Islamic Geomancy and a Thirteenth-Century Divinatory Device

EMILIE SAVAGE-SMITH and MARION B. SMITH

Islamic Geomancy and a Thirteenth-Century Divinatory Device

Islamic Geomancy and a Thirteenth-Century Divinatory Device

EMILIE SAVAGE-SMITH

and

MARION B. SMITH

Undena Publications

Malibu, California

To our parents
Clarence W. Savage
Jeanne Coverdill Savage
and in memoriam
Marion B. Smith, Sr.
Lucia Forsyth Smith

Preface

The subject of this book is an Islamic metal tablet from the thirteenth century A.D. in the possession of the British Museum (Department of Oriental Antiquities, Inv. No. 1888.5-26.1; bought in 1888 and formerly in the collection of M. Posno). The device has frequently been cited and photographed,[1] for it has been much admired as an outstanding example of Islamic metalwork. Descriptions such as "astronomical tablet," "astrological device," and "prognostication table" have frequently been applied to it, but a few references[2] have accurately noted its true nature as a device to be used in connection with the Islamic art of geomancy, *'ilm al-raml*. This study is the first to undertake a detailed investigation of the tablet, since only the tablet's maker and date have heretofore been published. Our analysis endeavors to examine the tablet in the context of geomantic theory and practice, requiring consequently a careful reading of the tablet's numerous inscriptions and a comparison with Islamic geomantic treatises circulating at that time.

Although geomancy is a form of divination that was widespread and popular in Europe during the medieval and Renaissance periods, it is relatively unknown to Westerners today. Frequently it has been dismissed by scholars as being of no significance but only a rather crude form of doing astrology "without stars," and in particular a way to avoid the astronomical observations and calculations necessary for casting a horoscope. While it is true that geomancy's materials are humbler, being simply dots customarily made in the dust of the ground or on a piece of paper, it provides opportunities for extremely involved and varied interpretative procedures.

The neglect that this subject has suffered may owe partly to biases

[1] Lavoix, 1878:783-784; Lane-Poole, 1898:44 and facing plate; Wiet et al., 1942:XI, 135 no. 4202; Barrett, 1949:xii, xxii, and pls. 16 and 17; Rice, 1953:230; Verhoeven, 1962:62 photograph; Aramco Handbook, 1968:42 photograph; Bronowski, 1973:167 color photograph. See Mayer, 1956:69 for a list of other brief citations.

[2] Pinder-Wilson, 1976:93; Maddison and Turner, 1976:110 (unpublished, a revised version of which will appear in the forthcoming *Répertoire* by Brieux and Maddison). There is a passing reference in Gunther, 1932:I, 241, which obviously refers to this device although it is not specific.

against such "pseudo-sciences" that seem to have been prevalent among scholars for a considerable period. Ridicule of such practices is not conducive to sound research into these areas, and, consequently, we believe that for our purposes the question of geomancy's ultimate validity is totally irrelevant. An attitude that persistently focuses on the intrinsic truth or falsity of geomancy can only obfuscate the investigation of questions which still need to be answered regarding the origin, diffusion, and structure of the process. It is to be hoped that researchers, in addition to ourselves, will seek to solve some of these problems. The geomantic figures and the way they are combined to obtain the design that is interpreted by the geomancer are interesting from a mathematical point of view, and indeed this aspect of the structure of geomancy has recently attracted the attention of a few scholars. The tablet that we describe in this volume predates all but a few of the manuscript sources relative to geomancy, and for this reason we believe that our study of the device may prove to be of some interest and value to future researchers.

The generous assistance of many persons has helped make this study possible. The authors are particularly appreciative of the help of R. H. Pinder-Wilson, formerly of the British Museum, now Director of the British Institute for Afghan Studies, Kabul. The interest and encouragement of Francis Maddison, Curator of the Oxford Museum of the History of Science, was also valuable as was the inquiry of Otto Mayr of the Smithsonian Institution National Museum of History and Technology which initiated the research. We also wish to acknowledge the help of Claude Audebert, Thomas G. Penchoen, Seeger A. Bonebakker, and Ismail K. Poonawala of the Gustave E. von Grunebaum Center for Near Eastern Studies, UCLA, and Father G. C. Anawati, Directeur, Institute Dominicain d'Études Orientales, Cairo, who were kind enough to read critically the interpretation of some or all of the inscriptions. In addition Fedwa Malti Douglas of the University of Virginia was helpful in obtaining copies and information on several items in Paris. All errors and misinterpretations, however, are the responsibility of the authors. The support furnished by the von Grunebaum Center for Near Eastern Studies at UCLA for the examination of the Near Eastern manuscript collection must also be acknowledged as well as the courteous assistance of the staffs of the Special Collections, UCLA University Research Library, the University of Oxford Bodleian Library, the British Library Department of Oriental Printed Books and Manuscripts, the University of Cambridge Library, the Princeton University Library, and the New York Public Library. The photographs of the device were generously supplied by the Department

of Oriental Antiquities of the British Museum. Finally, the authors wish to thank Malcolm Kerr and the editorial board of the Studies in Near Eastern Culture and Society Series for their interest in this project and in particular Teresa Joseph for her assistance and advice in all the technical aspects of producing this volume.

Contents

1. 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*,[1] possibly first used by Hugo Sanctallensis in the twelfth century as a translation of the Arabic term *'ilm al-raml* 'the science of sand', the most common name in Islam for this art.[2] 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 of geomancy with the archangel Gabriel (Jabrā'īl) who taught the practice to Idrīs.[3] Idrīs in turn taught Ṭumṭum al-Hindī, another legend-

[1] Isidore of Seville (d. A.D. 636) used the term *geomantia* in his *Etymologiarum*, Lib. VIII, ix, 12-13, where he cites the Roman scholar Varro (d. 27 B.C.) 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*. While Hugo Sanctallensis (Hugo of Santalla) working at Tarazona in Aragon was likely the first to use the term *geomantia* for the Islamic form of divination in his translation and abridgment of an Arabic tract, his slightly younger contemporary Gerard of Cremona (ca. 1114-1187) also translated into Latin a *Liber de geomancie* (see Sudhoff, 1914:99, and Grant, 1974:38). If the incipit (*estimaverint indi*) given for the translation by Gerard according to the list of works compiled by his students at Toledo is correct, then one of the extant manuscript versions attributed to Hugo (Tannery, 1920:403-409; Meyer, 1897:248-250) may in fact be by Gerard of Cremona. Several manuscripts are extant of a Latin geomantic tract based on an Arabic one by Alatrabulucus (Abū Sa'īd al-Ṭarābulsī, the teacher of the renowned master al-Zanātī?); see Tannery, 1920:324-328, 339-344, and 373-403; Haskins, 1924:78-79. For further discussion of various names of the art see Tannery, 1920:318-411, esp. 318-329.

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

[3] 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 Pedersen,

ary figure very frequently cited by geomantic authors.[4] A certain Khalaf al-Barbarī the Elder is said to have been a contemporary of the Prophet Muḥammad and to have traveled to India where he lived for 120 years, studying thoroughly the works of Ṭumṭum al-Hindī. He is said to have given, when he died in A.D. 634 (A.H. 13) at the age of 186, the book of Ṭumṭum to his pupil, a shaikh Nāṣir al-Dīn al-Barbarī the Younger.

From the latter a series of masters and pupils is traced[5] until reaching Abū Sa'īd al-Ṭarābulsī[6] who in turn was the teacher of the acknowledged master of geomancy, Abū 'Abdallāh 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 A.D. 1230 (A.H. 629), for he is cited as an authority on geomancy by 'Abd al-Raḥmān ibn 'Umar ibn Abī Bakr al-Dimashqī better known as al-Jaubarī. The latter, at the request of al-Malik al-Mas'ūd of the Artuquid dynasty which ruled parts of Diyār Bakr, the upper basin of the Tigris, from A.D. 1222 to 1231 (A.H. 619-629), wrote a treatise[7] on all the frauds,

*EI*², II, 362-364. The name Idrīs is probably to be identified with the Biblical Enoch rather than with Hermes Trismegistus; see Vajda, *EI*², III, 1030-1031, and Ibn Khaldūn, 1967*a*: I, 229 n. 345. Idrīs was a common name to which to attribute authority in occult and divinatory subjects, and is frequently cited as an authority on geomancy, as in Oxford, Bodleian Library, MS Arab. f. 36, and MS Marsh 216; Berlin, Deutsche Staatsbibliothek, Arab. MS 4200; and Paris, Bibliothèque Nationale, arabe MS 2631 and arabe MS 2632. For the legend of Idrīs and Gabriel and the origin of geomancy see al-Jaubarī, n.d. [ca. 1918]:60-62. Geomantic treatises occasionally cite as authorities Hermes (e.g., Paris, Bibliothèque Nationale, arabe MS 2697 item 1), Ptolemy (e.g., London, British Library, Or. Sloane MS 2650), and the prophet Daniel (e.g., Los Angeles, UCLA Near Eastern Coll. 898, MS 88). In the case of Daniel some entire treatises are ascribed to him, such as Rome, Biblioteca Vaticana, Arab. MS 1106 item 3; London, British Library, Or. MS Add. 9702 (in Turkish); Vienna, Nationalbibliothek, item 9; and Berlin, Deutsche Staatsbibliothek, Turk. MS 157 item 7.

[4] Alchemical, lapidary, and talismanic Arabic treatises are also attributed to this figure. See Hauber, 1909:457-472, and Goldziher, 1910:cols. 56-61. For a suggestion of a possible confusion between Hindī and *hindasī* (geometer), see Carra de Vaux, 1920:303. See also Sezgin, 1971:118-119, and Ullmann, 1972:298-299. Hartner in a book review, 1967:177-179, suggests that Ṭumṭum may be identified as Kanakah.

[5] For some accounts of the early masters see Klein-Franke, 1973:26-35, and Carra de Vaux, 1920:301-302.

[6] He is an author frequently quoted in the geomantic treatises, and some writings attributed to him are extant. A treatise entitled *Thamarat al-fu'ād al-muḥaddith 'an al-murād fī al-bawāṭin wa al-akbād* is extant (Paris, Bibliothèque Nationale, arabe MS 5834, fols. 110^a-119^b). Paris, Bibliothèque Nationale, arabe MS 2716, fols. 112^a-113^b, contains an *urjūza* (didactic poem) under his name, while Escorial MS arab. 924, fols. 9^a-13^b contains a chapter (*faṣl*) from a geomantic tract by al-Ṭarābulsī. Algiers, Bibliothèque Nationale, MS 1531, consists of a tract by al-Ṭarābulsī redone by Abū 'Abdallāh ibn Hārūn al-Sūsī.

[7] *Kitāb al-mukhtar fī kashf al-asrār*, ca. 1918:3. See also de Goeje, 1886:485-489. For

deceptions, and charlatans he had encountered while traveling throughout the Islamic lands, in which he cited as an authority on geomancy, after Ṭumṭum, al-Zanātī. Shaikh al-Zanātī is cited extensively by almost all later geomantic authors, and treatises under his name have been often lithographed in Cairo under various titles.[8]

There are intimations in the names of these legendary and quasi-legendary figures of a possible Hindu or Berber origin of the art. The possibly legendary Ṭumṭum al-Hindī implies an early connection with India, while the names of Khalaf al-Barbarī, Nāṣir al-Dīn al-Barbarī, al-Zanātī, and presumably also Abu Sa'īd al-Ṭarābulsī indicate Berber connections, and indeed there are purported Berber names given along with the Arabic names for the basic geomantic figures in several of the extant treatises. These terms, however, appear to be more frequently incorrect or simply unintelligib'e Arabic than actual Berber.[9] The peoples

the life of al-Jaubarī see Brockelmann, 1898-1949:I, 497 and Suppl. I, 910; and Brockelmann, *EI*²:I, 1026. The treatise by al-Jaubarī does not present a detailed discussion of the method of geomancy, although it does give an account of the legendary origins of the art.

[8] These texts are rare in Western libraries. There are two lithographed works, quite different in content, attributed to al-Zanātī, one of which is entitled *al-Aqwāl al-marḍīya fī al-aḥkām al-ramlīya li-l-shaikh al-Zanātī fī 'ilm al-raml* (Pleasing Statements on the Geomantic Principles of Shaikh al-Zanātī concerning the Art of Geomancy); a copy is at the New York Public Library. The second treatise is titled *Kitāb al-faṣl fī uṣūl 'ilm al-raml 'alā ḥukm al-qawā'id al-aṣlīya al-idrīsīya* (The Chapter on the Principles of the Art of Geomancy Based on the Authority of the Original Idrisian Principles) by Shaikh Muḥammad al-Zanātī and was printed several times in Cairo with slight variations; one copy dated A.H. 1280 (1863-64) is at the New York Public Library, another dated A.H. 1345 (1926-27) is at the École Nationale des Langues Orientales Vivantes in Paris, and a third undated at Princeton University Library. See Ben Choaib, 1906:62-71, for a summary of a printed text with the same title as the second work but with remarkably different contents. Yet surprisingly few manuscripts are extant of a geomantic treatise attributed to al-Zanātī. Such manuscripts available to the present authors, as well as the numerous quotations appearing in the large number of later compilations, seem to have little if any relation to the printed texts. Thus the establishment of the precise identity of the original treatise by al-Zanātī is not at all certain at this point. The available manuscripts containing treatises under the name of al-Zanātī were Escorial MS arab. 924, fols. 1^a-13^a; Paris, Bibliothèque Nationale, arabe MS 2732, fols. 176^b-181^a, arabe MS 5014, fols. 1^b-8^a, and arabe MS 2758 fols. 104^a-110^b (said to be by Abū 'Uthmān al-Zanātī); two Karshūnī manuscripts at Oxford, Bodelian Library, MS Selden superius 14, fols. 110^a-194^b, and MS Selden superius 15, fols. 43^b-79^b and 89^b-153^a; and two Turkish manuscripts at Copenhagen, Kongelige Bibliothek, Or. MS 23, and London, British Library, Or. MS Add. 5983, fols. 8^a-14^a. Monteil, 1931:fig. 7 between pp. 86-87 (see also pp. 88-95), reproduced a page from a Sudanese manuscript (present location unknown) of a text stated to be by al-Zanātī. The page is reproduced more clearly in Ibn Khaldūn, 1967*b*:225, fig. 7. Unfortunately it was impossible for us to examine the following manuscripts: Cairo: Dār al-kutub MS 75sh; Istanbul, Nuruosmaniye MS 3638, MS 3639, and MS 3640 (in Turkish), and Topkapi Sarayi, Ahmet III MS 1603; and Rabat, al-Khizāna al-'āmma, MS 2611 (1678D).

[9] Dr. Thomas Penchoen, Professor of Berber at the University of California, Los

of North Africa were well known for their mastery of various occult and divinatory practices. The Zanāta tribe, for example, practiced prognostication by the inspection of shoulder blades (scapulomancy, *'ilm al-aktāf*).[10] 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.[11]

Somewhat outside the above traditions is the attribution of a geomantic treatise to the Imām Ja'far al-Ṣādiq who died in A.D. 765 (A.H. 148), the last Imām recognized by both Twelvers and Isma'īlī Shī'ites.[12] 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 Hayyān known in the West as Geber.[13] Although the geomantic tract may not be by Ja'far al-Ṣādiq 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

Angeles, has kindly studied the so-called Berber terms employed in some of the geomantic treatises. To date only one of these *barbarī* names (*ābrīd* 'path' used for the Arabic *ṭarīq* which has the same meaning) can be stated with certainty to be Berber, but this same word might also be interpreted as a variant form of *barīd* which is an Arabic term of Persian origin referring to the courier system of mules or horses stationed at certain intervals for the transport of couriers and messages. Another may possibly be from a Berber root. Cf. Carra de Vaux, 1920:313. More shall be said of these terms as well as of variants of the *'arabī* terms in a forthcoming study by the present authors of the terminology employed in geomantic manuals.

[10] Doutté, 1909; Pottier, 1939:85; Margoliouth, 1912:816-818.

[11] The word *rammāl*, possibly 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 a North Arabian dialect have been found in Ṣafā, Ḥarra, and Lejā east of Damascus and date from the third to the sixth centuries A.D. See Harding, 1971:287.

[12] An incomplete manuscript is extant, Princeton University Library, Garrett Coll. MS 929 (547 H), 5 fols. Gotha, Thüringische Landesbibliothek, arab. MS 74, fol. 24[b] contains a short discussion of geomancy attributed to Ja'far. 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" (Burton, 1856:55-56).

[13] See Ruska, 1924:28-29, and Hodgson, *EI*[2], II, 374-375. The best-known and most authoritative treatise on sortilege, of the type known in the Muslim East as *fāl-nāma*, is that which goes under the name of the Imām Ja'far al-Ṣādiq. See Massé, *EI*[2], II, 760-761. See also Ebied and Young, 1976:296-307.

numerology in the Islamic world.[14] 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 al-Zanātī texts mentioned earlier.[15]

In addition to the writings of the authorities mentioned above, there were other sources of knowledge concerning geomancy which were available in the Islamic world by the middle of the thirteenth century. One of the great codifiers of geomancy was 'Abdallāh ibn Maḥfūf al-Munajjim (the astronomer) who lived before A.D. 1265 (A.H. 664).[16] His treatise, which is quite extensive and detailed, is extant in several Arabic manuscripts.[17] The great astronomer, mathematician, and philosopher Naṣīr al-Dīn al-Ṭūsī (d. A.D. 1275/A.H. 672), who founded the famous observatory at Maragha and wrote prolifically in both Arabic and Persian, 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 Geomancy) are extant.[18] Furthermore, several Persian treatises or parts of treatises on geomancy by Naṣīr al-Dīn al-Ṭūsī, as well as a Turkish version are also

[14] See Marquet, *EI*[2], III, 1071-1076, and Nasr, 1964:25-106.

[15] al-Zanātī, A.H. 1280 [1863]. See also Fahd, *EI*[2], II, 375-377.

[16] Fahd, 1966:201 n. 4. In the colophon to two Istanbul manuscripts (Esat Ef. MS 1988 and Ragip P. MS 964) the scribe states that both of these copies were made from a copy dated A.H. 665 (A.D. 1265), hence Ibn Maḥfūf must have lived before A.D. 1265.

[17] Los Angeles, UCLA Near Eastern Coll. 898, MS 129; Oxford, Bodleian Library, MS Arab. f. 36, and MS Marsh 216; Manchester, John Rylands Library, Arabic MS 373; Birmingham, Selly Oaks, MS 1930(911); Dublin, Chester Beatty, Arabic MS 5273; Berlin, Deutsche Staatsbibliothek, arab. MS 4200; Istanbul, Esat Ef. MS 1988 and Ragip P. MS 964; Patna (Bankipore), Khuda Bakhsh Oriental Public Library, Arabic MS 2487; Cairo, Dār al-kutub, MS 4473. The usual title of the treatise is simply *Kitāb fī 'ilm al-raml*, but according to Ḥājjī Khalīfa, 1835-1857: no. 11365, and two manuscripts (Manchester, John Rylands Arabic MS 373 and Oxford, Bodleian Library, MS Arab. f. 36) the title is *Kitāb al-muthallath* (or *al-muthallatha*) *fī 'ilm al-raml*. Note that the Oxford, Bodleian Library, MS Marsh 216, bears the title *Kitāb bughyat al-āmāl fī ṣinā'at al-raml wa taqwīm taḍayyuf al-ashkāl wa al-'alāma* (The Desire of Hopes concerning the Art of Geomancy and the Schema of Figures and Attributions of Meanings) by Abū Naṣr ibn Ṭarḫān al-Farābī, on the basis of which it has been attributed to the tenth-century philosopher al-Farābī. This attribution is certainly incorrect, for the manuscript is clearly an incomplete copy of the treatise by Ibn Maḥfūf.

[18] Algiers, Bibliothèque Nationale, MS 1530, fols. 25[b]-27[a] and Princeton, Garrett Collection Arabic MS 2748, fols. 38[b]-39[b], contain the shorter tract whereas Munich, Bayerische Staatsbibliothek, arab. MS 880, 90 fols., presents the more extensive work. See Mudarris Razavi, Sh 1335 [1956]: 57-58, and Nasr, *DSB*, XIII, 508-514.

found in libraries today,[19] 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 A.D. 1149 (A.H. 543) at the Persian city of Rayy.[20] In A.D. 1178 (A.H. 574) he composed in Persian an encyclopedia of Muslim sciences, *Jāmi' al-'ulūm*, for the Khwārizmshāh 'Alā' al-Dīn Muḥammad ibn Tukush who reigned from A.D. 1199 to 1220 (A.H. 596-617). This treatise contains a section on the science of geomancy.[21] In addition, an extant Arabic manuscript concerned in part with geomancy and a didactic poem (*urjūza*) on the same subject in another manuscript are both attributed to al-Rāzī.[22]

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. A.H. 272/A.D. 886). 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-failasūf al-shahīr bi-Abi Ma'shar al-Falakī*).[23] No treatise of such a title is attributed to Abū Ma'shar in the medieval biographical dictionaries.[24] The printed tract appears, with one important exception,

[19] For example, Oxford, Bodleian Library, MS Laud. Or. 313, fols. 75^b-77^b and MS Walker 55, fols. 41^b-47^b; 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 at Paris, Bibliothèque Nationale, arabe MS 2716, fols. 113^b-118^b. A Turkish translation (from Arabic or Persian?) of a lengthy tract by Naṣīr al-Dīn al-Ṭūsī on geomancy is at Hamburg, Stadtbibliothek, MS Orient. 253 (cxlii), fols. 41^b-163^b.

[20] For his life and writings see Anawati, *EI*^{2}, II, 751-755. A treatise on geomancy is also attributed to the theologian and philosopher Abū Ḥamid al-Ghazzālī (Latin Algazel) who died in A.D. 1111 (A.H. 505); the treatise is extant at Berlin, Deutsche Staatsbibliothek, arab. MS 2404. If this is a valid attribution (which is unlikely), it would be 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 Brockelmann, 1898-1949:I, 426, and Suppl. I, 755; Ullmann, 1972:227 and 274; Ahrens, 1917:203-205; and al-Ghazzālī, *al-Awfāq* [ca. 1973].

[21] al-Rāzī, [A.H. 1323 (1905)]: 187-189. Cf. Ḥājjī Khalīfa, 1835-1857: no. 3923.

[22] Florence, Bibliotheca Laurentiana, Or. MS 329 and an *urjūza* in Rome, Biblioteca Vaticana, arab. MS 1106, fols. 131^a-136^b.

[23] Abū Ma'shar, A.H. 1323 [1905]; other printings were made in Cairo, such as A.H. 1328 [1910]. See also Faddegon, 1928:150-158, who does not, however, mention its geomantic contents. The approach to geomancy in this work is an unusual one in the Islamic world in that the 16 geomantic figures are discussed exclusively in relation to the 12 zodiacal houses without any use of the customary geomantic tableau.

[24] Ibn al-Nadīm, 1871:279, and 1970:II, 658; Ibn al-Qiftī, 1903:154. See also

to be identical with Abū Ma'shar's tract "On the Nativities of Men and Women" (*Kitāb ṭāli' al-maulūd li-l-rijāl wa al-nisā'*) in which each zodiacal sign is discussed along with its three decans (*wujūh*). The printed booklet, however, 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-maulūd li-l-rijāl wa al-nisā'* which the present authors have examined.[25] 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 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-maulūd li-l-rijāl wa al-nisā'* apparently varies considerably in some of the extant manuscript copies,[26] 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.[27] 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 (*rilm al-raml*, and some, such as they by Naṣīr al-Dīn al-Ṭūsī, might not have been available in Mosul opposite the site of ancient Ninevah on the upper Tigris 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. The device studied

---

Brockelmann, 1898-1949:I, 221, and Pingree, *DSB*, II, 32-39, esp. p. 38, who aligned the printed tract with a work entitled *Kitāb al-mawālīd al-ṣaghīr* (The Small Book of Nativities) which is not extant today in manuscripts of that title.

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

[26] Ullmann, 1972:322 n. 4.

[27] Paris, Bibliothèque Nationale, arabe MS 2730 (Carra de Vaux, 1920:302 n. 1). An Arabic geomantic treatise by Abū 'Abdallāh Muḥammad ibn Ḥasan 'Alī ibn Muḥammad al-Lakhmī al-Andalusī (written in 1292/1875) also cites Abū Ma'shar as an authority (Los Angeles, UCLA Near Eastern Coll. 898, MS 618, fol. 2^a). Abu Ma'shar is cited as well in a Provençal geomantic treatise written about A.D. 1330; see Meyer, 1897:262.

here contains some features apparently not found in extant Arabic, Persian, or Turkish writings 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 of geomancy, for in one inscription he has the device say of itself: "from my intricacies there comes about perception 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,[28] 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

[28] Lot books that employ the geomantic figures have not been included in the summary of material available on geomancy in the thirteenth century because they are of a very different form of geomancy and 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 12 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. Three Turkish manuscripts are extant of such geomantic lot books supposedly written by 'Abdullāh ibn Anīs (or Anī) for the eighth-century caliph Hārūn al-Rashīd (London, British Library, Or. MS Harl. 262, and Or. MS Harl. 5522, and Vienna, Nationalbibliothek, Turkish MS 1509). Compare the study of Eis, 1956, who has edited a medieval German lot book in which one of the sixteen geomantic figures is produced to determine the answer. For a discussion of Latin geomantic lot books going under the name of Alfodhol, see Thorndike, 1927:326-331, 1929:90, and 1945:88-91. For a study of Arabic lot books and their relation to "Liber Alfadhol" of the Latin tradition see the studies of Kunitzsch, 1968:297-314, and 1969:667-672, who argues that such treatises do not predate the twelfth century. Kunitzsch does not discuss the procedures for determining the answer nor does he mention any connection with geomancy.

Also in the class of lot books there should be placed the so-called "manual of geomancy" entitled the *Experimentarius* by Bernard Silvester of Tours written in the twelfth century. This treatise, which he actually edited rather than authored himself, does not cast a geomantic tableau or even one geomantic figure, but 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 Savorelli, 1959:283-342; Thorndike, 1929-1958:II, 110-123; and Jeauneau, *DSB* II, 21-22. The Oxford, Bodleian Library, 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-Mauṣilī now at the British Museum.

There is considerable confusion in much of the 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.

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.[29]

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.[30] The word *takht* occurs in medieval Arabic mathematical writings as a term for a small board lightly covered with sand in which one could mark down numerals and then erase them by smoothing over the sand or dust or by covering it with additional dust.[31] 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 laila wa-laila* (*The Thousand and One Nights*) to a geomantic tablet used with a stylus of brass to form the figures is probable evidence of the early use of a dust board or tablet, although it is possible the references are later interpolations into the stories.[32] Such

[29] Treatises were also written in Persian on *'ilm al-raml*, but in Persian the word *raml* was given a second meaning. It came to be applied to the throwing of dice which were frequently strung together in groups of four. See Massé, *EI*^{2}, II, 761, and Massé, 1938:247 (Engl. trans. 1954:249). This form of divination is a type of lot casting related to the *sortes* of classical antiquity. The dice were not marked so as to produce a geomantic figure, and this form of divination has no relation with *'ilm al-raml*. Such confusion in the use of the term *raml* for the art of geomancy and for a form of sortilege employing dice has caused such errors as that of Nasr, 1976:207, who labels a photograph of two sets of such dice as "Instruments used in geomancy." 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 toward Mecca. That is, the plate gives the names of 34 cities and their corresponding directions and *inḥirāf*, which is the angle with reference to Mecca which gives the deviation of the direction of gaze from the north-south line. Such a plate is used neither in *'ilm al-raml* (geomancy) nor in sortilege with dice.

[30] E.g., Los Angeles, UCLA Near Eastern Coll. 898, MS 88, p. 31, uses the term *takht* which you mark with a stylus, *mīl*, once calling it *takht lauḥ* 'dustboard.' In the text attributed to al-Zanātī entitled *Kitāb al-faṣl fī uṣūl 'ilm al-raml* the word is more frequently used for the completed sixteen-place tableau of geomantic figures from which the reading is derived (al-Zanātī, A.H. 1280 [1863]:18 and 25 et passim), 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 (ibid., p. 24).

[31] Kūshyar ibn Labbān, 1965:5-6 et passim; Saidan, 1967:91-163 and 213-293. See also Souissi, *EI*^{2}, III, 468-469, 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.

[32] A collection of Arabic stories comprising *The Thousand and One Nights* appears to

a tablet or 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 discussing.

---

have formed about a Persian framework and to have developed with many additions from various locations from the ninth and tenth centuries A.D., taking final shape in the thirteenth century (see Littmann, *EI*^{2}, I, 358-364). 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 (320-326th night, *Alf laila wa-laila*, A.H. 1279 [1862]:II, 196-198 and 200-203; 1962:III, 1436 and 1464-1474). A gift of a geomantic sand board of gold (*takht raml min dhahab*) is mentioned in the tale of Qamar al-Zamān (202d night, *Alf laila wa-laila*, A.H. 1279 [1862]:II, 18; 1962:II, 1234). The tales of Jauda the Fisherman, Shīmās and Jali'ād, Gharīb and his brother Ajīb, and Delīlah the Crafty also mention a geomantic dustboard or tablet (see Rescher, 1919:36-38). While the practice of geomancy plays an important role in the story of Aladdin and the Wonderful Lamp, which is not usually grouped as one of the Arabian Nights, a tablet is not specifically mentioned in the tale, despite Burton's use of a geomantic table in the English translation (Zotenberg, 1888:11, 62, 63, 76, and Burton, *Supplemental Nights*, n.d.:III, 68, 156-157 and 179-180).

2. Principal 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 hereafter 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. 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. In either case 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. 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 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 (see fig. 1).

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, the remaining figures in the tableau are produced as follows (see 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

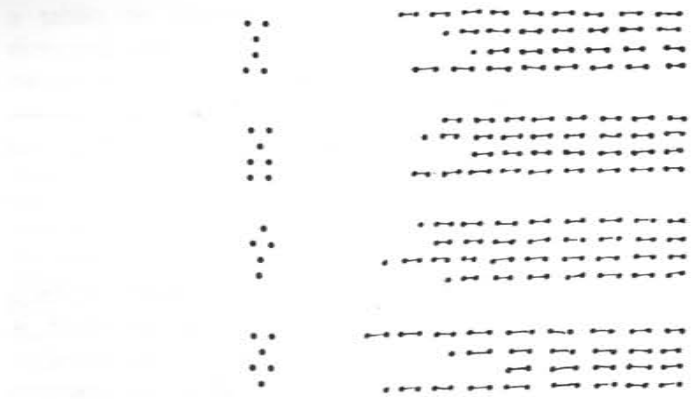


Fig. 1. The formation of the first four figures of a geomantic tableau.

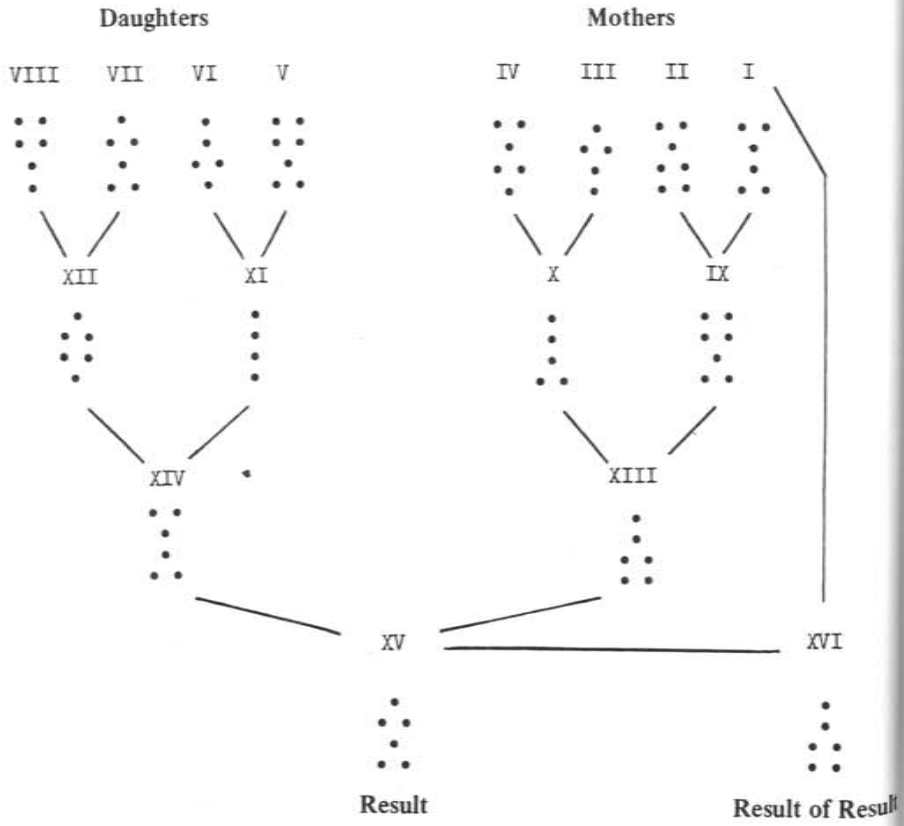


Fig. 2. An example of a complete geomantic tableau, with Roman numerals marking the number of the position or house.

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 VIII 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 in 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 righthand 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 16 (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 Chapter III, 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. *bait*) 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.[1]

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.[2]

[1] For readers interested in mathematical proofs of these properties see Jaulin, 1966:20-23 and 27.

[2] See Pedrazzi, 1972:146-161, and the monograph by the French structural anthropologist Jaulin, 1966. For a critical study of the latter work see Smith, 1979:67-100.

3. 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-Mauṣilī and dated 639 [A.H./A.D. 1241-42]. From the maker's *nisba* (the part of the name derived from the location or trade) one may infer that he was born in Mosul and very likely connected in some manner with the prominent metalworking center, especially renowned for its inlaid brass vessels,[1] which flourished there during the last fifty years of the Zangid dynasty (A.D. 1127 to 1262) established by the Saljūq Atābegs.

The fact that the maker's *nisba* is al-Mauṣilī is not necessarily conclusive evidence that he in fact resided and worked in Mosul, for there were artisans from that locality who worked in Cairo, Damascus, and elsewhere in the thirteenth century.[2] The quality and style of the metalwork, however, strongly supports the assertion that the device was made either in Mosul or by a craftsman trained there. From the standpoint of design and metallurgical craftsmanship the tablet compares very favorably with the some twenty-five pieces of metalwork signed by Mosul artists,[3] including a celestial globe made by Muḥammad ibn Hilāl al-Mauṣilī in A.H. 674 (A.D. 1274-5) which was produced after the center of metalwork began to decline following the sack of the city by the Mongol Hūlāgu in 1260.[4] 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[5] made by the Egyptian architect and mathematician Qaiṣar ibn Abī al-Qāsim ibn Musāfir al-Ashrafī al-Ḥanafī in 622 A.H. (1225-6 A.D.) for the Ayyūbid

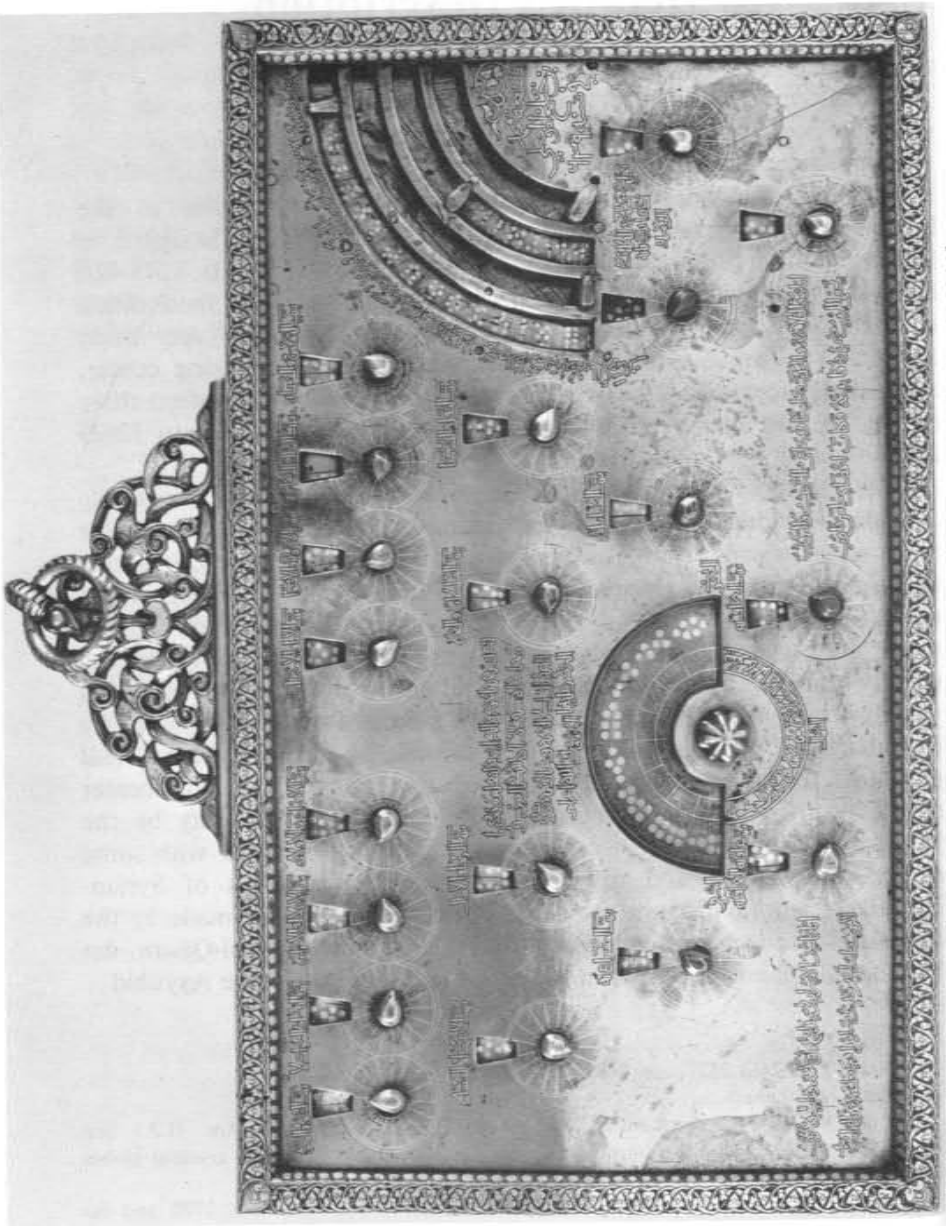
[1] Rice, 1957:326.

[2] Harari, 1939:2466-2539, esp. 2495.

[3] Barrett, 1949:xi-xiii.

[4] British Museum, Department of Oriental Antiquities, Inv. No. Or. Ant. 71.3.1. See Pinder-Wilson, 1976, and the forthcoming study and catalogue of Islamic celestial globes by E. Savage-Smith.

[5] Now in the collection of the Museo Nazionale, Naples. See Assemani, 1790, and the forthcoming study of celestial globes cited in the preceding reference.



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

ruler of Egypt al-Malik al-Kāmil, the nephew of Ṣalāḥ al-Dīn (known to the Franks as Saladin), and the fine astrolabes[6] made by ʿAbd al-Karīm al-Miṣrī who worked for the last Ayyūbid and the first Mamlūk ruler of Egypt.

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 Mosul. The device is of a brass alloy having a rich reddish color 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 high projection by which it can be suspended (see pl. 1 for overall view of the front of the device).

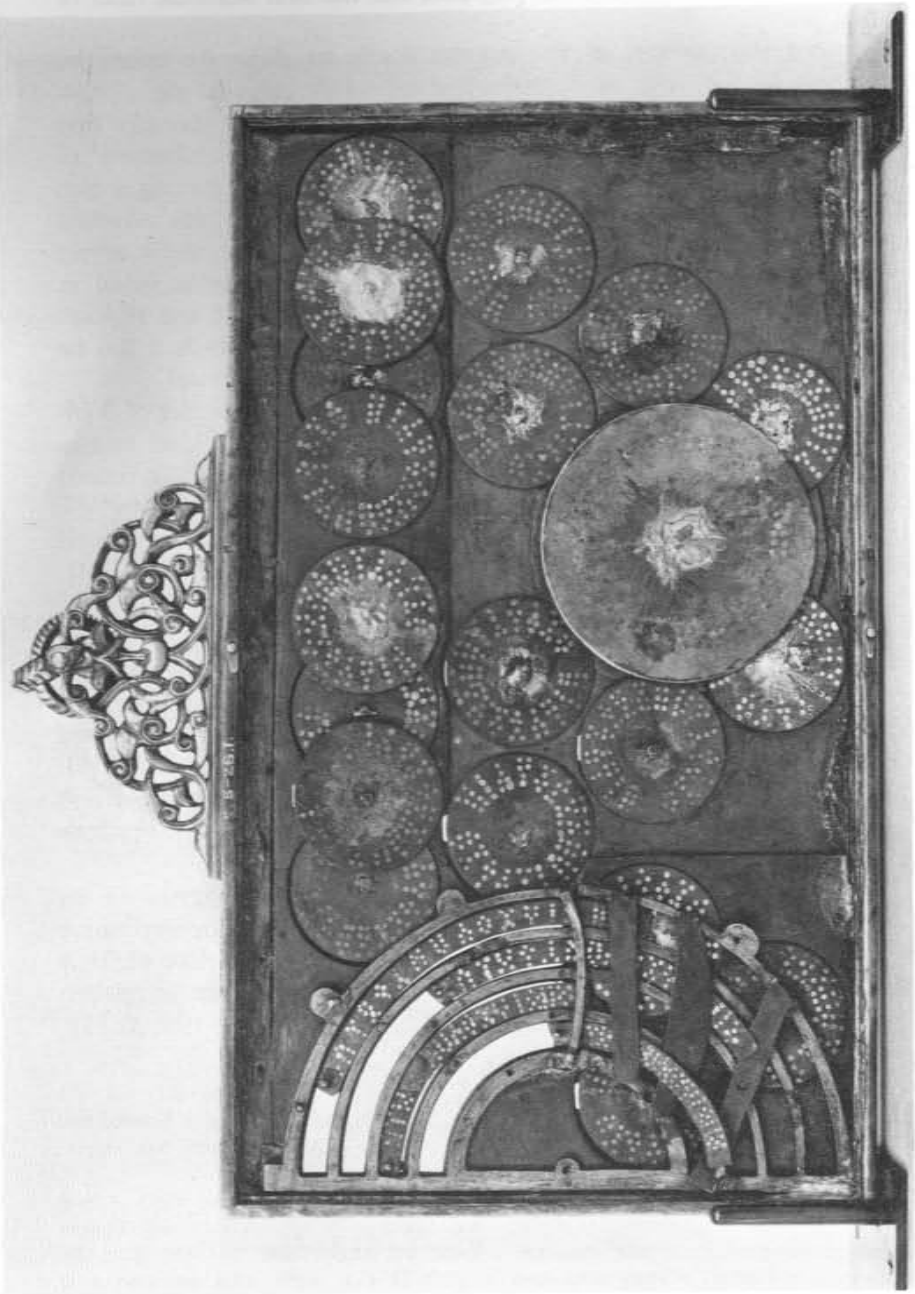
The front plate has nineteen small circles, each of a diameter of 3 cm surmounted by a window exposing a sector of the dial that rotates beneath the plate (see pls. 1, 3). A large dial near the center rotates beneath a semicircular window of diameter 8 cm (see pls. 1, 5 and 6). Four sliding arcs are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

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 filled with silver inlaid arabesque, and the narrow margin nearest the front plate is engraved in a chain pattern with centers inlaid with silver (see right-hand edge of pl. 4).

The manner in which the geomantic tablet was designed to be suspended closely resembles that common in astrolabes. The decorative triangular projection attached to the top edge of the frame (see pl. 1) is like the *kursī* 'throne' projecting from the upper part of an astrolabe.[7] The edges of the *kursī* are engraved and inlaid in arabesque (see pl. 11).

[6] Two astrolabes are extant, one dated A.H. 625 (A.D. 1227-28) and the other A.H. 633 (A.D. 1235-36). The former is now at the Oxford Museum of the History of Science and the latter in the Department of Oriental Antiquities, the British Museum. See Mayer, 1956:29-30.

[7] The decorative openwork of this particular *kursī* (height of 5.4 cm and width of base 13.5 cm) 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-Iṣfahanī in 1221-22 (A.H. 618). This astrolabe is at Oxford, Museum of the History of Science, Inv. No. IC 5.



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

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 there would probably have been attached a cord, *'ilāqa*, as was done with astrolabes.[8] The similarity of this suspensory device with those of astrolabes presents the strong possibility that the metalworker who executed this geomantic tablet was also an astrolabe maker, although the maker's name—Muḥammad ibn Khutlukh al-Mauṣilī—is not known to appear on any astrolabe or other pieces of metalwork.

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) sets 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 with some of the letters terminating in arabesque; it is inlaid with silver, with decorative devices placed at the four corners and at the center 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 lovely arabesque 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 *naskhī* script, inlaid in silver, on the front of the device beneath the four sliding arcs in the upper right-hand corner (see pls. 1, 4 and Appendix item 1 for transcription):

> The work of Muḥammad ibn Khutlukh al-Mauṣilī
> in the year 639 [A.H. = 1241-42 A.D.]

[8] See Morley, 1865:8, and Hartner, 1939 (repr. 1968):287-311, esp. 292.

The equivalent of the Latin *opus* in the signature is the noun *ṣan'a(t)* which occurs frequently on Islamic scientific instruments.[9]

Whether or not Muḥammad ibn Khutlukh al-Mauṣilī 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 known to occur in any literature or inscriptions nor on any other examples of metalwork or other products of an Islamic artisan or craftsman, nor is his name 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 clear 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.[10] Hence there is some possibility that Muḥammad ibn Khutlukh al-Mauṣilī 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 *naskhī* script on the back of the device in the center circle formed by the intertwining bands of arabesque (see pl. 12 and Appendix item 2 for transcription). This inscription, which is the only one on the entire device not inlaid in gold or silver, reads as follows:

In the small cabinet of Muḥammad al-Muḥtasib al-Bukhārī.

The entire inscription is written without any diacritical points and hence can be read in several ways,[11] but this interpretation appears the most

[9] *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 seventeenth century. See the forthcoming monograph on Islamic celestial globes by E. Savage-Smith. Mayer (1956:13 n. 1) asserts, however, that the noun *ṣana'a* rarely occurs on astrolabes.

[10] Ibid., pp. 13-14 and 21.

[11] The word translated here as "small cabinet" is *buwait*, the diminutive of *bait* meaning dwelling, lodging, chamber or cabinet, perhaps used here in the sense of cabinet of curiosities. See Blachère et al., 1968:II, fasc. 15, 930, and Lane, 1863:I, 290. The preferred and more acceptable form of the diminutive is *buyait*, but *buwait* is known to occur, and since it may have been inscribed as far east as Bukārā, it is not unreasonable to suggest that a less classical form of the word was used.

The proper name itself could also be read as Muḥammad al-Mukhlis al-Bukhārī, since the final *hā'* of *muḥtasib* is not well formed. The two words preceding the name could perhaps be read as the preposition *fī* 'in' plus a place name such as Buwaib in Iraq near Kufa (Yāqūt, 1906:II, 310) or the present-day town of Tuwair north of Baghdād or Buwaib in Egypt near Asyūṭ. But these interpretations seem very forced, while the grammatical structure of the entire inscription would not be as sound as reading *fī buwait* 'in the small cabinet of.' Another possible although unlikely reading is *fī nuwīn*, which might mean 'for Prince.' This is a very unacceptable use of the preposition *fī*, however, and *nuwīn* is a Persian word; the combination of these two words seems more unlikely than the uncommon but documented Arabic word *buwait* meaning a small cabinet or room. It would also be possible to read the inscription as *tuwuffiya* Muḥammad ibn al-Muḥtasib al-Bukhārī, which would mean 'Muḥammad ibn al-Muḥtasib al-Bukhārī died.' But no year of death is given as one would expect following this verb. Furthermore, the authors have been unable to find a similar statement on any inscription in the published repertories, and the purpose of inscribing such a statement on a piece of metalwork would seem obscure. For the foregoing reasons, therefore, the present authors have preferred the rendering *fī buwait* Muḥammad al-Muḥtasib al-Bukhārī, 'In the cabinet of curiosities of Muḥammad al-Muḥtasib al-Bukhārī.'

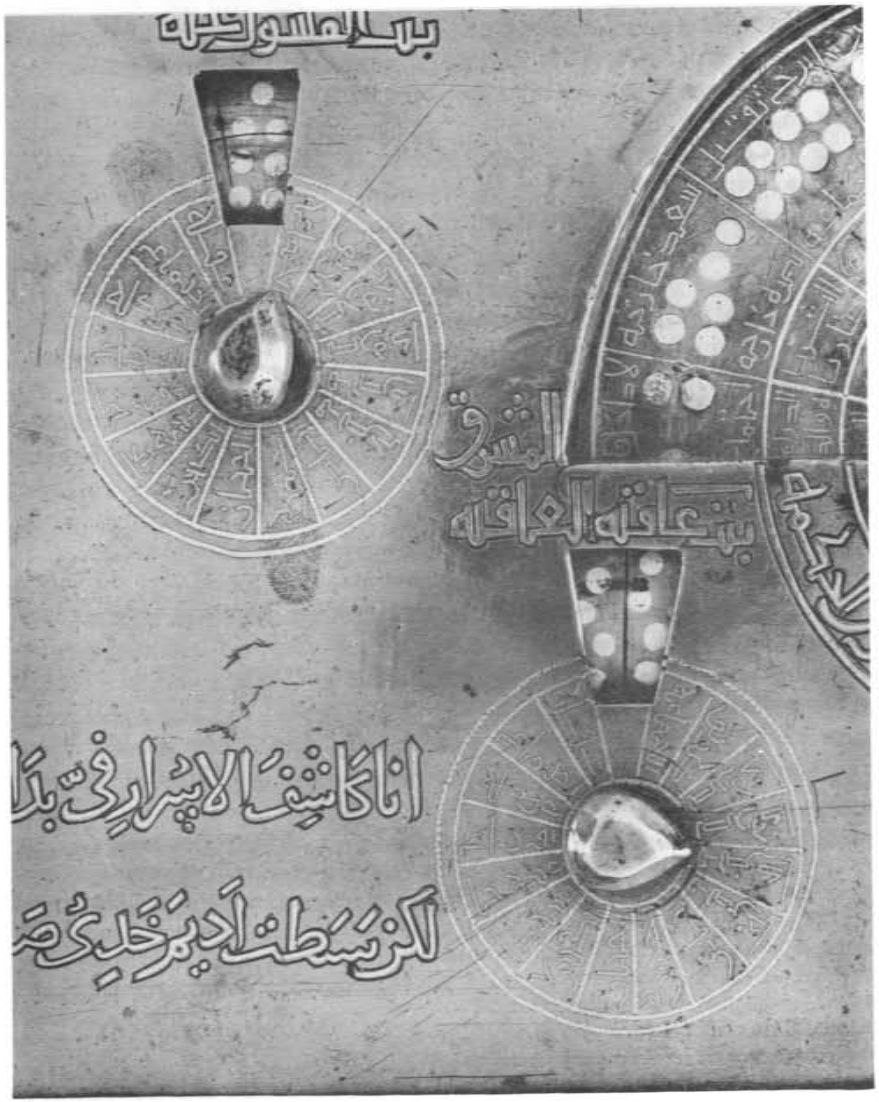
reasonable. Since there is no date given in this inscription we cannot know with certainty whether it was in his possession immediately after its execution or whether it came into his possession sometime later during the intervening six centuries before it came into the collection of the British Museum. Since it is the sole inscription on the tablet which is engraved only, not inlaid in gold or silver, and was inscribed with 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 was from 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 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.[12] 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 center 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,

[12] Cahen et al., *EI*^{2}, III, 485-493.



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

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 resoldered 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.

The list on page 24 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. 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.[13]

The first figure, which contains the maximum number of points

[13] For more detailed discussions of these terms and the "Berber" terms, see Carra de Vaux, 1920:306-308 and 311-314, and the forthcoming publication on the different types of Islamic geomantic treatises by E. Savage-Smith. For the present discussion the following texts have been most frequently consulted: Oxford, Bodleian Library, MS Greaves 40, MS Arab. f. 36, MS Marsh 216, MS Bodl. Or. 505, MS Huntington 456, MS Ouseley 156, and MS Huntington 193; London, British Library, MS Sloane 2650, MS Or. 2332, and MS Or. 12,395; Paris, Bibliothèque Nationale, arabe MS 2716, arabe MS 5014, arabe MS 2758, and arabe MS 2732; Princeton, University Library, Garrett Coll. MS 954 (547 H III) and Garrett Coll. MS 929 (547 H IV), and Garrett Coll. MS 962 (548 H); Los Angeles, UCLA Research Library, Near Eastern Coll. 895 MS 678 and MS 686, Near Eastern Coll. 898 MS 88, MS 618, and MS 685, and Near Eastern Coll. Wellcome MS 142; Cambridge Univ. Library MS Add. 3613(10), MS Add. 3624(8), MS Or. 901(8), MS Or. 431(7), Corpus MS Or. 80, Browne Coll. MS Q.2(9). The following printed texts were also compared: Abū Ma'shar, A.H. 1323 [1905]; Fakhr al-Dīn al-Rāzī [A.H. 1323 (1905)]; al-Zanātī, A.H. 1280 [1863] and A.H. 1326 [1908]; Da'ūd al-Anṭakī, A.H. 1282 [1865]:part 4, pp. 234-242; al-Tūnisī, 1965:332-339; al-Adhamī, n.d. [ca. 1945]; al-Yazdī, A.H. 1308 [1890]; and al-Ṭūkhī, A.H. 1376 [1956]. For a few figures the name might be explained by the very form of the figure itself, such as ⋮, having the name *al-ṭarīq* meaning path; however, to approach the meanings of most of the names in this manner seems to lead to highly questionable interpretations. For such a discussion see Hébert, 1961:121-122.

from the root *w-r-'* meaning to be timid,[15] but it is far from the most frequent word in geomantic manuals for the figure, the common one being *naqī al-khadd* meaning something like 'pure of cheek' or 'pure of visage.' The name *jaudala* comes from the verb *jadala* meaning to become robust or vigorous (said of a young man). While it is very common for this figure, of almost equal incidence is the name *kūsaj* or *kausaj*, meaning to be scanty-bearded.

The word *ijtimā'* meaning the act of being arranged, collected, and 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 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
[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 Maturation 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 Jealousies

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

[15] Various arrangements of diacritical points are found on the word, such as *auzā'*, but the most common spelling is *aurā'*.

[XIII]	The House of the Questioner

The dial to the left of the large center dial:

[XIV]	The House of the Object of the Inquiry

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

[XV]	The House of the Result

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

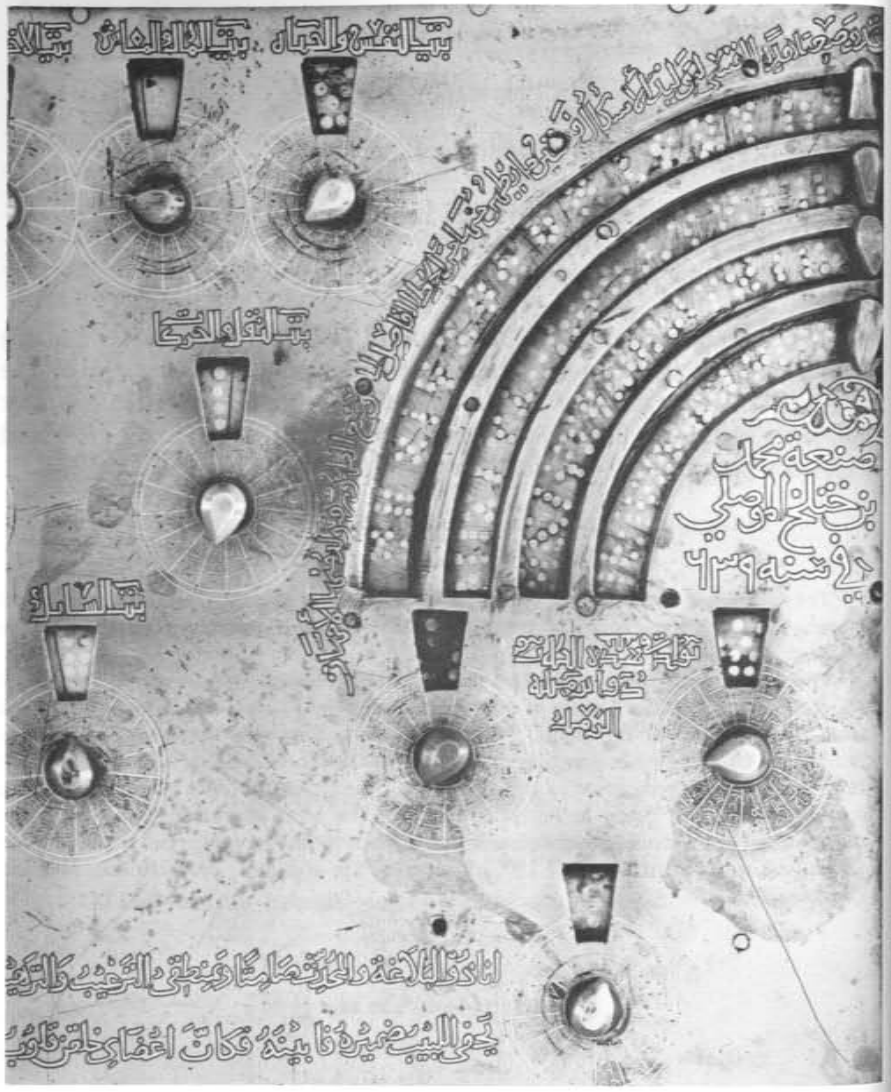
[XVI]	The House of the Result of the Result

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 is the engraved statement that follows, written in Kufic script and inlaid in silver (see pl. 4 and Appendix item 5):

In these positions[16] circles generate the geomantic triplet.[17]

[16] The word *ḥalāt* is probably intended to be *ḥālāt*, a common term in astrological literature in such expressions as those equivalent to *status planetarum ad invicem*. See Ullmann, 1972:357.

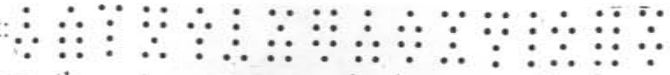
[17] The term *muthallatha*, translated here as triplet, occurs frequently in geomantic literature in the specialized sense of a group of three *raml* figures, one of which is derived from the other two by combining, or 'adding,' them. The word *muthallatha*, as well as *muthallath*, also appears as the title of the treatise by Ibn Maḥfūf, a treatise devoted in large part to the interpretation of triplets (see p. 5 n. 17, above). The significance of this concept is discussed below in the interpretation. 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, 1934:230 sec. 379, and Ullmann, 1972:356.



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]

The Sliding Arcs

Each of the four nested 90° arcs in the upper right-hand portion of the tablet contains a slide which may be moved by a small knob attached 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 a counterclockwise direction they form the following sequence, listed here from left to right:



As one goes from the outermost arc to the innermost the figures become increasingly crowded as the length of the arc becomes shorter, thereby affording less space for each figure.

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

> We have placed these arcs in order to generate the figures,[18] and so you [will examine] what appears next to the separating line at the point of visibility, and then from them you generate the Mothers.

A small pin inserted in the process of constructing the tablet has marred the inscription at the point *fa-tatabayyanu* 'you will examine,' so that a precise reading is not possible.

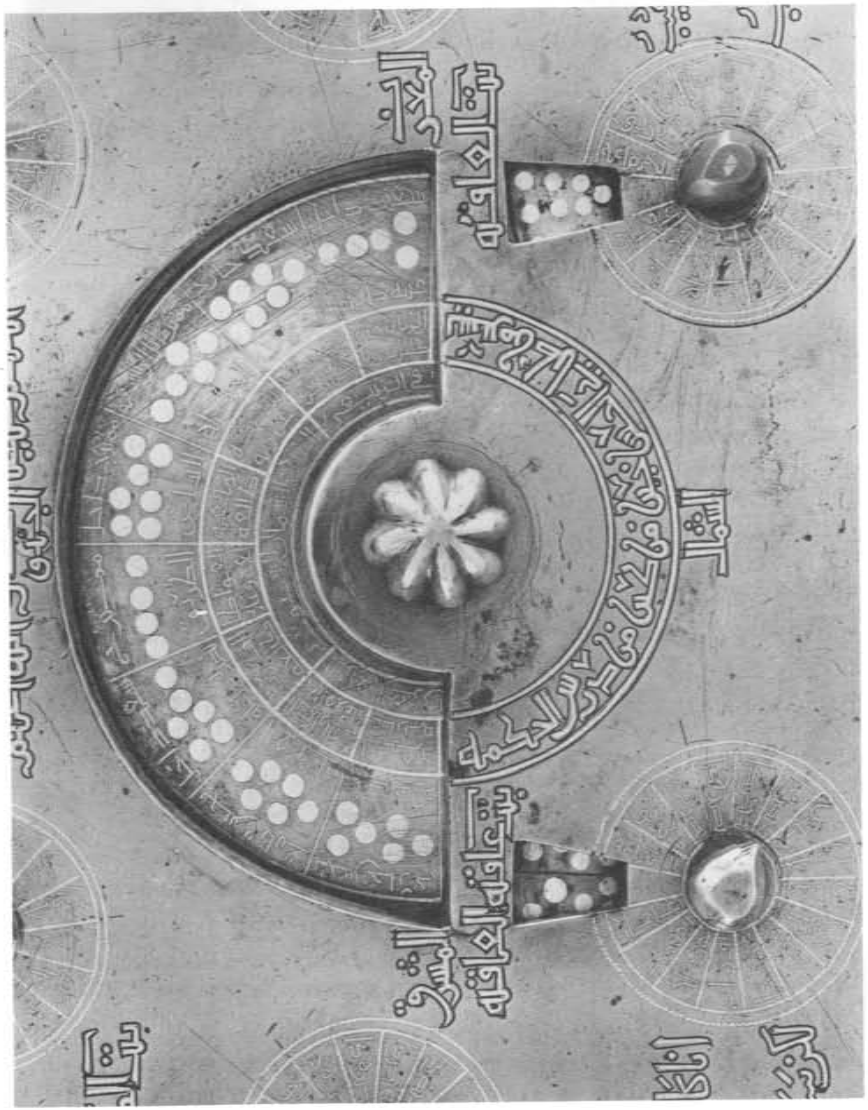
The Large Dial

Above the large central dial is an inscription, in Kufic script and inlaid in silver, which reads as follows (see pl. 1 and Appendix item 7):

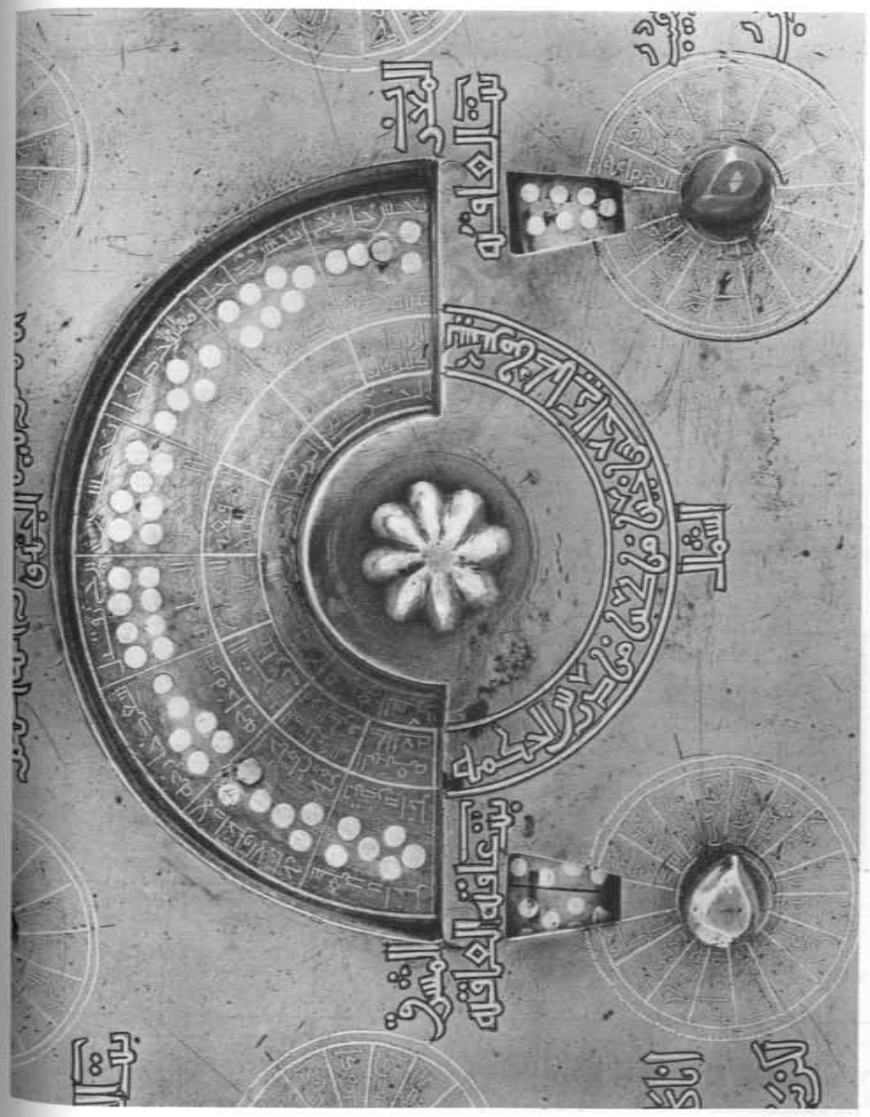
> We have established this circle so that you might learn from it the correspondences of the forms of the figures with the forms of the lunar mansions, rising and setting. Thereupon the power to interpret might belong to it [the circle], but God knows best.

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).

[18] *Shakl* (plural *ashkāl*) is the usual term for the geomantic figures. See al-Tahānawī, 1853-1862:II, 784.



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]

Table 1. Inscriptions on Large Rotating Dial

	Lunar mansion	Geomantic figure and name[a]	Indication
Northern winter quadrant	*al-balda*, setting	*al-jaudala*	Mixed, tending toward good omen
	al-haqʿa, rising	*al-bayāḍ*	Increasingly mixed
	al-ʿawwāʾ, rising and setting	*al-ṭarīq*	Mixed
	al-thurayyā, rising	*naṣra dākhila*	Increasing good fortune
Western autumnal quadrant	*al-simāk* and *al-ghafr*, rising and setting	*al-ʿuqla*	Constant ill luck
	al-hanʿa, setting	*qabḍ khārij*	Decreasing ill fortune
	al-zubānā and *al-iklīl*, rising	*ʿataba khārija*	Decreasing ill luck[b]
	al-dabarān, setting	*inkīs*	Increasing bad luck

[a]Geomantic figure within brackets shows the figure in its normal position.

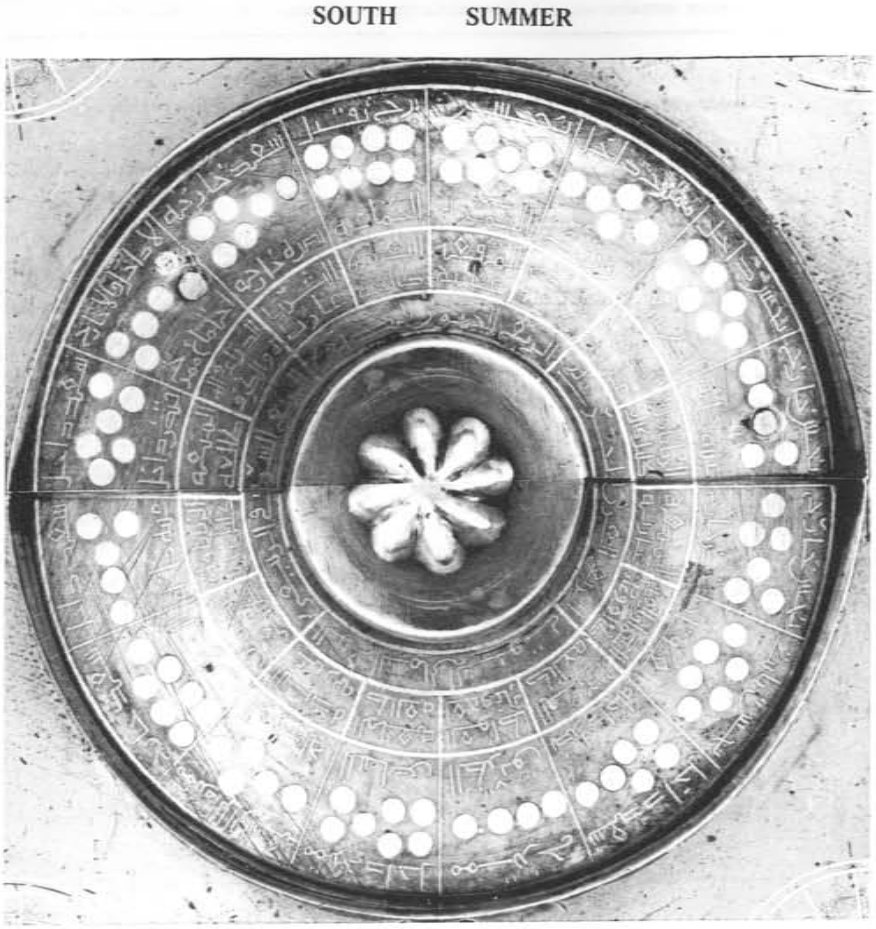
[b]The inscription actually reads *khārikh*, amended by the present authors to read *khārij*.

Table 1. Inscriptions on Large Rotating Dial (Continued)

	Lunar mansion	Geomantic figure and name	Indication
Southern summer quadrant	*al-balda*, rising	*aurāʿ*	Increasingly mixed
	al-haqʿa, setting	*al-ḥumra*	Ill fortune
	al-naʿāʾim, rising	*al-jamāʿa*	Serious adversity
	al-thurayyā, setting	*naṣra khārija*	Decreasing good fortune[c]
Eastern spring quadrant	*al-dhirāʿ*, *al-na[thr]a*, and *al-ṭarf*	*ijtimāʿ*[d]	Mixed, neither increasing nor decreasing
	al-hanʿa, rising	*qabḍ dākhil*	Increasing good fortune
	al-zubānā and *al-iklīl*, setting	*ʿataba dākhila*	Increasing good fortune
	al-dabarān, rising	*al-ḥiyān*	Decreasing good fortune

[c]The engraver has written *saʿd khārija* (with the adjective having an incorrect feminine ending) instead of *saʿd khārij*.

[d]The engraver has written *mumtazaj* 'mixed' alongside the name of the figure *ijtimāʿ*. Clearly the word is to be read with the line of writing above, giving the indication or interpretation of the figure and not as an adjective modifying *ijtimāʿ*.



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

[Above:]	South
[To the left:]	East
[Below:]	North
[To the right:]	West

Below the window exposing the large circular plate on the front of the device is a semicircular band, having the same radius as the underlying rotating plate, which contains an inscription inlaid in silver and in Kufic script. In this inscription the device, or possibly the large circular plate, is made to speak in the following words (see pls. 5 and 6 and Appendix item 9):

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

Behind the hemispherical window rotates a large circular plate turned by an eight-lobed knob on the front of the plate. In plate 7 this circular plate is shown in its entirety. Of course, only half of the plate is visible at any one time through the hemispherical window seen in plates 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 one of them are the sixteen geomantic figures formed by inlaid silver 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 *ṣafīḥa* of an astrolabe, which is the disk on which is engraved a stereographic projection of the heavens.[19] Consequently, the placement of South at the top is in keeping with the procedures followed by astrolabe makers and astronomers.

The inscriptions on the large rotating dial read as presented in table 1 (see also pls. 5, 6, and 7 and Appendix item 10), reading counterclockwise and from the inside band outward. Note that in plates 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 desire to conserve space. Note in plates 5 and 6 that 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 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 plate 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 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.

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 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

[19] Hartner, 1939 (repr. 1968):295 and 302.

solar year by breaking it into about twenty-eight periods.[20] 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.[21] 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 Islamic 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 vernal equinox, about 300 B.C.[22]

[20] 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 be quite specific regarding the type of rising or setting involved. The cosmical setting of a star or constellation (in the west as the sun rises in the east) has frequently but incorrectly been called the acronychal setting. The heliacal rising, sometimes called cosmical, occurs in the east at sunrise. The cosmical setting of a star or asterism and the heliacal rising of the opposite star group, in the ordering of the 28 lunar mansions, marked the beginning of a period called *nau'*, hence the term *anwā'* used for this early system (see Pellat, *EI*^{2}, I, 523-524).

[21] 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 Whitney, 1874:340-421; Yampolsky, 1959:62-83; Hommell, 1891:595-619; Weinstock, 1950:48-69; and Mercier, 1977:42).

[22] This attempted compounding of the *anwā'* with the lunar mansions (*manāzil*) gave

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 was still frequently 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, and the second one occurring about thirteen days later 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 means that the rising sun is in the segment of the zodiac or ecliptic containing that mansion.[23] An interval of approximately thirteen days passes between the rising of two adjacent lunar mansions. The setting of a lunar mansion is usually interpreted as the setting of that mansion in the west at dawn as the sun rises in the east (cosmical setting); hence the setting of a lunar mansion is at a six-month interval from its rising. When one lunar mansion is rising, the fourteenth one from it in the order of the twenty-eight lunar mansions will be 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.[24]

There was a tradition in the Islamic and Latin worlds of associating with the lunar mansions abstract patterns of dots or stars in small

rise to a type of Arabic literature known as *anwā'* literature in which lexicographers attempted to record 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 poetry (see Pellat, 1955:17-41, and Kunitzsch, *DSB*, XI, 246-247).

[23] 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.

[24] See Steinschneider, 1864:118-201; Griffini, 1907:423-438; Ruska, *EI*[1], I, 132; and Kunitzsch, 1959 and 1961.

geometrical designs. 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.[25] An Arabic brass celestial globe[26] dated 1318-19 (A.H. 718) and made by 'Abd al-Raḥmān ibn Burhān al-Mauṣilī 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 among 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.[27]

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 from the number of stars associated with that mansion. For example, the twenty-first mansion entitled *al-balda* is uniformly recognized by writers such as the well-known scholar al-Bīrūnī (d. after A.D. 1050/A.H. 442)[28] as referring to a starless region of the sky. 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 the sequence of lunar mansions begins, as is customary, with *al-sharaṭān*.

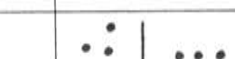
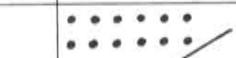
[25] al-Būnī, n.d. [ca. 1945]:10-25. It is noteworthy that Aḥmad ibn 'Alī al-Būnī, the acknowledged master of the occult sciences in Islam, did not include in his encyclopedia any mention of geomancy. See also al-Qazwīnī, 1849:42-51; a German translation of al-Qazwīnī's discussion of the lunar mansions and the constellations was published by Ideler, 1809.

[26] 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, among them the fact that the stars near the ecliptic are so poorly positioned that they do not conform to any well-defined epoch and the fact that the globe bears an inscription apparently in the same script as the signature, stating that it was made at the order of the treasury of the sultan Ulugh Beg, who lived in the fifteenth century. See the forthcoming study of Islamic celestial globes by E. Savage-Smith.

[27] In the *Experimentarius* associated with Bernard Silvester (see Savorelli, 1959, and p. 8 n. 28, above) the lunar mansions are used to designate the 28 topics of inquiry such as illness, marriage, victories, etc., each having 28 lines of responses.

[28] al-Bīrūnī, 1879:348 and 356.

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-Bōnī	Experimentarius
1	al-sharatān (al-naṭīḥ)	0° 0′ 0″ Aries VERNAL EQUINOX	SPRING	AUTUMN	2(3)	β γ *Arietis* (αβγ *Arietis*)			Anatha 3 stars
2	al-buṭain	12° 51′ 26″ Aries			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 φ^1 φ^2 *Orionis*			Almusan 5 
6	al-hanʿa	4° 17′ 10″ Gemini			2(5)	γ ξ *Geminorum* (γξημν *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	SPRING	3(2)	ικ λ *Virginis* (κ λ *Virginis*)			Alagafar 3
16	al-zubānā	12° 51′ 26″ Libra			2	$\alpha^{1,2}$ *Librae*			Azavenem 2
17	al-iklīl	25° 42′ 52″ Libra			3(5)	β δ π *Scorpii* (β δ π *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-naʿāʾim	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	saʿd al-dhābiḥ	0° 0′ 0″ Capricorn WINTER SOLSTICE	WINTER	SUMMER	2	$\alpha^{1,2}$ β *Capricorni* [ν *Cap* nearby]			Catateue 3
23	saʿd bulaʿ	12° 51′ 26″ Capricorn			2	ε ν *Aquarii* [μ *Aquarii* between]			Cadabula 2
24	saʿd al-suʿūd	25° 42′ 52″ Capricorn			3	β ξ *Aquarii* and c^1 *Capricorni*			Cadacaud 2
25	saʿd al-akhbīya	8° 34′ 18″ Aquarius			4	γ π ζ η *Aquarii*			Cadalaua 12
26	al-fargh al-muqaddam	21° 25′ 44″ Aquarius	SPRING	AUTUMN	2	α β *Pegasi*			Algarfalavar 2
27	al-fargh al-muʾakhkhar	4° 17′ 10″ Pisces			2	δ γ *Pegasi*			Algargalavar 2
28	baṭn al-ḥūt (al-rishāʾ)	17° 8′ 35″ Pisces			1	β *Andromedae* [Mirach]			Almazene 3

Occasionally a listing begins with a different mansion,[29] but even then the same sequential order is maintained. The position in the zodiacal houses is that given by al-Bīrūnī[30] in which the first mansion, placed at the vernal equinox, and the remaining mansions represent twenty-eight arbitrary divisions of the ecliptic, disregarding the positions in the sky of the asterisms for which the lunar mansions are named. The seasonal divisions are also derived from al-Bīrūnī, and differ from the modern ones in that the solstices and equinoxes occur within a season rather than at a change of season.

In column 5 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 ʿAbd al-Raḥmān al-Ṣūfī who in his tenth-century treatise on the constellations used the Ptolemaic star catalog in his identification of most of the stars in the asterisms.[31] Column 6 presents the most commonly accepted modern identifications of the stars.[32] Columns 7 and 8 give the designs of the asterisms found in the thirteenth-century writings of al-Qazwīnī and al-Būnī.[33] Column 9 gives the designs of the asterisms found in the twelfth-century Latin *Experimentarius* by Bernard Silvester along with the Latin names and the number of stars stated in that text.[34] 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. If instead the mansions are viewed as asterisms

[29] For example, the *Experimentarius* begins with the 28th mansion which it calls *Almazene*, making *Anatha* the 2d in the list. Some *anwā'* authors began their discussion with *al-thurayyā*, the third mansion; see Pellat, 1955:19.

[30] al-Bīrūnī, 1879:351. For further discussions of the lunar mansions see also pp. 335-365 and al-Bīrūnī, 1934:81-87, sec. 164-166.

[31] al-Ṣūfī, A.H. 1373 [1954] passim; partial French translation by Schjellerup (al-Ṣūfī, 1874). Al-Bīrūnī, 1879:355-356, also aligned the asterisms with the Ptolemaic catalog and gave coordinates corresponding to the early eleventh century.

[32] See Kunitzsch, 1961, passim; Peters and Knobel, 1915; and Kunitzsch, 1974.

[33] The patterns given by al-Qazwīnī are taken from the text given by Sédillot, 1849:II, 550-562, for they were omitted in the Wustenfeld edition (al-Qazwīnī, 1849:42-51). Al-Būnī (n.d. [ca. 1945]:18-24) 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 in his discussion of each mansion.

[34] The edition by Savorelli (1959:315-316) has been used for the chart.

and their locations with respect to the equinoxes are calculated for the thirteenth century, one finds that the seasonal rising or setting of the mansions mentioned on this device is affected in only one instance, which is noted in the discussion of that mansion.

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 (cosmical) setting actually occurs in the summer rather than winter.

"*al-haqʿa*, rising." The name of the fifth lunar mansion means a tuft of hair, a branding mark, or any other distinguishing mark of a horse. The asterism bearing this name consists of three stars in the form of a triangle in the head of Orion. Its (heliacal) rising is near the beginning of summer rather than the winter.

"*al-ʿawwā'*, 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. The name was applied to four or five stars in the Ptolemaic constellation Virgo. Its rising is in the autumn and its setting in the spring.

"*al-thurayyā*, rising." The third lunar mansion refers to the famous open star cluster called the Pleiades. It is a very old Arabic star name of obscure origins and etymology, but was most commonly associated with the central part of a large image covering not only the shoulder of Taurus, but also Perseus and Cassiopeia to the north and the head of the sea-monster Cetus to the southwest. The image was that 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 rising is in the spring.

Western Autumnal

"*al-simāk* and *al-ghafr*, rising and setting." The name *al-simāk* referring to the fourteenth lunar mansion 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, composed the asterism associated with the lunar mansion. The term is of very ancient, perhaps Babylonian, origin, and its meaning has been so obscured with time that translation is

impossible.[35] Many etymologies are presented in the early Arabic astronomical literature for the word *ghafr*, the name of the fifteenth mansion, the most common being that the name, from a root meaning to conceal, was applied because the stars were inconspicuous. The name referred to two or three stars in the Ptolemaic constellation Virgo. Since these mansions are on or near the autumnal equinox, their risings would indicate autumn and their settings spring.

"*al-han'a*, setting." The name of the sixth lunar mansion is derived from a root meaning either to fold or 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. The name was applied to two stars of the Ptolemaic constellation Gemini; some authors, however, indicate three additional stars in the asterism. Its setting occurs in winter.

"*al-zubānā* and *al-iklīl*, rising." The name of the sixteenth lunar mansion, *al-zubānā* (the two claws) was applied to the two large stars in the pans of the balance in the Ptolemaic constellation Libra. This lunar mansion 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.[36] 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 risings of both lunar mansions occur in the autumn.

"*al-dabarān*, setting." The name of the fourth lunar mansion was given to the star in the eye of the Ptolemaic constellation Taurus, the famous star called today Aldebaran. The name, from a root meaning to follow, refers to the fact that it follows the Pleiades. The setting of the lunar mansion occurs in the autumn; if the position in the thirteenth century of the corresponding asterism is considered, the setting would then be in early winter.

SUMMER SOUTHERN

"*al-balda*, rising." The twenty-first lunar mansion rises in the winter rather than summer, since its setting occurs in the summer as described above.

"*al-haq'a*, setting." The fifth lunar mansion sets in early winter.

[35] See Hommel, 1891:596-597.
[36] Ibid., 597, and Hartner, *EI²*, III, 501.

"*al-na'ā'im*, rising." The name of the twentieth lunar mansion means the ostriches and refers to an early conceptualization 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 rising is in the winter rather than the summer.

"*al-thurayyā*, setting." The setting of the third lunar mansion, associated with the Pleiades, occurs in the autumn rather than 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 (of the lion); but the traditions are confused as to which set of stars was indicated. *Al-nathra* means the cartilage of the nose, belonging to the large lion, and some writers associated it with the three stars in a row on the back of the Ptolemaic constellation Cancer—that is, two stars that had between them the open cluster called Praesepe or the Beehive, which was considered in both the Arabic and Greek traditions to the nebulous. Others limited the name to only the open cluster Praesepe. *Al-ṭarf* means the glance or vision (also of the large lion) and was applied to a star of the Ptolemaic constellation Leo and a star of the constellation Cancer. 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 risings of all three of these mansions occur in the summer, being around the summer solstice.

"*al-han'a*, rising." The sixth lunar mansion rises in the summer.

"*al-zubānā* and *al-iklīl*, setting." The sixteenth and seventeenth lunar mansions have their settings in the spring.

"*al-dabarān*, rising." The rising of the fourth lunar mansion occurs in the spring; if the position in the thirteenth century of the actual asterism is considered, the rising would occur in 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[37] 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." 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 the device. In an Arabic calendar written in Spain in A.D. 961,[38] which presents the *anwā'* traditions regarding natural phenomena of interest to pastoral peoples, the Pleiades are illustrated by a series of dots very closely resembling the geomantic figure  (*naṣra 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.

Although certain of the asterism designs would seem to suggest geomantic figures or parts of them, explicit alignments of the lunar mansions with geomantic figures is 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.[39] These two assignments differ from each other, while neither in any way corresponds with that of the geomantic device by Muḥammad ibn Khutlukh al-Mauṣilī.

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.[40]

[37] al-Bīrūnī, 1879:348.

[38] *Le calendrier de Cordoue*, 1961:15 and 164 (orig. ed., 1873:54 and 104).

[39] Los Angeles, UCLA Research Library, Near Eastern Coll. Minasian MS 1493, fol. 9^{b}, which was copied in A.H. 1031 (1621) from a copy dated A.H. 812 (1409), and UCLA Near Eastern Coll. Minasian MS 1495, fol. 4^{a} dated A.H. 1285 (1868).

[40] Haskins, 1924:77-78.

Table 3
Similarities between Geomantic Device and Hugo Sanctallensis Tract

Geomantic figure and name		Latin names	Asterism	Lunar mansion
naṣra dākhila		***Fortuna major*** ***Auxilium intus***	**Pleiades**	**third**
al-ḥiyān		***Barbatus*** ***Laetitia***	**Aldebaran**	**fourth**
al-jamā'a		***Congregatio*** ***Populus***	***γδεησφτζ*** ***Sagittarii***	**twentieth**

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, with no lunar mansions repeated.[41] 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.

A later English manuscript on geomancy[42] 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* (*naṣra khārija*) is assigned to the Pleiades. The geomantic device assigns both and to the Pleiades, the former rising (spring) and the latter setting (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 the other correspondences do not refer whatsoever to risings or 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. Only one association of geomantic figures with cardinal points and with the seasons, of the many found in the manuals studied, 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 Shaikh Ṭumṭum al-Hindī.[43] The volume appears to be a compilation from various sources, with several authorities cited such as the Shaikh al-Zanātī and Khalaf al-Barbarī in addition to Ṭumṭum al-Hindī. In both a square diagram and an accompanying text, contained in a section concerned with finding lost objects,[44] 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

[41] Oxford, Bodleian Library, MS Digby 50, fol. 2^{r}-2^{v}, a thirteenth- or possibly twelfth-century manuscript. See also Tannery, 1920:324-328, who gives the pertinent section of Paris, Bibliothèque Nationale, MS Lat. 7354, which is also a thirteenth-century manuscript.

[42] Oxford, Bodleian Library, MS Ashmole 434, fol. 17^{r}.

[43] Los Angeles, UCLA Research Library, Near Eastern Coll. 895, MS 678; copy dated 12th of Jumāda I, A.H. 1133 (March 11, 1721).

[44] Los Angeles, UCLA Research Library, Near Eastern Coll. 895, MS 678, fols. 36^{b}-38^{b}.

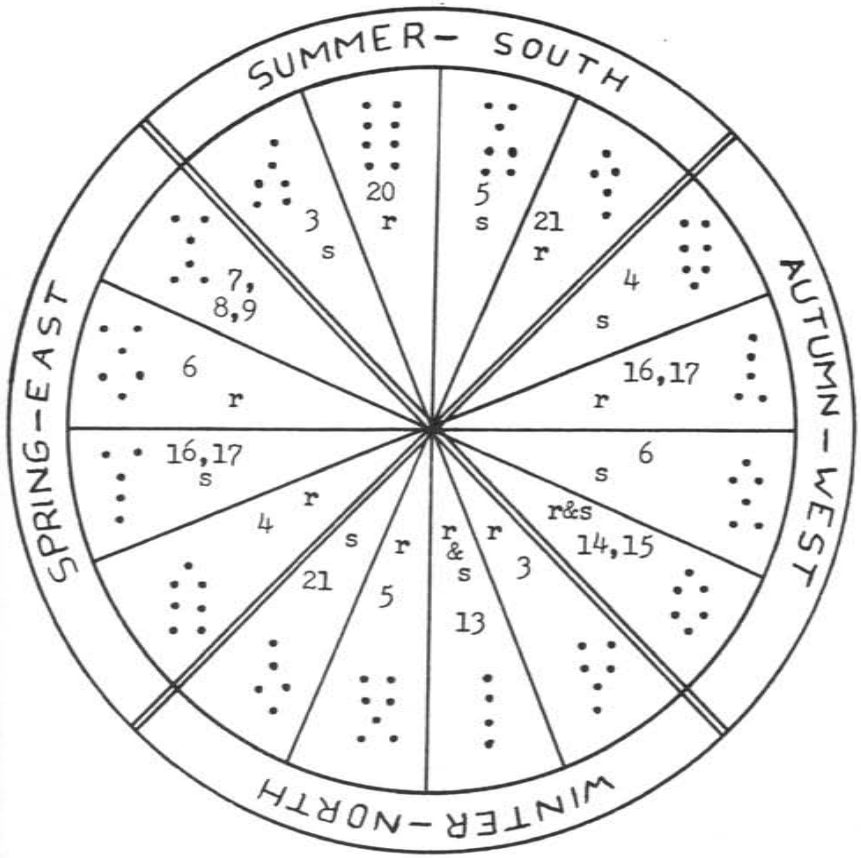


Fig. 3. The alignment of seasons, directions, geomantic figures and risings and settings of lunar mansions found on the large dial. The lunar mansions are indicated by a number representing their position in the sequence of twenty-eight mansions; r and s represent rising and setting respectively.

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. 3). 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 and the cosmical 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 term "setting." The correspondence of a single sector with both the 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, under this interpretation, indicate the acronychal (or heliacal) setting, that is, setting in the west at the same time as the sun sets. Although it is true that the thirteenth, fourteenth, and fifteenth mansions are those at or near the autumnal equinox, and at the equinoxes the mansion in which the sun rises would indeed be the same one in which the sun sets, the use of the term "setting" elsewhere on the dial must, under this interpretation, indicate cosmical setting, that is, setting in the west as the sun rises in the east.

A more serious inconsistency comes to light when one examines the sequence in which the lunar mansions are listed. Those that appear on the dial 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 counterclockwise, does not agree

even remotely with the true sequence of the lunar mansions along the ecliptic.

In examining the lunar mansions named in the summer quadrant of the dial one finds that almost without exception the rising or setting that is named would actually occur in the winter season, and likewise with those found in the winter quadrant. A simple relabeling of these two 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 here 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, the eighth, and the ninth mansions, which are listed all together on the large dial with the figure ⁘ (*ijtimā'*). Al-Qazwīnī and al-Būnī agree in their configurations for the seventh and ninth mansions, as is shown in the chart [see pages 40 and 41]. 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 (*ṣuwar*) 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,  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 figure is 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.

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. 3). 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, *naṣra 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

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. Top edge of frame with end of poem on either side of the suspensory device. [Brit. Mus. Neg. No. 046124]

alignment of the seasons and lunar mansions, and their failure to do so should not be interpreted as indicating an error on the part of the designer. Rather, it should be viewed as evidence that he was more concerned with preserving relationships between geomantic figures and also graphically representing with these figures certain lunar mansions than he was 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.

The Two Poems

To the right and below the large dial (see pl. 4) is a poem in *kāmil* meter, in which the tablet is speaking in the first person (see Appendix item 11 for transcription). The calligraphy is *naskhī* 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.[45]

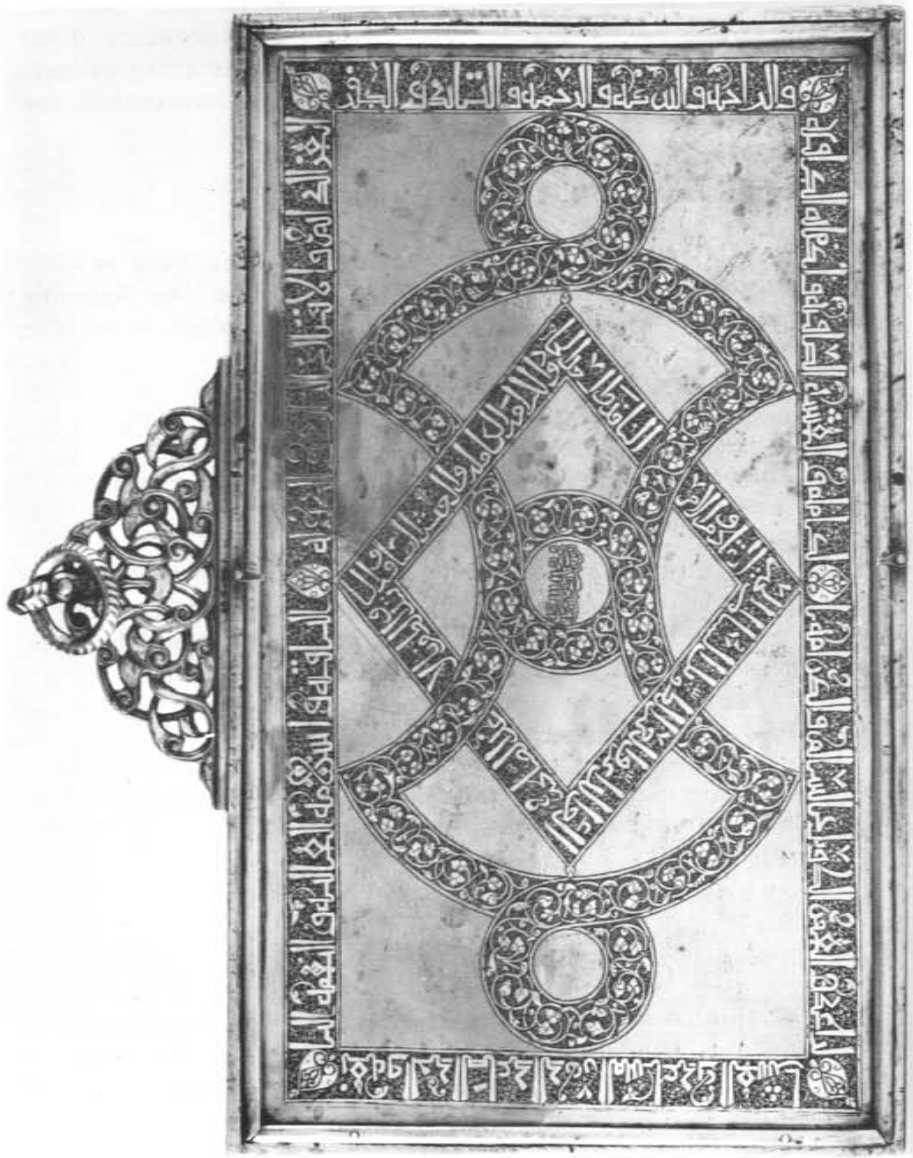
On the lower left-hand side of the tablet, to the left of the small dial labeled House of the Result of the Result, there is another poem in *kāmil* meter, also in *naskhī* script and inlaid in silver, in which the tablet again speaks in the first person (see pl. 1 and Appendix item 12).

> 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 *naskhī* 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

[45] 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.



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

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 verse, with the ring by which the device can be suspended separating the two half-verses of the last verse (see pls. 8, 9, 10, 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.[46]
It [the geomantic tablet][47] shows hidden secrets of the unseen[48]
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.[49]
The tablets of Moses were made valuable by what
wisdom and authority God gave them.
But it is sufficient honor for it [the tablet before us] that a hand touched it
which is superior to the hands of men[50] in strength and nobleness of character.

This poem is filled with religious imagery, using throughout the word tablet, *al-lauḥ*, in two senses, that of the geomantic tablet before us and the Mosaic tablets or the tablet of God in Heaven. The Mosaic tablets

[46] The word *qalam* usually means reed-pen or stylus. In this case two meanings could be intended in parallel with the traditions interpreting the 68th Sūra (*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" (Huart and Grohmann, *EI*^{2}, IV, 471).

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

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

[49] 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 *asḥāl*, 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.

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

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.

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 counterclockwise (see pl. 12 and Appendix item 14).

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

The inscription around the center diamond is engraved in *naskhī* script and inlaid in silver, beginning at the left-hand corner and proceeding counterclockwise (see pl. 12 and Appendix item 15).

> Everlasting glory, a long unimpaired life, outstanding character, efficacious power, fortunate omens, complete honor, a pure manner of life, support [from God] and success, in abundance for its owner.

Bands filled with decorative arabesque entwine the diamond and encircle the small center inscription containing the statement: "In the small cabinet of Muḥammad al-Muḥtasib al-Bukhārī" which was discussed earlier.

4. 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 its parts had been made hearts—that is, 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 which leaves 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 slide 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 in Chapter 2. 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,[1] 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,

[1] See, for example, Montéil, 1931:27-136; and Ben Choaib, 1906:62-71.

pride, prestige, self-motivation, creative matters, initiative, ingenuity, organization, 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.[2] Interpretive procedures, as distinguished from the meanings of the 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 a pregnancy and delivery a pregnant woman will have; whether a pregnant woman will deliver a male or female child and how many; whether it be 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 part of the body lies a person's illness; 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

[2] 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, MS Arab. f. 36, fol. 100^{b}.

devise a method for producing a reading or interpretation from just the labeling 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 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. Unfavorable figures, in terms of the attributions given on the large dial, would certainly indicate unfavorable immediate or future results. Favorable or mixed figures in such positions could be modified by any unfavorable 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 (houses XIII and XIV, respectively) could also have direct bearing upon the ultimate favorable or unfavorable 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 *mīzān*, "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 cases 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 *mīzān*, 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 analyzed 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.[3]

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 Jealousies) 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 (houses I through VI) then the questioner will win; if it is present in the section of the tableau belonging to the object of the question (houses VII through XII) then the adversary will win. If it repeats 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, neither party will be victorious. The consequences of the victory are 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 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 slide of this device, reading them in a counterclockwise direction, is one of the *taskīns* most frequently found in the treatises.[4]

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

[4] This ordering is frequently called the "*taskīn* of the circle" or *taskīn al-raml* belonging to al-Zanātī. See al-Zanātī, AH 1280 [1863]:5-8, 24-25, 31, 34-35; Da'ūd al-Anṭakī, AH 1282 [1865]:234; Oxford, Bodleian Library, MS Greaves 40, fol. 117[b], and MS Marsh 216, fol. 1[a]; and Los Angeles UCLA Research Library, Near Eastern Coll. 895, MS 678, fol. 78[a] and 114[b].

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, 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 things, which are the subject of frequent questions in the literature. There is a complicated procedure for finding lost or buried objects attributed to Ṭumṭum al-Hindī which occurs quite frequently in the manuals.[5] 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. 4).[6] It

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

[6] Paris, Bibliothèque Nationale, arabe MS 2697, fol. 16^a, and Los Angeles, UCLA Research Library, Near Eastern Coll. 895, MS 678, fol. 66^a.

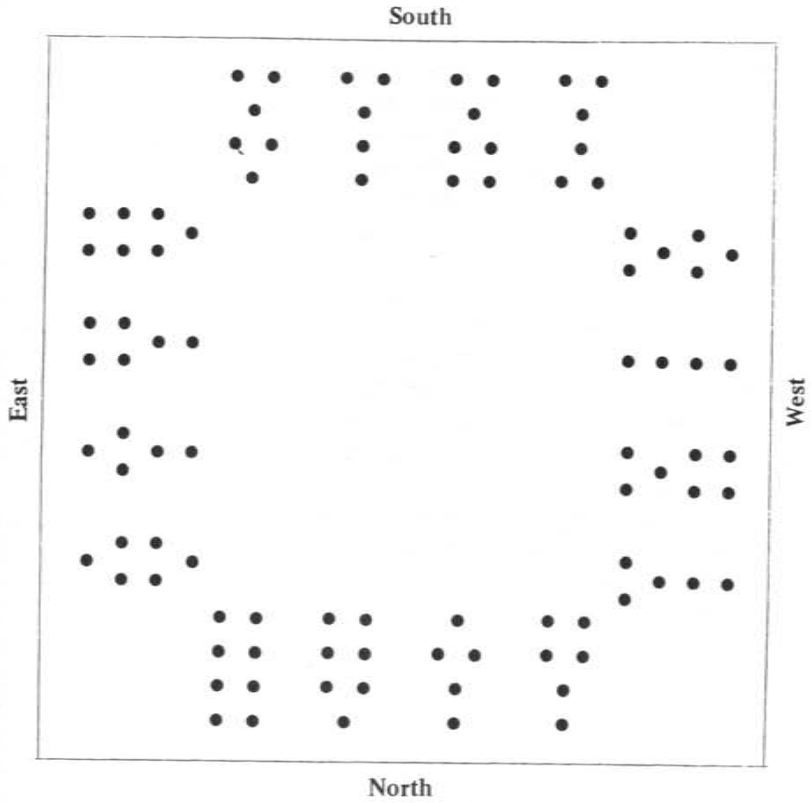


Fig. 4. Square relating geomantic figures with the four cardinal points for use in finding hidden or lost objects.

is assumed the geomancer knows that the top row or rank of a geomantic figure is called the "fire" and is assigned the value 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 having a single dot in the third rank and to multiply this number by three). If less than eight 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 then 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 and locates that figure in the square diagram in the manual (or in the case of this tablet the geomancer would locate the corresponding direction from the large dial). The corresponding position on the square which he has drawn on the ground in front of him then determines where the object is. 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 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 number obtained from the Mother and the number found from the figure in the *taskīn*. This 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[7] 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. Using the remainder he then casts off one number for each of the houses until the number runs

[7] al-Zanātī, A.H. 1280 [1863]:30-31.

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, 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 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.[8] 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

[8] al-Bīrūnī, 1879:351.

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 this 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 under the large dial that "from my intricacies there comes about perception superior to books concerned with the study of the art."

Because of the relative lack of Islamic manuscript material prior to the fourteenth century, the design of this tablet is quite important to the history of geomantic practices. 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.[9] 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 skillfully crafted and, one may safely assume, intended for a highly placed person interested in the geomantic art.

[9] Oxford, Bodleian Library, Bodl. MS 581, and Cambridge, Trinity 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).

Appendix
Transcription of Inscriptions

1 صنعة محمد بن ختلخ الموصلى في سنة ٦٣٩

---

2 في بويت محمد المحتسب البخارى

(في بوت محمد المحتسب البخارى ٥٣ بوفى محمد بن المحلس البخارى)

---

3 الجماعة

طريق

نصرة خا

نصرة دا

قبض دا

قبض خا

بياض

حمرة

الحيان

انكيس

عتبة دا

عتبة خا

اوراع

جودلة

اجتماع

عقلة

4 بيت النفس و الحياة بيت المال و المعاش بيت الاخوة و الاخوات بيت الآباء و الامهات

بيت الافراخ و الاولاد بيت الاعلال و الامراض بيت النشأ و المواصلات بيت الخوف و الموت

بيت النقل و الحركات بيت السلطان و العزّ بيت الوجاء و الآمال بيت الاعداء و الحسّاد

بيت السائل بيت المسئول عنه

بيت العاقبة بيت عاقبة العاقبة

---

5 تولد في هذه الحلات

دوائر مثلثة

الرمل

---

6 قد وضعنا هذه القسى لتوليد الاشكال فتتبيّن ما يظهر منها حدّ الخط الفاصل

الى وضع الظهور فتولد منها الامّهات

---

7 قد وضعنا هذه الدائرة لتعلم منها محاكاة صور الاشكال من صور المنازل

طالعة وغاربة ثم يقع الحكم عليها والله اعلم

---

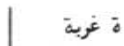
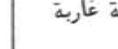
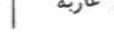
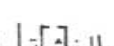
8 الجنوب

المغرب المشرق

الشمال

---

9 يسير من طيّاتي الحسّ خير من كتب فى درس الحكمة

الربع الشمالى الشتوى	البلدة غربة	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	قبض خارج		نحس خارج
	الزبانا والاكليل طالع	عتبة خارجة		نحس خارج [خارج]
	الدبران غاربة	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

انا ذو البلاغة والمحدث صامتا — وبمنطقى الترغيب والترهيب

يخفى اللبيب ضميره فأبيّنه — فكأنّ اعضائى خلقن قلوب

12 انا كاشف الاسرار فيّ بدائع — من حكمة وغرائب وغيوب

لكن بسطت اديم خدّ ى 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 و من 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 بالأعدّ للصاحبه

References

Abū Ma'shar

A.H. 1323 [1905] *Kitāb al-muḥaqqiq al-mudaqqiq al-Yūnānī al-failasūf al-shahīr bi-Abī Ma'shar al-Falakī*. Cairo.

al-Adhamī, 'Abd al-Qādir al-Ḥusainī

n.d. [ca. 1945] *Risāla mīzān al-'adl fī maqāsid ahkam al-raml*, in *Kitāb shams al-ma'ārif al-kubrā wa laṭā'if al-'awārif li-Aḥmad ibn 'Alī al-Būnī*. Cairo. Pp. 1-14.

Ahrens, W.

1917 "Studien über die 'magischen quadrate' der Araber," *Der Islam*, 7:186-219.

Alf laila wa-laila [The Thousand and One Nights]

A.H. 1279 [1862] *Kitāb alf laila wa-laila*. 4 vols. Būlāq.

1962 *The Book of the Thousand Nights and a Night*, trans. Richard F. Burton. 6 vols. New York. Repr. of 1885 original.

Anawati, G. C. *See EI²*.

al-Anṭakī, Da'ūd

A.H. 1282 [1865] *Tadhkira awwalī al-albāb wa al-jāmi' li-l-'ajab al-'ujjāb*. Būlāq.

Aramco

1968 *Aramco Handbook: Oil and the Middle East*. Haarlem.

Assemani, S.

1790 *Globus coelestis cufico-arabicus Veliterni Musei* Borgiani. Padua.

Barrett, Douglas

1949 *Islamic Metalwork in the British Museum*. London.

Ben Choaib, Aboubekr Abdesselam

1906 "Le bonne aventure chez les musulmans du Moghrib," *Le Revue Africaine*, 1:62-71.

al-Bīrūnī, Abū Raiḥān

1878 *Kitāb al-āthār al-bāqīya 'an al-qurūn al-khālīya*, ed. E. C. Sachau. Leipzig. See also Fück, 1952:45-98.

1879 *The Chronology of Ancient Nations: An English Version of the* Athar-ul-Bākiya *of Albīrūnī or "Vestiges of the Past" Collected and Reduced to Writing by the Author in A.H. 390-1, A.D. 1000*, trans. E. C. Sachau. London.

1934 *The Book of Instruction in the Elements of the Art of Astrology, Written in Ghaznah, 1029 A.D.*, ed. and trans. R. Ramsay Wright. London.

Blachère, R., M. Chouémi, and C. Denizeau

1967- *Dictionnaire arabe-français-anglais (langue classique et moderne)*. Paris. 3 vols. to date.

Brieux, Alain, and Francis R. Maddison

In prep. *Répertoire des facteurs d'astrolabes et de leurs ouvrages*, Première partie *Islam*.

Brockelmann, C. *See also EI¹*.

1898-1949 *Geschichte der arabischen Litteratur*. 2 vols. *Supplement*, 3 vols. Leiden and Weimar.

Bronowski, Jacob

1973 *The Ascent of Man*. Boston and Toronto.

al-Būnī, Aḥmad ibn 'Alī

n.d. [ca. 1945] *Kitāb shams al-ma'ārif al-kubrā wa laṭā'if al-'awārif*. Cairo.

Burton, Richard F.

1856 *First Footsteps in East Africa or, Exploration of Harar*. London.

n.d. *Supplemental Nights to the Book of the Thousand Nights and a Night*, Bassorah edition. London. 3 vols.

Cahen, C., et al. *See EI²*.

Le calendrier de Cordoue

1961 *Le calendrier de Cordoue*, ed. R. Dozy. New ed. with French trans. annotated by C. Pellat, Medieval Iberian Peninsula Texts and Studies, I. Leiden. Orig. ed., Leiden, 1873.

Carra de Vaux, Baron

1920 "La géomancie chez les arabes," in Paul Tannery, *Mémoires Scientifiques*, Vol. IV. Toulouse and Paris. Pp. 299-318.

Doutté, E.

1909 *Magie et religion dans l'Afrique du Nord: La societé musulmane du maghrib*. Algiers.

DSB

1970-1976 *Dictionary of Scientific Biography*, ed. C. C. Gillispie, 14 vols. New York.

Jeauneau, E., "Bernard Silvestre (Bernardus Silvestris), II, 21-22.
Kunitzsch, P., "Ibn Qutayba," XI, 246-247.
Nasr, S. H., "al-Ṭūsī," XIII, 508-514.
Pingree, D., "Abū Ma'shar," II, 32-39.

Ebied, R. Y., and M. J. L. Young
1976 "A Treatise on Hemerology ascribed to Ǧa'far al-Ṣādiq," *Arabica*, 23:296-307.

EI[1]
1911-1938 *The Encyclopaedia of Islam*, ed. M. Th. Houtsma, A. J. Wiensinck, et al. 1st ed. 4 vols. Leiden.
Brockelmann, C., "al-Djawbarī," I, 1026.
Hartner, W. "Miṇṭaḳa," III, 501-504.
Ruska, J., "Manāzil," III, 232.

EI[2]
1960- *The Encyclopaedia of Islam*. 2d ed. 3 vols. to date. Leiden.
Anawati, G. C., "Fakhr al-Dīn al-Rāzī," II, 751-755.
Cahen, C., et al., "Ḥisba," III, 485-493.
Fahd, Toufic, "Djafr," II, 375-377.
Hodgson, M. G. S., "Dja'far al-Ṣādiḳ," II, 374-375.
Huart, C., and A. Grohmann, "Ḳalam," IV, 471.
Littmann, E., "Alf layla wa-layla," I, 358-364.
Marquet, V., "Ikhwān al-Ṣafā'," III, 1071-1076.
Massé, H., "Fāl-nāma," II, 760-761.
Pedersen, J., "Djabrā'il," II, 362-364.
Pellat, Ch., "Anwā'," I, 523-524.
Souissi, M., "Ḥisāb al-ghubār," III, 468-469.
Vajda, G., "Idrīs," III, 1030-1031.

Eis, Gerhard
1956 *Wahrsagetexte des spätmittelalters aus Handschriften und Inkunabelen*, Texte des späten Mittelalters, Heft I. Berlin.

Faddegon, J.-M.
1928 "Notice sur un petit traité, d'astrologie attribué à Albumasar (Abū Ma'šar)," *Journal Asiatique*, 213:150-158.

Fahd, Toufic. *See also EI*[2]
1966 *La divination arabe; études religieuses, sociologiques et folkloriques sur le milieu natif de l'Islam*. Leiden.

Fück, J., ed.
1952 *Documenta Islamica inedita*. Berlin.

al-Ghazzālī, Abū Ḥamid Muḥammad [spurious?]
n.d. [ca. 1973] *al-Awfāq*, ed. Maḥmūd Ḥamdī. Cairo.

Goeje, M. J. de
1886 "Ǧaubarī's 'entdeckte Geheimnisse'," *Zeitschrift der Deutschen Morgenländischen Gesellschaft*, 20:485-489.

Goldziher, I.
1910 "Ṭumṭum al-Hindī," *Orientalische Literaturzeitung*, 13: cols. 56-61.

Grant, Edward, ed.
1974 *A Source Book in Medieval Science*. Cambridge, Mass.

Griffini, E.
1907 "Intorno alle stazioni lunari nell'astronomia degli arabi," *Rivista degli Studi Orientali*, 1:423-438.

Gunther, R. T.
1932 *The Astrolabes of the World*. 2 vols. Oxford.

Ḥājjī Khalīfa (Kātib Čelebi)
1835-1857 *Kashf al-ẓunūn: Lexicon bibliographicum et encyclopedicum*, ed. G. Flügel. Leipzig and London.

Harari, Ralph
1939 "Metalwork after the Early Islamic Period," in A. U. Pope, *A Survey of Persian Art*. Oxford. Vol. V, sec. xii, pp. 2466-2539, and Vol. VI, plates 1276-1396.

Harding, G. Lankester
1971 *An Index and Concordance of pre-Islamic Arabian Names and Inscriptions*. Toronto.

Hartner, W. *See also EI*[1].
1939 "The Principle and Uses of the Astrolabe," in A. U. Pope, *A Survey of Persian Art*. Oxford. Vol. III, pp. 2539-2554, and Vol. VI plates 1397-1404. Reprinted with additions to the text in W. Hartner, *Oriens-Occidens: Ausgewählte Schriften zur Wissenschafts- und Kulturgeschichte Festschrift zum. 60 Gegurtstag*, Collectanea III: Willy Hartner. Hildesheim, 1968.
1967 Review of *Picatrix: Das Ziel des Weisen von Pseudo-Maǧrīṭī*, trans. H. Ritter and M. Plessner, Studies of the Warburg Institute, Vol. 27, London, 1962, in *Der Islam*, 43:174-180.

Haskins, C. H.
1924 *Studies in the History of Mediaeval Science*. Cambridge, Mass. Repr. New York, 1960.

Hauber, A.
1909 "Ṭomṭom (Ṭimṭim) = Δαμδαμος = Dindymus?" *Zeitschrift der Deutschen Morgenländischen Gesellschaft*, 63:457-472.

Hébert, J. C.
1961 "Analyse structurale des géomancies comoriennes, malgaches, et africaines," *Journal de la Société des Africanistes*, 31:115-208.

Hodgson, M. G. S. *See EI²*.

Hommell, F.
1891 "Ueber den Ursprung und das Alter der arabischen Sternnamen und insbesondere der Mondstationem," *Zeitschrift der Deutschen Morgenländischen Gesellschaft*, 45:592-619.

Huart, C., and A. Grohmann. *See EI²*.

Ibn Khaldūn
1967*a* *The Muqaddimah*, trans. F. Rosenthal. 2d ed. Princeton. 3 vols.
1967*b* *Discours sur l'histoire universelle*, trans. Vincent Monteil. Beirut.

Ibn al-Nadīm
1871 *Kitāb al-Fihrist*, ed. G. Flügel. 2 vols. Leipzig. Repr. Beirut, n.d.
1970 *The Fihrist of al-Nadīm: A Tenth-Century Survey of Muslim Culture*, trans. Bayard Dodge. 2 vols. New York and London.

Ibn al-Qiftī
1903 *Ta'rīkh al-ḥukamā'*, ed. J. Lippert. Leipzig.

Ideler, C. L.
1809 *Untersuchungen über den Ursprung und die Bedeutung der Sternnamen: Ein Beytrag zur Geschichte des gestirnten Himmels*. Berlin.

Isidore of Seville
1911 *Isidori Hispalensis episcopi Etymologiarum sive originum libri XX*, ed. W. M. Lindsay. Oxford. Repr. Oxford, 1966.

al-Jaubarī, 'Abd al-Raḥmān ibn 'Umar ibn Abī Bakr al-Dimashqī
n.d. [ca. 1918] *Kitāb al-mukhtār fī kashf al-asrār*. Cairo.

Jaulin, Robert
1966 *La Géomancie: analyse formelle*, École Pratique des Hautes Études, Sorbonne, Cahiers de l'Homme, n.s. Vol. IV. Paris.

Jeauneau, E. *See DSB*.

Klein-Franke, F.
1973 "The Geomancy of Ahmad b. 'Ali Zunbul: A Study of the Arabic Corpus Hermeticus," *Ambix*, 20:26-35.

Kunitzsch, Paul. *See also DSB*.
1959 *Arabische Sternnamen in Europa*. Wiesbaden.
1961 *Untersuchungen zur Sternnomenklatur der Araber*. Wiesbaden.
1968 "Zum 'Liber Alfadhol' ein Nachlese," *Zeitschrift der Deutschen Morgenländischen Gesellschaft*, 118:297-314.
1969 "Der 'Liber Alfadhol': ein arabischen Losbuch und seine Schicksale im Morgen- und Abendland," *Zeitschrift der Deutschen Morgenländischen Gesellschaft*, Suppl. I, Teil 2, pp. 667-672.
1974 *Der Almagest: Die Syntaxis Mathematica des Claudius Ptolemaus in arabisch-lateinischer Uberlieferung*. Wiesbaden.

Kūshyar ibn Labbān
1965 *Principles of Hindu Reckoning: Kitāb fī uṣūl ḥisāb al-hind*, ed. and trans. Martin Levey and Marvin Petruck. Madison and Milwaukee.

Lane, E. W.
1863 *An Arabic-English Lexicon*. 8 vols. London. Repr. Beirut, 1968.

Lane-Poole, Stanley
1898 *Saladin and the Fall of the Kingdom of Jerusalem*. London.

Lavoix, Henri
1878 "La Galerie orientale du Trocadéro," *Gazette des Beaux-Arts*, 18:769-791.

Littmann, E. *See EI²*.

Maddison, Francis, and Anthony Turner
1976 Science and Technology in Islam: Catalogue of an Exhibition held at the Science Museum, London, April-

August 1976, in Association with the Festival of Islam. Unpublished.

Margoliouth, D. S.
1912 "Divination (Muslim)," in *Encyclopaedia of Religion and Ethics*, ed. J. Hastings and J. A. Selbie, Vol. IV, New York. Pp. 816-818.

Marquet, V. *See EI²*.

Massé, H. *See also EI²*.
1938 *Croyances et coutumes persanes, suives de Contes et chansons populaires*. Paris. Eng. trans. C. A. Messner, *Persian Beliefs and Customs*. New Haven, 1954.

Mayer, L. A.
1956 *Islamic Astrolabists and Their Works*. Geneva.

Mercier, Raymond
1977 "Studies in the Medieval Conception of Precession, Part II," *Archives Internationales d'Histoire des Sciences*, 27:33-71.

Meyer, P.
1897 "Traités en vers provençaux sur l'astrologie et la géomancie," *Romania*, 26:225-275.

Monteil, Charles
1931 "La divination chez les noirs de l'Afrique occidentale française," *Bulletin de Comité d'Études Historiques et Scientifiques de l'Afrique Occidentale Française*, 14:27-136.

Morley, W. H.
1865 *Description of the Planispheric Astrolabe Constructed for Shah Sultan Husain Saṭawi, King of Persia, and Now Preserved in the British Museum; Comprising an account of the astrolabe generally, with notes illustrative and explanatory: to which are added, concise notices of twelve other astrolabes, Eastern and European, hitherto undescribed*. London. Repr. in Gunther, 1932:I, 1-49.

Mudarris Razavi, Muhammad Taqi
1335 sh. [1956] *Khvājah Ṭūsī*. Tehran.

Nasr, S. H. *See also DSB*.
1964 *An Introduction to Islamic Cosmological Doctrines*. Cambridge, Mass.
1976 *Islamic Science: An Illustrated Study*. London.

Pedersen, J. *See EI²*.

Pedrazzi, Maino
1972 "Le Figure della Geomanzia: Un Gruppo Finito Abeliano," *Physis*, 14(2):146-161.

Pellat, Ch. *See also EI²*.
1955 "Dictions rimes, *anwā'*, et mansions lunaires chez les arabes," *Arabica*, 1:17-41.

Peters, C. H. F., and E. B. Knobel
1915 *Ptolemy's Catalogue of Stars: A Revision of the Almagest*. Washington, D.C.

Pinder-Wilson, R. H.
1976 "The Malcolm Celestial Globe," in *The British Museum Handbook*, Vol. I, *The Classical Tradition*, London. Pp. 83-101.

Pingree, D. *See DSB*.

Pope, Arthur Upham
1938-1939 *A Survey of Persian Art*. 6 vols. London and New York.

Pottier, R.
1939 *Initiation à la médecine et à la magie en Islam*. Paris.

al-Qazwīnī, Zakarīya ibn Muḥammad
1849 *Kitāb 'ajā'ib al-makhlūqāt wa gharā'ib al-maujūdāt: al-Qazwīnī's Kosmographie*, Erste Theil, *Die Wunder der Schöpfung*, ed. F. Wustenfeld. Göttingen.

al-Rāzī, Fakhr al-Dīn
[A.H. 1323 (1905)] *Jāmi' al-'ulūm*. Bombay.

Rescher, O.
1919 "Studien über der Inhalt von 1001 Nacht," *Der Islam*, 9:1-94.

Rice, D. S.
1953 "Studies in Islamic Metalwork, III," *Bulletin School of Oriental and African Studies*, 15:229-238.
1957 "Inlaid Brasses from the Workshops of Aḥmad al-Dhakī al-Mawṣilī," *Ars Orientalis*, 2:282-326.

Ruska, J. *See also EI¹*.
1924 *Arabische Alchemisten II, Ğafar al-Ṣādiq der secheste Imām*. Heidelberg. Repr. Wiesbaden, 1967.

Saidan, A. S.
1967 "The Comprehensive Work on Computation with Board

and Dust by Naṣīr al-Dīn al-Ṭūsī," *al-Abḥāth*, 20:91-163 and 213-292.

Savorelli, M. B.
1959 "Un Manuale di Geomanzia presentato da Bernardo Silvestre da Tours (XII Secolo): L'Experimentarius," *Rivista Critica di Storia della Filosofia*, 14:283-342.

Sédillot, L. P. E. A.
1849 *Materiaux pour servir à l'histoire comparée des sciences mathematiques chez les grecs et les orientaux*. 2 vols. Paris.

Sezgin, F.
1971 *Geschichte des arabischen Schrifttums*. Vol. IV. Leiden.

Smith, M. B.
1979 "The Nature of Islamic Geomancy with a Critique of a Structuralist's Approach," *Studia Islamica*, 49:5-38.

Souissi, M. *See EI²*.

Steinschneider, M.
1864 "Ueber die Mondstationen (Naxatra) und das Buch Arcandam," *Zeitschrift der Deutschen Morganländischen Gesellschaft*, 18:118-201.

Sudhoff, Karl
1914 "Die kurze 'Vita' und das Verzeichnis der Arbeiten Gerhards von Cremona, von seinem Schülern und Studiengenossen Kurz nach dem Tode des Meisters (1187) zu Toledo verabfasst," *Archiv für Geschichte der Medizin*, 8:73-82.

al-Ṣūfī, ʿAbd al-Raḥmān
A.H. 1373 [1954] *Ṣuwaru'l-kawakib or Uranometry: Description of the 48 Constellations. Arabic Text with the urjūza of Ibn u'ṣ-Ṣūfī. Edited from the oldest extant manuscript and based on the Ulugh Beg Royal Codex (Bibl. Nat., Paris, Arabe 5036) with Introduction Plates and Diagrams*. Hyderabad.
1874 *Descriptions des étoiles fixes composée au milieu du dixième siécle de notre ère, par l'astronome persan Abd al-Rahman Al-Sufi. Traduction littérale deux manuscrits arabes de la Bibliothèque Royale Copenhagen et de la Bibliothèque Imp. de St. Petersbourg*, trans. H. C. F. C. Schjellerup. St. Petersburg.

al-Tahānawī, Muḥammad ʿAlī
1853-1862 *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. 2 vols. Bibliotheca India, No. 17. Calcutta.

Tannery, Paul
1920 "La Rabolion" in P. Tannery, *Mémoires scientifiques*, Vol. IV, Toulouse and Paris. Pp. 319-410.

Thorndike, Lynn
1927 "*Alfodhol* and *Almadel*: Hitherto Unnoted Medieval Books of Magic in Florentine Manuscripts," *Speculum*, 2:36-331.
1929 "Alfodhol de merengi again," *Speculum*, 4:90.
1929-1958 *A History of Magic and Experimental Science up to the Seventeenth Century*. 8 vols. New York.
1945 "Alfodhol and Almadel once more," *Speculum*, 20:88-91.

al-Ṭūkhī, ʿAbd al-Fattaḥ al-Sayyid
A.H. 1376 [1956] *Manba' uṣūl al-raml, al-mushtamil ʿalā thamānīn darsan fī uṣūl ʿilm al-raml*. Cairo.

al-Tūnisī, Muḥammad ibn ʿUmar
1965 *Tashḥīdh al-adhhān bi-sīrat bilād al-ʿarab wa al-sūdān*, ed. Khalīl Maḥmud ʿAsākir and Muṣṭafā Muḥammad Musʿad. Cairo.

Ullmann, Manfred
1972 *Die Natur- und Geheimwissenschaften im Islam*. Handbuch der Orientalistik, Abt. 1, Ergänzungsband vi, Abschnitt 2. Leiden.

Vajda, G. *See EI²*.

Verhoeven, F. R. J.
1962 *Islam: Its Origin and Spread in Words, Maps and Pictures*. London.

Weinstock, Stefan
1950 "Lunar Mansions and Early Calendars," *Journal of Hellenic Studies*, 69:48-69.

Whitney, W.
1874 "The Lunar Zodiac," *Oriental and Linguistic Studies*, ser. 2, pp. 340-421.

Wiet, Gaston, Jean Sauvaget, and Etienne Combe
1936-1956 *Répertoire chronologique d'epigraphie arabe*. 15 vols. Cairo.

Yampolsky, P.
1959 "The Origin of the Twenty-Eight Lunar Mansions," *Osiris*, 9:62-83.

Yāqūt (ibn ʿAbdallāh al-Ḥamawī)
A.H. 1323 [1906] *Muʿjam al-buldān*. 10 vols. Cairo.

al-Yazdī, Muḥammad Bāqir ibn Murtaḍā
A.H. 1308 [1890] *Nafaḥāt al-asrār fī ʿilm al-raml*. Bombay.

al-Zanātī, Muḥammad
A.H. 1280 [1863] *Kitāb al-faṣl fī uṣūl ʿilm al-raml ʿalā ḥukm al-qawāʿid al-aṣlīya al-idrīsīya*. Cairo. Printed several times in Cairo with slight variations.
A.H. 1326 [1908] *al-Aqwāl al-marḍīya fī al-aḥkām al-ramlīya li-l-shaikh al-Zanātī fī ʿilm al-raml*. Cairo.

Zotenberg, H.
1888 *Histoire d'"Alā al-Dīn ou la lampe merveilleuse*. Paris.

Indices

Index of Manuscripts Cited

General Index

Islamic Geomancy and a Thirteenth-Century Divinatory Device

EMILIE SAVAGE-SMITH and MARION B. SMITH

A publication in the Studies in Near Eastern Culture and Society *series issued under the auspices of the G. E. von Grunebaum Center for Near Eastern Studies, University of California, Los Angeles*

The device described in this monograph is a unique instrument for use in the practice of geomancy (*'ilm al-raml*). This outstanding example of Islamic metalwork, inlaid with gold and silver inscriptions and arabesque and containing twenty dials, was made in Mosul in the year 1241 (639 A.H.) and now is in the collection of the British Museum. In addition to a detailed description and analysis of the device, the authors explain basic procedures used in geomancy as practiced in Islam and discuss the geomantic sources available to a thirteenth-century practitioner. The study includes twelve detailed photographs of the device along with several tables and diagrams necessary for its interpretation.

UNDENA PUBLICATIONS

P.O. Box 97, Malibu, California 90265