanistes* 31 (1961), 115-208, esp. 121-2.



Pl. 3. Detail of one of the nineteen small dials. [Brit. Mus. Neg. no. 046131]

The following list presents the inscriptions around the small engraved circles, reading clockwise from the open window, along with the corresponding geomantic figure which appears on the rotating dial:

al-jamā'a 

ṭarīq 

nuṣra khā[rija] 

nuṣra dā[khila] 

qabḍ dā[khil] 

qabḍ khā[rij] 

bayāḍ 

ḥumra 

al-ḥiyān 

inkīs 

'ataba dā[khila] 

'ataba khā[rija] 

awrā' 

jawdala 

ijtimā'

'uqla

The first figure, which contains the maximum number of points (eight) you can have in a figure, is given the common Arabic term *al-jamā'a* meaning a collection or assemblage of things or people. This is virtually the only term found in the literature for this figure, except for the so-called 'Berber' term and

the additional name *al-salāma* ('well-being') given it by Ibn Maḥfūf.[60]

The second figure, which has the minimum number of points (four), is called *ṭarīq* meaning 'way' or 'path'; and it is the only term used for the figure. *Nuṣra khārija* has a somewhat obscure meaning, possibly 'diminishing victory' or 'external help', while *nuṣra dākhila* means something like 'increasing victory' or 'internal help'; these names are nearly universal terms for the two figures, though *al-sulṭān* 'the ruler' and *tashmīr* 'preparing or despatching something' are provided respectively by Ibn Maḥfūf.

Qabḍ dākhil is also a term whose meaning is not altogether clear. *Qabḍ* means 'the act of taking or seizing something' and can sometimes mean 'prize' or 'possession'. Hence *qabḍ dākhil* might be translated as 'increasing seizure' or possibly as 'internal prize or property'. *Qabḍ khārij* might similarly be translated as 'diminishing seizure' or possibly 'external property'. *Bayāḍ* means 'white' and *ḥumra* 'red'. The latter two, as well as the previous two, are essentially the only terms employed in the literature for these figures, though Ibn Maḥfūf adds *al-laban* 'milk' and *al-damm* 'blood' for the last two.

The name *al-ḥiyān* appears to be one of several variant spellings of the word *al-laḥyān*, the latter spelling being the most commonly found. The word means the two jawbones, upper and lower, and, in a man, the part on which the beard grows. The misspelling found on the device occurs, but very infrequently, in geomantic treatises, one of which is by Ibn Maḥfūf.[61] Another name for this

---

[60] For more detailed discussions of these terms, see Kunitzsch (note 13) and Carra de Vaux, (note 8). For the present discussion the following texts have been most frequently consulted: Oxford, Bodleian Library, Oriental Collections, MSS Greaves 40, Arab.f.36, Marsh 216, Bodl. Or. 505, Hunt. 456, Ouseley 156, and Hunt. 193; London, British Library, OIOC, MSS Sloane 2650, Or. 2332, and Or. 12395; Paris, BnF, MSS arabe 2716, arabe 5014, arabe 2758, and arabe 2732; Princeton, University Library, Garrett Coll. MSS 954 (547 H III), 929 (547 H IV), and 962 (548 H); Los Angeles, UCLA, Research Library, Near Eastern Coll. 895, MSS 678 and 686, Near Eastern Coll. 898, MSS 88, 618, and 685, and Near Eastern Wellcome Coll. MS 142; Cambridge, University Library, MSS Add. 3613(10), Add. 3624(8), Or. 901(8), Or. 431(7), Corpus Or. 80, and Browne Coll. MS Q.2(9). The following printed texts were also compared: Abū Ma'shar, *K. al-Muhaqqiq* (note 30); Fakhr al-Dīn al-Rāzī, *Jāmi' al-'ulūm* (note 28); al-Zanātī, *K. al-Faṣl fi uṣūl*, printed in 1863/1280, and *al-Aqwāl al-mardiyya* (note 13); Da'ūd al-Anṭakī, *Tadhkira awwali l-albāb wa-l-jāmi' li-l-'ajab al-'ujjāb* (Būlāq, 1282 [1865]), part 4, 234-42; Muḥammad ibn 'Umar al-Tūnisī, *Tashḥīdh al-adhhān bi-sīrat bilād al-'arab wa-l-sūdān*, ed. Khalīl Maḥmūd 'Asākir and Muṣṭafā Muḥammad Mus'ad (Cairo, 1965); 'Abd al-Qādir al-Ḥusaynī al-Adhamī, *Risāla mizān al-'adl fi maqāsid aḥkam al-raml*, in *K. Shams al-ma'ārif al-kubrā wa-laṭā'if al-'awārif li-Aḥmad ibn 'Ali al-Būni* (Cairo, n.d. [1945]), 1-14; Muḥammad Bāqir ibn Murtaḍā al-Yazdī, *Nafaḥāt al-asrār fi 'ilm al-raml* (Bombay, 1308 [1890]); and 'Abd al-Fattaḥ al-Sayyid al-Tūkhī, *Manba' uṣūl al-raml, al-mushtamil 'alā thamānin darsan fi uṣūl 'ilm al-raml* (Cairo, 1376 [1956]). Berber terms are beyond the scope of this study.

[61] Ibn Maḥfūf calls *al-ḥiyān* a 'Berber' term (Oxford, Bodleian Library, Oriental Collections, MS Greaves 40, fol. 178a, and MS Arab.f.36, fol. 101b), giving as the Arabic *kathīr al-hayba* 'of great esteem' and *al-rajul al-kabīr* 'the great man'. See also Klein-Franke, 'The Geomancy of Ahmad b. 'Ali Zunbul' (note 10), 32, whose reading of *ḥayyān* in the text by Ibn Zunbul written in

figure is *ḍāḥik*, an adjective meaning 'laughing', which occurs in the literature about as frequently as *al-laḥyān* and its variants. The name *inkīs* is probably not of Arabic origin, though it might be interpreted as an unusual form derived from the root *n–k–s* meaning to turn something upside down. It is the most common term for the corresponding figure, although the passive participle *mankūs* meaning 'inverted' and hence 'unfavorable' and *nakīs*, 'inverting', occur as well as *rakīẓa* meaning a pole or peg or buried treasure.[62]

The word *'ataba* can mean either the lintel or the threshold of a doorway, and so *'ataba dākhila* is the outside lintel of a doorway while *'ataba khārija* is the outside threshold of the doorway. These are the two most common terms for these figures, although *rāya fariḥ* 'joyful banner' and *rakīẓa thābita* 'fixed pole or peg; fixed treasure' also occur respectively for these two figures.

The term *awrā'* ('the cautious ones') comes from the root *w–r–'* meaning to be timid,[63] but it is far from the most frequent word in geomantic manuals for the figure, the common one being *naqī l-khadd* meaning something like 'pure of cheek' or 'pure of visage'. The name *jawdala* is a bit of a puzzle, for it is from a quadriliteral root which is not otherwise attested in medieval or modern dictionaries. While it is a common name for this figure, of almost equal incidence is the name *kūsaj* or *kawsaj*, meaning to be scanty-bearded.

The word *ijtimā'*, meaning the act of being arranged or assembled, is the only term to be used in the literature for this geomantic figure. The name *'uqla*, 'a bond or shackle', is the most common label for the last figure in the listing above, although the term *thikāf* occurs occasionally. The latter word refers both to an instrument for straightening objects such as spears as well as to the art of fighting with a sword.

Sixteen of the nineteen small circles have an inscription in Kufic script inlaid in silver written above the open window, and these form the sixteen positions or houses of the geomantic tableau. The names provided for the houses agree with those that are often found in Arabic geomantic treatises. The labels over the first eight houses – that is, the eight small circles across the top of the device – reading right to left are as follows (see Pl. 1 and Appendix, item 4):

[I]	The House of Soul and Life
[II]	The House of Property and Wages
[III]	The House of Brothers and Sisters

---

the sixteenth century seems to imply the same reading as *ḥiyān*, which is the verbal noun from the third form of the root *ḥ–y–n* and as such means 'a certain period of time'; see E.W. Lane, *An Arabic-English Lexicon*, 8 vols. (London, 1863; rpr Beirut, 1968), II, 689.

[62] Ibn Maḥfūf gives *al-rajul alladhī l-aṣl* 'the man who is most strong of character'.

[63] Various arrangements of diacritical dots are found on the word, such as *awẓā'*, but the most common spelling is *awrā'*/*aurā'*.

[IV] The House of Fathers and Mothers
[V] The House of Offspring and Children
[VI] The House of Illness and Disease
[VII] The House of Women and Sexual Matters
[VIII] The House of Slaughter and Death

The next row of four houses, reading right to left:

[IX] The House of Movement and Changes
[X] The House of Power and Glory
[XI] The House of Hope and Expectations
[XII] The House of Enemies and Envious People

The small dial to the right of the centre large dial:

[XIII] The House of the Questioner

The dial to the left of the large centre dial:

[XIV] The House of the Object of the Inquiry

The small dial on the right below the large centre dial:

[XV] The House of the Result

The small dial on the left below the large centre dial:

[XVI] The House of the Result of the Result

The three remaining small dials do not bear individual labels and are grouped in an inverted triangular formation at the lower right of the device. Between the two upper dials of this group is the engraved statement that follows, written in Kufic script and inlaid in silver (see Pl. 4 and Appendix, item 5):

In these locations[64] circles generate the geomantic triplet[65].

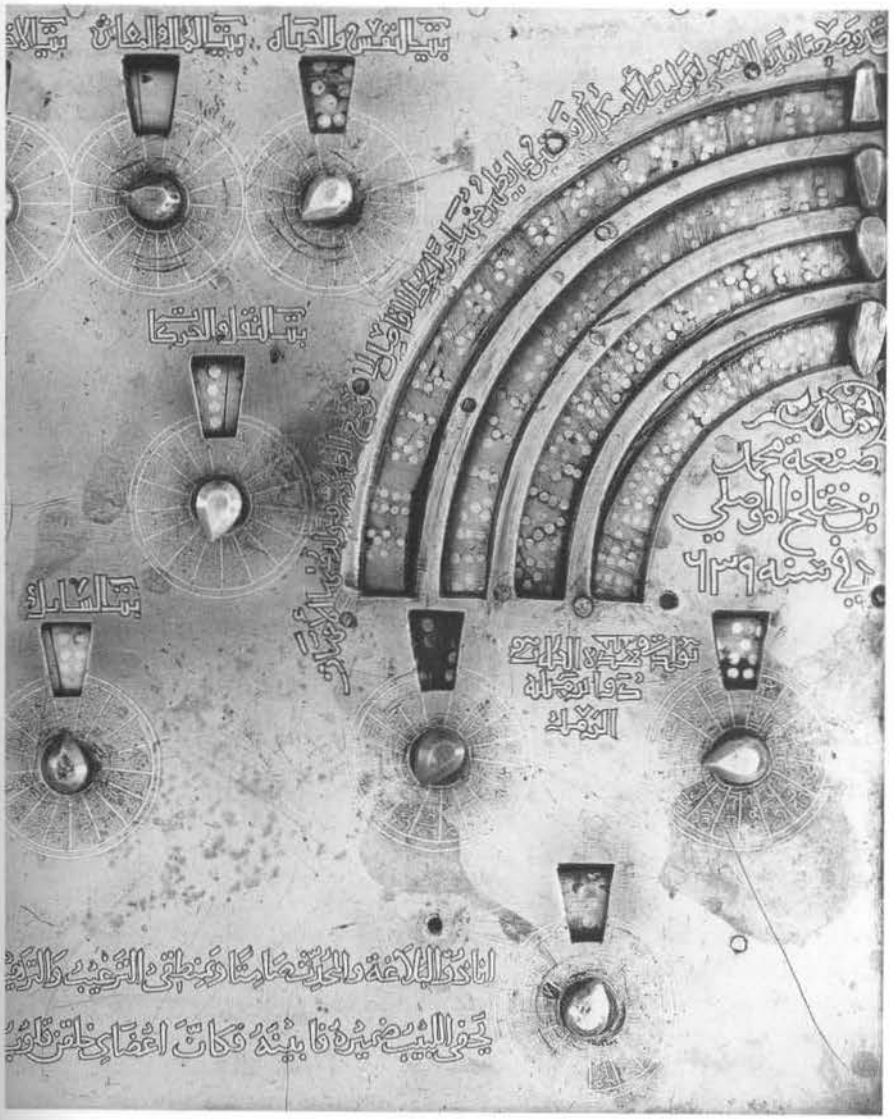
THE SLIDING ARCS

Each of the four nested 90° arcs in the upper right-hand portion of the tablet (see Pl. 4) contains a slide which may be moved by a small knob attached

---

[64] Reading *al-maḥallāt* instead of *al-ḥalāt* as engraved.

[65] The term *muthallatha*, translated here as triplet, occurs frequently in geomantic literature in the specialized sense of a group of three *raml* figures, one of which is derived from the other by combining, or 'adding', them. The word *muthallath*, as well as *muthallatha*, also appears as the title of the treatise by Ibn Maḥfūf, a treatise devoted in large part to the interpretation of triplets (see notes 22–24 above). The term *muthallatha* (and the plural *muthallathāt*) also occurs in astrological literature, but in the very different sense of trines (*triplicitates* in Latin treatises) of 120° alignments; see al-Bīrūnī, *The Book of Instruction in the Elements of the Art of Astrology*, ed. and trns. R. Ramsay Wright (London, 1934), 230 sec. 379; and Ullmann, *Natur* (note 8), 356.



Pl. 4. Detail of sliding arcs on front of device, with signature of maker and date beneath the smallest arc. [Brit. Mus. Neg. no. 046130].

directly to the slide. Each slide moves independently and contains the geomantic figures inlaid in silver dots. All sixteen figures appear on each arc in the same order of presentation, and, read in an anti-clockwise, direction they form the following sequence, listed here from right to left:

As one goes from the outermost arc to the innermost, the figures become increasingly crowded as the length of the arc becomes shorter.

Over the four slides is the following statement, inscribed in Naskh script and inlaid in silver (see Pl. 4 and Appendix, item 6):

> We have placed these arcs in order to generate the figures,[66] and so those that appear next to the separating line at the point of visibility are to be considered, and then from them you generate the Mothers.

A small rivet inserted in the process of constructing the tablet has marred the inscription at the point *fa-ya'tabiru* 'it/they are to be considered', so that a precise reading is not possible at this point.[67]

THE LARGE DIAL

Above the large central dial is a four-line inscription, in Kufic script and inlaid in silver, which reads as follows (see Pl. 1 and Appendix, item 7):

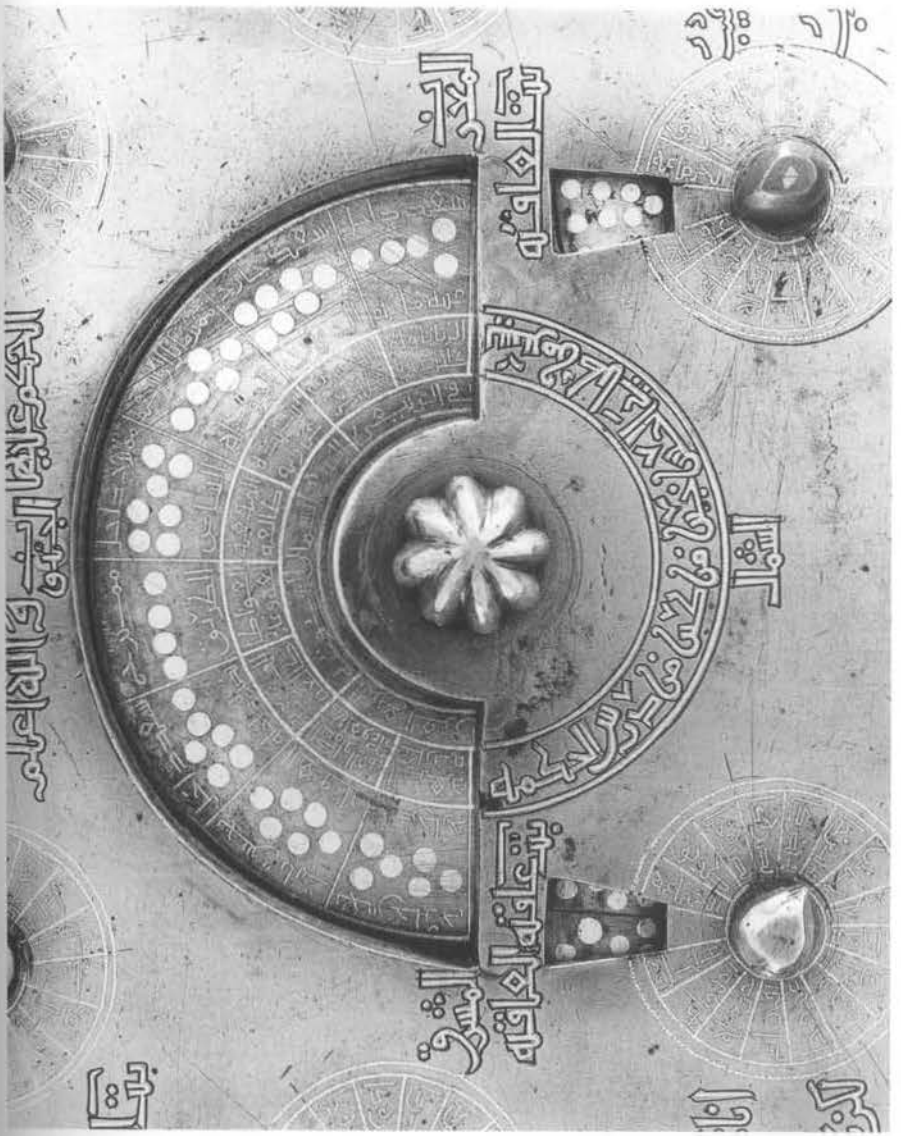
> [1] We have established this circle so that you might learn from it the
> [2] correspondences of the forms of the figures with the forms of
> [3] the lunar mansions, rising and setting. Thereupon the power to interpret
> [4] might belong to it [the circle], but God knows best.

On the front plate around the large dial engraved in Kufic script and inlaid in silver are the four cardinal points. These names are stable and do not turn with the dial (see Pls. 1–5 and Appendix, item 8). Below the hemispherical window exposing the large circular plate on the front of the device is a semicircular band, containing an inscription inlaid in silver and in Kufic script. In this inscription the device, or possibly the large circular plate, is made to speak the following words (see Pls. 5 and 6 and Appendix, item 9):

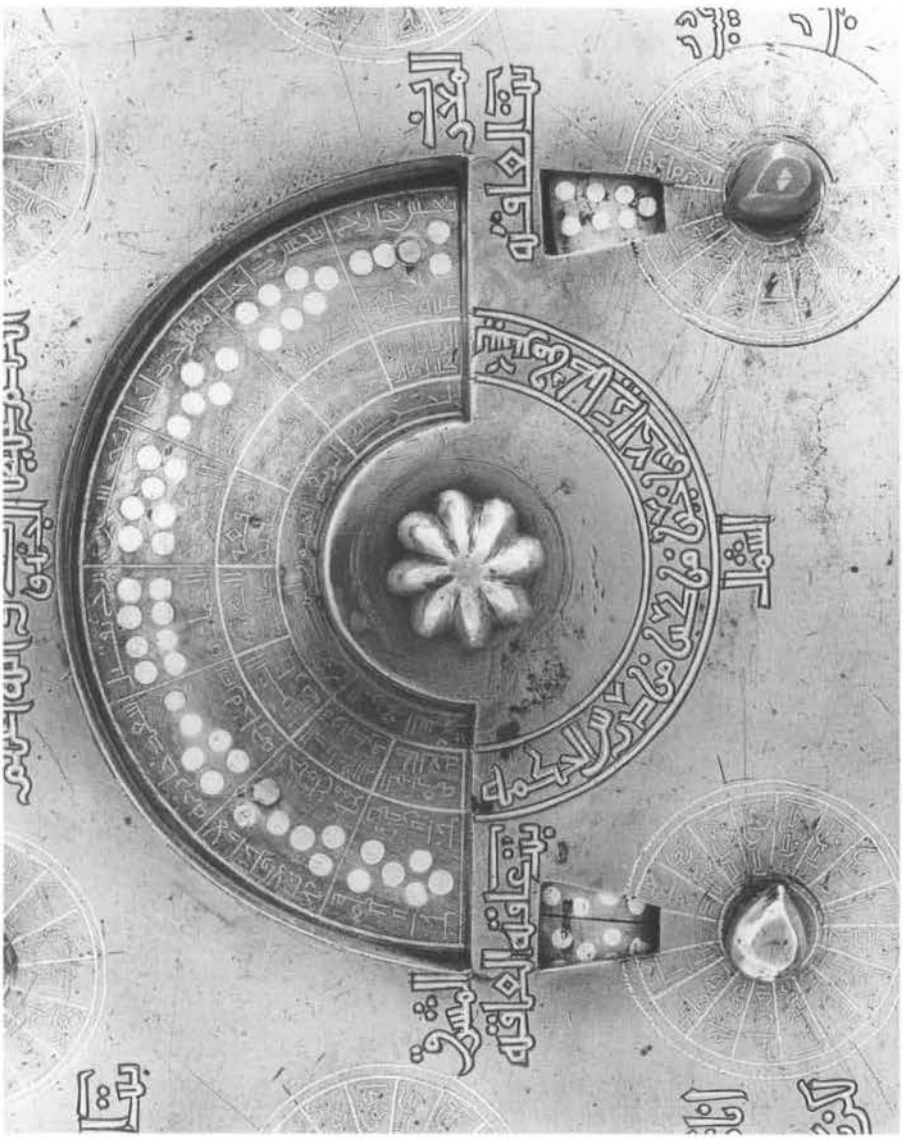
---

[66] *Shakl* (plural *ashkāl*) is the usual term for the geomantic figures. See Muḥammad 'Alī al-Tahānawī, *Kashāf iṣṭilāḥāt al-funūn: A Dictionary of Technical Terms Used in the Sciences of the Musulmans*, ed. Mawlawies Muhammad Wajih, Abd al-Haqq, and Gholam Kadir [Bibliotheca India, 17], 3 vols. (Calcutta, 1853-62), II, 784.

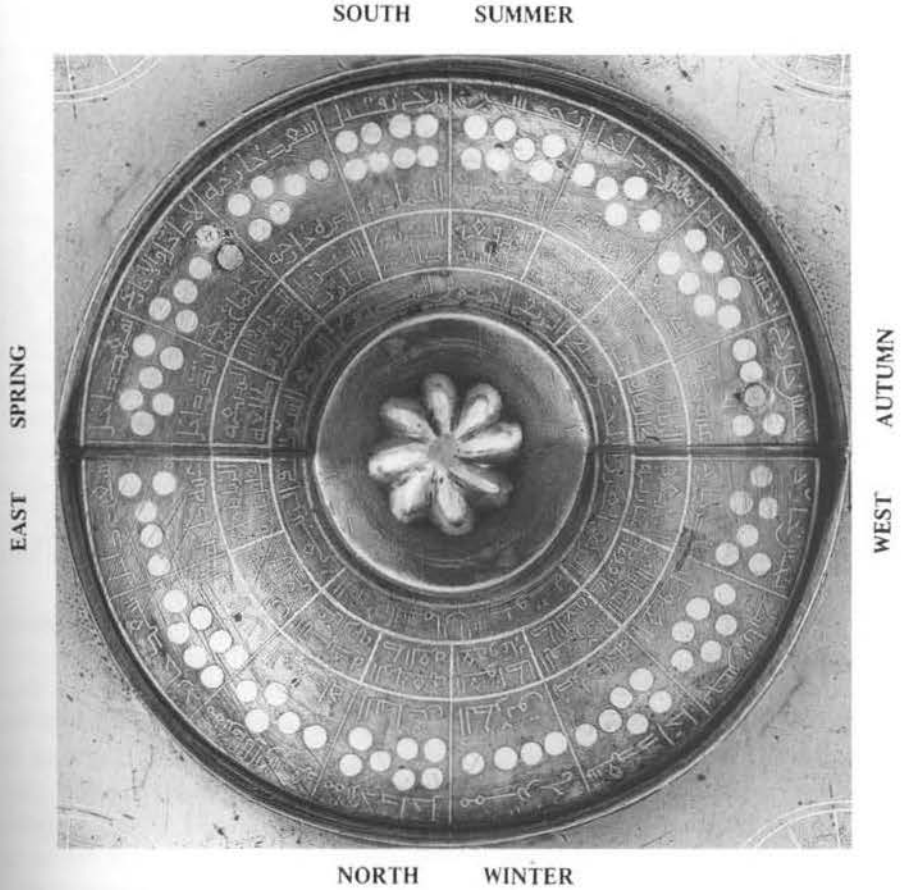
[67] Other readings have also been suggested, such as *fa-yatabayyanu* 'it/they will become clear'.



Pl. 5. Detail of one half of the large central dial with the northern–winter quadrant of figures at the top. [Brit. Mus. Neg. no. 046128]



Pl. 6. Detail of other half of the large central dial, with the southern–summer quadrant of figures at the top. [Brit. Mus. Neg. no. 046129]



Pl. 7. Composite photograph showing the complete central dial with the four quadrants of figures labelled.

> From my intricacies there comes about insight superior to books concerned with the study of the art [of geomancy].

Behind the window rotates a large circular plate turned by an eight-lobed knob on the front of the plate. In Pl. 7 the circular plate is shown in its entirety. Of course, only half of the plate is visible at any one time through the window seen in Pls. 5 and 6. The circular plate edged with inlaid silver wire contains five concentric bands: in four of the bands are inscriptions written in Kufic script with inlaid gold wire, and in the fifth are the sixteen geomantic figures formed by inlaid gold dots. In the outermost band are inscriptions giving the 'indication' or omen associated with the adjacent geomantic figure. The figures themselves occupy the second concentric band. The third band from the outside gives the name of the adjacent geomantic figure. These three bands are separated from the two inside bands by a second circle of inlaid silver wire. The next innermost band of writing presents the names of certain lunar mansions and states whether their rising or setting is intended. In this way an alignment of the geomantic figures with some of the lunar mansions is clearly indicated. Silver inlaid lines separate the sixteen items in these four bands, but the innermost band (separated from the adjacent band by another inlaid silver circle) is divided by silver lines into four equal quadrants. In this way the inscriptions in the innermost band group the geomantic figures into four sets corresponding to the seasons and the directions of the compass.

As the dial is turned clockwise, the four quadrants, or groupings of figures, appear in the window in the order southern, eastern, northern, and western and consequently have the same relative position on the plate as do the four stationary cardinal points engraved about the large dial. The arrangement of the stationary directions of the compass about the large central dial is the same as that of the quadrants on the back of an astrolabe and the orientation of a *ṣafiḥa* of an astrolabe, which is the disk on which is engraved a stereographic projection of the heavens.[68] Consequently, the placement of South at the top is in keeping with the procedures followed by astrolabe makers and astronomers.

For a transcription of the inscriptions on the large dial, see Appendix, item 10. Note that in Pls 5, 6, and 7, the geomantic figures represented by inlaid silver dots are displayed horizontally rather than in the usual vertical manner. The only explanation we can offer for this arrangement is the maker's need to conserve space. Also note that in Pls 5 and 6 the symbols of the figures in the southern and eastern quadrants, although still horizontal, have been reversed in their direction – that is, the symbols in the southern and eastern quadrants run in the opposite direction from those of the other two quadrants. To put it

[68] Hartner, 'Principle and Uses of the Astrolabe' (note 50), 295 and 302.

another way, the figures in the southern and eastern quadrants have their heads (their topmost marks) at the right end, while the figures in the northern and western quadrants have their heads at the left. In all likelihood this is because the metalworker held the plate steady in one position when inserting the silver studs. If the entire plate were viewed all at once, as in Pl. 7, the figures as placed by the maker would read properly. But as the plate is turned and viewed through the semicircular window, the figures in the bottom half are inverted, since the maker failed to take into consideration the effect that the rotating movement of the dial would have on the appearance of the figures when displayed in the window.

Since one of the more distinctive features of this device is the association of geomantic figures with lunar mansions, it is important that we consider in detail this alignment. Before doing that, however, some preliminary remarks on the origin and nature of the lunar mansions are necessary.

Table 1. Inscriptions on Large Rotating Dial

	Lunar mansion /	Geomantic name and figure[69] /			Indication
Northern winter quadrant	*al-balda*, setting	/ *al-jawdala*	○○●○●○	●○●○●○	Mixed, tending toward good omen
	al-haq'a, rising	/ *al-bayāḍ*	○○●○●○	●○●○●○	Increasingly mixed
	al-'awwā', rising and setting	/ *al-ṭarīq*	●●●●	●○●○●○	Mixed
	al-thurayyā, rising	/ *nuṣra dākhila*	○○●○●●	●○●○●○	Increasing good fortune

[69] We have interpolated the geomantic figures within vertical dotted lines so as to show the reader the figures in their normal orientation.

Table 1. Inscriptions on Large Rotating Dial (Continued)

	Lunar mansion /	Geomantic name and figure /		Indication
Western autumnal quadrant	*al-simāk, al-ghafr* rising and setting	/ *al-ʿuqla*		Constant ill luck
	al-hanʿa, setting	/ *qabḍ khārij*		Decreasing ill fortune
	al-zubānā, al-iklīl rising	/ *ʿataba khārija*		Decreasing ill luck[70]
	al-dabarān, setting	/ *inkis*		Increasing bad luck
Southern summer quadrant	*al-balda*, rising	/ *awrāʿ*		Increasingly mixed
	al-haqʿa, setting	/ *al-ḥumra*		Ill fortune
	al-naʿāʾim, rising	/ *al-jamāʿa*		Serious adversity
	al-thurayyā, setting	/ *nuṣra khārija*		Decreasing good fortune[71]
Eastern spring quadrant	*al-dhirāʿ, al-na*[*thr*]*a* and *al-ṭarf*	/ *al-ijtimāʿ*[72]		Mixed, neither increasing nor decreasing
	al-hanʿa, rising	/ *qabḍ dākhil*		Increasing good fortune
	al-zubānā, al-iklīl setting	/ *ʿataba dākhila*		Increasing good fortune
	al-dabarān, rising	/ *al-hiyān*		Decreasing good fortune

The origin of the system of lunar mansions is obscure and complex. The Bedouins of the Arabian peninsula in pre-Islamic times had a primitive system by which they estimated the passage of time and predicted meteorological

[70] The inscription actually reads *khārikh*, amended by the present authors to read *khārij*.

[71] The engraver has written *saʿd khārija* instead of *saʿd khārij*.

[72] The engraver has written *mumtazaj* 'mixed' alongside the name of the figure *ijtimāʿ*. It should be read with the indication or interpretation of the figure rather than the name.

events so as to locate winter and spring grazing lands whose locations varied greatly depending upon the rainfall. The pre-Islamic system called *anwā'* was based upon a series of prominent stars whose cosmical settings (setting in the west as the sun rises in the east) and heliacal risings (rising in the east with the sun) delineate the solar year by breaking it into about twenty-eight periods.[73] The stars themselves were held responsible for weather conditions. Sometime before the advent of Islam the Bedouins assimilated from India a system in which the zodiac, or ecliptic, was divided into twenty-seven or twenty-eight 'mansions' (*manāzil*) of the moon.[74] These mansions corresponded to places in the sky through which the moon passed in its course from new moon to new moon in twenty-seven or twenty-eight nights. The course of the moon is inclined to the ecliptic at an angle only slightly more than 5°, but its brilliance is such that nearby stars cannot be observed; hence the mansions were named for stars in the vicinity of but not directly along the ecliptic. Each mansion represents one day's travel of the moon, and corresponds, therefore, to roughly 13° along the ecliptic beginning at the vernal equinox.

In superimposing the system of *manāzil* upon the Bedouin grouping of fixed stars, the Arabs applied *anwā'* star names to the Hindu lunar-mansion divisions of the ecliptic. These two systems are not entirely compatible, however, for one is calculated on the basis of the risings and settings of fixed star groups and the other reckoned on regular intervals of the ecliptic taken from the vernal equinox. With the precession of the equinoxes, no fixed star will maintain the same distance from the vernal equinox. The most commonly accepted value in the medieval world for the precession was 1° per 66 years. Consequently one star group cannot be successfully aligned with one segment of the ecliptic measured from the vernal equinox for an extended period of time. The resulting *anwā'–manāzil* system began with a star group in Aries (probably to be identified with βγ *Arietis*) which corresponded to 0° House of Aries, at the

[73] A confusion in the use of the term 'acronychal' has occurred in much of the literature on lunar mansions; hence we have taken care to avoid the term and consequently have used only heliacal and cosmical (see Fig. 3). See also C. Pellat, 'Anwā' ' in *EI*[2] (note 6), I, 523–4.

[74] The number of lunar mansions seems to have been originally less than 28. Several theories have been put forward as to the origin of this system: that it is Chinese and spread from China to India, that it was originally Indian, that it was Babylonian in origin and extended thence to India, and that Hellenistic astronomy played a role in the diffusion either as a point of origin or through Hellenistic astronomical and trigonometric techniques current in India. See W. Whitney, 'The Lunar Zodiac', *Oriental and Linguistic Studies* 2 (1874), 340-421; P. Yampolsky, 'The Origin of the Twenty-Eight Lunar Mansions', *Osiris* 9 (1959), 62-83; F. Hommel, 'Über den Ursprung und das Alter der arabischen Sternnamen und insbesondere der Mondstationem', *Zeitschrift der Deutschen Morgenländischen Gesellschaft* 45 (1891), 592-619; S. Weinstock, 'Lunar Mansions and Early Calendars', *Journal of Hellenic Studies* 69 (1950), 48-69; and R. Mercier, 'Studies in the Medieval Conception of Precession: Part II', *Archives Internationales d'Histoire des Sciences* 27 (1977), 33-71.

vernal equinox, in about 300 BC.[75]

Following the advent of Islam and the reception and elaboration of Greek astronomy and astrology, the earlier Bedouin star groupings were overlaid with the Ptolemaic constellations which we recognize today. In most of the later prognostication using lunar mansions (which continued to be employed to predict rainfall and other meteorological phenomena), the system was interpreted in such a way that it was not affected by the precession of the equinoxes – that is, each zodiacal house, or 30° division of the ecliptic, was assigned two and one-third lunar mansions. In the Islamic system, the twenty-eight mansions are numbered, the first one coinciding (if the system is not precessed) with the vernal equinox, the second one occurring about thirteen days further into the zodiacal house of Aries. Each lunar mansion was given the name attributed to one of the twenty-eight *anwā'* star groups, even though the star groups were no longer in the segments of the ecliptic bearing their names. The rising of a lunar mansion is most often interpreted as the heliacal rising.[76] An interval of approximately thirteen days passes between the rising of two adjacent lunar mansions. When one lunar mansion is rising in the East with the sun (heliacally), the fourteenth one from it in the order of the twenty-eight lunar mansions will be setting (see Fig. 3). The setting of a lunar mansion in the West as the sun rises is called the cosmical setting and occurs at a six-month

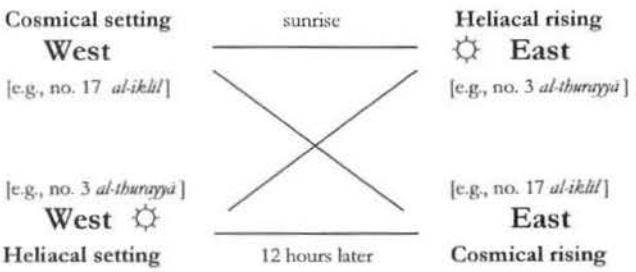


Fig. 3. Heliacal and cosmical risings and settings of lunar mansions.

[75] This attempted compounding of the *anwā'* with the lunar mansions (*manāzil*) gave rise to a type of Arabic literature, known as *anwā'* literature, in which lexicographers recorded the Bedouin associations of meteorological phenomena with this system. These works, besides containing an explanation of the *anwā'* star groups and the lunar mansions with the visibilities and settings, would include a discussion of the system of rains, winds, cold, and other weather conditions, illustrated with appropriate proverbs and poety. See C. Pellat, 'Dictions rimes, *anwā'*, et mansions lunaires chez les arabes', *Arabica* 1 (1955), 17-41

[76] Since the sun's brightness makes it impossible to see the actual rising of the lunar mansion occupied by the sun, the person observes between the beginning of dawn and the appearance of the sun the rising of the second lunar mansion preceding it in the established sequence. For example, the third lunar mansion is said to be rising if the first mansion is the last one whose rising is visible before the sun rises.

interval from its heliacal rising. When a lunar mansion sets in the West as the sun sets, then it is termed an heliacal setting, and this occurs on the same day as its heliacal rising. Similarly, the cosmical rising of a star (in the East as the sun is setting) occurs on the same day as its cosmical setting.

Many of the Arabic terms applied to lunar mansions were so ancient that when the lexicographers recorded them in the ninth century their significance had already been lost. Frequently, therefore, only a tentative translation can be given. The names appear to be older than many of the pre-Islamic Arabic star names, and the imagery behind them more obscure.[77]

There was a tradition in the Islamic and Latin worlds of associating with the lunar mansions abstract patterns of dots or stars in small geometrical designs (see Table 2). The thirteenth-century writer on occult sciences al-Būnī as well as the thirteenth-century cosmographer and geographer al-Qazwīnī have extensive sections on the lunar mansions illustrated with configurations of dots, some of which are suggestive of geomantic figures, although neither mention geomancy in their treatises.[78] An Arabic brass celestial globe[79] dated 718 H [= 1318-19] and signed by 'Abd al-Raḥmān ibn Burhān al-Mawṣilī represents the lunar mansions by patterns of inlaid silver dots along the ecliptic apparently in the same tradition. This particular globe appears to be unique amongst the Islamic celestial globes in this feature. Also, patterns of dots obviously related to the twenty-eight lunar mansions, though the term is not used, are found in the Latin *Experimentarius,* said to have been translated in the twelfth century from Arabic by Bernard Silvester of Tours.[80]

In many cases there is little similarity between the various patterns of dots assigned to a lunar mansion and the actual appearance of the stars in that region of the sky. Even the number of dots used in a design may be quite different

---

[77] See Savage-Smith, *Celestial Globes* (note 47), 119-32; M. Steinschneider, 'Über die Mondstation (*Naxatra*) und das Buch Arcandum', *Zeitschrift der Deutschen Morganländischen Gesellschaft* 18 (1864), 118-201; and P. Kunitzsch, *Arabische Sternnamen in Europa* (Wiesbaden, 1959) and *Untersuchungen zur Sternnomenklatur der Araber* (Wiesbaden, 1961).

[78] Aḥmad ibn 'Alī al-Būnī, *Kitāb Shams al-ma'ārif al-kubrā wa-laṭā'if al-'awārif* (Cairo, n.d. [1945]), 10-25. It is noteworthy that al-Būnī, the acknowledged master of the occult sciences in Islam, did not include in his encyclopaedia any mention of geomancy. For al-Qazwīnī, see *Kitāb 'Ajā'ib al-makhlūqāt wa-gharā'ib al-mawjūdāt: al-Qazwini's Kosmographie.* I: *Die Wunder der Schöpfung,* ed. F. Wüstenfeld (Göttingen, 1849), 42-51; a German translation of al-Qazwīnī's discussion of lunar mansions and the constellations was published by C.L. Ideler, *Untersuchungen über den Ursprung and die Bedeutung der Sternnamen: Ein Beytrag zur Geschichte der gestirnten Himmels* (Berlin, 1809).

[79] Oxford, Museum of the History of Science, Inv. no. 57–84/181, Billmeir Collection. There are, however, reasons for questioning the date of this globe; see Savage-Smith, *Celestial Globes* (note 47), 247-8 no. 60 and fig. 7.

[80] In the *Experimentarius* associated with Bernard Silvester (see note 36 above), the lunar mansions are used to designate the 28 topics of inquiry such as illness, marriage, victories, and so forth, each having 28 lines of responses.

Table 2. Positions and Interpretations of Lunar Mansions

	Names of the Lunar Mansions	Position in Zodiacal Houses	Season Rising	Season Setting	No. of Stars	Modern Identification	al-Qazwīnī	al-Būnī	Experimentarius
1	al-sharaṭān (al-naṭīḥ)	0° 0′ 0″ Aries VERNAL EQUINOX			2(3)	*β γ Arietis* (*α β γ Arietis*)			Anatha 3 stars
2	al-buṭain	12° 51′ 26″ Aries	SPRING	AUTUMN	3(4)	*ε δ ρ Arietis* (Fl. 41 [c], 39, 35, 36 *Arietis*)			Albatio 7
3	al-thurayyā	25° 12′ 52″ Aries			6(7)	Pleiades open star cluster			Athuria 18
4	al-dabarān	8° 34′ 18″ Taurus			1 (Hyades)	*α Tauri* [Aldebaran] (all the Hyades)			Adoran 2
5	al-haqʿa	21° 25′ 44″ Taurus			3	*λ φ¹ φ² Orionis*			Almusan 5
6	al-hanʿa	4° 17′ 10″ Gemini			2(5)	*γ ξ Geminorum* (*γ ξ η μ ν Geminorum*)			Atha 2
7	al-dhirāʿ	17° 8′ 35″ Gemini			2	*α β Geminorum* or *α β Canis minoris*			Arian 10
8	al-nathra	0° 0′ 0″ Cancer SUMMER SOLSTICE	SUMMER	WINTER	3	*γ δ Cancri* and open cluster M44 [Praesepe]			Anathra 2
9	al-ṭarf	12° 51′ 26″ Cancer			2	*λ Leonis, ν Cancri*			Altraf 4
10	al-jabha	25° 42′ 52″ Leo			4	*ζ γ η α Leonis*			Albuza 5
11	al-zubra	8° 24′ 18″ Leo			2	*δ θ Leonis*			Adchoretem 4
12	al-ṣarfa	21° 25′ 41″ Leo			1	*β Leonis*			Arfa 1
13	al-ʿawwāʾ	4° 17′ 10″ Virgo	AUTUMN	SPRING	5(4)	*β η γ δ ε Virginis* (*β η γ ε Virginis*)			Alaua 5

14	al-simāk	17° 8′ 35″ Virgo			1	*α Virginis* [Spica]			Asioneth 5
15	al-ghafr	0° 0′ 0″ Libra AUTUMNAL EQUINOX	AUTUMN		3(2)	ικλ *Virginis* (κλ *Virginis*)			Alagafar 3
16	al-zubānā	12° 51′ 26″ Libra		SPRING	2	$\alpha^{1,2}$ *Librae*			Azavenem 2
17	al-iklīl	25° 42′ 52″ Libra			3(5)	βδπ *Scorpii* (βδπ *Sco* plus two not identified)			Alaguiul 7
18	al-qalb	8° 34′ 18″ Scorpio			1	α *Scorpii*			Alcalu 3
19	al-shaula	21° 25′ 14″ Scorpio			2	λ υ *Scorpii*			Aleura 6
20	al-na'ā'im	4° 17′ 10″ Sagittarius			8	γ δ ε η σ φ τ ζ *Sagitarii*			Annea 9
21	al-balda	17° 8′ 35″ Sagittarius			0	[space below ξ o π d ρ υ *Sagittarii*]			Alvelde 7 (no design)
22	sa'd al-dhābiḥ	0° 0′ 0″ Capricorn WINTER SOLSTICE	WINTER	SUMMER	2	$\alpha^{1,2}$ β *Capricorni* [ν *Cap* nearby]			Cafateue 3
23	sa'd bula'	12° 51′ 26″ Capricorn			2	ε ν *Aquarii* [μ *Aquarii* between]			Cadabula 2
24	sa'd al-su'ūd	25° 42′ 52″ Capricorn			3	β ξ *Aquarii* and c^1 *Capricorni*			Cadacaud 2
25	sa'd al-akhbiya	8° 34′ 18″ Aquarius			4	γ π ζ η *Aquarii*			Cadalaua 12
26	al-fargh al-muqaddam	21° 25′ 44″ Aquarius			2	α β *Pegasi*			Algarfalavar 2
27	al-fargh al-mu'akhkhar	4° 17′ 10″ Pisces	SPRING	AUTUMN	2	δ γ *Pegasi*			Algargalavar 2
28	baṭn al-ḥūt (al-rishā')	17° 8′ 35″ Pisces			1	β *Andromedae* [Mirach]			Almazene 3

from the number of stars associated with that mansion. For example, the twenty-first mansion, entitled *al-balda*, is uniformly recognized by writers as referring to a starless region of the sky.[81] The pattern, however, associated with this mansion varies greatly, consisting of four, five, or even twelve dots.

Table 2 summarizes information regarding the lunar mansions which is important in attempting to understand this device and the fourteen mansions chosen for this large dial by the designer. In the chart presented in Table 2, the sequence of lunar mansions begins, as is customary, with *al-sharaṭān*. Occasionally a listing begins with a different mansion,[82] but even then the same sequential order is maintained. The position of the zodiacal houses in Table 2 is that given by al-Bīrūnī[83] (d. 1050/442 AH) in which the mansions represent twenty-eight arbitrary divisions of the ecliptic beginning at the vernal equinox, disregarding the positions in the sky of the asterisms for which the lunar mansions are named. The seasonal divisions in the third and fourth columns of Table 2 are also derived from al-Bīrūnī.

In column 5 of Table 2, the chart gives the usual number of stars assigned to the asterism associated with a lunar mansion and, in parentheses, differing traditional versions of the number of stars. All this information is derived from the text of 'Abd al-Raḥmān al-Ṣūfī who in his tenth-century treatise on the constellations used the Ptolemaic star catalogue in his identification of most of the stars in the asterisms.[84] Column 6 presents the most commonly accepted modern identifications of the stars.[85] Columns 7 and 8 give the designs of the asterisms found in the thirteenth-century writings of al-Qazwīnī and al-Būnī.[86] Column 9 gives the designs of the asterisms found in the twelfth-century Latin *Experimentarius* attributed to Bernard Silvester along with the Latin names and

---

[81] See, for example, al-Bīrūnī, *The Chronology of Ancient Nations. An English Version of the* Āthār-ul-Bākiya *of Albirūni or 'Vestiges of the Past' Collected and Reduced to Writing by the Author in AH 390-1, AD 1000*, trns. E.C. Sachau (London, 1879), 348 and 356.

[82] For example, the *Experimentarius* begins with the 28th mansion, which it calls *Almazene*, making *Anatha* the 2nd in the list. Some *anwā'* authors began their discussion with *al-thurayyā*, the 3rd mansion; see Pellat, 'Dictions rimes' (note 73), 19.

[83] al-Bīrūnī, *Chronology* (note 81), 351, and for further discussions of the lunar mansions, see 335-65. See also al-Bīrūnī, *Book of Instruction* (note 65), 81-7, sec. 164-6.

[84] 'Abd al-Raḥmān al-Ṣūfī, *Ṣuwaru'l-kawakib or Uranometry* (Hyderabad, 1373 [1954]), passim; partial French translation by H.C.F.C. Schjellerup, *Descriptions des étoiles fixes composée au milieu du dixième siècle de notre ère, par l'astronome persan Abd al-Rahman Al-Sufi* (St Petersburg, 1874).

[85] See Kunitzsch, *Untersuchungen* (note 77); and Savage-Smith, *Celestial Globes* (note 47), 121-32.

[86] The patterns given by al-Qazwīnī are taken from the text given by L.P.E.A. [Louis-Amélie] Sédillot , *Matériaux pour servir à l'histoire comparée des sciences mathematiques chez les grecs et les orientaux*, 2 vols. (Paris, 1849), II, 550-62; they were omitted in the Wüstenfeld edition of al-Qazwīnī (see note 78). Al-Būnī gives two different designs for some of the lunar mansions, in which case both are given on the chart; he does not, however, state the number of stars composing an asterism, as did al-Ṣūfī; see al-Būnī, *Shams al-ma'ārif* (note 78), 18-24.

the number of stars stated in that text.[87] The three writings were selected from a considerable number of treatises in which the lunar mansions are illustrated by abstract patterns because of the importance of the works. They are offered only as illustrations of the numerous designs associated with the asterisms and are not to be interpreted as the only representations found in the literature.

We now consider each of the fourteen lunar mansions named on the large dial. Throughout our discussion, these mansions are treated as segments of the ecliptic, and the season in which that segment would rise or set is indicated. See Fig. 3 to distinguish heliacal from cosmical risings and settings. If the mansions are viewed as asterisms and their locations with respect to the equinoxes are calculated for the thirteenth century, one finds that the seasonal rising or setting of the fourteen mansions mentioned on this device would differ from those given in Table 2 in only one instance, which is noted in the discussion of that mansion. The seasons associated with the mansions on the large dial (see Table 1), however, frequently fail to coincide properly with either a heliacal or cosmical interpretation of the rising or setting.

THE QUADRANTS

NORTHERN WINTER

al-balda, setting: The twenty-first lunar mansion is named 'the place', referring to an area behind the head of the Ptolemaic constellation Sagittarius which was said to contain no stars. Its heliacal setting would occur in the winter, in keeping with the seasonal quadrant in which it is placed on the device, while its cosmical setting would be in the summer.

al-haq'a, rising: The name of the fifth lunar mansion means a tuft of hair, a branding mark, or any other distinguishing mark of a horse. Its cosmical rising would occur near the beginning of winter, while its heliacal rising would be near the beginning of the summer.

al-'awwā', rising and setting: The meaning of the name of the thirteenth lunar mansion is uncertain, but it appears to be from a root meaning to howl or yelp, or to twist or bend. It was sometimes said that the name referred to dogs barking behind a large lion visualized in the sky. Its heliacal rising and setting would occur in the autumn, and its cosmical rising and setting in the spring – neither in the winter.

al-thurayyā, rising: The third lunar mansion refers to the open star cluster called the Pleiades. It is a very old Arabic star name of obscure origin and etymology, but was most commonly associated with the pre-Islamic image

[87] The edition by Savorelli has been used for this chart (see note 36). Compare Burnett (note 36), 118-20.

was of a woman, her head composed of the Pleiades, with one arm and hand passing through Perseus and Cassiopeia and her other hand in the area where the head of Cetus is now visualized. Its heliacal rising is in the spring, not the winter, and its cosmical rising in the autumn.

WESTERN AUTUMNAL

al-simāk and *al-ghafr*, rising and setting: The name *al-simāk* was applied to two stars, one we call Spica and the other Arcturus, which in the *anwā'* tradition were seen as forming the hind legs of a large lion. Only the star in Virgo (Spica), however, comprised the asterism associated with a lunar mansion, the fourteenth. Many etymologies are presented in the early Arabic astronomical literature for the word *ghafr*, the name of the fifteenth lunar mansion, the most common being that the name, from a root meaning to conceal, was applied because the stars were inconspicuous. Since these mansions are on or near the autumnal equinox, their heliacal risings and settings would be in the autumn.

al-han'a, setting: The name of the sixth lunar mansion is derived from the root meaning either to fold or to bend, or to brand a camel on the neck. Explanations of the word from both meanings appear in the early astronomical literature, although the most common is the latter, which maintains a parallel with the fifth mansion, *al-haq'a*, discussed earlier. Its cosmical setting would occur in early winter.

al-zubānā and *al-iklīl*, rising: The name of the sixteenth lunar mansion, *al-zubānā* (the two claws) reflected the ancient, probably Babylonian, conception of a scorpion larger than the now familiar Scorpio, its claws formed by the constellation known today as Libra.[88] The traditions are not consistent regarding the identification of the asterism associated with the seventeenth lunar mansion, *al-iklīl* (the crown). Five different interpretations emerge from the early literature, the most common opinion probably being that it referred to the three stars in a row in the Ptolemaic constellation Scorpio. The heliacal risings of both lunar mansions occur in the autumn.

al-dabarān, setting: The name of the fourth lunar mansion, from the root meaning to follow, was associated with the famous star called today Aldebaran. The name refers to the fact that it follows the Pleiades. The cosmical setting of this lunar mansion occurs in the late autumn. If the position in the thirteenth century of the corresponding asterism of Aldebaran is considered, the setting would then be in the early winter.

---

[88] See Hommel, 'Über den Ursprung' (note 74), 597, and Savage-Smith, *Celestial Globes* (note 47), 175.

SOUTHERN SUMMER

al-balda, rising: The twenty-first lunar mansion rises heliacally in the winter rather than summer, though its cosmical rising would be in the summer.

al-haq'a, setting: The fifth lunar mansion sets heliacally in early summer and cosmically in early winter.

al-na'ā'im, rising: The name of the twentieth lunar mansion means 'the ostriches' and refers to an early conceptualisation of the Milky Way as a river passing through the area now called Sagittarius, with four ostriches going toward the river and another four leaving on the other side. Its cosmical rising is in the summer, though its heliacal rising is in winter.

al-thurayyā, setting: The heliacal setting of the third lunar mansion, associated with the Pleiades, would be in the spring, with its cosmical setting in the autumn – neither in the summer.

EASTERN SPRING

al-dhirā', *al-nathra*, and *al-ṭarf*: These are the names of the seventh, eighth, and ninth lunar mansions, respectively. In the *anwā'* tradition a large lion – much larger than the Ptolemaic Leo – was visualized in the sky with its forelegs in the Ptolemaic constellations of Gemini and Canis Minor, the nose in Cancer, and the eye, forehead, neck, shoulder, and tail tuft in Leo, while its hind legs were in Boötes and Virgo. The names of lunar mansions numbered seven through eleven as well as number fourteen all reflect the image of this enormous lion. *Al-dhirā'* means the foreleg, *al-nathra* the cartilage of the nose belonging to the large lion, and *al-ṭarf* means the glance or vision, also of the large lion. The maker of the geomantic device has not indicated whether the risings or settings are to be considered, for he clearly ran out of room. In fact, he had so little space that he omitted two letters of the name *al-na*[*thr*]*a*. The heliacal risings of all three of these mansions occur in the middle of the summer, being around the summer solstice.

al-han'a, rising: The si xth lunar mansion rises heliacally in the early summer.

al-zubānā and *al-iklīl*, setting: The sixteenth and seventeenth lunar mansions have their cosmical settings in the mid to late spring.

al-dabarān, rising: The heliacal rising of the fourth lunar mansion occurs in the late spring. If the position in the thirteenth century of the actual asterism is considered, the rising would occur in the early summer.

PATTERNS IN THE ALIGNMENTS

The similarity between the abstract pattern for an asterism and a geomantic figure is in some cases quite pronounced. For example, one of the patterns

given by al-Būnī for the sixth lunar mansion, and also for the seventeenth and nineteenth mansions, is in fact a geomantic figure, and others could, were a person so inclined, be interpreted as parts of geomantic figures. The twentieth lunar mansion, *al-na'ā'im*, is said by al-Bīrūnī to consist of 'eight stars, four of them lying in the Milky Way in a square, which are the Descending Ostriches, descending to the water, which is the Milky Way; and four of them lying outside the Milky Way, also in a square, which are the ascending ostriches'.[89] That description does not disagree greatly with the pattern given by al-Qazwīnī and suggests the association of the geomantic figure *al-jamā'a* (⁘) with that lunar mansion, which is in fact the assignment given by given by the device. In an Arabic calendar written in Spain in AD 961,[90] which presents the *anwā'* traditions regarding natural phenomena, the Pleiades are illustrated by a series of dots closely resembling the geomantic figure named *nuṣra dākhila* (⁙) with which it is associated by the maker of this device. Although al-Qazwīnī's pattern for the Pleiades (the third lunar mansion) does not particularly resemble this geomantic figure, it does contain six dots which both al-Ṣūfī and al-Bīrūnī gave as the number of stars in this asterism.

Even though certain of the asterism designs would seem to suggest geomantic figures or parts of them, explicit alignments of the lunar mansions with geomantic figures are quite uncommon in Islamic literature. In fact, in the manuscripts and printed sources surveyed, only two items contain any such alignment. Both are late, anonymous, Persian manuscripts.[91] These two assignments differ from each other, while neither in any way corresponds with that of the geomantic device by Muḥammad ibn Khutlukh al-Mawṣilī.

In the Latin geomantic treatises, on the other hand, an assignment of lunar mansions to the geomantic figures occurs in the earliest literature. Hugo Sanctallensis in the twelfth century based his geomantic treatise upon, and in part translated, an Arabic work which has not yet been identified. By means of this work it is possible that Hugo introduced the art into the Latin West.[92] In his writing Hugo aligned the geomantic figures with twenty different lunar mansions, which are given in the order of their occurrence along the ecliptic,

---

[89] al-Bīrūnī, *Chronology* (note 81), 348.

[90] *Le calendrier de Cordoue*, ed. R. Dozy, new ed. with French trns by C. Pellat [Medieval Iberian Peninsula Texts and Studies, 1] (Leiden, 1961), 15 and 164.

[91] Los Angeles, UCLA Research Library, Minasian Coll. 1493, fol. 9b, copied in 1031 [= 1621] from a copy dated 812 [= 1409], and Minasian Coll. MS 1495, fol. 4a, dated 1285 [=1868].

[92] C.H. Haskins, *Studies in the History of Mediaeval Science* (Cambridge, MA, rpr New York, 1960), 77-8.

with no lunar mansions repeated.[93] Only three figures are assigned to the same lunar mansions in both the geomantic device and the treatise by Hugo Sanctallensis. These are listed in Table 3.

Table 3. Similarities between Geomantic Device and Hugo Sanctallensis Tract

Geomantic name and figure	Latin names	Asterism	Lunar Mansion
nuṣra dākhila	*Fortuna major* *Auxillium intus*	Pleiades	third
al-ḥiyān	*Barbatus* *Laetitia*	Aldebaran	fourth
al-jamā'a	*Congregatio* *Populus*	γδεηοφτζ *Sagittarii*	twentieth

A later English manuscript on geomancy[94] gives 'the geomanticall figures attributed to the fixed starres in the eighth Sphaere' which is, in fact, an alignment very similar to that of Hugo Sanctallensis, except that only eighteen lunar mansions are named and *Fortuna minor*  (*nuṣra khārija*) is assigned to the Pleiades. The geomantic device assigns both  and to the Pleiades, the former rising and the latter setting in the winter and summer according to the device, though actually in the spring and autumn.. This feature of the correspondences found on the device – namely, assigning a geomantic figure to the rising or setting of a lunar mansion – appears entirely unique, for all other correspondences we have found elsewhere do not refer to risings and settings.

In contrast with the lunar mansions, alignments of geomantic figures with the directions of the compass and/or the seasons are very common in the Islamic geomantic manuals. Of the many found in the manuals studied, however, only one association of geomantic figures with cardinal points and with the seasons bears much resemblance to that presented on the geomantic tablet, but in that instance the similarity is remarkable. It occurs in a manuscript entitled *Kitāb Ḍarb al-raml* ('Book on Geomancy') by the *shaykh* Ṭumṭum al-

[93] Oxford, Bodleian Library, Western Manuscripts, MS Digby 50, fol. 2r-2v, a thirteenth- or possibly twelfth- century manuscript. See also P. Tannery, 'La Rabolion' (note 11), 324-8, who gives the pertinent section of Paris, BnF, MS lat. 7354, which is also a thirteenth-century copy.

[94] Oxford, Bodleian Library, Western Manuscripts, MS Ashmole 434, fol. 17r.

Hindī.[95] The volume appears to be a compilation from various sources, with several authorities cited (in addition to Ṭumṭum al-Hindī), such as the *shaykh* al-Zanātī and Khalaf al-Barbarī. In both a square diagram and an accompanying text, contained in a section concerned with finding lost objects,[96] the groupings of the figures with the four directions and the four seasons are identical with those given on the geomantic device. In the text accompanying the diagram, not only are the figures grouped with the seasonal and directional quadrants, but there are indications or portents given to each figure, such as 'good omen' or 'increasingly mixed'. While the significations ascribed to the figures are not precisely the same as those on the geomantic device, the terms used, when not identical, are very similar.

The alignment of geomantic figures, lunar mansions, and seasons on the large dial possesses a number of remarkable features (see Fig. 4). With the quadrants of the dial bearing the labels of the seasons, it would be natural to assume that the designer intended for the entire dial to be interpreted chronologically, with each geomantic figure occupying a sector corresponding to one-fourth of a season, and consecutive sectors (in a clockwise direction) denoting consecutive time periods. That assumption would seem justified by the fact that for twelve of the sixteen sectors the rising (or setting) of a lunar mansion is placed diametrically opposite its setting (or rising). Such an arrangement could be interpreted as indicating the six-month alternation of the heliacal rising/setting and the cosmical rising/setting of a lunar mansion.

There are, nevertheless, serious inconsistencies which make this chronological interpretation of the dial quite unsatisfactory. The first inconsistency concerns the use of the terms 'setting' and 'rising' and whether heliacal or cosmical is intended.. The correspondence of a single sector with both rising and setting of a lunar mansion (as is done in two sectors, one containing the thirteenth mansion and the other the fourteenth and fifteenth mansions) must of course refer either to the heliacal rising and setting together or the cosmical rising and setting together. In the case of the fourteenth and fifteenth mansions, heliacal must be intended since they are placed in the autumnal quadrant. In the case of the thirteenth mansion, however, the rising and setting are said to occur in winter, which is inappropriate by either interpretation. In several other instances neither heliacal nor cosmical yield a satisfactory interpretation of the rising or setting in terms of the season specified.

An even more serious inconsistence comes to light when one examines the sequence in which the lunar mansions are listed. Those that appear on the dial

---

[95] Los Angeles, UCLA Research Library, Near Eastern Coll. 895, MS 678; copy dated 12 Jumādá I 1133 [= 11 March 1721].

[96] *ibid.*, fols. 36b-38b.

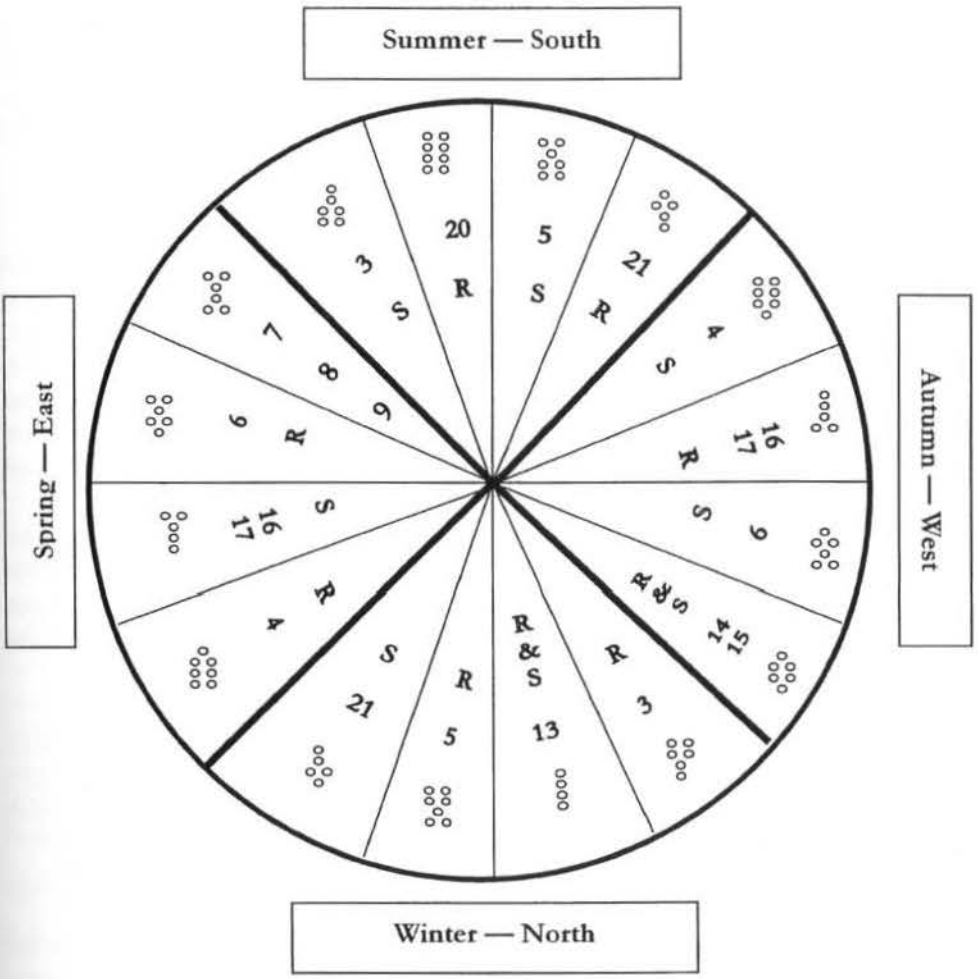


Fig. 4. The alignment of seasons, directions, geomantic figures, and risings and settings of lunar mansions found on the large dial. The lunar mansions are indicated by a number representing their position in the sequence of twenty-eight mansions. The letters 'R' and 'S' represent the rising and setting respectively.

180° from the thirteenth, fourteenth, and fifteenth mansions (which as stated above are close to the autumnal equinox) are not the ones near the vernal equinox, but rather the ones that occur at or near the solstices. Furthermore, the sectors of the dial marked with the rising (and setting) of the thirteenth and fourteenth mansions do not occur consecutively on the dial, but instead the

sector containing the figure marked as the rising of the third mansion is placed between them. Similarly, the rising of the fourth mansion is within the spring quadrant, although the risings of the third and fifth mansions are listed in the winter quadrant. In other words, the order of the mansions as listed on the dial, when read either clockwise or anti-clockwise, does not agree even remotely with the true sequence of the lunar mansions along the ecliptic.

In examining the lunar mansions named in the quadrants of the dial, one finds that of the sixteen seasonal assignments, nearly half are incorrect regardless of whether they are interpreted as heliacal or cosmical. A simple re-labelling of the quadrants, however, will not put the mansions in a chronologically correct sequence, since, for example, the rising of the fourth mansion will still occur in a sector other than that between the third and fifth ones. Consequently, it is evident that the difference between the correct order and that found on the device is so pronounced that it cannot be explained on the basis of scribal error or the accidental reversal by the maker of the winter and summer quadrants.

If the sectors of the dial were not intended to represent a chronological sequence of lunar mansions, how can the sequence of mansions and their alignment with geomantic figures be explained? It should be noted that more than a single lunar mansion is assigned to certain geomantic figures by the device, which would be clearly necessary if the aim of the designer were to establish a correspondence between all twenty-eight mansions and the sixteen geomantic figures. That is not, however, his goal for he only employed half of all the lunar mansions. A possible reason for his assignment of more than one mansion to a figure is found by examining the seventh, eighth, and ninth mansions, which are listed together on the large dial with the figure named *ijtimā'* (⁘). Al-Qazwīnī and al-Būnī agree in their configurations for the seventh and ninth mansions, as is shown in Table 2. They differ in regard to the eighth mansion, but this is the asterism containing the open cluster Praesepe whose representation has varied greatly. Consequently, it seems likely that the choice of the figure ⁘ for these three mansions is based on the combination of the three patterns, the top and bottom of the figure being formed by the seventh and ninth mansions, and the two middle dots representing the open cluster Praesepe associated with the eighth mansion.

From this it would seem that the primary concern in assigning geomantic figures to lunar mansions was agreement between the design of the figure and the appearance in the sky of the corresponding asterism or group of asterisms. That concern would be in keeping with the inscription the designer of the

device placed over the large dial: 'We have established this circle [dial] so that you might learn from it the correspondences of the forms of the figures with the forms of the lunar mansions, rising and setting'. Here the designer clearly speaks of aligning the shapes of the geomantic figures with the shapes of the lunar mansions; the word he has employed for shapes or forms (*suwar*) means also images or appearances and is frequently used for the outlines of constellations.

This concern on the part of the designer would also explain a very distinctive feature of the dial. In six instances the setting of a lunar mansion is assigned to a geomantic figure which is the inverted image of the figure assigned to that same mansion's rising. It is as though the rising in the east of an asterism was being pictured as a geomantic figure and its setting in the west represented by the figure turned 180°. Nowhere in the literature have we found such an alignment of the geomantic figures, nor one so clearly tied to visual representations.

If one focuses attention on how the geomantic figures, rather than the lunar mansions, are arranged on the dial and the correspondence of these figures with the lunar mansions and seasons, one finds great consistency and unquestionable evidence of purposeful design. To assist in our analysis of this design, we call two geomantic figures a symmetric pair if the 180° rotation of one of the figures yields the other figure; for example,  and  form a symmetric pair. In the set of sixteen geomantic figures there are six symmetric pairs and four figures that are not changed by the 180° rotation. We call these four figures autosymmetric.

For the purposes of this study, two figures are termed opposites if in each of their four rows they differ from each other in the number of dots displayed. For example,   are opposites. There are among the geomantic figures eight pairs of opposite figures, and two of these pairs are also symmetric pairs – that is,   and   .

On the large dial each of the six symmetric pairs are placed so that the two figures in a pair are diametrically opposite, one figure of the pair assigned to the rising of a certain lunar mansion and the other figure corresponding to the setting of the same mansion. In both instances on the dial where the rising *and* setting of lunar mansions are assigned to a single geomantic figure, one finds that the figures ( ) are autosymmetric and the lunar mansions at or near the autumnal equinox. The invariance of the figure under rotation seems a

particularly appropriate property for a figure assigned to both rising and setting. The other two autosymmetric figures ( ) lie on the dial opposite these two and are assigned to mansions occurring at or near the solstices. However, the first of these two autosymmetric figures is the sole figure on the large dial that lacks any indication of the rising or setting of the associated lunar mansion.

The partition of the set of sixteen geomantic figures into the four subsets associated with the seasons is remarkable in its symmetry. Each season is assigned a pair of opposite figures, one of the four figures whose opposite is symmetric to it, and one of the four autosymmetric figures (see Fig. 4). For example, for winter:

the pair of opposite figures  

the opposite-symmetric figure 

the autosymmetric figure 

Certainly such an arrangement indicates considerable familiarity with the geomantic figures and at least an intuitive awareness of the relations of symmetry and opposition which exist within the set of sixteen geomantic figures. On the other hand, it would seem the designer of this device was acquainted to some extent with certain traditional views of the lunar mansions. Evidence of this would be the partial agreement, mentioned above, of his alignment with others found in the literature. In particular the assignment of *al-jamā'a* to the twentieth mansion, *nuṣra dākhila* to the third, and *ijtimā'* to the combined seventh, eighth, and ninth lunar mansions, as well as his statement over the large dial, would seem to indicate that the designer of the device was using, at least to some extent, sources like those of the cosmologist al-Qazwīnī which represented the lunar mansions by designs of dots. Bearing in mind the great variation in the representations of the asterisms given in such literature, it is impossible to say at this point whether the particular assignment of geomantic figures to lunar mansions found on this dial was obtained completely from some source not known to us, or whether it was an alignment original with him.

The pronounced regularity in the groupings of the figures by seasons, and the obvious attempt on the part of the designer to graphically represent certain of the lunar mansion asterisms by means of geomantic figures, seem to suggest that the correspondences on this dial are to be viewed as independent and unrelated. In other words, the seasons are each assigned four geomantic figures, and each figure is aligned on the basis of likeness in appearance to the rising or setting of a lunar mansion. The two correspondences, however, are not

intended to give alignment of the seasons and lunar mansions. The curious anomaly mentioned earlier regarding the consistent positioning of auto-symmetric figures and yet the inconsistent treatment of their associated lunar mansions suggests that the designer was more concerned with the figures as abstract designs and the relationships between them than he was of the chronological sequence of lunar mansions. Certainly, he appears more intent on preserving relationships between geomantic figures, and also graphically representing with these figures certain lunar mansions, than he is with maintaining an astronomically correct sequence. If our interpretation is correct, then this device affords an interesting example of geomantic considerations taking precedence over astronomical, and consequently astrological, concerns.

Two Poems

To the right and below the large dial (see Pl. 4) is a poem in *kāmil* metre, in which the tablet is speaking in the first person (see Appendix, item 11, for a transcription). The calligraphy is Naskh script, inlaid with silver.

> I am the possessor of eloquence and the silent speaker
> and through my speech [arise] desires and fears.
> The judicious one hides his secret thoughts, but I disclose them,
> just as if hearts were created as my parts.[97]

On the lower left-hand side of the tablet, to the left of the small dial labelled 'House of the Result of the Result', there is another poem in *kāmil* metre, also in Naskh script and inlaid in silver, in which the tablet again speaks in the first person (see Pl. 1 and Appendix, item 12).

> I am the revealer of secrets; in me are marvels
> of wisdom and strange and hidden things.
> But I have spread out the surface of my face out of humility,
> and have prepared it as a substitute for earth.

The Frame

Engraved in Naskh script, inlaid in silver, and entwined with decorative vines, around the edge of the geomantic tablet is a poem in five *basīṭ* verses, in which, apparently, the maker is speaking to us concerning the device. The inscription begins at the upper right-hand corner as you view the tablet from the front and runs clockwise about the edge. The right-hand edge contains the first verse, the bottom edge two verses, the left-hand edge one verse, and the top edge one

[97] The idea apparently being, just as if the device's internal parts were hearts – i.e., as if the tablet were a living and hence perceptive being.

verse, with the suspensory device (*kursī*) separating the two half-verses of the last verse (see Pls. 8, 9, 10, and 11, and Appendix, item 13).

Examine the tablet and memorize it, for in it
there is meaning from the tablet [of God in Heaven] when it was marked with the pen.[98]
It [the geomantic tablet][99] shows hidden secrets of the unseen[100]
which were determined from time immemorial.
It [the tablet before us] agrees with geomancy in meaning but differs from it
because it generates the figures from nothing.[101]
The tablets of Moses were made valuable by what
wisdom and authority God gave them.
But it is sufficient honour for it [the tablet before us] that a hand touched it
which is superior to the hands of men[102] in strength and nobleness of character.

This poem is filled with religious imagery, using throughout the word tablet, *al-lawḥ*, in two senses, that of the geomantic tablet before us and the Mosaic tablets or the tablet of God in Heaven. The Mosaic tablets were made valuable by the wisdom and authority God gave them, but it is sufficient for the geomantic tablet that a hand touch it which is superior to that of other men – a clear reference to the fact that this device was being constructed for the use of an important personage.

---

[98] The word *qalam* usually means reed-pen or stylus. In this case two meanings could be intended in parallel with the traditions interpreting Sūra LXVIII (*sūrat nūn* or *sūrat al-qalam*) of the Qur'ān. The word *qalam* according to the traditions meant both an implement for writing and a '*qalam* of light, as long as the distance from heaven to earth, which wrote down all things that are to happen until the last judgement' (C Huart and A. Grohmann, 'Ḳalam' in *EI*[2] (note 6), IV, 471).

[99] Or possibly both the geomantic tablet and the tablet of God (or Mosaic tablet).

[100] The word *al-ghayb* is a very common word in the Qur'ān, again indicating that the poem is filled with religious ideas and parallels.

[101] Apparently a reference to the slides on the front of the geomantic tablet from which the figures are instantly selected rather than having been formed in the usual manner of counting random dots. *Ashkāl* is the usual word for the geomantic figures, but the word in the inscription is not well formed, for it looks more like *ashāl*, which does not seem appropriate in this context. Another possible interpretation of this verse might be 'geomancy agrees [with the tablet of God] in meaning, but differs from it because it [the tablet of God] creates forms from nothing – the sense in this case being that while God can create from nothing, the geomancer must physically generate the figures. The present authors, however, prefer the former interpretation.

[102] The word *al-warā* meaning 'mankind' is used here in the sense of hoi polloi, the common people.

Pl. 8. Right-hand edge of frame, with beginning of poem. [Brit. Mus. Neg. no. 046126]

Pl. 9. Bottom edge of frame. [Brit. Mus. Neg. no. 046125]

Pl. 10. Left-hand edge of frame. [Brit. Mus. Neg. no. 046127]

Pl. 11. The edge of frame with end of poem on either side of the suspensory device. [Brit. Mus. Neg. no. 046124]

Pl. 12. Back plate of geomantic device. [Brit. Mus. Neg. no. 015010]

THE BACK OF THE DEVICE

The back of the geomantic tablet contains two inscriptions giving blessings to the owner. The band forming the rectangular frame contains the following inscription written in Kufic script and inlaid in silver, beginning in the top right-hand corner of the back and proceeding anti-clockwise (see Pl. 12 and Appendix, item 14).

> Everlasting glory, continual and abiding prosperity, constant power, supreme peace, perpetual well-being, increasing good fortune, favourable fate, a comfortable manner of life, a long unimpaired life, complete honour, a pure manner of life, sufficient satisfaction, peace of mind, blessing, compassion, support [from God] and success.

The inscription around the centre diamond is engraved in Naskh script and inlaid in silver, beginning at the left-hand corner and proceeding anti-clockwise (see Pl. 12 and Appendix, item 15).

> Everlasting glory, a long unimpaired life, outstanding character, efficacious power, fortunate omens, complete honour, a pure manner of life, support [from God] and victory over the enemies for its owner.

Bands filled with decorative arabesque entwine the diamond and encircle the small centre inscription containing an owner's statement (see Pl. 12 and Appendix, item 2). As discussed above (pp. 21-2), this is likely not the name of the patron for whom the device was executed but rather than of a later owner:

> In the possession of Muḥammad al-Muḥtasib al-Bukhārī.

IV. Operation and Interpretation of the Tablet

This geomantic tablet presents only a small amount of information about the procedures intended for its operation. In the two poems on the front of the tablet, the device speaks in the first person telling us that it is a 'silent speaker' who is not judicious since it discloses innermost thoughts as if it were a living being. It continues in the second poem to say it is the revealer of secrets and has humbly spread out the surface of its face to serve as a substitute for earth – that is, the front of the device is to be used instead of the ground or a dust board for the formation of the geomantic tableau.

More specific directions are found in the engraved statement over the four curved slides. They leave no doubt that the tablet was designed so that the first four figures, the Mothers, would be obtained by using these slides rather than in the customary manner of making marks on the ground or on a dust board. The poem on the tablet's edge states that the device 'agrees with geomancy in

meaning but differs from it because it generates the figures from nothing,' referring, no doubt, to this manner of generating these four figures from the slides.

Consistently in the practice of geomancy, the first four figures are supposed to be derived in a manner free of purposeful or even conscious selection. Consequently, it seems reasonable to assume that, prior to the determination of the Mothers, all the slides would be in a 'closed position' – that is, pushed down so that no figures were visible. Then each slide in turn would be moved up an arbitrary amount, an action analogous to spontaneously putting down in the sand four rows of dots without counting them. It was probably the designer's intention that the slides be moved blindly so as to insure the purposelessness of the selection. Once the slides have been moved, the Mothers can be obtained following the directions given above the slides, which clearly describe which figure on each slide is to be selected. It is the one closest to the place where the slide disappears under the front plate, or, in other words, the visible figure closest to the horizontal edge of the aperture through which the side is visible. Hence, if we are correct in assuming that initially all the slides would be in a 'closed position,' then it would require some movement of each slide upward in order to produce a figure, since at the start all the figures would be out of sight. Although the tablet is explicit about where to locate the figure to be used, there is no indication of which slide provides the first figure, which the second, and so on. Nevertheless, in view of the ordering from right to left given in a geomantic tableau to the four Mothers, it would seem most likely that the nested sequence of slides would be read from the innermost outward – that is, from right to left along the horizontal margin of the slides, where the figures are located which the device instructs the user to take as the Mothers.

Having by means of the slides produced the Mothers, and having adjusted the dials for the first four houses so that each Mother was visible in the appropriate house, the other dials were doubtless turned so as to display the correct figures, in accordance with the procedures for forming a geomantic tableau discussed above (pp. 11–13). The device itself is totally silent with regard to how these additional twelve figures of the tableau are formed. The absence of instruction on how the figures in the various houses are derived is significant, for it clearly indicates that the tablet was intended for someone already acquainted with the process of casting a geomantic tableau.

For the interpretation of the tableau, the remaining parts of the device would be used: the large dial and the three small ones in the lower right-hand quadrant. The large dial obviously gives the interpreter information on the good or ill portent of each geomantic figure and its alignment with a season, a direction of the compass, and a lunar mansion. This information was clearly intended to assist the interpreter in divining the significance of a certain figure

occurring in a particular house.

From the nature of extant geomantic treatises themselves and from the observation of practicing geomancers in more recent times,[103] it may be presumed that geomancers in the thirteenth century customarily used a geomantic manual for assistance in the interpretation of the tableau. These manuals present a variety of materials such as alignments of the figures with numbers, elements, letters, planets, directions, seasons, illnesses, masculine and feminine, good or ill fortune, moisture or dryness, parts of the body, professions, animals, minerals, and other things, sometimes presented in chart form. Frequently the significance of each individual house and the basic subject it covers are enumerated; for example, House I is the house of the soul, life, strength, stability, pride, prestige, self-motivation, creative matters, initiative, ingenuity, organization, and all matters involving the mind and will. In addition, the characteristics and significations of each figure occurring in the various houses will sometimes be given, eliminating for the odd figures House XV.[104] Interpretative procedures, as distinguished from the meanings of figures and houses, were rarely described outside the context of discussing a specific question. Sample questions would be stated with detailed directions for the interpretation of the tableau.

Authors differ greatly with regard to what is assembled in a manual and to their individual interpretation of the nature of a figure or a house. Enormous variety is found in the characteristics or significations attributed to the figures, as well as in the procedures for actually interpreting a tableau, which vary from the simple to the extraordinarily complex and involved.

There is not as much variation in the types of questions asked, for certain ones dominate the manuals, such as – to name only a very few – who will win, the questioner or his adversary; who loves more, the questioner or the object of the question; whether a wife is intimate with another and if so with whom; what kind of pregnancy and delivery a pregnant woman will have; whether a pregnant woman will deliver a male or female child and how many; whether it is safe to travel by boat and what will occur during the voyage; whether an absent one will return or not; where to find the lost or hidden; how to determine the depth of water underground; whether it will rain or not; in what

---

[103] See, for example, C. Monteil, 'La divination chez les noirs de l'Afrique occidentale française', *Bulletin de Comité d'Études Historiques et Scientifiques de l'Afrique Occidentale Française* 14 (1931), 27-136; and Ben Choaib, 'Le bonne aventure' (note 13).

[104] Because of the relationship between the first four figures and figures five through eight, the figures in Houses XIII and XIV are not totally independent of one another. Both are even or both are odd. Consequently, the figure in House XV, being the 'sum' of these two, is always an even figure. This fact was known to some of the Islamic authors of geomantic treatises, such as Ibn Maḥfūf; see Oxford, Bodleian Library, Oriental Collections, MS Arab.f.36, fol. 100b.

part of the body lies a person's illness; and what will be the course of an illness.

From the evidence provided by the ordering of the figures on the slides, the significations given to the houses and figures, the names of the figures, and from the reference in the inscription under the large dial to 'books concerned with the study of the art', it is clear that the designer of this tablet was well versed in the geomantic literature of his day. The tablet itself, however, contains no information at all about the interpretive *processes*, which are customarily presented in the geomantic manuals, nor does it give even basic information about how to form a tableau. Obviously, either the designer intended for a geomantic manual to be employed along with the tablet, or he assumed that the user would be sufficiently familiar with the art to at least form a tableau and devise a method for producing a reading or interpretation from just the labelling of the houses.

From the extant geomantic treatises no single interpretative method for geomancy emerges, but rather the method frequently depends upon the nature of the question. From a large number of procedures which varied in complexity, one was chosen depending upon the nature of the question. If the tablet were to be used without the aid of a geomantic manual which would explain the procedures for answering a given question, it is likely that the geomancer would employ a very simple method such as inspecting the figures that appear in the House of the Result (position XV) or in the House of the Result of the Result (position XVI) together possibly with the figure occupying the house most closely related to the question being asked. House XV was usually considered to give the immediate result, while XVI was thought to give the long-range consequences of the result. Unfavourable figures, in terms of the attributions given on the large dial, would certainly indicate unfavourable immediate and future results. Favourable or mixed figures in such positions could be modified by any unfavourable signs appearing in the house whose subject covers the objects of the inquiry, such as illness or property. In addition, the portents associated with the figures in the House of the Questioner or in the House of the Object of the Inquiry (positions XIII and XIV, respectively) could also have direct bearing upon the ultimate favourable or unfavourable outcome for the questioner or the person who is the object of the question. Quite possibly the figure occupying the first house, which governs the soul of the questioner, would be taken into consideration as well, for this was generally thought to be a significant house no matter what the topic of the question happened to be.

If, however, the interpretation was limited to the procedures just discussed, then it is somewhat difficult to explain the function of the three small dials, which have over them the statement that 'the geomantic triplet' is formed by these circles. Any two figures and the 'sum' of those figures is referred to by

some writers as comprising a geomantic triplet, *muthallatha*, and the figure which is the 'sum' is called the *mīẓān*, 'the balance'. In casting any geomantic tableau several triplets are involved, but on this device the dials for the houses are located so that the figures to be 'added' would already be closely adjacent to one another and there would be no advantage in using the small dials in the lower right-hand corner (see Pl. 1). Only in the case of forming the figure for House XV (by 'adding' those in XIII and XIV), and especially in forming the final figure (by 'adding' those in XV and I), would these small dials be of some value in allowing one to place the figures in close proximity to one another for ease of calculating the *mīẓān*, which then would be displayed on the lowest of the three dials and then transferred to its appropriate position in the tableau.

On the other hand, it should be noted that in the manuals there are interpretive methods described using other special triplets to a considerable degree. For example, there are procedures in which after the tableau is completed the figure in a specific house is combined with the figure found in another certain house of the tableau, and the resulting figure analysed for its meaning. Sometimes many triplets were formed besides those necessary for the basic tableau. The following is an example of an elaborate, but not unusually complex, procedure in which the three small dials would have been useful.[105]

If the question is about who will win – the questioner or the adversary – the geomancer is told to 'add' together the figure in the first house (the House of Soul) and the figure in the eighth house (the House of Slaughter and Death) so as to form a new figure. Then he is to 'add' together the figure in the ninth house (the House of Movement and Change) and the figure in the twelfth house (the House of Enemies and Envious People) to form a new figure. These two newly produced figures the geomancer then 'adds' together to derive a third figure. If this third figure is present in the section of the tableau belonging to the questioner (positions I though VI) then the questioner will win; if it is present in the section of the tableau belonging to the object of the question (positions VII through XII), then the adversary will win. If it occurs in both sections, it will be even between the persons. If it is not present in either section, then the geomancer is to see what position it occupies in a fixed ordering of all the sixteen geomantic figures, called a *taskīn*, and whichever section it falls in, then that person will be the victor; should it occur in the last four positions of the *taskīn*, neither party will be victorious. The consequences of the victory are to be interpreted from houses XIII through XVI in the tableau.

Fixed orderings of all sixteen geomantic figures play a significant role in many treatises. These orderings, called *tasākīn* (sing. *taskīn*), vary to some extent

[105] Los Angeles, UCLA, Research Library, Near Eastern Coll. 898, MS 618, fol. 63b.

from author to author, but certain ones seem to have been especially popular and widely circulated. The order in which the figures occur on each sliding arc of this device (see Pl. 4), reading them in an anti-clockwise direction, is one of the *taskīn*s most frequently found in the treatises, presented here reading right to left:

In geomantic manuals, this ordering is frequently called the '*taskīn* of the circle'.[106] This is further evidence of the designer's acquaintance with the geomantic treatises or traditions. It could scarcely be coincidence that this same ordering occurs repeatedly elsewhere, for there is an extremely large number of possible orderings of the sixteen geomantic figures. In fact, the total number of arrangements exceeds twenty million millions. What is curious to note is that on this device this ordering is used for a part of the process not concerned with interpretation at all, but solely with the selection of the Mothers. This is particularly interesting in view of the fact that the entire geomantic process rests on the assumption that the Mothers are not consciously selected. Therefore, a less well-known arrangement of the figures on this part of the device would seem more suitable since it would be more likely to avoid a purposeful selection of certain figures for the first four figures. On the other hand, the presence of this *taskīn* on these slides may be owing to certain theories about this ordering which are not known to us at present.

The order in which the figures are presented on each of the nineteen small dials seems to be of no particular significance and is seldom, if ever, encountered in the extant treatises on geomancy. There is a pronounced pattern to the ordering, however, for the figures are in opposite or symmetric pairs:

The failure to encounter this ordering elsewhere would seem to indicate that either it was an invention of the designer, who arranged the figures in these pairs in order to assist the user in locating a particular figure on one of these dials, or it represents a *taskīn* that has not survived in the written discussions of geomancy.

Since the device presents the directions of the compass aligned with the geomantic figures, we can assume the designer intended it to be used for locating lost or stolen objects and concealed or buried items, which are the

---

[106] It is also called 'the geomantic *taskīn* (*taskīn al-raml*) belonging to al-Zanātī'. See al-Zanātī, *K. al-Faṣl fī uṣūl* (note 13, printing of 1280/1863), 5-8, 24-5, 31, 34-5; Da'ūd al-Anṭakī, *Tadhkira* (note 59), 234; Oxford, Bodleian Library, Oriental Collections, MS Greaves 40, fol. 117b and MS Marsh 216, fol. 1a; and Los Angeles, UCLA, Near Eastern Coll. 895, MS 678, fols. 78a and 114b.

subject of frequent questions in the literature. There is a complicated procedure attributed to Ṭumṭum al-Hindī that occurs quite frequently in the manuals.[107] It is impossible to know whether the designer assumed the user of the device would employ this procedure or whether the designer intended to simplify the method by having the user read the direction corresponding to the figure occupying, say, the fifteenth or sixteenth house.

The method as presented in the treatises begins with a square diagram assigning the figures to the four cardinal points (see Fig. 5). It is assumed the geomancer knows that the top row or rank of a geomantic figure is called 'fire' and is assigned a value of one, the second rank 'air' with value two, the third rank 'water' with value three, and the bottom row 'earth' with value four. Near the location where the item is thought to be, the geomancer is told to make a tableau and then to count how many waters are in it (i.e., to count the figures have a single dot in the third rank and to multiply this number by three). If less than eight, then there is nothing there. Otherwise the geomancer should proceed to produce a new tableau, after marking the directions of the compass on the ground. He then counts all the elements in the tableau, multiplying the number of single dots in each rank by the value of the rank. The sum is divided by 128, the remainder divided by 16, that remainder divided by 9, and finally that remainder divided by 4. If one is left, the direction is East; if two West; if three North, and if four South.

The geomancer then faces that direction and draws a square on the ground and follows the same procedure to produce a new tableau, and the numerical process is repeated until one, two, three, or four is left. Then the geomancer looks at the Mother in the tableau which corresponds to this remainder (that is, occupies the corresponding position in the tableau) and locates that figure in the square diagram (Fig. 5) and notes the direction. The corresponding position on the square which he has drawn on the ground in front of him then determines where the object is. In the case of one using this metal tablet rather than a manual, the geomancer would locate the corresponding direction from the large dial. If it is buried, then the depth can be determined by knowing that the element of fire is assigned the depth of a finger, air the depth of the breadth of a hand, water the length of a cubit, and earth the length of a human body.

The geomancer then looks at the figure of the Mother which was found to be the indicator, counts the ranks containing only one dot, and adds up the corresponding lengths. Then, using a certain ordering of the figures known as the '*taskīn* of the letters', he finds the figure that occupies the same position in

[107] Paris, BNF, arabe MS 2697, fols. 16a-16b, and Los Angeles, UCLA Research Library, Near Eastern coll. 895, MS 678, fols. 63b-65b. Compare Los Angeles, UCLA, Near Eastern Coll. 898, MS 43, fols. 11b-12a, by Ibn Ṭarāhī al-Ḥanafī al-Dhākir.

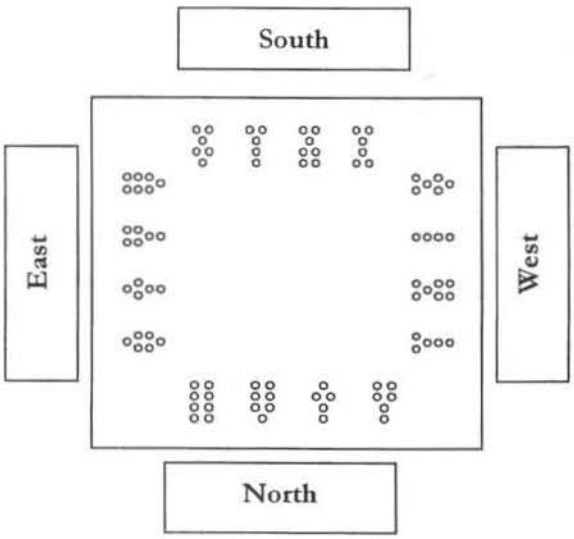


Fig. 5. Square relating geomantic figures with the four cardinal points for use in finding hidden or lost objects.

the *taskīn* that the Mother occupied in the tableau. He counts the ranks of that figure which contain a single dot and adds the corresponding lengths. Finally, he finds the sum of the lengths obtained from the Mother and the lengths found from the figure in the *taskīn*. This then is the depth at which the object is located.

A simpler version of the procedure for locating lost objects is given in a printed al-Zanātī text where it is said that at the suspected location the geomancer should put down a tableau and then add all the points of the figures together and subtract thirty-one.[108] Using the remainder he then casts off one number for each of the houses until the number runs out. The geomancer should then take the figure in the house where the number stops and 'add' it to the figure in the fifteenth house to produce a third figure (on the device, the geomancer could use the three small dials for this purpose). Then the geomancer is to see what direction is assigned to that resulting figure in the diagram (Fig. 5), and in that direction lies the lost or hidden object.

Just as the alignment of the figures with cardinal directions would have been of significance in responding to questions concerning spatial location, it is reasonable to assume that the seasonal groupings were intended for the interpretation of tableaux cast in an attempt to answer questions about time

[108] al-Zanātī, *K. al-Faṣl fī uṣūl* (note 13, printing of 1280/1863), 30-1.

and when an event would occur. The lunar mansion designation, on the other hand, may have only been meant to convey something of the quality of the figure and not to be used in the temporal location of events. The designer perhaps assumed that the user of this device would be acquainted with the association of particular lunar mansions with indications of weather conditions and good or ill portents, such as are given by al-Bīrūnī.[109] Nothing, however, on the device itself can guide the user in the application of the lunar mansions toward the interpretation of a geomantic reading. Nor is there any indication in the few treatises that align lunar mansions with geomantic figures of how the lunar mansions were to be applied in a geomantic reading.

Several remarkable features about the device from the standpoint of the practice of geomancy should be noted. The use of slides for producing the four initial figures, rather than marking down sixteen rows of dots which are then converted into four figures of four rows each, is striking in its uniqueness – a uniqueness the designer recognized when he said in the verse along the edge that the tablet 'agrees with geomancy in meaning but differs from it because it generates the figures from nothing'. Furthermore, the very concept of designing a mechanical device or tablet for the production and interpretation of a geomantic tableau appears to be entirely unique in the history of geomancy.

The alignments of the figures given on the large dial are notable for several reasons. The very insignificant role played by the lunar mansions in geomantic treatises makes their alignment here with geomantic figures surprising. Furthermore, in contrast with the remarkably logical patterns exhibited in the arrangement of geomantic figures and the seasons and cardinal points on the large dial, the sequence of the lunar mansions appears illogical and incorrect, unless, as suggested above, the maker were concerned only with aligning the shapes of the geomantic figures with the general appearances of the lunar mansion asterisms and did not intend the seasons and directions of the compass to also be attributed to the lunar mansions. While such an alignment based only on graphic representation of the lunar mansions is in keeping with the statement over the large dial, it does not reflect any known practice in geomancy current either then or later. It was quite possibly an original contribution by the designer and may offer some indication of his attitude toward geomancy as opposed to astrology. The maker was well aware of and proud of the tablet's unique features, as shown in the remark over the large dial that 'from my intricacies there comes about insight superior to books concerned with the study of the art'.

Because of the relative lack of Islamic geomantic manuscript material prior to the fourteenth century, the design of this tablet is quite important to the

[109] al-Bīrūnī, *Chronology* (note 81), 351.

history of geomantic practices. The device ranks as one of the earliest dated sources for a complex system of divination that was clearly fully developed and established by the time Muḥammad ibn Khutlukh al-Mawṣilī made it in 1241. It is also indicative of the importance given to the practice of geomancy in the thirteenth-century Islamic world that so meticulously designed and executed a piece would have been produced.

In medieval Europe geomantic treatises were on occasion produced for royal persons. Two examples are the geomancies written expressly for Richard II of England and Charles V of France.[110] They are beautifully executed manuscripts, highly decorated, and with striking miniatures. The metal geomantic tablet we have been examining would seem to be an Islamic parallel to these European royal geomantic manuscripts, for it is beautifully ornamented and skilfully crafted and, one may safely assume, intended for a highly placed person interested in the geomantic art.

Appendix

Transcription of Inscriptions

1: صنعة محمد
بن ختلخ الموصلى
في سنة ٦٣٩

2: فى نوبت محمد المحتسب البخارى [written entirely without diacritical dots]

3: الجماعة ⁘ // طريق ⁘ // نصرة خا ⁘ // نصرة دا ⁘ //
قبض دا ⁘ // قيض خا ⁘ // بياض ⁘ // حمرة ⁘ //
الحيان ⁘ // انكيس ⁘ // عتبة دا ⁘ // عتبة خا ⁘ //
اوراع ⁘ // جودلة ⁘ // اجتماع ⁘ // عقلة ⁘

4: بيت النفس والحياة // بيت المال والمعاش // بيت الاخوة والاخوات // بيت الآباء والامّهات // بيت الافراخ والاولاد // بيت الاعلال والامراض // بيت النسأ والمواصلات // بيت الخوف والموت // بيت النقل والحركات // بيت السلطان والعزّ // بيت الرجاء والآمال // بيت الاعداء والحسّاد // بيت السائل // بيت المسئول عنه // بيت العاقبة // بيت عاقبة العاقبة

[110] Oxford, Bodleian Library, Western Manuscripts, MS Bodl. 581 and Cambridge, Trinity College, MS 1447, respectively. See also the geomancies prepared for John Duke of Bedford (Oxford, St Johns College MS 18) and Wenceslaus (Vaclav IV), King of Bohemia and Holy Roman Emperor, 1378-1400 (Vienna, Nationalbibliothek, MS 2352).

5: تولد في هذه الحلات [- المحلات] // دوائر مثلثة // الرمل

6: قد وضعنا هذه القسنى لـــتوليد الاشكال فيعتبر [or فيتبيّن ؟] ما يظهر منها من الخط الفاصل الى موضع الظهور فـــتولد منها الامّهات

7: قد وضعنا هذه الدائرة لـــتعلم منها
محاكاة صور الاشكال من صور
المنازل طالعة وغاربة ثم يقع
الحكم عليها والله اعلم

8:

الجنوب

المغرب المشرق

الشمال

9: يسير من طيّاتي الحسّ خير من كتب فى درس الحكمة

10:

الربع الشمالى الشتوى:

البلدة غاربة	الجودلة		ممتزج مائل الى السعد
الهقعة طالعة	البياض		ممتزج داخل
العوا طالعة وغاربة	الطريق		ممتزج
الثريا طالعة	نصرة داخلة		سعد داخل

الربع الغربى الخريفى:

السماك والغفر طالع وغارب	العقلة		نحس ثابت
الهنعة غاربة	قيض خارج		نحس خارج
الزبانا والاكليل طالع	عتبة خارجة		نحس خارخ [- خارج]
الدبران غاربا	انكيس		نحس داخل

الربع الجنوبى الصيفى:

البلدة طالعة	اوراع		ممتزج داخل
الهقعة غاربة	الحمرة		نحس
النعائم طالعة	الجماعة		بوح ثقيل
الثريا غاربا	نصرة خارجة		سعد خارجة

الربع الشرقى الربيعى:

الذراع والنثرة والطرف	اجتماع ممتزج		لا داخل ولا خارج
الهنعة طالعة	قبض داخل		سعد داخل
الزبانا والاكليل غاربا	عتبة داخلة		سعد داخل
الدبران طالعا	الحيان		سعد خارج

11: انا ذو البلاغة والمحدث صامتا وبمنطقى الترغيب والترهيب
يخفى اللبيب ضميره فأبينه فكانّ اعضائى خلقن قلوب

12: انا كاشف الاسرار فيّ بدائع من حكمة وغرائب وغيوب
لكن بسطت ادیم خدّى صاغرا وجعلته عوض التراب ينوب

13: انظر الى اللوح واحفظه فانّ به معنى من اللوح لمّا خط بالقلم
يبدى من الغيب اسرارا محجّبة كانت مقدّرة فى سالف القدم
قد وافق الرمل فى المعنى وخالفه بكونه يوجد الاشكال من عدم
كان الواح موسى قد حسّنت بما انالها الله من حكمة ومن حكم
وحسبه شرفا ان لامسته يد تفوق ايدى الورى فى البأس والكرم

14: العزّ الدائم والاقبال خالد آبد والدولة الباقية والسلامة العالية والنعم التابعة الجدّ الصاعد [و] الدهر المساعد والعيش الراغد والعمر الطويل السالم والكرامة الكاملة والعيشة الصافية والكفاية الكافية والراحة والبركة والرحمة والتأييد والظفر

15: العزّ الدائم والعمر الطويل السالم [و]الخير القادم والامر النافذ والسعد الجادّ الكرامة الكاملة والعيشة الصافية والتأييد والظفر بالأعداء للصاحبه