(Atif fols. 170a–b) [p. 87 Ṣādir]

Epistle 19
On the Explanation of Minerals

[Being the fifth epistle from the second section of the *Epistles of the Brethren of Purity*, on the Natural Sciences]*

In the name of God, the Compassionate, the Merciful

Chapter 1

Know, O my brother, may God help you and us through a spirit coming from Him, that we have already explained in the epistle 'On the Opinions and Schools of Religion'[1] that the world is innovated, originated, invented, and existing created from nothing [*kā'in ba'd an lam yakun*],[2] and that He who originated, invented, created, and formed it is the Creator, may He be honoured and glorified, who originated it as He wanted, and said, *Be, and it was*,[3] as we have explained in the epistle 'On the Intelligible Principles'.[4]

And we have also explained in the epistle 'On Resurrection'[5] how the annihilation of the world is, and the concealment[6] of heavens and Earth, and how the second creation is,[7] the congregation, the reckoning, the scale, the passage on the path, the rescue from the Fire, and the

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* The title in Atif (fols. 170a1–b1) runs as follows: 'The Fifth Epistle from the Second Section on the Natural Sciences, on the Explanation of Minerals, among the Fifty-one Epistles of the Brethren of Purity, on the Purification of the Soul and the Rectification of Morals as a Part of a Sufi Discourse'. It is completed by the following eulogy: *In the name of God, the Compassionate, the Merciful. O Lord, pave the way.*

1 The text refers here to Epistle 42, where the origin of the world is one of the main issues addressed. See in particular *Rasā'il*, vol. 3, pp. 452.12–453.10, 455.9–456.15, 461.6–9, 463.22–464.1, and 473.15–23.

2 The *Rasā'il* often introduces the process of creation by series of verbs like this, which usually refer to God, apart from the active participle *kā'in*, indicating an agency from the part of the created being. On the translation of '*ba'd an lam yakun*' with 'nothing', see Epistle 15, note 30 (p. 119 above).

3 Here the formula '*Kun, fa-kāna*' recalls the divine Command, expressed in the Qur'an as '*Kun, fa-yakūn*'; cf. Qur'an 3:47 and 59; 6:73; 16:40; 19:35; 36:82; 40:68.

4 Note that MS [ش] combines the titles of Epistles 32 and 42, referring to a *Risālat al-arā' wa'l-madhāhib wa'l-mabādi' al-'aqliyya* (see the critical apparatus, p. 247, note 3). The text refers here to Epistle 32: 'On the Principles of the Intelligible Existing Beings According to the Pythagoreans' Opinion', where God is repeatedly introduced as the originator of everything. Similar content, but with a stronger stress on numerology and on the comparison between God and the number one, is found in the twin Epistle 33: 'On the Intelligible Principles According to the Ikhwān al-Ṣafā''s Opinion'.

5 The text refers here to Epistle 38.

6 Here the text uses the unusual term *ṭayy* that may refer to the Greek ἀποκάλυψις.

7 Here the formula '*nushū' al-ākhira*' recalls the 'second creation', expressed in the Qur'an as '*al-nash'a al-ākhira*'; cf. Qur'an 29:20 (Yusuf Ali: 'later creation') and 53:47 (Yusuf Ali: 'Second Creation'). The most relevant issues of Islamic eschatology are recalled immediately afterwards.

arrival and entrance into the Garden, and the manner of the reward of the All Merciful endowed with glory and honour.

However, we want to recall in this epistle a part of the events and of the existent beings that undergo generation and corruption under the sphere of the Moon in the duration [*ṭūl*, here and later] of time, ages, and cycles [*adwār*],[8] because we have already explained by logical [p. 88] demonstrations and rational proofs that the world of the spheres and the substances of its individuals are not mingled with each other, so their parts are not mixed, and nothing different from them is generated from them, but they remain as they are in the duration of time and of ages. Also, they neither change nor are transformed or corrupted, as far as they maintain this circular movement and spherical shapes, unless their Creator, Originator, and Creator[9] wants to nullify them, all at once or gradually, and to stop them from rotation[10] — something that would be easy for Him; *His is the loftiest likeness in the heavens and the earth; He is the All-mighty, the All-wise.*[11]

And know, O my brother, that the cessation of the spheres from rotation is the death of the world, the nullification of the life of all beings [*al-kull*], and the separation of the heavenly, Universal Soul from all bodies all at once, and that is the Great Resurrection, the universal ruin, and the nullification of the whole, because[12] the death of each animated individual [*kull shakhṣ min askhāṣ al-ḥayawān*] is the separation of the soul from its body, namely, its resurrection, as the

8 *Adwār*, namely, the cycles made of 360 solar years, while *akwār* are the cycles made of 120 lunar years. With regard to the "*ilm al-akwār wa'l-adwār*', one of the branches of astronomy, see [Hajji Khalifa] *Lexicon bibliographicum et encyclopædicum a Mustafa ben Abdallah Katib Jelebi dicto et nomine Haji Khalfa celebrato compositum* [...], ed. G. Fluegel, 4 vols. (Leipzig: Published for the Oriental Translation Fund of Great Britain and Ireland by Richard Bentley, London, 1835–1852), vol. 1, p. 36.4.

9 Here I have translated both the words *bāri'* and *khāliq* as 'Creator', meaning creation from nothing and from something else, respectively.

10 This translation comes from the emendation of *yuwaffiqhā* in the text into *yuwaqqifahā*, as it seems to be demanded from the following *wuqūf*. If one keeps the form *yuwaffiqhā*, the translation would be, 'while He [usually] makes them fit for rotation'.

11 Second part of Qur'an 30:27.

12 Arabic: *li-anna*. The Ikhwān infer the modality of the nullification of the whole from the modality of the death of individuals.

Messenger of God recalled, God bless him, 'He who has died already has his resurrection'.[13]

We have already explained in an epistle of ours that the world is a macroanthropos endowed with a body, a soul, a life, and knowledge; learn from there the true nature of what we have recalled.

Chapter 2

Know, O my brother, may God help you, that the transformation of the beings subject to generation and corruption that are under the sphere of the Moon is of five species: [i] the transformations of the four elements into each other, as we have partially explained its modality in the epistle 'On Generation and Corruption' [Epistle 17]; [ii] the atmospheric events and the changes of air, as we have partially explained in the epistle 'On Meteorology' [Epistle 18]; [iii] the transformation of the beings subject to generation and corruption that are formed and solidified in the interior of the Earth, in the depth [*'umq*, here and later] of seas, and in the cavity of mountains, namely, the mineral substances, as we shall partially explain their modality in this epistle; [iv] the transformation of plants and trees, namely, of each body that is nourished (fol. 171a) and grows, as we have partially explained in another epistle [Epistle 21]; [v] and the transformation of animals, namely, of each body that moves and senses, as we have partially explained in an epistle after the mention of plants [Epistle 22].[14]

And know, O my brother, that these things we have mentioned undergo generation and innovation, change and corruption [p. 89] in the duration of time and ages, in the alternation of night and day, and in the succession of winter and summer in relation to the four elements, namely, earth, water, air, and fire; and [know that] that the diversity of their states is according to the necessities of the decrees of

13 The same *ḥadīth marfū'* is quoted in Epistle 16, see above p. 166.

14 The Ikhwān do not mention explicitly Epistles 21 and 22, where these topics are dealt with.

the stars[15] in conjunctions,[16] millenaries,[17] and cycles,[18] and according to the configurations [*ashkāl*] of the [individuals of the] sphere, the journeys of the stars, and the projection of their rays from the poles and the horizons. And we want to explain how the formation of minerals [happens], and the secrets of the diversity of their substances, species, properties, benefits, and harm.

And as we have finished recalling the rotations of the spheres, the movements of the stars, and their conjunctions in years and ages, how many they are, and how they happen, in an epistle of ours,[19] know, O my brother, that every [being] that is generated and innovated under the sphere of the Moon has four causes: an efficient cause, a material cause, a formal cause, and a final cause.[20] The efficient cause of the mineral substances is nature, the Creator willing, high be His praise, and we have already explained the quiddity of nature and the quality of its acts in an epistle of ours.[21] The material cause of the mineral substances is quicksilver and sulphur, as we shall explain in this epistle.[22] The formal cause is the rotation of the spheres and the movements of the stars around the four elements, namely, fire, air, water, and earth.[23] The final cause is the benefits that both humans and animals attain from these mineral substances, God willing, be He exalted.

15 On the meaning of these words see Epistle 18, p. 198, note 38.

16 *Qirānāt*, namely, conjunctions between two or more planets, when they align at one point within the zodiac. Al-Bīrūnī, *The Book of Instruction*, p. 150.

17 *Ulūf*, namely, a special kind of revolutions and conjunctions, which lasts for a period of multiple thousands of years. See de Callataÿ, tr., *Ikhwân al-Ṣafâ'*, *Les revolutions et les cycles*, p. 55, note 10 (where the *Kitāb al-ulūf* by the great astronomer Abū Ma'shar, ninth century, is recalled) and p. 69, note 1.

18 See above, note 8.

19 The text may refer here either to Epistle 16, or to Epistle 3: 'On Astronomy'.

20 In the natural treatises, the four Aristotelian causes were already mentioned in Epistle 18, Chapter 13; see above, p. 211.

21 The text refers here to Epistle 20; see below, pp. 287–314.

22 In the natural treatises, quicksilver and sulphur were already mentioned in Epistle 15; see above, p. 113.

23 Note that the four elements are listed here in reverse order.

[p. 90] Chapter 3

Know, O my brother, that mineral substances are different in their natures, flavours, colours, and smells, all that according to the diversity of the soils of the places of their origin, of their waters, and of the changes of their climates.

In fact, the globe of the Earth in its whole and all its parts, its depth, its external and internal sides, are strata, set up layer on layer, sticking and knitted together, different in composition and in structure. So, among them there are rocks and hard mountains, rigid stones and boulders, smooth pebbles, bruised sands, loose argil, soft soil, and humus and salt-steppe [*shawraj*][24] mixed or contiguous with each other, as God, be He exalted, recalled by His saying, *In the earth are signs for those having sure faith*,[25] and He, be He exalted, said, *And on the earth are tracts neighbouring each to each, and gardens of vines*.[26]

They are different in their colours, flavours, and smells, and [there are] soil, argil, and red, white, black, green, blue, and yellow stones, as God, high be His praise, recalled by His saying, *And in the mountains are streaks white and red, of diverse hues, and pitchy black*.[27] And [there are] soil and argil with a pleasant (fol. 171b) taste, or a bitter flavour, or salt, or acrid [*ʿafiṣ*], or sweet, or acid [*ḥāmiḍ*], and those with a fragrant or a stinking smell.

And in addition to all that, the Earth in its whole has many disjunctions, holes, fissures [*tajāwīf*], veins, creeks, and rivers, inside and outside it, many chasms [*ahwiya*], caves, caverns, and fissures [*tajwīfāt*], and all those are full of waters and vapours, and the [p. 91] flavours, smells, thickness and thinness, weight and lightness of those waters are according to the soil of their places, the argil of their locations, or the mires of the depth [*qarār*, here and later] of their swamps [*mustanqiʿāt*].

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24 Cf. F. Steingass, *A Learner's Arabic-English Dictionary* (Beirut: Librairie du Liban, 1972), s.v. *shawraj*: 'salt-steppe'.

25 Qur'an 51:20.

26 First part of Qur'an 13:4, followed in the text by the word *āya* (verse), indicating a partial quotation from the Holy Book.

27 Second part of Qur'an 35:27.

And know, O my brother, that the mineral substances are of three species: [i] those that are formed in soil, argil, and briny earths, and that complete their ripeness in one year or less, such as sulphurs,[28] salts, alums, vitriols, and the like; [ii] those that are formed in the bottom [*qaʿr*, here and later] of seas and the depth of waters, which complete their ripeness only in one year or more, such as pearls and corals —[29] and one of them is a plant, namely, coral, and the other an animal, namely, pearl; [iii] those that are formed in the interior of stones, in the caverns of mountains, and in the interstices of sands, and they complete their ripeness only in many years, such as gold, silver, copper, iron, lead,[30] and the like; and [iv] those that complete their ripeness only in decades of years, such as hyacinth [*yāqūt*], chrysolite, and carnelian.[31]

We want to explain and describe in part how each of these species is formed, so that it may be a proof for the rest. However, before describing these things, we need to recall the form of the Earth, how it is divided into quarters, the properties [*ṣifāt*, here and later] of those quarters, how their states change, and how their properties are transformed during the ages and the long times, so we say: the Earth,

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28 See J. Ruska, *Das Steinbuch des Aristoteles, mit Literargeschichtlichen Untersuchungen nach der Arabischen Handschrift der Bibliothèque Nationale hrsg. und übersetzt* (Heidelberg: Carl Winter's Universitätsbuchhandlung, 1912), pp. 112.10–113.5 (where red sulphur is also mentioned), transl. at pp. 161–162. Ruska establishes a strict link between this work and the Ikhwān al-Ṣafāʾ; see p. 58ff.

29 On pearls and corals, see Theophrastus, *On Stones* VI.36 and 38. Theophrastus, *De Lapidibus*, ed. D. E. Eichholz (Oxford: Clarendon Press, 1965), p. 71. On this work, see below, note 88.

30 J. J. Clément-Mullet, 'Essai sur la minéralogie arabe', *Journal Asiatique* 6/11 (1868), p. 8, translates as 'étain'; but see below, note 93.

31 A different series of precious stones are mentioned by some MSS, such as diamond, carnelian, onyx, ruby (*balkhash*, never mentioned elsewhere by the Ikhwān), turquoise, as well as carbide. Dieterici, *Die Naturanschauung*, p. 99, gives the series: 'der Hyacinth, der Chrysolit, der Opal, der Onyx, Rubin, Türkis, Annachadsi, Diamant und dergleichen'. See the critical apparatus, p. 256, note 6. Clément-Mullet, 'Essai sur la minéralogie arabe', p. 109, translates *balkhash* as 'rubis balais', and quotes Sharaf al-Dīn al-Tifāshī (d. 1253), who considers *balkhash*, *binfish*, and *bajadhī* to be three kinds of ruby. At p. 120, he translates *bajadhī* as 'grenat'; it should correspond to *al-naḥādhī* in Dieterici (who simply transliterates it) and other MSS. I was not able to identify *al-kaharkar* provided by [ج], but Clément-Mullet, p. 55, speaks of a stone similar to ruby, called *krkhn* or *kirkhn*. So the writing of [ج] might be emended.

with all the seas, mountains, deserts, rivers, populated sites, and ruins that are on it, is a single globe suspended in the air at the centre of the world, its Creator willing, high be His praise, as we have explained in the epistle 'On Geography'.[32]

Now, we say[33] that the Earth in its whole is divided into two halves, a southern half and a northern half; that the external side of each of these halves is divided into two halves, so [p. 92] its whole consists of four quarters, each of these quarters being described by four species [of places]: [i] places like deserts, wastelands, waterless spaces, and ruins; [ii] places like seas, reed-beds, and ponds; [iii] places like mountains, hills, and [places of] elevation and depression; and [iv] places like pastures, villages, towns, and populated sites.

And know that these places change and are transformed in the duration of ages and times, and that the places like mountains become deserts and waterless spaces; the places like deserts become seas, ponds, and rivers; the places like seas become mountains, hills, humus, reed-beds, and jungle; populated sites become ruins, and places in (fol. 172a) ruin [become] populated sites.[34]

Now, we need to recall in part how these peculiarities [*awṣāf*] are, because this kind [of knowledge] belongs to the marvellous sciences, far from the minds of many learned [men] exercised [in sciences], not to speak of other people. Know, O my brother, may God help you and us through a spirit coming from Him, that every 3,000 years the fixed stars, the apogees of the planets, and their nodes[35] change their position

32 The text refers here to Epistle 4; *Rasā'il*, vol. 1, pp. 158–162. The same description has been given in Epistles 16 (see above, pp. 139 and 143), 17 (p. 179), and 20 (p. 295).

33 In spite of this introduction, the division of the Earth into four quarters is also dealt with in Epistle 4: 'On Geography'; see *Rasā'il*, vol. 1, pp. 161.2–9, 163.3.

34 These lines are translated with some differences in G. de Callataÿ, 'World Cycles and Geological Changes according to the Brethren of Purity', in P. Adamson, ed., *In the Age of al-Fārābī: Arabic Philosophy in the Fourth/Tenth Century* (London–Turin: The Warburg Institute–Nino Aragno Editore, 2008), pp. 179–193, at p. 188.

35 *Jawzaharāt*, nodes, means in astronomy the two opposite points of intersection of the orbits of the planets and the ecliptic — the *ra's*, head, being the one from which the planets move to the north, and the *dhanab*, tail, the one where they move to the south. Al-Bīrūnī, *The Book of Instruction*, p. 91.

in the constellations and in their degrees;[36] that every 9,000 years they change their position from one to another of the quarters of the sphere; and that every 36,000 years they accomplish a complete rotation in the twelve constellations. For this reason, the positions [*musāmatāt*][37] of the stars, the places of the Earth where their rays fall, and the climates of the [various] countries differ, and the succession of night and day, and of winter and summer in them [also] differ, either in balance and regularity, or by increase and decrease, or by excess of heat and cold, or by their balance. And these are reasons and causes for the variety of the states of the quarters of the Earth, the changes of climates of the [various] countries and places, and the alternation of their properties from one state to another.[38]

Those who study the science of [Ptolemy's] *Almagest* and the natural sciences know the true nature of what we have said. Because of these causes and reasons, populated sites become ruins, and places in ruin become populated sites, places like deserts become seas, and places like seas become deserts and mountains. [p. 93] Those who study natural and theological sciences, and who research into the causes of the beings subject to generation and corruption under the sphere of the Moon, and the way in which they change, know the true nature of what we have said.[39]

However, we want to recall and to describe in part how mountains are formed in seas, how soft argil becomes stones, how stones get broken and pebbles and sands come from them, how the flood of rains transports them to the seas in the course of wadis[40] and rivers, and how, from that, argil and sands, stones and mountains are assembled [*yanʿaqidu*, here and later] in the bottom of the seas.

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36 That is, they move 30 degrees (from one constellation to the next), owing to the precession of the equinoxes; see Bausani, *L'enciclopedia*, p. 124.

37 Cf. Dieterici, *Die Naturanschauung*, p. 100: 'die Längengrade'; Bausani, *L'enciclopedia*, p. 124: 'posizioni relative'; de Callataÿ, 'World Cycles and Geological Changes', p. 188: 'the azimuths'.

38 Cf. de Callataÿ's translation of this passage, ibid.

39 Cf. de Callataÿ's translation of this passage, ibid., pp. 188–189.

40 *Wādin*, pl. *awdiya* or *widyān*: a watercourse filled only at certain times of the year. Dieterici, *Die Naturanschauung*, p. 100: 'Bergbäche'.

Chapter 4

Know, O my brother, may God help you and us through a spirit coming from Him, that seas are like basins [*mustanqiʿāt*, here and later] on the face of the Earth, and that mountains between them are like dams and embankments for them, so that through them seas may be separated from each other, and the face of the Earth be not fully covered by water. In fact, if mountains did not exist on the face of the Earth, and if its face were circular[41] and smooth, the waters of the seas would expand on its face and would cover it from all its sides, they would embrace it as the globe of the air embraces all the Earth and seas, and the entire face of the Earth would be a single sea.

But the divine wisdom and the providence of the Lord required a part of the face of the Earth to be uncovered, so as to become an abode for terrestrial animals, and a part of it [destined to become] plantations of herbage, trees, and crops, as they are nourishment for animals and matter for their bodies, all that by decree of the Mighty, the Wise.

And know, O my brother, that these wadis and rivers all begin from mountains and hills, and move in their beds and in their course towards seas, reed-beds, and ponds, and that the mountains, because of the strong irradiation of the Sun, of the Moon and of the stars on them in the duration of time and ages, and because of the desiccation of their moistures, increase in drying and dryness, they get split and broken — especially in case of thunderbolts and earthquakes — and become stones, (fol. 172b) rocks, pebbles, and sands.

Then [p. 94] the flood of rains brings those rocks, stones, and sands down to the interior of wadis and rivers, and transports them, in the violence of its course, towards seas, ponds, and reed-beds.

And the seas, by the violence of their waves, of their perturbation, and of their ebullition, expand those sands, argil, and pebbles at their bottom, layer upon layer, in the duration of time and ages. They stick together upon one another, are assembled, and grow [*tanbut*] in the

41 It is also noteworthy, however, to recall the reading *munbasaṭan*, 'expanded' instead of *mustadīran* in [خ], [ش], and [غ], which also fits the context. This statement seems to be in contrast with Aristotle, *On the Heavens* II.4.287b4-22.

bottom of seas as mountains, hills, and slopes, just as sand-hills stick together in deserts and wastelands from the blowing of winds.[42]

And know, O my brother, that whenever the bottoms of the seas are engulfed by those mountains and hills we recalled to have grown [*tanbuta*] there, water rises and tries to expand, spreads along their coasts towards deserts and wastelands, and covers them with water. That cycle does not cease in the duration of time, until desert sites become seas, and likewise mountains do not cease from getting broken and becoming stones, or pebbles, or sands, the flood of rains brings them down, wadis and rivers transport them in their course towards seas, and there they are assembled as we have described, and the tall mountains sink and decrease, until they come to be on the same level as the face of the Earth.

And likewise, argil and sands do not cease from proliferating in the bottom of seas; hills, slopes, and mountains stick together and grow [*tanbutu*] from them, and water is poured out from that place until those mountains appear and those hills are revealed, and reed-beds are formed between them, or canals [*qaṣab*] and holes [*diḥāl*] are formed [*yanbutu*] in them. Floods do not cease from transporting there argil, sands, and mires,[43] until those places [that were formerly wet] are desiccated, and trees, herbage, and [other] small plants[44] grow [*yanbut*] there, and those places become [suitable] for beasts of prey and wild beasts [to live there]. Later, people repair to [those places, too] in search of advantages and comfort from fire wood and hunting,

42 Cf. de Callataÿ's translation of this passage, 'World Cycles and Geological Changes', pp. 189–190, followed by opposite comments on its scientific importance.

43 Dieterici, *Die Naturanschauung*, p. 102: 'Moder'.

44 I prefer a generic translation for the Arabic term *'ikrish*, which according to Kazimirski is a plant that grows at the base of palms and makes them die. It belongs to the *ḥamḍ* plants — bitter plants loved by camels; see A. de Biberstein Kazimirski, *Dictionnaire arabe-français*, 2 vols. (Beirut: Librairie du Liban, n. d.; repr. of the Paris ed., 1860), s.v. *'ikrish*. See also Freytag, who adds other names for this plant (ثَيِّل, حرشف, عُشْبَة مُقَدَّسة, and بَلَكَس); G. W. Freytag, *Lexicon Arabico-latinum*, 4 vols. (Beirut: Librairie du Liban, 1975; repr. of the Halis Saxonum ed., 1830–1838), s.v. *'ikrish*. There is further technical explanation — without relevance for our treatise — in R. Dozy, *Supplément aux dictionnaires arabes*, 2 vols. (Beirut: Librairie du Liban, 1991; repr. of the Leiden ed., 1881).

and they become places [suitable] for crops, [p. 95] seedlings, and plants, and [they also become suitable for] villages and towns, and people inhabit them.

Chapter 5

Know, O my brother, may God help you and us through a spirit coming from Him, that these seas, which we have recalled as being like basins on the face of the Earth, and as [having] among them tall mountains that are like dams for them, are joined to each other, either through gulfs on the visible side of the Earth, or through passages and veins for them in the hidden side of the Earth.

And [know] that in the middle of these seas there are many islands, big and small; some of them are inhabited by people — in farms [*mazāri*ʿ], villages, towns, and kingdoms; and some of them are deserts and wastelands in which mountains and reed-beds are found, [inhabited by] beasts of prey, wild animals, livestock, and other animals, the multiplicity of which is known only by God, glorified be His name. And [know] that in the middle of those islands there are small and large lakes, rivers, ponds, and reed-beds; some of them have pleasant waters, some others strongly salt [waters], and some others again strongly bitter [waters]; some of them have a remote bottom, dense waters, and violent waves, and some others do not. [They have] different states and peculiarities, and we shall recall part of their causes, so that the true nature of what we have said and the soundness of what we have described may be known.

Chapter 6

The cause of the agitation of seas, of the rising of their waters, of the surging [of these waters] on their (fol. 173a) coasts, of the violence of the collision of their waves, and of the blowing of winds at the time of their agitation towards the five directions in different times of winter and summer, spring, and autumn, at the beginning and at the end of months, and at [various] hours of night and day, [all that] is because of the fact that when their waters become hot in their depth, and warm,

they become thin and rarefy, hence they search for a space wider than that in which they were earlier, push each other, and some of their parts shove other parts towards the five directions — up, east, west, south, and north — [looking for] expansion, and, at the same time, on their coasts different winds are formed in different directions.

The cause of their agitation at some times and not at others is according to the configuration possessed by the sphere, to the projection of the rays of the stars on the surfaces of those seas from the horizons and the four poles, and to the conjunctions[45] of the Moon with them when it is [*'inda ḥulūlihi*] in its twenty-eight mansions, as it is mentioned in the books on the judgements of the stars.

The cause of the surging of some seas, and not of others, at the time of the rise and the setting of the Moon, is because of the fact that those seas have in their depth hard rocks and solid stones, and when the Moon irradiates the surface of that sea, [p. 96] the projection of its rays arrives at those rocks and stones that are in its depth, then they are reflected from [t]here backwards [*rāji'atan*, here and later], and those waters heat, become hot and thin, and search for a wider space, rise upwards, shove each other, roll in waves towards its coasts and inundate its shores, and the waters of those rivers that had been poured in[to that sea] retreat backwards. That cycle does not cease as long as the Moon rises to the pole of its sky [*watad samā'ihi*];[46] and when it arrives there and begins to descend, at that moment the ebullition of those waters comes to a stop, those parts become cold and closely packed, become dense and return to their depth, and rivers flow as usual, and that cycle does not cease as long as the Moon reaches the western horizon of those seas. Then the surging [of waters] begins

45 On the term *ittiṣālāt*, see above, translation of Epistle 18, p. 198, note 35.

46 Namely, the *medium caelum*. The poles, *awtād*, are the houses situated on the east and west horizons and on the meridian above and below the Earth; the first is the ascendant, the second (4th house) is also called the earth-pivot (*imum caelum*), the 3rd (7th house) is the descendant, and the 4th (10th house) the *medium caelum*. Al-Bīrūnī, *The Book of Instruction*, pp. 149–150. On the ascendant, see de Callataÿ and Halflants, *On Magic I*, p. 100, note 45: the ascendant, Greek ὡροσκόπος, is the point of the zodiac emerging at a given moment on the eastern horizon of a given place. From this point are counted the twelve 'houses' of 30° each, and each is associated with a peculiar 'allotment' (*qisma*) regarding human life.

[again] as usual, and that [happens] in the eastern horizon, and that cycle does not cease until the Moon reaches the pole of the Earth, and [then] once again the surging [of waters] ends. Later, when the Moon leaves the pole of the Earth,[47] the surging [of waters] begins to rise until the Moon reaches its eastern horizon again.[48] And if it is asked why the surging and ebb [of waters] do not occur when the Sun rises and irradiates the surface of these seas, we have already explained the cause of that in the epistle 'On Causes and Effects',[49] so learn it from there, if God wishes, be He exalted.

As to the cause of the diversity of the distributions of winds in the six directions, in night- and day-time, and in winter and summer, we have already mentioned it in the epistle 'On Meteorology'.[50]

As to mountains that we have recalled to be like dams and embankments for seas, their roots are steady inside the earth, their tops tall in the air [*jaww*], and their elevation lofty in the air [*hawā'*]; they are extended on the face of the Earth, their length being [*aṭwāluhā*] [up to] 200 *farsakh*.[51] Among them there are those [that are extended] from the east westwards, those [that are extended] from the north

47 Namely, the *imum caelum*; Dieterici, *Die Naturanschauung*, p. 104: 'untere Culmination'.

48 Note the following addition in [ڞ] (see the critical apparatus, p. 269, note 9): 'And know that the surging [of the waters] of seas and rivers is because of the humidity of the Moon, and humidity increases humidity. When the Moon rises and is high in the pole of [its] sky, humidity increases and the surging [of waters] occurs, whereas when the Moon descends, an ebb occurs. Surging and ebbing [of waters] are proper to the Moon only [*min nafsihi*] and not to the Sun or its emanation, because the Moon is cold and humid, and so is water. Now, the emanation of the Moon [marks] an increase in humidity, and the Moon increases and decreases. And likewise water increases and decreases, and because of that, the surging and ebbing [of waters] come from the Moon. The emanation of the Sun, on the contrary, occurs in [*yafīḍu 'alā*] the air; [the Sun] is big and its impression and action [probably, some words are missing here] with regard to ['*an*] the act of the Moon, because the Sun is warm, <... and ...>, and it neither increases, nor decreases'.

49 The title refers here to Epistle 40, but there is no mention of the issue in that treatise. The Ikhwān might here refer to the following Epistle 41: 'On Definitions and Descriptions' (perhaps formerly attached to Epistle 40?); *Rasā'il*, vol. 3, p. 391.2–7; they speak of the surging and ebbing of waters also in Epistle 18, see above, pp. 235–237 and 243.

50 The text refers here to Epistle 18; see above, pp. 199–200.

51 See note 27 to Epistle 16 (p. 144 above).

southwards, and those [that are extended] in directions intermediate between these [*fī nakbā' hādhihi'l-jihāt*]; some of their descriptions are mentioned in [the epistle 'On] Geography'.[52]

(fol. 173b) And know, O my brother, that among these mountains we mentioned, some are solid rocks, hard stones [*ḥijāra*], [p. 97] and smooth stones [*ṣafwān*], on which only small plants sprout, such as the mountains [near] Tihāma.[53] Some of them are loose rocks, soft argil, soil, sand, and pebbles, mixed and sticking together layer on layer, that is to say, with parts firmly connected, and, beyond that, they [have] many caverns, caves, chasms, wadis, sources, creeks, and rivers, with many plants, herbs, and trees, like the mountains of Filisṭīn, of Lakkām,[54] of Ṭabaristān, and others.

As to the caverns, caves, and chasms that are in the cavity of the earth and of mountains, when they have no openings from which waters may come out, those waters remain imprisoned there for a certain time, and when the interior of the earth and the cavity of those mountains become hot, those waters heat there and become thin, rarefy, and become vapour, rise up and search for a wider space. If the earth is much rarefied, those vapours are dissolved and come out from those openings; but if the external side of the earth is very dense and, [so,] inaccessible, that hinders [those vapours] from coming out, and they remain imprisoned, agitated in those chasms in search for an exit. Sometimes the earth splits in a certain place, and those winds come out suddenly, their place sinks down, noise and crashing are heard [because of] their [coming out], and an earthquake [follows].[55] And if there is no exit for them, they remain imprisoned there, and that earthquake continues until the air [*jaww*] of those caves and chasms becomes cold, those vapours thicken and become dense, their parts gather, further densify, and become water, and then begin rising to the depths of those caverns, caves, and chasms, and remain there for a certain time.

52 The text refers here to Epistle 4; *Rasā'il*, vol. 1, p. 171ff.

53 Tihāma is a narrow region of Arabia on the Red Sea.

54 Dieterici, *Die Naturanschauung*, p. 105: '(Libanon)'.

55 On earthquakes, see Drossaart Lulofs and Poortman, *Nicolaus Damascenus De plantis*, pp. 176–179; on this work, see below, Epistle 21, pp. 328–329, note 50.

And as long as their stagnation there is prolonged, they increase in purity and density, until they become quivering quicksilver; they are mixed with the soil of those caves, and the heat of the mine is constantly united to them in ripening and concocting them. So, [many] kinds of mineral substances come from them, different in natures, as we shall explain later. As to the cause of the diversity of the sources and springs that are found in the cavity of the earth, and in the caverns of mountains, in sweetness [*'udhūba*], saltiness, acidity, and acridity, in their containing sulphur, or naphtha, or oil, or as to the cause [p. 98] of their heat in winter, and of their coldness in summer, or of what is in the same state at all times, [all that] is according to the soils of their places, to the changes of climate of their sites, and to the accidents that befall them.

We need to mention a part of their causes, so that it may become an example [*qiyāsan*] for the others, so we say: the cause of the hotness of the waters of the majority of sources in winter, and of their coldness in summer, is because of the fact that heat and cold are two contraries that cannot coexist together in the same place and at the same time. Then, when winter comes and the air becomes cold, heat flees and comes to be concealed in the interior of the earth, so those waters that are in its interior and in its depth [*'umq*] become warm; and when summer comes and the air becomes hot, cold escapes away and comes to be concealed in the interior of the earth, so those waters become cold.

The cause of the hotness of some sources both in winter and summer in (fol. 174a) the same state is because of the fact that in the interior of the earth and in the caverns of mountains there are places with sulphurous soil, so those liquids that are poured here become oily, heat in them is always inflammable, and between or above them waters pass in creeks and in piercing veins, so those waters become warm while passing there and crossing them. Then they emerge and flow over the face of the earth; and when fresh air [*nasīm al-hawā'*] touches them, and the air becomes cold, they become cold, [too,] and sometimes congeal, then become dense, assemble together, and become quicksilver, or lead, or pitch, or naphtha, or salt, or sulphur, or borax, or alum, and the like, according to the diversity of the soils of the [various] places, and to the changes of climate.

The cause of the saltiness of waters[56] of seas in general is thanks to the providence of the Creator, high be His praise, and to the divine wisdom, in view of the universal wellness and the general advantage that are in them. In fact, when the parts of the vapours that arise from them in the air [*al-jaww*] are mixed with the air [*al-hawā'*] and agitated in the [various] directions, they prepare[57] [sea waters], make them salty, and hinder them from putrefaction, change, and corruption. Were it not [so], animals breathing the air would be instantaneously destroyed.

And likewise, too, the saltiness of sea waters hinders [other waters] from becoming brackish[58] or from changing — something that [p. 99] would imply the destruction of sea animals all together. And for this cause, also, [the purpose of] the violence of the waves of the sea most of the time is that the upper ones [i.e., waters] are mixed with the lower ones, and the lower ones with the upper ones, so that [sea waters] do not become too dense because of a long stagnation, or congeal, and [the waves do not][59] become all earth. And for this cause, too, the fact that the Sun and the stars shine on these [waters] and heat them, hinders them from becoming dense and congealing, and so it happens with air,[60] too. In fact, were it not for the projection of the rays of the stars by night, air would congeal in the places where the Sun and the Moon do not rise for a certain time, as under the southern and the northern poles.

The astringence of the waters of some sources is because of the fact that [waters] flow towards them from places whose soil contains

56 On the saltiness of seas, see ibid., pp. 180–182.

57 The Arabic is *dabaghathā*, which does not fit the context (the verb *dabagha* means 'to tan'). Dieterici, *Die Naturanschauung*, p. 107: 'zart', but I could not check to which Arabic term this translation corresponds, because this part of the epistle is not provided in Dieterici's Arabic text (see the description of Epistle 19, p. 101–102). My translation is based on the meaning provided by Lane, *Arabic-English Lexicon*, s.v. *dabūgh*: 'rain that puts the earth into a good state, and softens it'.

58 Dieterici, *Die Naturanschauung*, p. 107: 'stinkend zu werden', but I was not able to see the corresponding Arabic text (see above, note 57).

59 The change of subject is demanded by the different person of the verb in the text. Note, however, that [ح], [د], and [ط] have *fa-yakūnu*.

60 Arabic, '*bi'l-hawā' wa'l-jaww*'.

vitriols [*rājiyya*], and so is the rule that governs [water] with a flavour of sulphur or naphtha.

And know, O my brother, that in some places, on the top of mountains and in the interior of wadis, fires and lights are seen from afar, night and day, while a turbid smoke spreads and rises in the air [*sāṭi' fī'l-hawā', murtafi' fī'l-jaww*]; their cause is that in the cavity of those mountains there are caverns, caves, vapours, and igneous and inflammable air, towards which oily waters containing sulphur or naphtha flow, and constantly become matter for them. And they are like those that [are found] in the island of Sicily and on mount Rām Hurmuz[61] in Khwuzistān.

And in some places there are mountains on which mild winds constantly blow, and mountains on which cold winds blow at different times, and they are the mountains on which melting snows are found. From those liquefying [snows] [*min tilka'l-ruṭūbāt*] thin parts are dissolved and become vapour, rise in the air, and shove [winds] in the five directions, or in one direction only, (fol. 174b) like that which blows from the 'mountain of snow' by Damascus,[62] that which is in the country of Dāwur,[63] from the Ghūr mountains,[64] mount Damāvand,[65] and similar mountains. The mountains on which mild winds blow at all times are like that which is in the country of Bāmyān. In fact, from the lowest part of this mountain many sources spring, and around it there are many [p. 100] steppes [*murūj*], and in those steppes rivers and creeks flow from this mountain, but neither much snow nor rains are seen on it, whereas mild winds are noticed constantly blowing over it.

This is the proof that in the cavity of this mountain there are cold caves, caverns, and chasms, whose coldness is extreme, [whence] air congeals and becomes water, then it is poured into its lowest [part], is

61 Bausani, *L'enciclopedia*, p. 125: 'Muzmahar'.

62 Perhaps mount Hermon, called '*jabal al-thalj*' (mountain of snow). Dieterici, *Die Naturanschauung*, p. 108: 'vom Schneeberg in Damaskus'.

63 Dieterici, ibid.: 'in den Bezirken von Azrun (Hazru)'. The MSS consulted provide readings that much differ from each other; see the critical apparatus, p. 279, note 1.

64 Ghūr is the region to the west of Ghazni, in Afghanistan.

65 I follow the reading of the majority of the MSS consulted (see the critical apparatus, p. 279, note 3), but Atif has *Dunmāvand*. Damāvand is the highest peak of the Alborz Range, in the Persian region of Māzandarān.

seeped from narrow pores, and from them those sources and creeks flow towards those steppes, reed-beds, deserts, and villages, and humans and other animals that are there — wild beasts, beasts of prey, cattle, and birds — take advantage of them, as this mountain is far from seas, and clouds seldom arrive here owing to the long distance.

When you attentively consider, O my brother, what we have recalled, you will make clear to yourself the providence of the Creator, glorified be His name, in the organization of His creatures, the goodness of His administration of them, His compassion towards them, the multiplicity of the causes of comfort for them He disclosed, and [His] drawing advantages for them from all the possible aspects of matter in which His acts result.

Chapter 7

And know, O my brother, that the majority of wadis and rivers begin from mountains and hills, and in their course they go towards seas, reed-beds, ponds, stagnant waters, and lakes.

Among them there are long rivers, whose course is from the east westwards, like the river in Sijistān[66] that begins from the mountains of Bāmyān and the mountains of Ghūr, and passes westwards in the country of Kirmān, then to the sea of Bīram.[67]

Among them there are [rivers] that pass in their course eastwards, like al-Rass and al-Kurr,[68] both in the country of Adharbayjān, which begin from the mountains of Rūm,[69] pass bending eastwards towards the sea of Ṭabaristān,[70] and are poured into it.

Among them there are [rivers] whose course goes from the south northwards, like the Nile in Egypt: it begins from the mountains of

66 Dieterici, *Die Naturanschauung*, p. 109: 'wie der Harmend (Hilmend) von Sedjistan'.

67 Dieterici, ibid.: 'in das Meer Hormuz'.

68 Dieterici, ibid.: 'so der Araxes und Kur'.

69 Dieterici, ibid. explains: '(d. h. dem griechischen Reiche in Klein-Asien)'.

70 Dieterici, ibid. explains: '(caspische Meer)'.

the Moon beyond the equator,[71] and passes in its course bending northwards, until it is poured into the Mediterranean sea.[72]

Among them there are [rivers] whose course is bent from the north southwards, like the Tigris: it begins from the mountains in Armenia,[73] and passes in its course bending southwards, until it is poured into the Persian sea [p. 101] near ʿAbādān.

And among them there are [rivers] whose course is bent in one of these intermediate sides [*nakbāwāt*], like the Jayhūn[74] in Khurāsān and the Euphrates. In fact, the Jayhūn begins from the mountains of Ṣaghāniyān,[75] passes between the west and the north [*nakbāʾ al-gharb waʾl-shamāl*], and is poured into the sea of Jurjān, at the north of the mountains of Khwārazm, whereas the Euphrates begins from the mountains of Rūm, passes between the east and the south [*nakbāʾ al-sharq waʾl-janūb*], and is poured into the Persian sea near ʿAbādān.

As to the cause of the surging of the rivers the course of which is from the north southwards during springtime, it is because of the fact that, when snows are abundant in winter on the tops of northern mountains, and later the air [*al-jaww*] becomes hot due to the closeness of the Sun to their tops, those (fol. 175a) snows melt, and wadis and rivers flow from them.

As to the cause of the surging [of the waters] of the Nile in Egypt in summer, it is because of the fact that this river flows from the south northwards, and the origin of its course is beyond the equator, where it is summer when it is winter for us, and it is winter when it is summer for us, so at that time there are, there, many rains.

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71 This is the name given by Ptolemy to the mountain from which the Nile begins. It is found 16 degrees beyond the equator. See, e.g., the *Kitāb Gharāʾib al-funūn wa-mulaḥ al-ʿuyūn* ('The Book of Curiosities of the Sciences and Marvels for the Eyes') written in 1050 AD, Chapter 2.3, fol. 25b, where the Mountain of the Moon is mentioned, 'which is 1,000 miles high, and situated partly in the first clime and partly beyond the Equator, and is the source of the Nile which gushes out and branches out from it'; see http://realhistoryww.com/world_history/ancient/Misc/Arab_texts/Arab_texts_91.htm), and http://www.muslimphilosophy.com/ik/Muqaddimah/Chapter1/Ch_1_02.htm. These mountains correspond to the Rwenzori Mountains in Uganda.

72 Dieterici, ibid.: 'in das griechische Meer'.

73 Dieterici, ibid.: 'von Nisibin'.

74 Dieterici, ibid.: 'der Djihon'.

75 Ṣaghāniyān is a small region in Central Asia (Uzbekistan).

These rivers have twists and bends, and the explanation of their cause is long, and during their course all these irrigate arable lands, farms, towns, and villages, and the surplus of their waters is poured into seas, reed-beds, stagnant waters, and lakes, and are mingled with their water, be it sweet or salt.

And when the Sun and the stars shine on them, they heat them, and [those waters] become hot and thin, are dissolved and become vapour, rise in the air, are agitated in the [various] directions, and winds, clouds [*al-ghuyūm*, here and later], blizzards, drizzle, dampness, frost, rains, snows, and hail are formed from them on the tops of mountains, in deserts, in populated sites, and in ruins.

As to the rains that fall [*takūnu*] on the tops of mountains, they recede into the fissures [*shuqūq*] and interstices of those mountains, and are poured into the caves, caverns, and chasms that are found there; [these] are filled, [p. 102] and in the lowest [parts] of those mountains narrow openings are formed, from which those waters are seeped, flow, and assemble together becoming wadis and rivers; those snows on the tops of the mountains are melted, flow towards those wadis and rivers, and return in their course to the seas; then vapours, winds, clouds, and rains are formed from them, as it had happened the preceding year. This is the decree of the Mighty, the Omniscient.

Chapter 8

As we have finished recalling the form of the Earth, and describing mountains, deserts, and seas, and the diversity of the soils and waters of the [various] countries, we say now that there is no mountain or sea or open place or island or river or country or any place on the Earth, either small or large, either in a manifest or a hidden way, which does not have a property, or a number of properties, that does not belong to others.

One property of the various countries and places is that a kind or a number of kinds of mineral substances are formed in them [*hunākā*], or plants grow, or a genus of animals is born, which neither are formed in another country, nor grow in another place, nor are born elsewhere than there. For instance, elephants are generated only in the islands

of the southern seas under the zone [*madār*] of the constellation of Aries; thus, giraffes are generated only in Abyssinia, whereas sables, grey squirrels, and musked gazelles are generated only in eastern and northern deserts. Hawks, vultures, falcons, and similar species of birds hatch only on the tops of tall mountains; sand grouses and ostriches [p. 103] hatch only in deserts, wastelands, and waterless spaces; ducks, water birds [*ṭayṭawā*],[76] and the like hatch only on the shores of seas, the banks of rivers, stagnant waters, and reed-beds; ringdoves,[77] sparrows, (fol. 175b) and similar birds hatch only among trees and bushes [in] villages and gardens.

According to this example is the rule that governs plants: the palm and banana grow only in warm countries and in earths with soft soil; almonds, walnuts, pistachios, and the like grow only in cold or mountainous countries; sycamore and the thorn-tree of the desert[78] grow only in deserts and wastelands; and sugar canes and willows [only] on the banks of rivers. According to this example is the rule that governs the other plants.

And the rule that governs mineral substances is also thus: every species of them has a peculiar place and a well-determined soil in which alone it can be formed. Like gold, in fact it is formed only in sandy deserts, in mountains, and among loose stones; silver, copper, iron, and the like are formed only inside mountains and in stones mixed with soft soil; sulphurs are formed only in moist earths, soft soil, and oily moistures; salts coagulate only in briny earths and in places like salt-steppes; gypsum[79] and ceruse sprout [*yanbutāni*] only in sandy earths, whose soil is mixed with pebbles; vitriols are formed only in acrid and dirty [*qashifa*][80] soil. According to this analogy is the rule that governs the other species of mineral substances.

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76 See Steingass, *A Learner's Arabic-English Dictionary*, s.v.; Dieterici, *Die Naturanschauung*, p. 111: 'Möwen'.

77 The Arabic is *al-fawākhit*. Kazimirski, *Dictionnaire arabe-français*, s.v. *fākhita*: 'pigeon à collier'. Dieterici, *Die Naturanschauung*, p. 111: 'die Ringeltaube', but the Arabic text is not provided (see above, note 57).

78 These two plants are associated also in Epistle 21; see below, p. 331.

79 On gypsum, see also Theophrastus, *On Stones* (on which see note 88) IX.68, and p. 83 ed. Eichholz.

80 Dieterici, *Die Naturanschauung*, p. 111: 'schmuzfarbenem'.

[p. 104] Chapter 9

Know, O my brother, that mineral substances[81] have many species, the number of which can be calculated only by God, high be His praise, but some of them are known to people, and some are not known. Some wise men, among those who were concerned with the study of this science, and with the research into these things, stated that they had already known and counted about seven hundred[82] species of [minerals], all different in natures, shape, colour, flavour, smell, weight, lightness, damage, and benefit. We want to recall [them] in part, so that they may be the evidence for the others, and an example [*qiyāsan*] for them.

We say that among mineral substances there are those that are hard stones[83] that can be melted by a strong fire only,[84] and can be crushed by diamond only, [such] as hyacinth and carnelian; those that are earthen and loose, and cannot be melted, but can be pulverized, [such] as salts, vitriols, and talc; those that are watery, liquid, which escape [the action] of fire, [such] as quicksilver; those that are aerial, oily, consumed by fire, [such] as sulphurs and arsenics;[85] those that are vegetal, [such] as coral; those that are animal, [such] as pearl; those that are coagulated dew, [such] as ambergris and bezoars [*bādhahrāt*]; in fact, ambergris is a dew that falls on sea-shores, then coagulates in particular places and

81 After the 'geological' section, which extends over Chapters 3–4, the 'mineralogical' section begins here. I have already dealt with this in part in my article 'La science des pierres précieuses dans l'Épître des Ikhwān al-Ṣafā': entre les catalogues encyclopédiques et le commentaire philosophique', in C. Thomasset, J. Ducos, and J.-P. Chambon, ed., *Aux origines de la géologie de l'Antiquité au Moyen Âge*, Actes du Colloque International 10–12 mars 2005, Paris Sorbonne (Paris IV) (Paris: Honoré Champion, 2010), pp. 75–90.

82 Bausani, *L'enciclopedia*, p. 126: 'circa 900 specie'. At the beginning of the *Kitāb al-aḥjār* attributed to Aristotle seven hundred stones are mentioned; Ruska, *Das Steinbuch*, p. 93.6–7.

83 The Arabic is '*ḥajaratun ṣulba*'. After *ḥajaratun*, some MSS add: '[...] and, however, they are melted by fire and solidify when they become cold, like gold, silver, copper, iron, lead, black lead, glass, and the like, and [there are] those that are stone-like and arid [*ṣalda*] [...]'; see the critical apparatus, p. 290, note 2.

84 'Melting' is the same as the Greek τῆξις (cf. διάχυσις, ζέσις), i.e., liquefaction by heat, dissolution, to which πῆξις is opposed (solidification, hardening, coagulation, freezing). On these terms see Aristotle, *Meteorology* IV.6.382b30–31.

85 On arsenic, see Drossaart Lulofs and Poortman, *Nicolaus Damascenus De plantis*, p. 329; de Callataÿ and Halflants, *On Magic I*, p. 148, note 210.

at a well-determined time; and so is bezoar [*fāzahr*], too — in fact, it is a dew that falls on some stones, then permeates their interstices, pierces them, and coagulates there in special places and at a well-determined time; [those that are coagulated dew such] as manna, which is a dew that falls on a [certain] species of thorns; [p. 105] and so is resin — in fact, it is a dew that falls on a [certain] species of plant, a particular plant at a well-determined time, and coagulates on it; and so are pearls — in fact, they are a dew that takes root in the shell of a [certain] species of sea animal, then becomes thick, solidifies, and coagulates in it; and so is the bituminous [dew],[86] a dew that permeates the interstices of rocks, then becomes thick there, and becomes water, then it is seeped from narrow pores, (fol. 176a) solidifies, and coagulates. Dew is an aerial moisture that solidifies due to the cold of night, and falls on plants, trees, stones, and rocks.

According to this analogy is the rule that governs all mineral substances — in fact, their matter is [made of] moistures and waters, dampness and vapours, that coagulate for a long stagnation and for the passage of time in particular places.

We have explained, through that which we have recalled, that all mineral substances, in spite of the variety of their natures, colours, flavours, smells, weight and lightness, hardness and looseness, smoothness and roughness, and of their properties, benefits, and harm, are all composed and aggregated of earthen parts that are hard, weighty, dark, and dirty [*qashifa*];[87] or of watery parts [that are] liquid, flowing, pure, [intermediate] between weight and lightness;[88] of aerial

86 As noted by Paola Carusi, the text has: *al-mûmiyāyy*, a reading she considers to be the right one — also shared by [أ] and [ن] that read *al-mūmiyā'ī*, and by [ف] that reads *al-mūmāyy*, whereas [ب], [خ], [ر], [ز], [ش], and [غ] with different notations, and Dieterici have *al-mûmiyā'*.

87 Dieterici, *Die Naturanschauung*, p. 113: 'dicht', for the Arabic *kathīfa*, proposed also by other MSS; see the critical apparatus, p. 293, note 5. This reading seems a better fit for the descriptions that follow.

88 In the last chapter of Book III of the *Meteorology*, Aristotle gives a brief and general account of the formation of minerals and metals, and he promises a more detailed study, which never arrived; see my article 'Echi di *Meteorologica* IV nell'enciclopedia dei Fratelli della Purità', in C. Viano, ed., *Aristoteles chemicus. Il IV Libro dei Meteorologica nella tradizione antica e medievale* (Sankt Augustin: Academia Verlag, 2002), pp. 113–131. *Meteorology* IV is, however, the starting point for Theophrastus' *On Stones*. The distinction drawn in Chapter 1 between

parts [that are] light, soft, oily, pure, and luminous; [or they are made] of heat — strong or weak, ripe or defective; or [that they come] from an aggregation according to a perfect proportion or according to other harmonic proportions, and that there are twelve degrees multiplied by four natures — heat, cold, wet, and dry. Their whole makes 48 degrees. This is the length, [which] multiplied by itself [gives] 2,304.[89] This is the breadth, [which,] multiplied by its root, [*jidhrihi*, i.e., 48] [gives] 110,592. This is the cube [in] units.[90]

We need to explain this aspect because it is the root of knowledge of the way in which minerals are formed. [p. 106] Know, O my brother, that when the heat of a mine embraces those moistures congested in the interior of the earth and the vapours imprisoned there, they are dissolved, become thin and light, rise upwards towards the ceilings of those chasms and caves, and abide there for a certain time. And

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metals as watery substances and stones and minerals as earthen substances roughly corresponds to the distinction Aristotle had made between metals and 'fossils'. The work *On Stones* was a companion study to the work *On Metals*, to a work on petrifactions, one on Sicilian lava-flow, and one on salt, nitre, and alum (to which Diogenes Laertius refers), none of which has survived. By saying that stones are earthen substances, Theophrastus might be criticizing Aristotle, who had stated that some stones are composed of water (*Meteorology* III.10.389a8–9). Theophrastus' work is a collection of facts more than of theories; nonetheless, the editor (pp. 7–8) remarks that it was neglected by Arab scientists.

89 Note that MS [ل] announces a different value here in the text (emphasized by an ink of different colour), and gives in the margin the following values: '110,592, and by itself [*bi-nafsihi*] 5,308,416' [= $2{,}304^2$] and then gives in the text (in another colour): '5,309,416[7?]'. For other values proposed in the MSS tradition, see the critical apparatus, p. 294, note 5.

90 The number 12 might have been mentioned here as it is considered by the Ikhwān to be the noblest number (see, e.g., Epistle 40: 'On Causes and Effects', *Rasā'il*, vol. 3, p. 362.7–8), being the first abundant number ('abundant' describes any number for which the sum of its divisors is greater than it, see, e.g., Epistle 1: 'On Number', *Rasā'il*, vol. 1, p. 60.12–16 [= p. 35.5–10, El-Bizri]). The numbers 12 and 4 make 'two', which corresponds to length as stated in Epistle 2: 'On Geometry' (*Rasā'il*, vol. 1, p. 80.17–18 [= p. 78.10–12, El-Bizri]), while 48^2 is associated with the number 'three', namely, with breadth according to Epistle 2: 'On Geometry', (*Rasā'il*, vol. 1, p. 81.1–2 [= p. 79.1–3, El-Bizri]). $2{,}304^3$ indicates three-dimensionality (Epistle 2: 'On Geometry', *Rasā'il*, vol. 1, p. 81.3–4 [= p. 79.4–5, El-Bizri]). I have tried to explain this passage in my article 'Formules et tableaux ismaéliens des minéraux', in K. D'Hulster and J. Van Steenberghen, ed., *Continuity and Change in the Realms of Islam. Studies in Honour of Professor Urbain Vermeulen* (Leuven–Paris–Dudley, MA: Peeters, 2008), pp. 25–31.

when the interior of the earth becomes cold in summer, they solidify, become thick, and fall in drops again [*rājiʿatan*] towards the bottoms of those chasms and caves, are mixed with the soil and the argil of those places, and remain there for a certain time; the heat of the mine always [works] in ripening and concocting them, and they become pure for their long stagnation [there], and increase in weight and density. Those moistures, with the earthen parts with which they were mixed, and with the weight and density they acquire, as well as with their being ripened and concocted by heat, become quivering quicksilver, whereas those aerial, oily parts, with the earthen parts attached to them, and [with] their concoction by heat over the duration of time, become combustible sulphur.

And when the parts of sulphur and quicksilver are mixed for a second time, they intermingle, are mixed and united together, and heat always [works] in ripening and concocting them, so that, then, [various] kinds of different substances coagulate from them. In fact, when quicksilver is pure, and sulphur unstained, [when] their parts are mixed together, and their quantity is in the perfect proportion, [when] their [parts][91] are united and sulphur sucks the moisture of quicksilver, and absorbs its moistness, [when] the heat of the mine is balanced while concocting and ripening them, (fol. 176b) and no accident befalls them from coldness or dryness before they are ripe, then gold coagulates from that over the duration of time.[92] If an accident befalls them from [p. 107] coldness before ripening, they coagulate and become white silver; if dryness affects them owing to the excess of heat and an increase of earthen parts, they coagulate and become red copper; if cold affects them before the parts of sulphur are united to quicksilver, and before ripening, white lead [*raṣāṣan qalaʿīyyan*][93]

91 This translation is demanded by the plural form of the verb, *ittaḥadat*.

92 In Plato's *Timaeus* 24.60b, we read that gold is made of water which has been compacted by percolating (Greek: διήθησις) through rocks, whereas stones are made of earth which has been compacted as the result of being filtered through water. About gold, represented in *Timaeus* 24.59a–b as a very dense variety of 'fusible water' filtered through rock and then hardened, see also Theophrastus, *De Lapidibus*, ed. Eichholz, pp. 20–21.

93 Dieterici, *Die Naturanschauung*, p. 114: 'Zinnblei'; cf. Ruska, *Das Steinbuch*, p. 140, note 1. *Raṣāṣ* means 'lead' in general (= *ghalābā*); cf. Lane, *Arabic-English Lexicon*, s.v., whereas *usrub* means 'black lead', and *qalaʿī* means 'white lead'. Y.

coagulates from it; if cold affects them before ripening, and the earthen parts are more, they become black iron; if quicksilver is more, and sulphur less, and heat is weak, black lead [*usrub*][94] coagulates from it; and if [heat] is excessive and burns it, it becomes antimony.

According to this analogy mineral substances differ for reasons that are inherent in them [when they are] out of balance and out of the perfect proportion due to an increase or a deficiency of sulphur or quicksilver, or to the cold of the mine before their ripening, or to their coming out of balance. And according to this analogy is the rule that governs the substances that can be melted.

As to the stony substances, [such] as crystal, hyacinth, chrysolite, carnelian, and similar [minerals] that are not melted by fire, they coagulate from the waters of rains and from the dampness that permeate those caves, caverns, and chasms [formed] between solid mountains and hard stones, and no parts of earth and argil are mixed with them, but over the duration of time, as far as their stagnation there is prolonged, waters increase in purity, weight, and density, and the heat of the mine always [works] in ripening and concocting them, until they coagulate and become hard and pure stones. Their colours, purity, and heaviness [*razānatuhā*] are according to the lights of those stars governing that [particular] genus among substances, and to the projection of their rays on those particular places, as we will explain in the epistle on plants.[95] In fact, the colour of the yellow

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Marquet, *La philosophie des alchimistes et l'alchimie des philosophes. Jâbir ibn Ḥayyân et les « Frères de la Pureté »* (Paris: Maisonneuve & Larose, 1988), at p. 26, gives 'plomb blanc', and at p. 30, 'plomb blanc (ou étain ? *qal'ī*)'. According to D. Goltz, *Studien zur Geschichte der Mineralnamen in Pharmazie, Chemie und Medizin von den Anfängen bis Paracelsus*, Sudhoffs Archiv Zeitschrift für Wissenschaftsgeschichte, Beiheft 14 (Wiesbaden: Steiner, 1972), p. 243, it means 'Zinn'; and according to I. Afshar, 'Javāher-Nāme-ye Neẓāmī', in N. Pourjavady and Ž. Vesel, ed., *Naṣīr al-Dīn Ṭūsī philosophe et savant du XIII^e siècle* (Tehran: Presses Universitaires d'Iran–Institut Français de Recherche en Iran, 2000), pp. 151–165, at p. 158, it means 'tin'. Cf. also Goltz, *Studien zur Geschichte der Mineralnamen*, p. 310, where *al-qala'ī* is given in association with *al-usrub* and in the transcription 'alkali'.

94 Dieterici, *Die Naturanschauung*, p. 114: 'Schwarzblei', namely, '*raṣāṣ al-usrub*'; cf. Goltz, *Studien zur Geschichte der Mineralnamen*, p. 243. Freytag, *Lexicon Arabico-latinum*, s.v. *usrub*: ' plumbum, plumbum nigrum ', cf. s.v. *raṣāṣ*.

95 Epistle 21; but the issue is not dealt with in the treatise as we know it now.

hyacinth and of pure gold, the colour of saffron, and similar colours are related to the light of the Sun and to the shining of its rays, and so the white of silver, of salt, of crystal, of cotton, and similar colours of plants are related to the light of the Moon and to the shining of its rays, and according to this example the other colours of each species are related to one of the planets or [*wa*] to the fixed stars. That has already been recalled in the books on the decrees of the stars, as it has been said that black [belongs] to Saturn, red [p. 108] to Mars, green to Jupiter, blue to Venus, yellow to the Sun, white to the Moon, and the iridescent colour to Mercury.

As to the rule that governs the earthen substances, with regard to the way in which they are formed, it is that, when those waters are mixed with the soil of the [various] places, and the heat of the mine works on them, the main part of those liquids is dissolved, becomes vapour, and rises in the air, as we have recalled above,[96] and the heat of the mine performs an excess of ripening and concoction in what of them remains imprisoned, attached to the parts of earth, (fol. 177a) and joined to them, to the point that they become dense and coagulate.

And if the soil of those places is briny and salty [*mushawraja*],[97] various kinds of salts, boraxes, and alums are formed from them. If the soil of the places is acrid, various kinds of green and yellow vitriols, *qalqanṭār*,[98] and the like coagulate from it. If the soil of the places is [made of] pebbles, sands, and earth mixed together, gypsum, ceruse, and the like coagulate from it. If the soil of the places is soft earth and hot argil, truffles coagulate there from it, and various kinds of herbage, herbs, pasture, trees, and crop [*zar'*] grow.

96 See above, p. 238.

97 Cf. for this translation note 24 above. Dieterici, *Die Naturanschauung*, p. 116: 'salzig'. The Ṣādir edition explains: 'Perhaps *mashrūja*, from *sharj*, namely, the bending of water from a smooth to a stony area'; vol. 2, p. 108, note 1.

98 Dieterici, *Die Naturanschauung*, p. 116: 'Chalcitis, die eine Arte Glas ist'. The term, in the form *qalqaṭār*, is said to be the same as 'calcite', namely, yellow or red vitriol. The word does not come from the Greek χαλκῖτις, but from χαλκιτάριν, which is found in Alexandrian alchemy. See Goltz, *Studien zur Geschichte der Mineralnamen*, p. 283 and notes 344, 345, and p. 295 and note 386. According to Marquet, *La philosophie des alchimistes*, p. 27, it means 'peroxyde de fer'.

[p. 109] **Chapter 10**

Know, O my brother, that fire is the judge among mineral substances, which decides about them all and distinguishes between them and what is of another genus; and that the noblest of the[se substances] are those whose parts cannot be separated, [such] as gold and hyacinth, and that is due to the strength of the reciprocal union of those parts. In fact, there is no moisture among the interstices of their parts.

As to the cause of the fact that some mineral substances burn, because fire consumes them quickly, and [because] it flares up in them quickly, such as sulphur, arsenic, pitch, naphtha, and similar minerals, it is because of the fact that the aerial, oily parts stuck to the earthen ones are not united with them, and that there are few watery parts with them, and they are neither ripe nor united with them, so, when the heat of fire affects them, they quickly melt, are dissolved, and become smoke and vapour, and the earthen parts get separated, rise in the air, are mixed with it, and scatter among the parts of the air.

So, when it is asked what the cause is, on account of which gold melts but does not burn, and hyacinth neither melts nor burns, it is answered: the cause of the fact that gold melts is because of the oily moisture united with the earthen parts: when the heat of fire affects them, they melt, and the earthen parts that are with them soften. As to why does it not burn, it is because of the fact that the watery parts united with the earthen and the aerial [parts] confront fire, and remove from their earthen body the flare of fire with their coldness and wetness; and when those aerial, oily parts are brought out from fire, they solidify, and the watery parts become dense, coagulate, and become earthen parts, as they were. According to this analogy is the rule that governs the bodies that can be melted.

As to hyacinth, [it happens that] because the watery parts become dense and pure on account of a long stagnation among rocks and stones, and ripen as long as the heat of the mine concocts them, then its parts are joined and dry, and are not melted by fire, because no oily moisture is in them. As to the cause of its purity, it is [p. 110] because of the fact that in it there are no earthen, dark parts, and [that] they are all watery parts that have become dense and pure, and that have

ripened, solidified and dried, so that fire cannot separate its parts because of the strength of their union and dryness. As to the cause of the speed in which some bodies melt and burn, [such] as lead and black lead, it is because of the fact that the watery and the aerial parts are not united with the earthen parts. As to their blackness, it is because (fol. 177b) of the fact that they are not ripe; their heaviness is because of the multiplicity of the earthen parts in them.

Chapter 11

And know, O my brother, that these substances have many properties and different natures. Among them there are those contrary and incompatible with each other, and those similar and [apt to be] combined, which have various reciprocal influences — either attraction, or retaining, or repulsion and aversion — and which have also a hidden consciousness and a subtle sense, [such] as plants and animals — either aspiration and love, or hatred and enmity —, the core of whose causes is known only by God, glorified be His name.

A proof of the soundness of what we have recalled, and of the truth of what we have described, is the wise men's discourse in the Book of Stones, and their characterization of them as a nature that is [apt to be] combined with another nature, a nature that is [apt to] adhere to a[nother] nature, a nature that is [apt to be] associated with a[nother] nature, a nature similar to a[nother] nature, a nature that subjugates a[nother] nature, a nature that has power over a[nother] nature, a nature that is too weak for [another] nature, a nature that ignites a[nother] nature, a nature that is bad for a[nother] nature, a nature that is good with a[nother] nature, a nature that corrupts a[nother] nature, a nature that whitens a[nother] nature, a nature that reddens a[nother] nature, a nature that flees from a[nother] nature, a nature that hates a[nother] nature, and a nature that is intermingled with a[nother] nature.[99]

The nature that is [apt to be] combined with another nature is, for instance, diamond: when it is brought near to gold it adheres to it and

99 This passage is very close to the one cited in Ruska, *Das Steinbuch*, p. 95.7–10, transl. at p. 129.

retains it. It is said that diamond is found only in a gold mine, in a vein turned eastwards.[100] An[other] example is the nature of magnet[101] and iron; [p. 111] in fact, between these two dry and hard stones, and between their nature, there are affection and inclination: when iron is close to this stone at the point that it smells its odour, it goes towards it, and is attached to it, and the stone attracts [it] to itself, and retains it as a lover does with [his] beloved. And so the stone that attracts flesh, the stone that attracts hair, and the stone that attracts straw.[102] According to this example, there is no mineral stone without affection and inclination between its nature and the nature of another thing, whether people know that or not.

And know, O my brother, that the acts of these stones can be compared to the influence of a remedy on a sick organ, because a property of every sick organ is its inclination towards the nature of the remedy contrary to the nature of the illness that is in it; so when the remedy is brought near to the sick organ, and [the organ] senses it, the attractive power attracts it towards that organ, the ruling power keeps it close, so that the nature of the remedy to repel the nature of the illness that causes pain, gains power over it, subdues it, and repels it from the sick organ, as a warrior, a fighter or an opponent, against his adversary and enemy, calls for help to the power of him who [can] help, and [when he has received his help, he is able to] drive [his adversary or enemy] away from himself.

These [things are a sign] of the perfection of the reasons of God, be He exalted, of the wonders of His work, of the subtleness of [the way in which] He organizes [*tadbīrihi*] His animated creatures, and of the goodness of [the way in which] He governs [*siyāsatihi*] them, as for every disease that may occur He posed a remedy that heals [it],

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100 Cf. however the following remark by Pliny the Elder: 'Very rarely, and then only as a miracle, is *adamas* found in gold veins although it would seem it should only grow in gold'. S. H. Ball, *A Roman Book on Precious Stones, Including an English Modernization of the 37th Booke of the Historie of the World by Plinius Secundus* (Los Angeles: The Gemological Institute of America, 1950), p. 137.

101 On the magnet, see de Callataÿ and Halflants, *On Magic I*, p. 147, note 202. This mineral is known today as magnetite.

102 Cf. Ruska, *Das Steinbuch*, pp. 110.11–111.10, tr. at pp. 157–159. See also pp. 100.21–101.1, tr. at p. 139, on magnets attracting iron, copper, and hair.

then He inspired them with it, as [God], be He exalted, recalled by His saying in the language of His Prophet Muhammad, God bless him and give him peace, in a tale concerning Moses, His intimate friend, upon him be peace, when Pharaoh asked him and his brother Aaron, *[...] 'Who, then, O Moses, is the Lord of you two?' He said: 'Our Lord is He who gave to each (created) thing its form and nature, and further, gave (it) guidance,*[103] that is, [He Who] created them, gave them their form and made them know (fol. 178a) their benefits and harm, Who fortified and supported them, Who preserved, protected, organized, and governed them as He willed and how He willed, blessed be God, the best of Creators.

As to the nature that defeats another nature, it is like the nature of emery that consumes [p. 112] stones when it is rubbed [on them], softens them, and makes them smooth; and like the nature of black lead [*al-usrub al-wasikh*] that pierces diamond[104] — [that diamond,] which subjugates the other hard stones, because no stone subjugates diamond, whereas it subjugates them all, and if it is put on an anvil and is struck with a hammer, it enters either [in the anvil] or in [the hammer], and is not broken, but if it is placed between two lead sheets and is pressed,[105] it breaks up into fragments. [The nature that defeats another nature is also like] that of the volatile, liquid quicksilver, which has little endurance of the heating of fire: when hard mineral stones

103 Qur'an 20:49-50, which has *fa-man* instead of *man*, and writes *yāMūsā* as one word. Dieterici, *Die Naturanschauung*, p. 119, refers to '(S. 32, 6)'.

104 Cf. Ruska, *Das Steinbuch*, p. 141, note 7. However, note, for instance, that the Ismaili poet, traveller, and philosopher Nāṣir-i Khusraw (d. 1074) rejects this theory as absurd in Chapter XV of his *Kitāb Jāmiʿ al-ḥikmatayn* ('The Book Combining the Two Wisdoms' [the Greek and the Ismaili]). Cf. Nāṣir-i Khusraw, *Kitâb-e Jâmiʿ al-Hikmatain. Le livre réunissant les deux sagesses ou Harmonie de la philosophie grecque et de la théosophie ismaélienne*, ed. H. Corbin and Moh. Moʿin (Tehran–Paris: Département d'Iranologie de l'Institut Franco-Iranien–Librairie d'Amérique et d'Orient Adrien-Maisonneuve, 1953), pp. 167.5–6 and 182.6–18. French translation, *Le livre réunissant les deux sagesses (Kitāb-e Jāmiʿ al-Hikmatayn)*, tr. I. de Gastines (Paris: Fayard, 1990), pp. 189 and 200–201. English translation, E. Ormsby, *Between Reason and Revelation. Twin Wisdoms Reconciled. An annotated English translation of Nāṣir-i Khusraw's Kitāb-i Jāmiʿ al-ḥikmatayn* (London–New York: I. B. Tauris–IIS, 2012), pp. 155 and 165.

105 Dieterici, *Die Naturanschauung*, p. 119: 'und bedeckt ihn damit', with a different reading; see the critical apparatus, p. 309, note 5.

[such] as gold, silver, copper, and iron are plated with it, it weakens and loosens them, so that they can be broken with the smallest effort, and break into pieces; and like the stinking sulphur, which blackens luminous and bright stones, removes their colours and pigments, and empowers fire in them, so that they are burnt in the quickest space of time. The cause of that is that in sulphur there is an oily, viscous and hardened moisture, and when the heat of fire affects it, it melts, clings to the bodies of the stones, and is mixed with them, and when fire gains power over them, it burns, and those bodies burn with it, be they hyacinth, gold, or other stones.

As to the nature that embellishes and illuminates another nature, it is like sal ammoniac [*nūshādir*],[106] which penetrates into the depth of stones and cleanses them of dirt. As to the nature that helps another nature, it is like borax, which helps fire in quickly founding the mineral stones that can be melted; like vitriols and alums, which polish, illuminate, and purify them; and like magnesia [*al-maghnīsiyyā*][107] and alkali, which help in founding and purifying sand, so that transparent glass may come from it.

And according to this exemplification and analogy is the rule that governs the other mineral stones with regard to their reciprocal influences. As to their influences on animal bodies, they have been

106 According to Paola Carusi, what *nūshādir* is in reality is not certain. It could be ammonium chloride, an acid salt, but this is only a hypothesis.

107 Paola Carusi notes that there are two kinds of magnesia: the blackish manganese dioxide, used by glass-makers as a glass whitener, and also called 'the soap of glass-makers'; and an unidentified white magnesia, which according to some alchemists is obtained in the 'art' by bleaching magnesia, but the issue is not clear. See also *Les alchimistes grecs,*[…] *Tome I, Papyrus de Leyde, Papyrus de Stockholm, Fragmente de recette*, ed. and tr. R. Halleux (Paris: Les Belles Lettres, 1981), pp. 221–222, s.v. μαγνησία: 'Non identifié […] chez Théophr. Lap. 40 […] il est dit ressembler à l'argent. Selon Buttmann […] espèce de talc ou de nickel; selon Berthelot […] oxyde de fer; selon Lippmann […] alliage pâle; selon M. Stephanides […] pyrite de fer blanc. Dans *CAG* 188, substance blanche. Ne désigne le carbonate de magnésie qu'à partir du xix^{e} s.' I am indebted to Paola Carusi for this quotation. See also Ruska, *Das Steinbuch*, p. 129, note 4: 'Das Wort Magnesia ist ein Sammelname für schwefelhaftige Erze und verschiedene daraus gewonnene Produkte […] dann bezeichnet es aber auch — und in diesem Sinn wird es häufig in unserm Steinbuch verwendet — den Braunstein, der zur „Reinigung" der Glassflüsse dient'; and immediately afterwards he refers to this passage by the Ikhwān.

recorded in the books of medicine and [in those containing] remedies and drugs.

[p. 113] And know, O my brother, that these mineral substances have strange properties, and that their structure and their way of being produced [*takwīnihā*] is marvellous; and when an intelligent man reflects on the subtleness of the Creator's work, high be His praise, and on the perfection of His wisdom in them, he remains confused, astonished and perplexed, then [he feels the necessity] of increasing in knowledge and certitude, particularly when he reflects on the structure and way in which the pearl is produced. In fact, this substance is [made of] water and of an aerial, sweet, oily, and solid moisture, which has coagulated between two shells, as if they were two porcelain covers [*khazafatāni muṭabbiqatāni*], whose external sides are rough and dirty, and the internal sides are smooth, clean, and white. In their interior there is an animal, like a piece of flesh; its structure is like that of a womb, and its abode is the bottom of the salty sea. Those two shells are brought together on themselves from their sides, as a bird brings together its wings when he stops flying, for fear that the salty sea-water might enter in it [the small animal], so that, when (fol. 178b) [the small animal] perceives that sea has come to rest from the clash of its waves, it rises from the bottom [of the sea] up to its surface by night, at a well-determined moment of time, and it opens those shells as a young bird opens its mouth when the [mother-]bird feeds it, or as the mouth of the womb is opened during sexual intercourse. Then, something of the damp and the moisture of the air[108] filters into its interior, and drops of sweet water are assembled in it, of [the sort of] dew and frost that fall by night on plants and herbs. And when those shells — strongly brought together for fear that some salty sea-water might filter into it, and that that sweet moisture may be corrupted by the saltiness [of the sea that comes to be] mixed with it — have sufficiently [remained so], they gently descend to the bottom of the sea and abide there for a certain time; and when a long time has passed for that sweet moisture there, it becomes dense and heavy, arrives at the consistency of quicksilver, and rolls inside it[s shell] while it moves, so that it becomes round grains, as does quicksilver when it is scattered and rolls. Then, with

108 Both the words *hawā'* and *jaww* are used here.

the passing of time, it hardens, coagulates, and becomes big and small pearls. That is the decree of the Mighty, the Omniscient.

[p. 114] And know, O my brother, that when you attentively examine the objects of sense, regard the existing beings, and research into the generated beings that are under the sphere of the Moon, you find [that] the smallest in body [*juththa*, here and later], and the weakest in structure [are] the noblest in substance, the highest in power, and the most general in utility.

Look at these three things that are pearl, silk, and honey, and examine them attentively; you will find them to be, among people, the highest in power, the most general in utility, the most comfortable in clothing, the most pleasant in taste. And when you attentively examine what we have mentioned about the structure of this animal, it will become clear to you that [pearl] is the basest and weakest of sea animals — and how do you think the bee is not the weakest in constitution, and the smallest in body among flying animals, and likewise, is not the silk-worm the smallest animal in body, and the weakest in constitution?

Know, O my brother, that God, may He be glorified and honoured, created these mineral things for the advantage of animals, and especially of humans, and made [humans] in need of them [capable of] freely disposing of them, and [of] enjoying them until a certain time, so that the intelligent may reflect on their generation, innovation, and manufacture, and [that all] that may be an example [*qiyāsan*] for them to realize that the world, too, is innovated, fabricated, and generated from nothing [*ba'd an lam yakun*, here and later][109] — even though it is great in body, big in structure, long in life, prolonged [*kathīr*] in permanence, it is not known when it was generated and when it will be corrupted — and [so that all that may also be an example] for them to realize that [the world] has a Creator who created it, who gave it existence and form, who composed its spheres and made them turn, who set its stars running and put them in motion, who stretched their rays towards the centre, who mixed the elements, coupled natures, and begot from them the beings subject to generation and corruption, namely, animals, plants, and minerals, and who made them subservient to man and made him sovereign over them, able to freely dispose of

109 For this translation see above, note 2.

them as he wills, and to judge about them, whether he wants to take advantage of them, or [p. 115] to remove a harm through them.

However, the intelligent need inference of the concealed from the visible,[110] and analogy of the part with the whole,[111] in order [to acknowledge] that the world is innovated according to the experience [*khibra*] (fol. 179a) of their intellects, when they reflect on its innovation and generation from nothing, and [when] they research into that cause that leads to [acknowledgement] — for an artisan, [the existence of] an act without any prior act in him [*ba'd an lam yakun fi'lun*], namely, the cause called 'the final cause', because of which an agent accomplishes his act. And when the majority of the intelligent reflect on this cause and research into it, they do not arrive at knowing it.

And likewise, also, when they reflect <on the matter of the Agent, when He acted, in which time He operated, and in which place, they do not arrive at knowing or representing that. And also, when they reflect>[112] and research [in order to understand] from which thing He made it, how He formed it, where the compass was pointed when He shaped the globes of the spheres and made the stars turn, and similar objects of research and reflection about things whose knowledge is not in the capability of humans, nor is their representation in the power of their soul[, they do not arrive at knowing or representing that].

Then their ignorance, confusion, and doubts lead them to state [*ilā'l-qawl*] the timelessness [*qidam*] and eternity [*azaliyya*][113] of the world, with no other science or explanation, apart from their false imaginations and their vain and distorted fantasies. But God, high be His praise, before creating them, was well aware that such doubts and confusion would affect them, so He banished their deficiencies [*'ilalihā*] by showing them things about which they could not doubt, nor [could they doubt] about their generation and innovation, so that

110 This is the traditional method of knowledge in Islamic *kalām*.

111 This is one of the traditional ways of knowledge in the 'two-terms' Islamic logic.

112 The words between angled brackets are added in the text by the majority of the MSS consulted; see the critical apparatus, p. 315, note 2.

113 The word *qidam* is the contrary of temporal origin (*ḥudūth*), like *azal*, which denotes the constant duration of existence in the past, whereas *abad* indicates its constant duration in the future. See R. Arnaldez, 'Ḳidam', *EI2*, vol. 5, pp. 95–99.

it would be the evidence [*dalīlan*] for them, and a model [*qiyās*] of that which they were able neither to experience, nor to represent about the innovation and fabrication of the world, namely, the multiplicity of the beings subject to generation and corruption — minerals, animals, and plants.[114]

He also placed in the natural disposition of intellects the necessity to acknowledge that a perfect work comes only from a wise artisan. In addition, He made the sign [*athar*] of the work permanent in the product, so that they can experience it night and day from the rotation of the spheres around the centre, from the journey of the stars in [the spheres], from the succession of night and day, and of winter and summer in relation to the four elements, and from [their] changes and transformations.

The origin of the beings subject to generation and corruption according to these [modalities] is a proof for intellects, and pieces of evidence [taken] from senses, of the innovation of the world and of its origin [*takwīn*] from nothing, as nothing is found in all these particular, generated beings that does not come from an efficient cause, a material cause, a formal cause, and a final cause. We [p. 116] have already explained in the epistle 'On the Intelligible Principles' what [the role of] these causes is in the innovation and the generation of the world,[115] [so] learn that from there.

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114 This context expresses at a higher level the need of making the innovation of the world understandable to everybody according to their capabilities. Whereas here the means is entrusted to the status of the sublunar world, in Epistle 28: 'On the Limits of Human Knowledge' the Ikhwān rely on the tale of the confectioner's children; *Rasā'il*, vol. 3, pp. 25.11–28.8.

115 The text refers here to Epistle 32: 'On the Principles of the Intelligible Existing Beings According to the Pythagoreans' Opinion', where God is repeatedly considered as 'cause'; see in particular *Rasā'il*, vol. 3, pp. 178.8–184.17. The Ikhwān's approach in this treatise is exclusively Neoplatonic; every hypostasis is connected to the preceding one, and owes its existence and perfection to the preceding one. It is because of that that the Brethren can conclude: 'When the [Universal] Soul is perfected, Matter is [also] perfected. That is the outmost goal in the link of the Soul with Matter, and because of that the rotation of the sphere and the generation of the beings subject to generation occur, so that the Soul is perfected by making her virtues appear in Matter, and Matter is perfected by receiving them. If it were not so, *the rotation of the sphere would be useless*'; *Rasā'il*, vol. 3, p. 185.9–12 (my italics).

And as we recalled in part how minerals are formed, let us recall now in part the species of their substances and the properties of their species mentioned by the wise men, and let us begin by mentioning the noblest among them, namely, gold and hyacinth, then the others that follow them, one species after another.

Gold is a substance balanced in natures, with a sound mixture, its soul being joined to its spirit, and its spirit being joined to its body — and we mean by 'soul' the aerial parts, by 'spirit' the watery parts, and by 'body' the earthen parts.[116] However, due to the strong union and intermingling of its parts, it is not burnt by fire, as fire cannot separate its parts, and it neither decays into soil[117] nor is corroded over the duration of time, and accidental detriments do not change it. It is a body soft to the touch, yellow in colour, sweet in flavour, (fol. 179b) pleasant in smell, heavy and weighty [*razīn*]. The yellow of its colour [comes] from its igneous component, its purity and brightness [come] from its aerial component, its softness [comes] from the oily [nature] of its humid component [*ruṭūbatihi*], and its weight and heaviness [come] from its earthen component. In fact, its sulphur is clean, its quicksilver is pure, and their mixture is balanced. The heat of the mine has concocted them over the duration of time, gently and in a balanced way. And when the heat of fire affects it, its humid component is melted, encircles its body, faces the heat of fire, and drives away from its body the combustion of fire. And when it is taken away from fire, that humid component solidifies. When it is hammered, it is stretched by hammers, be it hot or cold; it can then be extended in all directions, can be made thin and stretched, and twisted in threads; it takes every form of vessels and pieces of jewellery, can be mixed in fusion with silver and copper, and gets separated from them when golden marcasite is thrown on them, because [marcasite] is of the genus of sulphur that burns other things and is not burnt. When

116 As suggested by Paola Carusi, these lines echo an alchemic doctrine; see, for example, the *Miftāḥ al-ḥikma* ('The Key of Wisdom'), which belongs to the corpus of the pseudo-Apollonius (Balīnās). Balīnās is one of the sources of Jābir ibn Ḥayyān, who states he has written a *Kitāb al-aḥjār ʿalā rayy Balīnās* ('The Book of Stones according to Balīnās' Opinion'). See also P. Carusi, 'Animalis Herbalis Naturalis', p. 55.

117 As is the case with living bodies, the Ikhwān mean.

it is pulverized and put in remedies for the eye, it is beneficial. When [p. 117] a spot is seared with it, it does not blister, and it is quickly soothed. It is helpful with black bile, with alopecia, and with ophiasis.[118] Among stars, it belongs to the allotment [*qisma*][119] of the Sun. Because of these properties and virtues, it is assembled and stored in treasure houses, and because of that people possess a small quantity of it, but keep it in high esteem, and its value is great, not because [only] a small quantity of it exists, but [because] everyone who takes possession of a big quantity of it buries it in the earth, or conceals it, so only a small part of it is manifest.

Hyacinths are hard, warm, and dry stones, extremely dry, weighty, pure, and transparent, of different colours — red, yellow, green, and blue[120] — and the origin of them all is sweet water deposited in their mines among hard stones, rocks, and [other] stones [*ṣafwān*] for a long time, whence [this kind of stone] becomes dense, pure, and heavy. The heat of mine ripened it during its long stagnation [there], so that its parts were joined and hardened. It is not melted in fire because of its scarce oiliness, nor does it crack in it on account of the density of its humid component, but it does increase in the beauty of its colour. In particular, files cannot work anything in red hyacinth due to its strong hardness and dryness; only diamond and emery [can do that] by fractioning [it] in water. Its mines are in the southern countries below the equator; a small quantity of it exists, of great value because of its paucity. Among its uses there is that he who wears [a ring adorned with] a piece of it, and is in a country whose inhabitants are affected by epidemic and plague, is saved from them, God willing, be He exalted. [He who wears such a ring] is noble in the eyes of people, and his needs and necessities of life are easily satisfied.

Emerald and chrysolite[121] are two cold and dry stones, of the same genus, [p. 118] which are found in gold mines. The best, most excellent, and strongest of them is green, pure, and translucent. Fatigue escapes

118 The Arabic is '*dā' al-ḥayya*', 'the sickness of the snake', a kind of alopecia, according to Dozy; *Supplément aux dictionnaires arabes*, s.v. *dā'*.

119 On this term, see note 46 above.

120 Cf. Ruska, *Das Steinbuch*, p. 99.7, transl. at p. 135ff. Red hyacinth is ruby, the blue is sapphire.

121 Cf. Ruska, *Das Steinbuch*, p. 98.10ff., tr. at pp. 134-135. *Zabarjad* is translated as

the vision of he who often looks at the stone [called] chrysolite.[122] He who is adorned with a necklace made of it, or wears a ring adorned with it, is saved from epilepsy.

Malachite is an enemy of chrysolite, (fol. 180a) similar to it in aspect; when it is situated together with it in the same place, it breaks it, makes its colour turbid, and removes its splendour [*naẓāratahu*].

As to pearl, it was already mentioned above, as well as the way in which it is formed. Its property is to be helpful for a heart palpitation [caused] by fear and anxiety that come from black bile, but it moistens the blood of the heart. It is put in eye remedies, and strengthens the nerves of the eyes. When it is fractioned and the white of leprosy is coated with it, it removes it. If he who is affected by epilepsy drinks that water, it calms it.

Silver is the closest to gold among the substances that can be melted. It is a cold, dry, and balanced body; it would almost have become gold, if the cold of its mine had not prevailed on it before ripening. It belongs to the allotment [*qisma*][123] of the Moon. When copper[124] and lead are thrown on it during fusion, it gets mingled with them, and when it is cleared out of them, it returns pure [*wa-idhā khullişat minhimā takhallaṣat*]. Sulphur blackens it, and quicksilver breaks it; borax embellishes its colour, helps it in fusion, and removes the burning of fire from it. When it is scraped off[125] and put in drinkable remedies, it protects[126] from viscous moistures. It is burnt by fire when that approaches it [*alaḥḥat ʿalayihā*]. It decays into earth over the duration of time.

'beryl' by Clément-Mullet, 'Essai sur la minéralogie arabe', p. 67, and 'Topas' by Dieterici, *Die Naturanschauung*, p. 126.

122 Dieterici, ibid., translates differently: 'Wenn jemand vielfach auf den Smaragd blickt, so heilt er dadurch die Schwäche seiner Augen', but he does not report the Arabic (see above, note 57).

123 On this term, see note 46 above.

124 Note that many MSS read *almass* (see the critical apparatus, p. 322, note 7), as does the Ṣādir edition.

125 Note that many MSS as well as Dieterici and the Ṣādir edition read *suḥiqat* (see the critical apparatus, p. 322, note 9), translated by Dieterici, *Die Naturanschauung*, p. 127: 'wird das Silber gestossen'.

126 Note that many MSS as well as Dieterici and the Ṣādir edition read *nafaʿat* (see the critical apparatus, p. 322, note 11), translated by Dieterici, *Die Naturanschauung*, p. 127: 'hilft'.

Copper is[127] a hot and dry body, excessive in both [of these qualities], [p. 119] and when acid substances [*ḥumūḍāt*] are brought near to it, it emits verdigris; verdigris is a poison. If copper is coated with quicksilver, [quicksilver] loosens and breaks it; if copper is founded, if Syrian glass[128] is thrown on it, and if it is thrown when it is warm [*bi-ḥarāratihi*] into water, its resulting colour is similar to the colour of gold; and when it is brought near to fire, it blackens, because fire is the judge among mineral substances that decides between them according to the truth. The temperament [*mizāj*] of he who is used to eat and drink in copper vessels gets corrupted, and severe illnesses befall him. When copper vessels are brought near to fish, they smell bad; and if copper vessels are turned upon grilled or cooked fish while it is still warm, it does not fail to become a mortal poison.

Ṭālīqūn[129] is a kind of copper on which an affecting substance [*adwiya*] has been thrown, with the result that it hardened; and if a knife or a weapon is made out of it,[130] it is extremely dangerous; and if a hook to catch fish is made out of it, and [a fish remains] attached to it, it is not possible for it to be freed from [that hook], even if the hook is small and the fish is big. When someone affected by the ache of facial paralysis enters a home in which no light can be seen, and he looks at a mirror made of *ṭālīqūn*, he is freed from facial paralysis. If *ṭālīqūn* is heated and plunged into water, no flies approach that water;

127 Note that many MSS have the following addition: '[...] is close to silver. There is no distinction between them two apart from redness and dryness. In fact, silver is white and soft and copper is red and dry, with much filth. Its redness comes from the strength of the heat of its sulphur[ous part], and its dryness and filth from its density [Dieterici, ibid.: '(...) von der Schmutzigkeit und Dicke (...)']. So he who is able to make it white and soft, or to make silver yellow and soft [but there must be a mistake here; Dieterici translates: 'gelb und trocken'], he achieves his need. Copper [...]'. See the critical apparatus, p. 323, note 2.

128 Syrians had discovered the technique of blown glass.

129 Dieterici, *Die Naturanschauung*, p. 127: 'Der Talqun (das Giftkupfer)'; D. Goltz, *Studien zur Geschichte der Mineralnamen*, p. 254, 'chinesische Eisen, ist name von griech. Metallikon'. See also B. Fehér, 'Mysterious Alloys in Early Muslim Metallurgy on the *ṭālīqūn* and the *Haft-ğūš*', in K. Dévényi and T. Iványi, ed., *Essays in Honour of Alexander Fodor On His Sixtieth Birthday*, monographic issue of *The Arabist. Budapest Sudies in Arabic*, 23 (2001), pp. 55-63.

130 The majority of the MSS consulted add here: 'and an animal is wounded by it'; see the critical apparatus, p. 324, note 12.

if tweezers [*minqāsh*] are made out of it, and the hairs of the body are plucked out with it and their spot is anointed, no hair will grow from that spot afterwards.

Tin [*al-qala'ī*] is close to silver in colour, but it is distinguished from it by three qualities: smell, laxity, and screeching [*ṣarīr*]. These detriments enter it[131] while it is still in its mine, as detriments enter an embryo[132] while it is still in its mother's belly. Its laxity [is due] to the abundance of quicksilver in it, and its screeching to the density of its sulphurous part and to the fact that it is scarcely mixed (fol. 180b) with quicksilver, so that it is layer upon layer, and owing to that it screeches. And its smell is bad because of its minimal ripening. If it is prepared with a branch of basil and with marcasites, salt, [p. 120] and arsenics in the required [quantity],[133] it is freed from these detriments, if God wishes, be He exalted. When tin is burnt and placed in ointments, it heals lesions and ulcers that have been formed in eyes.

Black lead [*al-usrub*] is a kind of lead,[134] but it has plenty of sulphur and is not ripe; its benefits are well known among people.

Iron has many kinds [*ajnās*]; among them, [one is] soft and supple, [and one is such] that, when it is watered [i.e., tempered by quenching (?)], it increases in hardness and sharpness. It is indispensable to artisans, and its benefits are evident and clear; it is indispensable to people just as fire, water, and salt are indispensable.

As for alloyed [*al-ma'mūla*] substances similar [to it], one is copper;[135] [when] an affecting substance [*adwiya*] is thrown on it, it increases in yellowness and softness. Bronze [*al-isfīdhruwī*][136] is copper mingled

131 Dieterici, *Die Naturanschauung*, p. 128, translates: 'dies rührt von widrigen Zufällen her [...]'.

132 I translate according to the reading *al-janīn* proposed by several MSS as well as by Dieterici (see the critical apparatus, p. 325, note 8), but Atif has *al-maflūj*.

133 Dieterici, *Die Naturanschauung*, p. 129 translates: 'Wird es aber mit Chrysantemzweigen, dem Markasit mit Salz und Arsenik richtig behandelt'.

134 Note that many MSS have '*khayr min al-raṣāṣ*', translated by Dieterici, ibid.: 'das beste Blei'. See the critical apparatus, p. 326, note 3.

135 The Arabic is, as usual, *nuḥās*, but Dieterici, ibid. translates more correctly: 'das Messing'.

136 Perhaps the same as the Persian *isbāḏruh*, for whose meaning see Goltz, *Studien zur Geschichte der Mineralnamen*, pp. 250–251. At note 161, we found the forms *isbādrīya* and *isbādārīj* as 'weisses Kupfer'; cf. the Arabic *safīd rūy* as 'Messing'. Dieterici, *Die Naturanschauung*, p. 129: 'Das Weissmetall'.

with tin; *mafragh*[137] is copper [mixed] with black lead; *murdāsanj*[138] is roasted black lead;[139] ceruse [*isfīdhāj*][140] [comes] from black lead and an acid environment; minium [*asrunj*][141] [comes] from it [i.e., black lead] and sulphur; cinnabar [*zunjufr*][142] [comes] from quicksilver and sulphur; malachite [*zinjār*][143] from copper and acid environment; and *martak*[144] from lead. As to their benefits, namely, of these stones, and

137 Dieterici, ibid.: 'das Mafrig'. I have not found any explanation about this term in the texts and dictionaries consulted.

138 Dieterici, ibid.: 'Die Silberglätte'. Perhaps this Neopersian term is the same as the Neopersian *murdeh säng* quoted in Goltz, *Studien zur Geschichte der Mineralnamen*, p. 245, that means 'toter Stein' (Bleiglätte). Cf. Ruska, *Das Steinbuch*, p. 138: 'oxidierte und sulfurierte Metalle'. According to Paola Carusi, it is litharge (PbO); in the Latin tradition, a *merdasengi* is used, which according to some people is *ablutum* (washed) litharge — namely, purified by its impurities; see *Sinonima Bartolomei*: 'Merdasengi, i. litargiri, secundum alios plumbum ustum ablutum'. See also *Les alchimistes grecs*, p. 220, s.v. λιθάργυρος: 'Monoxide de plomb (PbO) formé au cours de la fusion et de la coupellation du plomb argentifère. Peut avoir une couleur jaune d'or'.

139 Also on Paola Carusi's advice, I omitted the words *wa'l-ḥumūḍa*, following several MSS (see the critical apparatus, p. 327, note 3) as well as Dieterici, who in *Die Naturanschauung*, p. 129, translates: 'entsteht aus dem Blei, wenn es verbrannt wird'. Otherwise, according to Paola Carusi these words should have been translated: '*murdāsanj* comes from black lead [when] it is roasted [in the presence] of acid humidities [*ḥumūḍa*]'. This phrase, that could seem to be consistent with what is said immediately afterwards about ceruse and malachite, raises doubts from a chemical point of view: that is because litharge, a lead oxide, whenever it is formed in a humid and acid environment, is converted, at least in part, into salts; and if the acid is carbon dioxide, as is probable in this case, what is produced is carbonate, ceruse (*isfīdhāj*). As this situation is not favourable to getting litharge, it is very improbable that it could be cited in this passage.

140 Dieterici, ibid.: 'Das Bleiweiss'. Cf. Ruska, *Das Steinbuch*, pp. 138 and 125.4–6, transl. at p. 182: 'entsteht aus dem Blei'; Goltz, *Studien zur Geschichte der Mineralnamen*, pp. 222 and 246.

141 Cf. Ruska, *Das Steinbuch*, p. 137. Goltz, *Studien zur Geschichte der Mineralnamen*, p. 268, gives various vocalizations for this term (*isrinj*, *asranj*, and *usrunj*) of Persian origin.

142 Cf. Ruska, *Das Steinbuch*, p. 137; he explains in note 2 that it is 'das rote Quecksilberoxyd' (described at pp. 124.17–125.3, transl. at p. 182). Goltz, *Studien zur Geschichte der Mineralnamen*, p. 308: minium, considered at p. 286–288 the same as 'Zinnober, *qīnābārī*'.

143 Cf. the Persian *zinǧār* quoted in Goltz, *Studien zur Geschichte der Mineralnamen*, p. 256, meaning 'Kupferrost'.

144 Cf. the Persian *murdeh säng*. Goltz, *Studien zur Geschichte der Mineralnamen*, p. 245 (see above, note 138); whereas *martak* is Middle Persian, *murdasang* is

to their harm, they are well known among people, and they have been mentioned in books of medicine with their explanation.

Among mineral substances there are quicksilver and sulphur. Sulphur is an oily and viscous stone that adheres to mineral stones when they are melted; it is burnt by fire, and burns the stones that are with it because it is entirely oily. Quicksilver is a humid, fluid body that is unstable [*yaṭīru*][145] when affected by the heat of fire, with no endurance of the heat of fire. It gets gradually [*bi'l-tadbīr*][146] mingled with mineral bodies, and loosens, breaks, and weakens them. When the heat of fire affects those bodies, quicksilver flies away, and they return to their original state, as hard as they were. Its [behaviour] with these stones can be compared [p. 121] to [the behaviour] of water with dry argil. When water is sprinkled on it, [argil] becomes loose and crumbles, and when the heat of fire or the heat of the Sun affect it, it dries, and returns to as it was at the beginning.

Know, O my brother, that sulphur and quicksilver are the roots of the mineral substances that can be melted, as earth [*turāb*] and water are the roots of artificial bodies, such as unfired and baked bricks, bellows,[147] pots, and what is made out of argil. The way in which substances that can be melted are formed, and the causes of the diversity of their natures and qualities, have been mentioned already in a chapter before this one.[148]

Among mineral substances there are also the [various] species of salts,[149] alums, borax [*al-bawāriq*, here and later], and vitriol [*al-zājāt*,

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Neopersian (Bleiglätte). Cf. Ruska, *Das Steinbuch*, p. 137: Bleiglätte, synonym with *asrunj* above, 'wie selbst Blei uns Zinn fortwährend' (note 5).

145 Dieterici, *Die Naturanschauung*, p. 129: 'unruhig'.

146 Dieterici, ibid.: 'allmälig'.

147 This translation comes from an emendation in the Atif text, of *al-kīzān* into *al-kīrān* (see the critical apparatus, p. 329, note 2), which is translated so by the majority of the dictionaries consulted, but Dozy has *kūr* = fourneau (*Supplément aux dictionnaires arabes*, s.v. *kīr*). After the word *al-kīrān*, Atif gives *al-ghaḍā'ir*, which does not make sense; the readings proposed by the other MSS consulted are also useless (see the critical apparatus, p. 329, note 3). For this reason, I have omitted this word in my translation. Dieterici, *Die Naturanschauung*, p. 129, also has: '[...] getrockneter und gebrannter Mauersteine, Töpfe, Kessel und alles dessen [...]', but he does not provide the Arabic text (see above, note 57).

148 The text refers to Chapters 9 and 11 above.

149 Various sorts of salts described in Ruska, *Das Steinbuch*, p. 118.1–7, transl. at p. 172.

here and later]. Some of them are pleasant, like kitchen-salt and *andarānī* [salt];[150] some bitter, like the goldsmiths' polishing salt;[151] some sharp, like sal ammoniac [*nūshādir*];[152] some astringent [*qābiḍ*], like alums and vitriol;[153] (fol. 181a) some curative, like the [salt of] naphtha[154] and the Indian [salt];[155] there are also the comestible salts,[156] the nitre used by tanners,[157] alkali [*milḥ al-qilī*],[158] lime [*nūra*],[159] ash, and urine,[160] used by alchemists.[161] All these are liquids and waters mingled with the soils of [various] places of the Earth, which are burnt

150 Or even *darani*, Goltz, *Studien zur Geschichte der Mineralnamen*, p. 328; it is an especially pure salt, see p. 271 where it is mentioned with other kinds of salt. Dieterici, *Die Naturanschauung*, p. 130: 'ganz weisse Salz'.

151 Dieterici, ibid.: 'das Kunstsalz'. Dozy, *Supplément aux dictionnaires arabes*, s.v. *jalā'* has the translation: 'polissoir'; Kazimirski, *Dictionnaire arabe-français*, s.v. *ṣawgh* has *milḥ al-sāgha* as 'borax'.

152 On this term see above, note 106.

153 Dieterici, *Die Naturanschauung*, p. 130: 'das Kupfervitriol'.

154 Dieterici, ibid.: 'das Naphtha'. Goltz, *Studien zur Geschichte der Mineralnamen*, p. 271, note 278: 'petroleum-haltiges Salz'; Avicenna, *Qānūn* 151 is quoted, according to which 'man Steinsalz gewinne, wenn man das Petroleum wegkocht'.

155 Cf. Goltz, *Studien zur Geschichte der Mineralnamen*, p. 271, note 278; Dieterici, *Die Naturanschauung*, p. 130: 'indische Metall'.

156 The Arabic is '*bawāriq al-khubz*', whose translation is omitted by Dieterici, ibid. The translation I provide was suggested by Paola Carusi, who notes that Kazimirski, *Dictionnaire arabe-français*, s.v. *bawraq*, has 'sel de cuisine'. But kitchen-salt has already been mentioned above by the Ikhwān as '*milḥ al-ṭa'ām*'.

157 Dieterici, ibid. translates: 'auch gehört das Natron (Salpeter) hierher, das für die Gerber nützlich ist'. In the critical apparatus, p. 329, note 15, I have reported all MSS readings, which are usually explained with confusion in diacritical dots, because Dieterici associates the Persian form شورہ to *shawārikh*, whereas Dozy, *Supplément aux dictionnaires arabes*, associates that term to *shawraj* (s.v.); with regard to this, he quotes an expression by Ibn al-Bayṭār quite similar to the one given by the Ikhwān: '*milḥ al-dabbāghīn huwa al-shawraj min al-manṣūrī*'.

158 Goltz, *Studien zur Geschichte der Mineralnamen*, p. 234: 'Salzpflanzen'; p. 238, vocalized *al-qaly*: 'Kalium, potassium'; p. 271, note 278: *Al-qalī* = "Alkali".

159 Dieterici, *Die Naturanschauung*, p. 130: 'die Salze [...] des ungelöschten Kalks'. Ruska, *Das Steinbuch*, p. 140, note 4: 'Die Nūra ist gebrannter Kalk'; Goltz, *Studien zur Geschichte der Mineralnamen*, p. 261: 'gelöschter Kalk'; de Callataÿ and Halflants, *On Magic I*, p. 148, note 212: 'one of the various names for "quicklime"'.

160 '*Milḥ al-bawl*' in Goltz, *Studien zur Geschichte der Mineralnamen*, p. 271, note 278: 'Harnsalz'.

161 Dieterici, *Die Naturanschauung*, p. 130: 'die Chemiker'.

by the heat of the Sun, by fire, or by the heat of a mine, coagulate and become salts, alums, borax, and [various] kinds of vitriol.

Among mineral substances, there are the [various] species of arsenics, marcasites,[162] magnesia, haematite [*shādhanj*],[163] antimony,[164] and zinc [*al-tūtyā'*].[165] And among them there are glass, crystal, enamel, talc, [p. 122] jet,[166] carnelian, turquoise, garnet [*al-bajādhī*],[167] onyx, lapis lazuli [*al-azūrad*],[168] ambergris,[169] and malachite. Among them there are tar, naphtha, gypsum, ceruse, and the like.

Know, O my brother, that every species of these substances has properties, benefits, and detriments, the mention of which we left out for fear of prolixity, provided that they have been mentioned already by wise men in their books, which are in people's possession. However, we will mention the properties of some of them in part, so that they can be the evidence for the others we do not mention.

Malachite is a stone formed in a copper mine, the nature of which is cold and soft, as it [comes from] smoke raised from the sulphur generated in a copper mine, green like verdigris, and when it comes

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162 Dieterici, ibid.: 'Markasit (Wismuth?)'.

163 Cf. for this translation Goltz, *Studien zur Geschichte der Mineralnamen*, p. 294. Dieterici, *Die Naturanschauung*, p. 130: 'der Graustein (ein gräulicher wie eine Linse geformter Stein)'. For his reading, see the critical apparatus, p. 330, note 2.

164 Dieterici, ibid.: 'das Stibium'.

165 Described in Ruska, *Das Steinbuch*, p. 120.1–6, transl. at pp. 175–176. It corresponds to the Greek πομφόλυξ, translated as 'Hüttenrauch', and σποδός, translated as 'Ofenbruck'. Dieterici, *Die Naturanschauung*, p. 130: 'der Augenstein'. Goltz, *Studien zur Geschichte der Mineralnamen*, p. 259 = Pers. Dūd, Rauch. H. G. Liddell and R. Scott, *A Greek-English Lexicon* [...] *A New Edition* [...] by H. Stuart Jones [and] R. McKenzie (Oxford: Clarendon Press, 1940), s.v., gives 'zinc oxide', and 'oxide of certain metals' (but also 'ashes') respectively.

166 Clément-Mullet, 'Essai sur la minéralogie arabe', p. 205: 'jayet ou obsidienne'.

167 See also Dieterici, *Die Naturanschauung*, p. 130, but cf. for his reading the critical apparatus, p. 330, note 4. The stone is described in Ruska, *Das Steinbuch*, p. 102.13ff., transl. at pp. 143–144.

168 Described in Ruska, *Das Steinbuch*, p. 107.4–8, transl. at p. 153, 'Lasurstein' (lapis lazuli).

169 The word *al-gharawiyy*, as given in Atif, is not described in any of the dictionaries consulted, hence I have emended into *al-'anbar*, as proposed by some MSS and by Dieterici (see the critical apparatus, p. 330, note 6). Note that Goltz, *Studien zur Geschichte der Mineralnamen*, p. 325, has *ghirā'*, = 'Leim'; cf. Lane, *Arabic-English Lexicon*, s.v.

to a mountainous place, its parts thicken and become interwoven one above the other, assume a concrete form, and petrify. It has different colours, green like verdigris,[170] and it has the peculiarity of a poison: it ulcerates the intestines of him to whom [a solution of] its filings is given to drink, makes him sick, and inflames his stomach; if it is drunk and he [who drinks it] is sound, it is the contrary.[171] It is purified by the air, and is [also] made turbid by it; it prepares [*yadhhabu*] the fractioning of gold and its splitting when hammered; [in combination] with borax [*tinkār*],[172] it is stronger in its action. If it is liquefied and placed with some flies on a hornet bite,[173] it calms it; and if it is crushed and mixed with vinegar and is coated on a tetter, it removes it, and it is of help with pustules [coming forth] upon the head.

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170 I follow here Dieterici' reading *m.d.kh.n*, translated in *Die Naturanschauung*, p. 131: 'wie Kupferrost'. I have not found such meaning attributed to a word like that in the dictionaries consulted. Note that Steingass, *A Learner's Arabic-English Dictionary*, s.v. *madawḥas* consider it to be the same as *madḥūs*, 'suffering from whitlow'. On the other hand, the readings proposed in the MSS are useless, and are a demonstration of the misunderstanding of diacritical dots and of letters, which can be often noted, even in the case of better-known words. See the critical apparatus, p. 331, note 6.

171 Namely, it becomes sick. Perhaps, an explanation to this passage, which appears to be contradictory, can be found in the correspondent passage of Sharaf al-Dīn al-Tifāshī: 'Bere polvere o limatura di malachite è velenoso, corrode l'intestino [...] Una proprietà mirabile della polvere o della limatura di questa pietra è quella di proteggere contro gli avvelenamenti, però chi non ha l'abitudine di assumere veleni con regolarità in breve si ammala — l'intestino gli si corrode e tutto il corpo gli si infiamma — e muore; e questo, in particolare, se la malachite era stata limata col ferro [...]'. Aḥmad al-Tīfāshī, *Il libro delle pietre preziose, ed. I. Zilio-Grandi* (Venice: Marsilio, 1999), p. 120. Al-Tīfāshī's article on malachite is very close to the Ikhwān's presentation.

172 So Dieterici, *Die Naturanschauung*, p. 131. Cf. for this translation also Ruska, *Das Steinbuch*, p. 181; the mineral is described at pp. 123.16–124.2, transl. at p. 181 as 'eine Art Salz, in der ein Geschmack von Borax ist, wozu Bitterkeit kommt'. Clément-Mullet, 'Essai sur la minéralogie arabe', p. 248: 'soude borate'.

173 This translation takes into account the integration proposed by some MSS (see the critical apparatus, p. 332, note 1), and Sharaf al-Dīn al-Tifāshī's presentation of this remedy: 'Un'ultima proprietà: per guarire il morso di scorpioni e scarafaggi si catturano sette mosche e si schiacciano con una malachite, poi si riduce tutto in polvere, si stempera nell'acqua, infine si spalma sul morso'. Aḥmad al-Tīfāshī, *Il libro delle pietre preziose*, p. 121.

Among mineral [p. 123] substances there is also bezoar [*al-fazahr*].[174] It is a stone soft to the touch, of various colours. Its root is an aerial, oily moistness, solidified in its mine over a length of time, and it is a noble stone, from which honourable acts appear. In fact, it is helpful with lethal poisons, be these poisons warm or cold, and of animal, vegetal, or mineral origin. We need to expand the explanation of this chapter, as the minds of many people are confused with regard to the way in which poisons, theriacs,[175] and bezoars [*fazahrāt*] act on natural bodies, because they are inanimate bodies, and a demonstration has already been provided of the fact that a[n inanimate] body has no act in that it is a body,[176] and that an accident has no act, too, because it is much weaker than a body.

So, we need to recall first the quality of the acts that manifest from these bodies, one upon [*fī*] the other, then, to explain who really acts for them, in them, (fol. 181b) from them, and through them. Poisons are of two species, warm and cold. The cold ones solidify blood and the spiritual, subtle liquors [*al-ruṭūbāt*] in the organs of the body of an animal, through which the soundness of temperament [*mizāj*] and the subsistence of life [come].[177] The warm ones melt blood and those liquors and make them volatile, so that the body of that animal is annihilated or melts when they melt, and it perishes. As to the penetration [*dabīb*] of warm poisons in the bodies of animals, it is like the penetration of the colour of saffron: when it falls in water, it dyes it all at once. As to the cold [poisons], they are like rennet: when it falls in milk, it solidifies it in the shortest time. As to the penetration

174 Bezoar is described in Ruska, *Das Steinbuch*, pp. 104.13–105.11, transl. at pp. 147–149.

175 On theriacs, see Goodman and McGregor, *The Case of the Animals versus Man*, p. 290 note 484.

176 This idea was expressed in Epistle 18, see above, pp. 189–190.

177 The part missing in MS [ڑ] follows here (see the technical introduction, pp. 69–70). The most relevant differences from the edited version are: (i) the mention of 'amber' before malachite (see above, note 169); (ii) the writing *ka-madḥasan* (?; see also the critical apparatus, p. 331, note 6); (iii) the mention of water instead of air as the agent that makes malachite pure and turbid (Arabic: *yutakaddaru*; on this reading see also the critical apparatus, p. 331, note 13); and (iv) the omission of the adjective 'oily' from the qualities of bezoar.

of bezoars and theriacs,[178] whose actions are contrary to the actions of those poisons, it is like the action of acid substances: when they fall on the dye of saffron, either they cleanse it instantly, or hinder it from penetrating[179] when it has got to them.[180]

As to the agent that moves these bodies,[181] it is a spiritual faculty among those of the heavenly Universal Soul that are effused in all bodies from the sphere of the Moon down to the extreme centre of the Earth, and which is called 'nature'. These particular bodies — animals, plants, and minerals — are [p. 124] for nature like instruments and tools for the artisan that acts, and accomplishes through them, from them, and in them various actions and masterful[182] deeds, one upon [*fī*] the other, as a carpenter, who performs sawing with a saw, makes woodwork with an axe, makes holes with a drill and smoothing with a plane, and files with a rasp: he who acts is one, whereas acts are various according to the tools and instruments [that are of help in them], and to the purposes aimed at [by those acts]. This active faculty mentioned above is the one called by physicians and philosophers 'nature', and by the religious law [*al-nāmūs*] 'angels'. A physician is a servant of nature, who bestows on it [i.e., nature] what it needs[183] at the time it needs it, as a teacher bestows on his pupil his instruments at the time he needs [them], and serves him with them.

178 Theriacs are warm, as noted by Paola Carusi, and so are bezoars, which are stones found in the bodies of some animals.

179 That would be the cold effect of saffron.

180 Namely, poisons. My translation follows the emendations proposed in the critical apparatus, p. 334, notes 1 and 2. Dieterici, *Die Naturanschauung*, p. 132, translates: 'Auch hindern Sie, wenn sie sogleich angewandt werden, dass der Safran das zu Färbende durchdringe'.

181 Here, a new chapter should begin, but only [ز] (see the critical apparatus, p. 334, note 2) has a blank space, probably indicating a new *faṣl*. The topic hinted at here (and in several other places in these treatises) is extensively approached in Epistle 20.

182 Note the use of the Arabic *muftann* here, instead of the more usual *mutafannin* that we might have expected, 'many-sided'.

183 The text has '*mā tuḥtāju ilayhi*', but it should be *ilayhā*.

Chapter 12

Know, O my brother,[184] that when these particular incarnated souls — which are the servants of the Universal Soul — have acted well in their service to the Universal Soul, and have searched for remuneration and reward from God, be He exalted, they will have a rank elevated by God, and a nobility and a gratification after their separation from their bodies [*hayākilihā*], both [in case] their service was for the restoration of the matter of religion, and of this world.[185] In fact, nothing [concerning] them [*la-hā*] escapes God, when they were beneficent for the sake of God, in search of that which is by Him, and not even their share of this world escapes them,[186] as Borzūyah,[187] the physician, mentioned in the book *Kalīla and Dimna*,[188] that a sower does not sow in search

184 Here there is a digression, which ends when the Ikhwān begin again speaking of mineral substances. They again introduce diamond, repeating considerations they had already stated, but in the present case such considerations help in confirming the Ikhwān's ideas about the real agent of mineral actions (see the final part of Chapter 12, p. 275ff.).

185 The Ikhwān consider both deeds in favour of this world and of the hereafter to be worthy of God's reward.

186 The Ikhwān mean that those who act according to God's will live a happy life even in this word — they are rewarded by God already in this world.

187 In the work *Kalīla wa-Dimna* (on which see note 188 below), we read in the speech of Buzurjumihr ibn al-Bukhtikān (Persian: Bŏkhtagh, the minister of the first Sasanid king, Khusraw I Anūsharwān, r. 531–579; see H. Massé, 'Buzurgmihr', *EI2*, vol. 1, pp. 1358–1359) that Borzūyah (also transcribed Burzōe) ibn Ādharabād was the greatest among Persian physicians. He was charged by Khusraw with copying and translating from the Indian language the work he had brought from India after years of efforts. As a reward for his enterprise, Borzūyah requested from the King that Buzurjumihr write an introductory chapter to *Kalīla wa-Dimna*, in which he explained all the deeds he had accomplished in order to attain his goal.

188 The text refers here to a passage of Borzūyah's speech in *Kalīla wa-Dimna*, which I quote in A. Miquel's translation: 'Il n'est que de comparer en cela le médecin au *laboureur*: si celui-ci retourne et cultive la terre, c'est parce qu'il désire [obtenir] des céréales, et non de l'herbe; mais celle-ci, sous diverses espèces, poussera fatalement elle aussi'. Ibn al-Muqaffa', *Le livre de Kalila et Dimna*, tr. A. Miquel (Paris: Klincksieck, 1957), p. 32. Cf. Nasrollah Monschi, *Kalila und Dimna. Fabeln aus dem klassischen Persien*, ed. and tr. Seyfeddin Najmabadi and S. Weber (Munich: Beck, 1996), p. 405. *Kalīla wa-Dimna* was an Indian work (a 'mirror for princes', composed about 300AD), translated from Sanskrit into Pahlavi by Borzūyah. Later this version was translated into Arabic by 'Abd Allāh ibn al-Muqaffa'; see C. Brockelmann, 'Kalīla Wa-Dimna', *EI2*, vol. 4, pp.

of herbage, but for grain [*li'l-ḥubb*], but there is no doubt that herbage sprouts, whether the sower likes that, or not [*abā*]. So is the rule that governs he who searches for remuneration and reward from God, be He exalted: neither his share of this world, nor that which was destined to him escape him, whether he wants or not, be he disliking or pleased, in renunciation or (fol. 182a) covetous, in search or not in search. The confirmation of this opinion is God's saying, glorified be His name, *I have only created jinns and men, that they may serve Me. No Sustenance do I require of them,* [p. 125] *nor do I require that they should feed Me. For Allah is He Who gives (all) Sustenance — Lord of Power — Steadfast (for ever).*[189]

And know, O my brother, that His worship does not consist entirely of fasting and prayer, but it is the structure [*'imāra*] both of religion and of world, as He wants them both to be prosperous [*'āmirayni*], and the remuneration of he who strives for the goodness of one, or of both of them, is up to God, be He exalted, as He rules them both [*mālikuhumā*], all people are His servants, and the best loved for Him among His servants is he who strives for things that may be beneficial [*maṣāliḥ*] to His servants and for the development of both His two worlds, whereas the most hated for Him of His servants is he who strives for the annihilation of both of them, or for the annihilation of one of them, as God, be He exalted, mentioned by His saying, *The punishment of those who wage war against Allah and His Messenger, and strive with might and main for mischief through the land is: execution, or crucifixion, or the cutting off of hands and feet from opposite sides, or exile from the land: that is their disgrace in this world, and a heavy punishment is theirs in the Hereafter.*[190] And He said, glorified be He who says, *That man can have nothing but what he strives for; That (the fruit of) his striving will soon come in sight: Then will he be rewarded with a reward complete.*[191]

503–506. On *Kalīla wa-Dimna*, see also Goodman and McGregor, *The Case of the Animals versus Man*, pp. 156–158, note 163.

189 Qur'an 51:56–58.

190 Qur'an 5:33.

191 Qur'an 53:39–41.

And among the mineral substances there is diamond. The nature of the stone [called] diamond is coldness and dryness at the fourth degree, and these two natures are seldom combined in any of the mineral stones. Because of this property, it cannot be scraped by any of [*bi-jism min*] the mineral stones, but it influences, breaks, or crushes them, apart from a kind [*jinsan*] of black lead, which influences, breaks, and destroys it in spite of its laxity and softness and of its evil smell. And know, O my brother, that the influence of this vile, weak, and despicable stone on that noble, strong stone can be compared to the trouble of the weak, small, and despicable bedbug on the big-bodied and strong-powered elephant, which subjugates [the other] animals with the bigness of its body and the strength of its power, whereas that [small animal] overcomes, troubles, and subjugates it in spite of the smallness of its body and of the lightness of its movement. Indeed, in that there is an admonition to those who have eyes to see,[192] and an indication to those who are endowed with understanding,[193] with regard to the fact that He who gave power [*al-musallit*] to the great over the small [being] is [also] the One who strengthened the small over the big, [namely,] He Who created and gave form to both of them, praise be to Him, and be He extolled.

As to emery, it is close to these two natures of diamond, and because of that its influence on the stones is similar to the influence of diamond, but it is inferior to [diamond's] influence due to the deficiency of its nature compared with the nature of diamond.

As to the stone [called] magnet, it, too, is an admonition to those who are endowed with intellect and reflection about natural objects [*al-umūr*], and about the properties of their actions on each other, because between this stone and iron [p. 126] there is a relation[194] and

192 The Arabic '*ulū'l-abṣār*' obviously hints at special spiritual properties, such as in this case mental vision (*baṣīra*). The locution is found in the Qur'an; see 3:13, 24:44, and 59:2.

193 The Arabic '*ulū'l-albāb*' is very common in the Qur'an; see 2:179 (Yusuf Ali: 'men of understanding'), 197 and 269; 3:7 and 190; 5:100; 12:111; 13:19; 14:52; 38:29 and 43; 39:9, 18, and 21; 40:54; 65:10.

194 I translate thus the Arabic *munāsaba*. Paola Carusi remarks that we can explain this 'relation' as magnetite (iron oxide, Fe_3O_4) is an iron mineral. The ancients knew this, because in mines there are minerals that are forms of oxidation of

a similarity in nature, like the relation and similarity that exist between a lover and his beloved. In fact, iron, in spite of the strength of its dryness, of the hardness of its body, and of [its power of] subjugating mineral, vegetal, and animal bodies, is moved towards this stone, sticks to it, and adheres to it as a lover [*al-ʿāshiq al-muḥibb*] adheres to his beloved [*li-mashʿūqihi al-maḥbūb*], who is ardently desired by him. So, when the intelligent [man] endowed with reason reflects on the act (fol. 182b) of these two stones — and of other mineral stones and vegetal bodies — he knows, and it becomes clear to him, that the agent who moves them is other from them, because a body has no act in that it is a body — thanks to demonstrations that have been already provided, and of sound indications — and [it also becomes clear to him] that all these bodies, with their diversity, the diversity of their natures, of the kinds of their shapes, and of the properties of their natures, are like tools and instruments of the agent artisan, the mover [of everything], namely, the heavenly Universal Soul, to whom all these influences [belong] as her acts — and they [i.e., these influences] are called 'nature' — that she accomplishes and makes visible, God willing, glorified be His name.[195]

And as it has been already clarified by rational indications, the Creator, high be His praise, is not in direct contact with bodies by Himself, and does not undertake any act on His own apart from invention and origination alone. As to aggregation, composition, works, deeds, acts, and movements that come to be through tools and instruments in places and times, He commands His angels charged [with acting] and His servants endowed with inspiration to do what they have been commanded, as kings and leaders command their servants, attendants, and soldiers.[196]

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a certain metal, or its salts. For example, malachite (basic copper carbonate) is found in copper mines.

195 On the ambiguity of this passage see Introduction, p. 44.

196 MSS [ر] adds the following words (see the critical apparatus, p. 342, note 5): 'Indeed, they do not attend to [note that the verb *bāshara* is unusually constructed with the *fī* here] deeds such as building houses, towns, schools and mosques, but they give an order <...> to their servants and attendants, then after a certain time [*al-firāgh*], they link the construction and the mosques [saying] that "the chief so-and-so made it", or "the king built it". Understand then these allusions, and devote yourself to this, which is more obscure than that'.

[p. 127] Chapter 13

It has been clarified, by that which we have recalled, that the root and the matter of all mineral substances, with the multiplicity of their species, the diversity of their natures, and the kinds of their properties, are the four elements that are called 'the mothers' — namely, fire, air, water, and earth. It has been also clarified that the principle that acts [*al-fāʿil*] on them, aggregates their parts, and compounds them is nature, the Creator willing, He who is their Creator who created them [*bi-idhni bāriʾihā wa khāliqihā alladhī khalaqahā*]. And it has been also clarified that the purpose of these mineral substances is to be useful to humans and animals, and to restore the issue of life in this world, and the subsistence of animals in it until an appointed time.

And know, O my brother, that mineral substances, with the diversity of their natures, the species of their shapes, and the kinds of their properties, are like instruments for the agent nature [*liʾl-ṭabīʿa al-fāʿila*], and like tools for it, which accomplishes these acts, works, and deeds through them, from them, and in them in different places and various times, by composing, aggregating, combining, and separating the parts of these four elements, [and so determining] generation and corruption, and growing and deterioration, according to the rotation of the spheres, the movements of the stars, and the rising of the constellations at the horizon of the [various] countries — lands and seas, plains and mountains, places inhabited and in ruin — all that, the Creator willing, He who is its[197] Creator who created it, who gave it power over these elements, and who inspired it with a divine faculty towards [*ʿalā*] these acts and works, such as the formation of minerals, plants, and animals.[198]

And know, O my brother, that nature is one of the inspired angels of God, and of His virtuous servants,[199] who do what they are commanded, without disobeying their Lord, *and they stand in awe and reverence of His glory*.[200] And know, O my brother, that God, high be His praise, has no need, for His acts, of instruments and tools, places and times,

197 The context requires this and the following feminine pronouns to refer to nature.

198 On the ambiguity of this passage, see the Introduction above, p. 45.

199 These words also anticipate ideas broadly explained in Epistle 20.

200 These words echo the last part of Qur'an 21:28.

or matter and movements, (fol. 183a) but His act proper to Him — namely, origination, invention, bringing into existence, and making [things] emerge from non-being into being — is according to what we have explained in the epistle 'On the Rational Principles and the Spiritual Acts'.[201]

[p. 128] And know, O my brother, that a group of disputants denied the acts of nature because they ignored the quiddity of nature in itself, and did not know that it is one of the angels intimate with God, charged with the organization of His world, and with the wellness of His creatures. They linked all natural acts to the Creator, high be His praise, be they good or shameful, and be He excellent or evil.[202] Among them there is he who linked what is good to the Creator, be He Exalted, whereas what is shameful, he linked that to something else. Then they differed about this 'something else', about 'who it is'. Among them there is he who linked those natural acts to *tawallud*;[203] he who linked them to stars; he who linked them to fortune and chance; he who linked them to the ordinary course [of things]; and he who linked them to satans, but he does not know what satans are. They made all these speeches on account of their ignorance of the quiddity of nature, their scarce knowledge of its acts, and of the acts of the angels of God, charged with the preservation of His world, of the rotation of its spheres, of the journey of their stars, of the generation of its [i.e., of the world's] animals, of the growth of the plants of His earth, and of the formation of its minerals.[204]

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201 No epistle with this title is known to us. The text might refer here to Epistle 42; *Rasāʾil*, vol. 3, p. 465.4–12.

202 Here the text changes the subject — we have *kāna* instead of *kānat*, and the adjectives in masculine form. The Ikhwān may then hint at some dualistic conception.

203 According to Remke Kruk, this term indicates cause and effect without an intermediate point of volition, as well as the generation of plants and animals directly from inanimate matter. See 'Tawallud', *EI2*, vol. 10, pp. 378–379.

204 It may be noteworthy that the pseudo-Aristotelian *On the Cosmos* ends by giving a list of divine names, and culminates in the assertion that 'In sum, He is named God of heaven and earth, because He activates all levels and classes [*samāʾī wa-arḍī li-ajli fiʿlihi fī kulli tabīʿa wa-jins*], since He is the cause of existence as a whole'. After a series of names reminiscent of pagan traditions, and several other names that are close to the Muslim tradition, and after a quotation of Orpheus, the author continues as follows: 'I think He should be called also Necessity

And know, O my brother, that the Creator, high be His praise, is not in direct contact with bodies by Himself, and does not undertake any act on His own, but commands His angels charged [with acting] and His inspired servants, and they obey what they were commanded, as kings, who are the caliphs of God on His Earth, command their servants and attendants, and their troops, helpers, and subjects, and do not undertake any act by themselves, being too remote [for that]; so God, high be His praise, commands, or wills, or wishes, or says, *Be, and it was*,[205] and [pronounces] His saying, be He exalted, *And Our Command is but a single (act) — like the twinkling of an eye*,[206] and His saying, *be He blessed and exalted, And your creation or your resurrection is in no wise but as an individual soul.*[207] And know, O my brother, that when these acts and works that happen before the eyes of people [*'alā aydī 'ibādihi*] are linked to the Creator, be He Exalted, their link is similar to the link of [their] acts to kings, and [it is similar to] when it is said, 'The king so-and-so built the town so-and-so', or 'he excavated the river so-and-so', or 'he inhabited the country so-and-so' — as it is said, Alexander the Macedonian built the rampart of Gog and Magog,[208] Solomon, son of David [Sulaymān ibn Dāwūd], built

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[*ḍarūra*], since He is the motivating cause [*sabab wa-'illa*] [...] Thus I think He is also Destiny [*al-bakht*] and Fortune [*al-ḥaẓẓ*]. He is called, furthermore, Container [*wi'ā'*] [...] Through His agency all things take life; nothing exists beyond His limit. He is called also Allotter [*al-qāsim*] [...] He is also the Inescapable Cause and the Indescribable [...] In conclusion, it is said that God is the beginning, end, and middle, and whatever takes His direction, follows the straight, natural path [*wa-mā naḥā naḥwahu salaka* [*al-sabīla*] *al-mustaqīma*] [...]'. The text is concluded by a eulogy to the Prophet Muhammad. Brafman, '*The Arabic De Mundo*', pp. 208–210. At p. 237, the author refers to Plato, *Laws* IV.7.715e–716a, V.2.730a, V.3.730c.

205 Here the formula *Kun, fa-yakūn* (Qur'an 3:47 and 59; 6:73; 16:40; 19:35; 36:82; 40:68) is correctly reported. At this point, all MSS consulted add the following words (see the critical apparatus, p. 346, note 11): 'When He wanted by His order, will, wish, and by His invention, origination, giving birth and establishment, and innovating, the Prime Matter and the first creation as he mentioned by His saying, be He glorified and honoured, *For to anything which We have willed, We but say the Word, 'Be', and it is* [Qur'an 16:40, where there is *qawlunā* (above, 'the Word') — as do some of the MSS consulted — rather than *amrunā*].

206 Qur'an 54:50.

207 This is the first part of Qur'an 31:28.

208 This is an allusion to Qur'an 18:94–97, where Dhū'l-Qarnayn (i.e., according to

[p. 129] the mosque of Aelia [*Iliyā*],[209] Abraham [*Ibrāhīm*], upon him be peace, built the Ka'ba [*al-bayt al-ḥarām*], and al-Manṣūr built the 'city of peace',[210] as [all of that] came to be by their order, agreement, will, wish, and concern, not because they undertook these acts on their own, or were in direct contact with these deeds through their bodies.

And so is the rule that governs the relation of the acts of the angels of God, of His prophets, of His friends, and of His servants, be they natural or voluntary. So their link to God, be He glorified and honoured, is like this, as He mentioned, be He glorified and honoured, in His saying to His Prophet Muhammad, the elect, upon him be peace, *when thou threwest (a handful of dust), it was not thy act, but Allah's*;[211] in His saying, be He glorified and honoured, *It is not ye who slew them; it was Allah*;[212] in the saying, (fol. 183b) glorified be He who said, *Do ye then see? — the (human Seed) that ye throw out — Is it ye who create it, or are We the Creator?*;[213] in His saying, be He exalted, *See ye the seed that ye sow in the ground? Is it ye that cause it to grow, or are We the Cause?*;[214] and similar relations in acts, deeds, works, composition, aggregation, combination, separation, generation and corruption, and growth and decline. When they are linked to God, be He exalted, that link is this way, because God, be He exalted, is He who created the agents, the artisans and the manufacturers, as well as acts, be they

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tradition, Alexander the Great) builds a wall to enclose the nations of Gog and Magog.

209 This example hints at the tradition that relates to Solomon, King of the Israelites, building the First Temple (Hebrew: *Bet HaMikdash*; Arabic: *bayt al-quds*) in Jerusalem, in the 10th century BC. However, Jerusalem bears here the name of Aelia Capitolina, the city founded in AD 135 by the Romans on the ruins of Jerusalem (that had been destroyed by Titus in 70CE). After the Second Jewish Revolt (132–135), the name was given in honour of the Emperor Hadrian, whose *nomen* was Aelius. It is combined with the name of Jupiter Capitolinus: a sanctuary to Jupiter was built on the Temple Mount in intentional violation of Old Testament law, similar to the temple of Jupiter Optimus Maximus, the most important temple in Ancient Rome, located on the Capitoline Hill.

210 Arabic, '*madīnat al-salām*', namely, Baghdād, founded in AD 762 as new imperial residence and palace city by Abū Ja'far 'Abdallāh ibn Muḥammad al-Manṣūr, the second 'Abbasid caliph (r. 754–775 AD).

211 Qur'an 8:17, central part.

212 Qur'an 8:17, first part.

213 Qur'an 56:58–59.

214 Qur'an 56:63–64.

[of] humans, jinns, satans, or angels and nature.[215] They are all related to God, be He glorified and honoured, according to the same rule, because they are all His servants, troops, and attendants, whom He created, made grow, established, fortified, taught, guided, ordered, and prohibited. The obedient and the disobedient, the good and the evil, the noble and the defective, the beneficent and the wicked, he who lives in comfort and he who suffers, he who is afflicted and he who is in health, [all of] them God created *in diverse stages*,[216] for the abundance of His knowledge, the effectiveness of His wish, the enforcement of His judgements, and the glory of His might. He, in fact, is not asked about what He does, but they are asked.

[p. 130] And know, O my brother, that a group of disputants, as they did not know what nature is, linked all its acts to the Creator, glorified be His mention, and fell into a strong uncertainty, confusion, and doubts. In fact, as it was clear to them that an act comes only from an agent, but they experienced acts on which they could take up no position [with regard to their causes], they linked them to the Creator, be He honoured and glorified. Then they investigated and studied them, and they found some of them to be iniquities and [a sign of] corruption, such as the suffering of children, misfortunes of goods, supremacy of evils, loss of animals, as well as the sufferings, pains, strain, and trial that touch them. They felt disgust at linking them to the Creator, be He exalted, so they linked them to *tawallud*[217] according to their allegation; and among them [there was] he, who linked them to fortune and chance,[218] he who linked them to stars, he who linked them to jinns and satans, he who linked them to the Creator, glorified be His name, and who spoke of gratification and punishment, he who spoke of compensation and prescience, he who spoke of benevolence and conciliation, and other discourses, the explanation of which would

215 The occurrence of *wa* after a series of *aw* demonstrates the connection established by the Ikhwān between angels and nature, antithetically to all the other potential agents mentioned.

216 Cf., for this expression, Qur'an 71:14.

217 See above, note 203.

218 In the discussion of nature as the cause, Aristotle deals with fortune and chance in *Physics* II.4.195b31, and, extensively, in *Physics* II.4-6.

be long due to prolixity and [necessity of] verification.[219] They made long discussions on [such acts], and we have explained a part of their speeches in the epistle 'On Opinions and Religions';[220] so learn them from there, if God wishes.

And we have already explained that all of these are acts of the particular souls that are all faculties of the heavenly Universal Soul, as their Creator, be He glorified and honoured, brought it[221] forth, as He recalled by His saying, praised be He and exalted, *And your creation or your resurrection is in no wise but as an individual soul.*[222] What was good of these acts was linked to the good, safe souls, and what was evil was linked to the evil souls, and upon them punishment and gratification fall, [in terms] of requital and penalty.

And know, O my brother, may God help you and us through a spirit coming from Him, that your soul is one of the particular souls, [that] it is (fol. 184a) one of the faculties of the heavenly Universal Soul, [and that] it cannot stay in itself or separated from her, just as your body is a part of the body of the world,[223] [and that it can stay] neither as a whole nor separated from it. Then, look now at the quality of your acts, deeds, morals, opinions, and knowledge [*ma'ārif*], because your reward and gratification will be according to them, as the messenger of God, upon him be peace, said, *Indeed, it is your deeds that will be reported to you.*[224] [p. 131] And He said, be He exalted, as a confirmation

219 Namely, reporting all theories and verifying their attribution would require too much time and space to mention in the treatise. I follow Atif's readings, but the text is ambiguous. We might even read: '*min al-ta'dīl wa'l-tajwīd*' (see the critical apparatus, p. 351, notes 8 and 9), and hence translate: 'the explanation of which would be long [if we looked] for a settlement and an improvement [of such issue]'. Dieterici, *Die Naturanschauung*, p. 139: 'deren Ausführung hier zu weitläufig sein möchte, von Gerechtigkeit und Gnadenertheilung' (but the last part of the treatise in Arabic is omitted).

220 The text refers here to Epistle 42, where the topic is extensively treated; see in particular *Rasā'il*, vol. 3, pp. 474.3–480.21.

221 In this case, too, the context demands that the feminine pronoun refer to the Universal Soul, according to a special intention of Qur'an 31:28, which I have tried to clarify in my article 'The Role of the Divine Imperative (*amr*)', forthcoming.

222 First part of Qur'an 31:28, quoted also above, p. 279.

223 Here both *jasad* and *jism* are used.

224 See the Introduction, p. 33.

of the speech of His messenger, upon him be peace, *That man can have nothing but what he strives for; That (the fruit of) his striving will soon come in sight: Then will he be rewarded with a reward complete.*[225]

May God give you success, O brother, in achieving the right way, and may He guide you in doing right, and us and all our Brethren, whatever country they are in, because He is benevolent with His servants.

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The epistle 'On Minerals' is completed. Praise be to His friend [*walīy*],[226] and blessing be on His Prophet.

225 Qur'an 53:39–41, cited also above, p. 275.

226 Note the peculiarity of this eulogy.

(Atif fols. 184a–b) [p. 132 Ṣādir]

Epistle 20
On the Quiddity of Nature and the Quality of its Products

[Being the sixth epistle from the second section of the *Epistles of the Brethren of Purity*, on the Natural Sciences]*

In the name of God, the Compassionate, the Merciful

Chapter 1

As we have finished recalling the works of the humans in the epistle named 'On Practical Arts' [Epistle 8], we want to recall in this epistle the products of nature,[1] and first say what 'nature' is.

Know, O my brother, may God help you and us through a spirit coming from Him, that nature is one of the faculties of the Universal heavenly Soul, and that they are effused in all the bodies that are under the sphere of the Moon, from the sphere of Ether to the extreme centre of the Earth.

[p. 133] And know that the bodies that are under the sphere of the Moon are of two species, simple and composite. The simple ones are of four species: fire, air, water, and earth. The composite ones are of three species: minerals, plants, and animals.

This faculty, namely, nature, is effused in all of them as light is effused in air. It puts each of them in motion and in rest, and orders and brings each of them to completeness and perfection as their Lord wills, high be His praise, as we have explained in the five epistles, namely, the epistle 'On Generation and Corruption', the epistle 'On Meteorology', the epistle 'On Minerals', the epistle 'On Animals', and the epistle 'On Plants'.

And know, O my brother, may God help you and us through a spirit coming from Him, that the Universal Soul is the spirit of the world and that nature is her[2] act, that the four elements are the matter subject to her, that the spheres and the stars are like her tools, and that minerals, plants, and animals are her products — all that by the Creator's will, high be His praise.

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* The title in Atif (fols. 184a9–b1) runs as follows: 'The Sixth Epistle from the Second Section on the Natural Sciences, on the Quiddity of Nature and on the Quality of its Works, among the Fifty-one Epistles of the Brethren of Purity, on the Purification of the Soul and the Rectification of Morals as a Part of a Sufi Discourse'. It is completed by the following eulogy: *In the name of God, the Compassionate, the Merciful. O Lord, give us success.*

1 The reference to the epistle 'On Practical Arts' clarifies that the work of nature is considered similar to the work of humans. This is also a consequence of the conception of the world as a 'macroanthropos', restated later, p. 305. The comparison will continue when the Universal Soul is considered the *rūḥ* of the world.

2 See note 14 to Epistle 18, p. 190.

Chapter 2

And know, O my brother, that human artisans are they who make their works — that are all products of nature — with their bodies, hands, and feet, and who produce their crafts in the materials proper to them — which are also products of nature[3] — such as wood, iron, and similar materials, and by their tools too, such as axes, saws, needles, pens, and the like — all of them being, on the contrary, external to their essence.

As to the matter of nature, namely, the elements, it belongs to its essence, and, in relation to it, they are like the four temperaments in the body of a single animal, so they are not external to its essence. Its products are of three genera: minerals, plants, and animals. Under each genus there are species, and under those species there are individuals, the number of which is known only by God, high be His praise.

And know that the forms of genera and species are preserved in matter since they were put into existence, while individuals are always flowing, neither preserved nor fixed,[4] and that the cause of the preservation of the forms of genera and species in matter is the stability of their heavenly causes, while the change [p. 134] and flowing of individuals comes from the change of their causes.

In fact, the Universal heavenly Soul is the efficient cause of these genera, the elements are her matter, the sphere and the stars are like tools (fol. 185a) for her — what is subject to the decrees of the stars[5] are of three species: the spheres, the constellations, and the states of stars in them both; and their influences on these elements are according to three relations, as we explained in the epistle 'On Music',[6] namely, the relation of the magnitudes of their masses, the relation of their distances

3 In this statement the Ikhwān echo somewhat the Platonic idea expressed in *Republic* X.I.596ff., fully re-elaborated in the epistle 'On Minerals' (see above, p. 272). On the concept that art imitates nature see also Theophrastus, *On Stones* VIII.60 (p. 81 of the translation cited above, Epistle 19, p. 230, note 29).

4 The Arabic, here and later, is *ma'lūm*, i.e., 'precisely knowable'.

5 Literally, 'the judgements of the stars'; on the meaning of this term see Epistle 18, p. 198, note 38.

6 The text refers here to Epistle 5; cf. in particular *Rasā'il*, vol. 1, pp. 214.3–216.11 (= pp. 100.4–107.11, Wright), translated in Wright, *On Music*, pp. 130–134, and p. 225.6–11 (= pp. 137.10–138.7, Wright), translated in Wright, p. 147.

from their centres, and the reciprocal relation of the movements of the stars.

And as the relations between the fixed stars and these four elements are preserved with regard to their distances and movements, the forms of the three genera are preserved in matter, and as the relations between the centres of the spheres that carry them and these elements are also preserved with regard to distances, magnitudes, and movements, the forms of the species of these three genera are preserved in matter, too. And as the relations between the masses of the planets, their epicycles, and these four elements are neither preserved nor fixed in matter, but are always flowing, namely, they are under generation and corruption, individuals are neither preserved nor fixed, but always flowing.

Chapter 3

And know, O my brother, may God help you and us through a spirit coming from Him, that the world is made of eleven globes set one inside the other, as we explained in the epistle 'On the Heavens and the World',[7] and that the mass of the Sun is set in the central globe, because five globes are above it, and five under it.

Those that are above it are the globe of Mars; beyond it, the globe of Jupiter; beyond it, the globe of Saturn; beyond it, the starry globe; and beyond it, the all-embracing globe; and those that are under it are the globe of Venus; under it, the globe of Mercury; under it, the globe of the Moon; under it, the globe of fire[8] and air; and under it, the globe of earth and water.

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7 The text refers here to Epistle 16, Chapter 7; see above, pp. 142–143.

8 In Epistle 16, we find 'ether and air', probably because of the cosmological order described in Epistle 18, Chapter 4 (see p. 192 above). In scientific contexts *athīr* and *nār* may be considered as synonyms. Note that in his version of Aristotle's *Meteorology*, the Syriac Mālikī translator Yaḥyā (Yuḥannā) ibn al-Biṭrīq (d. 830). speaks of ether as 'air burning in the highness' (*'hawā' al-multahib al-'uluww'*, ed. Badawi (Cairo: Maktaba al-nahḍa al-miṣriyya, 1961), pp. 63.18–64.1; also C. Petraitis, *The Arabic Version of Aristotle's Meteorology, A Critical Edition with an Introduction and Greek-Arabic Glossaries* (Beirut: Dar el-Machreq, 1967). In the pseudo-Aristotelian *On the Cosmos* we have the following explanation: '(Its name) is not derived from heat or combustion, as some people assume, because the word "aether" and "combustion" [*iltihāb*] are similar in Greek [...] It

And know, O my brother, that the rule that governs the two globes that are above Saturn is different from the rule that governs the other globes, as the rule that governs the two globes that are under the sphere of the Moon is different from the rule of the others, but the forms of those other globes are [stable] in matter, while the forms of these ones flow and are not stable in matter.

The divine wisdom [p. 135] and the providence of the Lord placed the planets as intermediate between the two extremes that are the centre [of the world] and the all-embracing sphere, so that, when these stars [the planets] rise towards their apogees, they get close to those noble individuals that are in the starry sphere and draw from them emanation and power, while when they descend towards their perigees, those emanations and that power are joined to these four elements, and these three generated, begotten beings come from them — minerals, plants, and animals.

And know that when those emanations and powers are effused from there towards the centre of the world, blessings descend (fol. 185b) from heaven to Earth [in the form] of fortune, mercy, revelation, inspirational help, aid, benefits, and goods, and when those powers and emanations are effused in the elements, the mixtures in the depth of the Earth come from them, the different and copious advantages of the mineral substances appear on its face, and on its surface plants with many benefits, and in air and water animals with many forms and marvellous bodies, with the variety of their species and the types of their individuals, the number of which is known only by God, may He be honoured and glorified, until, when each of these things will have reached the utmost of their goals and the complete perfection of their limits [*tamām nihāyātihā min al-kamāl*] in their rotations lasting thousands of years, those powers will turn away returning towards the all-embracing sphere, as it had started the first time,[9] and resurrection[10]

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is given the name "aether", rather, because of its perpetual motion and sublime circular orbit'; Brafman, *The Arabic 'De Mundo'*, p. 172.

9 Dieterici, *Die Naturanschauung*, p. 144, says: 'Wie wir den Anfang einer Schöpfung hervorgehen hiessen, so lassen wir sie zurückkehren unserm gegebenen Versprechen gemäss, fürwahr, wir thun das'; i.e., Qur'an 21:104.

10 Here the Ikhwān use both *ba'th* and *nushūr*. Dieterici, ibid., translates: 'Daher

and ascension will occur, in the measure of 50,000 years among those which you count.[11]

Chapter 4

And know, O my brother, may God help you and us through a spirit coming from Him, that the influences of stars on these elements and the beings begotten from them are according to their relations, like the relations of musical strings. Their relations are according to their strings, to their thickness and perforation,[12] to their looseness and to the weight and lightness of their vibration [*taḥrīk*],[13] as we explained in the epistle 'On Music'.[14]

And know that the relations between the four elements and the beings begotten from them, and between the planets and the centres of their spheres, are now according to the noblest proportion, now according to the lowest proportion, and now according to a proportion intermediate between them.

When those relations happen to occur at the recommencement of the thousands of rotations according to the noblest proportion, those [p. 136] generated beings come to be at those times in the noblest states, and the majority of creatures are good and virtuous, as were the angels that existed before the creation of Adam. When [the rotations] are in the lowest proportion, the contrary of that occurs, as it will happen at the end of the time, when the world will decay. And when

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ist die Heimsuchung, die Wiedererweckung, die Himmelswanderung und die Auferstehung'.

11 These words recall Qur'an 70:4: *The angels and the Spirit ascend unto Him [ta'ruju] in a Day the measure whereof is (as) fifty thousand years.*

12 The text has *kharq*, but the contrary of *ghilaẓ* should be *diqqa*. Wright, *On Music*, p. 95, note 71, remarks that the use of *kharq* makes no sense in *Rasā'il*, vol. 1, pp. 194.18 and 195.3, but reads there *ḥazq*, 'tension' (see p. 40.1 and 5 Wright, respectively). Dieterici, *Die Naturanschauung*, p. 145, has: '[…] nach ihrer Dicke oder Dünne'. Whatever the choice, the text has to be emended; the manuscripts consulted are of no use for that.

13 Cf. for this translation, Wright, *On Music*, p. 91, with regard to *Rasā'il*, vol. 1, p. 192.3.

14 Cf. in particular *Rasā'il*, vol. 1, pp. 193.21–194.8 (translated in Wright, *On Music*, p. 91), and 205.3–14 (translated in Wright, pp. 116–117).

those relations are [at] an intermediate [level], the explanation of the formation of the generated beings according to that is long.

And know, O my brother, may God help you, that the noblest states of the stars are in their mansions, exaltations, and apogees, and that the lowest of their states are in the places opposite to those places, and in the intermediate places.

Chapter 5

Know, O my brother, that each existing being under the sphere of the Moon and each event in this world has a fixed time in which it happens, and that it does not occur either before or after that.

It has a cause, too, which necessitates its coming to be, and it comes to be only because of that.

And it has a place it exists in it only, and their specification is known only by God, may He be honoured and glorified. However, we will recall a part of them in brief, so that it can be a proof of the soundness of what we said, and so that what we have described may be represented to those who attentively reflect. God, high be His praise, established the sphere as embracing the Earth from all its sides, as has been explained in the epistle 'On Geography'.[15]

As the sphere is divided into four sections, and each of its quarters is at the zenith of a quarter of the Earth, each star rotates from the east westwards [above the Earth] and from the west eastwards [under the Earth], and is parallel to the circumference on the surface of the Earth [i.e., the equator];[16] and those rays have three angles — right, acute, and obtuse, and each angle has different influences, as we explained in the epistle 'On Meteorology'.[17]

Know, O my brother, that the Creator, (fol. 186a) high be His praise, made the movements of those individuals[18] in their rotation as the

15 The text refers here to Epistle 4; see, e.g., *Rasāʾil*, vol. 1, p. 160.9–12.

16 Dieterici, ibid., explains: 'und dieselben durch den Zenit über alle Theile der Erdoberfläche (ihren Meridian) gehen'.

17 The text refers here to Epistle 18, see above, p. 194ff.

18 According to this translation, 'individuals' are the stars, but by this term angels are also meant in the treatises. That could be echoed in Atif's text that says: 'the movement of the sphere for the individuals as the cause [...]'.

necessitating cause[19] of the origin of events, and as an efficient cause for the generated beings that are under the sphere of the Moon; He posed the times fixed according to their conjunctions,[20] oppositions, and unions[21] in the grades of the constellations; and He put the places in front of their azimuth and the places of incidence of their rays in correspondence [*ja'ala... mukhtaṣṣa*] with their coming to be and their occurrence.

In fact, the seven climes on the Earth are like the seven spheres, [p. 137] countries in climes are like the constellations in the spheres, towns and villages in countries are like the decans and the limits[22] in constellations, bazaar streets and shops in villages and towns are like the degrees and the minutes in limits, houses and stores are like the seconds, thirds, and quarters;[23] and the conjunctions of stars in the degrees of the constellations are the cause of the assembly of animals, mineral substances, and plants in countries, towns, and villages.

So the limits of Saturn in the constellations are the efficient cause of the formation of rivers, mountains, deserts, reed-beds, ponds, streets, roads, and similar local boundaries.

The limits of Jupiter in the constellations are the cause of the formation of mosques, temples, churches, places of prayer, and spaces for sacrifices; the conjunctions of the stars in its limits are the cause of the meeting of people on Fridays and feast days, in the [places] where the dispositions of the laws are taught, the prophetic books are read,

19 In this chapter, the Ikhwān use both *sabab* and *'illa* in the same sense.

20 The term *ijtimā'* indicates the reciprocal union of the planets.

21 The term *ittiṣāl* indicates the conjunction between the Sun and the Moon. See also above, Epistle 18, p. 198, note 35.

22 Dieterici, *Die Naturanschauung*, p. 146: '[...] wie die Marken und Grenzen'. On decans see above, Epistle 16, p. 152, note 86. 'Limits', *ḥudūd* (sg. *ḥadd*), are the five parts into which each constellation is divided, which differ with regard to the number of their degrees (they may have from a minimum of two to a maximum of twelve degrees). See Epistle 3: 'On Astronomy', *Rasā'il*, vol. 3, p. 124.2–5. Limits are said to be the unequal divisions of the zodiacal signs in Bīrūnī, *The Book of Instruction*, p. 265.

23 See Epistle 3: 'On Astronomy': 'Every constellation has thirty degrees, in the whole 360. Each degree has 60 parts, each of which is called a 'minute', in the whole 216,000; every minute has 60 parts called 'seconds', each second has 60 parts, each of which is called a 'third', and so till the quarters, the fifths and so on, infinitely'. *Rasā'il*, vol. 1, pp. 115.22–116.5.

jurisprudence is applied in religion, [as well as of their meeting] at the government of rulers and qāḍīs, and so on.

The limits of Mars in the constellations are the cause of the formation of fire-places, slaughter-houses, military encampments, places of war and dispute, and so on; the conjunctions of the stars and their unions in the limits of Mars are the cause of the confluence of people, plants, and mineral substances in these places and spaces.

The limits of Venus in the constellations are the cause of the formation of gardens, places of recreation, and congregations for fun, eating, drinking, and for joy, happiness, pleasure, as well as of beautiful landscapes; the conjunctions of the stars and the places where their rays fall in its limits are the cause of the confluence of people, plants, and animals in these places.

The limits of Mercury in the constellations are the cause of the formation of bazaar streets and places of artisans, of theological and scientific sessions, of cabinets of secretaries, of gatherings of qāḍīs, and of debates of learned people; the conjunctions of the stars in the limits are the cause of the gathering of people in these places. The degrees of their exaltation [*ishrāfihā*][24] are the cause of ranks and degrees of kings and chiefs among people, and the degrees of their fall [*hubūṭihā*][25] are the cause of places of tribulation, decline [*suqūṭ*], detention, and the like.

24 Usually, *sharf*, 'exaltation', is the position of a zodiacal sign with regard to planets, see Bīrūnī, *The Book of Instruction*, p. 258.

25 *Hubūṭ*, fall, or dejection, is the position of a zodiacal signs with regard to planets, ibid.

[p. 138] Chapter 6

On how the faculties of the [heavenly individuals, whose being is stable, and that are always in rotation, join to these] inferior [individuals] that are formed from [their] movements, have little stability and are always flowing[26]

Know, O my brother, may God help you and us through a spirit coming from Him, that geometrical demonstrations of the fact that the Earth is the centre of the world have been established, and that air and spheres surround it from all its sides.

And know that the Earth at the centre of the world can be compared to the Ka'ba [*bayt Allāh al-ḥarām*] in the centre of the Sacred Precinct [*al-ḥaram*];[27] that the all-embracing sphere, the other spheres, and their rotation around the four elements can be compared to those who make their *ṭawāf*[28] around the corners of the Ka'ba [*al-bayt*, here and later]; that the fixed stars with the places of incidence of their rays from the all-embracing sphere towards the centre of the Earth can be compared (fol. 186b) to the Muslims directed from the horizons of their countries towards the Ka'ba; that the planets in their way, going now from their apogees towards the centre, and now from their perigees towards the all-embracing sphere, can be compared to the pilgrims that now go from their countries toward the Ka'ba, and now leave the Ka'ba returning to their countries. When they walk directed toward the Ka'ba,

26 The words in square brackets are those introduced in the text from other manuscripts (see the critical apparatus). Note that MSS [ب], [غ], [ل], and [ن] add: 'and that is the conclusion of the epistle "On Nature"', and that MSS [ح], [ز], and [ك], as well as Dieterici, add: 'and this is the conclusion of our natural epistles'; see the critical apparatus, p. 375, note 11.

27 Here the Ikhwān continue with their comparison of the movements of stars with the rituals of pilgrimage (see above, Epistle 16). As is clearly testified in this treatise, *ḥajj* is considered by Muslims to stretch back thousands of years to the time of Abraham. When pilgrims converge on Mecca and perform the pilgrimage rituals, they recall facts of the lives of Abraham and his wife Hagar, whom Abraham had married upon request of his first wife Sarah, who was unable to conceive.

28 See above, note 90 to Epistle 16, p. 155.

each of them brings commodities, support, offerings, and necklaces[29] from his country going toward the Ka'ba. Then they convene there in the festive season with rare things and peculiar commodities proper to each country. They convene from each religious school [*madhhab*], compete, and come into direct contact.[30] When they conclude their rituals, each inhabitant of a country leaves with some rare things coming from other countries and with the forgiveness of God, may He be glorified and honoured, which is the most important thing.

And so, O my brother, may God help you, is the rule that governs the diffusion of the faculties of those heavenly individuals from the sphere that embraces all the others towards the centre of the world, because, when the places of incidence of their rays convene on the surface [p. 139] of the Earth, and when the parts of the elements become untied and combine with each other, those faculties are effused into them, and from them various types of begotten existing beings are formed — animals, minerals, and plants of different genera, and the multiplicity of their number is known only by God, may He be honoured and glorified. Later, when those faculties arrive to the highest of their goals and to the perfection of their limits to which they tend, they turn away returning towards the all-embracing sphere, and this is the cause of the resurrection [*ba'th*] of souls and of the revivification [*nashr*] of spirits, either with gain [*ribḥ*] and beatitude, or with regret and affliction.

Observe then, O my brother, and reflect on how your soul departs from the world of generation and corruption towards the world of the spheres from which it came, and consider the habitual practice of pilgrims when they have concluded their rituals, how they leave, longing for their homes and fatherlands. And know, O my brother, that all the rituals and duties of pilgrimage are models given by God, may He be glorified and honoured, to the human souls that arrive from the world of the spheres and the wideness of the heavens to the world of generation and corruption, so that he who is endowed with knowledge may reflect and consider, and his soul may be awakened from the sleep of carelessness and the slumber of ignorance, and he may recall its [the

29 The Arabic is *al-qalā'id*. The term echoes Qur'an 5:2 and 97.

30 According to other manuscripts (see the critical apparatus, p. 377, notes 9 and 10), these pilgrims simply 'buy and sell'.

soul's] origin and its return, [how it] longs to [return], and [how] it returns as it had come, and [how his soul] may answer the Summoner who invited it, may He be glorified and honoured, and [who] said, *'O (thou) soul, in (complete) rest and satisfaction, 'Come back thou to thy Lord — well pleased (thyself), and well-pleasing unto Him!'Enter thou, then, among My devotees! 'Yea, enter thou My Heaven!'*,[31] so that it says: 'Here I am, God, at your service!'.[32]

Consider then, O my brother, may God help you, and reflect on how pilgrims return to their countries. You will see that each inhabitant of a country has a caravan and a way by which they pass, helping each other, going and coming, and likewise did souls come to this world, each generation [*umma*] in the sign of a star and of a constellation in conjunction, and they do not depart from this world without a religion and a religious school. The provision of each soul is the good or the evil it has acquired, and do not think, O my brother, that you will be able to return on your own. Know that the way is long, and that the satans are lying in ambush, and consider that you can live only a troublesome life on your own, and that you will find [p. 140] a pleasant life only (fol. 187a) with the help of the inhabitants of a city, of a *sunna* and of a *sharīʿa*.[33] You have, then, to consider and realize that you need brethren and friends who may help, so that you can be saved from Gehenna by their intercession, ascend to the realm of heavens with their help, and enter paradise by God's mercy, may He be glorified and exalted.

And know, O my brother, may God help you, by a sure science that if a soul were able to save itself in isolation from others, God, exalted be His invocation, would not have ordered reciprocal help, and would not have said, glorified be He who said, *Help ye one another in righteousness and piety*,[34] and He said, be He blessed and exalted, *O ye who believe! Persevere in patience and constancy; vie in such perseverance*,[35] and He

31 Qur'an 89:27–30.

32 These words hint at the pilgrimage ritual of *labbayka*, consisting in saying 'Here I am, God' in a loud voice and repeatedly upon entering the state of ritual consecration (*iḥrām*) at the beginning of *ḥajj* (see below, pp. 301 and 303).

33 On this particular phrasing see the commentary, p. 36.

34 The Ikhwān quote here a small part of Qur'an 5:2.

35 The Ikhwān quote here the first part of Qur'an 3:200. The first words of the

said, praise Him, be He exalted, *One day We shall gather together from every people a troop*,[36] and He said, may He be glorified and honoured, *And those who feared their Lord will be led to the Garden in crowds*.[37]

Observe, O my brother, with the light of your intellect, consider with your comprehension, reach your *maqām*,[38] and turn your face to the Ka'ba. Perhaps you will know, by stopping at Mount 'Arafāt,[39] what was understood by those people, whom the Creator, high be His exaltation, hinted at by His saying, and He said, glorified be He who said, *and on the Heights will be those who would know every one by his marks*,[40] namely, their tokens,[41] and you will happen to go to Muzdalifa with them towards the object of desire,[42] *but they will have*

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quotation are found in many verses of the Qur'an.

36 The Ikhwān quote here the first part of Qur'an 27:83.

37 The Ikhwān quote here the first part of Qur'an 39:73.

38 There are various opinions on what exactly the *maqām* is, but I keep here the technical word linked to Islamic pilgrimage. With relation to *ḥajj*, the *maqām Ibrāhīm* is a site inside the mosque that is near the Ka'ba housing a stone with Abraham's footprints. After the completion of *ṭawāf*, pilgrims have to offer a two *rak'a*s prayer in this place. Others consider the *maqām* to be the whole place of the pilgrimage, or else 'Arafāt, Muzdalifa and the *Jimār* (see below), or even 'Arafāt only. In this context, the word also indicates the place of prayer and sanctification of the person invited to join the community of the Pure Brethren.

39 On the 9th day of *Dhū'l-ḥijja*, pilgrims go to the plains of Mount 'Arafāt to stand in vigil and prayer in the place where the Prophet Muhammad gave his last sermon (whence the place is named *jabal al-raḥma*, 'the mount of forgiveness'). This moment is known as *wuqūf* and is considered the highlight of the *ḥajj*. According to tradition, it was on Mount 'Arafāt that Adam and Eve separated for 200 years after their expulsion from Eden, then there they met, recognized each other, and were reunited, being forgiven by God. That is why pilgrims spend the whole day in this place supplicating to Allāh to forgive their sins, and praying for personal strength in the future. Failure to be present in the plain of 'Arafāt on the required day invalidates the pilgrimage. At 'Arafāt one must pray shortened versions of the *zuhr* (midday) and *'aṣr* (afternoon) prayers combined during the time of *zuhr*.

40 The Ikhwān quote here the central part of Qur'an 7:46 (echoed later at verse 48). In its whole, the verse runs as follows: *Between them shall be a veil, and on the Heights will be those who would know every one by his marks: they will call out to the Companions of the Garden, 'Peace on you'. They will not have entered, but they will have an assurance (thereof)*'. The Ikhwān appear to establish a common etymology between the names *'Arafāt* and *A'rāf*.

41 Dieterici, *Die Naturanschauung*, p. 150, adds here: '(d.h. dem ort zwischen Mina and Arafat)'.

42 This is a tentative translation of the words '*fa-yuzdalafu bika ma'ahum naḥw*

an assurance (thereof),[43] *Enter ye the Garden: no fear shall be on you, nor shall ye grieve.*[44]

And know, O my brother, may God help you and us through a spirit coming from Him, that he who made his pilgrimage with an inattentive and forgetful heart, without knowledge or mental vision, and who saw those rituals and their traditions without understanding their dignity [*maqāmahā*][45] or knowing what happens from them or being aware of any of their purposes or of what is aimed at by them, he returns from there with a negligent heart, a doubting soul, and a confused heart, because when he saw them and did not understand their meanings or comprehend their goals, at that moment [acts like]

al-mutamannā'. I could not find the verbal form *yuzdalafu* in any of the major Arabic dictionaries, but once again the Ikhwān establish a comparison between the spiritual itinerary of the initiate and one of the pilgrimage rituals. Dieterici, *Die Naturanschauung*, p. 150, translates: 'und Du gelangst nach Mina zu den Vollendeten'. When 'Arafāt rituals end at sunset, pilgrims then move to Muzdalifa, an area between 'Arafāt and Minā, east of Mecca, for prayer and a short rest. On the following morning they gather pebbles for the next day's ritual of the stoning of the devil after returning to Minā (see below). Even in view of the assimilation of the geographical place Minā and the spiritual condition *al-mutamannā* we might infer that the object of desire is God's forgiveness.

43 These lines echo the last words of Qur'an 7:46 (for which see above, note 40).

44 These lines echo the last part of Qur'an 7:49.

45 The comparison with precise rituals and places of pilgrimage continues here.

the throwing of the stones,[46] the run between Ṣafā and Marwa,[47] coming

46 The Ikhwān quote here other pilgrimage rituals, not in their proper order. The stoning of the devil is a ritual performed in the valley of Minā between sunrise and sunset on the 10th of *Dhū'l-ḥijja*, a day called *'īd al-aḍḥā*, the feast of immolation, in memory of when Abraham stoned the devil who had come between him and God's command. Stones are thrown at three stelae, the first or largest called *al-jamra al-kubrā* or *jamrat al-'aqaba*, the middle one *al-jamra al-wusṭā*, and the smallest one *al-jamra al-ūlā*, or *al-ṣughrā*. All three of them represent the devil: the first and largest represents his temptation of Abraham against sacrificing Ishmael, the second represents his temptation of Hagar to induce her to stop him, and the third represents his temptation of Ishmael to avoid being sacrificed. As the devil was rebuked each time, the throwing of the stones symbolizes those rebukes. Pilgrims collect 70 pebbles that will be thrown in the ritual during the next three or four days. This number is chosen because seven pebbles are to be thrown at the largest stele on the first day, and seven at each of the three *jamrāt* on the next two days, going in order from east to west. (Thus, at least 49 pebbles are needed for the ritual, more if some throws miss; if pilgrims stay at Minā for an additional day, they must again stone each wall seven times). This ritual also means defeating one's own internal despot, *al-nafs al-amāra*. If one succeeds in doing so during the stoning of *jamrat al-'aqaba*, that is, if one overcomes his own low desires, he crosses the step that separates God and His servant and so attains closeness to Allāh. So the stoning of the *jamrāt* also represents the repudiation of man's self. After the stoning of the devil, pilgrims leave the valley of Minā and return to Mecca for the farewell *ṭawāf* in *masjid al-ḥaram*. This is called *ṭawāf al-ziyāra or ṭawāf al-ifāḍa*, which symbolizes being in a hurry to respond to God and show love for Him, an obligatory part of the *ḥajj*. Finally, before leaving Mecca, pilgrims perform a farewell *ṭawāf* called the *ṭawāf al-wadā'*. Then pilgrims shave their heads, perform a ritual of animal sacrifice, and celebrate the three-day global festival of *'īd al-aḍḥā* (the feast of immolation). Animal sacrifice symbolizes God having mercy on Abraham and replacing his son Ishmael with a ram, which Abraham then sacrificed.

47 The second ritual of pilgrimage is to run back and forth seven times between the hills of al-Ṣafā and al-Marwa, now located in *masjid al-ḥaram*, the former approximately 800m from the Ka'ba, the latter about 100m from it. It is believed that Abraham was ordered by God to leave Hagar and Ishmael alone in the desert, just in this place, with only basic provisions, to test their faith. The run is a re-enactment of the frantic search for shelter, food, and water for Ishmael by Hagar when their provisions were exhausted. To make her search easier and faster, she went alone, leaving the baby on the sand and begging for God's assistance. She first climbed the nearest hill, al-Ṣafā, to look over the surrounding area. When she saw nothing, she went to the other hill, al-Marwa, to look around. While Hagar was on either hillside, she was able to see Ishmael and know he was safe. However, when she was in the valley between the hills she was unable to see her son (which is why one would run while in the valley between the hills, and walk at a normal pace while on the hillsides). Hagar travelled back and

into the state of ritual consecration [*iḥrām*],[48] *talbiya*,[49] *ṭawāf*,[50] *ʿumra*,[51] and similar duties and procedures, appeared to him like a game for children. According to this example, each human nation in its houses of worship, its traditions of obligations, and its sacrifices in its temples of prayer has models, allusions, and symbols [p. 141] forged for those who describe them with regard to the meaning hinted at by Abraham, the Friend [of God].

And know, O my brother, that the goal of the prophets, upon them be peace, and of those who established divine laws, is the same goal and the same intention in spite of the diversity of their laws, of the traditions of their obligations, of the times of their acts of worship, and of the places of their sacred sites, sacrifices, and prayers, just as the goal of all physicians is the same goal and the same intent, even though their cures in hospitals and their remedies differ according to the variety of the diseases occurring for bodies in different times, to diverse habits and to multifarious causes. In fact, the goal of all

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forth between the hills seven times in the scorching heat before she returned to Ishmael. When she arrived, she found that a spring had sprouted forth from the crying baby kicking at the sand with his feet (other versions of the story say that the angel Gabriel scraped his foot or the tip of his wing along the ground), and the Zamzam well miraculously sprang forth. Al-Ṣafā and al-Marwa are also mentioned in the Qur'an; see, 2:158.

48 If they are not already wearing it upon their arrival, pilgrims put on *iḥrām* clothing and then leave Mecca for the nearby town of Minā where they spend the rest of the day. The *iḥrām* is a garment consisting of two sheets of white unhemmed cloth, with the top draped over the torso and the bottom secured by a white sash; plus a pair of sandals. Women are simply required to maintain their *ḥijāb*. While wearing the *iḥrām*, pilgrims may not shave, clip their nails, wear perfume, swear or quarrel, have sexual relations, uproot or damage plants, kill or harm wild animals, cover the head (for men) or the face and hands (for women), marry, wear shoes over the ankles, perform any dishonest acts or carry weapons. So, *iḥrām* is the name given both to the clothing required for pilgrimage — meant to show the equality of all pilgrims, in front of God — and to the special spiritual state in which Muslims live while on the pilgrimage. It also symbolizes virtue and pardon from all sins.

49 See above, note 32.

50 See above, note 28.

51 I.e., the little or lesser pilgrimage, in contrast to the *ḥajj*. *ʿUmra* can be performed at any time of year and is optional for Muslims. Though it does not contain as many steps as *ḥajj*, *iḥrām* is requested and *ṭawāf* with two *rakʿas*, a sequence of acts in the *ṣalāt* (prayer), facing the *maqām Ibrāhīm* and the Kaʿba, and *saʿy* are to be completed as described above. Hair cutting is the last step.

physicians is to acquire health for the ill people and to preserve it for the healthy ones, and so the goal of the prophets, upon them be peace, and the goal of all those who established divine laws among philosophers and wise men[52] is to save souls immersed in the sea of matter, to make them emerge from the abyss of the world of generation and corruption, and to bring them to the paradise of the world of the spheres and the wideness of heavens, by remembering to them what they had forgotten about their origin and their return, as God, may He be glorified and honoured, said, *And We have indeed made the Qur'ān easy* (fol. 187b) *to understand and remember: then is there any that will receive admonition?*,[53] and said, praise Him, be He exalted, *But teach (thy Message): for teaching benefits the Believers*,[54] and said, *In order that they may receive admonition*,[55] so they will repent and return, as He said, may He be glorified and honoured, *'O (thou) soul, in (complete) rest and satisfaction,'Come back thou to thy Lord'*.[56]

[p. 142] **Chapter 7**

Know, O my brother, that all the traditions of the laws, the prophetic religions, the objects of philosophical laws, the obligations of religious laws, as well as all rituals of the houses of worship, sacrifices of temples, and prayers are allusions and symbols of that which Abraham, the Friend of the Merciful, hinted at by building the Ka'ba,[57] by placing the [Black] Stone and the *maqām*,[58] by teaching rituals to his progeny, by inviting people to the pilgrimage to the Ka'ba, so that they may experience their profit [from all of this].

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52 On this particular phrasing see commentary, p. 54.

53 Qur'an 54:17, 22, and 32.

54 Qur'an 51:55.

55 In the Qur'an the expression '*la'allahum yatadhakkarūn*' is found at 2:221; 14:25; 28:43, 46, and 51; 39:27; and 44:58.

56 Qur'an 89:27–28, already quoted above; see note 31.

57 These lines confirm what stated above at note 27. According to Islamic tradition, near the site of the Zamzam well Abraham rebuilt the *Bayt Allāh* (cf. the Hebrew *bethel*), a building which had been originally constructed by Adam and then became the Ka'ba, towards which all Muslims around the world face in prayer, five times each day.

58 See above, note 38.

In fact, he who is judicious, intelligent, quick-witted, and acute, and who, when he makes his pilgrimage, says '*labbayka*',[59] accomplishes the *ṭawāf*, prays, sees the Ka'ba and has experience of the [other] pilgrims, and of the marvellous things a pilgrim in the state of ritual consecration does, with regard to the traditions of rituals and to the obligations of pilgrimage such as coming into the state of ritual consecration, *talbiya*, *ṭawāf*, running [between Ṣafā and Marwa], stopping [at Mount 'Arafāt],[60] Muzdalifa,[61] shaving,[62] throwing stones[63] and similar obligations and ritual traditions of pilgrimage; and when he reflects on them with a vigilant heart, considers them with the eye of mental vision and with a pure soul, then he comprehends what Abraham, the Friend of the Merciful, wanted [to mean] by his prescriptions, and what was the ultimate goal in all of that. He knows, realizes, and is rightly guided, and his soul is rightly guided, is awakened and discerns, has experience and sees what God, be He exalted, hinted at by His noble speech, *And thou wilt see the angels surrounding the Throne (divine) on all sides, singing Glory and Praise to their Lord.*[64]

And know, O my brother, that the angels that surround the throne are those who carry the throne,[65] and they are the fixed stars that surround the ninth sphere from inside, as pilgrims surround the Ka'ba from outside in their *ṭawāf*. And they sing their Lord's praise as He said, may He be glorified and honoured, *Not one of us but has a place appointed* [*maqām*]; *And we are verily ranged in ranks (for service); And we are verily those who declare (Allah's) glory!*,[66] and they believe and acknowledge that [p. 143] beyond them, their degrees and their positions, there are other nobler and higher objects [*umūr*], the knowledge of which escapes them, and their comprehension remains exhausted behind them,[67] just as a believer pilgrim acknowledges

59 See above, note 31.
60 This is the *wuqūf*, for which see above, note 39.
61 See above, note 42.
62 See above, notes 46 and 48.
63 See above, note 46.
64 Qur'an 39:75.
65 Cf. Qur'an 69:17, echoed in Epistle 16. See above, p. 139 and note 16.
66 Qur'an 37:164–166.
67 I.e., in its vain attempt to know them.

that beyond the heavens there is the *much-frequented House*,[68] and that around it the ensemble of the angels with their *ṭawāf* make a pilgrimage every day, thousands by thousands, without ever returning to it, and they say that this Ka'ba on the Earth corresponds to that *much-frequented House* that is in heaven, and that rituals are images and allusions to those traditions and rituals proper to the angels around the *much-frequented House*.

Chapter 8

As we have finished recalling what we needed on this matter [*ma'nā*], we say afterwards that some of the learned spoke about the decrees of the stars and correlated their indications to the generated beings but denied their acts in the world of generation and corruption; that others correlated their indications [to the generated beings] and after a certain consideration recognized them, (fol. 188a) however they did not look into the true natures of things so as to know how [indications] are, so they did not recognize them [in their truth].

As to those who denied their indications and acts, they neglected the study of this science.

Those who correlated their indications and acts [to the generated beings] recognized that [correlation] after study, strong research, consideration, and examination of the matters of existing beings one after another, until they reached the last one. So they studied the first ones of them, and saw that they were linked in the same way by a same cause, like number.

Chapter 9

As we already spoke about what has been said, that all these things are the result of the action of nature, then that the heavenly individuals are like tools for it,[69] and that the faculties of those individuals are like

68 These words refer to Qur'an 52:4.

69 It should be the opposite: at the end of Chapter 1, these things are said to be the result of the act of the Universal Soul, and nature is said to be the tool of the heavenly individuals.

nature's helpers, we need to explain the true sense [*ḥaqīqa*] of that, and we also say that we have already explained the meaning of the wise men's saying, that the world is a macroanthropos with a body and a soul.

We explained the composition of its body in five books, namely, the epistle 'On Meteorology', the epistle 'On Generation and Corruption', the epistle 'On the [Thesis] that the World is a Macroanthropos', the epistle 'On the Study of Stars' [*tanjīm*], and the epistle 'On the Heavens and the World',[70] and we want to explain how the effusion of the faculties of its soul[71] is in the bodies that are under the sphere of the Moon.

Know, O my brother, that the body of the world in its entirety can be explained as the body of a single man; that the rule that governs all its spheres, the strata of its heavens, the stars of its spheres, the elements of its natures, [p. 144] and its begotten beings — the whole of its body — can be explained as if they were the organs [*aʿḍāʾ*] of the body [*badan*] of a single man and the articulations of his body [*jasadihi*]; that its soul makes its spheres rotate one through the other, and moves theirs stars by the Creator's will, high be His praise, as the soul of a single man moves the members [*aʿḍāʾ*] of his body [*jasadihi*] and the articulations of his body [*badanihi*]; and that its soul has various ways of moving its stars [so that they can act] on what is under the sphere of the Moon (elements and their begotten beings), and that it has actions on them, through them, and from them [i.e., the stars], the number of which is calculated only by God, high be His praise, as the soul of a single man has many actions on his entire body [*badanihi*] and the articulations of his body [*jasadihi*], as we explained in the epistle 'On the Composition of the Body'.[72]

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70 The Ikhwān refer here to Epistles 18, 17, 34, 3, and 16, respectively.

71 The Ikhwān refer here to the Active Soul.

72 This is the title of Epistle 23, but in this treatise one can found only some references to the relation between (human) body and (human) soul; see, e.g., *Rasāʾil*, vol. 2, p. 285.8–9. The topics mentioned are rather addressed in Epistle 34: 'On the Wise Men's Statement, that the World is a Macroanthropos'. The likeness between the parts of the world and the parts of the human body, the Universal Soul and the human soul that move the universe and the human body respectively, and the acts of the Universal and of the human soul are all addressed in the first chapter of the Epistle; see *Rasāʾil*, vol. 3, pp. 212–214.

This is because the body of the world is composed of eleven globes, as we explained in the epistle 'On the Body',[73] and the sphere is divided into two halves, as the body of a man [is divided] into two halves; in the sphere there are twelve constellations for the journey of its stars, six of which are northern and six are southern, as in the [human] body there are twelve orifices, six of which are on the right side and six on the left side,[74] for the stream of his senses and the effusion of the faculties of his soul; in the sphere there are seven well-ordered stars that guarantee the foundation of the structure [*amr*] of the sphere and are the cause of the existing beings, God willing, may He be glorified and honoured, as in the [human] body there are seven active powers that guarantee the foundation of the structure [*amr*] of the body and the integrity of his condition, namely, the attractive power, the retentive power, the digestive power, the expulsive power, the nutritive power, the accretive power, and the generative power.[75]

Each of these faculties has a peculiar organ in the body, through which those faculties are effused towards (fol. 188b) all its parts, namely, the parts of the organs of the body [*al-jasad*], in which its actions become manifest in the body [*al-badan*]. So from the stomach, liver, heart, brain, lung, spleen, gall, and other organs, the soul propagates these powers in the body [*al-badan*], and its actions are spread throughout the body [*al-jasad*], and so is the rule that governs the actions of the seven stars in the sphere.

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73 On the world as composed of eleven spheres in Epistle 34: 'On the Wise Men's Statement, that the World is a Macroanthropos', see *Rasā'il*, vol. 3, pp. 221.12–13 and 224.4–13 (see also above, Epistle 16, Chapter 4).

74 These orifices are the two eyes, the two ears, the two nostrils, the two mammae, the mouth, the navel and the 'two ways' (namely, the anus and urinary bladder — or genital organs, according to Bausani). See, e.g., Epistle 26: 'On the Wise Men's Statement, that Man is a Microcosm', *Rasā'il*, vol. 2, p. 463.21–22. The orifices are called 'doors' in Epistle 23: 'On the Composition of the Body', *Rasā'il*, vol. 2, p. 382.10–11.

75 This last power is named in an unusual way (*al-muwallida*), whereas it is usually called *muṣawwira*, 'formative' — as in the majority of the consulted MSS; only [ر] has *al-mumayyiza*, 'discriminating'; see the critical apparatus, p. 394, note 9. These powers display different functions in relation to the different bodies to which they are applied. In the natural treatises, these functions are explained with reference to plants; see below, p. 326ff.

From the Universal Soul her faculties are spread within all the parts of the world, and through them her actions become manifest in the generated beings that are under the sphere of the Moon. As from excess and deficiency in the actions of these faculties confusion and ominous events occur in a body [*al-badan*], as physicians know well, so from excess in the influences of these stars, or from deficiency in the acts of their powers, ominous events and corruption come into the world of generation, as the experts of the decrees of the stars proclaim.

And as the explanation of the medical [p. 145] science is long, and the [medical] art is admirable — as Hippocrates, [one of] the wise of the Greeks, said,[76] — so is the explanation of the decrees of the stars long — as the Persian wise man Buzurjumihr ibn al-Bukhtikān[77] said, '*Kār hast wa mard nīst*';[78] however we will recall a part of it.

Chapter 10

Know, o my brother, may God help you and us through a spirit coming from Him, that from the mass of the Sun a spiritual faculty is spread throughout the entire world, and is effused in its spheres, in the elements of its natures and in its begotten beings, in all the universal and particular bodies; and through it arise the integrity of the world, the perfection of its being, and the completeness of its permanence, as innate heat is spread from the heart throughout the whole body, through which come the life of the body [*al-badan*] and the integrity of the body [*al-jasad*]. Philosophers call this faculty and what is spread

76 This is a paraphrasis of the well-known first aphorism by Hippocrates — the Arabic Buqrāṭ: *ars longa, vita brevis*. It is frequently cited by the Ikhwān; see, e.g., Epistle 2: 'On Geometry', in particular *Rasā'il*, vol. 1, p. 100.1–2 (= p. 116.2, El-Bizri. On the Arabic tradition of this work, known as *Kitāb al-fuṣūl*, see A. Dietrich, 'Buḳrāṭ', *EI2, Supplement*, vol. 12, p. 155. For further data, see C. Baffioni, *Frammenti e testimonianze di autori antichi nelle Epistole degli Iḫwān aṣ-Ṣafā'*, (Rome: Istituto Italiano per la Storia Antica, 1994), p. 187.

77 On Buzurjumihr ibn al-Bukhtikān see above, Epistle 19, p. 273, note 187.

78 I.e., 'Work remains, man does not'. This is the general sense of Buzurjumihr's description of Borzūyah's enterprise (on which see above, Epistle 19, p. 273, note 187), but here the approaching of two great physicians, a Greek and a Persian, in their thought seems to be the most important point. It is also to be noted that according to some scholars, Buzurjumihr and Borzūyah are the same person; see Ibn al-Muqaffa', *Le livre de Kalila et Dimna*, tr. Miquel, pp. 325–326, note 13.

from it and from its actions in the world 'spiritualities of the Sun',[79] and that is according to the fact that they particularize bodies [*jism*] one after another, as innate heat particularizes the organs of the body [*al-jasad*] one after another. The explanation of how that happens is long. We have already recalled a part of that in the epistle 'On the Acts of the Spiritual Beings',[80] as well as in the epistle 'On Minerals, Plants, and Animals'.[81] The law[82] calls this faculty 'an angel endowed with cohorts and helpers', and Isrāfīl,[83] upon him be peace, is among them.

In the same way, a spiritual faculty is spread from the mass of Saturn, effused throughout the whole world — spheres, elements, and begotten beings. From it, cohesion and stability of forms in matter occurs, as from the mass of the spleen the faculty of the black humour [*khilṭ*][84] is spread in the whole body [*al-jasad*] and in its articulations, through which the cohesion of the parts of the body [*al-badan*] — bones, nerves,

79 The Arabic is *rūḥāniyyāt*. This topic is also addressed in Epistle 49: 'On the Quality of the States of the Spiritual People [*al-rūḥāniyyīn*]', but see also Epistle 32: 'On the Principles of the Intelligible Existing Beings According to the Pythagoreans' Opinion', *Rasā'il*, vol. 3, p. 190.4–15.

80 The text refers here to Epistle 49. With regard to the spiritualities of the Sun see *Rasā'il*, vol. 4, pp. 214–217, 224–227, 230, 232–233.

81 Note that in this case the Ikhwān speak of one *risāla* only, on minerals, plants, and animals, while, when referring to their treatises, they use the word *risāla* every time before their titles. Either this form is a mistake, or it may hint at the existence of a first, older (and shorter?) nucleus of the encyclopaedia.

82 The term used here and later, *nāmūs*, is obviously a transcription of the Greek *νόμος*. It may indicate human law, but sometimes — as in this case — it is a synonym of *sharī'a*.

83 These lines introduce the embryonic angelology of the Ikhwān al-Ṣafā'. Cf. my article 'The Angelology System in the Iḫwān al-Ṣafā'', in *Arabistika i isljamoznanie. Studii po slučaj 60-godiščninata na doc. d.f.n. Penka Samsareva*, ed. S. Evstatiev, H. Čobanova, and I. Djulgerov, 2 vols. (Sofia: Universitetsko izdatelstvo 'S. Kliment Ohridski', 2003), vol. 2, pp. 435–442; and O. Lizzini, 'L'angelologia nelle Epistole dei Fratelli della purezza: l'esempio della natura', in *Angeli. Ebraismo Cristianesimo Islam*, ed. G. Agamben and E. Coccia (Vicenza: Neri Pozza, 2009), pp. 2007–2010 (the article contains a complete Italian translation of Epistle 20, at pp. 1984–2012). On Isrāfīl see A. J. Wensinck, 'Isrāfīl', *EI2*, vol. 4, p. 211. For the angels' names, see S. Burge, *Angels in Islam. Jalāl al-Dīn al-Suyūṭī's al-Ḥabā'ik fī akhbār al-malā'ik* (London: Routledge, 2011), a comprehensive study of angels in Islam, through an analysis of *al-Suyūṭī's* (d. 1505) collection of *ḥadīth*s [*non vidi*]. I am indebted to Tara Woolnough for this reference.

84 Namely, black bile.

and skin — occurs, as well as solidification of the liquid parts. If it were not for bones, nerves, and skin, the matter of the body [*al-jasad*] would flow away, as do water and air. Philosophers call this faculty 'the spirituality[85] of Saturn', the law calls it 'an angel endowed with cohorts and helpers': the Angel of Death is among them, and Munkar and Nakīr[86] as well.

In the same way, from the mass of Mars a spiritual faculty is spread, effused throughout the whole world — spheres, elements, and begotten beings —, and through it occur the intent and activation for researched aims, as well as zeal (fol. 189a) in deeds and works, elevation in high positions, and the search for the utmost in reaching perfection and obtaining completeness[87] in all existing beings. Philosophers call this faculty and its actions that are spread throughout this world [p. 146] 'spiritualities of Mars', and the law calls it 'an angel endowed with cohorts and helpers': Jibrā'īl is among them, and Mālik[88] the furious and all the guardians of hell, upon them be peace as well. Their effusion throughout the world and the spreading[89] of their faculties is like the yellow faculty[90] that is spread from the mass of the gall-bladder; it distinguishes between the mixtures that reach it [sending them] towards their places, to which they are directed from the extremities of the body [*al-badan*] and the limits of the body [*al-jasad*], and which influence rage, hatred, fury, and so on.

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85 This is the only case in which the singular *rūḥāniyya* is used. The plural *rūḥāniyyāt* is found only in MSS [ح], [ر], [ش], [غ]; see the critical apparatus, p. 397, note 11.

86 Munkar and Nakīr are the angels that interrogate the dead in the grave and torment those who deserve chastisement. Under this aspect they are cited in Epistle 22: 'On Animals'. For Qur'anic and other religious sources, see Goodman and McGregor, *The Case of the Animals versus Man*, p. 311, note 553.

87 I accept here the reading proposed by the majority of the manuscripts examined, as well as by Dieterici; see the critical apparatus, p. 398, note 4.

88 On this angel, the guardian of hell, see Lizzini, 'L'angelologia', p. 1464.

89 These words — *sarayān* and *inbithāth* — combined here together for the first time in the text may translate the Greek Neoplatonic technical terms ὑπερρύη and ὑπερπλήρες, for which see Plotinus, *Enneads* V.2.1.

90 Namely, the yellow bile humour. All MSS consulted speak of *quwwa*, however, perhaps because they refer to its function here; Lizzini, 'L'angelologia', p. 2008, also translates 'potenza gialla'.

In the same way, from the mass of Jupiter a spiritual faculty is spread, effused throughout the whole world, through which the balance of contrary natures and the harmonization of contrasting powers is realized; it is spread throughout the begotten and the generated beings, and preserves the order of the existing beings, as from liver the sanguine humour is spread, of which it is said that it puts the mixtures of the body [*al-jasad*] in balance, equalizes the combination of natures, makes the body [*al-jasad*] grow and structures [*al-abdān*] develop, makes life pleasant and living nice — spirits are delighted and souls harmonized. Philosophers call this faculty and what is spread from it and from its actions 'spiritualities of Jupiter' and the law calls it 'an angel endowed with cohorts and helpers', and 'Riḍwān, the treasurer of the Garden'[91] is among them.

In the same way, from the mass of Venus a spiritual faculty is spread, effused throughout the whole body [p. 147] of the world and its parts, and through it come the adornment of the world, the goodness of its order, the brightness of its lights, the beauty of the existing beings, and the ornament of the generated beings, as well as the desire and love for all of them and every [kind of] love and affection, as from the mass of the stomach the desire for pleasures is spread towards all the canals of the senses through which that which is coveted is enjoyed, amenities are found delightful, and adornment is appreciated, and, because of that, permanence in this world is desired, and arrival to the hereafter is wished for. Philosophers call this faculty and what derives from it 'spiritualities of Venus', and the law calls it 'an angel endowed with cohorts and helpers', 'the Houris'[92] are among its spiritualities, and 'the maids of the Garden'.

In the same way, from the mass of Mercury a spiritual faculty is spread, effused throughout the whole body of the world and its parts, and through it knowledge and sensation come into the world, as well as thoughts, inspiration, revelation, prophecy, and all sciences, as from the brain the imaginative faculty is spread,[93] as well as what follows it

91 On Riḍwān see W. Raven, 'Riḍwān', *EI2*, vol. 8, p. 519.

92 On the Houris see A. J. Wensinck-[Ch. Pellat], 'Ḥūr', *EI2*, vol. 3, pp. 581–582.

93 On the primacy of brain see Goodman and McGregor, *The Case of the Animals versus Man*, p. 81, note 52. In this the Ikhwān, probably under Pythagorean

as regards the intellect, imagination, reflection, vision, discernment,[94] acumen, thoughts, inspiration, sensation, knowledge, and all sciences. Philosophers call this faculty and what is with it 'spiritualities of Mercury', and the law calls it 'an angel endowed with cohorts and helpers', and the '*youths*'[95] who are the (fol. 189b) servants of the inhabitants of paradise are among them, as well as 'the honourable secretaries',[96] and 'the honourable pious'.[97]

In the same way, from the mass of the Moon a spiritual faculty is spread, effused throughout the whole body of the world and its parts, through which the existing beings can breathe in both the worlds, and now it inclines and descends from the world of the spheres at the beginning of the month, and now [it returns] from the world of generation towards the world of the spheres at the end of the month, and it is the intermediate faculty between the world of the spheres, the source of permanence and duration, and the world of the elements, the source of generation and corruption, as from the mass of the lung a faculty is spread, from which respiration occurs, now by inhalation of air from outside in order to preserve innate health for the body [*al-jasad*], and now by sending it out for its ventilation. Philosophers call this faculty and what is spread from it 'spiritualities of the Moon', and the law calls it 'an angel endowed with cohorts and helpers'; through it angels bring revelation and messages from heaven, and through it the children of Adam rise with their deeds to heaven, and by it spirits ascend, and angels in succession[98] are among them.

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influence, contrast with al-Fārābī who follows Aristotle in claiming the primacy of the heart. They consider the brain to be the seat of thought.

94 I accept here the reading proposed by the majority of the manuscripts examined, as well as by Dieterici; see the critical apparatus, p. 401, note 9.

95 Cf. Qur'an 56:17: *Round about them will (serve) youths of perpetual (freshness).*

96 My translation echoes Qur'an 82:11: *Kind and honourable — writing down (your deeds).*

97 My translation echoes Qur'an 80:16: *Honourable and Pious and Just.*

98 The Arabic reads *al-mu'aqqibāt*. My translation echoes the beginning of Qur'an 13:11: *For each (such person) there are (angels) in succession, before and behind him.* Dieterici, *Die Naturanschauung*, p. 158, translates: 'auch gehören zu diesen die mit dem Tag und der Nacht betrauten Engel'. Lizzini, 'L'angelologia', leaves the Arabic term in the text and explains at p. 2010, note 82: 'Sono angeli che, come spiega il nome, si succedono l'uno all'altro, istituendo un legame permanente tra l'uomo e il cielo'.

In the same way, from the mass of each fixed star spiritual faculties are spread, effused throughout the whole body of the world — from the summit of the eighth sphere that is 'the throne that comprises'[99] to the extreme centre of the Earth —, as part of the light of the Sun is spread through the air and translucent bodies, and through it the forms of the genera of the existing beings are preserved in [p. 148] matter, and through it come the godliness of the world and the foundation of its being, by the Creator's will, high be His praise. From them come the stability of the inhabitants of the heavens and earth, and the Exalted hinted at them by His saying, *none can know the forces of thy Lord, except He.*[100] And He related, be His memory glorified, a tale about them, *Not one of us but has a place appointed; 'And we are verily ranged in ranks (for service); 'And we are verily those who declare (Allah's) glory!'.*[101] And those who carry the throne are among them. As to the angels that prostrated before Adam, the father of mankind, who are the caliphs on the Earth of those that are in the spheres, they are the souls of all animals that prostrate before Adam and his progeny in obedience, and that are subject to them till the day of resurrection.[102]

Chapter 11

And know, O my brother, may God help you and us through a spirit coming from Him, that the ruin of the world is similar to the corruption of generation, and the corruption of generation is because of the prevalence of one of the elements, either by way of a water flood, like the one that occurred at the time of Noah, or by way of a fire flood [i.e., a conflagration], like the one the occurrence of which was promised in the Qur'an by God, may He be glorified and honoured, at the end of the time, and He said, *the Day that the sky will bring forth a kind*

99 I.e., the heavens and Earth; reference to Qur'an 2:255.

100 This is a part of Qur'an 74:31.

101 Qur'an 37:164–166, already quoted above, on p. 303.

102 In this note, the Ikhwān seem to believe that every living being on the Earth is endowed with a soul — not only human beings. In this, they anticipate Avicenna and Suhrawardī. Cf. also Epistle 34: 'On the Wise Men's Statement, that the World is a Macroanthropos', *Rasā'il*, vol. 3, pp. 213.17–24 (where the 'angels' correspond to the philosophical faculties) and 217.9–11.

of smoke (or mist) plainly visible, Enveloping the people: this will be a Penalty grievous.[103]

The cause of each is that when the water constellations and the water planets take over conjunctions, a water flood will occur, and when the fire constellations [take over], a fire flood will occur. And when the heart of Leo[104] reaches the limit of Mars[105] in the constellation of Leo, after years, the ascendant[106] of the conjunction, the ascendant of the change of the year and the ascendant of the month will be [in] fire constellations,[107] and Mars will rule (fol. 190a) them, then a water and a fire flood will likely occur in that time, and the air will be likely heated and radiate as a *samūm*[108] fire, so that plants will be burnt and animals will go to ruin, and the world — namely, the surface of the Earth — will remain a ruin without life.

Later, God, may He be glorified and honoured, will originate the second creation[109] as He promised in the Qur'an by His saying, be He blessed and exalted, *And ye certainly know already the first form of creation: why then do ye not celebrate His praises?*[110] And the Exalted said, and *creating you (again) in (forms) that ye know not.*[111] At that moment the inhabitants of paradise will be there in ease and comfort, and the inhabitants of hell will remain forever in it in punishment. We already mentioned in the epistle 'On Resurrection'[112] how that happens.

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103 Qur'an 44:10–11.

104 *Qalb al-asad*, namely, 'Cor Leonis, ὁ Βασιλίσκος in Ptolemy; vulgò Regulus', as explained in the article 'On the Arabic Names of the Stars', by an anonymous Correspondent of the journal. Published as n. LVII in *The Philosophical Magazine, or Annals of Chemistry, Mathematics, Astronomy, Natural History, and General Science* (ed. R. Taylor and R. Phillips, London), 8 (1830), pp. 368–374, on p. 372. I am indebted to Tara Woolnough for this reference.

105 On this term see above, note 22.

106 'Ascendant' is the star or sign that appears on the Eastern horizon.

107 Lizzini, 'L'angelologia', p. 2011 translates: 'Così quando il cuore del Leone raggiungerà il limite di Marte nella costellazione del Leone, dopo anni, sorgerà la congiunzione e sorgeranno le nuove lune delle costellazioni ignee'.

108 I.e., a hot wind.

109 In the form '*al-nash'at al-ākhira*' this is mentioned in Qur'an 29:20 (but cf. Qur'an 53:47 for the form as '*al-nash'at al-ukhrā*').

110 Qur'an 56:62.

111 Second part of Qur'an 56:61.

112 The Arabic reads, '*Risāla al-ba'th wa'l-nushūr*', i.e., Epistle 38. For further references, see Lizzini, 'L'angelologia', p. 2011, note 88.

So be awakened, O my brother, from the sleep of carelessness and the slumber of ignorance, prepare yourself, and act in view of the return[113] and of the second creation;[114] perhaps you will rise on the day of resurrection with the happy ones, you will ascend to the kingdom of heaven, you will enter the cohort of angels that are in *the Exalted Assembly*,[115] and you will not [p. 149] be of those who want to live in this world and [who want] an eternal stay in the world of generation and corruption, remaining there for long periods without tasting [anything] cool or drinking,[116] *as often as their skins are roasted through, We shall change them for fresh skins, that they may taste the Penalty*.[117] May God protect you, O pious Brother, and make you, us, and all the Brethren attain the world to come[118] with the pious, as He has power on everything He wants.

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The epistle 'On the Quiddity of Nature and the Quality of its Products' is completed. Praise be to His friend, and blessing be upon His Prophet.

113 The word *maʿād* is the philosophical equivalent of *baʿth*.

114 See above, note 109.

115 Qur'an 37:8, 38:69.

116 These lines echo Qur'an 78:23–24: *They will dwell therein for ages. Nothing cool shall they taste therein, nor any drink.*

117 These lines quote Qur'an 4:56.

118 The Arabic reads '*dār al-qarār*', for which see the final part of Qur'an 40:39: *it is the Hereafter that is the Home that will last*. The same reference is found in Epistle 18; see above, p. 219, note 116.

(Atif fols. 190a–b) [p. 150 Ṣādir]

Epistle 21
On Plants

[Being the seventh epistle from the second section of the *Epistles of the Brethren of Purity*, on the Natural Sciences]*

In the name of God, the Compassionate, the Merciful

Chapter 1[1]

As we have finished recalling mineral substances and explaining in part the way in which they are formed, the quantity of their genera, the kinds of their species, and the properties of their benefits and harm in an epistle of ours; and [as we have] explained in it that the last mineral degree is contiguous with the first degree of plants, we want to place after it the epistle 'On Plants', and to explain in it, also in part, the way in which plants grow, the quantity of their genera, the kinds of their species, and the properties of their benefits and harm.

We will explain in it also that the last vegetal degree is contiguous with the first animal degree, then we will place after it the epistle 'On Animals', and we will explain that the last [p. 151] animal degree is contiguous with the first human degree, [and that] the last human degree is contiguous with the first degree of angels that are the inhabitants of heavens and the dwellers of the spheres that God, be He exalted, created for the structure [*'imāra*] of His world, obedient in His compliance without disobeying their Lord. They do what they were ordered [to do],[2] they aspire by that to a means [for coming] as near as possible to their Lord,[3] and they hope for His mercy and are anxious for fear of Him.

Know, O my brother, that you are appointed to meet your Lord, [having been] sent to this world, which was intended [*maqṣūd*] for you[4] since when you were created, and being moved from one state into another more perfect, complete, and nobler, until you will meet your

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* The title in Atif (fols. 190a15–b1) runs as follows: 'The Seventh Epistle from the Second Section on the Natural Sciences, on Plants, among the Fifty-One Epistles of the Brethren of Purity, on the Purification of the Soul and the Rectification of Morals as a Part of a Sufi Discourse'. It is completed by the following eulogy: *In the name of God, the Compassionate, the Merciful. O Lord, give us success.*

1 Unlike all the other treatises, Epistle 21: 'On Plants' is divided into three chapters only, the first and the third very long, and second of a few lines. However, I did not add other subdivisions, because the treatment of the matter is extremely discontinuous. I limited myself to indicating the name of the fruits and plants to which the Ikhwān devote particular attention.

2 Cf. Epistle 19, p. 280, above.

3 For this expression, cf. Qur'an 5:35 and 17:57.

4 Life in this world is for the Ikhwān the necessary condition for salvation in the hereafter.

Lord and will [directly] experience Him, and [until] what He promised to you will be fulfilled. Among those states there are those you have already passed through and experienced, and those you have not yet reached. In fact, there was a long time [*ḥīnun min al-dahr*] for you, in which you were nothing worthy of mention [*madhkūran*], then you were created from sperm [made] of vile water,[5] then you were moved into a womb, a solid abode.[6] You remained there nine months in order to bring [your] structure to completion and [your] form to perfection, then you were moved to this wide air,[7] and you remained [in that state for] four years in order to bring [your] education to perfection and to construct [your] strength.[8][At that time,] senses experienced their proper objects [*maḥsūsāt*], and comprehension, mind, discernment, cogitation, inspection, and innate knowledge arose for you. Then you were admitted to school and were taught what you did not know — reading, writing, literature, mathematics, book-keeping, and measures

5 For this expression, cf. Qur'an 32:8 (Yusuf Ali: 'fluid despised') and 77:20 (Yusuf Ali: 'fluid despicable').

6 For this expression, cf. Qur'an 23:13 and 77:21 (Yusuf Ali: 'place of rest, firmly fixed').

7 That is, this world where the new-born is no longer constricted as he was in his mother's womb. Here the Ikhwan also echo what they said in Epistle 25: 'On Conception'; see in particular *Rasā'il*, vol. 2, p. 442.17–20, but also Epistle 32: 'On the Principles of the Intelligible Existing Beings According to the Pythagoreans' Opinion', *Rasā'il*, vol. 3, p. 195.12–14.

8 Here the Ikhwān echo what they said in Epistle 25: 'On Conception'; *Rasā'il*, vol. 2, p. 446.14–20 (but see also Epistle 32: 'On the Principles of the Intelligible Existing Beings According to the Pythagoreans' Opinion', *Rasā'il*, vol. 3, p. 195.15–17). In Epistle 25: 'On Conception' the Ikhwān combine the Qur'anic ideas about conception with certain notions taken from Greek medicine (in particular, the theories about the seven-months new-born) and a form of 'astral anatomy' of the embryo that is proper to Islamic medicine. The development of the embryo in the nine months of pregnancy is described in the first part of the treatise, pp. 420–430 and 433–442. Later, the Ikhwān mention the influences of the stars of the various phases of human development after birth. The reference to the first four years of life, under the influence of the Moon, are referred to in *Rasā'il*, vol. 2, p. 444.14–16. For comparisons with other authors (such as Balīnūs, 'Alī ibn al-'Abbās al-Majūsī, and 'Arīb ibn Sa'īd al-Qurṭubī) that adopt this idea, see my article 'L'influenza degli astri sul feto nell'Enciclopedia degli Iḫwān al-Ṣafā'', *Medioevo. Rivista di storia della filosofia medievale* 23 (1997), pp. 409–439; and, on Epistle 25, my article 'L'Epistola sul concepimento nell'Enciclopedia degli Iḫwān al-Ṣafā'', *Medicina nei secoli, Arte e scienza* 6/2 (1994), pp. 365–376.

and weights —, then you were promoted [*nuqilta*] to the meetings of the people of science and virtue in mosques, [places of] prayers, religious shrines, and feasts, and to bazaar streets, [places where] arts [were practised], and travels, so that you might experience this world with the mountains, deserts, wastelands, seas, towns, villages, and rivers that are in it, and in it [you might] see with your eyes the [various] types of creatures among animals, plants, and minerals, and [you might] know the changes of their conditions in heat and cold, night and day, winter and summer, and light and darkness, and the changes of winds, clouds, and rains; and [so that you might] see with your eyes the rotation of the spheres, the ascensions of the constellations, the journey of the planets, the events of the days, and the various adversities; all that, so that your soul might be awakened from the sleep of carelessness and the slumber of ignorance, you might reflect on what you have experienced, and you may take warnings from what you have seen of the states of this world; [p. 152] and [so that you might] know by a sure knowledge [*'ilman*] that you will be moved from here to another condition after death, and that you will be generated a second time;[9] [and so that you might] prepare yourself for the journey and make provisions for the travel,[10] (fol. 197a) before life is annihilated and the instant of death approaches. [Life in this world should consist in] following angels' habits, be adorned with their good qualities, renouncing the habits of the brethren of satans and of the cohorts of Iblīs.

We have already explained how that [happens] in the fifty-first epistle,[11] know [it] from there, if God wishes, be He exalted. And know

9 Cf. for this expression Qur'an 29:20 and 53:47. See also above, the English translation of Epistle 19, p. 225, note 7.

10 Here there is a shift of folios in Atif. Folios 197a–b correspond to pp. 152.2–155.11 of the Ṣādir edition. In Dieterici, text from p. 151.2 (*alladhīna khalaqahum*) to p. 152.5 (*in shā' Allāh*) of the Ṣādir edition is lacking (= fols. 190b8–197a3 Atif in the succession re-established above). As to the extant part of fols. 197a–b, Dieterici cuts fol. 197a15–20 (from '*ka-mā yajillu al-mulūk*' to '*fī'l-Qur'ān*'); fol. 197b1–9 (from '*hākadhā yujidu*' to '*bayyin li-nā*'); fol. 197b14–17 (from '*mithāl dhālika*' to '*aḥwāl al-nabāt*'); and fol. 197b19–21 (from '*idh kāna al-nabāt*' to *sharḥuhā*).

11 Namely, the epistle 'On the Hierarchical Arrangement [*kayfiyya naḍad*] of the World in its Whole'. Probably, the Ikhwān hint here at the hierarchical disposition of beings resumed in that treatise, which is the topic addressed at the beginning of Epistle 21: 'On Plants'.

that a well-arranged artefact indicates a wise artisan, even though the artisan[12] is veiled from sight perception. [For] every intelligent [person], when he attentively considers the states of plants, with regard to the [various] kinds of their shapes, the extension of their veins [*ʿurūqihā*], the ramification of their branches in the air, the division of their leaves in the [various] kinds of shapes, the colours of their flowers,[13] and the diversity[14] of their colours, flavours, and smells, it becomes clear to him and he knows with an inescapable knowledge [*ʿilman ḍarūriyyan*] that they have a wise artisan, because his mind gives him testimony that the four elements, contrary in powers, incompatible in natures, cannot be assembled or aggregated, nor do they come to be shaped according to [*taṣīru ʿalā*] these descriptions mentioned above, unless by the intention of a wise artisan about whom there is no doubt. However, when he reflects about the way in which His work [was performed], about why He made [things] so, and about why He makes such and such, he neither understands nor knows [all that] which is not represented to him.

Because of that, we needed to recall this kind [of knowledge] in part, so that everyone who listens to it, and reflects on it, may increase in knowledge [*ʿilman*].

And know, O my brother, may God, be He exalted, help you, that plants are evident and patent, unhidden artefacts,[15] but their fabrication [*ṣināʿatuhā*] is hidden, secret [*bāṭin*], and veiled from sight perception, and that it[16] is what we call 'particular souls'.[17] Interpretations [regarding such an agent principle] are different, but the meaning is one.

12 I emended here Atif, which has *al-maṣnūʿ*. In principle, this reading would also fit the Ikhwān's point, but the emendation seems to be requested from the following statement that hints at objects that can be viewed and known, such as plants.

13 Here, Atif adds '*min al-aṣbāgh*', which could be translated 'with regard to their pigments', but it is pleonastic and should be deleted. The MSS examined provide relevant changes in this passage; see the critical apparatus, p. 414, notes 3–6.

14 Several MSS, as well as Dieterici (see the critical apparatus, p. 414, note 5) provide the following addition: 'of the forms of their grains and of the shapes of their fruits — small or big — as well as to the diversity'.

15 See above, note 12.

16 That is, the agent principle of their fabrication.

17 Several MSS, as well as Dieterici (see the critical apparatus, p. 415, note 3) provide the following addition: 'and philosophers call them "natural faculties", while

However, wise philosophers [*al-falāsifa al-ḥukamā'*] related these artefacts to the natural faculties, and the Law[18] [related them] to angels, whereas it did not relate them to God, praise Him, because the Creator, honoured be His majesty, is too high [p. 153] as to be in direct contact with natural bodies, physical movements, and corporeal deeds, just as kings, lords, and leaders are too high as to be in direct contact with acts on their own, even though [each of them can] be related to [such acts] because they have ordered and wanted them, as it is said that Alexander [the Great] built the rampart, Solomon built the mosque of Aelia, al-Manṣūr built Baghdād [*al-madīna*],[19] given that their construction was realized by their order, not because they were charged of [those] acts on their own. According to this example, the acts of the servants of God are related to God, be He blessed and exalted, as He mentioned by His saying to His Prophet Muhammad, the messenger of God, upon him be peace, and He said, [...] *when thou threwest (a handful of dust), it was not thy act, but Allah's*[...],[20] and said, *It is not ye who slew them; it was Allah*[...],[21] and said, *Fight them, and Allah will punish them by your hands*[...];[22] there are many verses on this concept in the Qur'an.

And know, O my brother, may God help you and us through a spirit coming from Him, that an intelligent and reasonable person, when he attentively regards the states of plants, and reflects and considers them, he does not find any of them to be out of the form of its genus, or to transgress the shapes of its species, and likewise, he does not ever see an olive leaf come out of a palm tree, or a date come out of an olive tree, or the grain of barley come out of a spike of wheat. And, according to this analogy, [one could speak of] the other species of grains, fruits, legumes, and herbs: you see them, every one preserving

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the Law calls them "angels", and "cohorts of God, charged with the cultivation of plants, the generation of animals, and the formation of minerals"'.

18 The Arabic is *al-nāmūs*, but indicates the Muslim religious law, *al-sharī'a*. This issue is extensively explained in Epistle 19; see above, p. 272ff.

19 The same references, in a similar context, were given in Epistle 19; see above, p. 280 and notes 208–210.

20 The Ikhwān quote here the central part of Qur'an 8:17.

21 The Ikhwān quote here the first part of Qur'an 8:17.

22 The Ikhwān quote here the first part of Qur'an 9:14.

the form of the others of its genus and the shape of its species, as if they were poured in matrices of different shapes, (fol. 197b) preserved in [their] species. And thus is found the rule that governs the animals perfect in structure, complete in form: the forms of their genera and the shapes of their species are preserved, because a foal is [never] seen coming out of the womb of a camel, or a goat coming out of the womb of a cow, or a crane coming out of the egg of an ostrich, or a chick coming out from the egg of a dove.

And when a reasonable and intelligent person reflects on these things, and searches and looks for a cause, sometimes he fancies or imagines that nothing other than that belongs to the artisan's power, or [p. 154] he thinks that matter receives only that form, or he says that wisdom does not necessitate anything other than that. If he imagines and thinks that in the artisan's power there is nothing other than that, his reason denies it, because he who is able to invent an artefact will have still more power on changing its structure. Or he thinks and imagines that matter does not receive any form other than that, but how [might that be possible], when [matter] is subject to the reception of all forms? And if he says that wisdom does not necessitate anything other than that, what is the aspect of wisdom when it does not make any calf come out of the womb of a she-camel, or any camel from the womb of a goat, or any young bird from the egg of a dove? It is clear to us.

And know, O my brother, may God help you and us through a spirit coming from Him, that every species of plants has a root [*aṣl*], that its root has a juice [*kaymūs*][23] and that its juice has a mixture,[24] from which only that juice comes; and from that juice, only that species of plants is formed, even if [all of them] were irrigated by the same water, they were grown in the same ground, the breeze of the same air reached them, and the heat of the same sun ripened them.

23 The Arabic is *kaymūs*, transcription of the Greek χυμός. *Kaymūs* 'is a humour or combination of humours', while *mizāj* implies both 'mixture' and 'temperament'; *akhlāṭ* is also a mixture, but, more specifically, the four humours from which the temperaments are derived. Cf. for these explanations Wright, *On Music*, p. 96, note 76.

24 The Arabic is *mizāj*, transcription of the Greek μῖξις.

Prime Matter is subject to the reception of all forms, but each of the secondary matters [*al-hayūlāt al-thawānī*][25] receives one form only, being particularized [by that one] in itself. An example of that is that soil [*turāb*] and water are at the basis [*mawḍū'a li-*] of wheat and cotton trees, but only from cotton does a yarn come, only from a yarn does a cloth come, from a cloth a garment,[26] and so on; whereas from only wheat does flour come, only from flour does dough come, and from dough bread. Then, according to this example and analogy, the states of plants differ, and that is because when the wetness of water and the subtle parts of earth [*laṭā'if ajzā' al-turba*] take place in the veins of plants, they change and become a certain juice according to a certain mixture, and from that juice and that mixture nothing comes other than that species and that plant. And so is the rule that governs its leaves, blossoms, fruits, and grains. [p. 155] Then, plants are different in natures with regard to flavours, colours, and smells, in order to be nourishment for animals; and as animals are different in natures, each sort [*lawn*] of plant was placed as the nourishment for a species of animals, or as the remedy for an illness that may occur to it, the commentary on which is mentioned in the books [*kitāb*] of veterinary science and of medicine.

And know, O my brother, may God help you, that every species of plants has four causes: a material cause, an efficient cause, a final cause, and a formal cause. The material cause is the four elements (fire, air, water, and earth). The efficient cause is the Universal Soul. The final [cause] is that [plants] were created for the sake [*min ajl*] of animals as nourishment and benefits for them. The formal cause is the heavenly causes [*asbāb*],[27] the explanation of which is long, (fol. 191a) and that

25 These words, which are found also later in other passages of the treatise, are reminiscent of Aristotle's distinction between Prime Matter and second matters. Beings are composed of different matters and forms. In order to avoid regression to infinity, Aristotle established the existence of a Prime Matter deprived of all forms and determinations (as a pure potentiality). All matters different from it are called 'second matters'.

26 For a similar but broader consideration, see above, Epistle 15, pp. 111–112.

27 'È interessante rilevare qui la presenza di un primo tentativo di inserire lo studio dei vegetali negli schemi ontologici dell'aristotelismo neoplatonizzante del Medioevo arabo-islamico, tentativo che sarà poi portato a compimento da Avicenna che introdurrà la botanica tra le scienze della tradizione aristotelica'; M.

by permission of the Creator, high be His praise.[28] We want to set forth each cause in detail, and to clarify it, so that in that there may be an admonition for those who have eyes to see,[29] and an [occasion of] knowledge for those who are endowed with understanding.[30]

In fact, when the parts of the elements are assembled, mixed, mingled, and united, they become matter for the generation of plants. The cause for their assemblage and mixing is the rotation of the spheres around [the world of] elements, the journey of the planets in the constellations, and the fall of their rays in the air[31] towards the centre of the earth, all that by permission of God, be He exalted, and by the subtlety of His wisdom, He] Who created the spheres and made them rotate, Who divided the constellations and made them appear [*fa-aṭlahahā*], Who gave form to the planets and made them travel, and Who sent souls [to the Earth] and appointed them as [His] representatives,[32] blessed be He, the best of creators and the wisest of wise.

As to the way in which [all] that [occurred], we recall and explain it for those who understand, with God's help and the success granted by His goodness [*ḥusn tawfīqihi*], God willing, be He exalted. And know that when the Sun rises on [p. 156] the horizons of countries and shines on the face of the Earth, the waters of the seas and rivers become hot and their parts become subtle, and they become subtle and light vapour; they rise in the air, in the atmosphere of the sky, at the point when they reach the surface of [the globe of] Zamharīr, and go beyond the globe of Nasīm, they become cold there, fall down, assemble together, become dense, pile up [*tarākamat*] and become clouds,[33]

Zonta, 'Botanica', in *Storia della Scienza* (2012), available online at http://www.treccani.it/enciclopedia/la-civilta-islamica-scienze-della-vita-botanica_(storia-della-scienza)/. There is no indication of page numbers in this article.

28 Here, Atif has a sign probably indicating an omission, followed by a blank space.

29 On this locution see above, Epistle 19, p. 275, note 192.

30 On this locution see above, Epistle 19, p. 275, note 193.

31 The Arabic is '*fī jaww al-hawā'*'.

32 These words may hint at the Ikhwān's doctrine, that blessed souls — and especially the prophets' souls — are sent to the Earth to help human souls attain salvation.

33 The Arabic is '*ghuyūman wa-saḥāban*'.

blizzards, drizzle, and dew;[34] they pile up and winds transport them towards the tops of mountains and the surfaces [*wujūh*] of deserts, wastelands, open spaces, and villages, in arable lands and plantations; rains pour down there, the face of the earth is moistened, earth [*turāb*] sips the humidity of water, and their parts [i.e., of earth and water] are mixed and joined together. And when the sun rises on the face of the Earth and heats it, those parts of water become hot and light, and begin rising from the depth of the Earth toward its surface [*wajh*]. They push with themselves those parts of earth united to them towards the visible surface of the Earth. Later, the faculties of the simple soul that are under the sphere of the Moon, effused in bodies, give form — from that matter — to the species of plants, with the [various] kinds of their shapes, and the colours of their pigments, as human artisans produce in the bazaar streets of towns various kinds of artefacts from the materials related to their arts [*al-mawḍūʿa fī ṣināʿātihim al-maʿrūfa*], as we have explained in our epistles.[35]

And know, O my brother, may God help you and us through a spirit coming from Him, that the faculties of the Universal, simple Soul we mentioned that produce the genera and species of plants are those that are mentioned in the prophets' books, upon them be peace, as being angels of God, be He exalted, and His cohorts charged with them.[36] In fact, it has been reported in the succession of the *akhbār* [i.e., *al-akhbār al-mutawātira*][37] that with every drop [God] sends down from heaven there is an angel charged with it, who brings it to Earth, and that with every leaf, fruit, and grain of plants He makes come out in the Earth [there is an] angel who makes them grow and rise, and

34 I translate so the Arabic *saqiyyan*, although the current term for 'dew' is *ṭall* (which may also mean 'drizzle', according to the contexts). Dieterici, *Die Naturanschauung*, p. 167: 'Reif'.

35 As a matter of fact, the issue of human artisans is proper to Epistle 8: 'On the Practical Arts and their Goals', but it is also widely debated in the whole encyclopaedia, often in comparison with God — the supreme Artisan — and the metaphoric artisans proposed for the heavenly ontological hypostases. See in this volume pp. 42–43.

36 Namely, with the production of plants.

37 Namely, the *ḥadīth*s whose *isnād* has so many transmitters that there could be no collusion, all being known to be reliable and not being under any compulsion to lie. See J. Robson, 'Ḥadīth', *EI2*, vol. 3, pp. 23–28, on p. 25.

who preserves them from the detriments that may affect them, until [all of them] are completed and perfected and reach the highest of their goals and the extreme of their limits, all that by permission of the Creator [*al-bari' al-khāliq*], high be His praise. And so is the rule that governs all animals, as God, be He exalted, mentioned by His saying, *For each (such person) there are (angels) in succession, before* (fol. 191b) *and behind him: they guard him by command of Allah.*[38]

We call [the angel] charged with plants 'vegetal soul'. And know, O my brother, that God, may He be glorified and honoured, has supported[39] the vegetal soul with seven active powers, namely, the attractive power, [p. 157] the retentive power, the digestive power, the expulsive power, the nutritive power, the formative power, and the accretive power.[40] And know that each of these powers in the bodies of animals and plants makes something different from that which is made by another power. The act of the first in the generation of plants is to attract the saps of the four elements and to absorb their subtle [parts] together with the homeomeries that are in them, in one species after another, from the roots of plants; then they are seized with [the action of] the retentive power, are digested with [the action of] the digestive [power], then are expelled towards extremities with [the action of] the expulsive [power], then are nourished with [the action of] the nutritive [power], then they grow and increase in the various parts [*aqṭārihā*] with [the action of] the accretive [power], then they are formed according to the species of their shapes and pigments with [the action of] the formative [power]. In fact, when the attractive power sucks the moisture of water through the veins of plants as a cupper sucks blood by cupping glasses, or as fire sucks oil by a wick and attracts it, the subtle parts of earth join strongly to [that moisture], and when that matter sets in the veins of plants, the digestive [power] ripens it, and it becomes juice [*kaymūs*] according to a certain mixture, which is

38 The Ikhwān quote here the first part of Qur'an 13:11.

39 Note that the Arabic is *ayyada* here, a verb usually indicating 'inspirational help' in the Ikhwān. Probably, as the universe is conceived as a whole, with parts interconnected, vegetal souls, too, enter in the Creator's project of salvation.

40 Here the Ikhwān are referring to plants the seven faculties that guarantee foundation and integrity of every natural being, mentioned above. The issue is more widely addressed in Epistle 20, p. 306ff.

similar to the body [*jirm*] of the veins; the nutritive power takes it and pastes on every shape[41] the matter that fits it, and it increases in its parts [*aqṭārihā*] in length, breadth, and depth; then [the expulsive power] pushes upwards what was in excess of that matter, and has become subtle and thin, in the trunks [*uṣūl*],[42] twigs, and branches of plants; the attractive [power] attracts it there, and the retentive [power] retains it so that it does not flow downwards again. Then the digestive power ripens it a second time, changes its mixture and quality, and makes it similar to the body [*jirm*] of the trunks, the branches and the twigs, and [transforms it into] matter for them. Then they increase in their parts [*aqṭārihā*] in length, breadth, and depth, and [the expulsive power] pushes upwards what was in excess of [that matter], and has become subtle and thin, towards the higher branches and twigs, the attractive [power] attracts it there, and the retentive [power] seizes it. Then the digestive power concocts[43] it a third time, ripens it and transforms it into another mixture similar to the body [*jirm*] of the stems [*'urūq*],[44] blossoms, flowers, seed coats [*akmām al-ḥabb*], and fruits, and into matter for them, and they increase in their parts [*aqṭārihā*] in length, breadth, and depth; and [the digestive power] makes what of it has become subtle and thin a matter for grains [p. 158] and fruits, and the [retentive power] retains it there. Then the digestive power concocts it again another time, ripens it, makes it subtle, mixes it here, and makes what is dense and thick in it matter for the body [*jirm*] of stems and stones [*nawā*], and increases in them length, breadth, and depth; then [this power] makes what is subtle and pure of it matter for the grains,[45]

41 I.e., probably, on every part of the plants. Among the MSS consulted, only [ب] provides a different reading, *shay'* (thing).

42 The word *aṣl*, pl. *uṣūl*, takes two different meanings in this treatise, 'root' and 'trunk', according to the various contexts.

43 That is (here and later), it submits the saps to the concoction process.

44 The word *'irq*, pl. *'urūq*, also takes different meanings in this treatise, 'vein', 'stem', and even 'root', according to the various contexts.

45 From here onwards, Atif's text has been compared with the Ṣādir edition, too — a unique case in the present edition (but only the most relevant readings are reported in the apparatus). Many words of this treatise occurring in Atif do not exist in Arabic, or do not make sense in the various contexts. Perhaps the copyist did not know the related technical terminology, or his model was particularly defective.

core [*lubb*], and fruits, namely, [the parts] thin [*al-raqīq*] and fat [*al-duhn*], [and for the] juice,[46] syrup,[47] colour, flavour, and smell [of plants] different in natures, (fol. 192a), benefits, harm, and mixtures in[48] their degrees, as they are recorded in the books of medicine and in the books of nourishments and herbs with their explanation, the mention of which we have left out for fear of prolixity.

Those that we have mentioned are all acts of the vegetal soul, which is at the service of the animal soul, intermediate between it and the four elements. The veins [of plants] attract their saps raw and unripe, then they purify, ripen, and concoct them, and animals take them as nourishment — subtle, pure, delicious, healthful, and salubrious. All that is [a sign of] the benevolence of God, high be His praise, of His compassion for them, of His mercy for them, and of His gentleness to them.[49] To Him laudation, praise, thanks, and invocation, and from Him graciousness, favour, signs, and blessings, both in the hereafter and in the first [stage of existence].

And know, O my brother, that plants are every body that comes out from earth, is nourished, and grows.[50] Some of them are trees,

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46 In note 1 at p. 158, the Ṣādir edition clarifies that *shīraj* is '*duhn al-simsim*', sesame oil, but in Epistle 21 the term is to be taken in a more generic sense. Dieterici translates: 'Saft'.

47 The Ṣādir edition vocalizes *dubs*, with no explanation. Dieterici translates: 'Honig'.

48 Namely, the degrees in which the qualities linked to the four elements are variously distributed in plants and their parts.

49 Note that the text uses here masculine plural pronouns.

50 The real treatment about plants begins here, after the Ikhwān have indicated the function of the seven faculties with reference to the vegetal kingdom. On the Arabic works about plants preceding or contemporary with the *Rasā'il*, see T. Fahd, 'Botanique et agriculture', in R. Rashed, ed., *Histoire des sciences arabes. 3: Technologie, alchimie et sciences de la vie* (Paris: Seuil, 1997), pp. 75–110, on pp. 73–77; M. Ullmann, *Die Natur- und Geheimwissenschaften im Islam* (Leiden: Brill, 1972), pp. 63–77, and Zonta, 'Botanica'. The most influential Greek work was the *On Plants* by the rhetorician, historian, and philosopher Nicolaus of Damascus (first century BC). The work has been edited by H. J. Drossaart Lulofs and E. L. J. Poortman, *Nicolaus Damascenus De Plantis. Five translations* (Amsterdam–Oxford–New York: North-Holland Publishing Company, 1989). Perhaps it was in origin a part of a wider compendium of Aristotle's philosophy, later lost; for this reason, it may have been attributed to Aristotle. (Drossaart Lulofs believes a botanical work by Aristotle in two books to have existed, but that it is lost at least since the second century CE. Nicolaus may have based himself on this work, and on the *On the Causes of Plants* and the *Enquiry into*

whose twigs and stems are planted; others are crops, whose grains and bulbs are sown. Others are formed from parts of the elements when they are mixed and mingled, as pasture and herbs. Each of these three genera[51] is divided into many species, with various aspects and

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Plants by Theophrastus.) Nicolaus' work was translated into Syriac probably between the sixth and the eighth centuries; only some fragments are extant, as well as quotations by the Syriac philosopher Abū'l-Faraj, called Bar Hebraeus, d. 1286. Then the work was translated from Syriac into Arabic by Isḥāq ibn Ḥunayn. (The text was edited by 'Abdurraḥmān Badawi in *Aristotelis De Anima et Plutarci: De Placitis Philosophorum, Averroïs: Paraphrasis Libri de Sensu et Sensato, Aristotelis: De Plantis* (Cairo: Imp. MISR S.A.E.- Maktaba al-nahda al-miṣriyya, 1954), where the book is attributed to Nicolaus of Damascus (*Tafsīr Niqūlaws tarjama Isḥāq ibn Ḥunayn, bi-iṣlāḥ Thābit ibn Qurra*, in two books). Finally, the work was translated from Arabic into Latin by Alfred of Sareshel — thirteenth century; cf. *Nicolai Damasceni de Plantis Libri duo Aristoteli vulgo adscripti ex Isaaci ben Honaici versione Arabica Latine vertit Alfredus*, recensuit E. H. F. Meyer (Leipzig, 1841) — whose knowledge of Arabic and whose Latin style leave something to be desired, and who became known to the Latin Middle Ages. I will quote from Aristotle's *Quae feruntur De plantis, De Mirabilibus Auscultationibus, Mechanica, De Lineis Insecabilibus, Ventorum Situs et Nomina, De Melisso Xenophane Gorgia*, ed. O. Apelt (Leipzig: Teubner, 1888); English translation by E. S. Forster in *The Works of Aristotle Translated into English*, ed. W. D. Ross, vol. 6 *Opuscula* (Oxford: Clarendon Press, 1913); Forster's translation has been made from the Latin version edited by Meyer. The Greek text in the Bekker and Teubner editions is a translation from the Latin back into Greek, and is therefore twice removed from the original. As to Theophrastus' capital works on plants, the six (originally, eight) books of the *On the Causes of Plants* were probably translated into Arabic by the Baghdādī physician Abū Isḥāq Ibrāhīm ibn Bakkūsh al-'Ashshārī (second half of the 10th century) under the title *Kitāb asbāb al-nabāt*, but already Ibn al-Nadīm (d. 990) could have found in Arabic only a part of the first Book (no explicit quotation has been so far found in the Medieval Arabic literature according to Zonta, 'Botanica'). I share Zonta's opinion that Balīnūs was one of the most important sources for the treatise of the Ikhwān on plants; as to the other important source, the *Filāḥa al-nabaṭiyya ('The Nabataean Agriculture')*, a careful comparison would be necessary. A list of the topics addressed by Ibn Waḥshiyya in his extensive work is given by Fahd, 'Botanique et agriculture', pp. 80–110. The sketch of al-Dīnawarī's (ninth-century) book of plants given by Fahd on pp. 75–76 suggests that the Ikhwān may have known the work of the founder of Arabic botany, who also locates this science after a treatment of astronomical, meteorological, and mineralogical issues.

51 The Ikhwān mention three kinds of plants only. Arabic authors, however, provide other divisions. See Ullmann, *Die Natur- und Geheimwissenschaften im Islam*, pp. 84–86, and Fahd, 'Botanique et agriculture', p. 80ff. Theophrastus lists four categories: trees (δένδρον), shrubs (θάμνος), undershrubs (φρύγανον), and herbs

numerous qualities of which we need to recall a part and which [we have] to explain, so that they may be an example for the others and an indication of the many from the few.

We shall begin first by mentioning trees, and we say that trees are every plant [*nabt*] that stands on its trunk [*ʿalā sāqihi*][52] with [its] roots planted in the ground [*muntaṣiban aṣluhu*], rising in the air; a whole year passes for it and it does not wither.

Stalkless plants[53] are every plant that does not stand on its trunk [*ʿalā sāqihi*] rising in the air, but extends itself on the face of the earth or is attached to a tree and climbs [p. 159] with it in the air by its hooks, [so as] not to carry on itself the weight of its fruits, as [do] pumpkin, cucumber, melon, and the like.

And know that some trees are complete and perfect, and others are defective and imperfect. A complete and perfect tree is that which has these nine parts, namely, trunk [*aṣl*], roots [*ʿurūq*], twigs [*quḍbān*], branches [*furūʿ*], blossoms, leaves, bark, resin, and fruits.[54] A defective

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(πόα); see *Enquiry into Plants* I.3.1. Nicolaus also lists four categories, speaking of *shajar* (trees), *mā bayna'l-shajar wa'l-ḥashīsh* (what is between trees and herbs — *thāmnū* [transcription of the Greek θάμνος] and *ḥubūb*, *ḥashīsh* (herbs), and *ʿushb* (herbage); see Drossaart Lulofs and Poortman, *Nicolaus Damascenus De Plantis, Arabic translation*, I.4.88 (pp. 154–155; Zonta, 'Botanica' has: '[...] secondo lo schema teofrasteo: alberi [...], frutici [...], erbe (*ḥašīš*, *ʿušb*), suffrutici (*buqūl*)'.

52 On this distinction, see Drossaart Lulofs and Poortman, *Nicolaus Damascenus De Plantis*, Bar Hebraeus' Syriac version, p. 84.

53 I take the meaning given by Steingass, *A Learner's Arabic-English Dictionary*, s.v. *najm*. Ullmann, *Die Natur- und Geheimwissenschaften im Islam*, p. 86, translates, 'Stern', explained at p. 85 as: 'die Gewächse, die eines Stengels oder Stammes entbehren'. Zonta, 'Botanica', translates, 'Erba'.

54 Dieterici, *Die Naturanschauung*, p. 171 gives the following list: 'Wurzelstamm und Wurzelzweigen, Stamm, Aeste, Blätter, Blüthe, Frucht, Rinde und Gummi'. Dieterici and the Ṣâdir edition give the same list, in a slightly changed order. The parts of the plants are listed in the pseudo-Aristotelian *On Plants* 818a4–17. Cf. also Theophrastus, *Enquiry into Plants* I.1.9. In Ibn al-Ṭayyib's version of the *On Plants* by Nicolaus of Damascus we find the following list: roots (*uṣūl*), stems (*sūq*), branches (*shuʿab*), bark (*liḥāʾ*), twigs (*aghṣān*), flowers (*zuhar*), blossoms (*warad*), leaves (*waraq*), fruits (*thamar*), seed (*bizr*), knots (*ʿuqad*), and thorns (*shawq*); see Drossaart Lulofs and Poortman, *Nicolaus Damascenus De Plantis*, pp. 220–221. A comparison between parts of plants and parts of animals is found in its Syriac version (in Bar Hebraeus' *Candelabrum*, p. 56).

tree is that which lacks one or more of them, as sycamore,[55] the thorn-tree of the desert, willow [*khilāf*],[56] tamarisk, and the like among [plants] that have no fruits, or leaves, or blossoms, or resin.

And know that among complete trees there are those more complete and perfect than others, which compete in that[57] from many points of view. Some [compete] from the standpoint of their trunks [*uṣūlihā*] — and they rise in the air, and spread their branches [*yatafarra'u*] in various directions, as [do] mulberry, fig, walnut, and so on. Others rise in the air in a vertical position [*muntaṣiban*], isolated, as [do] palm, cypress, fennel [*qannā*],[58] teak, and so on. And so is the rule that governs their roots ['*urūqihā*] inside the earth: the roots of some of them descend into the earth perpendicularly [*muntaṣiban*] like pegs, others go straight in various directions. Some of them [p. 160] are inclined and crooked and intertwine, others are close to each other (fol. 192b) in [the point of] their origin [*manābitihā*], and thicken beside each other. Some are isolated and nothing else grows near them.

There are plants and trees with leaves and fruits proportionate in magnitude, colour, shape, and touch, as are citron, orange, pear [*kummathrā*], apple, and the like. And there are plants and trees with fruits and grains not proportionate to their leaves in magnitude, as pomegranate, fig, grapes, walnut, palm, and the like. In fact, the [fruit of the] citron tree has a rounded shape, is green in colour, soft to the touch, and proportionate to its leaves; the [fruit of the] orange has a spherical shape proportionate to its leaves; the [fruit of the] pear tree has a conic shape, and so do its leaves; the [fruit of the] apple has a spherical shape, and so do the leaves of its tree. As to the fruit of the pomegranate, it is not proportionate in magnitude to the

55 Note that the Ṣādir edition has *al-ilb*, explained in note 5 at p. 159 as 'a tree like citron [*utrujj*]'.

56 In my translation I have followed Dieterici, *Die Naturanschauung*, p. 171: 'der Weidenbaum', and the Ṣādir edition, which in note 7, ibid., clarifies *khilāf* as 'a kind of willow [*ṣafṣāf*]'. Cf Lane, *Arabic-English Lexicon*, s.v. *khilāf*; Freytag, *Lexicon Arabico-latinum*, s.v. *khilāf*; Kazimirski, *Dictionnaire arabe-français*, gives: 'saule d'Egypte'; cf. Dozy, *Supplément aux dictionnaires arabes*, s.v. *mā' al-khilāf*.

57 Namely, in completeness and perfection.

58 Cf. Dozy, *Supplément aux dictionnaires arabes*, s.v. *qannā*, who cites Dioscorides III.84 (ἐμφερὴς νάρθηκι).

leaves of its tree, and nor are [the fruit of the] fig, grapes, and other [trees]. According to this example [*qiyās*] is the rule that governs the grains and seeds of plants: some are proportionate and others are not proportionate — all that for [various] causes, reasons, and purposes.

Chapter 2
On the explanation of the genera of plants from the standpoint of [their] places

Know, O my brother, that there are plants that grow in deserts, in wastelands, and on the tops of mountains, others that grow by the coasts of rivers and the shores of seas, others in reed-beds [*ājām*] and thickets, others that are sown and planted by people in villages and arable lands, in gardens and fields.[59] And know that the majority of plants grow on the face of the earth, apart from a few of them [p. 161] that grow under water, as do the Nabataean cane,[60] rice, water-lily, and various species of small plants [*'ikrish*].[61] There are plants that grow on the surface [*wajh*] of the water,[62] as water moss;[63] others that grow [*yanfasikhu*] on [other] trees and plants, as does dodder;[64] others that grow on the surface [*wajh*] of rocks,[65] as does green manure.[66] There are plants that grow only on good soil; others that grow only in warm countries or in cold [countries]; others that grow only in sands or

59 This is a tentative translation of Atif's reading *afraja* (?), on the basis of the explanation provided by Kazimirski, *Dictionnaire arabe-français*, s.v. *afraju*: 'Qui a certaines parties très-espacées, très-distancées, écartées'; Lane, *Arabic-English Lexicon*, s.v. *farij*, *afraju*, has: 'A place which is *tafarruj* [diversion, amusement]'; Dieterici, *Die Naturanschauung*, p. 172: 'Wiesen'.

60 Note that the Ṣādir edition has '*qaṣab al-sukkar*', sugar cane.

61 For this translation, see above, Epistle 19, p. 234, note 44.

62 Cf. the pseudo-Aristotelian *On Plants* 825a40ff.; and Drossaart Lulofs and Poortman, *Nicolaus Damascenus De Plantis*, Arabic translation, II.4.185, at pp. 190–191.

63 The term *ṭuḥlub* may also mean 'borage'; Drossaart Lulofs and Poortman, *Nicolaus Damascenus De Plantis*, p. 440, translate 'duckweed'.

64 The Ṣādir edition has *ka'l-kashutha*, explained in note 3 as 'a plant attached to boughs, without stem in the earth' (see also p. 168, note 1). Dieterici, *Die Naturanschauung*, p. 172: 'die Schmarotzerpflanzen'.

65 Cf. the pseudo-Aristotelian *On Plants* 826a20ff.

66 Dieterici, *Die Naturanschauung*, p. 172: 'das Ruinengrün'.

among pebbles, stones, rocks, and dry soils; and others that grow only in briny and salt-steppe soils.[67]

Chapter 3
On the explanation of the diversity of plants from the standpoint of [their] times

Know, O my brother, may God help you, that the majority of herbage, pasture, and herbs grow in spring days, because of the temperate weather, the good air, and the abundant rains previously fallen in winter. As to those of them that grow in the [other] three seasons, they are few.[68]

Among them there are those that people sow and take care of with irrigation, like wheat, barley, bean,[69] lentil, and others that are sown in autumn and harvested in spring; those that are sown in winter and are seen in spring, as are cucumber, water-melon, aubergines, and so on; [p. 162] those that are sown in autumn and take root in winter, as are carrots, turnip, cabbage, and cauliflower;[70] those that are sown in summer (fol. 193a) and harvested in autumn, as are sesame, maize, rice, and so on; and those that are sown in spring and take root in autumn, as are cotton and hemp.

And know, O my brother, that the Creator, high be His praise, made the leaves of plants as an adornment for them, a cover for their fruits, and a protection for their grains, blossoms, and flowers from excessive heat and cold, and from violent winds, dust, and the strong glare of the sun.

And He made them also as a shade for animals, and as a shelter for them, a veil, a soft bed [*waṭā'*],[71] a nourishment, and a matter for their bodies, and as remedies and numerous benefits. And so is the rule that

67 I have emended the text here (see the critical apparatus, p. 437, note 2). For this translation, see above, Epistle 19, p. 229, note 24.

68 Cf. the pseudo-Aristotelian *On Plants* 821b3–5.

69 In note 6 at p. 161, the Ṣādir edition gives it as a synonym of *fūl*. According to Steingass, *A Learner's Arabic-English Dictionary*, s.v.: 'Egyptian bean'.

70 The Ṣādir edition chooses the form: *al-q.rn.bīṭ*.

71 Dieterici, *Die Naturanschauung*, p. 173: 'Unterlage'. In note 4, the Ṣādir edition explains *waṭā'* as a synonym for *farāsh*, 'cover, bed'.

governs their fruits, grains, seeds, bark, stems, roots, core, twigs, and branches. Each of these species is endowed with numerous benefits that are known only by God, may He be glorified and honoured. A part of them has been recorded in books on medicine and in books on herbs, and what is neither known nor recorded is more than what is known and recorded.

Know, O my brother, that among the leaves of trees and plants there are those that have an elongated shape, and are conic in their upper part and rounded at their lower part; those that have a circular shape; those that have a bulging[72] shape; those with a hornet-like shape;[73] those endowed with fingers and divided into two halves; those that are triangular, doubled, and [with parts] in reciprocal opposition; those isolated and away from [others];[74] those broad, large, and long; those rough; those soft [*raqīq*] to the touch and translucent; and those [p. 163] with a pleasant smell and a bitter flavour, those with a sweet flavour, or with other flavours.

The most common [*akthar*] of the colours of the leaves of plants is green, but among them there are those with a deeper colour, others dust-coloured, others of a pure colour, others of a swarthy colour, and others with the external part of a colour contrary to the colour of their internal part. And so is the rule that governs their fruits, grains, blossoms, seeds, and flowers — all that for [various] causes, reasons, and purposes.

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72 This is a tentative translation resulting from the emendation of Atif's reading *jāmūsī* into *ḥābūṭī*, with MS [ٹ], as an extension of the meaning of the adjective *ḥabiṭ* given by Lane, *Arabic-English Lexicon*, s.v. as 'having his belly swollen'. For this and other readings, see the critical apparatus, p. 439–440, note 15). Note, however, that in many MSS this and the following words are omitted. In note 7 at p. 162, the Ṣādir edition remarks on the uncertainty of his own reading, *jābūtī*. The passage is omitted in Dieterici, but in his addition mentioned in the critical apparatus, pp. 443–444, note 5, it is clear that he reads *ṣalībī*; consequently, in *Die Naturanschauung*, p. 173, he translates: 'kreuzförmig.

73 Dieterici, ibid.: 'einige haben die Gestalt eines Topfes' for the Arabic *safaṭī*, and then he adds: 'andere die einer Schärpe [*ṭaylasānī*], wieder andere die eines feinen Panzerhemdes [*sābūrī*], noch andere haben die einer Olive [*zaytūnī*], oder die einer Schleife' [*ḥamūsī*].' Dozy, *Supplément aux dictionnaires arabes*, s.v. gives for *zanbūr* also the meaning 'clitoris'.

74 Dieterici, *Die Naturanschauung*, *ibid.*: 'andere aber einzeln zu beiden Seiten'.

In fact, there are fruits whose rind is thin, with a silky and close texture, others whose rind is thick, and the texture either fibrous and tightened,[75] or cartilaginous [*ghuḍrūfiyya*] and hard, or stone-like[76] and dry, or reticular and square; or their texture is with ventricles,[77] thick [*thakhīna*, here and later], and tender.[78] The interior of the rind of other fruits is either a thick and compact pulp, or liquid, flowing, and pleasant, or sweet, or acrid, or bitter, or salty, or acidulous [*muzza*], or tasteless, or acidic, or oily and fatty.

There are fruits that inside their pulp have a kernel, either roundish in shape, or elongated, or conic, or massive [*muṣmata*], or hollow with a fat core inside, or are bitter, or sweet, or of another of the nine flavours.[79]

Other fruits have inside their pulp a grain, small or big or hard or soft and with a viscous liquor [*ruṭūba*] around it, or coarse [*qashifa*][80] and hard, of various shapes. As to the hollow [fruits], either in their interior there is a core, or they are void.

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75 The Arabic is *mu'warraba* (also in Dieterici), and I do not see other possible translations. The Ṣādir reading, *mawzī*, does not seem better, neither do the other MSS readings, for which see the critical apparatus, p. 441, note 7.

76 The Arabic is *khazafi*, literally 'porcelain-like'.

77 This is my tentative translation for the Arabic *khurūshiyya* which might also mean 'wrinkled'; Dieterici reads *karafsiyya* and in *Die Naturanschauung*, p. 174 he translates: 'wie ein Labmagen'.

78 For the Arabic *khamīla* I take the meaning given by Steingass, *A Learner's Arabic-English Dictionary*, s.v. *khamīl*.

79 The Ikhwān establish nine flavours: *ḥalāwa* (sweetness), *marāra* (bitterness), *mulūḥa* (saltiness), *dusūma* (fattiness), *ḥumūḍa* (acidity), *ḥarāfa* (pungency), *'ufūṣa* (acridity), *'udhūba* (pleasantness), and *qubūḍa* (astringence). See, e.g., Epistle 24: 'On Sense and Sensibilia', *Rasā'il*, vol. 2, p. 402.12–14. These flavours, with the exception of 'pleasantness', correspond to the eight flavours in Aristotle: γλυκύ (sweet) and from it λιπαρόν (fat), πικρόν (pungent) and from it ἁλμυρόν (salt), and, intermediate between them, δριμύ (acrid), αὐστηρόν (bitter), στρυφνόν (astringent, sour), and ὀξύ (sharp). See *On Sense and the Sensible* 4.442a12ff. and *On the Soul* II.10.421a30; and C. Baffioni, 'Les sens chez les Iḫwān al-Ṣafā' et l'héritage aristotélicien', in *I cinque sensi — The five senses*, Micrologus Library 10 (Florence: Sismel, 2002), pp. 463–476. For flavours in Balīnūs' *Kitāb sirr al-khalīqa* ('The Book of the Secret of Creation'), see my article 'Antecedenti greci e arabi delle dottrine degli Iḫwān al-Ṣafā' sulla sensazione', in R. B. Finazzi and A. Valvo, ed., *Pensiero e istituzioni del mondo classico nelle culture del Vicino Oriente* (Alessandria: Edizioni dell'Orso, 2001), pp. 27–53, on pp. 30–38.

80 This translation is according to the explanation given by the Ṣādir edition at note 4 at p. 163.

And know, O my brother, that among the leaves of trees and plants (fol. 193b) and their fruits, grains, blossoms, and flowers, there are relations and similarities in smallness and bigness, and differences from various standpoints: from the standpoint of form and shape, from the standpoint of colour, flavour, and smell, from the standpoint of tenderness and roughness, and of hardness and softness, [p. 164] from the standpoint of smallness and bigness, of wideness and narrowness, of thickness and thinness, of translucency and opacity [*kumuda*], of doubleness and singularity, and other [standpoints] the explanation of which would be long — all that for causes, reasons, and purposes, the core of which is known only by God, may He be glorified and honoured, Who created and brought them out, as He knew them.[81]

However, we shall mention a part of them, and we shall report on their material causes, their formal reasons, and their final goals, so that it may be an indication for the other [parts], and an incitement for noble souls to reflect on the marvels of the artefacts of the Creator, may He be glorified and honoured, and [so that] it may be an admonition for those who have eyes to see,[82] who reflect on the creation of heavens and earth and on the [divine] signs that are in the remotest regions and in themselves, and [so that] it may also be a guide for the hearts of the confused people who think that [the creation and God's signs] are not due to the work of a wise Artisan, or to the intention of Someone endowed with an intention, but [that they are] due to chance, or they link them to nature without knowing what nature is, and to stars and to the [encompassing] sphere without knowing how that happens, why and for what [purpose].[83]

[The Date]

And know, O my brother, that there is a fruit elongated in shape, rounded in structure, of different colours, having around its kernel a subtle rind, silky, soft to the touch, with a hard texture; and around that kernel is a thick pulp, around which [there is] a hard and smooth

81 This statement indicates that Muslim philosophers, including the Ikhwān, consider the divine attribute of science, and not the attributes of word, will, and power, to be the starting point of creation.

82 The same expression, "*ibratun li-ūlī'l-abṣār*", has been used above, at fol. 191a1–2 Atif; see above, p. 324.

83 See also above, Epistle 19, p. 278.

rind; on the back of the kernel is a hollow, and at the opposite side an elongated hole, in which [there is] a fibrous stuffing; and at the top of the fruit, outside, is a cavity,[84] around which are scattered splinters,[85] adherent to the fruit.[86] The matter of this fruit before ripeness is acrid, and after ripeness it is sweet and viscous, and [this fruit] is the date.

[The Pomegranate]

There is a fruit with a roundish shape and a big structure, around which there is a fibrous, thick rind, hollow from its interior, wide, and in which there are two parts[87] divided, and in it are small swellings in touch with each other,[88] around which [there are] inlaid grains,[89] with conic shapes, and in the interior of those grains is a delicate, silky, [p. 165] and soft kernel, and a fat core inside; in the lowest [part] of the fruit, from the exterior, [there is] a circular opening, and in it a fibrous cover, around which [there are] protruding splinters, and around them a circular, conic opening. It is the pomegranate fruit.

[The Lotus]

There is a fruit with roundish shape, smooth, and with a thick pulp, in its interior is a spherical kernel, rough to the touch, and inside the kernel is a fat core, and it is the lotus.

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84 The Arabic is *qam'a*. The cavity is that in which the pedicule of the fruit is placed, according to Steingass, *A Learner's Arabic-English Dictionary*, s.v. *qima'*. So Dieterici, *Die Naturanschauung*, p. 176, translates: 'eine Vertiefung für den Stiel'.

85 In note 3 at p. 164 the Ṣādir edition explains *shaẓiyyāt* as each half (*filqa*) of something, but his explanation does not seem clear to me. The text may refer to the relieved rind that is found at the top of the fruit.

86 Cf. Dieterici, *Die Naturanschauung*, p. 176, translates the words *''alayihā shaẓiyyāt mutafarriqa mutashabbitha bi'l-thamara*' with 'über welche sich auseinandergehende mit der Frucht verbundene (Spāne) Fasern hinziehen'.

87 The Arabic is *juz'āni*. Dieterici reads '*khazā'inu maqsūmatun*' and ibid. translates: 'wohlvertheilte Fruchtzellen'.

88 This is my tentative translation for '*di'āṣ mumissa*'. Dieterici reads '*di'āṣun mutasannamatun*' and ibid. translates: 'wellenförmige runde Felder'; the Ṣādir edition has *ad'āṣ*, contrary to the MSS reading, and explains it in note 4 at p. 164 as a synonym for *kuthbān* (sandhills, dunes).

89 This is my tentative translation for '*ḥubūb muraṣṣa'a*'. Dieterici, *Die Naturanschauung*, p. 176: 'Beeren, wohlgereiht'.

[The Walnut]

There is a fruit with a roundish, basket-like[90] form, with a thick rind around it, in its interior is another rind, stone-like, similar to a shell, hollow, and in which there are two divided compartments [containing] a fat core, around which [there is] a subtle rind, and between the two is a parted screen,[91] with well-arrayed divisions. (fol. 194a) When this fruit is cut, it is divided into two halves like two baskets. It is the walnut fruit.

[The Almond]

There is a fruit with a conic, basket-like[92] shape, around which [there is] a fibrous rind, in its interior is a stone-like, hard rind, in which [there are] piercing holes,[93] containing [*fīhā*] fibrous wicks,[94] and in the interior of this rind is a fat core, around which [there is] a thin, hard rind. It is the almond fruit.

[The Fig]

There is a fruit with no kernel, around which there is a fleshy rind, with a conic, pine-like shape, in its bottom is a roundish hole in which there are splinters;[95] inside this fruit there are small, soft grains; the flavour of its matter before ripening — a white, dense milk — is sharp and burning, and after ripening it is sweet. It is the fig fruit.

[The Grape]

And there is a fruit with different shapes — roundish [*mustadīr*], elongated, curved [*mudaḥraja*], conic — and different colours — black, white, red, yellow, and dusty —, around which [there is] a subtle rind, [p. 166] hard and smooth, attached to its pulp, and inside its pulp are grains of different shapes — like those of an olive or of a blister —, single and in couples, or [in groups of] three or four, similar to

90 At p. 162, note 5 and p. 165, note 2 Ṣādir clarifies the term *safaṭī* as 'basket-like' (*safaṭ* = *'wi'ā' ka'l-quffa'*). Cf. Steingass, *A Learner's Arabic-English Dictionary*, s.v. *safaṭ*. Dieterici, *Die Naturanschauung*, p. 176: 'topfrunde'.

91 Dieterici, ibid.: 'eine Hülle, die sich lostrennen lässt'.

92 Arabic, again: *safaṭī*, translated by Dieterici, ibid., p. 177: 'topfartige'.

93 Dieterici, ibid.: 'durchgehende Löcher'.

94 Dieterici, ibid.: 'faserige Dochte (Faserbündel)'.

95 Dieterici adds *zaradiyya*, and ibid. translates: 'Fäden wie Panzer geschürzt'. Many MSS add here *zi'barī*, as does the Ṣādir edition, which in note 3 at p. 165 explains that *zi'bar* indicates the seam of clothes when sewn together.

porcelain or to bone [*khazafiyya wa-'iẓāmiyya*], either hard or soft, and inside those grains is a fat core; the matter of its pulp before ripening is acidic, and before that it is acrid, and after ripening sweet. It is the fruit which is grapes.

[Other Fruits]

There are fruits with conic shapes, around which there are subtle rinds attached to their pulp, which is dense and thick, in whose interior is a stone-like, shell-shaped kernel, smooth inside, and in them [there is] a fat core. The colours of these fruits are different, their flavour is pleasant and sweet or bitter and acid, and before ripening they are all acrid. They are the plum, apricot, peach,[96] and the like.

There are fruits with spherical or elongated or rounded shapes,[97] around which [there are] fleshy and dense rinds, the flavour of their pulp is acidic, in their interior there are grains around inlaid small swellings,[98] among their interstices is a fleshy pulp [*luḥma*, here and later], with an acidic flavour, and the colours of their rinds [is] green, red, and yellow; their matter before ripening is acrid, as with citron, orange, lemon, and the like.

There are fruits with small grains, in whose interior there is a grain[99] like the grain of vegetables;[100] and others whose fat core does not ripen, as with oak, gallnuts, the fruit of the cypress, and the myrobalan.

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96 The text has '*wa-hiya al-ijjāṣ wa'l-mishmish wa'l-khawkh*'. Dieterici has the same names, but in *Die Naturanschauung*, pp. 177–178, he translates: 'Dies gilt von der schwarzen Pflaume (aus Damascus), von den Aprikose und Kirschpflaume'. The word *khawkh* can mean 'plum', too; cf. Kazimirski, *Dictionnaire arabe-français*, s.v.; Dozy, *Supplément aux dictionnaires arabes*, s.v.; Steingass, *A Learner's Arabic-English Dictionary*, s.v.

97 Dieterici, *Die Naturanschauung*, p. 178: 'entweder kugelrund, oder länglichrund (eirund), oder stielrund'.

98 This is my tentative translation of the Arabic "*alā di'āṣ muraṣṣi'a al-tilāl*'. Dieterici reads '*da'ā'im muraṣṣafa tushbihu al-bard fī*', and ibid. translates: 'in wohlgereihten Zeltabtheilungen, die den Landstrichen vergleichbar sind'.

99 Here Atif repeats the same words stated above; see the critical apparatus, p. 451, note 4. Some MSS add other words, which may be translated: 'a stone-like kern and inside it a fat core'.

100 The whole passage runs in Dieterici, *Die Naturanschauung*, ibid., as follows: 'Andere Früchte sind eben nur kleine Körner, die in ihrem Innern einen steinigen Kern haben, in dessen Innern sich eine fettige Masse befindet. Dies gilt von den Gemüsesamen, dem Pfeffer- und Pinienkorn'.

And know, O my brother, may God help you and us through a spirit coming from Him, that when the wise Creator, high be His praise, originated the existing beings and invented the generated beings, He made the root of them all from a single matter, but contrasted them through various forms, made them different, variegated, and distinct as genera and species, distinguished between their extremities, but linked their beginnings with their ends (fol. 194b) with a single link according to [p. 167] a disposition and an order proper to the arrangement of [His] wisdom and the perfection of [His] work that are [manifest] in them, so that all existing beings are a single world, ordered according to a single order and a single disposition, as a sign of a single Artisan.

Because of that the existing beings [exist] — different in genera, distinct in species, the first ones linked to the last ones [though being] before them in order and disposition — and the begotten, generated beings that are under the sphere of the Moon [exist], and they are of four genera: minerals, plants, animals, and man. In fact, under each of those genera there are many species, among which are those that are at the lowest degrees, those that are in the noblest and the highest [degrees], and those that are between the two extremes. The lowest extremes of minerals are what is adjacent to earth — gypsum, vitriol, and the species of alums; the noblest extreme is [constituted by] <hyacinth [*yāqūt*] and gold, and the other [minerals] are between these two extremes in nobility>[101] and baseness, as we have explained in the epistle 'On Minerals' [Epistle 19].[102]

And thus is also the rule that governs plants; in fact they are many species, distinct and opposite to each other, but among them there are those that are at the lowest level, adjacent to minerals, namely, green manure, and those that are at the noblest level, adjacent to the animal level, namely, the palm tree.

The explanation of that is that the first and the lowest vegetal degree is what is adjacent to earth [*turāb*], namely, green manure [*kadhā*], and it is nothing else than dust compressed on earth [*arḍ*], rocks, and

101 At this point, Atif indicates a lacuna in the margin. I have reported between hooked brackets the addition provided in all the MSS consulted. See the critical apparatus, p. 452, note 10.

102 See above, p. 261.

stones, then those rains and the night dew [*nadan*] fall upon it, and at early morning it appears green as if it were something grown out of sowing [*zarʿ*] and herbs. And when the heat of the Sun at midday touches it, it dries, then it returns to green [*tuṣbiḥu*] in the following morning thanks to the dampness of night and the freshness of air [*ṭayyib al-nasīm*]. However, truffles [*hādhā*] and green manure [*dhāka*] grow only in spring days, in places similar to each other [*al-biqāʿ al-mutajāwira li-taqārub ma baynahā*], because this one is a vegetal mineral, and that one is a mineral plant.

[The Palm]

As to the palm,[103] it is the last vegetal degree, adjacent to the animal [degree], because palm is an animal plant, as some of its actions and states are distinct from the states of plants, even though its body is a plant. The explanation of that is that the active power is separated from the passive power. An indication of that is [p. 168] that its male individuals are distinct from the female individuals, and its male individuals have a semen [with which they pollinate] the female ones, as happens in animals.[104] As to the other plants, their active power is not separated from the passive [power] with regard to an individual, but only with regard to an action, as we have explained in an epistle of ours. In fact, when the tops of palms are cut, they dry, their growth and development end, and they die, as is found in animals. By this consideration it is clear that the palm is a plant with regard to its body, but an animal with regard to its soul, as its actions are the actions proper to an animal soul, while the shape of its body is the shape of a plant.

And in plants there are other species, whose action is also the action of an animal soul, but whose body is a vegetal body, namely, parasitic

103 On palm, see the pseudo-Aristotelian *On Plants* 821a14–23.

104 Cf. *Maqāla tashtamil ʿalā fuṣūl min Kitāb al-ḥayawān li-Arisṭū (Tract comprising Excerpts from Aristotle's Book of Animals) attributed to Mūsā b. ʿUbaid Allāh al-Qurṭubī al-Isrāʾīlī*, ed. and tr. J. N. Mattock (Cambridge: Heffer & Sons for the Cambridge Middle East Centre, 1966), p. 66: 'There is no sex-differentiation in plants, but there is a slight difference which corresponds to this; that is to say that is a single family, such as the date palm, there are some plants that bear fruit, and others that do not, but are of use to those that do in the "concoction" of their fruit'. Mattock refers to *On the Generation of Animals* I.1.715b19–24, though he notes that the date palm is not mentioned there. Cf. also Theophrastus, *On the Causes of Plants* II.10.1.

plants.[105] In fact, this species of plant has neither a root fixed in the earth, as the other plants, nor leaves like their leaves, but it clings to trees, crops [*zarʿ*], and thorns, absorbs from their moistures and is nourished, as does the worm that crawls on the tops of trees and the twigs of plants, bites them, eats them, and is nourished by them. (fol. 195a) Even though the body of this species of plants resembles plants, the action of its soul resembles the action of animals.

It is clear, through what we have described, that the last vegetal degree is contiguous to the first animal [degree]. The other vegetal degrees are intermediate between these ones. And know that the first animal degree is also contiguous to the last vegetal [degree], as the first vegetal [degree] is contiguous to the last mineral [degree], and the first mineral [degree] is contiguous to earth and water, as we have explained above.[106]

The lowest and most defective animal is that which has one sense only,[107] namely, a small creeping thing.[108] It is a worm [that lives] inside a cane that grows on the rocks that are on the shores of seas and the banks of rivers. That worm extracts [p. 169] the half of its body [*shakhṣihā*] from inside that cane, stretches it to the right and the left, and looks for something useful to its body [*māddatan yufīduhā*

105 Cf. the pseudo-Aristotelian *On Plants* 826b32–827a1. Note that the Arabic is *kushūth*, which occurs in the Arabic translation of Nicolaus Damascenus' *On Plants* II.6.204, and is translated by Drossaart Lulofs and Poortman, *Nicolaus Damascenus De Plantis*, 'dodder' (see p. 332 and, for the Hebrew translation, p. 398).

106 See above, p. 317.

107 Cf. Drossaart Lulofs and Poortman, *Nicolaus Damascenus De Plantis*, Ibn al-Ṭayyib's version, pp. 218–219. Nicolaus denies that plants have senses at all.

108 The Arabic is *ḥalazūn*, and my translation is based on the first explanation of the term provided by Lane, *Arabic-English Lexicon*, s.v. The specific meaning 'snail' seems out of place here, as is clarified by the explanation following in the text itself. Cf. also Dieterici, *Die Naturanschauung*, p. 180: 'die Rohrschnecke (Larve)'; Zonta, 'Botanica': 'animali chiusi nelle conchiglie'. This animal is also mentioned in Epistle 22: 'On Animals'. See Goodman and McGregor, *The Case of the Animals versus Man*, p. 133.4 of the Arabic text, and the translation 'snails' at p. 192. Two passages identical with this one are found in Epistle 34: 'On the World as a Macroanthropos' (*Rasāʾil*, vol. 3, p. 227.5–11) and in Epistle 51: 'On the World in its Whole' (*Rasāʾil*, vol. 4, pp. 278.18–279.5). These passages continue in an identical way, within contexts related to the hierarchy of beings that have the same content as Epistle 21: 'On Plants'.

juththahā].[109] When it feels something moist and soft, it extends itself towards it, whereas when it feels something rough or hard, it shrinks and plunges inside that cane, being on its guard against [the possibility that] that it may be harmful for its body or may corrupt it [*li-haykalihā*]. It has no hearing, sight, smell, or taste, but only touch.

Likewise are the majority of worms that are formed in the earth [*al-ṭīn*], in the depth of seas and in the bottom of rivers: they, too, have no hearing, sight, taste, or smell, because the divine wisdom does not give animals any organ unless they need it to attract a benefit or drive back a harm. If it had given them what they do not need, that would have been evil for them with regard to their preservation and duration. This species is a vegetal animal, because its body grows as some plants do, but it stands autonomously,[110] and because of the fact that it moves its body with a voluntary movement, it is an animal, whereas, because of the fact that it has only one sense, it is the most defective of animals in level. That sense is shared by plants, because plants have a sense.[111]

An indication of that is that plants have a sense [necessary] for them to direct themselves, through their stems [*bi-ʿurūqihi*], towards water [*nahr*] and moist places, and to hinder them from sending themselves towards dry rocks. In addition, when their place of origin happens to be in a furrow, they bend and deviate from it searching for spaciousness and wideness. And if above them there is a ceiling that hinders them from going upwards, and [if] some hole is left for them by one side, they bend towards that direction so that, when they extend themselves, they [may] rise [upwards] from there. These acts indicate that [plants] have a sense and a [capacity for] discernment in the measure of [their] need [of them].

Plants, on the contrary, have no pain sense, because it is not proper to the divine wisdom to establish [*an taj'ala*] pain for plants. And

109 All MSS use here various forms of the verb *ghadhā*, to nourish.

110 I freely translate the Arabic '*wa-yaqūmu ʿalā sāqihi qā'iman*', which contrasts these worms to plants, and is literally translated by Dieterici, *Die Naturanschauung*, p. 181: 'steht grade auf seinem Schenkel (wie ein Stengel)'.

111 For a contrary opinion cf. the pseudo-Aristotelian *On Plants* 815b19ff. A sort of hierarchy might be seen in the assertion of 817b25–35, which begins by: 'Plants are only created for the sake of animals, and animals are not created for the sake of plants' (tr. Forster).

[the divine wisdom] did not establish [*lam taj'al*] for them any device [apt to] remove [pain], as it did for animals, because as it established for [animals] the feeling of pain, it also established for them a device [apt to] drive [it] back, either by flight and escape, or by wariness and resistance.

It is clear through what we have described how the animal degree is adjacent to plants, so we want to explain how the animal degree is adjacent to the human [degree] [p. 170] not from one side only, but from various sides. In fact, as the animal level is a place of origin for virtues and a source for noble traits, these cannot be contained by one animal species only, (fol. 195b) but by several species.

So, among them there is that which is close to the human [level] for the form of its body, as is the ape; that [which is close to it] for the dispositions [*akhlāq*] of its soul, as is the horse in many of its dispositions, or as is the bird-man,[112] as is the elephant in its acumen, and as are the parrot and the nightingale and other sorts of birds with many voices, tunes, and melodies, and as is the bee, with [its] subtle deeds, up to similar genera. In fact, man employs or likes the company of those animals only,[113] whose soul is close to the human soul. As to the ape, because the shape of its body approaches the shape of the human body, its soul imitates the acts of a human soul, too, as is witnessed in reference to it, and [as is] well known among people. As to the noble horse, for the nobility of its dispositions it came to be a means of transport for kings, because sometimes, for its manners [*min adabihi*], it happens not to urinate or drop dung as long as it is in the presence of the king, or carries him. Moreover, besides that, it has acumen and boldness in fight, and patience in challenges and injuries, as it befalls a brave man, as the poet described by saying:

> And when my colt complains to me about some wound
> When a variety of piercing [befalls him], I say to him: Be bold!

112 It is not clear to what the words '*al-ṭā'ir al-insī*' may refer. Dieterici, *Die Naturanschauung*, p. 182, tries to clarify by translating: 'der menschen-Vogel (Papagei)'. Note, however, that *al-babbaghā'* is mentioned later in the text.

113 Note that the text says here '*yasta'miluhu*' and '*ya'nasu bihim*', using masculine pronouns.

As you see me, I do not accept his excuse,
He champs his bit around the bridles, and neighs.[114]

As to the elephant, it understands speech with [its] acumen, and follows orders and prohibitions as an intelligent man obeys what has been ordered and prohibited. So these animals are at the last animal degree, adjacent to the human level, as some human virtues appear from them. The other animal species are between these two degrees. [p. 171] As we have finished mentioning the animal degrees adjacent to the human level, it is necessary for us to mention the first human degree adjacent to the animal [degree].

Know, O my brother, that the lowest of human levels that is adjacent to the animal [level] is the level of those who do not know objects other than the sensible ones, who do not recognize goods other than the physical ones, who do not search but for the wellness of bodies, who do not crave but for the levels of this world, and who do not wish but for remaining in them forever, although they are aware that there is no possibility for them to do that; and [it is the level of those] who do not desire pleasures other than eating and drinking, like beasts;

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114 These are two distinct poetry lines. The first line is by Mālik b. ʿAwf b. Saʿd b. Rabīʿa al-Naṣrī (seventh century). In the *Kitāb al-Zahra* by Abū Bakr Muḥammad b. Dāwūd al-Iṣfahānī (d. 294/909), Bāb 76 — *Dhikr al-iftikhār biʾl-shajāʿa waʾl-intiṣār*, 'Chapter on the Mention of a Boast about Courage and Victory', the first line coincides with the verse quoted by the Ikhwān, but the second one is different:

وإذا شكا مُهري إليّ حرارةً عند اختلاف الطعن قُلتُ له اقدم

إنّي بنفسي في الحروب لتاجرٌ تلك التجارةُ لا انتقادُ الدرهم

(note the different wording at the end of each hemistich). Muḥammad b. ʿAbd al-Raḥmān al-ʿUbaydī (8th/14th century) cites the same verse in his *Tadhkira al-saʿdiyya fī al-ashʿār al-ʿarabiyya*. The two lines are also cited (anonymously) by Abū ʿAlī al-Ḥasan b. Masʿūd al-Yūsī (d. 1102/1691) in his *Zahr al-akam fī al-amthāl waʾl-ḥikam*. The verse should be contained in the *Kitāb al-Aghānī*. I am deeply indebted for these remarks to Omar Alí-de-Unzaga who has extensively worked on the *Rasāʾil* and poetry quotations. I note, in addition, that in the first hemistich these authors have *ḥarāra* instead of *jirāḥa* provided by the Ikhwān as well as by all MSS consulted. Dieterici, *Die Naturanschauung*, p. 183, translates: 'Klagt mein Rösslein mir von Wunde beim Stoss und Gegenstoss, sag' ich zu ihm: dring' vor! Sieht's dann, dass ich nicht dulde sein Entschuldigen, beisst es in Zügel und Gebiss und murrt'.

who do not contend but for sexual intercourse and marriage, like pigs and donkeys; who do not covet but the accumulation of supplies for enjoyment of life in this world without having any need of that, like ants; who love what is of no use for them, like a magpie; who do not know adornment other than the colours of [their] dresses, like peacocks; and who quarrel about the vanities of this world, like dogs do about corpses.

Even though their corporeal form is the human form, the acts of their souls are those of the animal and vegetal soul, and I pray to God, O pious and merciful brother, that He guard you against being of them or like them, as well as us and all our Brethren, whatever country they are in.

As to the human level adjacent to the angels' level, it is when man works hard at desisting from [p. 172] every (fol. 196a) blameful disposition he has been accustomed to since his youth, and towards acquiring the beautiful dispositions contrary to them, so as to become a good and noble man, and as to make his soul an angel in potentiality. And when it [the soul] is separated from its body[115] at his death, it will become an angel in actuality, and he will ascend with [such an angelic soul] to the reign of heavens, [his soul] will enter the cohort of angels, and will meet its Lord in salutation and peace [*bi'l-taḥya wa'l-salām*], as God, be He exalted, recalled by His saying, *Their salutation on the Day they meet Him will be 'Peace!'* [...],[116] and He said, glorified be He who said [so], and honoured be He beyond [*min*] everything, *those whose lives the angels take in a state of purity, saying (to them), 'Peace be on you* [...],[117] and He said, glorified be His mention, *'Peace unto you for that ye persevered in patience! Now how excellent is the final Home!'*,[118] and He said, [...] *No fear shall be on you that day, nor shall ye grieve.'*,[119] and He said, *In the case of those who say, 'Our Lord is Allah,' and, further, stand straight and steadfast, the angels descend on them*

115 The text says *jasadahā*, referring body to soul and not to man.

116 The Ikhwān quote here the first part of Qur'an 33:44.

117 The Ikhwān quote here the first part of Qur'an 16:32.

118 The Ikhwān quote here Qur'an 13:24.

119 The Ikhwān quote here the last part of Qur'an 7:49. Note that the word *al-yawm* is not in the verse, and it is in fact omitted in some of the MSS consulted; see the critical apparatus, p. 463, note 3.

(from time to time): 'Fear ye not!' (they suggest), 'nor grieve! But receive the Glad Tidings of the Garden (of Bliss), that which ye were promised!',[120] and there are many verses in the Qur'an about this concept.

And as we have finished [mentioning] how the roots, fruits, and leaves of trees are, and [as] we have mentioned them in brief, we want also to mention a part of the causes of the [various] kinds of their composition and of the reasons because of which it is necessary for it to be so, in such a way that their purpose may be clarified, as well as the Lord's providence and the divine wisdom in them, as [God] gave them the form, and produced and completed them to the attainment of their goals and the perfection of their limits.

[Again on the Palm]

To that [issue][121] the palm tree belongs. In fact, it has many subtle roots [*'urūq*], a slow growth, and a long life; it is erect in rising, with a circular trunk [*aṣl*, here and later],[122] a hexagonal outcome [*makhārij*] of its branches,[123] long leaves [*awrāq*], double and in opposition to each other, a loose mass [*jirm*],[124] and a body [*jism*] disjointed in composition,[125] its interstices stuffed, with a loose junction[126] twisted

120 Qur'an 41:30, quoted entirely apart from the *inna* at the beginning.

121 That is, the composition of the palm according to God's providence and wisdom.

122 Dieterici, *Die Naturanschauung*, p. 184: 'Wurzelstamm', properly, 'rhizome'.

123 The Arabic is *sa'af*. My translation is based on Lane, *Arabic-English Lexicon*, s.v., according to which this word indicates among other things 'palm-branches, as long as they have the leaves upon them'. MS [ح] explains this term in the margin as 'palm covers' (غطات النخل), I wonder whether it might be translated by 'sheath'. Dieterici, *Die Naturanschauung*, p. 184, has 'das Blatt', and at p. 185 translates the Arabic *al-awrāq* as 'Blättchen'.

124 In note 1 at p. 172, the Ṣādir edition (which reads '*muzdawaja muqābili rikhwi'l-jirm*') emphasizes the difficulty in understanding these words. Dieterici, *Die Naturanschauung*, p. 185: 'einen weichen Körper'.

125 Dieterici, ibid. translates the Arabic '*mutakhalkhil tarkiba'l-jism*' with 'und hängen die einzelnen Theile desselben nicht fest zusammen'.

126 This is a tentative translation for the Arabic *zi'bar*, on the basis of the explanation provided by the Ṣādir edition (see above, note 95). Lane, *Arabic-English Lexicon*, s.v. *zi'bir* gives the meaning 'villous substance, upon the surface of a garment'. Dieterici reads *bi-zabadin*, but in *Die Naturanschauung*, ibid., he translates: 'eine weiche Bindemasse'.

around it; at the origins of its branches [*ʿalā uṣūl al-saʿafa*] are knitted[127] fibres, tightened[128] in three strata.

The multiplicity of the roots [*ʿurūq*] of this tree is such that the natural attractive power may attract through them many matters, and that is for the need this genus of plants [p. 173] [has to absorb] many matters for the bigness of its body [*jismihā*], the magnitude of its mass [*jirmihā*], the tallness of its stature [*qāma*], and the high number of its branches and leaves [*saʿafātihā wa-awrāqihā*]. [The multiplicity of its roots is also such that] nature may employ some [of] those matters in their mass in length, breadth, and depth, and [that it may] employ some [other matters] in the mass of their trunks in length, breadth, and depth, some in the mass of their leaves [*awrāqihā*] in the same way, some in their fibre, some in the mass[129] of the kernel, and some in the flesh, syrup, and juice of their fruits.

As to the cause of the fact that the composition of the mass of its trunk [*aṣl*] was made [*juʿila*, here and later] tender, loose, and disjointed, it is so that the attraction of those matters from its lowest [parts] to the summits of the tops of its stumps [*ajdhāʿihā*, here and later][130] and to the ramifications of its branches and leaves [*saʿafihā wa-awrāqihā*] would be easy for the natural powers. If the mass of its trunk were not tender, but hard, thick, and compact, as [that of] the other tall trees, like teak, sycamore, cypress, and mountain cypress,[131] the attraction of those matters up to there would be difficult for the natural powers.[132] And for the multiplicity of the roots [*ʿurūq*, here and

127 Dieterici, ibid.: 'an den Anfängen seiner Triebe'.

128 See above, note 75.

129 Here MSS [أ], [ج], [ح], [خ], [ز], [ش], [ف], [ل], as well as Dieterici, have the following addition: 'of the seed coats of their spadix, some in the mass of their brunches, some in the mass [...]'; see the critical apparatus, p. 466, note 4. For similar additions in other MSS, see the critical apparatus, p. 466, notes 1 and 2–3. In note 2 at p. 173, the Ṣādir edition explains *qinwān* as 'the watered wine of a palm, as a bunch of grapes'.

130 Dieterici, *Die Naturanschauung*, ibid.: 'Stämme'.

131 This is the meaning of the word according to Freytag, *Lexicon Arabico-latinum*, s.v. *ʿarʿar* and Steingass, *A Learner's Arabic-English Dictionary*, s.v. Dozy, *Supplément aux dictionnaires arabes*, s.v., gives 'genévrier (...) Iuniperus phoenicia'.

132 Namely, the seven powers mentioned at p. 326 and widely dealt with in Epistle 20, see p. 306ff.

later] of the palm tree there is another cause. In fact, as the trunk[133] of its body [*jirmihi*] is composed of twigs as they were threads assembled and intertwined,[134] for each of those threads roots extending in the earth were made, through which matters might be absorbed towards each singular thread, so that the division of those (fol. 196b) matters towards those twigs would be easy for nature since the beginning.

And as the composition of the body [*jirm*] of the palm tree[135] is as we have recalled with regard to looseness and disjointedness, nature twisted around it fibrous branches[136] — around the points of origin [*uṣūl makhārij*] of their branches [*sa'afātihā*] [departing] from their stumps — as covers tied around the middle of a busily working porter:[137] all that is on account of its purpose [which] is that the origins [*uṣūl*, here and later] of those branches [*sa'afāt*] adhere around their stumps,[138] and are neither separated from them when violent winds agitate them, nor are those stumps cracked from the weight of its higher parts over the lower ones when [the palm tree] inclines to the right and the left when winds move it.

As to the cause because of which a cover was placed on the spadix,[139] it is so that it might preserve and protect it from the detriments that may

133 Cf. Dieterici, *Die Naturanschauung*, p. 185: 'Stamm'.

134 The Arabic is *quḍbān*, but Dieterici, ibid., translates: 'einselnen Fasern' (and still 'Fasern' immedately later).

135 The Arabic is '*jirm shajarat al-nakhl*', but Dieterici, ibid., p. 186 again translates: 'Palmstamm'.

136 The Arabic is '*sa'afāt min al-layf 'alā uṣūl*', Dieterici, ibid.: 'ein Fasergewebe, das sich auf den ursprünglichen Ausgangsorten seiner Triebe von den Stämmen aus erhebt'.

137 The Arabic is '*mayāziru mashdūdatun 'alā wasaṭi ḥammālin mutashammirin*', but the reading of these words is suspect. I translated basing myself on the forms *mi'zara* provided by Lane, and '*shadda azrahu*' (or '*min azrihi*') that means 'to help, support, back up' according to H. Wehr, *A Dictionary of Modern Written Arabic*, ed. J. Milton Cowan (Wiesbaden: Otto Harrassowitz, 1971). Dieterici, *Die Naturanschauung*, p. 186, translates: 'Es ist, als ob dies Lasten wären, die mitten auf einem rüstigen Kameel festgebunden wären', but he reads *ma'āzir* and *jammāl* (with MSS [ا] and [ج]) respectively.

138 The Arabic is *judhū'* translated by Dieterici, *Die Naturanschauung*, p. 186: 'Stämme', as later the Arabic *ajdhā'*.

139 The Arabic is *ṭal'*. Dieterici, ibid.: 'Fruchtknospen'. In note 1 at p. 173, the Ṣādir edition explains the term as 'what appears in the fruit of palm at the beginning of its apparition'. The term appears in the Arabic translation of Nicolaus Damascenus' *On Plants* I.6.119, and is translated by Drossaart Lulofs, *Nicolaus*

occur from excessive cold, strong rain, [p. 174] violent winds, dust, and similar things harmful to it, and so that it might emerge moist, damp, tender, and soft. When [the spadix] becomes stronger and harder, those seed coats are broken and [so are their] covers with them, so it appears to the freshness of the air and the heat of atmosphere, and becomes fat, ripens at the heat of the Sun and becomes unripe dates,[140] then [*wa*] juicy [*raṭban*], fresh [*janiyyan*], and digestible [dates],[141] and later it dries and becomes dates [*tamran*] or solidified syrup.

As to the silky texture that is found around its kernel, it was placed as a screen [*ḥājizan*] between the mass of the kernel and the syrup of the date, in such a way that it would not absorb the acridity of the mass of the pit, and the thickness of its [i.e., the date pit's] substance [did not absorb] the syrup and juice of the date. In fact, it [belongs] to the nature of the substances of the earthen bodies to sip [*tashraba*] and absorb the moisture of the subtle and oily[142] liquors [*ruṭūbāt*, here and later]. If that subtle, silky textured cover had not been placed there, the syrup of the date would have been mixed with the mass of its kernel, and there would be [not even] a small advantage in that.

As to the elongated cavity [*ḥufra*] in the mass of the date kernel, and to the wick that is found in it, they have been placed so that those matters might flow in it from its beginning to its end, and it might be solidified little by little. As to the pit [*nuqra*] that is found on the back of the kernel, it was placed as a door and an outcome when it is planted [*'inda'l-ghars*]; from there the stem [*'irq*] of the kernel emerges to attract matters and to absorb moisture and liquor from the [place of] plantation [*min al-ghars*],[143] and from there the foliage bunch[144]

Damascenus De Plantis, 'spathe' (see p. 164 and, for more explanations on this term, pp. 284 and 302).

140 In note 2 at p. 174, the Ṣādir edition explains the term *busran* as 'the fruit before becoming ripe dates, when dates become bigger'.

141 In notes 3 and 4, ibid. the Ṣādir edition explains the term *ruṭaban* as 'the ripening of the unripe date' and the term *haḍīman* as 'contained in the cavity of its vessel, namely, its cover, called "dry in the mouth"'.

142 I follow the reading *al-duhniyya* provided in the majority of the MSS consulted and by Dieterici and the Ṣādir edition; see the critical apparatus, p. 470, note 3. Note that Atif has *al-zahima*, 'fetid'.

143 Dieterici, *Die Naturanschauung*, p. 187: 'aus der Pflanzstätte sauge'.

144 The Arabic is '*ṭāqatu'l-waraqa*'. In note 4 at p. 174, Ṣādir explains the term

emerges, which comes to light at first, and appears from the earth at the [moment of] plantation.[145] Then [the moisture and liquor] become a root, then [*wa*] a stump in the passing of days and the duration [*ṭūl*] of time.

As to the funnels[146] that are on the tops of the dates, they were placed as a filter for the matters that [p. 175] the natural powers attract up to there, and [so that the natural powers] might distinguish the dense from the subtle, send the subtle and fine [part] to the exterior of the mass of the date, and solidify it around [the kernel in the form of] syrup <and juice, and send the thick[147] [part] to the mass of the kernel and solidify it around [the kernel]>.[148]

Nature distinguishes exactly this way in the walnut, almond, pistachio, and similar [plants], but sends the thick and arid [part] to their exterior, and the subtle and thin [part] to their interior, conversely to what it does in the fruit of date.

As to the fruit of fig and to the sycamore,[149] it does not distinguish their thin [part] from the thick, because their matters and juice [*kaymūs*] are balanced, and there is no big disparity between the parts of earth and the parts of water, so nature does not need to distinguish and divide them as it did in the fruit of date (fol. 198a) and similar fruits. Nature has already distinguished those matters, and has placed in the interior of the fruit small grains, and [has placed] around their exterior a subtle, evident rind that protects their moistness from dust.

ṭāqa as 'bundle' or 'bunch'. Dieterici has '*al-waraqa al-laṭīfa*', and in *Die Naturanschauung*, p. 187, he translates: 'die feinen Blättchen'.

145 I followed Dieterici's readings, shared by the majority of the MSS consulted (see the critical apparatus, p. 471, note 6). Atif reads '*awwalan fa-awwalan*' (little by little) perhaps due to a *lectio facilior* consequent to the '*awwalan fa-awwalan*' at fol. 196b15.

146 The Arabic is *aqmāʿ*. Dieterici, ibid.: 'Die Kappen'. See also above, note 84.

147 MSS [أ], [ج], [ح], [ش], [غ], and [ن] add here: *al-faḥl* (male), MS [خ]: *al-fijj* (unripe), and MS [د]: *al-qaḥil* (dry); see the critical apparatus, p. 471, note 13.

148 The words between angled brackets are provided by all MSS except [ر]; see the critical apparatus, p. 471, note 12.

149 I emend the text into *al-jummayz*. Atif, perhaps due to a *lectio facilior*, has *al-jummār*, 'palm pith, palm core'.

As to the way in which the veins [*'urūq*][150] of the fig tree are composed, as well as the mass [*jirm*] of its roots [*uṣūlihā*],[151] twigs [*quḍbānihā*],[152] leaves, and fruits, it is not like the composition of a palm tree, because their roots [*'urūquhā*][153] are thick, extended under the earth in [various] directions, straight and bent, and in them there are cavities like those that are found inside a cane, but a bit narrower; and so is the composition of the roots [*uṣūl*][154] of a fig tree, and of its twigs [*quḍbānihā*],[155] and branches: in them there are subtle cavities, with nodes[156] like those of a cane, and in those cavities [there are] junctions [*zi'ābir*],[157] whose interstices are stuffed.[158]

As to the cause of those cavities that are in its veins [*'urūqihā*], roots [*uṣūlihā*], and twigs [*quḍbānihā*],[159] it is so that retaining those matters — namely, the parts of earth and the watery liquors — from the depth of the earth towards the roots [*uṣūl*][160] of the tree would be easier for the retentive power, as well as pushing them from its lowest [parts] to the highest of its tops and to the extremities of its branches.

And those knots were placed in a [certain] place of that tree[161] and the junctions [*zi'ābir*] were stuffed,[162] so that retaining those matters there would be easier for the retentive power, in such a way that they

150 Dieterici, *Die Naturanschauung*, p. 187: 'Wurzelfasern', properly, 'fibrils' (cf. Lat. *caliandrum*).

151 I follow here Dieterici, ibid.: 'Wurzeln'.

152 Dieterici, ibid.: 'Stämmlein'.

153 I follow here Dieterici, ibid.: 'Wurzeln'.

154 Dieterici, ibid.: 'Stammwurzeln'.

155 Dieterici, ibid.: 'Stämme'.

156 The Arabic *'uqad* may translate both the Greek ὄζοι (branches, or, properly, the knot or eye from which a branch springs, cf. Theophrastus, *Enquiry into Plants* I.1.9) and ἶνες (ribs in the leaves of plants, cf. *Enquiry into Plants* III.12.7ff.). See for these explanations and references Liddell and Scott, *A Greek-English Lexicon*, s. vv. ὄζος and ἶς.

157 For this translation see above, note 126.

158 Dieterici reads *mazā'id* instead of *zi'ābir* and in *Die Naturanschauung*, p. 188, translates: 'noch eine Füllung mit vollen Zwischenräumen'.

159 Dieterici, ibid.: 'in den Wurzeln, Wurzelstämmen und Stämmen'.

160 Dieterici, ibid.: 'Wurzelstamm'.

161 Dieterici, like the majority of the MSS consulted (see the critical apparatus, p. 475, note 4), reads *al-tajwīfāt*, and ibid. translates: 'an den Stellen dieser Höhlungen'.

162 Dieterici reads again *mazā'id*, and translates ibid.: 'voll angefüllt'.

would not return to the lowest of its lower [parts], and they remain there so that the digestive power may digest them, [p. 176] the nutritive power may use them, and the accretive power may increase their bulks [*ajrāmihā*] and extremities in length, breadth, and depth.

As to <the vine, the mass of its roots [*uṣūlihā*][163] and the structure [*jism*] of its twigs [*quḍbānihā*][164] are composed differently from> the palm tree and the fig tree. Its roots [*'urūquhā*] go under the earth extended in [various] directions, fine and thick, and in it there are cavities like those that are in the roots [*'urūq*] of the fig tree, but the bulk [*jirm*] of its roots [*uṣūlihā*] extends itself, long and subtle, on the face of the earth, and it cannot stand on its trunk [*'alā sāqihi*] if it rises much in the air, as other trees do; on the exterior of its twigs [*quḍbānihi*][165] there are evident knots and joints between nodes,[166] and in them cavities, stuffed in [their] junctions[167] <as the twigs> of a fig tree, and around it [the vine] a fibre for the purpose we have recalled,[168] woven,[169] loose, and flexible, and at the knots of its twigs tendrils[170] emerge, tender, evident,[171] twisted around the trees, and attached to them, and they rise around them so as to take upon themselves the weight of its fruits, as its trunks [*uṣūluhā*][172] are subtle and cannot carry them. Its fruits produce grains that are assembled together, close, and attached in clusters, with no need of cover or coats to protect them from detriments, as the fruit of the palm needs, because their matter is thick, hard, and acrid, and detriments do not occur for them as they do

163 Dieterici, ibid.: 'Wurzelstamm', here and later.

164 Dieterici, ibid.: 'Stamm'.

165 Dieterici, ibid.: 'Ruthen'.

166 The Arabic is *anābīb*; Dieterici, ibid.: 'Augen'.

167 For this translation see above, note 126. Dieterici reads '*maḥshūwatun zā'idan*', and translates ibid.: 'ganz voll'.

168 See above, p. 352.

169 I emended according to the reading *muntasija*, proposed by Dieterici and the majority of the MSS consulted; see the critical apparatus, p. 477, note 2.

170 Dieterici, *Die Naturanschauung*, p. 188, translates: 'Ranken'.

171 The Arabic is *mubayyina*; Dieterici reads *muthallatha*, and in *Die Naturanschauung*, p. 188, he translates: 'dreieckige'. For other readings, see the critical apparatus, p. 477, note 5.

172 Dieterici, ibid.: 'Wurzelstamm'.

for the fruit of the palm, because its matters emerges[173] loose, tender, and damp, and detriments quick[ly occur for it].

As to the composition of the grape fruit and to its grains, when they are ripe, a subtle, silky textured rind appears around them, made [*ju'ilat*] to preserve their liquors, syrup, and juice from the detriments that [may] occur for them from wind, dust, and the heat of the Sun, which would dry and dissolve those liquors, as happens with the waters of basins.

In the middle of its pulp [*laḥmatihā*] pips[174] are placed — hard, stone-like, and hollow — (fol. 198b) in whose interior there is a fat core. They are the grape seed and seedling;[175] and between those pips and the syrup of the grape there is no need of any subtle coverage like that which is [needed] between the kernel and the syrup of a date, as we have recalled above,[176] because those [p. 177] pips, even though their substances are earthen and acrid, are[177] small, and because they are also loose, their hardness is not like the hardness of the kernel of a date, nor is the thickness of its substance like [the date's] thickness.

Another cause is that they are hollow, and in their interior there is a fat core, so nature should not fear that those pips may dry out the juice of the grape, so no screen was placed between them as it was placed in the structure of the date.

And still another cause is that [the quantity of] the syrup and the juice of a grape is a lot in relation to the mass of those pips, whereas the rule that governs the mass of the kernel and the syrup of a date is not like that, but the mass of its kernel in relation to its syrup and juice is the double.[178]

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173 Here, Atif has *min*, followed by a sign probably indicating an omission, and a small blank space.

174 In note 1 at p. 176, the Ṣādir edition explains the term *'ajamāt* as a synonym of *nawā*, 'date pits'.

175 Dieterici, *Die Naturanschauung*, p. 189: 'So ist der Kern des Weinstocks und sein Same'.

176 See above, p. 337.

177 Atif alone has *dhī*, and above it a correction sign.

178 I propose this translation for the Arabic '*kathīrun bi-marratin*', which is attested by certain of the MSS consulted. See the critical apparatus, p. 480, notes 7 and 8. Dieterici, *Die Naturanschauung*, p. 189: 'der Dattelkern macht im Vergleich mit

And if one says or imagines that trees are planted without any need of a seedling to be sown or of a seedling to be preserved till the moment of need, what wisdom there would be in the existence of the pips of the grape, and of the grains in the cavity of the fruit of date? It should be known that such a measure of knowledge did not escape the divine wisdom and the providence of the Lord,[179] whereas that cause and reason remains hidden to you, [if] you speak [this way] [*ayyuhā'l-qā'il*].

So doubts, confusion, suppositions, corrupt fancies, and false imagination befell you, but we have already mentioned their cause and reason, as well as the answer to your question, in another place: you will find them there,[180] if God wishes, be He exalted.[181]

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dem Honig und dem Saft viel aus (d. h. genügt zur Saat)', given by his reading *kathīrun* only.

179 I translate here the addition provided at this point by MS [ف] (see the critical apparatus, p. 481, note 3): 'because [God] embraces everything with [His] knowledge, His knowledge embraces both universals and particulars, nor is hidden from Him *'(so much as) an atom on the earth or in heaven'* [cf. Qur'an 10:61; and also Qur'an 34:3 and 22], but it remained hidden to you — be you intelligent or ignorant of the real natures of things, of the knowledge of matters and <...>. Wake up then from the sleep of carelessness and the slumber of ignorance, and *teach (thy Message): for teaching benefits the Believers* [Qur'an 51:55], *'Behold, in the creation of the heavens and earth, there are indeed Signs for men of understanding'* [Qur'an 3:190] and *'an instructive example for those who have vision'* [Qur'an 24:44; cf. Qur'an 3:13: *'a warning for such as have eyes to see'*]. So, what is the good for you, O brother, with the corrupt fancies and the contingent opinions about the causes of those reasons, and about the causes of the reason for the appearance of the diversity of plants and the diversity of animals, when the matter [*hayūlā*]of nature is the same for all [of them], and controls them all every time? If you want to know that, practise constantly [my conjecture] the reading of the sapiential books. May God give success to you, to us, and to all our Brethren in achieving the right path, and may [He] guide you, us and all our Brethren on the right way'.

180 If this 'question' regards the parts and composition of plants, as they are addressed in these pages, it is impossible to indicate references to other treatises in the encyclopaedia as we know it presently.

181 The treatise ends in a sudden way, without any spiritual or moral exhortation, and it is probably missing some parts, as is testified by the following addition, provided by MS [ح] and Dieterici after *hunāka*, and by MSS [ز], [ف], [ك], and [ل] after *'Allāh ta'ālā'*. I included the addition in my edition because, with its final reference to the human body, it seems to complete the general treatment of the epistle, at least in part. As usual, I have reported in the apparatus the most relevant discrepancies only; I have also added punctuation to this text, which

<The influences of nature on fruits [consist] in ripening — namely, in the concoction, by the innate heat, of the humid components of matter [*li-ruṭūbāt al-hayūlā*] that are in them. If that were not possible, decay would occur in the seeds of plants. Seedlings of every sowing are warm and humid, but their heat is more than their humidity when heat and cold embrace it, or cold and humidity are hidden in the interior of bodies, and [heat] burns [them like] rennet solidifies milk for an excess of heat in it. In heat there is an attractive power that attracts the humid components [*al-ruṭūbāt*] to itself, is nourished and lives as long as its matters lasts. Heat is the agent [*al-fā'ila*] and similarly humidity [*al-ruṭūba*] is matter for it; the [first] movement is upwards and what is [first] moved [*muḥarrakuhā*] is to the right and the front.[182] The heart is the noblest part of the body, but it is not nobler than the body; the roots ['*urūq*] of a tree are the noblest of its parts, but are not nobler than it. Small [things] in their multiplicity match the big [things] in their paucity. As the first mover is one, for every existing being there is one principle only. As soon as it is split [and] doubled, from the heart in animals two veins appear, one [going] towards the upper [part] of

looks very different from the rest and perhaps does not always fit Arabic rules. It might be a rough translation. Dieterici, *Die Naturanschauung*, p. 190: 'Die Einwirkung der Natur auf die Früchte bringt die Reife. Diese besteht darin, dass die natürliche Wärme die Materie in ihnen kocht, ist das nicht möglich, so entsteht hieraus die Unfruchtbarkeit des Pflanzensamens. Die Samen aller Saaten sind warm, feucht, doch überwiegt ihre Hitze ihre Feuchtigkeiten, wenn die Hitze sie umgiebt und die Kälte sich im Innern der Körper birgt, wo die Hitze sie verbrennt, wie der Labmagen durch die grosse Hitze in ihm die süsse Milch gerinnen lässt. In der Hitze liegt eine ziehende Kraft, welche die Feuchtigkeiten zu sich zieht und sich davon nährt und lebt, so lange ihr Stoff dauert. Die Wärme ist die Künstlerin und die Feuchtigkeit ist die Materie für sie, wie anfänglich die Bewegung nach oben existirte; aber der sie Ausführende ist der rechte Arm. Der vordere Theil des Herzens ist der vorzüglichste aller Körpertheile, doch ist er nicht vorzüglicher, als der Leib selbst. Die Wurzeln des Baumes sind das Vorzüglichste aller seiner Theile, doch sind sie nicht vorzüglicher als er selbst. Das Kleine steht in seiner Menge dem Grossen in seiner geringen Anzahl gleich. Weil der erste Beweger nur einer war, rührt Alles, was da ist, aus einem Anfang her. Das Erste, was sich vom Innersten des Herzens bei den Thieren abzweigt, sind zwei Adern, von denen die eine nach dem oberen Theile des Körpers die andere nach dem unteren geht. Vom Samenkorn gehen ebenfalls zwei Triebe aus, der eine steigt nieder and der andere steigt auf nach oben'.

182 I do not understand Dieterici's interpretation: '[...] der sie Ausführende ist der rechte Arm. Der vordere Teil des Herzens [...]'.

the body, and the other towards its lower [part], and from the seeds [of plants] two roots [*ʿurūq*][183] [appear, too], one descending, and the other rising upwards>.

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The epistle 'On Plants' is completed. Praise be to His friend [*walīy*],[184] and blessings be on His Prophet.

183 Properly, the stem and the root. Note Dieterici's translation: 'zwei Triebe'.

184 Note the peculiarity of this eulogy; see also above, Epistle 19, p. 283, note 226.

Appendix A: An Addition to Epistle 15

Just before the conclusive exhortations of the treatise,[1] six manuscripts ([ج], [ز], [ف], [ك], [ل], [ن])[2] — among which [ف] and [ن] are among the most ancient — add a passage lacking in the Ṣādir edition, but present in Dieterici.[3] I have established the text on the basis of [ف] that, except for a few cases, seems to provide the best version, with the support of [ك] and [ل].

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1 After the words '*a'dā' al-raḥmān*' (Atif fol. 147a12).

2 It is not always possible to indicate the page of the MSS in which the addition appears. In [ج] the foliation seems to exist but it is hardly visible; [ز] has a foliation in European numerals outside the page layout; [ف] seems to have a double foliation, one of which is numbered at the far top of the recto, hardly visible, and the other is not numbered; [ك] seems to have no foliation; [ن] has a double foliation, one, in European numerals, probably in pencil, and the other, smaller, in Arabic numerals, higher and at the extreme top left of the verso, always visible. All existing foliations are placed at the top of the recto; the foliations that are likely not original are found at the bottom right of the sheet (I have indicated them between square brackets). So in [ج] the addition is found at fols. [101 recto]20–[verso]19; in [ز], at fols. 113v16–114r10; in [ف] at fol. 80v4–22; in [ك] it is on the fourth sheet, right side, line 31–left side, line 17; in [ل] at fol. 144v, in the margin; and in [ن] at fol. 135 (136)r28–v21, inside a passage by another hand, signaled as an interpolation by a row of dots in red ink at the top of the folio. Note that [ل] (1417 CE) gives the addition in the margin, a sign that it is probably comparing several versions.

3 See F. Dieterici, *Die Abhandlungen der Ichwân es-Safâ in Auswahl, zum ersten Mal aus arabischen Handschriften herausgegeben* (Leipzig: J.C. Hinrische Buchhandlung, 1883), pp. 40–42.

Text

واعلَمْ يا[4] أخي، أيَّدَكَ[5] الله وإيَّانا بروحٍ منه، بأن[6] من[7] الأشياء ما قد بلغ[8] لكَ[9] وجاورتَ وشاهدتَ[10]، ومنها ما لم يبلغها[11] بعدُ، وذلك أنَّك قد أتي عليك حين من الدهر لم تكن[12] شيأً مذكوراً؛ ثم خُلِقتَ من[13] نطفة من ماءٍ مهين؛ ثم نُقِلتَ إلى الرحم في[14] قرارٍ مكين، و[15] مكثتَ هناك تسعة أشهر لتتميم البنية وتكميل الصورة[16]؛ ثم نُقِلتَ إلى هذا الجَوّ الفسيح، ومكثتَ أربع سنين لكمال التربية ولتشتد[17] القوة، وشاهدتَ بالحواس[18] محسوساتها وحصل[19] لك الفهم والذهن والتميز والفكر والروية والمعرفة الغريزية؛ ثم أسلمتَ إلى[20] المكتب وعلمتَ ما لم تكن تعلم من القراة والكتابة والأدب والرياضة وحساب الدواوين[21] والكيل و[22] الموازين؛ ثم نُقِلتَ إلى مجالس أهل العلم والفضل

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4 سقط من ز، ن: يا أخي [...] منه، وكذلك من [D].

5 سقط من ن: أيَّدَك [...] منه.

6 بأن: أن [ن].

7 سقط من ز: من.

8 بلغ: بان [لعل ج، ف] بلغتَ [D].

9 سقط من ج، ز: لك، وكذلك من [D].

10 شاهدتَ: شهدت [ك].

11 يبلغها: تبلغها [D].

12 تكن: يكن [ك، ل].

13 سقط من ج، ف، ن: من؛ سقط من ز: من نطفة، وكذلك من [D].

14 سقط من ج، ز، ك: في [قارن رسالة 21].

15 و: ثم [ن].

16 الصورة: القوة [ك].

17 لتشتد: لشدّة [ز] واشتد [ك، ل] لتشديد [ن] لشدة [D].

18 بالحواس: بالجواهر [ز].

19 حصل: فيحصل [ج].

20 الى المكتب: لك الكتب [ز]، وكذلك [D].

21 الدواوين: الدوانين [ز].

22 و: في [ج]؛ والموازين: وبالموازين [ف].

في[23] المساجد والصلواة[24] والمشاهد والأعياد، وإلى الأسواق والصنائع لتشاهد[25] هذا العالَم بما فيه من الجبال والبراري والبحار والمدن والقرى والأنهار، وعاينت فيها أصناف الخلائق من[26] الحيوان والنبات والمعادن، وعرفتَ[27] تصاريف أحوالها في الحر والبرد والليل والنهار والشتاء والصيف والنور والظلمة، وتصاريف الرياح والغيوم والأمطار، وعاينت دوران الأفلاك وطوالع البروج ومسيرات[28] الكواكب وحوادث الأيام ونوائب الحدثان، وذلك كله[29] كيما تنبه نفسُك من نوم الغفلة وتَستَيقظ[30] من رقدة الجهالة، وتتفكر[31] فيما شاهدتَ[32] وتعتبرَ بما رأيتَ من أحوال هذه الدنيا، ولتعلمَ[33] علماً يقيناً بأنك[34] ستنقل بعد الموت[35] من ههنا إلى مملكة أُخرى[36] وتنشى نشواً آخر. فتستعد

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23 زيادة في ل، مطموس: المجالس.

24 الصلواة والمشاهد: الصلوة و‹...› [ز] الصلوة والمشاهد [ك، ل] الصلوات والمشاهد [ف، ن] الصلوات والمواعظ [D].

25 لتشاهد: كما ورد [D]؛ لنشاهد [ج، ز، ف، ك، ل، ن].

26 من: و [ن].

27 سقط من ن: وعرفتَ [...] والأمطار، وبدل «والأمطار» ورد = وهي مطار؛ الأمطار: الأوكار [ك].

28 مسيرات: مسراة [D].

29 كله كيما تنبه: كيما تنتبه [ن].

30 تَستَيقظَ: تيقظ [ز]، وكذلك [D].

31 تتفكر: يتفكر [ج] تفكر [ف] تنفكر [ك].

32 شاهدتَ وتعتبرَ بما رأيتَ: شهدت و يعتبر بما رأيتَ [ج] شهدت وتعتبرَ بما رأت [ز] شهدت وتعتبرَ بما رأيتَ [ف].

33 لتعلمَ: ليعلم [ج، ل] تعلم [ز]، وكذلك [D].

34 بأنك: بأنه [ز] أنك [ن].

35 الموت: كما ورد ف؛ سقط من ج، ز، ك، ل، ن: بعد الموت.

36 أُخرى وتنشى نشواً آخر. فتستعد للرحلة: أُخرى بعد الموت وتنشى نشواً آخر. وتستعمل الرحلة [ج] أُخرى بعد الموت و تنشو نشواً آخر. وتتعد للرحلة [ز] وتنشوا نشواً آخر. فتستعد للرحلة [ف] أُخرى بعد الموت وتنشى نشواً آخر. فتستعد للرحلة [ك، ل] أُخرى بعد الموت و تنشو نشواً أُخرى. وتستعد للرحلة [ن] أُخرى و تنشؤ نُشوءا آخر. فتستعد للرحلة [D].

للرحلة [وتتزود[37] للسفر قبلَ فناء العمر وتقارب الأَجل، وهو أن[38] تتخلَّق[39] بأخلاق الملائكة[40] وتتزيَّن بشمائلها، وتترك أخلاق إخوان الشياطين وجنود إبليس أجمعين،] وهذه[41] كفاية للعاقل، وهذه صورة العالَم[42] الأكبر و[43] ما فيه من الحيوان والنبات والمعادن و[44] اتصال بعضِها ببعض. وقد قلتُ في كتابي[45] إنَّ[46] ابتِداءَ الأشياء الحركة وآخِرَها السكون، فلذلك جُعِلَ أوَّلُ حدودِ الفلك النار وآخِرُه[47] الأرض، لِمَوضِع حركة الإبتِداء وسكون[48] الإنقِضاء[49]؛ وجُعِلَ فيما بين إبتِداء[50] دوران الفلك إلى انقِضاء[51]

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37 تتزود: ترود [ن].

38 أن: بأن [ن].

39 تتخلق: يتخلق [ج].

40 الملائكة وتتزيَّن بشمائلها، وتترك: الملائكة ويتزين بشمائلها، وترك [ج] الملكية وتتزيَّن بشمائلها، وتترك [ز، ك] الملائكة وتزين بشمائلهم، وترك [ن].

41 هذه: هذا [ف] في هذا [ن].

42 سقط من ف: العالَم.

43 سقط من ز: وما فيه.

44 زيادة في ن: لعطارد.

45 زيادة في ن: هنا.

46 إنَّ: إنه [ز].

47 آخِرُه الأرض، لِمَوضِع حركة: آخِرُه الأرض، الموضع حركة [ج] آخِرُه الماء، لِمَوضِع حركة [ز، ك، ل] آخِرُها الماء، لِمَوضِع حركة [ف] آخِرُها الأرض، لموضعي حركة [ن] آخِرُه الأرض، لأن موضع الحركة [D]؛ زيادة في ك، مطموسة: الما.

48 سكون: موضع السكون [D].

49 الإنقضاء: إنقضائها [ك].

50 إبتِداء دوران: الإبتداء لدوران [ن].

51 انقِضاء: انقضائه [ج، ف].

حركات[52] و[53] سكون[54] لكثرة[55] عدد أجزاء الفلك و[56] على قدر قوة الحركات وضعفها، ولأن[57] رأيتُ للفلك[58] إثنا عشر حَداً مُكَوَّنة من أربع قوى، و[59] اثنان منها ساكنات[60]، ورأيتُ المتحرِّك من القوى على إثنى عشر حَداً، فوجدتُ بعضَها[61] ساكناً وبعضَها متحرِّكاً، فابتدأت الحركة من رأس الفلك، وجُعِل[62] على إثرها[63] أن[64] تكون مع كل متحرك ساكن، ليعتدل[65] القوى الأربع وليستقيم[66] دوران الفلك، فيكون من دورانه جميعُ ما في العالَم و[67] تُرى من أعلا إلى أسفل جميعُ الخفيَّات.

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52 حركات: حركاته [ز]، وكذلك [D].

53 سقط من [D]: و.

54 سكون: سكونات [ج، ن].

55 لكثرة: لكثرت [ل].

56 زيادة في ن: هي.

57 لأن: لأني [ن] لئن [D].

58 للفلك إثنا عشر حَداً مُكَوَّنة من: للفلك إثنا عشر حَداً ملونة من [ج] للفلك إثنا عشراً ملونة من [ز] للفلك إثنا عشر حَداً ملونة من [ف] للفلك إثنا عشر حَداً مُكَوَّنة وعلى قدر قوة الحركات من [ك] إثنا عشر حَداً ملوة <؟> من [ل] لفلك إثنى عشر حَداً مكنونة من [ن] للفلك إثني عشرة سكونة مع [D].

59 واثنان: فاثنان [ز، ك، ل]، وكذلك [D] فاثناتان [ف] واثنتان [ن].

60 ساكنات: ساكنان [ك، ن]، وكذلك [D] ساكنتان [ل].

61 سقط من ل: بعضها ساكنا و.

62 جُعِل: جعلت [ج، ز، ف، ك، ل].

63 إثرها: الر<...> [ل].

64 أن تكون مع: السكون يمنع [ج، ز، ك، ن] السكون مع [ف] السكون منع [ل] أن تكون يتبع [D].

65 ليعتدل: ليعدل [ف] ليعبد [ل].

66 ليستقيم: تستقيم [ف] يستقيم [ك، ن] بعضهم [ل].

67 وتُرى من أعلا إلى أسفل: تنقل الأعلى إلى الأسفل [ن] وترا ترا الى اسفل [D، كذا].

Remarks

At the beginning, [ن] writes the *yā* of '*yā akhī*' with *alif madda*, like [ز] in *fa-ithnāni*. [ج] adds an unreadable word in the margin after *al-raḥim*; all MSS invert *mīm* and *tā'*, mistakenly writing *tamtīm* instead of *tatmīm* (*al-bunya*) (following Dieterici's reading).

All MSS mistakenly read *sittīn* instead of *sinīn* (following Dieterici's reading). There is uncertain writing for التميز in [ز] and [ك]; Dieterici has *al-tamyīz* التمييز. Dieterici's writing for الغريزية in Atif is الغريزة. The writing of *al-mashāhid* in [ز] is uncertain. The writing of *al-anhār* in [ك] is uncertain. [ك] writes من هاهنا instead of من ههنا and then deletes the first *alif*; من is added between the lines.

The words between square brackets correspond to fol. 197a1–2 Atif (= p. 152.2–4 of the Ṣādir edition); they are missing in all manuscripts but are found in Dieterici and have been reported as they are found in the parallel passage of Epistle 21.

The words '*wa-ju'ila fī-mā bayna ibtidā'i dawarāni'l-falaki ilā inqiḍā*' […]' are missing in [ك] probably due to homoioteleuton. The words '*fa-yakūnu min dawarānihi*' are not readable in [ل]. The writing of the *min* before *al-a'lā* in [ز], [ك], and [ل] is uncertain. A cancellation follows in [ن] the words: '*ilā asfal jamī*°.

Translation

Know, O my brother, may God help you and us through a spirit coming from Him, that there are things you have already achieved, passed through, and experienced, and other [things] you have not yet achieved. In fact, there was a long time [*ḥīnun min al-dahr*] for you, in which you were nothing worthy of mention, then you were created from sperm [made] of vile water, then you were moved into a womb, in a solid abode. You remained there nine months in order to bring [your] structure to completion and [your] form to perfection, then you were moved to this wide air, and you remained [in that state] four years in order to bring [your] education to perfection and to construct [your] strength.

[At that time], you experienced with senses their proper objects [*maḥsūsāt*], and comprehension, mind, discernment, cogitation, inspection, and innate knowledge arose for you. Then you were admitted to school and were taught what you did not know — reading, writing, literature, mathematics, book-keeping, and measures and weights; then you were promoted to the meetings of the people of science and virtue in mosques, [places of] prayer, religious shrines, and feasts, and to bazaar streets and [to places where] arts [were practised], so that you might experience this world with the mountains, deserts, seas, towns, villages, and rivers that are in it, and in it [you might] see with your eyes the [various] types of creatures among animals, plants, and minerals, and [you might] know the changes of their conditions in heat and cold, night and day, winter and summer, and light and darkness, and the changes[68] of winds, clouds, and rains; and [so that you might] see with your eyes the rotation of the spheres, the ascensions of the constellations, the journey of the planets, the events of the days, and the various adversities; all that, so that your soul might be awoken from the sleep of carelessness and woken from the slumber of ignorance, you might reflect on what you have experienced, and you might take warnings from what you have seen of the states of this world; and [so that you might] know by a sure knowledge ['*ilman*] that you will be moved, after death, from here to another kingdom, and that you will be generated a second time.

Prepare yourself, then, for the journey [and make provisions for the travel, before life is annihilated and the instant of death approaches — that is, follow angels' habits, be adorned with their good qualities, and renounce the habits of the brethren of satans and of the cohorts of Iblīs].

This is that which suffices [*kifāya*] for him who is endowed with reason, and this is the disposition [*ṣūra*] of the macrocosm and of the animals, plants, and minerals that are in it, and their reciprocal conjunction.

I have already said in my book that the beginning of things is motion, and that their end is rest. Owing to that, this fire was placed as the first of the limits of the sphere, and earth as the last limit, because

68 Or even: 'the changes of their conditions in heat and cold [...] and in the changes of winds', etc.

the place [*mawḍi'*] of movement is the beginning and [the place of] rest is the end; and [owing to that], between the beginning and the end of the rotation of the sphere, movements and rest were placed [in correspondence with] the multiplicity of the number of the parts of the sphere, and according to the power and the weakness of the movements.

Because [of that] I saw for the sphere twelve limits formed from four powers, and two of them at rest, and I saw the motive power [acting] over twelve limits, and I found some of them to be at rest and some in motion. Movement begins at the top [*ra's*] of the sphere, and immediately after, for [every being] in motion rest was placed into being, in such a way that the four powers were balanced, the rotation of the sphere was kept in order, and from its rotation all that which is in the world could come [out], and all that which was hidden, from the top to the bottom, could be seen.

Commentary

The first part of this addition is very close to the content of fols. 190b10–25; 197a1–197b25 (= pp. 151.6–155.11 of the Ṣādir edition) of the epistle 'On Plants' (the text continues with fol. 191a1 Atif);[69] the second part is not found in any of the other epistles of the Ikhwān.

Man, and all natural beings as well, seems to be oriented toward the purpose of attaining salvation. The passage outlines a cosmology in short. Motion is the principle of everything, rest is the end. This statement shows that it is necessary to accept the reading *arḍ* rather than *mā'* (also provided by some MSS): just as fire symbolizes motion, earth symbolizes rest. The 'limits' spoken of here seem to be those of the sublunar world, according to the representation accepted also by the Ikhwān.[70] However, the qualities of 'first' and 'last' for these limits appear to be merely a consequence of the previous statement.

At this point, the writer begins speaking of the supralunar world. In some way, motion and rest regulate the heavenly spheres, too, but the author does not enter into details. Later, he refers to twelve limits — namely, the constellations — but still the text is obscure when it

69 See above, pp. 323–324.

70 See above, pp. 368–369.

says that these are formed by four powers. What are these powers? Perhaps, the four elements (there are powers in motion and powers in rest), or else the four qualities, namely, hot, warm, dry and wet? These powers determine motion and rest in the sphere in a balanced way, so that everything existing in the world can 'come out'. (The theory of the *kumūn* and the *ẓuhūr* seems to be echoed in these lines.)

Though the allusion to the *kifāya* — what suffices to deserve God's requital — brings the passage back to the previous context, its content, apparently concerning cosmology, seems strictly related to astrology and even to alchemy. It is also noteworthy that the speaker uses the first person singular of the verb — which is rare in the encyclopaedia — and explicitly refers to 'my book'.

After a search into contemporary cosmological and alchemical works, I was able (also thanks to the precious Indexes provided by Ursula Weisser) to find an identical passage in the *Sirr al-khalīqa* ('The Secret of Creation') by Balīnūs,[71] the Arabic pseudo-Apollonius of Tyana.[72]

Consistently with the context, the words following '*wa-hādihi kifāya li'l-'āqil*' are the incipit of Chapter 11 of the fourth *maqāla On Plants* (titled by Weisser '*Ṣūrat al-'ālam al-akbar*'), p. 369.7–8, Weisser. In the *Sirr al-khalīqa*, at pp. 370–371 three images follow, which should clarify the text.

I give here the text as it is found in Balīnūs; the words added or differing from the addition reported above have been underlined. Vocalizations and notations are those provided by Weisser.

قد قُلتُ في ابتداءِ كتابي إنّ ابتداء الأشياء الحركةُ وآخِرها السُكونُ؛ فلذلك جعلتُ أوّلَ حُدود الفلك النارَ وآخِرها الماء لموضع حركة الابتداء وسكون الانقضاء، وجعلتُ

71 On pseudo-Apollonius of Tyana, known also as Balīnās, see M. Plessner, 'Balīnūs', *EI2*, vol. 1, pp. 994–995.

72 Balīnūs al-ḥakīm/pseudo-Apollonius of Tyana, *Sirr al-khalīqa wa ṣan'at al-ṭabī'a, Kitāb al-'ilal/Buch über das Geheimnis der Schöpfung und die Darstellung der Natur (Buch der Ursachen)*, ed. U. Weisser, Sources & Studies in the History of Arabic–Islamic Science, Natural Sciences Series I (Aleppo: Ma'had al-turāth al-'ilmī al-'arabī/Institute for the History of Arabic Science, University of Aleppo, 1979).

فيما بين ابتداء دَوَران الفلك إلى انقضائه حركات بعد سكون لكثرة عَدَد أجزاء الفلك وعلى قدر قُوّة الحركات وضعفها. ولأنّي رأيتُ الفلكَ اثنا عشر حدّاً متكوّنة من أربع قُوىً فاثنتان منها ساكنتان واثنتان متحرّكتان، ورأيت المتحرّك من حُدود الفلك هو الفاعل بالساكن وإنّ به الابتداء، والمفعول من حُدود الفلك هو الانقِضاء، فقسّمتُ الأربع قُوىً على اثنا عشر حدّاً فوجدتُ نِصفَها ساكناً ونِصفَها متحرّكاً، فابتدأتُ بالحركة من رأس الفلك وجعلتُ على إثرها السُّكون يتبَع كلَّ متحرّك ساكنٌ لتعتدل القوى الأربع ويستقيم دَوَرانُ الفلك، فيكون من دورانه تولُّد لبمواليد ويُعلَم بعَدَد حركاته جميع ما في العالَم وبتقلُّب [كذا] أعلاه على أسفله جميعُ الخفيّات إن شاء الله.

The text corresponds to the second paragraph of Chapter 11 (p. 372.11, Weisser). After having reproduced the first diagram instead of Chapter 11.1, Weisser translates Chapter 11.2 as follows:

> Erläuterung: Aller Dinge Anfang ist die Bewegung, ihr Ende die Ruhe. Deshalb ist das erste Zeichen der Himmelssphäre feurig, das letzte wäßrig, dazwischen wechseln Ruhe und Bewegung einander ab. Die Sphärenabschnitte sind aus den vier Qualitäten entstanden, als die beiden bewegten auf die beiden ruhenden einwirkten. Deshalb sind die vier Qualitäten so auf die zwölf Zeichen verteilt, daß sie zur Hälfte ruhend und zur Hälfte bewegt sind. Die Einteilung beginnt am höchsten Punkt der Sphäre mit *Bewegung*, darauf folgt *Ruhe* und so fort. Diese regelmäßige Verteilung der Qualitäten hält die Sphäre in Bewegung, damit sie die drei Naturreiche hervorbringt. Alle Phänomene des Kosmos lassen sich aus der Zahl der Himmelsbewegungen ablesen.

The diagram represents a series of five concentric circles, beginning with the outermost circle of the twelve signs of the zodiac, which are alternately one in motion and one in rest, beginning with Aries, which is in motion. The second inner circle is that of Fire, active, warm–dry, and masculine; the third circle is that of Air, also active and masculine, but warm–humid. The fourth circle is that of Water, passive, feminine, and cold–humid. Finally, the fifth and innermost circle is that of Earth, also passive and feminine, but cold–dry.

From many points of view, the text from the *Sirr* is clearer, and makes immediately evident that the choice I proposed in favour of *arḍ*

instead of *mā'* is mistaken, though it appeared more consistent with the Ikhwān's general view. That can explain both my choice, and the alternative proposed in the consulted MSS, which probably tried to conciliate the text from which they were copying with the cosmology of the *Rasā'il.*

It is also worth noting that in the passage from the *Sirr*, the first singular person of the verb is always used. Finally, the fact that some authors (or, perhaps, the single model from which our MSS were copied) felt the need to add some lines from the *Sirr* to the natural epistles proves the closeness of the Brethren with one of most important alchemic sources.[73]

73 See P. Carusi, 'Filosofia alchemica e rappresentazione: il diagramma delle nature e la ruota della fortuna', in G. Marino, ed., *Atti del V Convegno nazionale di storia e fondamenti della chimica (Perugia, 27–30 Ottobre 1993)* (Rome: Accademia Nazionale delle Scienze, 1994), pp. 121–135, at p. 134; and P. Carusi, *Il trattato di filosofia alchemica Miftāḥ al-ḥikma, ed i suoi testimoni presso la Biblioteca Apostolica*, in *Miscellanea Bibliothecae Apostolicae Vaticanae IX* (Studi e Testi, 409) (Vatican City, 2002), pp. 35–84.

Appendix B: An Addition to Epistle 20

Chapter 7 of Epistle 20 begins as follows:

> Know, O my brother, that all the traditions of the laws, the prophetic religions, the objects of philosophical laws, the obligations of religious laws, as well as all rituals of the houses of worship, sacrifices of temples, and prayers are allusions and symbols of that which Abraham, the Friend of the Merciful, hinted at by building the Ka'ba, by placing the [Black] Stone and the *maqām* [...].[1]

After the mention of Abraham building the Ka'ba (at fol. 187b6 Atif), before recalling that he placed the Black Stone (*waḍ'ihi'l-ḥajar*), [ف] (as we know, one of the more ancient MSS, dated AH 704) has *waḍ'ihi* only, followed by an addition at fols. 101v13–102r14.[2]

At lines 14–16 the copyist repeats — with some differences[3] — the lines 3–5 of fol. 187b Atif (from '*al-diyānat al-nabawiyya to ilā mā ashāra ilayhi*'), and then he begins again to report the text, with the words '*waḍ'ihi'l-ḥajar*', etc.

This addition is found neither in the other consulted MSS, nor in Dieterici or in the Ṣādir edition. I could not find any passage similar to this addition elsewhere in the Ikhwān corpus.

The text — which I have divided into paragraphs for the sake of better clarity — runs as follows:[4]

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1 See above, p. 302.

2 The foliation [100] is placed only on the page where the treatise begins. See Appendix A, p. 359, note 2.

3 They can be seen in the edited text, as I have reported them.

4 I am grateful to my friend Delia Cortese, who offered her great expertise in manuscript knowledge in helping me to solve some reading problems of this addition. Of course, the responsibility for the final result is mine only.

[١.] وذكر، فإنَّ الذِكرى تنفع المؤمنين، وتوبوا إلى الله جميعاً أيةُ[5] المؤمنون لعلكم تفلحِون، قد أفلح من زكاها، وقد تزكى، وقد ذكر إسم ربه فصلى، قد أفلح من زكاها، وقد خاب من دَسَّاها.

[٢.] وكما أن معالجات الأَشخاص في البلدان المتفاوتة والأَهوية مختلف[6] بحسب أمزجتهم كمالاً، يمكن لطبيبٍ أن يسقى المريض في البلدان الحارة سقمونيا لزوال المادة الصفراء وبه الخالصة، وكذلك لا يمكن للطبيب أن يدفع الدواء المُسهل للأَطفال وإعطاء الترياق لهم كي لا يضرّون بذاك الترتيب، بل يجب على الطبيب أن يشغَلَ بمداواة أمراضهم فيما يلين <...>[7] ولا يخرج مراهم إلى ما هو أَشَرّ وأُضِرَّ من ذلك، لأن الترياق من أنفع الدواء في أَكثر الأَمراض، لكن لا يوافق جميع الأَشخاص ولا في جميع الأَزمان لذلك على وزنٍ متفاوتٍ. كذلك سنة الله وقواعد فرائض النواميس وموضوعات أَصحاب الشرائع الذين هم أَطباء النفوس، مثل الصلوات الخمس المفروضة على أُمةٍ من الأُمم، ومحلل بعض المشروبات والمأكولات ونكاح الأَخوات، وكان الأَمر بخلاف ذلك في زمانٍ من الأَزمان على أُمةٍ من الأُمم الأُخر المفروضة من الله تعالى غير تلك القاعدة. وكذلك نظافة الأَطراف المخصوصة عند التَوَجُّه إلى الله تعالى المُعَبَّر عنها أهل الشريعة بالطهارة والوضوء. وكذلك الأَشكال المختلفة من الأُستوى والإعْوِجاج والتربيع والتثليث حاله للعبادة المُعَبَّر عنها الرعية بالصلوة. وكذلك إخراج قدراً يسيراً من الأَموال والبذل إلى أَشخاصٍ مخصوصة. وكذلك السفر الطويل المُعَقَّب الواجب من الناس من إستِطاع إليه سبيلاً إلى بيت الله الحرام، التاركون أَهلَ المنزِل والأَولاد والمُتَوَجّهون إلى الخوف والجوع والعطش، تَمَسُّكاً بقول الآخِر شَخَصَ[8]. وكذلك المجاهدة مع أَبناء جنسهم بالسيوف والرماح ووَبال الرِجال. وكذلك القيام في ظلم الليالي مع مقاساة شدة البرد، وصوم جميع النهار مع ضعيف أَبدانهم في الصيف

5 أيةُ: ورد ناسخ [ف] لعل = أنها.

6 It should be مختلفة.

7 The words that follow are not clear, but the ductus seems to be تاير لهم or even أمراضهم.

8 If my reading is correct, we should expect إليه here.

والأزمان الحارة. وكذلك وجوب القَصاص لسببٍ قِبَلَ أبناء الجنس، والإجتماع في الأعياد والجمعات لمّا كثر الأُخوة والمَوَدّات فتَذكار أمرِ المعاد ونظائر ذلك فيما رَسَم وأوجب واضع الشريعة في نواميس الإلٰهية.

[٣.] فإن الغرض في جميع ذلك بعينها مثل غرض الطبيب الحاذق، أن يتركب دواء على حسب أمزجةِ كل شخصٍ، ويتعرف في أوزان الأدوية وتكثيرها وفي إختلاف المشروبات والأغذية للأصحاء والمرضى، إذ غرضُه الأقصى ومطلوبُه الأعلى[9] إعتدال مزاج الشخص وإشتغاله في[10] إحساب المريض عن هاوية الأمراض وجهنم الأسقام وترغيبه حالة المداواة في الدخول إلى جنّة الإعتدال والصحة لشفاعة الطبيب الشفيق النبي هو له، كالذي وَضَعَ المراسم ورتّب القواعد في وقتٍ من الأوقات ولكلِ أُمةٍ من الأُمم بخلاف ما رُتِّبَ <و>فتاً أُخر في زمانٍ قبله أو بعده بحسب احتمالِ قبولِ الخلائق الأبرياء.

[٤.] <اعْلَم>، يا أخي، أن في زمنِ إبرٰهيم، عليه <السلام>، كان ترتيبه النواميس الإلٰهية ترتيباً من الخلائق أن نجتهم من عبادة الأصنام، وفي زمنِ موسى، عليه <السلام>، إطهار السِحر، حتى تَوَكُّل موسى، عليه <السلام>، وضَرب العصى فانفجرت منه اثنى عشرة عيناً قد عَلِمَ كل أناس مشربهم، وكذلك في زمن عسى، عليه <السلام>، مع الحواريين، حتى أوحى الوحي الوقتَ إلى نبيئنا محمد، صلى الله عليه وسلم، في تحريم الخمر وتحريم تزويجِ الأخَوات وغير ذلك من ترغيب الأُمة في الجنان في الحور والغلمان وأنهار من خَمرٍ لذةٍ للشاربين وتخويفهم من الجَهَنَّم والسَعير والزمهَرير في أَسفل السافلين.

[٥.] هذا <يله رب على قدر مُقَرَّر الخ ...> كلُ أُمةٍ من الأُمم، لأنَّ كلَ وقتٍ يحتمل قواعدَ غيرَ ما يحتمل القوم في وقتٍ آخر، وكلموا الناس على قدر عقولهم من هذه الجهة، صارت واجبة قطعاً، وعليكم تدين العجائز فرضٍ من فروض الأعيان. ولا يُظن بواضع النواميس وأصحاب الشرائع الإلٰهية ظَنُّ السوء، وعليك أن تتبع فيما أشاروا

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9 We should have here هو.

10 كرر ناسخ [ف] «في» مرتين.

وتبيّنوا في قواعد موضوعاتهم لمصلحة العامة ولصلاح العالم وبقاء الأشخاص، فلو لا ذلك[11] القواعد والمراسم لخرِب العالم وهلكوا الناس.

[٦.] فعُلِمَ بذلك أن قواعدَ الشرعيّات مصلحة معجبة، وذلك من جهةِ اكتساب النفوس البشرية في هذه المزرعة الغائبة العلمَ والمعروفة بذاتها وبذات الله تعالى وبصفاته وبموجوداته الروحاني[12] والجسماني[13]. لعلَّ شاكَ في الآخِرة من السرور واللذة فيما لا عين رأت أو لا أُذن سمعت ولا خطر على قلب بشر.

[٧.] فانتبه يا أخي من نوم الغفلة ورقدة الجهالة، وفكر في أسرار واضعي النواميس، ولا تكن من العارضين عليهم، وكن مواصيّاً فيما أمروك، واجتهد في ترغيب الجهال والعوام في مراتبهم قواعد واضعي النواميس، وقِس قواعد ما أمَرَ به صاحب الشريعة على قواعد أسرار الطبيب في ترتيب الأشربة والأغدية، ولأنَّ الإنسانَ مركبٌ من جسماني وروحاني، والأنبياء، عليهم السلام، هم أطباء النفوس والأطباء أنبياء الجسد. ففي جملة ما أتى به صاحب الشريعة سِر من الأسرار مَخفيّاً عن الأعيان والأشرار، فلو كان جميعُ الأُمةِ في رمز ما عليه مثل ما جاء الصِدّيق الأكبر أو أسد الله في أرضه، رضى الله عنهما، لكانت ترتيب الشريعة على غير ما أتت فيه، ولو كان مخاطباته مع المبدئون، أشار فيما أشار معهم على قدر قول القوم. فعليك المُتابَعة على قدر الحمد والطاقة، لا سنن الديانات النبويّة وموضوعات نواميس الحكمية[14] ومفروضات الشرائع كلها ومناسك بيوتات العبادات وقرابين الهياكل وبِيَع وصلوات ومساجد كلها إشارات ومرامز[15] إلى ما أشار إليه وضعُه الحجرء [...].

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11 كذا.

12 كذا.

13 كذا.

14 ورد ناسخ [ف] الحركميّة وهذه خطأ.

15 ورد ناسخ [ف] مراره.

Translation

[1.] *But teach (thy Message): for teaching benefits the Believers,*[16] *And O ye Believers! Turn ye all together towards Allah, that ye may attain Bliss,*[17] *Truly he succeeds that purifies it,*[18] and *those will prosper,*[19] *And glorify the name of their Guardian-Lord, and (lift their hands) in prayer,*[20] *Truly he succeeds that purifies it,*[21] *And he fails that corrupts it!*[22]

[2.] Just as the treatments of individuals in different countries and climates differ in accordance with the perfection of their mixtures, it is possible for a physician to give a sick person scammony[23] to drink in warm countries, in order to extinguish [dyscrasia in] the yellow matter,[24] and [to restore] through it the pure [mixture],[25] and likewise[26] it is not possible for [that] physician to hand a laxative [*al-dawā' al-mushil*] to children, or to give them a theriac,[27] in such a way that they are not

16 This is a quotation of Qur'an 51:55 that, to the best of my knowledge, is quoted three times in the *Rasā'il*: in Epistle 9: 'On Morals', vol. 1, p. 338.9–10; in Epistle 20 (see above, p. 302, note 54); and in Epistle 31: 'On the Causes of the Diversity of Languages', vol. 3, p. 173.12–13.

17 This is a quotation of the last part of Qur'an 24:31.

18 This is a quotation of Qur'an 91:9 that, to the best of my knowledge, is also quoted three times in the *Rasā'il*: in Epistle 1: 'On Number', vol. 1, p. 76.13–14 (= p. 66.3–4, El-Bizri); in Epistle 38: 'On Resurrection', vol. 3, pp. 289.24–290.1; and in Epistle 49: 'On the Quality of the States of Spiritual People', vol. 4, p. 243.2.

19 This is a quotation of part of Qur'an 87:14, which in its entirety runs as follows: *But those will prosper who purify themselves.*

20 This is a quotation of Qur'an 87:15.

21 This is a new quotation of the last part of Qur'an 91:9 (see above, note 18).

22 This is a quotation of Qur'an 91:10 that, to the best of my knowledge, is quoted twice in the *Rasā'il*, immediately after 91:9, in Epistle 1: 'On Number', *Rasā'il*, vol. 1, p. 76.14 (= p. 66.4, El-Bizri), and in Epistle 49: 'On the Quality of the States of the Spiritual People', *Rasā'il*, vol. 4, p. 243.2.

23 Scammony is a drastic purgative, also prescribed by Greeks and Arabs for gout, rheumatism, and other chronic diseases.

24 In view of the actions of scammony, perhaps the text should be here emended to '*al-mirra al-ṣafrā'*'.

25 Namely, eucrasia in yellow bile.

26 Namely, here and later, the difference in treatments because of the diversity of countries and of their climates.

27 Theriac, or theriaca, was a medical concoction originally formulated by the Greeks in the first century AD. It was an antidote, considered a universal panacea. See also above, Epistle 19, note 175 on p. 271, and notes 178 and 180 on p. 272.

damaged by such a preparation [*tartīb*],[28] but it is necessary for [that] physician to be busy with the therapy of their diseases, in what [can] soothe <their diseases>,[29] and not to effuse ointments on that which is worse and may be damaged because of that [*min dhālika*]. In fact, theriac is among the most useful medicaments for the majority of diseases, but it suits neither all individuals, nor every time, [needing to be] different in weight for that; likewise[30] [are] God's tradition [*sunna*], the foundations of the obligations of the laws [*al-nawāmīs*], and the impositions [*mawḍūʿāt*] of the legislators [*aṣḥāb al-sharāʾiʿ*] who are the physicians of the souls — such as the five [official] prayers imposed [*al-mafrūḍa*] on a certain community [*umma*], or the fact of declaring as legally permissible [*muḥallil*] some beverages [*mashrūbāt*], foodstuffs [*maʾkūlāt*], and sexual intercourse with sisters,[31] whereas the issue is to the contrary at a certain time for a certain community among the others subject to obligations [*al-mafrūḍa*] from God, be He exalted, other than that foundation. And likewise is the cleanliness of the extremities peculiar to turning towards God, be He exalted, by which the followers of the law [*ahl al-sharīʿa*] are designated in ritual purity [*ṭahāra*] and in ablution [*wuḍūʾ*].[32] Likewise [are] the different shapes — straight and bent, in a square or in a triangle — of their state in worship, by

28 This translation corresponds to the reading '*kay lā yuḍarrūna bi-dhāka'l-tartīb*', but the MS is not clear here. We might also read '*kay lā yuḍarru wazn bi-dhāka'l-tartīb*', 'so that the weight of such a preparation would not be damaged' — namely, the preparation based on scammony.

29 See above, note 7.

30 Here the second part of the comparison is introduced, by the word *kadhālika*; the comparison began at the beginning of the text, immediately after the Qur'anic quotations, by the word *kamā*.

31 The Holy Book codifies permanent hindrances to marriage, on the basis of blood ties, of affinity, and of nursing. These lines hint at the first kind of hindrance, for which see the first part of Qur'an 4:23, *Prohibited to you (for marriage) are: your mothers, daughters, sisters; father's sisters, mother's sisters; brother's daughters, sister's daughters; foster-mothers (who gave you suck), foster-sisters* [...]. Such a prohibition was already in force among pagan Arabs, although Islamic law widely debates on the juridical condition of the Mazdeans converted to Islam, who had lawfully got married to their mothers or sisters. I am indebted for these remarks to Agostino Cilardo.

32 *Ṭahāra* indicates ritual purity as a necessary condition for the valid performance of prayer; *wuḍūʾ* indicates a simple ablution, sufficient for cleansing after a minor ritual impurity.

which subjects [*al-raʿīya*] are designated in prayer. Likewise [are] the giving of a little quantity of properties, and the spending on behalf of particular individuals. Likewise [is] the long travel due from people capable of that, along the way towards God's Kaʿba, with people leaving the[ir] house and [their] children, facing fear, starvation, and thirst, in adherence to the speech [of God concerning] the hereafter, [towards which] they travel. Likewise [is] the fight together with others of the[ir] genus with swords and lances, and the harm for men. Likewise [is] standing in the shadow of nights while suffering the strength of cold, and fasting the whole day in spite of the weakness of their bodies in summer and in warm times. Likewise [is] the imposition of retaliation [*wujūb al-qiṣāṣ*][33] for a certain cause in respect to the people of the[ir] genus, the gathering in feasts and Fridays, when friendship and love increase, and the remembrance of the issue of return and of similar [issues] in that which the legislator [*waḍiʿ al-sharīʿa*] described and imposed in the laws concerning divine [matters].[34]

[3.] Indeed, the purpose in all that in itself is like the purpose of a skilled physician — to compound a medicament [*dawāʾ*] according to the mixtures of each individual, and to know the weights of medicaments and the [way in which] they may be increased, as well as the diversity of beverages [*mashrūbāt*] and foods [*al-aghdiya*] [appropriate] to healthy and sick people —, as his utmost purpose and his highest desire is [to restore] the proportion of the mixture of an individual, to devote himself to satisfying a sick [person, taking him away] from the abyss of sicknesses and the Gehenna of illnesses, and to interest him in a therapy [*ḥālata'l-mudāwāh*] [apt] for entering the Garden of proportion and health; for the intercession of a solicitous physician, who is a prophet for him [namely, the sick person], is just as [is the case for] he who fixed rituals and settled [religious] foundations at a certain moment and for every[35] community, contrarily to that which was settled at another moment, in a time before or after that, according to the potentiality of reception of innocent creatures.

33 On *qiṣāṣ*, cf. Qur'an 2:178, 179, and 194.

34 This should be the translation of '*nawāmīs al-ilāhiyya*'. To translate 'the divine laws', we should have '*al-nawāmīs al-ilāhiyya*'.

35 Perhaps, we should read '*li-ummatin min al-umam*', 'for a certain community'.

[4.] <Know>,[36] O my brother, that at the time of Abraham, upon him <be peace>,[37] his codification [*tartīb*] of divine laws [concerned] dispositions [apt to] rescue them from the worship of idols; [that] at the time of Moses, upon him <be peace>, [it concerned] the purification of magic, until the appointment of Moses, upon him <be peace>,[38] and *he struck [the rock with] his staff*,[39] and *gushed forth therefrom twelve springs. Each group knew its own place for water*;[40] and [that] likewise [it happened] at the time of Jesus, upon him <be peace>, together with his apostles, until inspiration was given — in the course of time — to our Prophet Muhammad, God bless him and give him peace, concerning the interdiction of wine, the interdiction of marrying sisters, and other [precepts useful for] inciting the [Muslim] community to paradise, [where they will stay] with *Companions with beautiful, big, and lustrous eyes*,[41] and [with] *youths (handsome)*,[42] and [where there are] *rivers of wine, a joy to those who drink*,[43] and for warning[44] them [by mentioning] the *Gehenna*,[45] the *Blazing Fire*,[46] and the *excessive cold*[47] in the lowest of the low.

[5.] With this <the Lord charged him [namely, Muhammad] up to a certain extent...>[48] every community, because every moment has a capacity for foundations different from those of which people

36 The word *i'lam* should be integrated in the text.

37 In this addition, the word *al-salām* is always missing in the eulogy.

38 Probably, the text means the appointment of Moses as the prophet of his time.

39 These words recall some words of Qur'an 2:60.

40 This is a quotation of part of Qur'an 2:60.

41 This is an allusion to Qur'an 44:54, cf. 52:20, 55:72, and 56:22.

42 This is an allusion to Qur'an 52:24.

43 This is a quotation of part of Qur'an 47:15.

44 The word *takhwīf* is found in Qur'an 17:59.

45 The word *jahannam*, hell, appears very frequently in the Holy Book.

46 The word *sa'īr* occurs several times in the Holy Book. See in particular Qur'an 42:7, and 22:4, 31:21, 34:12, and 67:5 for the locution "*adhāb al-sa'īr*'. In 67:6 we find the locution "*adhāb al-jahannam*'.

47 The word *zamharīr* is found in Qur'an 76:13. The verse runs as follows: *Reclining in the (Garden) on raised thrones, they will see there neither the sun's (excessive heat) nor (the moon's) excessive cold*. This verse recalls somewhat the cosmological representation given by the Ikhwān in Epistle 16.

48 This is a translation of my tentative reading of these words, which are not clear; I could not find any Qur'anic quotation in their support. There seems to be a blank space after these words, perhaps indicating the beginning of a new chapter.

are capable in another moment. [Legislators] spoke to people in proportion to their intellects in this regard, [and then foundations] became absolutely necessary, and it is up to you [*ʿalaykum*] to leave old people free [*tadyīn*] from the precepts [*farḍ min furūḍ*] [appropriate to] people of distinction.[49] No bad supposition[50] should be made about a legislator [*wāḍiʿ al-nawāmīs*] and the followers of divine laws [*aṣḥāb al-sharāʾiʿ al-ilāhiyya*], but it is up to you [*ʿalayka*] to follow that to which they alluded and explained with regard to the foundations of their impositions [*mawḍūʿāt*] for the advantage of the masses, the goodness of the world, and the permanence of individuals: if it were not for those foundations and rituals, the world would be destroyed, and people would perish.

[6.] It is known from that that the foundations of legal [issues] [*al-sharʿiyyāt*] are an admirable advantage — from the standpoint of the acquisition, by human souls, of this field [*mazraʿa*] concealed with regard to science, but known with regard to its essence and to the essence of God, be He exalted, to His attributes, and to His existing beings, both spiritual and corporeal. Perhaps one doubts of the hereafter with regard to the joy and pleasure for that which no eye ever saw, or ear listened to, or to any human heart occurred.[51]

[7.] Be awakened then, O my brother, from the sleep of carelessness and the slumber of ignorance; reflect on the secrets of legislators [*wāḍiʿī'l-nawāmīs*, here and later]; do not be of those who attack them, but be among those who are charged with that which they ordered you; make every effort in inciting the ignorant and the masses, in

49 The reading of these words is extremely uncertain, and so is their translation.

50 The Arabic is '*ẓann al-sūʾ*', whereas it should be recalled the current locution is '*sūʾ al-ẓann*'.

51 These words, which can be compared to I Corinthians 2:9 and occur in a variety of ancient Christian sources. See for references C. Baffioni, 'Metaphors of Light and the "Verse of Light" in the Brethren of Purity', in P. Adamson, ed., *In the Age of al-Fārābī: Arabic Philosophy in the Fourth/Tenth Century* (London–Turin: The Warburg Institute–Nino Aragno Editore, 2008), pp. 163–177, at p. 176, note 42. The saying is found in other places in the *Rasāʾil*. See Epistle 27: 'On How Particular Souls Develop in Human Natural Bodies', *Rasāʾil*, vol. 3, p. 6.10–11; Epistle 30: 'On the Peculiarity of Pleasures and the Wisdom and Quiddity of Life and Death', *Rasāʾil*, vol. 3, pp. 77.2–3 and 82.10–11; and Epistle 49: 'On the Quality of the States of the Spiritual People', *Rasāʾil*, vol. 4, p. 235.15.

their [different] degrees, [towards] the foundations of the legislators; and draw analogies for the foundations of that which was ordered by the legislator [*ṣāḥib al-sharīʿa*, here and later] from the foundations of the secrets of a physician in the preparation [*tartīb*] of beverages [*ashriba*] and foods.

In fact, man is composed of a corporeal and a spiritual [element], and prophets, upon them be peace, are the physicians of the souls, whereas physicians are the prophets of the body. On the whole, what was brought by the legislator is a deep secret [*sirr min al-asrār*] hidden both from the people of distinction and from the evildoers, and if the whole of the community were, with regard to any symbol of it, like that which was mentioned[52] by 'the Greatest Righteous', or by 'the Lion of God on His earth', may God be pleased with them both,[53] the codification [*tartīb*] of the religious law [*al-sharīʿa*] would have been other than that produced;[54] and if his [namely, the legislator's] addresses were to the novices,[55] he would have made allusion to that to which he alluded with them in proportion to the speech [addressed to] [general] people.

Then, your following [the law] will be in proportion to [your] praise [*ḥamd*] and capability, not to the practices of the prophetical religions, the impositions [*mawḍūʿāt*] of the laws [concerning] sapiential [issues],[56] the obligations of all religious laws [*al-sharāʾiʿ kullihā*], the [various] rituals in the houses of worship, and the sacrifices in temples, synagogues, [places of] prayer, and mosques; all [these being]

52 I read *jāʾ* here. There are no diacritical dots, and the last letter, perhaps a *thāʾ*, has been effaced by the copyist.

53 The allusion is to Abū Bakr and ʿAlī. Abū Bakr was named al-Ṣiddīq (the most truthful), or even al-Ṣiddīq al-Akbar. The Prophet Muhammad called ʿAlī Asadullāh, 'the Lion of God', after the battle of Khaybar (629), where the Muslims fought against the Jews living in that oasis.

54 The Arabic "*alā ghayr mā atat fihi*' should imply another *tartīb*, the one proper to physicians, however, the feminine persons of the verbs seem to refer to *sharīʿa*, not to *tartīb*.

55 We should have المبدئين here, instead of المبدئون, another possible reading for an unclear word.

56 This should be the translation of '*mawḍūʿāt nawāmīs al-ḥikmiyya*', or we should read '*mawḍūʿāt al-nawāmīs al-ḥikmiyya*', 'impositions of the sapiential laws'.

allusions [to] and symbols[57] of that to which his [Abraham's] placing the stone[58] alluded[...].

Commentary

From the standpoint of the copyist's writing, we can note the following notations: long *alif* instead of *alif maqṣūra*; *tā' marbūṭa* written as a *hā'* (without diacritical dots); *hamza* is not written; diacritical dots often missing, or misplaced; there is a deletion at line 13; mistakes which indicate that the copyist is not always consistent in concord between words in gender or number (some of these mistakes have been highlighted in the notes).

From the standpoint of content, the text is opened by a series of Qur'anic quotations and is full of allusions to the Holy Book.

[1.] The initial set of quotations consists entirely of exhortations. In the Qur'an, the first one is directed by God to the Prophet Muhammad. The second is a general exhortation, which concludes the verse traditionally considered to oblige women to hide themselves from strangers. All the others are divine vaticinations in favour of believers.

[2.] The main subject of the addition is a comparison between physicians and prophets, an issue already dealt with in the encyclopaedia.[59] Medical treatments differ in relation to different individuals and climates. In the same way, religious obligations differ — prophets are the physicians of the souls. The fundamentals of Muslim religion are cited here, in succession: the five prayers; the legal permissibility for certain beverages and foods, and for determined sexual intercourse; ritual purity and ablution; the various positions assumed during prayer; alms; pilgrimage; *jihād*; fasting; retaliation; Friday and other feasts.

[3.] A skilled physician aims at assembling a well-balanced medicament good for healing, and at knowing beverages and foods

57 I translate according to my emendation of the text, as مرارة (?) does not seem to make sense here.

58 Because of the addition, the case of *waḍ'* is changed in respect of the reading *waḍ'ihi* of the other MSS.

59 Among the passages in the encyclopaedia closest to this addition are Epistle 25: 'On Conception', *Rasā'il*, vol. 2, p. 443.13–16, and Epistle 42: 'On Opinions and Religions', *Rasā'il*, vol. 3, p. 485.10–13.

suitable for healthy and sick people, in order to guarantee eucrasia. A physician is again called a 'prophet', and metaphors in use for paradise and hell are interestingly and repeatedly referred to health and sickness.

[4.] The examples of Abraham and Moses follow; Jesus is cited without any explanation regarding his mission.[60] At the end of the cycle of prophecy the Prophet of Islam was sent. Now, other Muslim precepts are mentioned, such as the interdiction of wine and of marriage with sisters, and there is incitement to enter paradise and avoid hell.

[5.] Precepts for the different addressees of a prophetic message are indicated here. The Brethren are invited to follow legislators and to support their teachings, without having bad opinions of them, because religion is at the basis of the survival of the world. A social role is here attributed to religion, but as 'legislators' are obviously the prophets, it seems strange that the author uses the plural here, all the more so if we consider that he has been speaking of Muslim religion.

[6.] The meaning of the assertion in this paragraph is not clear. It regards the content of religion, which is considered difficult to know in its esoteric meaning, even though its issues (God, His attributes, and His creatures) are patent — and might be advantageous in discerning the hidden aspects of religion.

[7.] At this point, the text addresses the Brethren in the usual way, again inviting them to support legislators, and to be among their *awṣiyā'*. This translation comes from my tentative reading *mawāṣīan*; the other possible reading, *nawāṣiban*,[61] does not seem to make sense here, as it indicates the opponents of 'Alī. The comparison proposed between legislators and physicians continues.

In fact, the text says, humans are composed of a body and of a soul, and both need to be healed. The secrets of prophecy are now explicitly mentioned, by analogy with the secrets of physicians. If, the text says, the symbols employed by a legislator alluded to the community as a whole, then religious law would differ from a medical therapy, because

60 Usually, the Ikhwān refer to Christ's capacity of raising the dead and of healing leprous people. See, e.g., Epistle 42: 'On Opinions and Religions', *Rasā'il*, vol. 3, p. 485.14–20.

61 The word *nawāṣib* occurs in Epistle 31: 'On the Causes of the Diversity of Languages', *Rasā'il*, vol. 3, p. 161.9, together with other Muslim groups.

it would be one and the same. The reference to Abū Bakr and ʿAlī can be read as a reference to the first of the *'khulafā' al-rashīdūn'*, the rightly guided caliphs, and to the first of the Shīʿī *a'imma*, which implies that the legislator in this paragraph is the Shīʿī imām, who speaks to everyone according to his capabilities. This interpretation seems to be confirmed by the following statement, which means that a call to novices is similar to the call to masses — but the Shīʿī imām's speech is addressed to initiates, too — in different terms. When such a legislator addresses specific groups of people, he can be compared to a physician that treats his patients differently.

The last words of the passage seem then to hint at the special gifts of a particular initiate — praised for his capability in understanding esoteric meanings — that locate him beyond the religious obligations imposed on everybody.

Some of the topics addressed in this addition are found in other places of the encyclopaedia. In this regard, this addition is perfectly consistent with the letter and spirit of the *Rasā'il*, as is also testified by the presence of the usual exhortation, 'Be awakened then, O my brother, from the sleep of carelessness and the slumber of ignorance'.

However, and if my edition of the text is correct, the last section seems to give a deeper insight of the comparisons introduced in Chapter 7 of Epistle 20, where Muslim religious tradition is connected with Abraham's acts in building the Kaʿba and the rituals of pilgrimage. This sounds like a sort of first level esoteric explanation of Muslim religion, while the addition seems to state the existence of a deeper esoteric meaning of religion — an 'esotericism of the esoteric'.

In view of these considerations, we are not able to establish whether this addition was originally a genuine part of the encyclopaedia, later lost (at least in the other consulted MSS), or an interpolation by the copyist of [ف] or by his model.

Appendix C: An Addition to Epistle 16

At the end of the Epistle, there is in [ج][1] and [ف][2] the same addition. It occurs after the words '*wa-lā hum yaḥzanūn*' at fol. 157a5 of Atif, before the final invocations. This addition is found neither in the other consulted MSS, nor in Dieterici or the Ṣādir edition.

The addition is divided into four chapters, the first of which is titled: 'Chapter on the knowledge of the parts of the world in its entirety'. It corresponds to pp. 351.3–357.17 of the *Risālat al-Jāmiʿa* in Ghālib's edition, attributed to the second 'veiled' (*mastūr*) imām, Aḥmad,[3] up to the words '*ilā mustaḥaqqihi*', and to pp. 33.1–45.2 of the version attributed to the Spanish scientist and scholar Maslama al-Majrīṭī.[4] In this work, this passage is a part of the explanation of the so-called 'third' epistle on the world as a macroanthropos (Epistle 34, the third of the third section of the encyclopaedia). The same text is found in the *Risāla Jāmiʿat al-Jāmiʿa*, from Chapter 6 to the first half of Chapter 9 (pp. 79.2–87.9, ed. Tāmir).[5]

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1 MS [ج] is numbered at the top of each recto folio in Latin figures. The addition extends from fols. 108a23 to 111a6.

2 See fols. 85b22–87a19.

3 Namely, Aḥmad b. ʿAbdallāh b. Muḥammad b. Ismāʿīl b. Jaʿfar al-Ṣādiq, the second veiled imām after ʿAbdallāh and before his son al-Ḥusayn and ʿAbd Allāh al-Mahdī, who later became the founder of the Fatimid dynasty. M. Ghālib, ed., *al-Risālat al-Jāmiʿa. Tāj Rasāʾil Ikhwān al-Ṣafāʾ wa-Khullān al-Wafāʾ, taʾlifu al-imām al-mastūr* Aḥmad b. ʿAbdallāh b. Muḥammad b. Ismāʿīl b. Jaʿfar al-Ṣādiq (Beirut, 1984).

4 He is supposed to have introduced the *Epistles* to Spain. J. Ṣalībā, ed., *al-Risālat al-Jāmiʿa, al-mansūba liʾl-ḥakīm al-Majrīṭī, al-juzʾ al-awwal*; *al-Risālat al-Jāmiʿa, al-mansūba liʾl-ḥakīm al-Majrīṭī, wa-hiya tāj Rasāʾil Ikhwān al-Ṣafāʾ wa-Khullān al-Wafāʾ, al-juzʾ al-thānī* (Damascus, 1949).

5 ʿĀ. Tāmir, ed., *Risāla Jāmiʿa al-jāmiʿa* (Beirut, n.d. [1982]).

The rest of the text — namely, the second part of Chapter 3 — corresponds to the *Risālat al-Jāmiʿa*, pp. 519.12–524.9 of Ghālib's edition and pp. 359.2–367.6 of Ṣalībā's edition, as a part of the commentary on the 'fifth' epistle, on the divine law [Epistle 47, the sixth of the fourth section].

The last part of the text – namely, Chapter 4 — corresponds to p. 525.1–7 of Ghālib's edition and to p. 368.2–9 of Ṣalībā's edition.

In view of the fact that the contents of this addition have much in common with Epistle 40: 'On Causes and Effects' and with Epistle 25: 'On Conception', the edition and translation of the whole text will be provided as an Appendix to one of these treatises, which will also allow a broader and more precise commentary. Here, I shall confine myself to providing a short abridgement of the text that — as far as I could see — has apparently very little to share with Epistle 16. It would seem that the anonymous copyist who added these pages[6] to that treatise wanted to substitute its technical details with a more 'metaphysical' representation of the world in its entirety.

In Chapter 1, the world is said to be 'within God's imperative' and 'within His handful'[7] and under His volition'. The following succession, God –> divine imperative –> [Active] Intellect –> Universal Soul –> Prime Matter –> forms –> Absolute Body –> spheres –> Earth, is at the basis of the presentation.

In view of the fact that everything under God is 'in couples'[8] (whereas God alone is the one, the unique, and the everlasting),[9] the following correspondences between upper and lower world are established:

6 They contain plenty of Qur'anic quotations and allusions, of which a small number are indicated in this Appendix.

7 For the term *qabḍa* see Qur'an 39:67.

8 These words somewhat echo the doctrines of Balīnūs; see above, Appendix A.

9 God is called *al-wāḥid* (as in Qur'an 2:163; 5:73; 6:19; 12:39; 13:16; 14:48 and 52; 16:22 and 51; 18:110; 21:108; 22:34; 29:46; 37:4; 38:65; 39:4; 40:16; 41:6); *al-fard* (that is not a Qur'anic term, but was related to God by the eleventh-century Ismaili thinker Ḥamīd al-Dīn al-Kirmānī); and *al-ṣamad* (see Qur'an 112:2). Qur'an 112:3 is also referred to.

[Active] Intellect	the particular intellect
Universal Soul and angels (Qur'an 40:7 and 2:255)	the particular soul
Prime Matter	the 'mothers'
the form of the [Universal] (*al-nafsāniyya*) Soul, which brings the world of spheres to perfection	the human form, which is the perfection of natural bodies
Absolute Body, with the spheres inside it	the centre of the Earth, which embraces all that is in it

In Chapter 2, a sort of a 'technical vocabulary' of the Ikhwan's cosmology is provided, through the explanation of what (i) Universal Body, (ii) Prime Matter, (iii) simple bodies, (iv) simple souls, (v) begotten bodies, (vi) animal, vegetal, and mineral souls, (vii) particular bodies, and (viii) 'the soul that sets in motion' are. The author concludes by saying that all these explanations show the world to be like 'a single man who obeys his Creator', which should emphasize the link with Epistle 16 of the encyclopaedia.

The addition, however, rather than being a way of recalling the vision of the world as a 'macroanthropos', leads to a 'double interpretation' of the scheme of Neoplatonic origin contained in it, one of whose options brings the hierarchical description back to a clearly Ismaili conception.

I am speaking of the initial words, where all masculine singular pronouns following the mention of God's imperative (*amr*) may refer either to God or to the imperative itself. The former option is demanded by the fact that the passage is added to a treatise by the Ikhwān al-Ṣafā', who — unlike the Ismailis — place God both at the beginning of the ontological process, and at the extreme end of the gnosiological process they describe.[10]

10 The distance from the Ikhwān is indicated by the fact that in Chapter 2, both the *Risālat al-Jāmi'a* and the *Risāla Jāmi'at al-Jāmi'a* make clear that the 'epistle' to which the authors refer is their only work, but here there is obviously no mention of that, instead hinting at a 'comprehensive discourse'. It is supposed to have been developed in 'this epistle', which somewhat substitutes the entire encyclopaedia. Qur'an 31:28 is now quoted (*And your creation or your resurrection is in no wise but as an individual soul*), paralleling the function of this 'epistle' with the Universal Soul that guarantees the survival of the entire world.

On the other hand, we have seen that the text belongs to the *Risālat al-Jāmiʿa* and the *Risāla Jāmiʿat al-Jāmiʿa*, and if they can be attributed to an Ismaili milieu, it is quite difficult to imagine that the discourse refers to God rather than to His imperative (or, in philosophical terms, to His *ibdāʿ*), because Ismaili thinkers leave God out from every ontological representation. This latter interpretation is also confirmed by the fact that, later, the text says that 'All things are linked to each other, and God's imperative embraces them from all their sides'.[11] In addition, the Intellect is called 'the supreme veil and the greatest door' towards God unity and uniqueness:[12] differently stated, it is considered to be the 'actualizing agent' of every relationship with God, who is then the *maḥjūb*, what leads us to recall the title of a well-known work of another Ismaili thinker, the *Kashf al-maḥjūb* by Abū Yaʿqūb al-Sijistānī (tenth century).

Chapter 3 begins by the explanation of what (ix) particular souls are, namely, the faculties spread from the Universal Soul when she craved for the world of nature because of her incapability of fully receiving the emanation of the Intellect (*al-ifāḍa al-ʿaqliyya*). This echoes another Sijistanian conception, and, rather than continuing with the explanation of the 'technical vocabulary', the explanation has the function of introducing the second part of the chapter, which describes the 'fall' and the 'redemption' of the Universal Soul.

As if prefiguring the 'heavenly drama' concerning al-Kirmānī's third intellect in the vision of the Ṭayyibī writer Ibrāhīm ibn al-Ḥusayn al-Ḥāmidī (d. 1162) in his *Kanz al-walad* ('The Treasure of the Son'),[13] the Universal Soul — if my reading is correct — is said to have been 'caught by trepidity in praising and sanctifying God', which implied her fall down to the still centre of the universe. But when the Universal Soul repents, she will return to the upper world. God's messengers were sent just in order to allow her — who is scattered in the particular souls — to be redeemed.

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11 I have commented on this text from this second perspective in my article 'The Role of the Divine Imperative', forthcoming.

12 Namely, the closest veil to God's majesty but, at the same time, the highest door to knowledge of God.

13 Cf. De Smet, *La quiétude de l'intellect*, p. 248ff.

When that happens, the final judgement will occur. Several key-terms of the judgement as preached in the Qur'an appear here, such as balance, bridge, angels, guardians, and witnesses. At that moment, the Universal Soul will collect its faculties (the particular souls) back for judgement. She is then compared to a king who sent his helpers into the different regions of his reign with various kinds of orders. Later, he calls back his subjects in order to judge both those who obeyed his orders, and those who refused them and even arrived to kill his emissaries. He rewards those who obeyed or turned repentantly to him, and sends to perpetual punishment those who disobeyed.

One realizes then that in this addition the issue of resurrection is dealt with in terms of final judgement, differently from the last chapter of Epistle 16, in which resurrection was connected to the end of the universe, when emanation from one to the other hypostases is interrupted.

Both the king of the story and the Universal Soul receive an inspirational help (*ta'yīd*) from God. That implies that God is the supreme judge and arbiter. As in Epistle 19, God's direct involvement in what happens in the world is here denied.[14] Later, the final judgement is again extensively compared to the judgements that occur in this world.

The third part of the chapter introduces the six *nuṭaqā'* (the prophets who brought a revelation). They were sent 'to straighten the form of [God's] religion through [its] representation in the souls of those who [are ready to] receive it'. These prophets are compared to a body that develops and becomes completed during pregnancy.

In that he was 'the first speaker [*nāṭiq*] who spoke [*naṭaqa*] by God's order and revelation', as well as 'the father and the root of human beings', Adam is compared to the 'quintessence [*sulāla*] of clay'.[15] Noah is placed at the level of the sperm (*nuṭfa*).[16] Abraham is said to be like the 'leech-like clot' (*'alaqa*),[17] attached to both the two roots (*al-aṣlayn*), and the two ramifications (*al-far'ayn*) generated by him. As the *far'ayn* are indicated to be his two children, Ismā'īl and

14 We have here the quotation of the central part of Qur'an 8:17.

15 For which see Qur'an 23:12.

16 In the terms described in Qur'an 23:13.

17 Cf. Qur'an 22:5; 23:14; 40:67; 75:38.

Isḥāq, the text would require that the *aṣlayn* are the quintessence and sperm, equivalent to Adam and Noah. (It is to be noted, however, that embryology would demand the roots to be identified with sperm and menstrual blood, or — according to the Hippocratic and Galenic perspectives, shared by prophetic medicine — with the female and male sperms.) From Abraham 'the pure prophets' came, belonging to 'the house of prophecy and wisdom', and to 'the house of imamate and mercy'.

At this point, Moses is compared to a pregnant woman that is in an intermediate position between the potentiality of the embryo and the actuality of her new-born child. Likewise, Moses was pregnant with the order 'in potentiality' belonging to the three prophets who preceded him, but in his Torah he also pointed to the three who would come after him, with their order 'in actuality'.

The author says now that from Moses' call (the term *da'wa* is used) the Messiah appeared, but then he continues to speak about Moses. He is placed at more or less the same level as Adam, because 'God chose Moses by himself, as He had created Adam by his own hand, and had made His angels prostrate to him'. God appointed Moses as His successor on Earth, just as He had appointed Adam and had left paradise in heritage to him and his wife. Moses' law is God's proof (*ḥujja*), extracted from him just as Eve was extracted from Adam. As Adam was the first human being, from Moses the process leading to the 'second creation' took its origin.

The embryological comparisons continue with Jesus, who is said to be like the lump (*muḍgha*)[18] of the laws of those who preceded him. His call was like Adam's call, consisting is providing examples and ordering pious deeds, until the sixth — namely, the Prophet Muhammad — came.

The Prophet Muhammad is like bones that have the function of strengthening an embryo. Against the unbelievers, who thought that he would have disappeared as the bones disappear from mortal remains, God indicated him with the words of Qur'an 36:79, *He will give them life*. This verse hints at the 'first creation', but also indicates

18 Or, also the 'morsel of flesh' according to Yusuf Ali's translation. The text refers here to Qur'an 22:5 and 23:14.

that the secrets of the Holy Book will be disclosed when 'the seventh' appears. He is 'the greatest mahdī', who is compared to the final phase of completion of an embryo through flesh and blood.[19]

At the advent of 'the seventh', religion will reach its completion, just as at the fourth month of pregnancy the spirit of life appears in an embryo. Then, the world will pass to the heavenly dimension leaving the earthly dimension, just as the new-born leaves its mother's womb and reaches the earthly world.

The spirit of a 'learned believer' is now compared to a new-born: the former lives his 'second creation' by attaining paradise, just as the latter comes to the earthly world. The second creation is 'the command of the seventh, namely, the last creation in the last day'.

Following ancient medical theories,[20] the author recalls that a new-born is viable only if its birth occurs at the seventh or at the ninth month of pregnancy. A great secret is behind the death of a baby at the sixth and at the eighth month of pregnancy, just as in the fact that God established that the Prophet Muhammad would not have a son 'who may keep memory of his loins, and be the heir of his position [*maqām*] in the community'. So those who came after him 'fell from his rank'.

A political judgement may be hidden in this remark. Chapter 4 follows, where the movement of the elements (called 'the mothers', which has a richer flavour after the previous comparisons with the various phases of pregnancy) are intended for the manifestation of the rational beings (the text says 'the world') charged with God's worship, just as the movements of males and females aim at generating 'a form similar to them'. The movement of the prophets is mentioned, too,

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19 These words may be an allusion to Qur'an 23:14 where we read *fa-kasawnā* ('and [We] clothed'), as an allusion to covering bones with flesh.

20 Cf. L. Denooz, *Transmission de l'art médical de la Grèce à l'Islam. Étude du traité Sur le fœtus de sept mois de Galien, de sa traduction par Ḥunayn b. Isḥâq et de son commentaire par Ṯâbit b. Qurra*, Association pour la Promotion de l'Histoire et de l'Archéologie Orientales, mémoires n° 2 de l'Université de Liège (Liège, 1999); and my articles 'L'influenza degli astri sul feto nell'Enciclopedia degli Iḫwān al-Ṣafā'', *Medioevo. Rivista di storia della filosofia medievale* 23 (1997), pp. 409–439, and 'L'embryologie islamique entre héritage grec et Coran: les philosophes, les savants, les théologiens', in L. Brisson, M.-H. Congourdeau, and J.-L. Solère, ed., *L'embryon: formation et animation. Antiquité grecque et latine, traditions hébraïque, chrétienne et islamique* (Paris: Vrin, 2008), pp. 213–231.

aimed at arriving at the manifestation of the second creation and of God's religion in its fullest formulation. The death of another son is now mentioned — who should be the seventh imām's son: he is called 'the eighth', who 'did not reach [the seventh's] level', just as a new born in the eighth month of pregnancy 'falls from the rank of maturity'. Here the multifaceted term *balāgh* occurs, meaning both 'maturity' and '[full degree of] eloquence'. When, in the ninth month of pregnancy, the same conditions as those of the seventh month return, the birth will again occur in completeness of structure. And here, we find the term *waḍʿ*, indicating 'birth', but the 'imposition of a [religious] law' as well.

This last remark may be an allusion at the Fatimid rule — paralleled to the coming of the 'second creation'. Thus, the second creation after conception, namely the passage from the womb to the world, corresponds to the gaining of political power from the part of the Prophet's descendants.

In view of its original location, the addition gives further support to the hypothesis of an Ismaili commitment of the Ikhwān al-Ṣafā', and the differences from the versions provided in the *Risālat al-Jāmiʿa* (in its two versions) and in the *Risāla Jāmiʿat al-Jāmiʿa* may open new perspectives about the chronology and the exact formulation of these texts.

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