Following the Steps of the Ikhwān al-Ṣafā' in the Ottoman World. II: ʿAbd al-Raḥmān al-Bisṭāmī and His *Tashjīr* Diagrams of Science*

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Abstract

In various places of his extensive production the fifteenth-century littérateur and occultist ʿAbd al-Raḥmān al-Bisṭāmī (d. 858/1454) presents a classification of the sciences in the form of a tree. In this paper we discuss four variants of this '*tashjīr*' representation from four different works of al-Bisṭāmī as they have come down to us in manuscripts. We compare these diagrams with one another, discuss their respective textual environments, and bring al-Bisṭāmī's arboreal representations in line with the classification of the sciences of the Ikhwān al-Ṣafā', their obvious source. By putting this *tashjīr* representation side by side with other examples of tree-shaped science classifications inside and outside the Islamic world, we seek to better assess al-Bisṭāmī's original contribution in turning the Ikhwān's system of organizing knowledge into a tree-shaped diagram.

Key Words

Ikhwān al-Ṣafā'; ʿAbd al-Raḥmān al-Bisṭāmī; Ramon Llull; Ottoman world; *tashjīr*; diagram of sciences

The significance of ʿAbd al-Raḥmān al-Bisṭāmī (d. 858/1454) in the transmission of science is being recognized today with ever greater unanimity and clarity. Over

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the last quarter of a century, scholarship has seen a remarkable burgeoning of studies highlighting different facets of this prolific littérateur, expert in *ʿilm al-ḥurūf* (the science of letters) and other occult disciplines, who spent most of his life traveling between the great centres of learning of the Mamluk and Ottoman courts and who never seemed to have tired himself of writing books of encyclopaedical nature and proportion.[1]

In line with al-Bisṭāmī's esoteric preoccupations and teaching and learning activities, various scholars have also sought to better understand the role he played as part of a group of intellectuals who used to define themselves as « Ikhwān al-Ṣafāʾ wa-Khullān al-Wafāʾ » (The Brethren of Purity and the Friends of Loyalty), in explicit reference to the tenth-century encyclopaedists and philosophers, authors of the famous *Rasāʾil* (Epistles).[2] As these investigators have shown, this extraordinary network, which linked the Mamluk, Timurid and Ottoman courts and included intellectuals such as Sayyid Ḥusayn Akhlāṭī (d. 799/1397), Molla Fenārī (d. 834/1431), Ṣāʾin al-Dīn Turka Iṣfahānī (d. 835/1432) or Sharaf al-Dīn ʿAlī Yazdī (d. 858/1454), began to exist from the end of the eighth/fourteenth century and remained active for the greatest part of the ninth/fifteenth century. In a recent study conducted jointly with Fatma Sinem Eryılmaz and dealing with the impact of the 'genuine' Ikhwān al-Ṣafāʾ on three universal histories of Ottoman times, it is suggested that the Neo-Ikhwān network

[1] See in particular: Denis Gril, « Ésotérisme contre hérésie: ʿAbd al-Raḥmān al-Bisṭāmī, un représentant de la science des lettres à Bursa dans la première moitié du XVe siècle », in Gilles Veinstein (ed.), *Syncrétismes et hérésies dans l'Orient seldjoukide et ottoman (XIVe–XVIIIe siècles). Actes du Colloque du Collège de France, octobre 2001*, Peeters, Paris 2005, p. 183–195; Noah Gardiner, « Forbidden Knowledge? Notes on the Production, Transmission, and Reception of the Major Works of Aḥmad al-Būnī », *Journal of Arabic and Islamic Studies*, 12 (2012), p. 81–143; Jean-Charles Coulon, « Building al-Būnī's Legend: The Figure of al-Būnī through ʿAbd al-Raḥmān al-Bisṭāmī's *Shams al-āfāq* », *Journal of Sufi Studies*, 5/1 (2016), p. 1–26; Noah Gardiner, « The Occultist Encyclopaedism of ʿAbd al–Raḥmān al-Bisṭāmī », *Mamluk Studies Review*, 20 (2017), p. 3–38; Id., « Lettrism and History in ʿAbd al-Raḥmān al-Bisṭāmī's *Naẓm al-sulūk fī musāmarat al-mulūk* », in Liana Saif, Francesca Leoni, Matthew Melvin-Koushki, Farouk Yahya (eds.), *Islamicate Occult Science in Theory and Practice*, Brill, Leiden – Boston 2021, p. 230–266.

[2] On this network, see also: Cornell H. Fleischer, « Ancient Wisdom and New Sciences. Prophecies at the Ottoman Court in the Fifteenth and Early Sixteenth Centuries », in Massumeh Farhad, Serpil Bağci (eds.), *Falnama, the Book of Omens*, Arthur Sackler Gallery. Smithsonian Institute, Washington 2010, p. 231–243; Matthew Melvin-Koushki, « The Quest for a Universal Science: The Occult Philosophy of Ṣāʾin Al-Dīn Turka Iṣfahānī (1369–1432) and Intellectual Millenarianism in Early Timurid Iran », Ph.D. Diss., Yale University 2012, p. 240–247; İlker Evrim Binbaş, *Intellectual Networks in Timurid Iran. Sharaf al-Dīn ʿAlī Yazdī and the Islamicate Republic of Letters*, Cambridge University Press, Cambridge UK 2016, in particular p. 104–113 (« The Ikhvān al-Ṣafāʾ: a Clandestine Network »); Matthew Melvin-Koushki, « The New Brethren of Purity: Ibn Turka and the Renaissance of Neopythagoreanism in the Early Modern Persian Cosmopolis », forthcoming in *Intellectual History of the Islamicate World*, 11/2 (2023).

may have extended to the Sufi Fethullah Çelebi (d. 969/1562), that is, to the time of Sultan Süleyman himself.[3]

The purpose of the present article is to go into more detail, and more systematically, on one aspect of this latter study, namely, the arboreal representations of the classification of knowledge as found in some places of al-Bisṭāmī's enormous production. The issue was also briefly touched upon by Veysel Kaya and Cornell H. Fleischer in recent publications, as will be noted below. In the following pages, I discuss four variants of this '*tashjīr*' representation from four different works of al-Bisṭāmī as they have come down to us in manuscripts. I compare these diagrams with one another, discuss their respective textual environments, and bring al-Bisṭāmī's arboreal representations in line with the classification of the sciences of the *Rasā'il Ikhwān al-Ṣafā'*, their obvious source. By putting this *tashjīr* representation side by side with other examples of tree-shaped science classifications inside and outside the Islamic world, I will seek to better assess al-Bisṭāmī's original contribution in turning the Brethren's system of organizing knowledge into a tree-shaped diagram. I shall deal respectively with the *Naẓm al-sulūk fī musāmarat al-mulūk*, the *Shams al-āfāq fī 'ilm al-ḥurūf*, the *Durrat tāj al-rasā'il wa-ghurrat minhāj al-wasā'il*, and the *al-Fawā'iḥ al-miskiyya fī l-fawātiḥ al-makkiyya*.

I. Naẓm al-sulūk fī musāmarat al-mulūk

The *Naẓm al-sulūk fī musāmarat al-mulūk* (The Ordering of Ways for the Conversation of Kings) is a treatise which al-Bisṭāmī completed in 833/1429–1430. This fascinating work purports to provide an eschatological vision of prophetic history extending from the creation of Adam to the author's own epoch. As part of its introductory chapter, the *Naẓm* contains material on the scientific achievements of nine 'peoples' or 'nations' (*umam*) and the related issue of how to organize knowledge.[4] In the holograph manuscript of this work preserved in Topkapı Library is found a beautiful representation of the disciplines (*al-funūn*) that make up human knowledge, shaped like a tree.[5]

[3] Fatma Sinem Eryilmaz, Godefroid de Callataÿ, « Following the Steps of the Ikhwān al-Ṣafā' in the Ottoman World. I: Insights from Three Universal Histories », forthcoming in *Journal of Islamic Studies*, 34/3 (2023).

[4] For an overview of this work, see Gardiner, « Lettrism ».

[5] Al-Bisṭāmī, *Naẓm al-sulūk*, Istanbul, Topkapı Sarayı Müzesi Kütüphanesi MS 1597, fol. 53a.

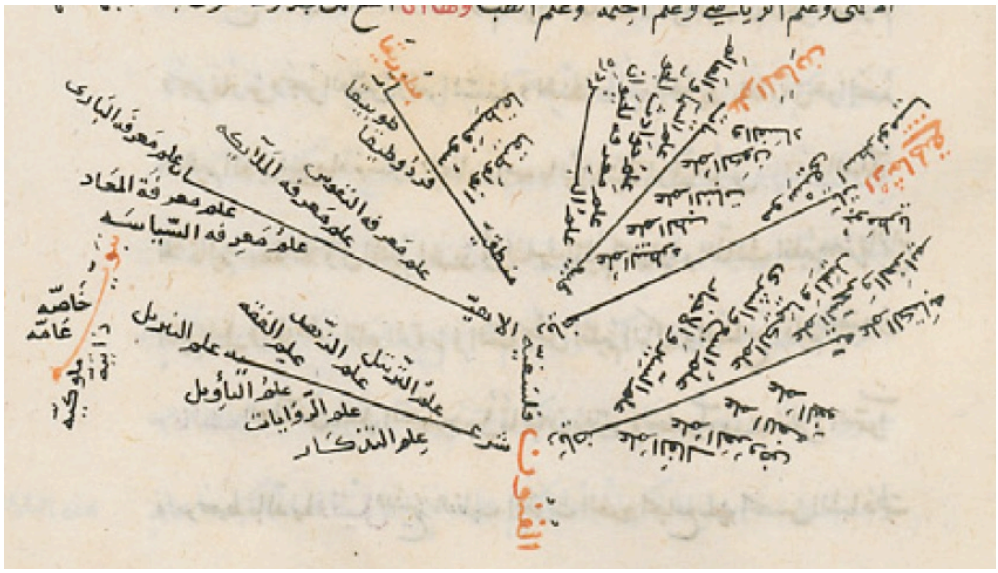

Fig. 1: The *tashjīr* in the *Naẓm al-sulūk*
Istanbul, Topkapı Sarayı Müzesi Kütüphanesi, MS 1597, fol. 53a
(© Topkapı Sarayı Müzesi Kütüphanesi)

The trunk is represented by the « philosophical » [disciplines] (*falsafiyya*), which branch out into four main divisions, namely « the mathematical » (*al-riyāḍiyyāt*), « the physical » (or « the natural », *al-ṭabīʿiyyāt*), « the logical » (*al-manṭiqiyyāt*), and « the divine » (*al-ilāhiyyāt*). Each of these branches is in turn made up of individual sciences, respectively 4, 9, 5, and 5, for a sum total of 23 philosophical disciplines. Governance (*siyāsa*), one of the divine sciences, has the unique particularity to be further subdivided into « domestic » (*khāṣṣa*), « public » (*ʿāmma*), « prophetic » (*nabawiyya*), « angelic » (*mulūkiyya*), and « private » (*dhātiyya*). In addition to the four branches of philosophy, another two groups of sciences emerge from the lower part of the trunk. Since the diagram does not show any soil around the base of the tree, it cannot easily be decided whether these latter groups – the « propaedeutical » (*riyāḍiyya*) and the « religious » (*sharʿiyya*), consisting of 9 and 7 sciences respectively, and bringing the sum total of sciences in the classification to 39 – should be regarded as two supplementary branches or as the two roots of the tree. What a closer look at the diagram reveals instead is that these two groups should be considered on a par with the group of philosophical sciences as a whole. Indeed, these three groups are all referred to by the mention of their names in the adjectival form (*falsafiyya*, *riyāḍiyya*, *sharʿiyya*), in contrast to the four parts of philosophy for which the substantival form is used (*riyāḍiyyāt*, *ṭabīʿiyyāt*, *manṭiqiyyāt*, *ilāhiyyāt*). As may be observed, all parts of the tree have been drawn in black ink, except for the word *al-funūn* at the base of the trunk and for the

following four disciplines (or sub-disciplines): arithmetic, mineralogy, rhetoric (here rather curiously spelled out as '*biṭūrīqā*') and prophetic governance. These few words are highlighted in red ink.

Any reader familiar with medieval Islamic classifications of knowledge will immediately identify Epistle 7 of the *Rasā'il Ikhwān al-Ṣafā'* as the source on which al-Bisṭāmī's tree diagram is based, as was pointed out by Veysel Kaya and Cornell Fleischer in recent contributions.[6] A glance at the two systems is enough to see that they agree on nearly everything, from the overall structure to the names of ramifications and to the appellations of individual disciplines (see appendix: « the classification of the Ikhwān al-Ṣafā' »).[7] Just like in Epistle 7, al-Bisṭāmī's *tashjīr* classification uses the same word for two distinctive groups of sciences: *riyāḍiyya* for the propaedeutical disciplines and *riyāḍiyyāt* for the mathematical ones.[8] Even the five-fold subdivision of the science of governance is found the same in both, as is also the contrasting use of adjectival and substantival forms that I have just mentioned in line with the hierarchy of disciplines.

In terms of content, the comparison of documents reveals that the only divergences from the Ikhwānian model are: 1) the incorporation of a science of « recitation » (*tartīl*) in the religious group; 2) the addition of three natural sciences – veterinary (*bayṭara*), medicine (*ṭibb*) and falconry (*bazdara*) – and the suppression of « the science of physical principles » in the same group. These are, admittedly, adaptations rather than major changes.

What distinguishes al-Bisṭāmī's classification from its model and makes it original with respect to it lies in the way this division of knowledge is presented, that is, in the diagrammatic form of a tree. We shall later seek to better situate al-Bisṭāmī's *tashjīr* in the overall history of arboreal representations of science

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[6] Veysel Kaya, « Abdurrahman Bistâmî'nin Bilimler Tasnifi », *Istanbul Üniversitesi Ilahihat Fakültesi Dergisi*, 35 (2016), p. 187–216 and « Abdurrahmān Bistāmī », in Henrik Lagerlund (ed.), *Encyclopedia of Medieval Philosophy: Philosophy between 500 and 1500*, 2nd edition, Springer Nature B. V., Dordrecht 2020, p. 1–4; Cornell H. Fleischer, « Learning and Sovereignty in the Fifteenth and Sixteenth Centuries », in Gülrü Necipoğlu, Cemal Kafadar, Cornell H. Fleischer (eds.), *Treasures of Knowledge. An Inventory of the Ottoman Palace Library (1502/3–1503/4)*, vol. I: *Essays*, Brill, Leiden – Boston 2019, p. 155–160.

[7] For the classification of the Ikhwān see my edition in Nader El-Bizri, Godefroid de Callataÿ, *The Epistles of the Brethren of Purity. On Composition and the Arts. An Arabic Critical Edition and English Translation of Epistles 6–8*, Oxford University Press in association with the Institute of Ismaili Studies, Oxford 2018, p. 71–96 of the Arabic edition, and p. 75–91 and 107–120 (introduction and English translation). See also Godefroid de Callataÿ, *Ikhwan al-Safa'. A Brotherhood of Idealists on the Fringe of Orthodox Islam*, Oneworld, Oxford 2005 (Makers of the Muslim World), p. 59–72 (« Encyclopaedism »).

[8] On this ambiguity in the Ikhwān see Carmela Baffioni, « Oggetti e caratteristiche del curriculum delle scienze nell'Enciclopedia dei Fratelli della Purità », in Gianni Di Stefano (ed.), *Studi arabo-islamici in memoria di Umberto Rizzitano*, Istituto di Studi Arabo-Islamici « Michele Amari », Mazara del Vallo 1991, p. 25–31.

classifications. For the moment, we shall limit ourselves to pointing out that this type of figuration is not found in the manuscripts of the *Rasā'il* and that it cannot even be inferred from the text. The paragraph introducing the classification of Epistle 7 refers to the genera of the sciences (*ajnās al-'ulūm*) and to the species of these genera (*anwā' tilka al-ajnās*)[9] but neither in this paragraph nor in the enumeration of groups and sciences that follow is there any term or concept suggesting a tree-form visual representation.

Let us now turn back to our holograph manuscript of the *Naẓm* and consider the lines that immediately precede al-Bisṭāmī's *tashjīr*. They deserve to be quoted in full:

> you should know that sciences, in spite of having numerous principles and of ramifying in various derivations (*ma'a tukaththiru usūl aṣnāfi-hā wa-tusha''ibu afnān furū'i-hā*), divide (*tanqasimu*) into religious (*shar'iyya*) and rational (*'aqliyya*). Religious sciences divide into practical (*'amaliyya*) and theoretical (*'ilmiyya*), and rational sciences into intuitive (*badīhiyya*) and acquired (*kasbiyya*). This said, there are six religious sciences: (1) Arabic (language) (*'ilm al-'arabiyya*), (2) principles of jurisprudence (*'ilm uṣūl al-fiqh*), (3) theology (*'ilm al-kalām*), (4) jurisprudence (*'ilm al-fiqh*), (5) exegesis (*'ilm al-tafsīr*), and (6) (prophetic) tradition (*'ilm al-ḥadīth*). There are six rational sciences: (1) logic (*'ilm al-manṭiq*), (2) physics (*'ilm al-ṭabī'ī*), (3) divine (*'ilm al-ilāhī*), (4) mathematics (*'ilm al-riyāḍī*), (5) philosophy (*'ilm al-ḥikma*), and (6) medicine (*'ilm al-ṭibb*). Here is a chart (*jadwal*) to inform you about the different sciences, and this is what it looks like (*ṣūra*).

What is curious about these lines is that they clearly do not tally with the Ikhwān's views. If we had to find a model for this organisation, we could perhaps think of the system devised by the tenth-century Khurasanian Abū l-Ḥasan al-'Āmirī (d. 381/992), who in his *Kitāb al-i'lām bi-manāfiq al-islām* (Expounding the Merits of Islam) similarly used a philosophical vs religious bi-partition to distribute eight of the above twelve disciplines, but this would leave the incorporation of the other four sciences unexplained anyway.[10] If al-'Āmirī's well thought-out construction

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[9] *Rasā'il Ikhwān al-Ṣafā'*, Epistle 7, ed. DE CALLATAŸ, p. 71.

[10] AL-'ĀMIRĪ, *I'lām bi-manāfiq al-islām*, ed. GHORAB, Dar al-Kâtib al-'Arabi, Cairo 1967, p. 84–85. Al-'Āmirī's distribution consists in placing three philosophical arts (physics, mathematics and metaphysics) and three religious arts (prophetic tradition, jurisprudence and theology) and their respective instruments (logic and language) opposite each other, the pairs between philosophical and religious disciplines being justified by the fact that they call upon either sensual perception, intellectual perception, or the combination of both. On this system, see: HANS HINRICH BIESTERFELDT, « Abū l-hasan al-'Āmirī und die Wissenschaften », in WOLFGANG VOIGT (ed.), *XIX. Deutscher Orientalistentag*, F. Steiner, Wiesbaden 1977, p. 335–341; WOLFHART HEINRICHS, « The Classification of the Sciences and the Consolidation of Philology in Classical Islam », in JAN WILLEM DRIJVERS, ALASDAIR A. MACDONALD (eds.), *Centres of Learning: Learning and Location in Pre-modern Europe and the Near East*, Brill, Leiden 1995, p. 119–139. Translation of the relevant pages in FRANZ

was really the source followed by al-Bisṭāmī, one may wonder what, for instance, could have motivated this latter to add a *'ilm al-ḥikma* (literally, the science of wisdom, but perhaps it just means philosophy here), a discipline that sounds so redundant in this context. In any case, it is obvious that there is a profound gap between the content of the lines quoted above and the chart that they are supposed to introduce. As will be seen, the study of other works by al-Bisṭāmī in which the *tashjīr* classification also appears will lead us to the same conclusion.

II. Shams al-āfāq fī 'ilm al-ḥurūf

As its title makes it clear, *Shams al-āfāq fī 'ilm al-ḥurūf* (The Sun of Horizons in the Science of Letters) is a pure treatise of lettrism, that is, as Noah Gardiner describes it in a recent article chiefly concerned with this work, « a cosmologically-oriented discourse on the powers of the Arabic alphabet and the names of God that, in certain iterations, including al-Bisṭāmī's, also encompassed occult practices such as divination and the making of talismans ».[11] Composed in 826/1423, this treatise also contains a section of the classification of sciences with the *tashjīr* representation of the Brethren's classification. Yet, in contrast to the harmonious proportions and regularity of the tree in the Topkapı Library copy of the *Naẓm*, the diagram in the BNF Arabe 2689 copy of the *Shams* seems to have been executed in haste and without care (cf. Fig. 2).[12]

Possibly for lack of space on the page, the tree is shown lying on its side within a rectangular frame, with the trunk horizontal and the branches therefore extending perpendicularly upwards and downwards with respect to the page. This horizontality is interesting to observe, for it reminds us that a *tashjīr* could be something more abstract than the figuration of a tree in nature. There are various elements in this representation that are almost illegible, truncated or simply missing. Some groups of sciences are not placed where they should be. There are even several disciplines that have been interchanged with others, under other headings, and without any coherence.[13] As for the text that immediately precedes

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ROSENTHAL, *The Classical Heritage in Islam*, University of California Press, Berkeley – Los Angeles 1975, p. 63–70.

11 GARDINER, « The Occultist Encyclopedism », here p. 8.

12 AL-BISṬĀMĪ, *Shams al-āfāq*, Paris, Bibliothèque Nationale de France MS Arabe 2689, fol. 40v.

13 For other examples of distortion in the transmission of al-Bisṭāmī's *tashjīr* diagrams, see FLEISCHER, « Learning », here p. 159: « From the late sixteenth century, scribes producing copies of the popular *Fawā'iḥ* or *Naẓm*, charged with reproducing, among other things, the Tree of Sciences, show themselves to have been largely flummoxed by the inclusion of Politics as a branch of Metaphysics, presumably because the inclusion made no sense to them. The subcategories of *siyāsa* [...] fade away, *siyāsa* is not even recognized, sometimes rendered as the more metaphysical-sounding *sā'a* (The Hour), and sometimes reduced to unrecognizable scrawl. The later unrecognizability of the world of the fifteenth century is writ large, and tellingly so ».

the *tashjīr*, it is the same as in the *Naẓm* but it is complemented here with two popular sayings on the opposition of science and ignorance. In the first is found the classical definition of science as « being cognizant of the knowable the way it is » (*ma'rifa al-ma'lūm 'alā mā huwa bi-hi*).[14] The second, which al-Bisṭāmī perhaps found in lettrist circles of his time, is meant to correspond more closely to his own views: « If you say 'what is wisdom?,' we will say: 'esoteric knowledge (*bāṭin al-'ilm*) is in that the [genuine] sage (*al-ḥākim*) sees wideness in narrowness, whereas he whose wisdom is constrained (*al-maḥkūm 'alay-hi bi-l-ḥikma*) sees narrowness in wideness' ».

Interestingly, the page facing the *tashjīr* in the manuscript also includes a rectangular frame, but this time vertical. Within this frame, technically referred to as a synoptic table (*taqwīm*) are listed, in two columns, the sixty sciences that make up the celebrated classification of the Persian scientist and theologian Fakhr al-Dīn al-Rāzī (d. 606/1209) (cf. Fig. 3).

They are taken from his *Ḥadā'iq al-anwār fī ḥaqā'iq al-asrār* (Gardens of Radiances in the Realities of Secrets), as al-Bisṭāmī this time explicitly acknowledges.[15] Also known as *Jawāmi' al-'ulūm* (Compendium of sciences) – or *Jāme' al-'olūm*, since this work was written in Persian –, this typical representative of the encyclopaedic genre became immensely popular. It circulated in several versions with various enumerations of the scientific disciplines, but it is the one counting 60 sciences, frequently referred to in later literature as *Kitāb al-sittīn* / *Ketāb-e Settīnī* (Book of sixty), that became the most influential.[16] With only minor discrepancies attributable to the vagaries of the manuscript transmission, we observe that al-Bisṭāmī faithfully follows the sequence in which the sciences are treated in the

[14] For an extensive list of definitions of knowledge in medieval Islamic literature, see Franz Rosenthal, *Knowledge Triumphant. The Concept of Knowledge in Medieval Islam,* with an Introduction by Dimitri Gutas, Brill, Leiden – Boston 2007, p. 46–69.

[15] al-Bisṭāmī, *Shams al-āfāq*, Paris, Bibliothèque Nationale de France MS Arabe 2689, fol. 41r (for the table with the sixty sciences) and 41v (for the mention of the source).

[16] On Fakhr al-Dīn al-Rāzī's *Kitāb al-sittīn* and its place in Islamic encyclopaedic literature see: Hans Hinrich Biesterfeldt, « Medieval Arabic Encyclopedias of Science and Philosophy», in Steven Harvey (ed.), *The Medieval Hebrew Encyclopedias of Science and Philosophy*. *Proceedings of the Bar-Ilan University Conference*, Springer, Dordrecht – Boston – London 2000, p. 77–98, here p. 97–98; Hans Hinrich Biesterfeldt, « Arabisch-islamische Enzyklopädien: Formen und Funktionen », in Christel Meier (ed.), *Die Enzyklopädie im Wandel vom Hochmittelalter bis zur Frühen Neuzeit*. *Akten des Kolloquiums des Projekts D im Sonderforschungsbereich 231 (29. 11.– 1. 12. 1996)*, Fink, München 2002, p. 43–83, here p. 76–78; Živa Vesel, *Les encyclopédies persanes. Essai de typologie et de classification des sciences*, Editions Recherche sur les Civilisations, Paris 1986, p. 35–38 ; Ead., « Les encyclopédies persanes: culture scientifique en langue vernaculaire », in Godefroid de Callataÿ, Baudouin Van den Abeele (ed.), *Une lumière venue d'ailleurs : Héritages et ouvertures dans les encyclopédies d'Orient et d'Occident au Moyen Age, Actes du colloque international de Louvain-la-Neuve (19–21 mai 2005)*, Brepols, Turnhout 2008 (Réminisciences, 9), p. 49–89, here p. 66–89 (including an appendix [based on the summary of the *Jāme' al-'olūm* in the Bombay facsimile edition of M. Tasbīḥī] which details each science and seeks to provide a better understanding of the internal organisation of the work).

original work, a sequence whose internal logic may not be immediately perceptible but which nevertheless clearly separates the religious/traditional sciences (from 1 to 22) and the rational/intellectual sciences (from 23 to 60).[17]

In short, we find ourselves again in front of a text in which different systems to organize human knowledge are placed side by side without further explanation. Of the three classifications provided by al-Bisṭāmī in the *Shams*, only that of al-Rāzī, here put on a tabular form, is duly acknowledged in the text. The fact that the other two are found the same here as in the *Naẓm* suggests that the author, while confronted with the problem of classifying sciences, limits himself to producing one or other of the models that he knows, but the question remains whether the *tashjīr* representation is his invention or if he took it up from somewhere else.

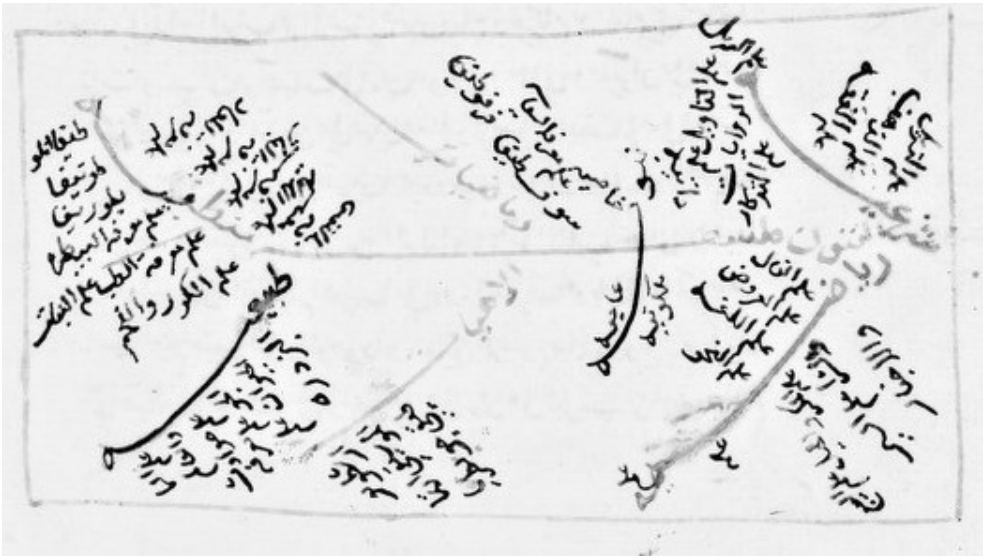

Fig. 2: The *tashjīr* in the *Shams al-āfāq*
Paris, Bibliothèque Nationale de France, MS Arabe 2689, fol. 40v
(© Bibliothèque Nationale de France)

[17] For this list being slightly divergent from that found in the above-mentioned summary of the *Jāme' al-'olūm* (which consists of 21 traditional and 39 intellectual disciplines, the last of which being the science of chess), see Vesel, « Les encyclopédies persanes », p. 68, n. 75.

Fig. 3: The *taqwīm* in the *Shams al-āfāq*, with Fakhr al-Dīn al-Rāzī's 60 sciences
Paris, Bibliothèque Nationale de France, MS Arabe 2689, fol. 41r
(© Bibliothèque Nationale de France)

III. Durrat tāj al-rasā'il wa-ghurrat minhāj al-wasā'il

The *Durrat tāj al-rasā'il wa-ghurrat minhāj al-wasā'il* (The Pearl in the Crown of Epistles and the Finest Modes of Connections) is an auto-biographical and auto-bibliographical treatise which al-Bisṭāmī composed in 834/1430–1431, one year after the *Naẓm*. This work, whose text is preserved in only one known copy, namely Istanbul, Süleymaniye Nuruosmaniye Library MS 4905, also contains a *tashjīr* representation of the Ikhwān's classification.

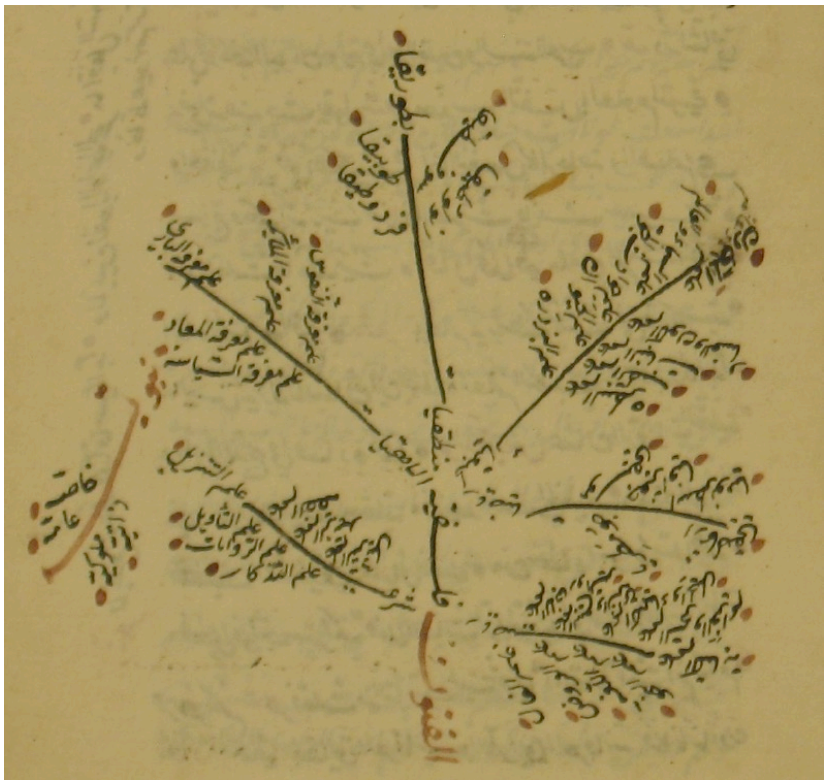

Fig. 4: The *tashjīr* in the *Durrat tāj*
Istanbul, Süleymaniye Nuruosmaniye Library, MS 4905, fol. 20r
(© Süleymaniye Nuruosmaniye Library)

This *tashjīr* looks very much like that of the *Naẓm*. Like this latter, it features a vertical and elegantly drawn tree, with a similar disposition of the branches. A closer look reveals that it also corresponds to it in almost every detail. The only divergence in the names of sciences is the replacement of geometry (*jumaṭriyā*) with geography (*jūghrāfiyā*), which is likely to be a confusion from the copyist – a

confusion all the more excusable as there exists an epistle of geography in the *Rasā'il Ikhwān al-Ṣafā'*. This epistle occupies the fourth position in the corpus, which means that it strikingly cuts off the disciplines of the quadrivium in two groups: on the one hand, arithmetic, geometry and astronomy (in 1 to 3), and on the other hand, music (in 5).

Here again it seems worthwhile quoting the lines that introduce the figure:

> As you should know, the nations that took interest in science and inventions (*istinbāṭ*) were the Indians, the Persians, the Chaldeans, the Jews, the Copts, the Romans, the Greeks, and the Arabs. In the year 568 from the death of Moses – peace be upon him! – appeared the nation of the Greeks. All rational sciences – the logic, the natural, mathematical and the divine – derive from them. They used to call philosophers those learned in these sciences. There were groups (*ṭawā'if*) of Indian, Persian and Greek philosophers. Here is a tree (*shajara*) to inform you about the scientific disciplines (*al-funūn al-'ilmiyya*), and this is what it looks like.[18]

The reference to the nations with an interest in science reminds us of the section on *umam* in the *Naẓm*, although the two texts do not set out exactly the same doctrine. In the *Naẓm* we are told of nine nations in all, eight of which corresponding to ethnic or religious groups such as the Greeks, the Jews or the Ṣābi'ans, and the last one identified as the « the nation of the wise men » or « the nation of the philosophers » (*ummat al-ḥukamā'*). This latter group, to which the author devotes all his attention, transcends these divisions: its members « are distinguished by their access to higher realms of knowledge rather than by confession or ethnicity ».[19] In the lines quoted above, there is no question of this special group and the division between the remaining eight nations is purely ethnic. The source followed here by al-Bisṭāmī is Ṣā'id al-Andalusī (d. 462/1070), who in the *Ṭabaqāt al-umam* (Categories of Nations) discusses the scientific achievements of the same eight nations.[20] It is possible that al-Bisṭāmī had access to Ṣā'id through Abū l-Fidā' (d. 732/1331), since this latter closely follows the *Ṭabaqāt* in the *Mukhtaṣar fī akhbār al-bashar* (Compendium of human history) and provides there also the same chronological indication in relation to Moses's death.[21] Otherwise, what is worth observing in the lines quoted above is that they do not betray, as our previous examples did, a profound hiatus between the text

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18 AL-BISṬĀMĪ, *Durrat tāj*, Istanbul, Süleymaniye Nuruosmaniye Library MS 4905, fol. 20r.

19 GARDINER, « Lettrism », here p. 245.

20 ṢĀ'ID AL-ANDALUSĪ, *Ṭabaqāt al-umam*, ed. CHEIKHO, Institut für Geschichte der arabish-islamischen Wissenschaften, Frankfurt am Main 1999, p. 7: « As to the nations that took interest in science they are eight: the Indians, the Persians, the Chaldeans, the Jews, the Greeks, the Romans, the Egyptians, and the Arabs ».

21 See ABŪ L-FIDĀ', *Mukhtaṣar fī akhbār al-bashar*, ed. MAḤMŪD DAYYŪB, Dār al-kutub al-'ilmiyya, Beirut 1997, vol. I, p. 134–135.

and the visual representation (here explicitly referred to as a *tashjīr* diagram) that illustrates it. Banal and conventional as it is, the evocation of the Greeks as masters in the four branches of philosophy fits nicely with what the tree diagram is meant to represent. That the tree is entirely modelled upon the Ikhwān's classification without this being acknowledged suggests that their encyclopaedia never ceased to be an important link in the transmission of Greek philosophy to Islam and that it could still serve as an ideal introduction to each of its parts in al-Bisṭāmī's time.

IV. al-Fawā'iḥ al-miskiyya fī l-fawātiḥ al-makkiyya

We will close this review of al-Bisṭāmī's tree diagrams with the one found in the introduction to his *al-Fawā'iḥ al-miskiyya fī l-fawātiḥ al-makkiyya* (Musky Scents on the Meccan Revelations), a massive encyclopaedic work our author put an end to in the early 840s/1440s after collecting material for decades (cf. Fig. 5). The presence of a *tashjīr* classification of the sciences in this treatise is nothing to be surprised about since the *Fawā'iḥ* is probably of all of al-Bisṭāmī's works the one most concerned with the problem of classifying knowledge. Since the decisive impact of the Ikhwān on this treatise has already been discussed in some detail by Veysel Kaya in the article mentioned above,[22] we shall limit ourselves here to examining the *tashjīr* diagram itself, again in relation with the surrounding textual information.

The *tashjīr* as we find in the manuscript of the Süleymaniye Kütüphanesi Hamidiye much resembles those of the *Naẓm* and the *Durrat Tāj* in style, disposition and content, except that half of the disciplines making up the branch of natural sciences have been left aside, apparently by negligence. As in the other two diagrams, some concepts are also written in red but, excepted for *al-fūnūn* and *nabawiyya*, words in red most generally do not coincide in general. This *tashjīr* is preceded by the following lines, which once again take us back to the indebtedness to the Greeks in terms of rational sciences:

> They called philosopher whoever is an expert in them. It is said that wisdom [or philosophy] (*ḥikma*) came down from the heavens by means of three organs (*a'ḍā'*) [belonging] to peoples of the earth: the brains of the Greeks (*admighat al-yūnān*), the hands of the Chinese (*aydī ahl al-ṣīn*) and the tongues of the Arabs (*alsinat al-'arab*). May al-Shāfi'ī – May God Most-High be satisfied with him – return to God, he who says: « poetry (*shi'r*): cleanse the soul with sciences (*al-'ulūm*) to make it ascend and to preserve everything, for [this soul] is a house for everything. The soul is like a glass bottle: science is the lamp and the wisdom of God the oil. If it is visible, you are alive. If it is dark, you are dead ». Here is a tree (*shajara*) to inform you of the

[22] KAYA, « Abdurrahman Bistâmî'nin Bilimler Tasnifi ».

conventional disciplines (*al-funūn al-rasmiyya*) and the branches of wisdom (*al-shujūn al-ḥikmiyya*). This is what it looks like.[23]

That wisdom came down from the heavens through the organs of these three nations of the earth is a traditional Arabic saying, which one comes across in various medieval texts. The same holds true for the glass bottle analogy of the soul, elaborated from the Verse of Light (Q. 24:35). Al-Bisṭāmī may have derived them from a variety of sources, but the mention of al-Shāfi'ī makes it a plausible reference to the Shāfi'ī theologian and jurist Ibn Khallikān (d. 681/1282), who cites both maxims in his *Wafayāt al-a'yān wa-anbā' al-zamān* (Deaths of the Eminent Men and History of the Sons of the Epoch).[24] As in the *Durrat tāj*, the diagram is specifically defined as a tree (*shajara*).

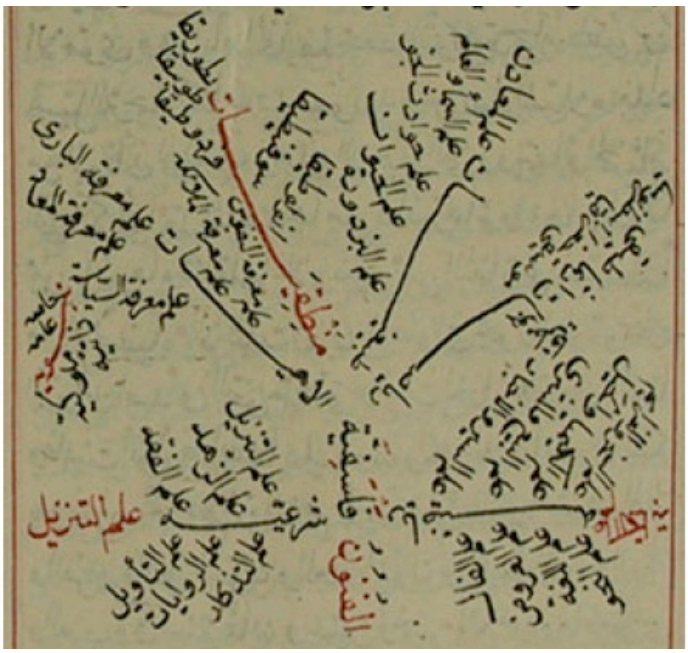

Fig. 5: The *tashjīr* in the *Fawā'iḥ al-miskiyya*
Istanbul, Süleymaniye Kütüphanesi Hamidiye, MS MS 688, fol. 12b
(© Süleymaniye Kütüphanesi Hamidiye)

[23] AL-BISṬĀMĪ, *Fawā'iḥ*, Istanbul, Süleymaniye Kütüphanesi Hamidiye MS 688, fol. 12b.

[24] IBN KHALLIKĀN, *Wafayāt al-a'yān wa-anbā' al-zamān* (Deaths of the Eminent Men and History of the Sons of the Epoch), translated by BARON DE SLANE as *Ibn Khallikān's Biographical Dictionary*, 1842–1874, (5/7, 811 and 2/7, 311). For these lines of poetry, attributed to Ibn Sīnā, in line with the concepts of *ḥikma* and *'ilm*, see ROSENTHAL, *Knowledge Triumphant*, p. 40. See also BINYAMIN ABRAHAMOV, « Ibn Sīnā's Influence on al-Ghazālī's Non-Philosophical Works », *Abr-Nahrain*, 29 (1991), p. 1–17, here p. 8–12.

V. *Diagramming the Brethren's Classification: al-Bisṭāmī's Invention?*

Al-Bisṭāmī's literary production is immense and has remained, for a good part, unchartered territory.[25] The greatest part of this bulky corpus of writings still awaits to be edited. It is eminently possible that in the multitude of extant manuscripts several other variants of the *tashjīr* diagram will come to light, but the four examples we have collected and discussed above are sufficient at least to draw some elementary conclusions. First, the fact that these examples come from four different texts shows how important al-Bisṭāmī viewed the issue of organizing knowledge and how attached he remained to this topic throughout is life. Secondly, the fact that this diagram is reproduced essentially the same in manuscripts, irrespective of the nature of the works in which they appear, seems to indicate that al-Bisṭāmī was, as it were, in the habit of spontaneously resorting to it in a wide variety of contexts touching the Greeks and their genius in rational thinking but not necessarily in close relation to the classification of sciences *per se*. Thirdly, that no explicit or implicit reference is made in these places to the Ikhwān al-Ṣafā' suggests that their classification had acquired the status of a standard model on the subject, on a par with, or perhaps even more than above, Fakhr al-dīn al-Rāẓī's *Kitāb al-sittīn*. This confirms a point that I have already stressed elsewhere in various places: in addition to being an ideal model of introduction to philosophy and a convenient encyclopaedic work to use and to refer to, the corpus of *Rasā'il Ikhwān al-Ṣafā'* offered to later authors the great advantage to be anonymous, a circumstance which cannot but have encouraged later scholars to draw on them freely, whether in an acknowledged or unacknowledged manner.[26]

Recent scholarship on al-Bisṭāmī's indebtedness to the *Rasā'il* reveals that his works do include some references to their anonymous authors in the form of subtle allusions. Thus, the prologue of the *Naẓm* includes an unmistakable reference to « the Brethren of Purity and the Friends of Loyalty » (*ikhwān al-ṣafā' wa-khullān al-wafā'*), as Gardiner observed,[27] and the same kind of shibboleth-like formulations were also detected by Kaya in various other works, including the

[25] For the author's assertion that he wrote more than 180 treatises, see AL-BISṬĀMĪ, *Durrat tāj*, Istanbul, Süleymaniye Nuruosmaniye Library MS 4905, fol. 21b–37b.

[26] GODEFROID DE CALLATAŸ, « Did the Ikhwān al-Ṣafā' inspire Ibn Ṭufayl to his *Ḥayy Ibn Yaqdhān*? », *Ishraq: Islamic Philosophy Yearbook*, 3 (2012), p. 82–89; ID., « From Ibn Masarra to Ibn 'Arabī: References, Shibboleths and Subtle Allusions to the *Rasā'il Ikhwān al-Ṣafā'* in the Literature of al-Andalus », in ANTONELLA STRAFACE, CARLO DE ANGELO, ANDREA MANZO (eds.), *Labor Limae. Studi in onore di Carmela Baffioni*, as *Studi Magrebini*, 12–13 (2014–2015), vol. XII, p. 217–267; ID., « Who Were the Readers of the *Rasā'il Ikhwān al-Ṣafā'*? », *Micrologus. Nature, Sciences and Medieval Societies*, 24 (2016), p. 269–302.

[27] GARDINER, « Lettrism and History », p. 234.

Fawā'iḥ.[28] On the other hand, and perhaps because of this roundabout allusion to the Ikhwān in the prologue, we observe that extensive parts of the *Naẓm* are taken up verbatim from the *Rasā'il* without further acknowledgement. Interestingly, this is the case for the geographical section that immediately follows the *tashjīr* diagram in our manuscript, and which is for the most part a literal reiteration from Epistle 4 of the Ikhwān.[29]

With this in mind we are left with one final question: did al-Bisṭāmī himself conceive the tree diagram or did he find it ready for use in one of his sources? As previously mentioned, we should start by ruling out that al-Bisṭāmī could have derived the *tashjīr* from the Ikhwān's encyclopaedia itself. As opposed to other epistles such as those on arithmetic, geometry, astronomy or geography, which contain visual material in the form of tables, charts and schematic drawings of various types, manuscripts of Epistle 7 do not feature anything of this kind and neither is there to be found in the text any term or concept that can even remotely evoke an arboreal organisation of the classification. On the other hand, using tree diagrams was such a wide-spread technique in the Middle Ages (possibly also in Late Antiquity)[30] and the number of works possibly consulted by al-Bisṭāmī so large[31] that identifying the source he could have used is like looking for a needle in a haystack. Besides, as was pointed by Michael Evans in a seminal contribution to the field of medieval diagram representations,

> such designs (called *figurae* in Latin, *schemata* in Greek) are more widespread in medieval manuscripts than is usually realised, but difficult to locate through

[28] Kaya, « Abdurrahman Bistâmî'nin Bilimler Tasnifi », p. 199, n. 28.

[29] Compare al-Bisṭāmī, *Naẓm al-sulūk*, Istanbul, Topkapı Sarayı Müzesi Kütüphanesi MS 1597, fol. 53b–54a with Epistle 4 in Ignacio Sánchez, James Montgomery, *The Epistles of the Brethren of Purity. On Geography. An Arabic Critical Edition and English Translation of Epistle 4*, Oxford University Press in association with the Institute of Ismaili Studies, Oxford 2014, p. 16–23 of the Arabic edition, and p. 55–56 (English translation).

[30] For discussions of the origin and development of the *tashjīr* and similar techniques, see: John E. Murdoch, *Album of Science: Antiquity and the Middle Ages*, Scribner's Sons, New York 1984, p. 38–51; Emilie Savage-Smith, « Galen's Lost Ophthalmology and the 'Summaria Alexandrinorum' », *Bulletin of the Institute of Classical Studies*, 77 (2002), p. 121–138; Pippa Salonius, Andrea Worm, « Introduction », in Pippa Salonius, Andrea Worm (eds.), *The Tree. Symbol, Allegory, and Mnemonic Device in Medieval Art and Thought*, Brepols, Turnhout 2014 (International Medieval Research 20), p. 1–12; Annemieke R. Verboon, « The Medieval Tree of Porphyry: An Organic Structure of Logic », in Salonius, Worm (eds.), *The Tree*, p. 95–116; Jeremy Kurzyniek, « Diagramming the Bedroom Sciences in 'Alī ibn Naṣr al-Kātib's *Jawāmīʿ al-ladhdha* », in Nadia M. El Cheikh, Bilal Orfali (eds.), *Approaches to the Study of Pre-Modern Arabic Anthologies*, Brill, Leiden 2021 (Islamic History and Civilization, 180), p. 103–148; Ayelet Even-Ezra, *Lines of Thought. Branching Diagrams and the Medieval Mind*, The University of Chicago Press, Chicago – London 2021, especially p. 16–25.

[31] For the list of 238 works (all of which on the occult) that al-Bisṭāmī claims in the *Shams al-āfāq* to have read, see Gardiner, « Occultist Encyclopedism », p. 30–38.

> catalogue entries, since their neglect by art historians is generally matched by that of librarians, who omit them from codicological descriptions.[32]

In the context of Arab-Islamic classifications of sciences, the example that immediately comes to mind is that of the mid-fourth/tenth century scholar Ibn Farīghūn, who uses *tashjīr* representations throughout his *Jawāmiʿ al-ʿulūm* (Compendium of the sciences) (cf. Fig. 6).[33] In various of his publications, Hans Hinrich Biesterfeldt has already commented on this (in his view)

> comparatively rare method of visualizing the progressive diaeresis of superordinate concepts (in this case of various scientific domains with their respective sub-disciplines and professional areas, the respective kinds of expertise required for them, etc.) in the form of 'trees' whose 'branches' are marked by lines in black or red ink .[34]

As was stressed by Biesterfeldt, Ibn Farīghūn's treatise can be considered a worthy representative of the *Fürstenspiegel* tradition in medieval Islam.[35] Extensive and systematic as the recourse to *tashjīr* figurations in this work is, tree diagrams are there used to represent different facets of a kaleidoscopic range of disciplines rather than to illustrate the intrinsic coherence of human knowledge as generally assumed by the philosophers. Consequently, even if Ibn Farīghūn's *Compendium* includes in its penultimate section some diagrams in line with philosophical, metaphysical and logic matters, a tree to represent all the sciences at once, such as al-Bisṭāmī's *tashjīr*, is nowhere to be found in it. Additionally, and more importantly still, it will be remembered with Biesterfeldt that in the history of Islamic classifications the *Jawāmiʿ* is best defined as a « dead end », with « its scanty manuscript tradition and more importantly [with] the fact that it is not referenced in later works and that the name of its author was completely forgotten ».[36] In spite of a close resemblance in the technique – the ramification of key-concepts, written

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[32] Michael W. Evans, « The Geometry of the Mind », *Architectural Association Quarterly*, 12 (1980), p. 32–55, here § 3.1 « Figurae ».

[33] For a recent but poorly reliable edition of the treatise, see Ibn Farīʿūn (sic), *Kitāb Jawāmiʿ al-ʿulūm*, ed. Qays Kāẓim al-Janābī, Maktabat al-thaqāfat al-dīniyya, Cairo, 1328/2007. For a facsimile edition of one of the few extant manuscripts of the work, see Ibn Farīʿūn (sic), *Compendium of the Sciences. Jawāmiʿ al-ʿulūm. Facsimile of ms 2768, Ahmet III Collection, Topkapı Sarayı Library*, ed. F. Sezgin, Institut für Geschichte der arabish-islamischen Wissenschaften, Frankfurt am Main 1985. I am grateful to Hinrich Biesterfeldt for sharing with me his copy of this rare facsimile edition.

[34] Hans Hinrich Biesterfeldt, « Ibn Farīghūn », in Ulrich Rodolph, Rotraud Hansberger, Peter Adamson (ed.), *Philosophy in the Islamic World*, Brill, Leiden – Boston 2017, p. 246–249, here p. 247.

[35] Hans Hinrich Biesterfeldt, « Ibn Farīghūn's *Jawāmiʿ al-ʿulūm*: Between Classification of Sciences and Mirror for Princes », in Regula Forster, Neguin Yavari (ed.), *Global Medieval: Mirrors for Princes Reconsidered* (Ilex Foundation), Harvard University Press, Boston 2015, p. 11–25.

[36] Biesterfeldt, « Ibn Farīghūn's *Jawāmiʿ al-ʿulūm* », here p. 23.

in red or black ink –, it is most unlikely that Ibn Farīghūn could have been a direct source of inspiration to al-Bisṭāmī.

From a purely conceptual viewpoint, al-Bisṭāmī's *tashjīr* has more in common with « the Tree of All Sciences » from Ramon Llull's celebrated *Arbor scientiae*, a work written in the years 1295-1296 when its author was in Rome. The *Arbor scientiae*, of which a Catalan version also exists,[37] is an encyclopaedical treatise of massive proportions generally acknowledged as the most accomplished and successful effort of medieval times to present human knowledge in the form of trees. The work consists in the textual description of sixteen allegorical trees, each one divided into seven parts (roots, trunk, branches, twigs, leaves, flowers and, fruit) to represent a specific science, such as *Arbor elementalis* (Tree of Elements), *Arbor humanalis* (Tree of Man) or *Arbor maternalis* (Tree of the Virgin Mary). In addition to these sixteen individual trees that make up Llull's « Forest Encyclopaedia » – to take up Frances Yates's formulation in her pioneering study on « the Art of Ramon Llull »[38] –, the work also evokes an inclusive tree more in keeping with the title of the work and designed to represent in a synthetic manner « all the sciences that it is possible to deal with through these sixteen trees ».[39] It is with the figure of this universal Tree of Knowledge that the treatise opens in the illustrated editions that were being printed from early in the sixteenth century, although there is today a general agreement among scholars that Llull conceived his trees as mental representations and that these were turned to visual objects only at a later stage (cf. Fig. 7).

In the illustrations from the Renaissance editions, the tree appears with eighteen roots, representing nine transcendent principles (such as *virtus* or *gloria*)

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[37] Alexander Fidora, « Noch einmal '*Arbor scientiae* oder *Arbre de sciencia*'. Zum Verhältnis von lateinischer und katalanischer Fassung der llullschen Enzyklopädie », *Faventia*, 25/2 (2003), p. 67–73.

[38] Frances A. Yates, « The Art of Ramon Llull », *Journal of the Warburg and Courtauld Institutes*, 17/1–2 (1954), p. 115–173, here p. 151. On the encyclopaedical nature of Llull's treatise, see Lola Badia, « The *Arbor Scientiae*: A 'New' Encyclopedia in the Thirteenth-Century Occitan-Catalan Cultural Context », in Fernando Domínguez Reboiras (ed.), *Arbor Scientiae: der Baum des Wissens von Ramon Llull. Akten des Internationalen Kongresses aus Anlaß des 40-jährigen Jubiläums des Raimundus-Lullus-Instituts der Universität Freiburg im Brisgau*, Brepols, Turnhout 2002 (Instrumenta patristica et mediaevalia, 42), p. 1–19.

[39] Ramon Llull, *Arbor scientiae*, ed. Villalba i Varneda, Brepols, Turnhout 2000 (Corpus christianorum. Continuatio mediaevalis 180A; Raimundi Lulli Opera Latina 24), vol. I, p. 8: « Per has sedecim arbores de omnibus scientiis tractari potest ». On the title of the book and the use of the singular form therein, see Anthony Bonner, « The Structure of the *Arbor scientiae* », in Domínguez Reboiras (ed.), *Arbor Scientiae*, p. 21–34, here p. 33: « We must take Llull's title literally. He presents us with sixteen trees, but he does not call the work *Arbores scientiae*, and although he shows it is general to all sciences, he does not call it *Arbor scientiarum*, as some Renaissance commentators tried to rename it. It is simply the *Arbor scientiae*, with both nouns in the singular ».

on the left and nine art principles (such as *differentia* or *aequalitas*), and with sixteen branches for each of the individual domains discussed in the rest of the book. The image also features Llull and a monk discussing on either side of the trunk. As Evans notes, the *Arbor Scientiae* « is both the tree under which Llull met the monk who prompted him to compile the new redaction of his work, and the conventional form in which to expound it ».[40]

Placed next to each other, Llull's allegorical tree and al-Bisṭāmī's *tashjīr* have an undeniable air of resemblance. In their endeavour to organise the whole of human knowledge as a tree, the Christian and the Islamic metaphors pursue the same fundamental objective and use the same visual symbol. In the detail, however, they could hardly be more at variance with one another. Not a single arrangement of disciplines is found the same, nor any other peculiarity which could suggest some kind of continuity. Some historians of art hold the view that they belong to two different traditions technically referred to as « tree-diagrams » (as with Llull) and « branch-diagrams » (as with al-Bisṭāmī) and that the former never transferred to the East,[41] which would suggest therefore invalidating *ab ovo* any possibility that Llull's *Arbor Scientiae*, or one of its numerous followers, could have had on al-Bisṭāmī. This means that we are faced with another dead end.

Now we may ask ourselves whether we could not as well consider things in the opposite direction, that is, from the Arab-Muslim world to Ramon Llull. The question of the influence of Arab authors on the Catalan mystic and philosopher has never ceased to be hotly debated. As Anna Akasoy and Alexander Fidora point out, « a variety of possible connections have been suggested and discussed, at times quite controversially. These potential Islamic influences range from logic and philosophy over mysticism to literature ».[42] The problem with many of these presumed connections is that they are based on limited portions of texts and take very little account of the context. Remarkably enough, one of the least attackable hypotheses lead us back to the Ikhwān al-Ṣafā'. There are indeed between Llull's

[40] Evans, « Geometry », here § 3.3 « Arbor scientiae ».

[41] Savage-Smith, « Galen's lost ophthalmology », p. 122: « Modern scholars have called the Latin branch-diagrams 'dichotomies' to distinguish them from 'arbores' or tree-diagrams in which material was written in small cells arranged within the outline of a large tree having a trunk and root at the bottom. The earliest instance of an *arbor*-diagram occurs in a ninth-century copy of the *Etymologies* written in the seventh century by Isidore of Seville. While it is evident that in the ninth century branch-diagrams were being used in Arabic treatises (possibly continuing a now lost Alexandrian tradition) and tree-diagrams were being used in the Latin West, the two techniques of diagramming are sufficiently different as to suggest independent traditions. The Arabic method transferred to Europe, while the Latin one remained restricted to Western compositions ».

[42] Anna Akasoy, Alexander Fidora, « Ibn Sab'īn and Raimundus Lullus – The Question of the Arabic Sources of Lullus' Logic Revisited », in Anna Akasoy, Wim Raven (ed.), *Islamic Thought in the Middle Ages. Studies in Text, Transmission and Translation in Honour of Hans Daiber*, Brill, Leiden – Boston 2008, p. 433–458, here p. 433.

Libre de bèsties and the famous animal fable of Epistle 22 certain close parallels that could hardly be explained otherwise than by a common filiation, as was convincingly demonstrated by John Dagenais.[43] But suggestive as are these and other parallels between the Brethren and Llull,[44] they are of limited interest for us here, since they do not concern the tree motif.

Valuable material in that direction also exists, but the least that can be said is that it is not unanimously supported in modern scholarship. Thus, in his « Le symbole de l'arbre chez les auteurs arabes antérieurs à Llull » – in fact, the refutation of an article on the same subject by Miguel Cruz Hernández –, Dominique Urvoy pointed out two main channels of transmission that could have influenced Llull.[45] On the one hand, he put forward philosophical current that emerged from the fourth/tenth century in al-Andalus with Sa'īd b. Fatḥūn al-Saraqusṭī, the author of a (now lost) treatise entitled *Shajarat al-ḥikma* (The Tree of Wisdom). On the other hand, he mentioned an eastern and shi'ite current, impersonated by the mystic philosopher Shams al-Dīn al-Shahrazūrī, a contemporaneous of Llull and the author of an important encyclopaedic work known as *Rasā'il al-Shajara al-ilāhiyya fī 'ulūm al-ḥaqā'iq al-rabbāniyya* (The Epistles of the Divine Tree on the Sciences of Godly Realities). In between, Urvoy posited the towering figure of Ibn 'Arabī (d. 638/1240), himself known to have written two works bearing the word *shajara* in the title. Because of its title, and since it indeed qualifies as an encyclopaedia of sciences in its own right, Shahrazūrī's treatise deserves special mention here, especially as its author explicitly refers to the Ikhwān in several places by calling them either « the author(s) of the Epistles of the Brethren of Purity » (*ṣāḥib/aṣḥāb rasā'il ikhwān al-Ṣafā'*), « the author of the Brethren's Epistles » (*ṣāḥib al-rasā'il al-ikhwāniyya*), or even « the author of the Brethren of Purity » (*ṣāhib ikhwān al-ṣafā'*).[46] Unfortunately, those passages in which Shahrazūrī cite the *Rasā'il* do not deal with the classification of knowledge

[43] Jean-Guy Dagenais, « New Considerations on the Date and Composition of Llull's *Libre de Bèsties* », in Manuel Duran, Albert Porqueras mayo, Josep Roca-Pons (eds.), *Actes del Segon Col.loqui d'Estudis Catalans a Nord-Amèrica, Yale 1979*, Publicacions de l'Abadia de Montserrat, Badalona 1982, p. 131–139.

[44] For a comparison between the *Rasā'il* and Llull's *Llibre de les meravelles*, see Josep Puig Montada, « Ramon Llull and the Islamic Culture of the Mediterranean », in Akasoy, Raven (eds.), *Islamic Thought*, p. 503–519.

[45] Dominique Urvoy, « Le symbole de l'arbre chez les auteurs arabes antérieurs à Llull », in Fernando Domínguez Reboiras, Jaime de Salas (eds.), *Constantes y fragmentos del pensamiento luliano. Actas del simposio sobre Ramon Llull en Trujillo, 17-20 septiembre 1994*, Niemeyer, Tübingen 1996, p. 91–77, here p. 92. See also Miguel Cruz Hernández, « El símbolo del árbol en Ramon Llull e Ibn al-Jatīb », *Studia lullistica. Miscellanea in honorem Sebastiani Garcias Palou*, Moll, Palma de Mallorca 1989, p. 19–25, which was itself a refutation of: Emilio de Santiago Simón, « Raimundo Lulio e Ibn Al-Jatib. Notas para un curioso paralelismo », *Miscelánea de estudios árabes y hebraicos*, 29–30 (1980), p. 189–193.

[46] See for instance Shahrazūrī, *Rasā'il al-shajara al-ilāhiyya*, ed. Najaf Gulī Ḥabībī, Iranian Institute of Philosophy, Tehran 1383–1385/2004–2006, vol. II, p. 200 and vol. III, p. 314, 326, 522, 559, 564.

and nothing like the classification from Epistle 7 is found in the text. In spite of having enjoyed a great popularity, especially in Ottoman times,[47] it remains problematic to determine the impact that Shahrazūrī's *Shajara* had on *tashjīr* representations of the division of science.

Our last move will bring us back to the world of those visual representations, but extending the scope to diagrams other than exclusively related to the classification of knowledge. We know that, from the thirteenth century at least, genealogical *tashjīr* diagrams began to circulate, first in the Central Asia and then spreading westward to cover most of the Muslim world.[48] The first work in which these diagrams appear is actually entitled *Shajara-yi ansāb* (Tree of Genealogies). Written by Fakhr-i Mudabbir (d. 633/1236), a Persian author active at the court of the Ghaznavids and the Delhi Sultanate, it includes 139 genealogies to cover the whole history of the world, from Adam's progeny and Muḥammad's descendants to the Ghaznavid and Ghūrid dynasties in his own time.

The schematic figurations of such genealogies in the only extant manuscript of Fakhr-i Muddabir's *Shajara* resemble much al-Bisṭāmī's *tashjīr*, except that the tree is there inverted to allow the root-ancestor of the tree to occupy the top position.[49] It is interesting to observe with Binbaş that, after this first attempt at visualizing genealogies in the format of a tree, 'the systematic use of genealogical trees began almost a century later in the Mongol period in Iran'.[50] In the same order of ideas, it is also worthwhile remembering that the Islamic world saw during the same period the unprecedented development of an alternative form of visual representations, namely the *taqwīm* (table-format), convenient not only for historiographic and genealogical purposes but also for a wide variety of sciences, on the model of works such as the medical *Taqwīm al-ṣiḥḥa* by Ibn Buṭlān in the fourth/tenth century or the geographical *Taqwīm al-buldān* by Abū l-Fidā' in the early eighth/fourteenth century.[51] It turns out that one category of these *taqwīm*s,

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[47] Reza Pourjavady, Sabine Schmidtke, « Some Notes on a New Edition of a Medieval Philosophical Text in Turkey: Shams al-Dīn al-Shahrazūrī's *Rasā'il al-shajara al-ilāhiyya* », *Die Welt des Islams*, 46/1 (2006), p. 76–8, here p. 79.

[48] İlker Evrim Binbaş, « Structure and Function of the 'Genealogical Tree' in Islamic Historiography (1200–1500) », in İlker Evrim Binbaş, Nurten Kiliç-Schubel (eds.), *Horizons of the World: Festschrift for İsenbike Togan – Hudûdü'l-Âlem: İsenbike Togan'a Armağan*, İthaki Publishing, Istanbul 2011, p. 465–544.

[49] Binbaş, « Structure », p. 508: « Simply put, the most prestigious place in a tree metaphor is its roots, but the most prestigious place on a manuscript page is at the top, where the ancestor, the most prestigious person a genealogical tree, is placed ».

[50] Binbaş, « Structure », p. 522.

[51] Denise Aigle, « L'histoire sous forme graphique, en arabe, persan et turc ottoman. Origines et fonctions », *Bulletin d'études orientales*, 58 (2008–2009), p. 11–49, here p. 13 : « Au XIV^e^ siècle, on trouve non seulement des *taqwīm* historiques, mais aussi d'autres types de textes qui utilisent cette présentation. Je désigne ces textes comme un genre littéraire « para-historique » : ouvrages géographiques, dictionnaires biographiques, manuels de chancellerie. Il se pourrait qu'à cette

namely the astronomical almanacs, experienced a particularly significant boom at the Ottoman court during al-Bisṭāmī's lifetime, and can only have exerted a strong impact on a mind such as his.[52] Thus, while evoking al-Bisṭāmī's project of making the Ottoman imperial power the culmination of a prophetic cycle of sacred history begun with Adam, Fleischer also stresses that

> this project would seem to be intimately related to the genesis of the other earliest Ottoman sources we possess: the 'almanacs' (*taqwīm*) that emerge from 1420 onwards, which contains chronologies in reverse – usually from Creation to the present – that tie proximate dynastic history and the present day to a larger cosmic course.[53]

I have pointed out above some of the problems that medieval diagrams continue to pose for researchers. In her recent and stimulating essay on medieval branching diagrams, Ayelet Even-Ezra also reminds us that « the history of intercultural influence in manuscript culture and in diagramming habits in the Middle Ages – early and late alike – largely remains unchartered territory ».[54] For whoever assumes that al-Bisṭāmī simply copied an existing model for his *tashjīr*, it is clear that the present study cannot claim to have identified any smoking gun and that more research should be done to try to find one. This said, I believe that the recourse to diagrams and visual renditions of all sorts, which is well-attested in al-Bisṭāmī's epoch and amply documented in his own works, rather invites us to contemplate the alternative hypothesis, a hypothesis according to which al-Bisṭāmī would have himself turned the Ikhwān's science classification into a tree. Similarly, I am of the opinion that al-Bisṭāmī should be credited with having himself introduced four « new » sciences into the original arrangement: medicine, veterinary, falconry, together with the religious science of recitation.

époque, au cours de laquelle l'historiographie islamique trouve un important développement, on ait éprouvé le besoin de rationaliser les données pour les rendre plus directement accessibles ».

52 Ahmet Tunç Şen, « Astrology in the Service of the Empire: Knowledge, Prognostication, and Politics at the Ottoman Court, 1450s–1550 », Ph.D. Diss., University of Chicago, 2016, in particular Chapter Four (« Chronicling the Past, Mirroring the Present, Divining the Future: *Taqwīm*s (Almanac-Prognostications) in the Ottoman context »). See also: Ahmet Tunç Şen, Cornell H. Fleischer, « Books on Astrology, Astronomical Tables, and Almanacs in the Library Inventory of Bayezid II », in Necipoğlu, Kafadar, Fleischer (eds.), *Treasures of Knowledge. An Inventory of the Ottoman Palace Library (1502/3–1503/4)*, vol. I: *Essays*, Brill, Leiden – Boston 2019, p. 767–821. In this latter contribution, the authors note (p. 771) the presence of « the Epistle of Ikhwan al-Ṣafa on mathematical sciences including the science of the stars » as part of the inventory and emphasize sultan Bayezid's personal interest in astronomy and astrology.

53 Fleischer, « Learning », p. 158.

54 Even-Ezra, *Lines of Thought*, p. 25.

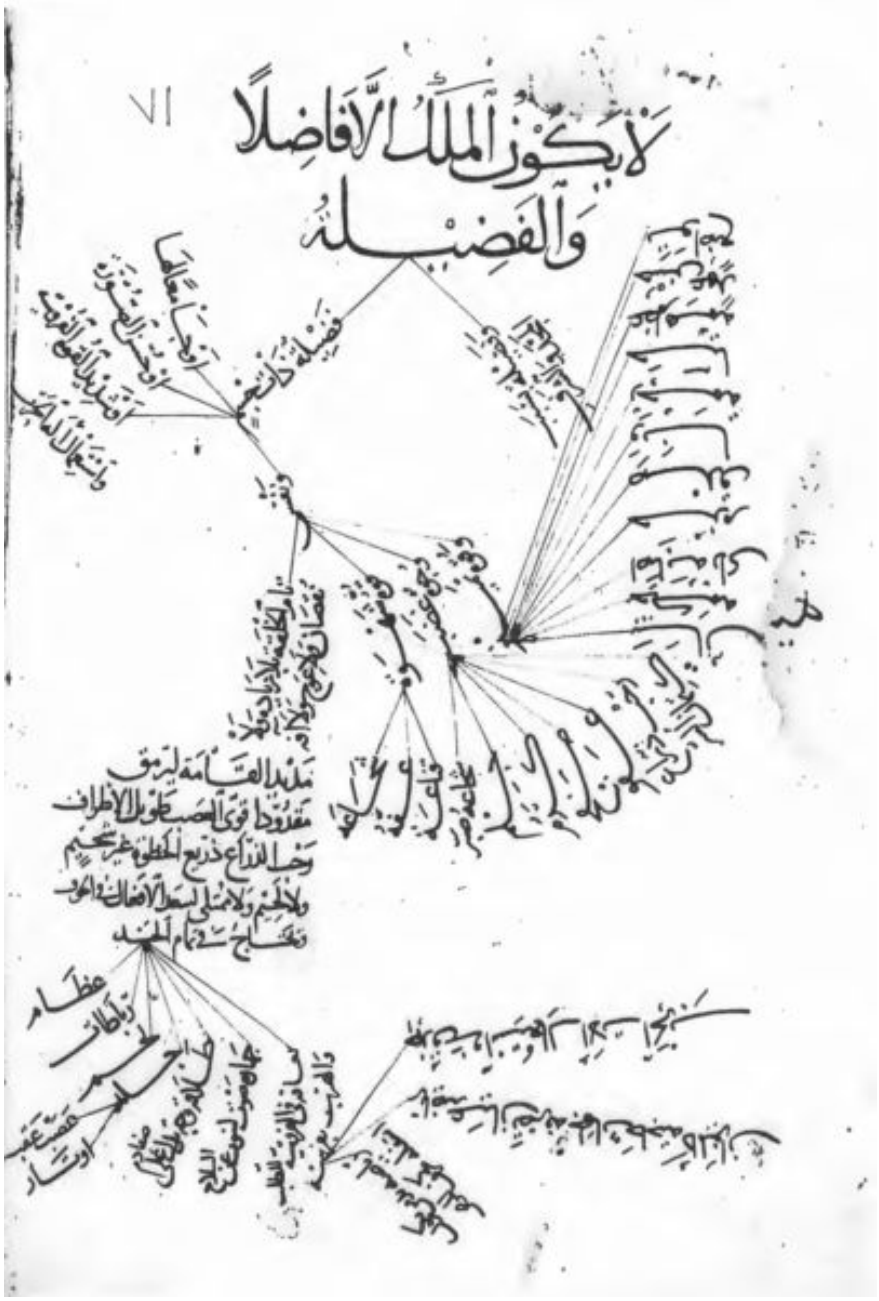

Fig. 6: A *tashjīr* from Ibn Farīghūn's *Jawāmi' al-'ulūm*
Istanbul, Topkapı Sarayı Library, MS 2768, Ahmet III Collection
(© Topkapı Sarayı Library)

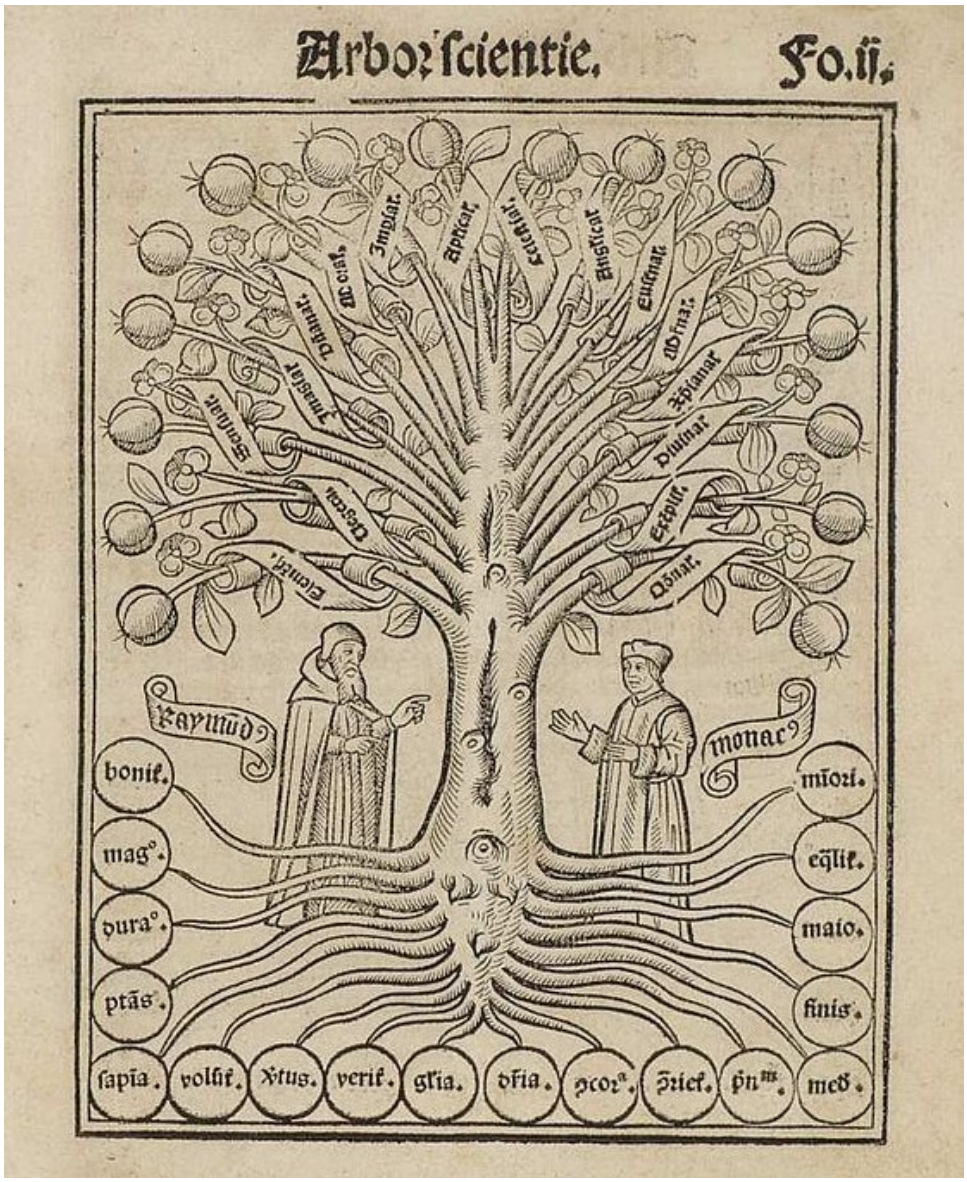

Fig. 7: The *Arbor scientiae* of Ramon Llull
(Madrid, Biblioteca Nacional de España, *Arbor scie[n]tie venerabilis et celitus illuminati patris Raymundi Iullii*, 1515; wikicommons)

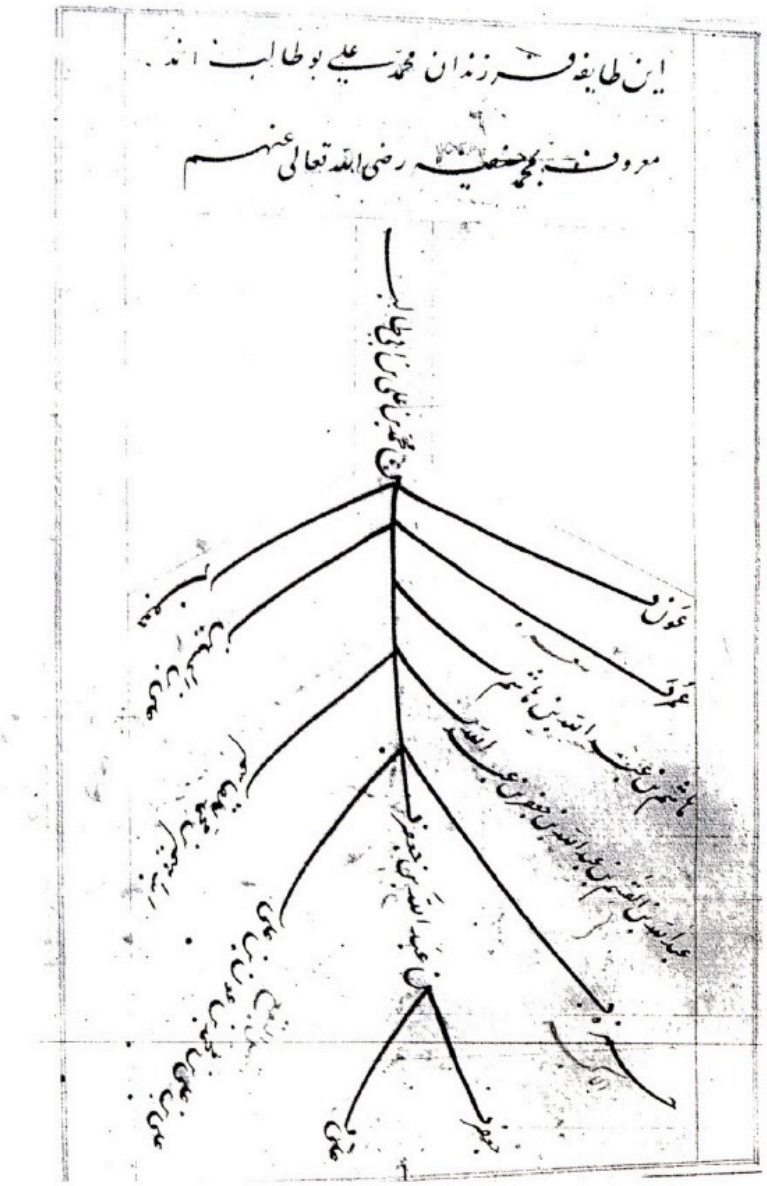

Fig. 8: A genealogical *tashjīr* from Fakhr-i Mudabbir's *Shajara-yi ansāb*
Dublin, Chester Beatty Library, MS 364, f. 119a
(© Chester Beatty Library)

Appendix

THE CLASSIFICATION OF KNOWLEDGE IN THE *RASĀ'IL IKHWĀN AL-ṢAFĀ'*
(from Epistle 7, ed. DE CALLATAŸ, p. 72–95)

You should know, my brother, that there are three kinds of sciences (*'ulūm*) which people busy themselves with: the propaedeutical (*al-riyāḍiyya*), the religious conventional (*al-shar'iyya al-waḍ'iyya*), and the genuine philosophical (*al-falsafiyya al-ḥaqīqiyya*).

The propaedeutical, that is, the sciences of education (*'ilm al-ādāb*), are those which have been established, for the most part, for the pursuit of livelihood and the improvement of life in this world. They are of nine kinds (*anwā'*):

(1) writing and reading (*'ilm al-kitāba wa-l-qirā'a*)

(2) language and grammar (*'ilm al-lugha wa-l-naḥw*)

(3) calculation and operations (*'ilm al-ḥisāb wa-l-mu'āmalāt*)

(4) poetry and prosody (*'ilm al-shi'r wa-l-'arūḍ*)

(5) auspices and omens, and the like (*'ilm al-zajr wa-l-fa'l wa-mā shākala-hā*)

(6) magic, incantations, alchemy, mechanical devices, and the like (*'ilm al-siḥr wa-l-'azā'im wa-l-kīmiyā' wa-l-ḥiyal wa-mā shākala-hā*)

(7) professions and crafts (*'ilm al-ḥiraf wa-l-ṣanā'i'*)

(8) sale and purchase, trades, cultivation, and breeding (*'ilm al-bay' wa-l-shirā' wa-l-tijārāt wa-l-ḥarth wa-l-nasl*)

(9) biographies and historical reports (*'ilm al-siyar wa-l-akhbār*)

The religious sciences, which were established for the healing of souls and the pursuit of the hereafter, are of six kinds:

(1) the science of revelation (*'ilm al-tanzīl*)

(2) the science of interpretation (*'ilm al-ta'wīl*)

(3) the science of transmissions and reports (*'ilm al-riwāyāt wa-l-akhbār*)

(4) the science of jurisprudence, norms, and laws (*'ilm al-fiqh wa-l-sunan wa-l-aḥkām)*

(5) the science relating to remembrance, exhortations, asceticism, and mysticism (*'ilm al-tadhkār wa-l-mawā'iẓ wa-l-zuhd wa-l-taṣawwuf*)

(6) the science of the interpretation of dreams (*'ilm ta'wīl al-munāmāt*)

The philosophical sciences are of four kinds: (1) mathematical (*al-riyāḍiyyāt*); (2) logical (*al-manṭiqiyyāt*); (3) natural (*al-ṭabī'iyyāt*); (4) and divine (*al-ilahiyyāt*).

There are four kinds of mathematical sciences:

(1) arithmetic (*al-arithmāṭīqā*)

(2) geometry (*al-jumaṭriyā*)

(3) astronomy (*al-asṭrunūmiyā*)

(4) music (*al-mūsīqā*)

The logical sciences are of five kinds:

(1) poetics (*būyuṭīqā*)

(2) rhetoric (*rīṭūrīqā*)

(3) topics (*ṭubīqā*)

(4) analytics (*anūlūṭīqā*)

(5) sophistry (*sūfisṭīqā*)

The natural sciences are of seven kinds:

(1) the science of physical principles (*'ilm al-mabādī' al-jusmāniyya*)

(2) the science of the heavens and the world (*'ilm al-samā' wa-l-'ālam*)

(3) the science of generation and corruption (*'ilm al-kawn wa-l-fasād*)

(4) the science of atmospheric events (*'ilm ḥawādith al-jaww*)

(5) the science of minerals (*'ilm al-ma'ādin*)

(6) the science of plants (*'ilm al-nabāt*)

(7) the science of animals (*'ilm al-ḥayawān*)

The divine sciences are of five kinds:

(1) the knowledge of the Founder (*ma'rifat al-bārī*)

(2) the science of spiritual beings (*'ilm al-ruḥāniyyāt*)

(3) the sciences of psychic beings (*al-'ulūm al-nafsaniyyāt*)

(4) the science of governance (*'ilm al-siyāsa*), which is of five kinds: prophetic (*nabawiyya*) governance, royal (*al-mulūkiyya*) governance, public

(*ʿāmmiyya*) governance, domestic (*khāṣṣiyya*) governance, and private (*dhātiyya*) governance

(5) the science of the Return (*ʿilm al-maʿād*)

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