

3 • Cosmographical Diagrams

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SCOPE

Many Islamic texts in Arabic, Persian, and Turkish contain illustrative diagrams. Although almost all such diagrams either are intended as graphic aids to the texts they accompany or are employed as clear and efficient methods of presentation, some simultaneously serve as graphic representations of cosmological ideas or, in a few cases, as complete cosmographies. The identification of a given diagram as cosmologically significant is admittedly not always a matter of certainty. For the purposes of a general survey, it will be sufficient to include those specimens that exhibit a certain measure of correlative thought—that is, diagrams where two or more different orders of existence or component parts of the universe are correlated with each other, as well as those that are presented as partial or total representations of the structure of “perceived” reality (whether material or spiritual).

It needs to be emphasized that the diagrams thus brought together are fairly broad in range, encompassing material that falls into many specialized areas such as astronomy, astrology, alchemy, geomancy, geography, philosophy, theology, and mysticism. There was in Islam no single, continuous tradition of cosmological speculation that produced a more or less homogeneous set of diagrams to illustrate the major features of a universally accepted Islamic cosmology. Instead, there existed several distinct schools of thought that rested on different, if interrelated, cosmological doctrines, and the frequency with which graphic representation was used for better presentation varied considerably from one school to another. Although this chapter focuses on the cosmographical diagrams themselves and not on the cosmologies behind them, it is necessary at this point to give a brief account of the historical development of cosmological speculation in Islam in order to place the later discussion of the diagrams themselves into its proper intellectual and cultural context.¹

COSMOLOGY IN ISLAM

In premodern Islamic high culture, cosmological thought was cultivated primarily within three major intellectual

traditions: the philosophical/scientific, the gnostic, and the mystic. Significantly, mainstream religious scholarship itself stayed for the most part clear of concentrated reflection on the structure and nature of the universe. Devotees of the religious sciences, most prominently scholars and lawyers of the Qurʾān and hadith (reports on the sayings and doings of the Prophet Muhammed), even looked askance at attempts to construct comprehensive cosmologies. The distanced attitude of the religious scholars toward cosmological speculation was dictated in large part by the rather meager cosmological content of the two major sources of Islamic religious scholarship—the Qurʾān and the hadith.

The Qurʾān, the single most important source of Islamic culture, does not contain a systematic cosmology. No single Qurʾānic verse addresses the structure of the universe directly, and materials of cosmological import that appear in the Qurʾān are as a rule devoid of descriptive detail and do not lend themselves to comparative analysis. Thus God is said to be established on a throne (Qurʾān 7:54, 10:3, 13:2, 20:5, 25:59, 32:4, 57:4), yet the Qurʾān records only that this throne either rests on water (11:7) or is borne by angels (69:17) and that it encompasses the heavens and the earth (2:255). The sky, frequently described as a canopy spread over the earth (2:22, 20:53, 21:32, 40:64, 43:10, 50:6, 78:6), was raised without any supports that humans could see (13:2) and is illuminated by the sun and the moon (25:61, 71:16, 78:12), but the seven heavens it is said to comprise (2:29, 17:44, 41:12, 65:12, 67:3, 71:15, 78:12) exist but in name—only

1. Some earlier general discussions of Islamic cosmology, of unequal quality, are Carlo Alfonso Nallino, “Sun, Moon, and Stars (Muhammadan),” in *Encyclopaedia of Religion and Ethics*, 13 vols., ed. James Hastings (Edinburgh: T. and T. Clark, 1908–26), 12:88–101; Reuben Levy, *The Social Structure of Islam* (Cambridge: Cambridge University Press, 1957; reprinted, 1965), 458–505 (chap. 10, “Islamic Cosmology and Other Sciences”); Seyyed Hossein Nasr, *An Introduction to Islamic Cosmological Doctrines: Conceptions of Nature and Methods Used for Its Study by the Ikhwān al-Ṣafāʾ, al-Bīrūnī, and Ibn Sīnā*, rev. ed. (London: Thames and Hudson, 1978); Edith Jachimowicz, “Islamic Cosmology,” in *Ancient Cosmologies*, ed. Carmen Blacker and Michael Loewe (London: George Allen and Unwin, 1975), 143–71; and Anton M. Heinen, *Islamic Cosmology: A Study of as-Suyūṭī’s “al-Hayʾa as-saniya fi l-hayʾa as-sunniya,”* with critical edition, translation, and commentary (Beirut: Franz Steiner, 1982).

the lowest heaven is described as adorned with the beauty of the stars (37:6, 41:12, 67:5). Similarly, the earth, spread wide and held firmly in place by mountains (13:3, 15:19, 16:15, 21:31, 31:10, 50:7, 51:48, 55:10, 78:7, 79:32), proves to be only one of seven earths that match the seven heavens (65:12); the other six earths, however, remain totally obscure. Consequently, though it would not be wrong to state that in broad outline the Qur'anic universe is a hierarchical, multilayered complex that stretches from the throne of God on top through the seven heavens in between down to the seven earths at bottom, it is not possible to answer crucial questions concerning the size, shape, nature, and location of the entities that make up this universe.

The hadith corpus, the second major source of the Islamic religion after the Qur'an, is richer in cosmological content. It not only provides many details that complement the Qur'anic material but also attributes cosmological status to certain entities that are only nominally mentioned in the Qur'an, such as the Tablet, the Pen, and the Balance.² In spite of the relative wealth of material available, however, it is hardly possible to build a homogeneous cosmology on reports transmitted by the hadith any more than on the Qur'an because of the disconnected, inconclusive, and frequently irreconcilable nature of the reports in question.³

The development of a separate tradition of religious, as opposed to philosophical and scientific, cosmological speculation was also hindered by the early crystallization of theological trends that dissuaded believers from literalist interpretations of transmitted knowledge, including the Revelation. They were clearly discouraged from adopting an inquisitive attitude toward ambiguous or enigmatic sections of the Qur'an and the hadith. In the interpretation of the Qur'an, for instance, the "throne" was either explained away as a metaphorical expression for God's knowledge and power or simply accepted as a real entity. No attempt was made to render it more intelligible to the human mind, since the real meaning of the Qur'anic word "throne" was thought to be beyond human comprehension.⁴

It is no doubt partially due to the entrenchment of such theological approaches that a separate tradition of religious cosmological speculation did not develop in Islam. What exists, instead, are either relatively short accounts of Creation, and thus of the universe, that are incorporated into larger historical, religious-literary, and encyclopedic works, or independent and brief collections of hadith on cosmological topics.⁵

Not all channels of inquiry relied so heavily on the Qur'an and the hadith as did religious scholarship. Early in Islamic history several other intellectual traditions came into being that were more favorably disposed to cosmological thought. The earliest of such traditions was

the philosophical/scientific, which came into its own during the third and fourth centuries of Islam (ninth and tenth centuries A.D.) under the direct influence of pre-Islamic, especially Greek, schools of learning. Already in the second Islamic century, the Muslims had begun to grow familiar with the pre-Islamic scholarly traditions of the Near East and India, and there had been considerable infusion of Indian and Iranian learning into the nascent

2. For the cosmological significance of these entities, see the following articles in *The Encyclopaedia of Islam*, 1st ed, 4 vols. and suppl. (Leiden: E. J. Brill, 1913–38), and new ed. (Leiden: E. J. Brill, 1960–): Arent Jan Wensinck (rev. Clifford Edmund Bosworth), "Lawḥ," 5:698 (new ed.); Clément Huart (rev. Adolf Grohmann), "Ḳalam," 4:471 (new ed.); and Eilhard Wiedemann, "al-Mizān," 3:530–39 (1st ed.).

3. For examples of cosmological material in hadith literature, see Abū 'Abdallāh Muḥammad ibn Ismā'īl al-Bukhārī (194–256/810–70), *Ṣaḥīḥ al-Bukhārī*, 7 vols., ed. Muḥammad Tawfiq 'Uwaydah (Cairo: Lajnat Iḥyā' Kutub al-Sunnah, 1966/67–1976/77), 5:259 ff. ("Kitāb bad' al-khalq"), esp. 259–69; Mubārak ibn Muḥammad, called Ibn al-Athīr (544–606/1149–1210), *Jāmi' al-uṣūl fī aḥādīth al-rasūl*, 10 vols., ed. 'Abd al-Qādir al-Arnā'ūt (n.p.: Maktabat al-Ḥulwānī, Maḥḥabāt al-Malāḥ, Maktabah Dār al-Bayān, 1969–72), 4:19–41 (nos. 1994–2015, "Fī khalq al-samā' wa-al-arḍ wa-mā fihumā min al-nujūm wa-al-āthār al-'ulwiyah"); 'Alī ibn Ḥusām al-Dīn al-Muttaqī al-Hindī (d. 975/1567 or 977/1569), *Kanz al-'ummāl fī sunan al-aqwāl wa-al-af'āl*, 16 vols., ed. Bakrī al-Ḥayyānī, Ṣafwat al-Saqā, and Ḥasan Zarrūq (Aleppo: Maktabat al-Turāth al-Islāmī, 1969–77), 6:122–86 ("Kitāb khalq al-'ālam"); Muḥammad ibn Ya'qūb al-Kulaynī al-Rāzī (d. 329/940–41), *al-Uṣūl min al-kāfi*, 4th ed., 8 vols., ed. 'Alī Akbar al-Ghaffārī (Beirut: Dār Sa'b and Dār al-Ta'arūf, 1980–81), 1:129–33 ("Bāb al-'arsh wa-al-kursī").

4. Different orthodox approaches to the issue of the throne of God are discussed briefly in Arent Jan Wensinck, *The Muslim Creed: Its Genesis and Historical Development* (New York: Barnes and Noble, 1932), 115–16 and 147–49. Mahmoud M. Ayoub, *The Qur'an and Its Interpreters* (Albany: State University of New York Press, 1984–), 1:247–52, contains a succinct account of the different interpretations of the famous "Throne Verse" (2:255).

5. Notable among general works that contain accounts of the Creation are Abū 'Alī Aḥmad ibn 'Umar ibn Rustah (fl. ca. 290–300/903–13), *Kitāb al-a'lāq al-nafisah*; see the edition by Michael Jan de Goeje, *Kitāb al-a'lāq an-nafisa VII*, Bibliotheca Geographorum Arabicorum, vol. 7 (Leiden: E. J. Brill, 1892; reprinted 1967), 1–24; Abū Ja'far Muḥammad ibn Jarīr al-Ṭabarī (d. 311/923), *Ta'rikh al-rusul wa-al-mulūk*; see the edition by Michael Jan de Goeje, *Annales quos scripsit Abu Džafar Mohammed ibn Džarir at-Tabari*, 15 vols. in 3 ser. (Leiden: E. J. Brill, 1879–1901; reprinted 1964–65), 1st ser., 1:1–78; Abū al-Ḥasan 'Alī ibn al-Ḥusayn al-Mas'ūdī (d. 345/956), *Murūj al-dhahab wa-ma'ādīn al-jawhar*, 7 vols., ed. Charles Pellat (Beirut: Manshūrāt al-Jāmi'at al-Lubnānīyah, 1965–79), 1:31–32 and 99–110; Abū Naṣr al-Muṭaḥhar ibn al-Muṭaḥhar (or al-Ṭāhīr) al-Maqdisī (fl. 355/966), *Kitāb al-bad' wa-al-ta'rikh*, 6 vols., ed. Clément Huart (Paris: Ernest Leroux, 1899–1919), Arabic text 1:112–208 and 2:1–73 (Huart mistakenly attributes the work to Abū Zayd Aḥmad ibn Sahl al-Balkhī); and *Rasā'il ikhwān al-ṣafā' wa-khullān al-wafā'*, 4 vols. (Beirut: Dār Bayrūt, Dār Ṣādir, 1957), 1:114–82 ("al-Qism al-riyāḍī, rasā'il 3 and 4" on astronomy and geography) and 2:24–51 ("risālah 16"). For a good list of independent collections of hadith on cosmological subjects, see Heinen, *Islamic Cosmology* (note 1), to which should be added Abū Bakr Muḥammad ibn 'Abdallāh (or 'Abd al-Malik) al-Kisā'ī (fl. eleventh century), *'Ajā'ib al-malakūt*; see Carl Brockelmann, *Geschichte der arabischen Litteratur*, 2d ed., 2 vols. and 3 suppl. vols. (Leiden: E. J. Brill, 1937–49), 1:428–29 and suppl. 1:592.

Islamic high culture. This early eastern phase was, however, soon to give way to a most decisive Greek phase through an unprecedented movement of translation into Arabic of scientific and philosophical texts, either directly from Greek originals or from intermediate Syriac versions. This translation movement resulted in a veritable proliferation of scientific and philosophical activity and led to the establishment of *falsafah* ("philosophy," in the classical Greek sense of an encyclopedic system of knowledge that includes both "physics" and "metaphysics") as a major tradition of learning within Islamic culture.⁶

The legacy of Greek learning was far from being determinate in scope and uniform in nature, and the difficulties of translating an enormous body of specialized literature in Greek into Arabic certainly added to the confusion. It would nevertheless not be mistaken to state that the great majority of Hellenizing Muslim philosophers and scientists, who allotted a substantial role to human reason (as opposed to revelation) in their quest for the "truth," subscribed to Ptolemaic cosmology or to slightly modified versions of it. Reason fortified by scientific observation dictated that the universe was geocentric in structure, with a limited number of heavenly spheres (usually nine) arranged concentrically around the earth in the middle, and that the latter, itself spherical in shape, was only partially inhabitable. Harnessed to many different philosophical and theological systems throughout the centuries, this essentially Ptolemaic cosmology became the most widely accepted view of the universe among educated Muslims.

Mainstream religious scholars never ceased to view the "extraneous" philosophical and scientific thought with suspicion, which meant there would always be a chasm between Muslim piety on the one hand and intellectual commitment to the principles of the "sciences of the ancients" on the other.⁷ Interpenetration was inevitable, however, and theological and theosophical schools in the first instance adopted Hellenistic philosophical material pertinent to their concerns with remarkable facility. Cosmologically most significant was the adoption of Neoplatonic doctrines, not by theology, which was on the whole argumentative and apologetic in character, but by Gnostic and mystic theosophy, both of which manifested a distinct tendency to philosophical speculation. Gnostic theosophy, represented most prominently by Ismā'īlī thought, flourished especially in the tenth and eleventh centuries, whereas mystical-philosophical theosophy, which began to take shape somewhat later, came into its own during the thirteenth century under the formative influence of the philosopher-mystic Ibn al-ʿArabī and continued to be cultivated right up to the modern period. Both the Gnostics and the mystics were esotericists in religion who assigned priority to the "hidden inner truth" over its apparent outward manifestations. They therefore

felt themselves free, even compelled, to venture beyond an esoteric approach to the Qurʾān and the hadith and proceeded to build elaborate cosmologies that had no parallels in the literatures of the religious sciences.

In summary, one could say that, owing to the indifferent attitude of traditionalist religious scholars toward cosmological speculation, systematic reflection on the structure of the universe was a challenge taken up only by philosophers on the one hand and by Gnostics and mystics on the other hand. It is the works produced by these groups, who felt justified in broaching areas that were viewed with suspicion in legalist circles, that form the major source of cosmographical diagrams in Islam.

GENERAL CHARACTERISTICS OF COSMOGRAPHICAL MAPS AND DIAGRAMS

At the present stage of scholarship in Islamic studies it is not possible to draw up an exhaustive list of extant Islamic cosmographical diagrams. The relevant manuscript sources are as yet very far from being completely and satisfactorily cataloged. More significantly, published catalogs, which frequently exhibit a total unawareness of the "possibility" that graphic representation might form a separate field of study, largely fail to record the presence of drawings in the manuscripts they describe. In these circumstances, locating cosmographical diagrams in Islamic works is a tedious and drawn-out task that necessarily has to rely more on published texts than on unpublished manuscript sources. This dependency on the work of modern editors has its own drawbacks, since even in the case of reliable critical editions the student of cosmography is compelled to fall back on the manuscripts themselves in order to determine the exact number of diagrams contained in any given work and to further examine the originals at first hand. In a general study such as the present survey, however, it is not possible to go into such detail, nor do the diagrams themselves always warrant close scrutiny of this nature. Clearly this survey of Islamic cosmographical diagrams, the first of its kind in scholarly literature, cannot be exhaustive and will need to be supplemented as more and more manuscripts are made available to the researcher.

Almost all the diagrams presented in the following

6. The scholarly literature on the classical heritage of Islam is reviewed in Felix Klein-Franke, *Die klassische Antike in der Tradition des Islam* (Darmstadt: Wissenschaftliche Buchgesellschaft, 1980).

7. Compare Ignaz Goldziher, "Stellung der alten islamischen Orthodoxie zu den antiken Wissenschaften," *Abhandlungen der Königlich Preussischen Akademie der Wissenschaften, Philosophisch-Historische Klasse* (1915), Abhandlung 8; English translation, "The Attitude of Orthodox Islam toward the 'Ancient Sciences,'" in *Studies on Islam*, ed. and trans. Merlin L. Swartz (New York: Oxford University Press, 1981), 185–215. More discussion with profuse references can be found in Klein-Franke, *Die klassische Antike* (note 6).

pages appear as illustrative material in books and were obviously intended as visual aids to the texts they accompany. This does not mean that none of them can stand alone without their textual context or that none have any independent value on their own. There are some that would be perfectly intelligible and clear even without any textual explanation and others that serve as “graphic text,” that is, that contain material otherwise not presented or explained in the text. Such diagrams cannot be treated as simple illustrations subservient to the text surrounding them.

Whether independently valuable or not, all the figures involved are primarily didactic in nature. They are intended more as general and often arbitrary visual images of certain cosmological ideas than as technically precise and measured representations of space. This is true not only of figures that graphically represent spiritual or sacred space, in which case it would hardly be appropriate to search after technical precision and accuracy, but also of those presented as realistic representations of physical space. Generally speaking, there is no consideration of scale where this could be applicable, and the emphasis is on gross outlines, with little or no attention paid to details.

The diagrams exhibit a certain graphic consistency that is perhaps best characterized by the overwhelming use of geometric forms. More specifically, concentric circles divided into equal parts by means of radii seem to be the predominant pattern used for illustrating cosmological schemes. This popularity of circular representation in Islamic cosmographical diagrams no doubt reflects the universal acceptance in Islamic culture of the Aristotelian belief that the sphere is the most perfect of all forms. Very often this belief in the perfection of the spherical form was coupled with the argument that God could only have created the best of all possible worlds, which naturally led to the conclusion that the universe was spherical. A clear statement of this kind of reasoning is provided by Ḥaydar Āmulī (720/1320 to after 787/1385), who was probably the most productive of all Islamic cosmographers:

The form of the world, the heavenly spheres, the bodies, and the [four] elements was made spherical, since the spherical, round form is the best of all forms, as it is said: “The best of all forms is the circular form.” If a form more beautiful and more perfect than the circular form were to be possible, then the world would have been created in that form, since it is established that “a world more excellent than this one is not possible, because if it were to be possible, it would have been necessary to [attribute] either impotence or avarice to God—who is [however] beyond these two [attributes].” Thus it is proved that a more excellent and more beautiful form than this one [that is, the spherical form] and this state is not possible.⁸

Others, however, had different reasons for thinking that the created universe was spherical. A case in point is that of the mystic philosopher Ibn al-‘Arabī, who built an interesting argument on Qur’ānic material:

Know that since the world is spherical, man yearns for his beginning [when he reaches] his end; thus our coming into existence from nonexistence is from God and to him shall we return, since he said, “everything will be returned to him” [11:23], and he said, “and fear the day when you shall be brought back to Allah” [2:281], and he said, “he is the place of destination” [5:18 and others], and “the end of all things belongs to him” [31:22]. Do you not see that when you start drawing a circle . . . you do not stop drawing it until you reach its beginning [point] and [only] then it is a circle? If this was not the case so that we were to have originated from him in a straight line, we would not return to him, and his word would not be true, and yet he is the truthful one and to him shall you return. Thus everything and every being is a circle returning to him from whom it originated.⁹

It was due to the prevalence of these and similar views that the sphere figured prominently in Islamic cosmological speculation and hence the circle in Islamic cosmography.

The technical simplicity of the cosmographical diagrams under review meant there was little need for specialized draftsmen to execute them. It is safe to assume that the scribe and the draftsman were frequently the same person. Lack of specialization at the production end was paralleled by lack of differentiation at the receiving end: the figures were addressed to the same audience as the texts that contained them. On a different level, the extent to which cosmography was “submerged” in the text surrounding it is demonstrated by the absence of specific terms that apply only to cosmographical diagrams. The relevant terminology is very general in nature and could apply equally well to maps, pictures, miniatures, and marginal illumination. The following terms are used most frequently in relation to cosmological diagrams: *ṣūrah* (form); *ṣūrah* combinations like *ṣūrat al-shakl* (the drawing of the form), *ṣūrat al-dā’irah* (the drawing of the circle); and *ṣūrat al-‘ālam* (the representation of the world); *dā’irah* (circle); *taṣwīr* (depiction); *rasm* (picture), *shakl* (shape); and *mithāl* (representation).

8. Sayyid Bahā’ al-Dīn Ḥaydar ibn ‘Alī al-‘Ubaydī al-Ḥusaynī Āmulī, *al-Muqaddimāt min kitāb naṣṣ al-nuṣūṣ fi sharḥ fuṣūṣ al-ḥikam* (The prefatory sections from the Book of the Text of Texts on the interpretation of *The Bezels of Wisdom*); see the edition by Henry Corbin and ‘Uthmān Yaḥyā, *Le texte des textes (Nass al-nusus)* (Paris: Librairie d’Amérique et d’Orient, Adrien-Maisonneuve, 1975), 100, par. 234 (author’s translation).

9. Muḥyī al-Dīn Muḥammad ibn ‘Alī ibn al-‘Arabī (560–638/1165–1240), *al-Futūḥāt al-Makkīyah*, ed. ‘Uthmān Yaḥyā and Ibrāhīm Madkūr (Cairo: Jumhūriyah Miṣr al-‘Arabīyah, Vizārat al-Thaqāfah, 1972–), vol. 4 (author’s translation).

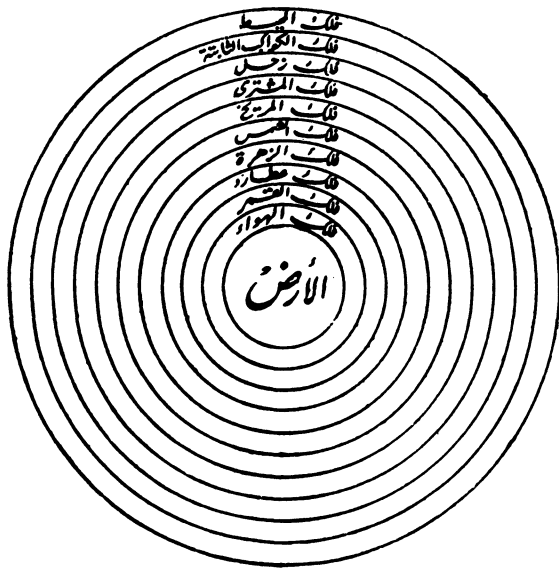
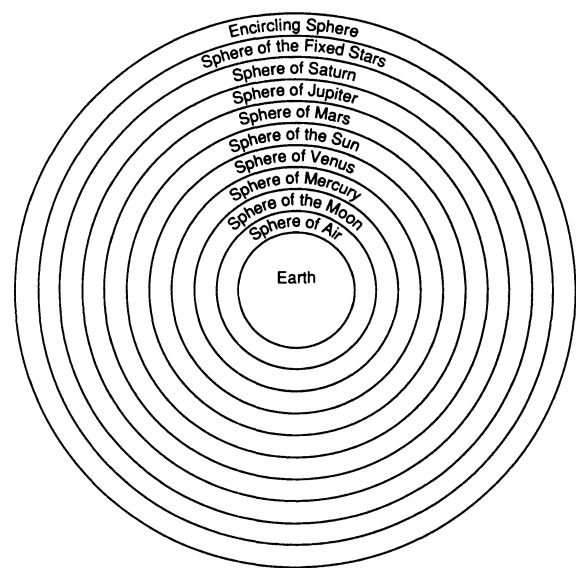


FIG. 3.1. THE CELESTIAL SPHERES FROM *RASĀ'IL IKHWĀN AL-ṢAFĀ'*. Translation on the right. The exact dating of this text has given rise to considerable controversy among modern scholars; for a recent forceful argument that the work should be dated to between 260/873 and 297/909, see Abbas Hamdani, "The Arrangement of the *Rasā'il ikhwān al-ṣafā'*



and the Problem of Interpolations," *Journal of Semitic Studies* 29 (1984): 97–110, esp. 110. Diameter of the original: 8.3 cm. From *Rasā'il ikhwān al-ṣafā' wa-khullān al-wafā'*, 4 vols. (Beirut: Dār Bayrūt, Dār Ṣādir, 1957), 1:116 ("al-risālat al-thālithah min al-qism al-riyāḍī").

EXOTERIC REALISM: PHILOSOPHICAL AND SCIENTIFIC DIAGRAMS CELESTIAL DIAGRAMS

The Ptolemaic model of the universe formed the subject of a set of diagrams that appear in various works written by Muslim philosophers and scientists or by others they influenced.¹⁰ In the *Almagest*, Ptolemy had adopted the traditional ascending order of seven celestial spheres (moon, Mercury, Venus, sun, Mars, Jupiter, Saturn), and in the *Planetary Hypotheses* he had described these as spherical shells contiguous with each other in such a way that the outer limit of each shell corresponds to the inner limit of the one directly above it.¹¹ In Islam, once it became known and accepted, this model was normally represented simply by a set of concentric circles drawn around a spherical earth in the middle. In different diagrams of the same kind, the seven planetary spheres were usually combined with those of the three elements—water, air, and fire—which were believed to surround the earth (the fourth element) in that ascending order. The outer boundary of the Ptolemaic universe was then extended beyond the sphere of fixed stars (also referred to as the sphere of the zodiac) by adding a sphere entitled the "encircling sphere" or "the sphere of spheres" to explain the diurnal motion of the sphere of the fixed stars (figs. 3.1 and 3.2).

The first examples of the celestial-sphere diagrams all date back to the turn of the eleventh century,¹² suggesting that Ptolemaic cosmology, already known to the Muslims from the ninth century onward through Arabic translations of Ptolemaic works, gained prevalence especially during this period. Thereafter, the validity of this model of the universe was on the whole never questioned by Muslim philosophers and scientists. The appearance of Ptolemaic celestial-sphere diagrams, even in completely mystical works as late as the end of the medieval period, is testimony to the spread and endurance of the model.¹³

10. No attempt was made to be exhaustive in illustrating the following section, since examples of all the types of diagrams discussed here can be found in abundance in texts of the later Islamic Middle Ages, about A.D. 1500–1800.

11. Ptolemy's "*Almagest*," trans. and annotated G. J. Toomer (London: Duckworth, 1984), 38–47 (bk. 1.3–8) and 419–20 (bk. 9.1).

12. See *Rasā'il ikhwān al-ṣafā'*, 1:116 (note 5), reproduced here as figure 3.1; Abū al-Rayḥān Muḥammad ibn Aḥmad al-Bīrūnī (d. after 442/1050), *Kitāb al-taḥfīm li-avā'il šinā'at al-tanjīm* (comp. 420/1029), ed. Jalāl al-Dīn Humā'ī (Tehran, 1974), 57; and Ḥamid al-Dīn Aḥmad ibn 'Abdallāh al-Kirmānī, *Raḥat al-'aql* (comp. 411/1020–21), ed. Muḥammad Kāmil Ḥusayn and Muḥammad Muṣṭafā Ḥilmī (Cairo: Dār al-Fikr al-'Arabi, 1953), 82.

13. Two examples of later celestial sphere drawings are in Ibrāhīm ibn al-Ḥusayn al-Ḥāmidī (d. 557/1162), *Kanz al-walad*, ed. Muṣṭafā Ghālib (Wiesbaden: Franz Steiner, 1971), 169, and Erzurumlu Ibrāhīm Ḥaqqī, *Ma'rifetnāme* (comp. 1170/1756), ed. Kırımlı Yūsuf Zīyā (Istanbul: Maṭba'at al-Ḥāmidī, 1911–12), 50, reproduced here as figure 3.2 from a manuscript copy of the work.



FIG. 3.2. THE CELESTIAL SPHERES FROM THE MA'RIFETNĀME. For a translation see figure 3.1, diagram on the right.

Size of the original: 8.1 × 8.4 cm. By permission of the British Library, London (MS. Or. 12964, fol. 39b).

The celestial diagrams were sometimes accompanied and complemented by related diagrams. Such were the figures of the spheres of individual planets, separate diagrams of the sublunar spheres of the four elements (fig. 3.3),¹⁴ and figures that illustrate the correlations believed to exist between the signs of the zodiac, on the one hand,

and the planets, the four elements, the four directions, the mineral world, the parts of the human body, and so forth on the other hand (figs. 3.4 and 3.5).¹⁵ In all these cases Muslim scholars were drawing upon Hellenistic material of more or less determinate origin, and it is possible that the diagrams themselves had precedents in Greco-Roman antiquity.

GEOGRAPHICAL DIAGRAMS

The influence of Ptolemy was also extensive in the formation of Islamic views concerning the configuration of the earth. In its Ptolemaic version, the theory that the inhabited portion of the earth was divided into seven *climata* (Arabic *iqḷim*, pl. *aqālim*) rapidly became an inalienable part of Islamic high learning, although research on technical aspects of the theory—namely, the determination of the boundaries between *climata* based on latitude calculations—was naturally the preserve of a handful of qualified scientists. In quite a few scientific as well as nonscientific works, the seven-*climata* system was illustrated by simple diagrams consisting of eight straight parallel lines or concentric circles drawn within a circle that represented the earth (figs. 3.6 to 3.9).¹⁶ None of these diagrams reflect a concern with accuracy in representing the *climata*. Instead, they seem to have been intended primarily to orient readers in a very general sense and probably also to demonstrate the centrality, in the inhabited world, of the fourth region where the administrative center of the Islamic empire was situated.¹⁷

14. Examples appear in al-Bīrūnī, *Kitāb al-taḥfīm*, 29 (note 12); Shihāb al-Dīn Abū 'Abdallāh Yāqūt ibn 'Abdallāh al-Ḥamawī al-Rūmī al-Baghdādī (d. 626/1229), *Kitāb mu'jam al-buldān*; see the edition by Ferdinand Wüstenfeld, *Jacut's geographisches Wörterbuch*, 6 vols. (Leipzig: F. A. Brockhaus, 1866–73), 1:14–15, reproduced here as figure 3.3; and İbrāhīm Ḥaḳḳı, *Ma'rifetnâme*, 127 (note 13). This view of the earth's atmosphere draws directly upon Aristotle's *Meteorologica*.

15. Correspondence between the signs of the zodiac and the planets: *Rasā'il ikhwān al-ṣafā'*, 1:120 (note 5); al-Bīrūnī, *Kitāb al-taḥfīm*, 396 (note 12). Correspondence between the signs of the zodiac, the four directions, and the four elements: al-Bīrūnī, *Kitāb al-taḥfīm*, 322, reproduced here as figure 3.4; Abū Mu'īn Nāṣir Khusraw Qubādiyānī, *Kitāb-i jāmi' al-ḥikmatayn* (comp. 462/1069–70); see the edition by Henry Corbin and Muḥammad Mu'īn, *Kitāb-e jāmi' al-ḥikmatayn* (Tehran: Département d'Iranologie de l'Institut Franco-iranien, 1953), 278 reproduced here as fig. 3.5. Correspondence between the signs of the zodiac, the planets, the organs of the five senses, the brain, and the heart: Nāṣir Khusraw, *Kitāb-i jāmi' al-ḥikmatayn*, 287. Correspondence between the signs of the zodiac, certain minerals, and the planets: Shams al-Dīn Abū 'Abdallāh Muḥammad ibn İbrāhīm al-Dimashqī (d. 727/1327), *Nukhbat al-dahr fi 'ajā'ib al-barr wa-al-baḥr*; see the edition by A. F. M. van Mehren, *Nukhbat ad dahr fi 'adschā'ib al barr wal baḥr* (Saint Petersburg, 1866; reprinted Leipzig: Otto Harrassowitz, 1923), 52.

16. These drawings are also discussed in the context of geographical mapping in this volume, chapter 6.

17. André Miquel, "İklim," in *Encyclopaedia of Islam*, new ed., 3:1076–78, with further bibliography; also Ernst Honigsmann, *Die sieben*

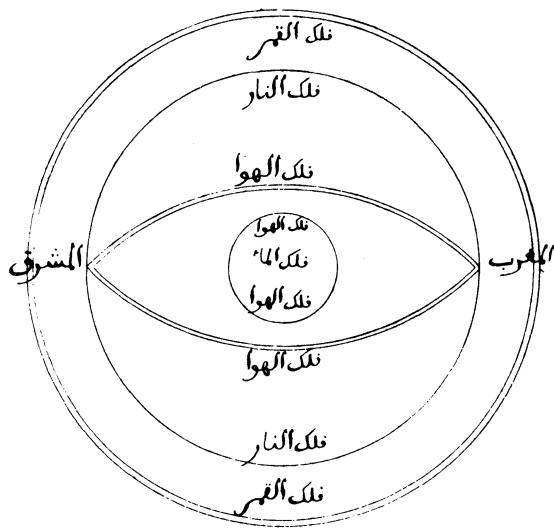
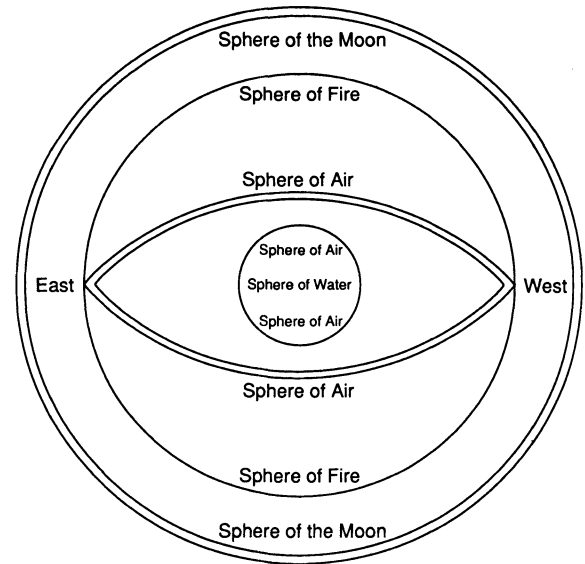


FIG. 3.3. THE LUNAR SPHERE AND THE SPHERES OF THE FOUR ELEMENTS. Illustration taken from Yāqūt's *Kitāb mu'jam al-buldān*. Translation on the right.



Diameter of the original: 10 cm. From *Jacut's geographisches Wörterbuch*, 6 vols., ed. Ferdinand Wüstenfeld (Leipzig: F. A. Brockhaus, 1866–73), 1:14–15, by permission of F. A. Brockhaus.

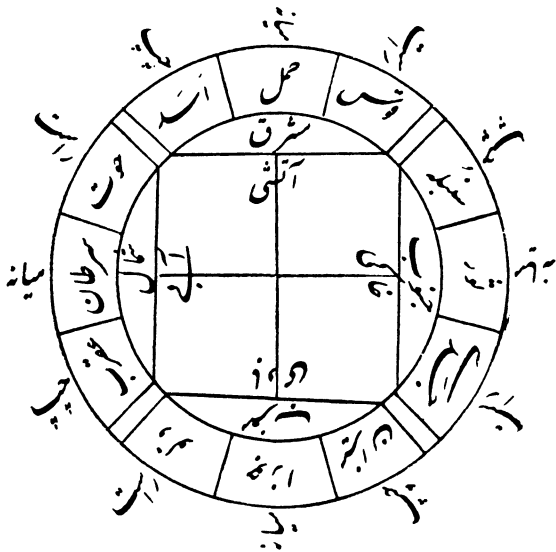
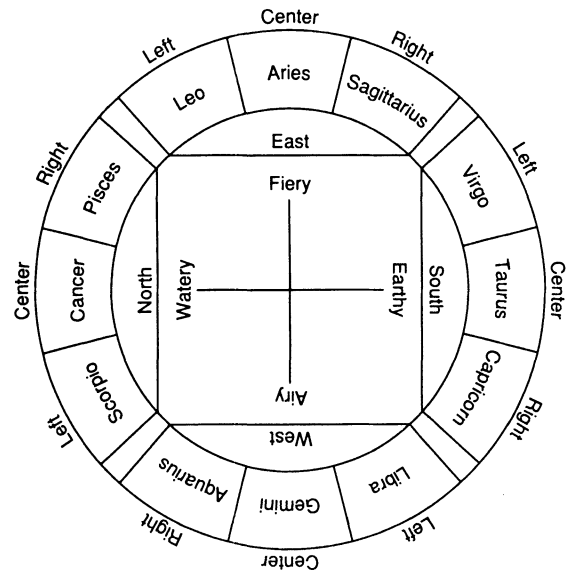


FIG. 3.4. CORRESPONDENCE BETWEEN THE SIGNS OF THE ZODIAC, THE FOUR DIRECTIONS, AND THE FOUR ELEMENTS. Translation on the right.



Size of the original: not known. From al-Bīrūnī, *Kitāb al-taḥfīm li-awā'il šinā'at al-tanjīm*, ed. Jalāl al-Dīn Humā'ī (Tehran, 1974), 322.

The same concern was also dominant in a rival theory of dividing the earth into regions—the seven-*kishvar* system of Persian origin. In this view the inhabited portion of the world was made up of seven circular regions (Persian *kishvar*) of equal size, arranged so that six of the regions totally engulf the seventh central one. As pointed out by the celebrated scholar al-Bīrūnī, who first drew a diagram of this view of the world (fig. 3.10), “This par-

Klimata und die pōleis epīstēmōi (Heidelberg: Winter, 1929). Further examples: al-Bīrūnī, *Kitāb al-taḥfīm*, 191 (note 12); Yāqūt, *Kitāb mu'jam al-buldān*, 1:28–29 (note 14); Zakariyā' ibn Muḥammad al-Qazwīnī (d. 682/1283), *Kitāb 'ajā'ib al-makhlūqāt wa-gharā'ib al-mawjūdāt*; see the edition by Ferdinand Wüstenfeld, *Zakariya ben Muhammed ben Mahmud el-Cazwini's Kosmographie*, 2 vols. (Göttingen: Dieterichsche Buchhandlung, 1848–49; facsimile reprint Wiesbaden: Martin Sändig, 1967), 1:148; *Kitāb al-bad' wa-al-ta'rikh* (dated 977/1569–70), Bodleian Library, Oxford, MS. Laud. Or. 317, fol. 46a.

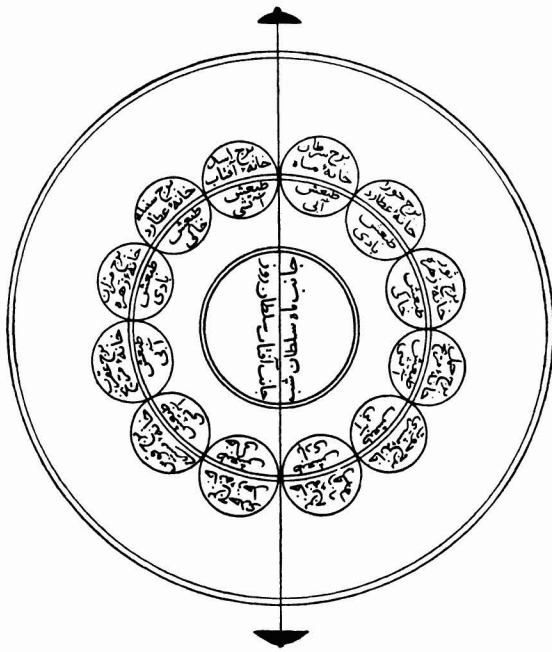
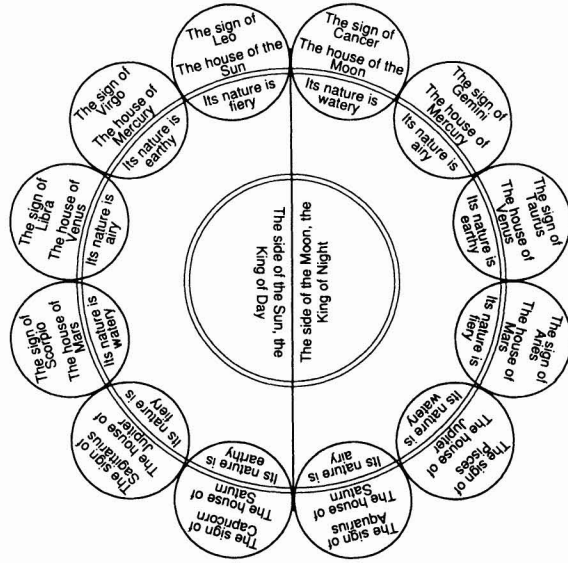


FIG. 3.5. CORRESPONDENCE BETWEEN THE SIGNS OF THE ZODIAC, THE PLANETS, AND THE FOUR ELEMENTS. Illustration taken from Nāṣir Khusraw, *Kitāb-i jāmi' al-ḥikmatayn*. Translation on the right.



Size of the original: 11.4 × 9.9 cm. From Henry Corbin and Muḥammad Mu'īn, eds., *Kitāb-e jāmi' al-ḥikmatayn* (Tehran: Département d'Iranologie de l'Institut Franco-iranien, 1953), 278. By permission of the Institut Français de Recherche en Iran.

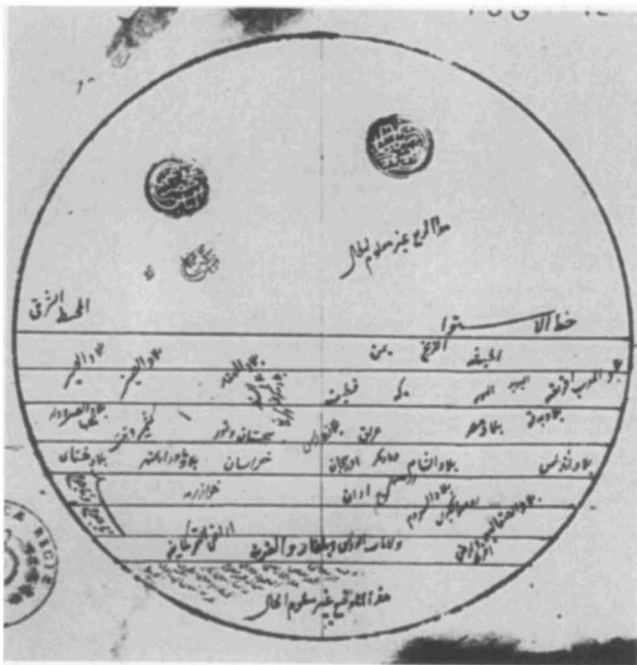
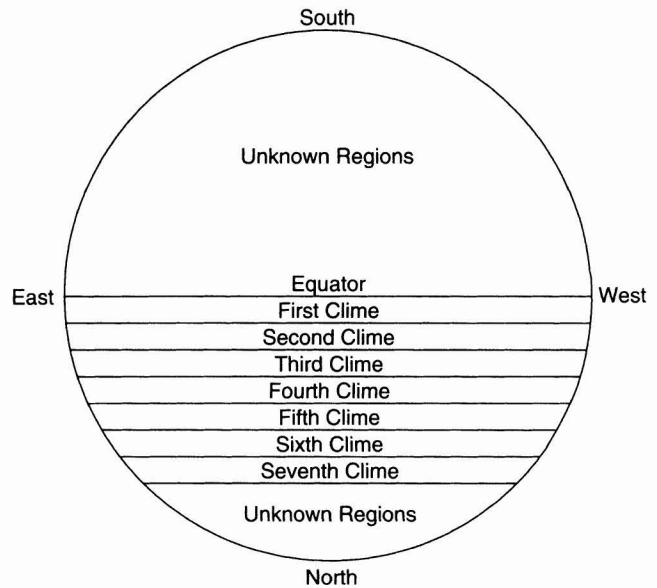


FIG. 3.6. THE SEVEN CLIMATA WITH INTERSPERSED PLACE-NAMES. Drawing from the title page of the anonymous manuscript *Kitāb hay'at ashkāl al-arḍ wa-miqdāruhā fi al-tūl wa-al-'arḍ al-ma'rūf bi-jughrafiyah*, dedicated to Sayf al-Dawlah (d. 356/967), a Hamdanid sultan. Approximate trans-



lation on the right. (This manuscript is discussed below as an abridgment of Ibn Ḥawqal, see figs. 5.11, 6.2, 6.3, 6.10, and appendix 5.1, no. 42.)

Diameter of the original: 15.2 cm. By permission of the Bibliothèque Nationale, Paris (MS. Arabe 2214).

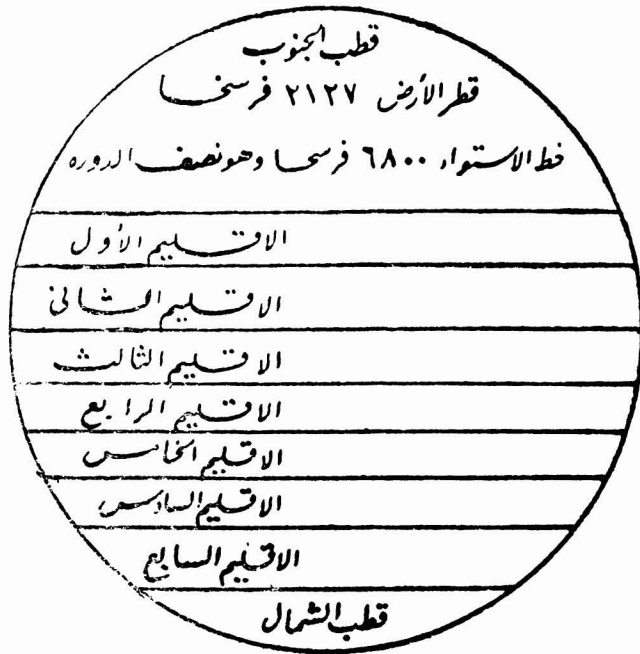


FIG. 3.7. THE SEVEN CLIMATA FROM RASĀ'IL IKHWĀN AL-ṢAFĀ'. For an approximate translation see figure 3.6, diagram on the right. Diameter of the original: ca. 5.5 cm. From *Rasā'il ikhwān al-ṣafā' wa-khullān al-wafā'*, 4 vols. (Beirut: Dār Bayrūt, Dār Ṣādir, 1957), 1:165.

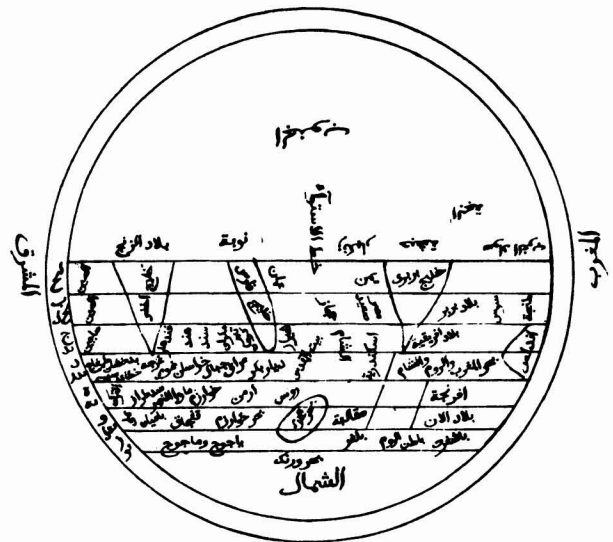


FIG. 3.8. THE SEVEN CLIMATA FROM AL-QAZWĪNĪ'S KITĀB 'AJĀ'IB AL-MAKHLŪQĀT. For an approximate translation see figure 3.6, diagram on the right. (See also fig. 6.8 below.)

Diameter of original: approx. 11 cm. From *Zakariya ben Muhammed ben Mahmud el-Cazwini's Kosmographie*, 2 vols., ed. Ferdinand Wüstenfeld (Göttingen: Dieterichsche Buchhandlung, 1848–49; facsimile reprint Wiesbaden: Martin Sändig, 1967), 2:8, by permission of Dieterichsche Verlagsbuchhandlung, Mainz.

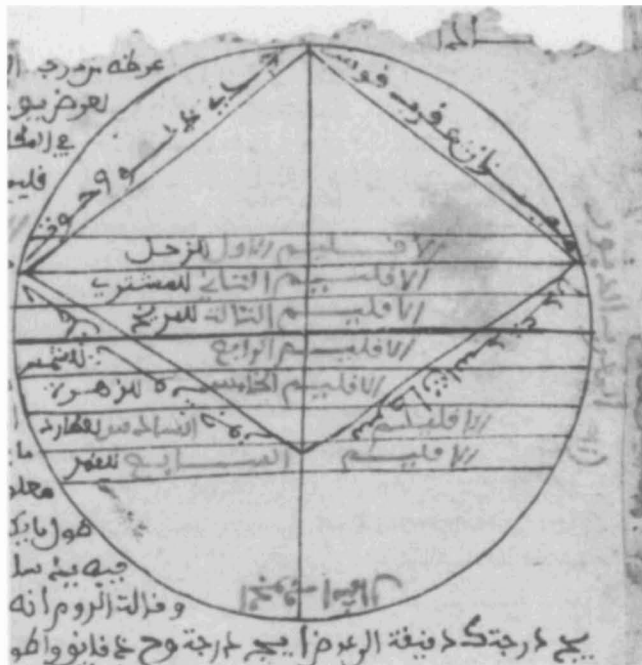
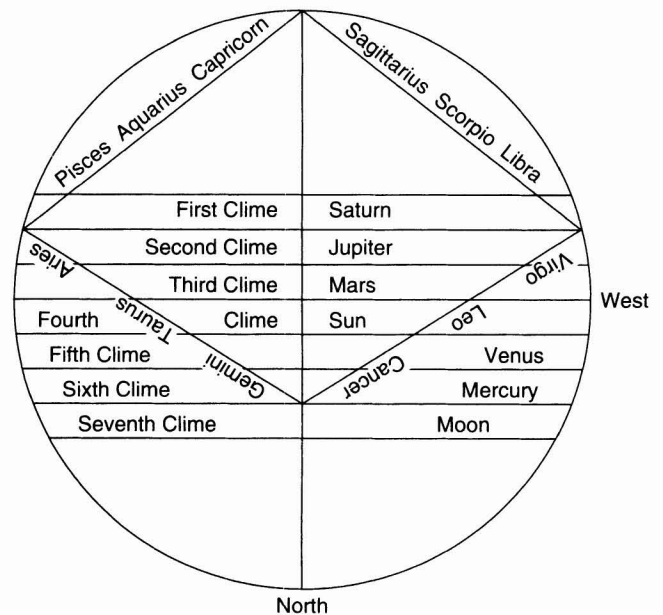


FIG. 3.9. THE SEVEN CLIMATA FROM KITĀB AL-BAD' WA-AL-TA'RĪKH. This diagram illustrates the correspondences between the seven *climata*, the seven planets, and the twelve signs of the zodiac. The authorship of this Arabic manu-



script, dated 977/1569–70, has been the subject of some debate among scholars; see p. 145. Translation on the right. Diameter of the original: 10.2 cm. By permission of the Bodleian Library, Oxford (MS. Laud. Or. 317, fol. 7a).

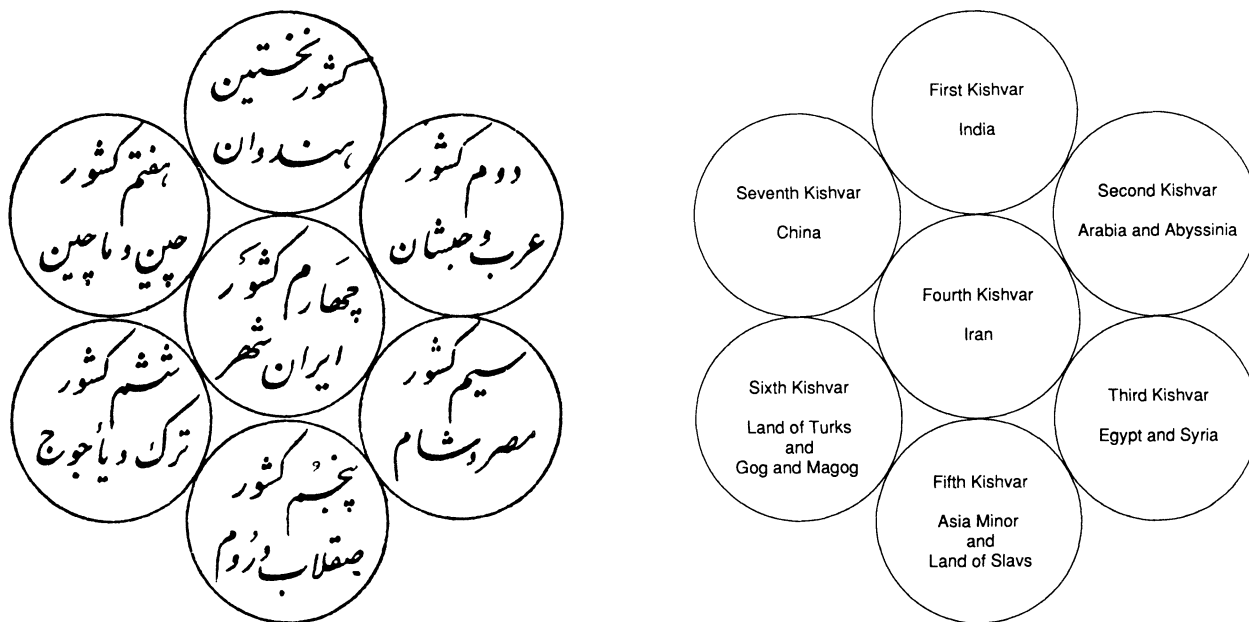


FIG. 3.10. THE SEVEN KISHVARs. Translation on the right. Size of the original: not known. From al-Birūnī, *Kitāb al-taḥfīm*

li-avā'il šinā'at al-tanjīm, ed. Jalāl al-Dīn Humā'ī (Tehran, 1974), 196.

tion ha[d] nothing to do with natural climatic conditions, nor with astronomical phenomena. It [was] made according to Kingdoms which differ[ed] from one another for various reasons—different features of their peoples and different codes of morality and customs.”¹⁸ In reality, the seven-*kishvar* view drew directly upon the ancient Indo-Iranian belief that the world was divided into seven regions that were thought to have come into existence when the first rain fell on the earth and broke it into seven pieces. In Islamic times, however, this belief survived only marginally and never matched the Ptolemaic seven-*climata* scheme in popularity.¹⁹

More widespread than the Iranian *kishvar* partitioning and, properly speaking, more Islamic than either of the two “extraneous” schemes so far mentioned was a geographical regionalization of the world around the Ka‘ba. The maps produced by this process are numerous enough to form a distinct class of sacred geography, with several subdivisions, and they are described in a separate chapter.²⁰ In themselves they can hardly have been of practical use to the believer who needed to ascertain the direction of the qibla from a given geographical location. It might have been for this reason that directions for determining the qibla in each region were at times incorporated into the text that accompanied the pictorial representations. The Ka‘ba-centered scheme was preferred predominantly in religious works, most probably with the purpose of emphasizing a sacred geography over profane schemes that had their origins in non-Islamic cultures.

ESOTERIC SPECULATION: Gnostic and Mystical Diagrams Gnostic Diagrams

Perhaps the earliest and most important corpus of occult and scientific writings in Islam is attributed to Jābir ibn Ḥayyān. Consisting of numerous tracts and treatises, some containing cosmographical diagrams, the texts were compiled at the end of the eleventh century at the latest.

18. Al-Birūnī, *Kitāb taḥdīd nihāyat al-amākin li-taḥṣīḥ masāfat al-masākin*, ed. P. G. Bulgakov and rev. Imām Ibrāhīm Aḥmad (Cairo: Maḥba‘ah Lajnat al-Ta‘līf, 1964), 135; English translation: *The Determination of the Coordinates of Positions for the Correction of Distances between Cities*, trans. Jamil Ali (Beirut: American University of Beirut, 1967), 102.

19. On the seven-*kishvar* system in ancient Iranian thought, see Mary Boyce, *A History of Zoroastrianism*, vol. 1, *The Early Period* (Leiden: E. J. Brill, 1975), 134; Ehsan Yarshater, “Iranian Common Beliefs and World-View,” in *The Cambridge History of Iran* (Cambridge: Cambridge University Press, 1968–), vol. 3, *The Seleucid, Parthian and Sasanian Periods*, ed. Ehsan Yarshater, pt. 1, pp. 343–58. esp. 351; and Henry Corbin, *Terre céleste et corps de résurrection de l’Iran Mazdéen à l’Iran Shi‘ite* (Paris: Buchet/Chastel, 1960), 40–48. All three sources rely on the *Avestas* and the *Bundahishn*. The survival of this system in Islamic texts is studied briefly by Edward S. Kennedy, *A Commentary upon Birūnī’s “Kitāb Taḥdīd al-Amākin”*: *An 11th Century Treatise on Mathematical Geography* (Beirut: American University of Beirut, 1973), 73–74. Further examples of seven-*kishvar* diagrams appear in al-Birūnī, *Taḥdīd*, 136, English translation, 102 (note 18); Yāqūt, *Kitāb mu‘jam al-buldān*, 1:26–27 (note 14); and al-Dīmašqī, *Nukhbāt al-dahr*, 25 (note 15).

20. See chapter 9 of this volume.

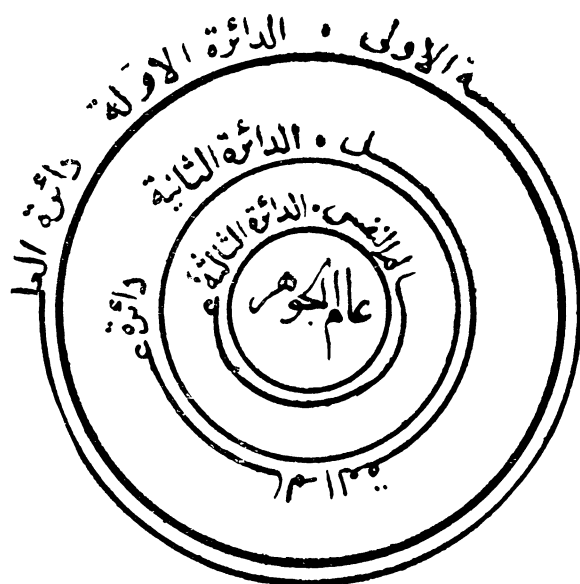
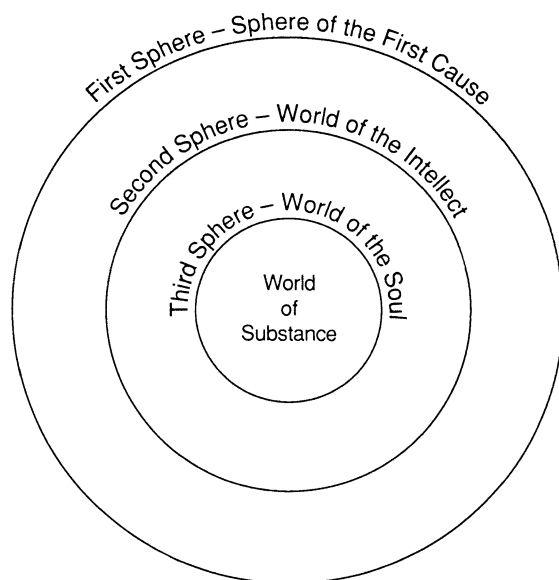


FIG. 3.11. JĀBIRIAN COSMOLOGY: THE FIRST FOUR "HYPOSTASES." Translation on the right. Size of the original: not known. From *Jābir bin Ḥayyān: Essai*



sur l'histoire des idées scientifiques dans l'Islam, vol. 1, *Mukhtār rasā'il Jābir b. Ḥayyān*, ed. Paul Kraus (Cairo: Maktabat al-Khanjī wa-Maṭba'atuhā, 1935), 408.

The Jābirian alchemy rests on a peculiar cosmology that combines material from Aristotelian (the sphere of the First Cause), Neoplatonic (the spheres of Intellect, Soul, and Substance), and Ptolemaic (the spheres of the seven planets, of the fixed stars, and of the four elements, in this descending order) ideas and sources. This cosmology is laid out most clearly in the treatise entitled *Kitāb al-taṣrīf* (The book of conjugation), where the views put forward are partially illustrated by simple diagrams that consist of several concentric circles (fig. 3.11).²¹ The connection between this eclectic view of the universe and alchemy is then explained in another short treatise called *Kitāb al-mizān al-ṣaghīr* (The book of the small balance). There it is stated that everything below the third and fourth spheres of Soul and Substance comes into being through a process of generation whereby the Soul unites with the Substance (which consists of the four elementary natures of heat, cold, humidity, and dryness) to produce the bodies that make up the physical world. Closely involved in this process are the four categories of quality, quantity, time, and space. The direct influence of these determines the exact composition of any given combination of the Soul and the four elementary natures. The possible combinations of influences that could be worked on the Substance by the categories are presented by means of a set of diagrams (fig. 3.12).²² It is the purpose of Jābirian alchemy to determine the precise composition of any given physical entity through a close analysis of the influences exercised upon it by the four categories. The eventual aim was to discover the secrets of generation and apply them alchemically in the laboratory.²³

Leaving aside partial exceptions, it does not seem that later occult scientists shared Jābir ibn Ḥayyān's enthusiasm for cosmographical diagrams.²⁴ Instead it was the

21. *Jābir bin Ḥayyān: Essai sur l'histoire des idées scientifiques dans l'Islam*, vol. 1, *Mukhtār rasā'il Jābir b. Ḥayyān*, ed. Paul Kraus (Cairo: Maktabat al-Khanjī wa-Maṭba'atuhā, 1935), 406 (the first three hypostases), 408 (the first four hypostases—reproduced here as fig. 3.11), 408–10 (the fourth hypostasis Substance, which is composed of the four elementary natures of heat, cold, humidity, and dryness). According to Jābir, the division of Substance into its components can be conceptualized in three different ways: as four equal parts of a sphere; as four small spheres within a larger sphere; and as concentric spheres inside each other.

22. *Mukhtār rasā'il Jābir b. Ḥayyān*, 443, 446, 447, and 448 (different possible combinations of the four categories of quality, quantity, time, and space) (note 21).

23. A detailed exposition of Jābir ibn Ḥayyān's thought can be found in Paul Kraus, *Jābir ibn Ḥayyān: Contribution à l'histoire des idées scientifiques dans l'Islam*, 2 vols., Mémoires Présentés à l'Institut d'Égypte, vols. 44 and 45 (Cairo: Imprimerie de l'Institut Français d'Archéologie Orientale, 1942–43). For a concise account of Jābir, see Paul Kraus (rev. Martin Plessner), "Djābir b. Ḥayyān," *Encyclopaedia of Islam*, new ed., 2:357–59.

24. A diagram illustrating the correlations between letters of the Arabic alphabet, parts of the human body, signs of the zodiac and the four elements appears in Muḥyī al-Dīn Abū al-'Abbās Aḥmad ibn 'Alī al-Būnī al-Qurashī (d. 622/1225), *Shams al-ma'ārif wa-laṭā'if al-'awārif* (Cairo: Maṭba'ah Muṣṭafā al-Bābī al-Ḥalabī wa-Awladīhi, 1926–27), 318. An English translation of the diagram, though not totally faithful to the original, is in Seyyed Hossein Nasr, *Islamic Science: An Illustrated Study* (London: World of Islam Festival, 1976), 35. Another diagram, called *zā'irajah* and attributed to al-Sabṭī (fl. end of the sixth/twelfth century), is reproduced and discussed by Ibn Khaldūn (d. 808/1406), *The Muqaddimah: An Introduction to History*, 3 vols., trans. Franz Rosenthal (New York: Bollingen Foundation, 1958), 1:238–45 and 3:182–214 (diagram in Arabic on folded insert between 3:204 and

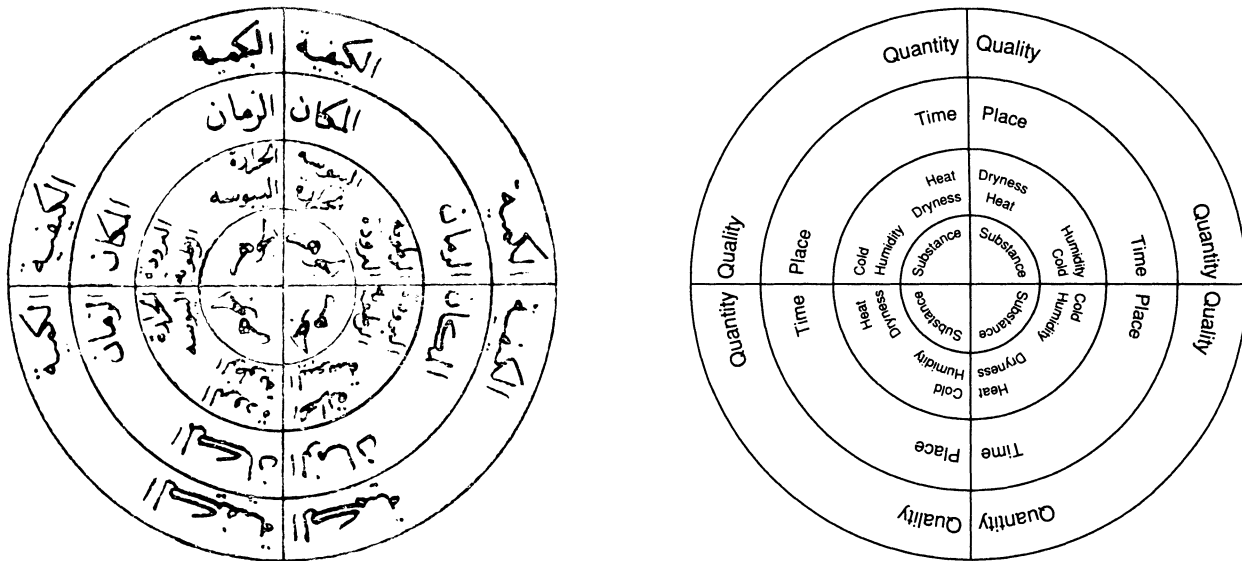


FIG. 3.12. JĀBIRIAN COSMOLOGY: ONE POSSIBLE COMBINATION OF THE FOUR CATEGORIES OF QUALITY, QUANTITY, TIME, AND SPACE. Translation on the right. Size of the original: not known. From *Jābir bin Ḥayyān: Essai*

sur l'histoire des idées scientifiques dans l'Islam, vol. 1, *Mukhtār rasā'il Jābir b. Ḥayyān*, ed. Paul Kraus (Cairo: Maktabat al-Khanji wa-Maṭba'atuhā, 1935), 447.

Gnostic Ismā'īlīs who took a deep interest in cosmology and produced a great number of sacred cosmographies. Ismā'īlism attained full maturity after it adopted Neoplatonic doctrines during the tenth and eleventh centuries. The synthesis of the original Ismā'īlī Gnostic teachings with Neoplatonic ideas led to the development of complicated cosmologies that are characterized above all by a strict hierarchical ordering of the component elements of the universe and a symmetrical juxtaposition of the physical and spiritual worlds. This predilection for hierarchy and symmetry might explain the appearance of a large number of cosmographical diagrams in the works of prominent Ismā'īlī thinkers.

The first name to be mentioned in this connection is al-Sijistānī (d. between 386/996 and 393/1002–3), one of the earliest Ismā'īlī philosophers whose works are available to us in late manuscript copies. Al-Sijistānī put forward his cosmological teachings in several monographs, but he used cosmographical drawings in a work that was not primarily concerned with cosmology, *Kitāb ithbāt al-nubū'āt* (The book of the proof of prophecy). None of the diagrams contained in the *Ithbāt* are complete cosmographies. They are intended to illustrate only some of the correlations al-Sijistānī establishes between what to him are the two cosmic orders that make up the universe—the natural order (or world of nature) and the normative order (or world of religion). The former consists, in descending order, of the Intellect, the Soul, and the Substance, which in turn comprise the seven spheres (the “fathers”), the four elements (the “mothers”), and the three *mawālīd* (“offsprings”) of animals, plants, and

minerals, while the latter is but a hierarchy of spiritual or sacred entities that corresponds exactly to the natural order. With the exception of one diagram that is somewhat general in nature,²⁵ all of al-Sijistānī's drawings deal with particular aspects of these two parallel hierarchies, such as the Intellect, the Soul, physical directions, natural and “prophetic” species, natural and prophetic movements, and physical quantity.²⁶

Al-Sijistānī's attempts at a systematic cosmology were taken further by the later philosopher Ḥamid al-Dīn Aḥmad ibn 'Abdallāh al-Kirmānī (d. after 411/1020–21)

205; English translation in pocket at the end of vol. 3). *Zā'irajah* was the generic name given to a peculiar set of circular drawings that were used as a means of divining the future through letter magic. The method is little understood, but it certainly seems to have had cosmological dimensions, since the diagrams normally included circles for the heavenly spheres, the four elements, and all kinds of physical and spiritual beings, as well as letters, numbers, and different ciphers.

25. The diagram illustrates the subdivisions of the sphere of substance with the hierarchy proceeding from the center outward; Abū Ya'qūb Iṣḥāq ibn Aḥmad al-Sijistānī, *Kitāb ithbāt al-nubū'āt*, ed. 'Ārif Tāmīr (Beirut: Manshūrāt al-Maṭba'at al-Kāthūlūqiyah, 1966), 22.

26. Samuel Miklos Stern, “Abū Ya'qūb Iṣḥāq b. Aḥmad al-Sidjī,” in *Encyclopaedia of Islam*, new ed., 1:160; Paul Ernest Walker, “Abū Ya'qūb Sejestānī,” in *Encyclopaedia Iranica*, ed. Ehsan Yarshater (London: Routledge and Kegan Paul, 1982–), 1:396–98; and Ismail K. Poonawala, *Biobibliography of Ismā'īlī Literature* (Malibu: Undena, 1977), 82–89. The bibliography from all three sources should be complemented by Mohamed Abu'aly Alibhai, “Abū Ya'qūb al-Sijistānī and 'Kitāb Sullam al-Najāt': A Study in Islamic Neoplatonism” (Ph.D. diss., Harvard University, 1983).

Other drawings, not reviewed here on account of their partial nature, can be found in al-Sijistānī, *Kitāb ithbāt al-nubū'āt*, 17 (printed version not accurate), 37, 45, 52, 82, 89, 102, 126, 131, and 151 (note 25).

in a major work entitled *Rāḥat al-ʿaql* (The comfort of the intellect). In his effort to synthesize the conflicting theories of his predecessors (including al-Sijistānī), al-Kirmānī introduced into Ismāʿīlī philosophy the doctrine of ten intellects. According to this scheme, the Intellect and the Soul of al-Sijistānī's natural order were conceived as only the first two in a descending series of ten intellects. The remaining eight corresponded to the seven spheres plus the active intellect that governs the sublunar sphere. In addition, al-Kirmānī thought in terms of four rather than two cosmic orders, which were the world of creation (*ʿālam al-ibdāʿ*), the world of matter (*ʿālam al-jism*), the world of religion (*ʿālam al-dīn*), and the world of the second emanation (*ʿālam al-inbiʿāth al-thānī*). These four cosmic orders were united into a meaningful whole through a theory of evolution, the two ends of which were respectively the Primordially Originated One (*al-mubdaʿ al-awwal* = the First Intellect = the First End) and the Second Emanation (*al-inbiʿāth al-thānī* = the Human *Mahdī* = the Second End). Al-Kirmānī illustrated his theories in diagrams: the interrelations among the four cosmic orders were clarified through two sets of diagrams where al-Kirmānī resorted to numerological comparisons (figs. 3.13 and 3.14), while the theory of evolution was graphically expressed in the form of concentric circles.²⁷

The Neoplatonizing cosmologies of al-Sijistānī and al-Kirmānī found varying degrees of acceptance in later Ismāʿīlī doctrinal thought. Their predilection for graphic illustration, however, certainly seems to have been taken up by subsequent Ismāʿīlī thinkers, as evidenced by the cases of Nāṣir Khusraw (394 to ca. 481/1004 to ca. 1088–89) and al-Ḥāmidī (d. 557/1162). Besides the more or less standard drawings of the heavenly spheres and of the zodiac, both Nāṣir Khusraw and al-Ḥāmidī also designed original diagrams to illustrate specific aspects of their cosmological doctrines. The former had recourse to the ever popular scheme of partitioned concentric circles on several occasions in his *Khvān al-ikhvān* (The table of the brethren) to present in simple visible form certain sets of correlations that he described at length in the text (fig. 3.15). The latter, whose tendency toward visual thinking is reflected in the many simple drawings strewn across his *Kanz al-walad* (The treasure of the son), chose to represent his innovative doctrine of the “fall” of the third intellect and the resulting cosmology in a simple cosmography.²⁸ That the number of printed Ismāʿīlī works is as yet very small is a real obstacle to meaningful generalizations about the degree and nature of graphic representation in Ismāʿīlī cosmological treatises as a whole. Yet it seems safe to assume that the renewed interest in Ismāʿīlism that is currently visible among historians of Islamic thought will eventually lead to the discovery of many more Ismāʿīlī cosmographies than the ones recorded here.

MYSTICAL DIAGRAMS

The literature of Islamic mysticism, vast in size and scope, is on the whole devoid of graphic elements. Given the unsusceptibility of mystical experience to any form of “representation,” such a reluctance by mystics to translate inner experiences onto the plane of visual expression is hardly surprising. Even mysticism, however, is not impervious to philosophical speculation, and whenever philosophizing tendencies manifest themselves and mystics begin to subject “ineffable” mystical experiences to systematic scrutiny, there may also emerge the need for graphic illustration. Such, in any event, is the case in Islamic mysticism, where the few cosmological diagrams that can be located in the literature all bear the indelible stamp of Ibn al-ʿArabī, the mystic-philosopher whose all-encompassing philosophy of being can be said to have transformed the whole subsequent history of Islamic mystical thought.

Ibn al-ʿArabī himself drew several diagrams to illustrate certain aspects of his mystical doctrines. Two cosmographical drawings concerning the different planes of being and the creation of the world through divine names appear in a well-known short work entitled *Inshāʾ al-dawāʾir* (The production of spheres).²⁹ That he chose this title for the work in question suggests that Ibn al-ʿArabī

27. J. T. P. de Bruijn, “al-Kirmānī,” in *Encyclopaedia of Islam*, new ed., 5:166–67; and Poonawala, *Biobibliography of Ismāʿīlī Literature*, 94–102 (note 26), both with additional bibliography, to which should be added: Faquir Muhammad Hunzai, “The Concept of Tawḥīd in the Thought of Ḥamid al-Dīn al-Kirmānī” (Ph.D. diss., McGill University, 1986). For other, on the whole noncosmological, drawings of al-Kirmānī, see *Rāḥat al-ʿaql*, 72, 130, 135, 137, 154, 157, 168, 216–17, and 337 (note 12). See also al-Kirmānī, *Majmūʿah rasāʾil al-Kirmānī*, ed. Muṣṭafā Ghālib (Beirut: al-Muʿassasat al-Jāmiʿiyah liʾl-Dirāsāt wa-al-Nashr wa-al-Tawzīʿ, 1983), 36–37 and 69–70. A manuscript of this latter work (now in the possession of Mrs. Henry Corbin, dated 1251/1836), which I consulted in a photocopy at the Institute of Ismaili Studies in London, has two more drawings (fols. 241b and 246a) that do not appear in the printed version.

28. Al-Ḥāmidī, *Kanz al-walad*, 81 (note 13). It is not clear why a slightly different version of this same drawing is reproduced at the end of sec. 5 on p. 95. References on Nāṣir Khusraw and al-Ḥāmidī can be found in Poonawala, *Biobibliography of Ismāʿīlī Literature*, 111–25 and 141–43, respectively (note 26). Editions of their relevant works are: Nāṣir Khusraw, *Khvān al-ikhvān*, ed. Yaḥyā al-Khashshāb (Cairo: Maṭbaʿat al-Maʿhad al-Ilmī al-Farānsī liʾl-Āthār al-Sharqīyah, 1940); idem, *Kitāb-i jāmiʿ al-ḥikmatayn* (note 15); and al-Ḥāmidī, *Kanz al-walad* (note 13). For other diagrams by Nāṣir Khusraw and al-Ḥāmidī that are not included in the present survey, see *Khvān al-ikhvān*, 152, 155, and *Kanz al-walad*, 119, 125, 149, 169, 251, 255, and 259.

Examples of diagrams in other Ismāʿīlī works that need further study appear in al-Dāʾī al-Qarmaṭī ʿAbdān, *Kitāb shajarat al-yaqīn*, ed. ʿArīf Tamir (Beirut: Dār al-Āfāq al-Jadīdah, 1982), 44 and 88, as well as Jaʿfar ibn Muṣṭafā al-Yaman (d. A.D. 958 or 959), *Sarāʾir wa-asrār al-nuṭāqāʾ*, ed. Muṣṭafā Ghālib (Beirut: Dār al-Andalus, 1984), 216.

29. Ibn al-ʿArabī, *Kleinere Schriften des Ibn al-ʿArabī*, ed. Henrik Samuel Nyberg (Leiden: E. J. Brill, 1919), 23 and 35 (the second diagram is not reproduced in the printed edition). The former depicts the dif-

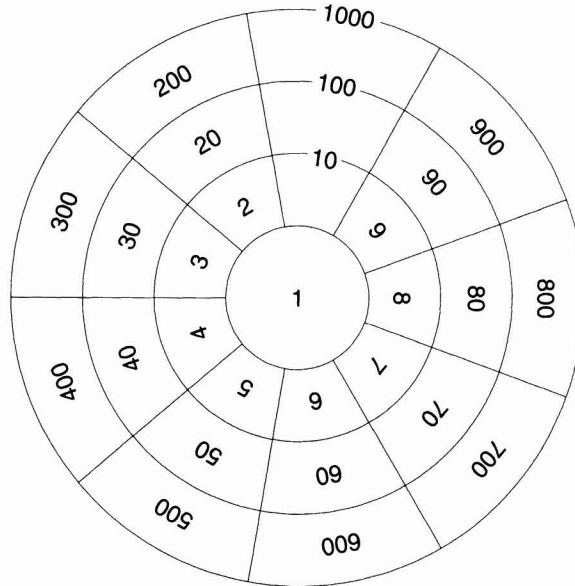
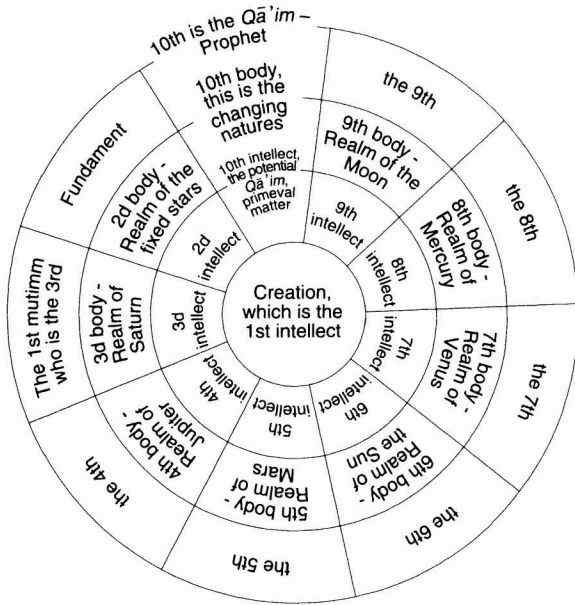
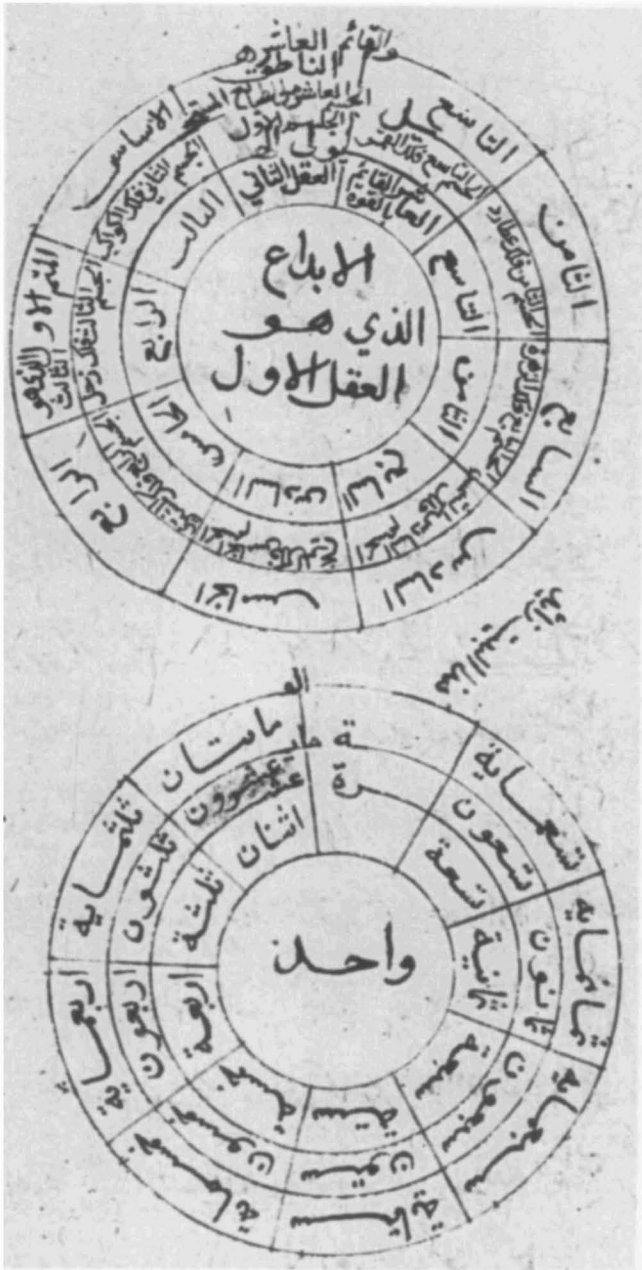


FIG. 3.13. THE FOUR COSMIC ORDERS ACCORDING TO AL-KIRMĀNĪ. The world of creation, as the “cause” (*‘illah*) of all the other orders, is at the center and is thus correlated to the numeral 1, which is the “cause” of all other numerals. Translation on the right. The line drawing in the printed edition (*Rāḥat al-‘aql*, ed. Muḥammad Kāmil Ḥusayn and Muḥammad

Muṣṭafā Ḥilmī [Cairo: Dār al-Fikr al-‘Arabī, 1953], 128) is misleadingly inaccurate. Diameter of the upper circle: approx. 8 cm. By permission of Abbas Hamdani, University of Wisconsin–Milwaukee (MS. al-Kirmānī, *Rāḥat al-‘aql*, “al-mashrī‘ al-khāmis min al-sūr al-rābī‘,” fol. 103a).

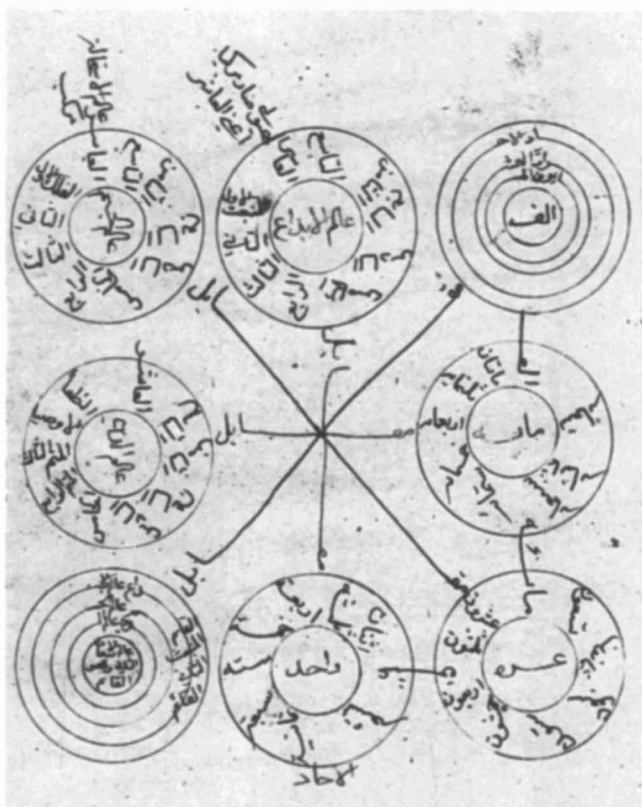
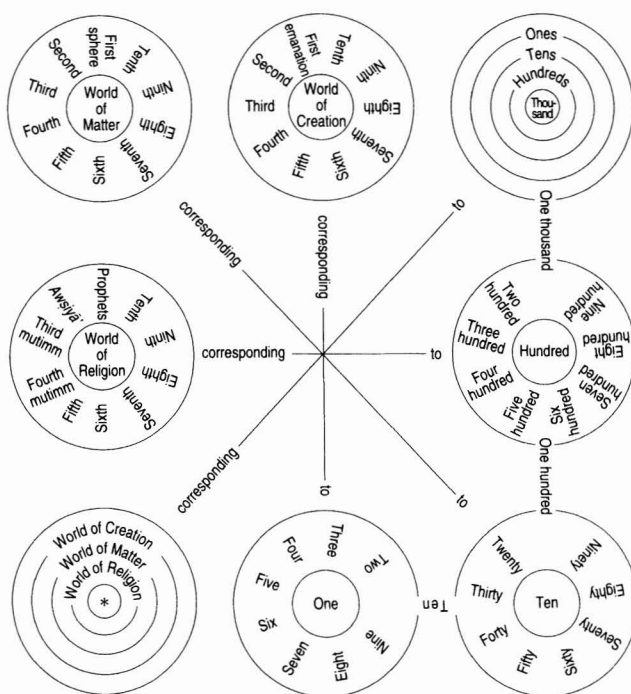


FIG. 3.14. AN ALTERNATIVE CONCEPTION OF THE FOUR COSMIC ORDERS ACCORDING TO AL-KIRMĀNĪ. The world of creation comprehends all the other cosmic orders, like the numeral 1, which is said to comprehend the other numerals. The world of second emanation is placed at the center, since it contains elements of all the other cosmic orders,

assigned particular importance to the diagrams in question, though, it appears from the text, primarily for didactic purposes. Another cosmographical drawing by Ibn al-ʿArabī appears in his magnum opus, *al-Futūḥāt al-Makkiyah* (The Meccan revelations or conquests), which has as its subject the relation between the “center” (= the Absolute manifesting itself as God) and the spheres surrounding it (= “genera and species,” that is, permanent archetypes; fig. 3.16).³⁰

If one bears in mind that Ibn al-ʿArabī’s philosophy is notoriously dense and his style of writing correspondingly convoluted, it is not surprising that at least some of his later commentators had recourse to diagrams in order to present his doctrines in a readily intelligible manner. Variations of Ibn al-ʿArabī’s diagram of the different planes of being seem to have enjoyed particular popularity among his spiritual disciples. Such diverse figures as the poet Maghribī (d. 809/1406–7), the encyclopedist mystic-scholar Ibrāhīm Ḥaḳḳī (d. 1194/1780), and the mystic Muḥammed Nūrū’l-ʿArabiyū’l-Melāmī (1228–1305/



* World of second emanation who is the Qā'im, the Expected One

like the numeral 1,000 which contains all numerals from 1 to 1,000. Translation on the right.

Size of the original: approx. 12 × 13.5 cm. By permission of Abbas Hamdani, University of Wisconsin–Milwaukee (MS. al-Kirmānī, *Rāḥat al-ʿaql*, “al-mashrīʿ al-khāmis min al-sūr al-rābīʿ,” fol. 127b).

ferent planes of being according to Ibn al-ʿArabī. Although the accompanying text does not reflect it directly, this diagram is an illustration of Ibn al-ʿArabī’s theory of “five divine presences.” For a clear exposition of this theory, see Toshihiko Izutsu, *Sufism and Taoism: A Comparative Study of Key Philosophical Concepts* (Berkeley: University of California Press, 1984), pt. 1, “Ibn ʿArabī,” esp. 19–20. The latter diagram concerns the creation of the world through divine names. A summary of the “cosmogony” appears in Masataka Takeshita, “An Analysis of Ibn ʿArabī’s *Inshāʾ al-dawāʾir* with Particular Reference to the Doctrine of the ‘Third Entity,’” *Journal of Near Eastern Studies* 41 (1982): 243–60, esp. 256–58 (I owe this reference to Peter Heath, Washington University in Saint Louis). On divine names, see Izutsu, *Sufism and Taoism*, 99–109.

30. On Ibn al-ʿArabī, see Ahmed Ateş, “Ibn al-ʿArabī,” in *Encyclopaedia of Islam*, new ed., 3:707–11, the references in James Winston Morris, “Ibn ʿArabī and His Interpreters,” *Journal of the American Oriental Society* 106 (1986): 539–51, 733–56, and 107 (1987): 101–19, and more recently, William C. Chittick, *Ibn al-ʿArabī’s Metaphysics of Imagination: The Sufi Path of Knowledge* (Albany: State University of New York Press, 1989). The *Inshāʾ al-dawāʾir* was edited by Nyberg in *Kleinere Schriften des Ibn al-ʿArabī*, 3–38 (note 29), and *al-Futūḥāt al-Makkiyah* is currently being edited by ʿUthmān Yahyā and Ibrāhīm Madkūr, 10 vols. to date beginning in 1972 (note 9).

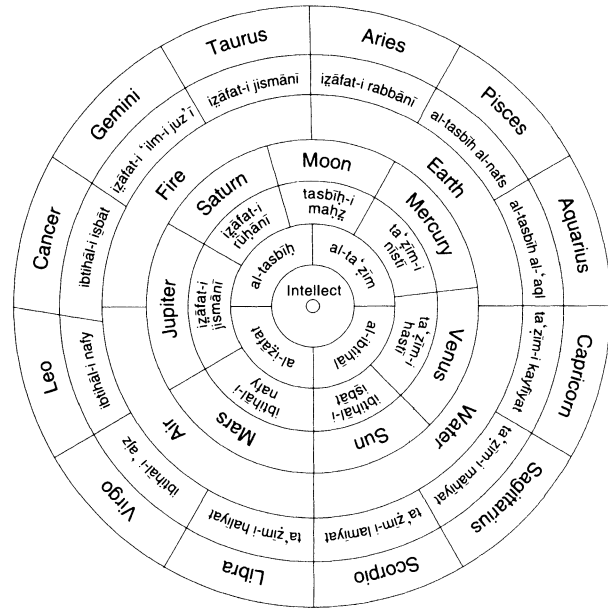
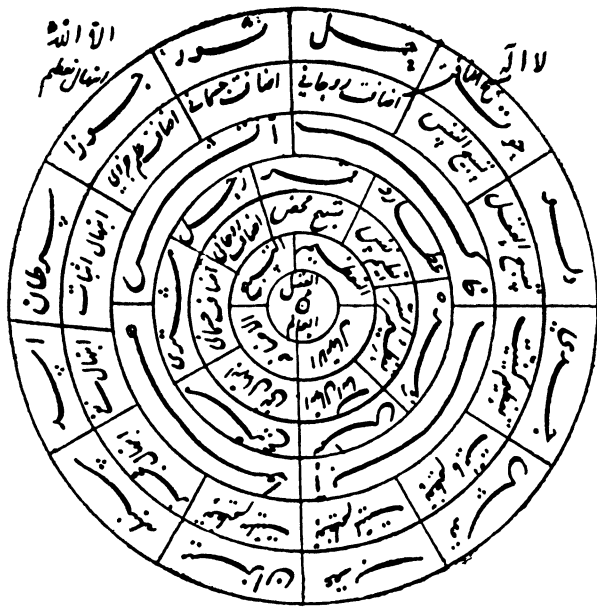


FIG. 3.15. THE UNIVERSAL INTELLECT, THE CREATOR, AND THE CONSTRUCTION OF THE UNIVERSE ACCORDING TO NĀSĪR KHUSRAW. This diagram demonstrates the correlation that exists between the way the Universal Intellect worships the Creator and the way the universe is constructed. The Universal Intellect's worship of the Creator is based on the structure of the Muslim testimony of faith, *lā ilāhah illā'llāh* (there is no God but Allah), which is composed of four words, seven syllables, and twelve letters. Thus the Universal Intellect worships the Creator based on the four fundamental modes of *tasbiḥ* (*pākizah kardan*, "purification"), *izāfat* (*bāz bastan*, "tracing its origin to God"), *ibtiḥāl* (*gardan nihādan*, "submission") and *ta'zīm* (*buzurg dāshtan*, "glorifi-

cation") as well as based on several subdivisions of these into seven and twelve parts. This structure of worship is said to correspond to the structure of the Universe that is built out of four elements, seven planets, and twelve signs of the zodiac. Not incorporated into the diagram is another set of correlations with the human body, namely its four humors (blood, phlegm, black bile, and yellow bile), its seven internal organs (brain, heart, lungs, liver, pancreas, gallbladder, and kidneys), and its twelve "visible" organs (head, face, neck, breast, stomach, back, two hands, two legs, and two feet). Translation on the right. Size of the original: not known. From Nāsir Khusraw, *Khvān al-ikhvān*, ed. Yaḥyā al-Khashshāb (Cairo: Maṭba'at al-Ma'had al-'ilmī al-Faransī li'l-Āthār al-Sharqīyah, 1940), 139.

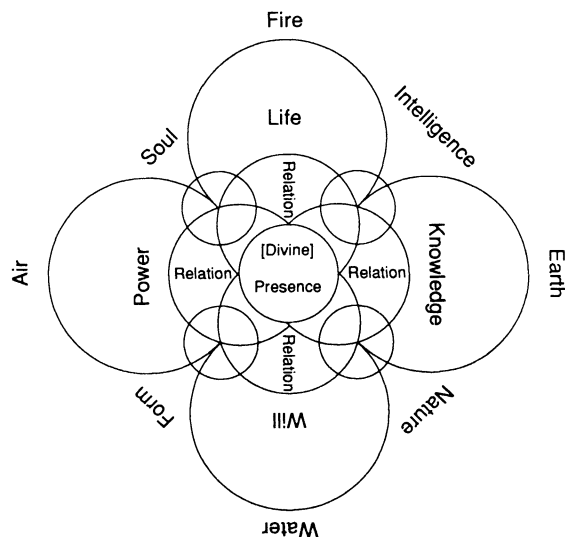
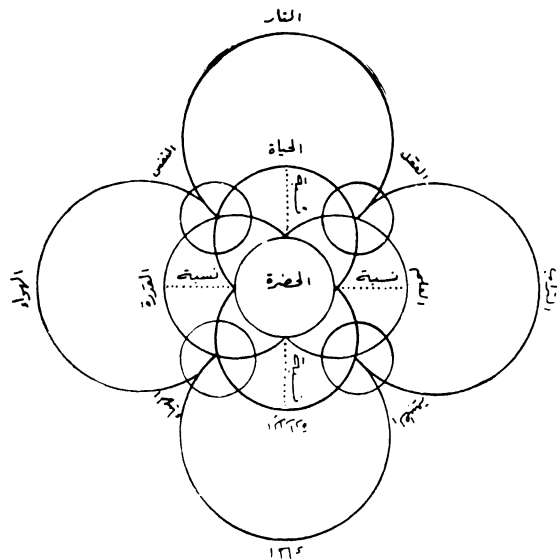


FIG. 3.16. A PARTIAL ILLUSTRATION OF THE RELATIONS BETWEEN THE "DIVINE PRESENCE" AND "PERMANENT ARCHETYPES" ACCORDING TO IBN AL-'ARABĪ. Translation on the right.

Size of the original: approx. 11 × 11 cm. From Ibn al-'Arabī, *al-Futūḥāt al-Makkīyah*, ed. 'Uthmān Yaḥyā and Ibrāhīm Madkūr (Cairo: Jumhūriyah Miṣr al-'Arabīyah, Vizārat al-Thaqāfah, 1972-), 4:158 (chap. 47).

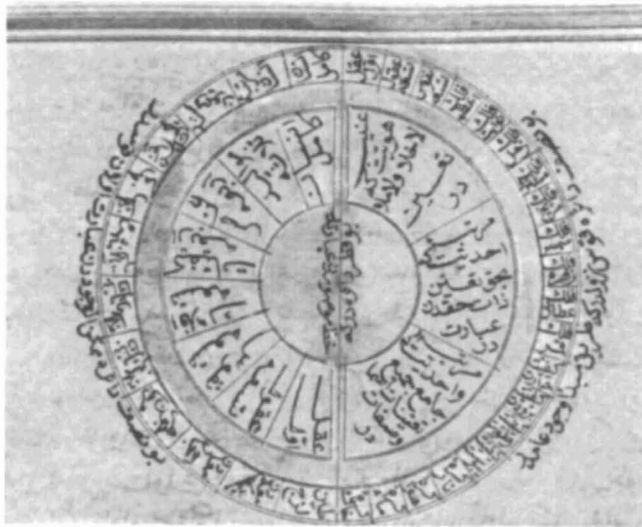


FIG. 3.17. DIAGRAM OF THE DIFFERENT LEVELS OF BEING FROM THE MA'RIFETNĀME. Size of the original: 5.6 × 8.5 cm. By permission of the British Library, London (MS. Or. 12964, fol. 28b).

1813–88) all produced slightly different versions of this diagram (fig. 3.17).³¹ More significantly, however, it was one of these distant disciples of Ibn al-ʿArabī—namely, Ḥaydar Āmulī—who, to all indications, alone in the history of Islamic thought developed a veritable art of cosmographical “diagramology.”

Ḥaydar Āmulī stands at the pinnacle of a particular trend in *ithnā ʿasharī* Shīʿī thought that is characterized by a high degree of openness to mystical speculation and, more specifically, by an effort to integrate the thought of Ibn al-ʿArabī into Shīʿī philosophy. The argument central to his profuse philosophical output is encapsulated in the maxim “the true Shīʿīs are Sufis and the true Sufis are Shīʿīs.” The Sufi par excellence for Ḥaydar Āmulī seems to have been Ibn al-ʿArabī, and he devoted his formidable intellectual energies to the task of merging *ithnā ʿasharī* doctrines and Ibn al-ʿArabī’s theories into a consistent and rigorous whole.³² In this effort he freely resorted to graphic representation and drew many cosmographical diagrams, of which only twenty-eight have so far been recovered.³³ These are extremely elaborate diagrams that reflect almost all aspects of Ḥaydar Āmulī’s wide-ranging speculations, and as such they require separate collective treatment elsewhere.³⁴ Several of the drawings are meant to illustrate points of Ibn al-ʿArabī’s teachings, and at least in some cases they derive from drawings by Ibn al-ʿArabī himself. But the great majority of Ḥaydar Āmulī’s diagrams are original. They have as their subject the complex network of correspondences between the two major spheres of creation—the world of manifest, corporeal entities and the world of hidden, spiritual beings. These

two complementary faces of creation are referred to by Ḥaydar Āmulī as the *Kitāb āfāqī* (Book of horizons) and the *Kitāb anfusī* (Book of souls) respectively. Also involved in this “science” of correspondences is the Book of revelation—the Qurʾān—which seems to act as a heuristic device in the effort to discover or uncover the series of correlations that underlie and connect the two spheres of creation.

Other than the sheer numbers of diagrams involved,

31. Shams al-Dīn Muḥammad Maghribī, *Jām-i jahānnumā* (Tehran, 1935) appended to the end of Naṣīr al-Dīn Muḥammad ibn Muḥammad al-Ṭūsī’s *al-Jabr wa-al-ikhtiyār* (1934), 8 and 17; see also *Jām-i jahānnumā*, in *Divān-i kāmīl-i Shams-i Maghribī*, ed. Abū Ṭālib Mir ʿAbidīnī (Tehran: Kitābfurūshī-i Zavvār, 1979), 309. ʾIbrāhīm Ḥaḳḳī, *Maʿrifetnāme*, 50 (note 13). Abdūlbākī Gölpinarlı, *Melāmīlik ve Melāmīler* (Istanbul: Devlet, 1931), 270, reproduces the diagram from Muḥammed Nūrūʾī-ʿArabiyūʾī-Melāmī’s *al-Anwār al-Muḥammadīyah* (MS. Abdūlbākī Gölpinarlı, date and folio number not given—Gölpinarlı’s manuscripts are now preserved in the Mevlana Müzesi in Konya, Turkey). Gölpinarlı is of the opinion that Seyyid Muḥammed copied this diagram from Maghribī’s *Jām-i jahānnumā*. He also points out that the Turkish mystic Niyāzī-i Miṣrī (d. 1105/1694) included a similar drawing in his *Devre-i ʿarṣīyeh*, a work I could not consult.

32. E. Kohlberg, “Ḥaydar-i Āmulī,” in *Encyclopaedia Iranica*, 1:983–85; Josef van Ess, “Ḥaydar-i Āmulī,” in *Encyclopaedia of Islam*, new ed., suppl. fasc. 5–6, 363–65; Henry Corbin, *En Islam iranien: Aspects spirituels et philosophiques*, 4 vols. (Paris: Editions Gallimard, 1971–72), vol. 3, *Les fidèles d’amour: Shīʿisme et Soufisme*, 149–213; and Peter Antes, *Zur Theologie der Schīʿa: Eine Untersuchung des Ġamīʿ al-asrār wa-manbaʿ al-anwār von Sayyid Ḥaydar Āmulī* (Freiburg: Klaus Schwarz, 1971).

33. The diagrams appear in Ḥaydar Āmulī’s *al-Muqaddimāt* (note 8). Originally scattered into different chapters of the Arabic text in manuscript copies, the diagrams have been brought together at the end of the printed text by Ḥaydar Āmulī’s modern editors. Other works of Ḥaydar Āmulī that apparently contained diagrams but that do not appear to be extant were *Risālat al-jadāwil al-mawsūmah bi-madarīj al-salīkīn fī marātib al-ʿarifīn* (The book of diagrams concerning the spiritual ranks of the Gnostics in which are marked the degrees of the mystic wayfarer) and *Kitāb al-muḥīṭ al-ʿaẓam wa-al-tūr al-ashamm fī taʾwīl kitāb allāh al-ʿazīz al-muḥkam* (The book of the encircling ocean and the towering mountain concerning the esoteric interpretation of the mighty and firm book of God). For *Risālat al-jadāwil*, see Ḥaydar Āmulī, *Kitāb jamīʿ al-asrār wa-manbaʿ al-anwār* in the edition by Henry Corbin and ʿUthmān Yaḥyā, *La philosophie Shīʿite* (Paris: Librairie d’Amérique et d’Orient, Adrien-Maisonneuve, 1969), 40 (French introduction). As for the *Kitāb al-muḥīṭ al-ʿaẓam*, Ḥaydar Āmulī writes in his *al-Muqaddimāt* that this Qurʾānic interpretation contained seven introductory sections (*muqaddimāt*) and twelve diagrams (*dawāʾir*), with no further information (pp. 147–49 of the Arabic text [note 8]). This same passage is inaccurately translated by the editors (p. 6 of the French introduction) to read “nineteen diagrams.”

34. An exhaustive analysis of six of the diagrams in question can be found in Henry Corbin, “La science de la balance et les correspondances entre les mondes en gnose islamique (d’après l’oeuvre de Ḥaydar Āmulī, VIII^e/XIV^e siècle),” *EranoS* 42 (1973): 79–162; English translation, “The Science of the Balance and the Correspondences between Worlds in Islamic Gnosis,” in *Temple and Contemplation*, by Henry Corbin, trans. Philip Sherrard (London: KPI in association with Islamic Publications, 1986), 55–131. In view of the complicated nature of Ḥaydar Āmulī’s diagrams and the extensive textual material incorporated in them, it is not feasible to reproduce any of them here.

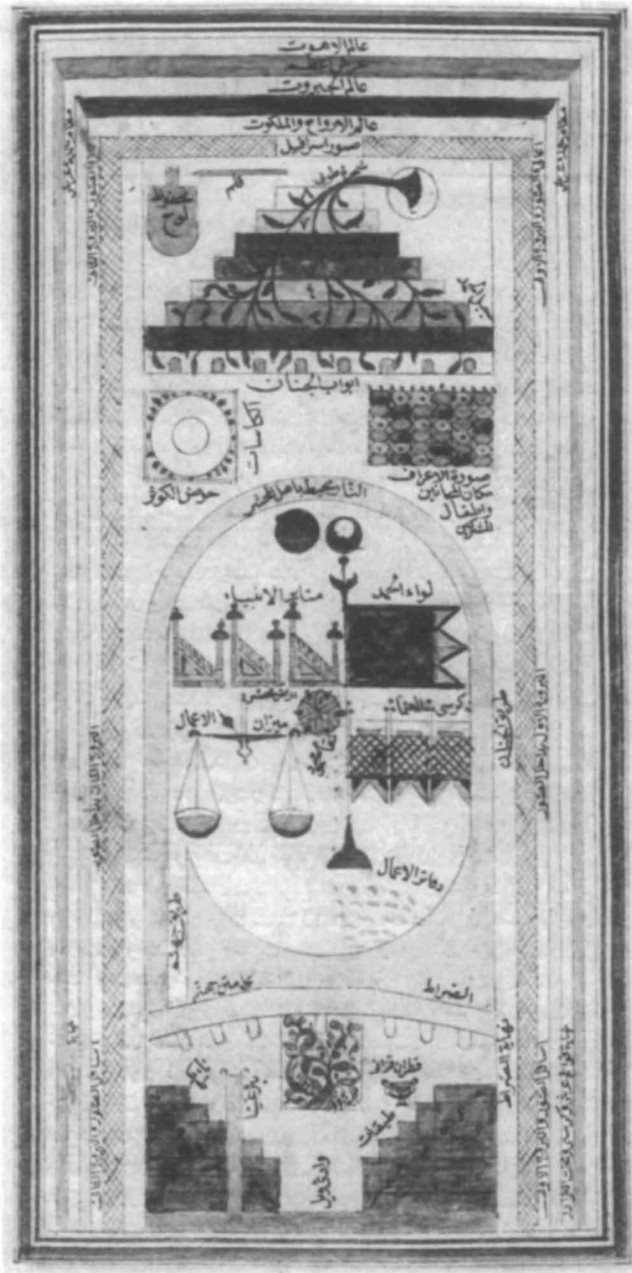


FIG. 3.18. THE "TOPOGRAPHY" OF THE DAY OF JUDGMENT FROM THE *MA'RIFETNĀME*. The place of resurrection and judgment is in the middle, surrounded by a circle of fire and complete with the balance with which human deeds are going to be weighed, the "deed records" (*dafātir*), and the banner of praise, as well as assigned seats for all the prophets and the religious scholars who are going to oversee the process of judgment. The only exit from this place of assembly leads to the straight path that stretches above hell at bottom: only those whose good deeds outweigh their sins will be able to cross this bridge over hell and take the route to paradise on top.

Size of the original: 19 × 9.3 cm. By permission of the British Library, London (MS. Or. 12964, fol. 24a).

what is intriguing about Ḥaydar Āmulī's cosmographies is the importance the author assigns to them: they are not mere illustrations. Instead they are conceived by Ḥaydar Āmulī as an independent section of the work in which they appear.³⁵ It is not easy to know the intended meaning of such autonomy of the graphic image vis-à-vis the written word, yet there is reason to think that the diagrams in question were not all the results of a conscious attempt at clarity of presentation. In at least some cases, the representation on paper, far from being a mere illustrative tool, records the real visionary experiences of the author.³⁶ It is most likely, therefore, that in Ḥaydar Āmulī's eyes the diagrams possessed a degree of directness and intimacy far surpassing the oblique and much attenuated residue of reality contained in the written text. The graphic, in this case, was a more representative medium for conveying spiritual and metaphysical realities than the verbal. As such it demanded "preferential treatment" from the author, who responded by turning into a "diagramologist." There were many others in the history of Islamic thought, as demonstrated in this chapter, who resorted to graphic representation at certain points along several disparate paths of cosmological speculation. But Ḥaydar Āmulī is quite singular in his belief in the representational power of diagrams. In this sense he is perhaps the only true "cosmographer" in that complex history.

RELIGIOUS COSMOGRAPHY

The preceding survey of the cosmographical drawings found in Islamic philosophical/scientific and Gnostic/mystical texts suggests that mainstream religious literature is on the whole devoid of cosmographical representation. While this is certainly a valid generalization, it

35. Ḥaydar Āmulī, *al-Muqaddimāt*, Arabic text, 18, par. 50, lines 18–20 and French introduction, 18–21 and 32–33 (note 8). In this passage, Ḥaydar Āmulī conceived of his work in seven sections: three preliminary sections (*tamhīdat*), three principal chapters (*arkān*), and the diagrams (*dawā'ir*). The number of diagrams is given as twenty-seven in this same section, though in fact twenty-eight all together are included in the work. It is probable that the number twenty-seven was meant to refer to the twenty-seven chapters of Ibn al-ʿArabī's *Fuṣūṣ al-ḥikam*, the work of which *al-Muqaddimāt* is ostensibly an interpretation.

36. Such is the case with *al-Muqaddimāt*, fig. 7 in the section of diagrams following the Arabic text (note 8). Ḥaydar Āmulī bases this diagram on a vision he saw in the night sky over Baghdad in the year 755/1354. In this vision the names were written in red while the figures were drawn in lapis lazuli blue. The "fourteen innocents" of Shīʿī Gnosis (the twelve Imams, the Prophet Muḥammad, and his daughter Fāṭimah) are arranged in a particular order around the square with the four Muḥammads and the four ʿAlis on the four corners. It is probable that the vision and its subsequent recording in a work devoted to the interpretation of Ibn al-ʿArabī's *Fuṣūṣ al-ḥikam* were occasioned by Ḥaydar Āmulī's reaction to Ibn al-ʿArabī's views on *walāyah*. This question is discussed by Henry Corbin in *Les fidèles d'amour*, 201–8 (note 32).

should not be imagined that the dislike of Muslim scholars of the “religious sciences” for cosmological speculation (and perhaps also for visual representation) was universal. A case in point is the complete religious cosmography found in the encyclopedic work titled *Maʿrifetnâme* (The book of Gnosis) by the aforementioned scholar-mystic İbrâhîm Hakkî (plate 3), which is accompanied by a striking “topographic” representation of the Day of Judgment (fig. 3.18).³⁷ The appearance of such exceptional visual renderings of the religious cosmos, complete with an eight-layered paradise on top of an eight-layered hell at bottom, in one of the most popular religious manuals in late Ottoman Turkish leaves open the possibility that similar cosmographies are to be

found in other late religious works in Islamic languages, even though no such drawings have yet come to my attention. Equally intriguing is the likelihood that loose cosmographical drawings circulated among the populace. The ground is shaky here, since documentation on popular culture is meager and mostly of very recent origin. Nonetheless, evidence in published works indicates that research on this front is sorely needed.³⁸

37. On Erzurumlu İbrâhîm Hakkî, see Ziya Bakıcıoğlu, “İbrahim Hakkî (Erzurumlu),” in *Türk Dili ve Edebiyatı Ansiklopedisi*, 6 vols. to date (Istanbul: Dergâh Yayınları, 1976–), 4:325–26.

38. See for instance, the two drawings reproduced in Malik Aksel, *Türklerde Dini Resimler* (Istanbul: Elif Kitabevi, 1967), 112 and 127.