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An Introduction to Islamic Cosmological Doctrines

CONCEPTIONS OF NATURE AND METHODS
USED FOR ITS STUDY BY THE
IKHWĀN AL-ṢAFĀ', AL-BĪRŪNĪ, AND IBN SĪNĀ

Revised Edition

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Dedicated in Humble Gratitude
to my Parents
Seyyed Valīallāh and Ashraf Nasr
to Emad Kia
and to
Sidi Ibrāhīm 'Izz al-Dīn
al-'Alawī

CHAPTER 2

The Principles of the Study of the Cosmos and the Hierarchy of the Universe

The universe described in the *Rasā'il* is a unified whole whose various parts are held together by the analogy which exists between them. As the Ikhwān write, "The whole world is one as a city is one, or as an animal is one, or as man is one."[1] Its parts are held together like the organs of a living body which derives its being and sustenance from the Divine Word.[2] The language with which this interrelation is expounded is that of symbolism, particularly numerical symbolism. Everywhere within the Universe the key to the understanding of things is numbers, which, like the morning sun, disperse the fog of the unintelligibility of things considered only in their terrestrial opaqueness.

The Ikhwān emphasize the symbolic character of this world in many passages, as, for example, when they write:

> He made these His works manifest, to the end that the intelligent might contemplate them; and He brought into view all that was in His invisible world, that the observant might behold it and acknowledge His Skill and Peerlessness, and Omnipotence, and Soleness, and not stand in need of proof and demonstration. Further, these forms, which are perceived in the material world, are the similitudes of those which exist in the world of spirits save that the latter are composed of light and are subtle; whereas the former are dark and dense. And, as a picture corresponds in every limb

[1] «... وانّما كلّها عالم واحد، كمدينة واحدة، اوكحيوان واحد، اوكانسان واحد.»
Jāmi'ah, I, 386.

[2] «... انّ العالم كلّه بافلاكه العاليه وسماواته السّاميه وما فيه من الانوار الروحانيّة والانفس المتحرّكه والقوى السّاريه فى اركان الجسمانيّة، والاجسام الطبيعيّة وجميع الموجودات و سائر المخلوقات، ممّا حوته السّماوات والارض، من اعلى عليّين الى اسفل سافلين كلّه جسم واحد، منتهىٰ بقبول الفيض الكلّيّ من بارئه سبحانه وان كلمة الله تعالى متصّلة به تمدّه بالافاضة والجود، ليتم ويبقى فى الوجود.»
Jāmi'ah, I, 635–636.

> with the animal it represents, so these forms, too, correspond with those which are found in the spiritual world. But these are the movers, and those the moved . . . The forms which exist in the other world endure; whereas these perish and pass away.[3]

In this world of symbols the Ikhwān study Nature with the purpose of discerning the wisdom of the Maker. "Know," they write, "that the perfect manufacturing of an object indicates the existence of a wise and perfect artisan even when he is veiled and inaccessible to sense perception. He who meditates upon botanical objects will of necessity know that the beings of this reign issue from a perfect artisan . . ."[4]

Of the many types of symbolism which the Ikhwān use, numbers are the most important because through numbers they are able to relate multiplicity to Unity and bring to light the harmony which pervades the Universe.[5] Regarding their treatise on music, the Ikhwān write:

> One of the aims of our treatise on music consists of demonstrating clearly that the whole world is composed in conformity with arithmetical, geometrical and musical relations. There, we have explained in detail the reality of universal harmony. We understand, therefore, that thus considered, the body of the world resembles an animal or the unique system of a single man or the totality of a city which shows also the Unity of its Maker (*mukhtari'*), the Creator of forms (*muṣawwir*), or of its Composer *mu'allif*), that is God.[6]

[3] Ikhwān al-Ṣafā', *Dispute between Man and the Animals*, trans. J. Platts, pp. 122–123.

[4] «... ثمّ اعلم ايّها الملك العادل انّ هذه الصّور والاشكال والهياكل والصفات الّتى تراها فى عالم الاجسام وجواهر الاجرام هى مثالات واشباه اصباغ تلك الصّور الّتى فى عالم الارواح غير انّ تلك نورانيّة شفافة وهذه ظلمانيّة كاسفة ومناسبة هذه الى تلك كنسبة التّصاوير والنّقوش الّتى على وجوه الارواح وسطوح الحيطان الى هذه الصّور و الاشكال الّتى عليها هذه الحيوانات من اللّحم والدّم والعظام والجلود لان تلك الصور الّتى فى عالم الارواح متحرّكات وهذه متحرّكات والّتى دون هذه ساكنات صامتات ومحسوسات فانيات فاسدات وتلك ناطقات معقولات روحانيّات غير مرئيّات باقيات.»
R., II, 232.

[4] *R.*, II, 130.

[5] For an exposition of the basic relation between mathematics and music among the Pythagoreans, see H. Kayser, *Akroasis, die Lehre von der Harmonik der Welt* (Stuttgart, 1947); English trans. R. Lilienfeld as *Akróasis, The Theory of World Harmonics* (Boston, 1970).
The Ikhwān once again demonstrate their strong Pythagorean tendencies when they in their treatise on music state that "the science of proportions—itself known under the name of music—is indispensable to all kinds of professions."

[6] *R.*, I, 160.

The science of number (*'ilm al-'adad*) is considered by the Ikhwān as the way leading to the grasp of Unity,[7] as a science which stands above Nature and is the principle of beings[8] and the root of the other sciences, the first elixir and the most exalted alchemy.[9] It is, moreover, the first effusion (*faiḍ*) of the Intellect imprinted upon the Soul[10] and the "tongue which speaks of Unity and transcendence."[11] No wonder, then, that the *Rasā'il* always compare the relation of God to the world—or, metaphysically speaking, of Being to existence—as that of One to the other numbers.[12] In the more esoteric *Risālat al-jāmi'ah*, it is implied in one place that Being (*al-wujūd*) corresponds to one, and the Infinite, or the Divine Essence, to zero. Zero, therefore, symbolizes the Divine Ipseity, which is above all determinations including Being.[13] As 'Awā writes:

[7] *Jāmi'ah*, I, 173. «... فانّه الطريق الى التوحيد ...»

[8] *R.*, III, 201. «... انّ الموجودات بحسب طبيعة العدد ...»

[9] «... انّ صور العدد فى النفوس مطابقة لصور الموجودات فى الهيولى وهى امتزاج من العالم الاعلى وبمعرفته يتدرّج المرتاض الى سائر الرياضيّات والطبيعيّات وما فوق الطبيعيّات وان علم العدد هو «جذر» العلوم، وعنصر الحكمة ومبداء المعارف اسطقّس المعانى، الاكسير الاوّل والكيميا الاكبر ...»

Jāmi'ah, I, 9. Later they identify the first elixir with God. *Ibid.*, p. 16.

[10] «... فكان علم العدد تأييدًا من العقل للنفس، وكان اوّل جود فاض من العقل على النفس ...»
Jāmi'ah, I, 28.

[11] *Jāmi'ah*, I, 30. «... وان علم العدد هو لسان ينطق بالتوحيد والتنزيه ...»

[12] *R.*, I, 28. This statement is made over and over throughout the *Rasā'il*. Referring to the creatures, the Ikhwān state that they proceed from God and return to Him, just like the generating and reduction of numbers with respect to unity. "Know, brother, that the Creator, Most Exalted, created as the first thing from his light of Unity the simple substance (*al-jawhar al-basīṭ*) called the Active Intellect (*'aql*)—as 2 is generated from one by repetition. Then the Universal Soul was generated from the light of the Intellect as 3 is generated by adding unity to 2. Then the *hylé* was generated by the motion of the Soul as 4 is generated by adding unity to 3. Then the other creatures were generated from the *hylé* and their being brought to order by the Intellect and the Soul as other numbers are generated from 4 added to what went before it . . ." *R.*, I, 28–29. The complete text of the treatise on arithmetic has been translated by B. R. Goldstein as "A Treatise on Number Theory from a Tenth Century Arabic Source," *Centaurus*, 10:129–160 (1964).

[13] *Jāmi'ah*, II, 295. Iamblichus likewise wrote that the series of numbers should be carried below one to zero (*to ouden*), which is their source. P. Tannery, *Mémoires scientifiques* (Toulouse, 1912) II, 196.

En un mot, "la théorie du nombre" est, aux yeux des Frères de la Pureté, la sagesse divine et est au-dessus des choses. Les choses ne sont formées qu'après le modèle des nombres.[14]

As we have already noted, the Ikhwān believed themselves to be the disciples of Pythagoras and of such followers as Nicomachus, especially in considering numbers as the cause of all things and the key to the understanding of the harmony pervading the Universe.[15] The basic question to be asked, therefore, is the exact meaning of the Pythagorean numbers which the Ikhwān employ constantly. A full study of this subject would require—to say the least—a treatise of its own and lies outside of our range of discussion. Considering the affinity of the Ikhwān with the Pythagoreans, however, particularly in mathematics, it is essential to define briefly the meaning of number and geometry according to this ancient Greek school, which was to have disciples until the very end of the Graeco-Roman period, and which was so influential in the formation of Muslim intellectual sciences.

The Pythagorean Notion of Arithmetic and Geometry

As Schuon has stated so accurately concerning the traditional notion of numbers:

> This is numbers in the Pythagorean sense, of which the universal rather than the quantitative import is already to be divined in geometrical figure; the triangle and the square are "personalities" and not quantities, they are essentials and not accidentals. Whilst one obtains ordinary numbers by addition, qualitative number results, on the contrary, from an internal or intrinsic differentiation of principial unity; it is not added to anything and does not depart from unity. Geometrical figures are so many images

[14] *L'Esprit critique des Frères de la Pureté* . . ., p. 62.

[15] «... وهى مطابقة لقول الحكماء والفيثاغوريين فى الاخبار عن كون الموجودات عن البارى سبحانه ككون الاعداد عن الواحد، واسباب الكائنات الكلّيات والجزئيّات عن البارى عزّ وجلّ وترتيبها فى الوجود كترتيب العدد الصحيح عن الواحد الذى قبل الاثنين وهذا القول اصوب الاقوال واصح المقالات وابين الدلالات، ولذلك وافق مذهب اهل هذا الرأى، مذهب اخواننا الكرام ...»

Jāmi'ah, II, 23.

"Pythagoras was the first who spoke of the nature of numbers. He taught that the nature of numbers is in relation with that of Nature. Whoever knows the nature of numbers, their species and genus and their properties, can know the quantity of species

of unity; they exclude one another or rather, they denote different principial quantities; the triangle is harmony, the square stability; these are "concentric," not "serial," numbers.[16]

The Pythagorean numbers, being a qualitative rather than just a quantitative entity, cannot be identified simply with division and multiplicity as can modern numbers. They are not identical with quantity, that is, their nature is not exhausted by their quantitative aspect alone. On the contrary, because they are a "projection of unity" which is never totally separated from its source, the Pythagorean numbers, when identified with a certain existing entity in the world of multiplicity, integrate that entity into Unity, or Pure Being, which is the source of all existence. To identify a being with a certain number is to relate it to its Source by means of the inner bond which relates all numbers to Unity.

The misunderstanding of this conception of numbers has made many ancient works, including the *Rasā'il*, appear ridiculous in the eyes of many modern readers.[17] Yet ancient sources as well as the Ikhwān have repeated many times exactly what they mean by numbers and how they make use of them. Just to cite an example, the famous first-century (A.D.) Pythagorean, Nicomachus, whose *Introduction to Arithmetic* and *Theologoumena Arithmetica* are among the most important and influential expositions of this school's theory of numbers, asks regarding the primacy of arithmetic over the rest of the *Quadrivium*:

Which then of these four methods must we first learn? Evidently, the one which naturally exists before them all, is superior and takes the place of origin or root, and, as it were, of mother to the others. And this is arithmetic, not solely because we said that it existed before all others in the mind of the creating God like some universal and exemplary plan, relying upon which as a design and archetype example the Creator of the Universe sets in order his material creations and makes them attain to their proper ends; but also because it is naturally prior in birth, inasmuch

of beings and their genus." Dieterici, *Die Philosophie der Araber*, vol. II: *Lehre von der Weltseele*, p. 441.

[16] F. Schuon, *Gnosis, Divine Wisdom*, trans. G. E. H. Palmer, p. 113, n. 1.

[17] "It would be ridiculous if one wished before having acquired any notion concerning the value and use of the algebraic signs, to explain a problem contained in these signs. This is, however, what has often been done relative to the language of Numbers. One has pretended, not only to explain it before having learned it, but even to write of it, and has by so doing rendered it the most lamentable thing in the world. The savants seeing it thus travestied have justly made it reflect, by the same language upon the ancients who have employed it." Fabre d'Olivet, *The Golden Verses of Pythagoras*, p. 228.

as it abolishes other sciences with itself, but is not abolished together with them.[18]

As for the meaning of numbers and their relation to Nature, he says:

All that has by nature and with systematic method been arranged in the Universe seems both in part and as a whole to have been determined and ordered in accordance with number, by the forethought and mind of Him that created all things; for the pattern was fixed, like a preliminary sketch, by the domination of number pre-existing in the mind of the world-creating God, number conceptual only and immaterial in every way, so that with reference to it, as to an artistic plan, should be created all these things, times, motions, the heavens, the stars, all sorts of revolutions.[19]

Similar definitions may be found in the writings of many other members of this school. In the Islamic world, Jābir, who employs numbers exclusively as the basis of the balance, also uses the qualitative number of the Pythagoreans, since the Jābirian balance is essentially an instrument for measuring the tendency of the World Soul toward each substance.[20] As for the Ikhwān, number for them is "*the spiritual image resulting in the human soul from the repetition of Unity.*"[21] It is, therefore, the "projection of unity," a projection which is never divorced from its source. And since numbers are the projection of the number one, the *Rasā'il* do not consider one itself to be the beginning of numbers. They believe two to be the first number and unity itself the origin and principle of all numbers.

In geometry, also, they follow the Pythagoreans by describing the "virtues" and "personalities" of various geometrical figures.[22] The final aim of geometry is to permit the faculties of the soul to reflect and meditate independently of the external world so that finally "it wishes to separate itself from this world in order to join, thanks to its celestial ascension, the world of the spirits and eternal life."[23]

The double aspect of mathematics, as a quantitative and qualitative science, makes this form of knowledge in a way "the ladder of Jacob." The use of mathematics in the study of the world of quantity

[18] Nicomachus, *Introduction to Arithmetic*, trans. M. L. D'Ooge (Chicago; Ency. Brit. 1953), p. 813. This work, which was translated into Arabic by Thābit ibn Qurrah, became one of the main sources of information in the Muslim world about the Pythagorean notion of numbers.

[19] Nicomachus, pp. 813–814.

[20] Or, as Corbin has said: "Puisque la Balance a pour principe et raison d'être de mesurer le Désir de l'âme du monde incorporé à chaque substance" ("Le Livre du Glorieux de Jābir ibn Ḥayyān," *Eranos Jahrbuch*, 18:84 [1950]).

[21] *R.*, I, 25 (italics ours).

[22] *R.*, I, 58–59.

[23] *R.*, I, 65.

becomes, therefore, a bridge by means of which one can journey from that world to the world of the archetypes. Number, because of its symbolic aspect, becomes not only the instrument of division but also that of unification and integration. The Pythagorean numbers as used by the Ikhwān, by virtue of their inner identification with the "Platonic ideas," or archetypes, of creation, have the power of synthesis in addition to that of analysis which they possess as a result of having a quantitative aspect.

In a further study of numbers which involves their odd-even, rational-irrational, and similar properties, the Ikhwān divide numbers into four groups: unities, dozens, hundreds, and thousands (much like the Chinese) and relate this fourfold division to the fourfold division which they see everywhere in Nature. They write:

> God himself has made it such that the majority of the things of Nature are grouped in four such as the four physical natures which are hot, cold, dry and moist; the four elements which are fire, air, water and earth; the four humours which are blood, phlegm, yellow bile and black bile; the four seasons . . . the four cardinal directions . . . the four winds . . . the four directions envisaged by their relation to the constellations (*awtād*); the four products which are the metals, plants, animals and men.[24]

If numbers are so closely bound to the "book of Nature," they are also intimately connected with the "book of Revelation"—that is, the letters of the Arabic alphabet, Arabic being the language of the Islamic Revelation. The Ikhwān use Table I for the numerical values of the letters:[25]

TABLE I. THE NUMERICAL VALUE OF LETTERS ACCORDING TO THE IKHWĀN AL-ṢAFĀ'

a	b	j	d	h	w	z	ḥ	ṭ	i,y	k	l	m
1	2	3	4	5	6	7	8	9	10	20	30	40

n	s	'	f	ṣ	q	r	sh	t	th
50	60	70	80	90	100	200	300	400	500

kh	dh	ḍ	ẓ	gh	bgh	jgh
600	700	800	900	1000	2000	3000

[24] *R.*, I, 27.

[25] *R.*, I, 26. For a discussion of the value of the letters of the Arabic alphabet and their symbolic meaning drawn from the *Jafr jāmi'* of Nasībī and *Shaṭḥīyāt* of Baqlī, see L. Massignon, *Essai sur les origines du lexique technique de la mystique musulmane* (Paris, 1954), pp. 90–101. There are actually thirteen different systems of numeral symbolism of which six, called *al-dawā'ir al-sittah*, are most frequently used. See Ibn Sīnā, *Kunūz al-mu'azzimīn* (Tehran, 1331 [1952]), Introduction by J. Homā'ī, p. 40.

The science of the numerical symbolism of letters, *'ilm al-jafr*, which is comparable to sciences of a similar nature that existed among the ancient Pythagoreans, the Hindus, and the medieval Kabbalists, is said by masters of this science in Islam to have come down from 'Alī ibn Abī Ṭālib. It plays a very important role in *taṣawwuf* and among many Shī'ite schools and is basic for the symbolic interpretation (*ta'wīl*) of certain Quranic texts.[26] The Ikhwān also make some use of it so that in a way they place numbers as the link and deciphering code between the book of Revelation and that of Nature.[27] The constant reference to numbers which we shall see in the following chapters, and the language of analogy which the Ikhwān employ so often, are so many ways of seeing Unity within multiplicity and multiplicity as the projected image of Unity.

The Hierarchy of Being

The creation of the world by God, or the manifestation of existence by Being, is compared by the Ikhwān to the generation of numbers from One. Having divided all beings into the particular and general, they further divide the latter category itself into nine "states of being," since 9, by virtue of coming at the end of the decimal cycle, closes that cycle, and symbolically brings to an end the series of numbers. The creation of the Universe, beginning with the Creator, descending through the multiple states of Being, and ending with the terrestrial creatures whose final link is man, is outlined in the following manner:

1. Creator—who is one, simple, eternal, permanent.
2. Intellect (*'aql*)—which is of two kinds: innate and acquired.
3. Soul (*nafs*)—which has three species: vegetative, animal, and rational

[26] Of the 28 letters of the Arabic alphabet, 14, or half of them, appear at the beginning of the various *sūrahs*. The Ikhwān, like Jābir and al-Majrīṭī, divide the alphabet into 14 letters corresponding to the septentrional signs of the Zodiac and 14 to the meridional; this division is also one of luminous and tenebrous qualities of soul and body. The 14 letters at the head of the *sūrah* correspond to the dark signs since due to inverse analogy the 14 visible signs are dark for the soul, and vice versa (*R.*, III, 152). This correlation between Nature and the Quran points to the correspondence which exists between the cosmic milieu and Revelation in the mind of Muslim authors. See L. Massignon, "La Philosophie orientale d'Ibn Sīnā . . .," *Mémorial Avicenne*, 4:9 (Cairo, 1954).

[27] "De même que le *ta'wīl* amène à éclore le sens ésotérique, alchimie et théurgie, médecine et astrologie, sont pour leur part autant d'exégèse du texte cosmique." Corbin, "Le Livre du Glorieux . . .," p. 77.

4. Matter (*hayūlā'*)—which is of four kinds: matter of artefacts, physical matter, universal matter, and original matter.
5. Nature (*ṭabī'ah*)—which is of five kinds: celestial nature and the four elemental natures.
6. Body (*jism*)—which has six directions: above, below, front, back, left, and right.
7. The sphere—which has its seven planets.
8. The elements—which have eight qualities, these being in reality the four qualities combined two by two:

   Earth—cold and dry
   Water—cold and wet
   Air—warm and wet
   Fire—warm and dry

9. Beings of this world—which are the mineral, plant, and animal kingdoms, each having three parts.[28]

There is an important distinction to be made in this table of generation. The first four numbers are simple, universal beings—the numbers 1 to 4 already containing in themselves all numbers, since $1 + 2 + 3 + 4 = 10$—while the other beings are compound.[29]

The Ikhwān describe the production of the "great chain of Being" in the following manner:

> The first thing which the Creator produced and called into existence is a simple, spiritual, extremely perfect and excellent substance in which the form of all things is contained. This substance is called the Intellect. From this substance there proceeds a second one which in hierarchy is below the first and which is called the Universal Soul (*al-nafs al-kullīyah*). From the Universal Soul proceeds another substance which is below the Soul and which is called Original Matter.[30] The latter is transformed into the Absolute Body, that is, into Secondary Matter which has length, width and depth.[31]

[28] *R.*, III, 185, 203–208. B. Carra de Vaux, *Les Penseurs de l'Islam*, IV (Paris: Geuthner, 1923), 109–110. In the text, numbers 2 to 9 in the outline are given as 1 to 8 so that with the Creator the total becomes 9. It should be noted that each general being is itself divided into a number of species equal to the number of that being. This ontological hierarchy is the basis of the Ikhwān's study of Nature and cosmology.

[29] It is from this point of view that the Ikhwān, in other places in their *Rasā'il*, divide the hierarchy of Being into the fourfold division of God, Universal Intellect, Universal Soul, and *hylé*. (*R.*, I, 28.)

[30] The hierarchy outlined here follows in many ways that of Jābir except that Jābir in his *Kitāb al-khamsīn* places Nature after the soul. See Kraus, *Jābir ibn Ḥayyān*, II, 150.

[31] Dieterici, *Die Lehre von der Weltseele*, p. 15. *R.*, II, 4f.

The Relation between God and the Universe

The bringing into being of various creatures by God does not in any way nullify in the mind of the Ikhwān the fundamental distinction between God and the Universe. The Universe is "all the spiritual and material beings who populate the immensity of the skies, who constitute the reign of multiplicity which extends to the spheres, the stars, the elements, their products and to man."[32] This Universe, which they sometimes call a city or an animal, but always something distinct from the Divine Unity, is related to God by its existence (*wujūd*), its persistence in being (*baqā'*), its completeness (*tamām*), and its perfection (*kamāl*). The Universal Intellect, which is at the same time a great veil hiding God as well as the great gate to His Unity,[33] inherits the four above-mentioned virtues from God and transmits them to the Universal Soul, which remains passive and feminine with respect to the Intellect.[34]

The Ikhwān also make use of the symbolism of love (*'ishq*) in terms similar to those used by the Ṣūfīs in order to show the attraction between God and the Universe. According to them, the whole world seeks the Creator and loves Him. In fact, the Creator is really the only Beloved (*ma'shūq*) and the only object of desire (*murād*).[35] They make the power of yearning (*shawq*) the very cause of the coming into being

[32] *R.*, I, 99. The Ikhwān write at times that God is above Being, while in other instances they imply that Being is divided into God and Universe. See R. L. Fackenheim, "The conception of substance in the philosophy of the Ikhwān aṣ-Ṣefā' (Brethren of Purity)," *Medieval Studies*, 5:117 (1945).

[33] «ان العالم كلّه بما فيه ، داخل فى امر الله عزّوجل ، غير خارج عنه ولا هارب منه ، وانّما فى قبضته وتحت ارادته ، فاوله ، واعلاه ، واقربه من باريه هو العقل وهو مثل الحجاب الاعظم ، والباب الاكبر ، الذى منه الوصول الى توحيد الله عزّوجل .»

Jāmi'ah, II, 33. The twofold aspect of the Intellect as created and uncreated seems to be implied here.

[34] *R.*, III, 188.

[35] «المعشوق ، المطاع المحبوب ، المراد المطلوب ، على الحقيقة هو البارى سبحانه وان الخلائق كلّها وجملة العالم باسرها مشتاقة اليه .»

Jāmi'ah, II, 159. Interpreting the Quranic verse «وَإِن مِّن شَيْءٍ إِلَّا يُسَبِّحُ بِحَمْدِهِ .» they say,

«التسبيح بحمده هو المسارعة الى امتثال امره ونهيه اليه والدّئوب .»

of things and the law governing the Universe.[36] It was through *shawq* for Allah that the Universal Soul brought the outermost sphere of the Universe, the *Muḥīṭ*, into existence. The *Muḥīṭ* in turn rotated to form the sphere below it, this process continuing all the way down to the sphere of the moon.[37]

Contrary to many followers of Hellenistic philosophy and cosmology, and particularly the Peripatetics, the Ikhwān believe in instantaneous creation rather than in the eternity of the world, and they severely criticize the *dahrīyūn*, or those who believe in the eternity of the world.[38] According to them, God has created the first four universal beings in the series of effusions (*faiḍ*) instantaneously. The other beings in the Universe, on the other hand, have been brought into existence directly by the Universal Soul "acting with the permission of Allah Most High."[39] The *Rasā'il* emphasize that the relation of God to the world is not just that of a mason to a house or of an author to a book:

The world in relation to Allah is like the word in relation to him who speaks it, like light, or heat or numbers to the lantern, Sun, hearth or the number One. The word, light, heat and number exist by their respective

[36] "God is the first Beloved of the Universe." Everything which is not God proceeds from Him and aspires to return to Him. This aspiration is the law of the Universe—the *nāmūs*, and the prophet is in fact called *ṣāḥib al-nāmūs*, the possessor of the Law.

„اعلم ان وقوف الافلاك عن الدوران هو موت العالم وبطلان حياة الكل ومفارقة النفس الكلية الفلكية من الاجسام كلها دفعة واحدة وتلك هي القيامة الكبرى والبؤرة الكلي وبطلان الجملة ..."

R., III, 275.

[37] *Jāmi'ah*, I, 276–278. Jābir also considers the *shawq* of the soul for Allah as the cause of the coming into being of the world. Kraus, *Jābir ibn Ḥayyān*, II, 156.

[38] According to the Ikhwān the Universe is not *qadīm*, or eternal, but *muḥdath*, or created. One day it will die when the Universal Soul leaves it, as a man dies when the soul leaves his body.

„العالم محدث مبدع مخترع كائن بعد ان لم يكن وان مبدعه ومخترعه ومحدثه وخالقه ومصوره هو البارئ جل جلاله ابدعه كما شاء وكيف شاء ..."

R., II, 76. They write regarding the death of the Universe:

„ان الله هو المعشوق الاول وان كل الموجودات اليه تشتاق ونحوه تقصد واليه ترجع - الامر كله لان به وجودها وقوامها وبقاءها وثباتها وكمالها انما هو الوجود المحض ولذته البقاء والدوام ... "

R., II, 77.

[39] *R.*, III, 330–332.

sources, but without the sources could neither exist nor persist in being. The existence of the world is thus determined by that of Allah . . .[40]

The use of numerical or light symbolism does not prevent the Ikhwān from emphasizing the absolute transcendence (*tanzīh*) of God with respect to the world.[41] Yet, they know also that His Qualities are "lines drawn by the fiat of effusion in the Book of the Universe like verses engraved in souls and in matter."[42]

The notion of the transitory and imperfect nature of this world and its corollary, the absolute perfection of God, which are so characteristic of the Islamic perspective, are expounded again and again throughout the *Rasā'il*. "There is no one in the world," they write, "who possesses every noble quality and every blessing . . . Perfection is for the Most High God alone, and for none besides."[43]

Also contrary to the Peripatetics and certain other Greek schools and their followers in the Muslim world, the influence of God in the Universe is not limited to the heavens nor bound by the "position" of God as the "Prime Mover." The Ikhwān envisage a Universe whose anatomy is based upon an ontological and not just a logical hierarchy. One of the Ikhwān tells us:

I have heard that some foolish men suppose that the favours of God, Most High, do not pass the lunar sphere. Were they to attentively regard and reflect upon the circumstances of all existing things, they would learn that His goodness and loving kindness comprehends all—small and great.[44]

In this Universe of purpose where "God, Most High, has created nothing in vain,"[45] there are correspondences and analogies, descents and ascents of souls, differentiation and integration, all knit into a harmonious pattern which is very far from a "rationalistic castle." It is rather the "cosmic cathedral" in which the unicity of Nature, the interrelatedness of all things with each other and the ontological dependence of the whole of creation upon the Creator, is brought into focus.

The Universal Intellect and Soul

As numbers 2 and 3 in the hierarchy of beings, standing just below the Creator, the Intellect and Soul assume the role of the principles

[40] *R.*, III, 319. [41] *R.*, IV, 252–256. [42] *R.*, IV, 225.
[43] Ikhwān, *Dispute between Man and the Animals*, trans. J. Platts, p. 34.
[44] *Dispute* . . ., p. 120. [45] *Ibid.*

of the whole Universe; the duality upon which things are based returns to them in one way or another.

Various people have said that the world is made of form and matter, others light and darkness, substance and accident, spirit and body, Guarded Tablet and Pen, expansion and contraction, love and hate, this world and the next, cause and effect, beginning and end, exterior and interior, high and low, heavy and light.[46]

But, according to the Ikhwān, "in principle all these views are the same; they disagree only in secondary aspects and in expression." In all these cases the duality refers to the Intellect and Soul which contain in themselves the active and passive principles through which the life and activity of the Universe can be understood. Creation is the "dynamic" and "feminine" aspect of the Divine. It itself possesses an "active" and "masculine" aspect which is called Nature and which is the source of all activity in the Universe; and a "passive" and "feminine" aspect which to us appears as the "matter" or "inert" base of this activity.[48]

In the chain of causation, the Intellect can be said to have only an efficient Cause which is God.[49] With respect to God, the Intellect is purely passive, in obedience, tranquillity, and permanent desire for union with the Divine Principle. Since the Intellect is the highest being in the Universe, its passivity with respect to God may be said to symbolize the passivity of the whole of creation with respect to the Creator. The Universe can only receive while the Creator can only give.[50]

The Universal Soul in turn acts passively, and like "matter," with respect to the Intellect, which is active with respect to it. It has only two causes, the efficient one being God and the formal one the Intellect.[51] The Universal Soul receives from the Intellect all the virtues, forms, and positive qualities, and transmits them in turn to the whole of the Universe.[52]

The Universal Soul is to the Universe what the human soul is to the human body, and it has, therefore, for its field of action—in the geocentric cosmos where the earth lies stationary at the center with nine concentric spheres around it—the whole of the Universe from

[46] *Jāmi'ah*, II, 7–8. [47] *Jāmi'ah*, II, 8.

[48] For a full explanation of the active-passive polarization in the Universe, see T. Burckhardt, "Nature sait surmonter nature," *Etudes Traditionnelles*, 51:10ff (1950).

[49] The Ikhwān interpret by symbolic interpretation (*ta'wīl*) the Quranic verse (XVII, 89): "And verily we have displayed for mankind in this Qur'ān all kinds of similitudes . . ." to justify this assertion scripturally.

[50] *R.*, III, 187ff. [51] *R.*, III, 233. [52] *R.*, III, 235.

the outermost sphere which is the *Muḥīṭ* to the center of the earth.[53] It is also the prime-mover which makes the sphere of the fixed stars perform its diurnal motion.[54] All bodies in the Universe are like tools in the hand of the Universal Soul which performs all actions through them in the same way as a carpenter uses his tools for various ends.[55] All change in the Universe, therefore, is directed by the Soul.

The Ikhwān emphasize the dominance of the Universal Soul over the whole Universe:

This Universal Soul is the spirit of the world as we have exposed it in the treatise where we said that the world is a great man. *Nature is the act of this Universal Soul.* The four elements are the matter which serve as its support. The spheres and the stars are like its organs, and the minerals, plants and animals are the objects which it makes to move.[56]

The Universal Soul can be divided in several ways according to what aspect of its multiple activities is envisaged. The Ikhwān sometimes divide its forces into fifteen parts: seven superhuman, one human, and seven subhuman. The two divisions immediately above are the angelic and prophetic, while the two immediately below are the animal and vegetative.[57] In this vast cosmos, from the outermost heaven which symbolizes the spiritual and intellectual world to the earth which being farthest away from heaven symbolizes material existence, the parts of the Soul move according to three motions:

(1) Away from the outer sphere (*Muḥīṭ*) toward the world of generation and corruption and ultimately hell.
(2) Upwards toward heaven.
(3) Horizontal oscillation without knowledge of where to go, as in the souls of animals.[58]

[53] *R.*, II, 224.

[54] Carra de Vaux, *Les Penseurs de l'Islam*, IV, 107. Placing *al-nafs al-kullīyah*, or the Universal Soul, at the heaven of the fixed stars was already accomplished by Jābir. Kraus, *Jābir ibn Ḥayyān*, II, 137–138, n. 5.

[55] ". . . وانّما لها فضل الا لفضس وانّما فضل افعالها بقوّتها في الاجسام وان لاجسام كلّها آلات ولحركاتٌ و مفعولات بها ."

R., II, 56.

[56] Dieterici, *Lehre von der Weltseele*, 43ff. Also Carra de Vaux, *Les Penseurs de l'Islam*, IV, 107 (italics ours).

[57] *R.*, I, 240. Also 'Awā, *L'Esprit critique* . . ., p. 167.

[58] 'Awā, *ibid.*, p. 168. There is a striking resemblance between the three cosmic tendencies of ascent, descent, and horizontal expansion described by the Ikhwān and the

The cosmic tendencies and qualities which are to be found everywhere owe their existence to these fundamental tendencies of the Universal Soul which is the cause of all activity in the world.

Matter

The notion of matter is elaborately developed by the Ikhwān and along lines which separate their views from those of the Aristotelian school. According to the Ikhwān, Prime Matter is already far removed from Pure Being and possesses in itself only existence and persistence. It is, however, a positive spiritual principle rather than just potentiality. It is the first being in the descending scale of beings here considered that does not desire virtue and goodness by itself. However, it is still a "spiritual form emanating from the Universal Soul";[59] it is still simple, intelligible, and imperceptible to the senses. Coming after the numbers 1, 2, and 3, it has three causes, the efficient being God, the formal the Intellect, and the final the Soul.[60]

Primary Matter is to be distinguished from Secondary Matter, the latter being the first metaphysical step toward the concrete. Primary Matter first receives the three spatial dimensions to become the Absolute Body (*al-jism al-muṭlaq*), or "the matter of the all." Then Secondary Matter comes into being with God as its efficient cause, the Intellect as its formal cause, and the Soul as the final cause. As for the material cause, it belongs to Secondary Matter itself and resides in the simple substance which admits of three dimensions. Hence four causes come to act upon all bodies which are composed of Secondary Matter.[61]

As mentioned already, the Ikhwān use "matter" in four distinct ways:

(1) Matter of artificial works.
(2) Matter of natural objects.
(3) Universal Matter (or Secondary Matter).
(4) Original Matter.

These four types are described in the following manner:

The natural matter consists of fire, air, water and earth. All that is found in the sublunary sphere—the animals, plants, and minerals—come from

three Hindu *gunas*: *sattwa*, *tamas*, and *rajas*. See R. Guénon, *Man and his Becoming According to the Vedanta*, trans. R. C. Nicholson (London, 1945), pp. 51–52.

[59] *R.*, III, 230.

[60] *R.*, III, 233. Also 'Awā, *L'Esprit critique* . . ., pp. 168–169.

[61] *L'Esprit critique*, pp. 170–171.

these constituents and by corruption return to them. *Their creator is Nature* which is one of the forces of the celestial Universal Soul.

Universal Matter is the Absolute Body. From this Body is drawn the entire corporeal Universe, that is, the celestial spheres, stars, the elements and all other beings whatever they may be. They are all bodies and their diversity comes only from their diverse forms.

Original matter is a simple and ideal substance which cannot be sensed because it is none other than the form of unique existence; it is the primitive foundation. If this foundation receives quantity it becomes by virtue of that reception the Absolute Body about which one affirms that it has three dimensions—length, breadth and thickness. If this foundation receives quality, as, for example, the form of a circle, triangle or rectangle, it becomes a special body which is determined as being such and such. Thus quality is equal to 3, quantity to 2, and the primitive foundation to 1. Just as 3 comes after 2, so does quality come after quantity, and just as 2 comes after 1, quantity comes after the primitive foundation. In its existence the primitive foundation precedes quantity and quality as 1 precedes 2 and 3.

The primitive foundation, quantity, and quality are simple, ideal forms which cannot be sensed. When one of them is united to another, the first is matter at the same time that the second is form. Quality is form with regard to quantity, and quantity is matter for quality. Quantity in its turn is form for the primitive foundation, and the primitive foundation is matter for quantity.[62]

In summary, we can present the Ikhwān's notion of matter in the following hierarchy:

Original Matter—possessing no determination other than existence.
↓
Universal Matter—possessing quantity and the three dimensions (Absolute Body).
↓
Determined Body—formed of the union of Absolute Body playing the role of matter and a particular form.

Matter then possesses several levels of existence, each more "condensed" and "coagulated" than the next, beginning with the primary or original matter which does not even possess quantity and is a spiritual form, and ending with the matter of particular objects which are perceptible by the senses and are the terminal stage of manifestation, being as far away from the Divine Principle as the conditions of cosmic manifestation permit.

[62] *R.*, II, 4ff. Dieterici, *Die Naturschauung und Naturphilosophie der Araber* . . . (Berlin, 1861), pp. 2–3, and E. Duhem, *Le Système du monde* (Paris, 1913–1919), IV. 466–467.

Nature

The Ikhwān emphasize in their description of the Universal Soul that it is the cause of all actions in the Universe. Now, as the matter which was described above is acted upon in one way or another and is the receiver of action, so is one of the faculties of the Universal Soul the cause of all change and activity in the sublunary region; this faculty is called Nature.

Nature is none other than one of the faculties of the Universal Soul of the spheres which is propagated in all the bodies existing in the sublunary region beginning from the sphere of the ether until the center of the world. Bodies below the sphere of the moon are of two kinds: simple and complex. There are four simple bodies: fire, air, water and earth; and three types of composed bodies: minerals, plants and animals. This faculty which I like to call Nature is spread within all things as clarity is spread in the air. Its Nature makes them move or rest, it governs them, it perfects them and makes each come to the place where it tends according to how it becomes them.[63]

All events occurring on earth and below the sphere of the moon are then due to this spiritual agent called Nature which orders all change and is the cause of all "physical" events we see here around us.[64] It is in the affirmation of this view that the Ikhwān write in another passage that:

Nature is only one of the faculties of the Universal Soul which has expanded in all the sublunary bodies. In the language of religion (*shar'ī*) it is called the Soul in charge of maintenance and organization or order in the world by permission of Allah. In philosophic terminology, it is a natural force acting by the permission of the Creator on the bodies in question. Those who deny the action of Nature have not understood the true sense of these denominations . . .

Know, Oh Brother, that those who deny the action of Nature say that there is no proper action except by the Alive, the Powerful [this is in reference to the Ash'arite theologians]. This saying is correct; however,

[63] Dieterici, *Lehre von der Weltseele*, p. 43; *Jāmi'ah*, I, 311; Carra de Vaux, *Les penseurs de l'Islam*, IV, 106–107.

[64] «اعلم انّ لمّا كان الذين يتكلّمون في الحوادث والكائنات التي هي دون فلك القمر من الحكماء والفلاسفة العلماء ينسبون هذه الآثار والافعال كلّها الى الطبيعة .»
Jāmi'ah, I, 309.

«الطبيعة ... قوة من قوى النفس الكليّة وهي سارية في جميع الاجسام التي دون فلك القمر من لدن كرة النار الى منتهى مركز الارض .»
Jāmi'ah, I, 311.

they think that the Alive, the Powerful, does not bring into existence except by means of a body . . . They do not know that there is along with the body a substance which is ultimately spiritual and invisible. This is the Soul, which they describe as being an accident, by means of which change occurs in the body. It is this, that is, the Soul, by means of which actions appear in bodies.[65]

The concern of the Ikhwān in describing nature is more with what the Latins, with a somewhat different connotation, called *natura naturans* and not so much with *natura naturata*, which forms the subject matter of the modern natural sciences.

The *Rasā'il* emphasize the importance of understanding and accepting the presence of this spiritual force called Nature which is the performer of all actions. In fact, they often identify materialists with those who deny Nature, for they know that the cosmological and metaphysical aspects of the traditional sciences such as astrology, and not the predictive aspect, which is completely secondary, derive directly from this conception of an organic Universe where the sublunary parts have no autonomy of their own independent of the Universal Soul[66] and its faculty Nature, any more than human limbs have any autonomy of motion independent of the human will which moves them. The consideration of "inert matter" to which motion and life are incidental is diametrically opposed to the Ikhwān's conception of the activity of the physical domain as being due to the force of Nature which pervades it throughout. The Universe for the Ikhwān acts more like a live organism whose motions come from a force within rather than a cadaver to which external motion has been added.

The Spheres and the Elements

The astronomy of the Ikhwān—which will be discussed in greater detail below—conforming to the general view of medieval cosmologists, places the earth at the center of the Universe with the Moon, Sun, and the planets rotating about it. Beyond the sphere of Saturn there is the Sphere of Fixed Stars and finally the outermost sphere, or *Muḥīṭ*. In the heavens, which possess circular motion, perfect circular

[65] *R.*, II, 55. See also *R.*, II, 112–113.

[66] According to the Ikhwān, the Universal Soul acts through three agents: the 12 signs of the Zodiac, the heavens (*aflāk*) and the planets. *Jāmi'ah*, I, 313. The action of these agents upon the sublunary region which underlies the whole of astrology is a necessary consequence of the function of the Universal Soul as the cause of all action in the world. Moreover, the agents of the Universal Soul act upon this world as a soul upon a body, not as almost "material rays" or any gross ideas of the kind entertained by so many modern astrologers.

form and movement are joined to matter to bring into being the quintessence, or the substance, of which the heavens are made. By the quintessence the Ikhwān mean a substance having such properties that "on the one hand the celestial bodies accept neither generation nor corruption nor change nor transformation nor augmentation nor diminution, and that on the other hand their movements are all perfect, thus circular."[67] The "quintessence" or "fifth element," of the Ikhwān, however, differs from the ether of Aristotle or Ibn Sīnā. Whereas the latter school considers the cosmos as being completely divided into two regions, the sublunary made of the four elements and the celestial made of ether which does not possess any of the four essential qualities of hot, cold, wet, and dry, the Ikhwān conceive of a unified cosmos in which the quintessence also possesses the four qualities.[68] Otherwise it would not be possible to assign to the planets and the signs of the Zodiac the qualities which are the basis of astrology. This distinction between a divided and unified cosmos is to be found throughout the Middle Ages among the Aristotelian and Hermetic schools.

By the elements, the Ikhwān—like nearly all other Muslim authors—mean the four elements mentioned by Empedocles and Aristotle, that is, fire, air, water, and earth, which, as described above, possess in pairs the combination of the four qualities of heat, cold, dryness and moistness. They refer to the sphere of the elements as *usṭuqus*, from the Greek term *stoichos*, meaning support or base, since the elements are the ground from which the creatures of the earth come into being. The elements are the constituent parts of all the members of the three kingdoms of minerals, plants, and animals. Nature acts upon these elements in various ways, and the soul appropriate to each kingdom and each species is added to this mixture by the Universal Soul in order to bring particular members of each species into being. The elements cannot act by themselves but are always subservient and passive to the force of Nature which acts upon them from above and within.

Time, Space, and Motion

The physics of the Ikhwān, unlike that of Aristotle, does not have the problem of motion as its central subject. In fact, in order to understand fully the physics of the Ikhwān, it is necessary to go beyond not only the Cartesian conception of matter but also the *materia* of the Stagirite. One can say about the Ikhwān with respect to the problem of motion what has been said about the early pre-Socratic Greek philosophers:

> If we would understand the sixth-century philosopher, we must disabuse our minds of the atomistic conception of dead matter in mechanical motion and of the Cartesian dualism of matter and mind. We must go back to the time when motion was an unquestionable symptom of life, and there was no need to look for a "moving cause." Matter or body requires a distinct moving cause only when it has been deprived of its own inherent life . . . Motion was inherent in the divine stuff because it was alive . . .[69]

The Universe which the *Rasā'il* describe is, like the cosmos of the ancient Greeks, one which is alive, being composed of a body and the Universal Soul which animates the whole of it. Consequently, the question of motion does not have the same status with the Ikhwān as it does with either Aristotle or the Cartesians.

Inasmuch as things do move, however, and events do take place in time and space, the conception of these primary matrices of physical events and necessary conditions of terrestrial existence must be described. Time and space, which are intimately connected with motion, are considered in the *Rasā'il* more from their cosmological aspect than from the kinematic point of view.

The Ikhwān reject the Aristotelian notion of time as being nothing but the measure of movement, although they still relate it to the motion of the heavens, which are the generators of space as well as of time.[70] But they consider also the psychological aspect of time, about which they write:

> Time is a pure form, an abstract notion, simple and intelligible, elaborated in the soul by the faculties of the spirit. It is born there through meditation upon the regular repetition of nights and days around the earth and resembles the generation of numbers by the repetition of One.[71]

[67] *R.*, II, 39.

[68] The Ikhwān do, however, agree with the Peripatetics that the ether is beyond corruption and heaviness and lightness. Sometimes they even imply that it is beyond the four qualities, but most often assign qualities to the planets and signs of the Zodiac. See *R.*, II, 26ff, 39–42.

[69] F. M. Cornford, *Principium Sapientiae* (Cambridge University Press, 1952), pp. 179–181.

[70] *Jāmi'ah*, I, 177. «ولما كان الفلك هو سبب وجود المكان، وعدد حركاته هو الزمان. ولما كان الزمان مقدار حركة الفلك.»

Jāmi'ah, I, 48. Inasmuch as the Universal Soul is the cause of motion of the heavens, it is also the cause of space and time.

[71] *R.*, II, 15.

Time is also intimately connected with creation and in fact is created with the world. Likewise, the last Day (*yawm al-qiyāmah*) is not just another day in time but the termination of time itself.[72]

As for space, it has no reality independent of this world, but is, on the contrary, one of the conditions of physical existence. It is therefore useless to ask whether there is vacuum or plenum outside of the Universe. There is neither one nor the other because there is no space outside the cosmos and the Universe cannot be said to be in space.[73] Rather, all that is in space is by nature dependent upon the Universe. From a physical point of view space, or place, is the boundary of bodies as defined by Aristotle and the Muslim Peripatetics.[74] From a more inward point of view it is an abstract, simple, intelligible idea, "a form abstracted from matter and existing only in the consciousness,"[75] rather than either the surface of a substance or the void. The Ikhwān, as a matter of fact, reject the possibility of a void; since, according to them, and following the argument of the Aristotelians, a void must be in a place, or what is currently called space; but place is a quality of bodies and cannot be found except where there are bodies, so that where there are no bodies there is no place or space and, therefore, no void. On the contrary, space for the Ikhwān is something always filled, even when it seems empty to the senses. "Not a span of space is there," they write, "but what is occupied by spirits who dwell therein."[76] They never say, however, that all of space is filled only by "material" or "physical" beings; for them space dwelt in by spirits is as "full" as one filled by water.

The question of motion is inseparable from the Universal Soul and its faculties inasmuch as all motion is due to this soul. As the Ikhwān state: "We call 'souls' certain real substances, living and moving by their essences, and we designate under the name 'move-

[72] *Jāmi'ah*, II,'48–49.

[73] « وليس خارج العالم شيئ آخر ، لا خلاء ولا ملاء ، وليس في مكان ، وكل ما فيه مكان موكل به ، وكل واحد من العالم بمكان هو اليق به من امكنة العالم ... »

Jāmi'ah, II, 24.

[74] *R.*, III, 361. « ... وكل موضع تمكن فيه المتمكن ، وهي نهايات الاجسام »

For the definition of place given by Aristotle, see his *Physics*, bk. IV, chap, iv; also H. Wolfson, *Crescas' Critique of Aristotle* (Cambridge, Mass., 1929) chap. II.

[75] *R.*, II, 9–10.

[76] Ikhwān, *Dispute between Man and the Animals*, trans. J. Platts, p. 229.

ment' the actions of a soul on a body."[77] And again: "By its active life the soul models the matter of the body as well as that of the exterior world."[78]

Universal Soul, then, is the cause of motion, while "movement is a form imposed on a body by the Universal Soul after it has been shaped, and rest is the absence of this form."[79] Comparing movement to light, the Ikhwān consider motion not as a material activity but a spiritual form. "Movement is a spiritual and complimentary form (*al-ṣūrat al-rūḥānīyah*) which traverses all parts of moving bodies and expands within them instantaneously like light in order to terminate abruptly their rest."[80]

They give several different classifications of motion, one being according to the objects moved, that is, the movement of the seven heavens, the fixed stars, planets, comets, meteors, air, wind, and other meteorological phenomena; seas, streams, rain, motion of the interior of the earth such as earthquakes, or of beings like the minerals inside the earth, the plants and trees on the surface of the earth, and finally the animals in various directions of space.[81] To realize that all of these movements, which are so diverse in appearance, are due ultimately to a single agent who is the Universal Soul is to see in a striking way the unicity of Nature. To show further the interrelatedness of all things, the Ikhwān also classify the motions of the Spirit (*rūḥ*), in a manner similar to that of bodies, and relate the two to each other. For example, they compare the motion of the interior of the earth with the abrogation (*naskh*) of previous *sharī'ahs* by the Prophet Muḥammad—upon whom be peace—and the motion of the planets to the *sharī'ah* of the various prophets.[82]

Another method of classification closer to the Aristotelian, and in a way reducible to it, is outlined on the following page.

The Ikhwān, however, do not proceed much further in discussing the intricacies of motion in a manner that one finds in the writings of Ibn Sīnā or Abu'l-Barakāt al-Baghdādī. The main interest of the authors of the *Rasā'il* remains the unified and organic Universe whose unicity they seek to bring to light through analogy and symbolism.

[77] *R.*, III, 306. « قد بينا ان المحرك والمسكن للاجسام هي النفس »

R., III, 305. It should be emphasized that the souls in various species in the world such as the animal and vegetative do not actually signify a plurality of souls but various functions of the single Universal Soul.

[78] *R.*, I, 225. [79] *R.*, II, 12. [80] *R.*, II, 12.

[81] *Jāmi'ah*, II, 238. [82] *Jāmi'ah*, II, 253ff.

- Motion
  - Physical (*jismānī*)
    1. Generation (*kawn*)—passage of something from potentiality to act by which things come into existence.
    2. Corruption (*fasād*)—the reverse of generation.
    3. Augmentation (*ziyādah*)—stretching of the extremities of a body with respect to its center.
    4. Diminution (*nuqṣān*)—opposite of augmentation.
    5. Alteration (*taghyīr*)—change of quality of an object, such as its color.
  - Spiritual (*rūḥānī*)
    6. Translation, or local movement (*naqlah*)—passage in space and time from one point to another.
       - Straight (*mustaqīmah*)
       - Circular (*mustadīrah*)
       - Combination of the two (*murakkabatun minhumā*)[83]

The Analogy of Microcosm and Macrocosm and the Great Chain of Being

All the principles and concepts which have been explained thus far are integrated by the Ikhwān into the closely related ideas of the analogy of the microcosm and macrocosm and the chain, or hierarchy, of being. Both of these ideas are universal and far from being limited to Greek, Islamic, or Christian cosmologies, have their exact counterparts in China, India, and elsewhere. They are moreover, "conceptual dimensions" which through their beauty and profundity can lead the soul far beyond the domains of the physical aspects of Nature. Both ideas, in fact, belong to the domain of theology and metaphysics as well as to cosmology. The Ṣūfī doctrine concerning the Universal Man (*al-insān al-kāmil*), the Hindu conception of *Purusa*, and the Chinese *Chen-jen* all attest to the universality of the macrocosm-microcosm analogy and its importance in domains beyond that of the sciences of Nature. In the study of the Universe, also, these ideas hold a vital position, because they serve as the central link in showing the unicity of Nature and in demonstrating the inward relation between man and Nature; consequently, the study of Nature in medieval science acts as a support for spiritual realization, as conversely, the study by man of himself leads to his understanding of the inner aspects of Nature.[84]

[83] *Jāmi'ah*, II, 237. *R.*, II, 10–13.

The essential techniques of numerical symbolism and analogy, which, as we mentioned above, form the basic language of the Ikhwān, are used throughout the *Rasā'il* in the context and the service of illuminating the reality and beauty of the relation between the microcosm and macrocosm and the hierarchy of Being. To a reader unsympathetic to this perspective, such efforts may seem artificial and unreal. If, however, one possesses the "conceptual perspective" necessary for an understanding of these symbols, the beauty and grandeur of these analogies become evident. A physical "application" of this doctrine, which is easier to visualize than its literary description, is found in the medieval cathedral and the Hindu temple. Both of these buildings are the "body of the Universal Man" as well as a miniature cosmos, and reflect in their beauty the grandeur of the conceptions which underlie their construction. In Islam, also, *taṣawwuf* itself and much that is the fruit of the Ṣūfī spirit, whether it be in poetry or in architecture, express in the last analysis the doctrine of the Universal Man[85] which along with Unity (*al-tawḥīd*) comprises the essence of Islamic spiritual doctrines.

Nearly every chapter of the *Rasā'il* and every domain of Nature that is studied is elucidated and elaborated with reference to the analogy between man and the Universe. The Ikhwān write:

> Know, oh Brother, that by the Universe (*'ālam*) the sages (*ḥukamā'*) mean the seven heavens and the earths and what is between them of all creatures. They also call it the great man (*al-insān al-kabīr*) because it is seen that the world has one body in all its spheres, gradation of heavens, its generating elements (*arkān*) and their productions. It is seen also that it has one Soul (*nafs*) whose powers run into all the organs of its body, just like the man who has one soul which runs into all of his organs. We desire to mention in this treatise the form of the world and describe the composition of its body as the body of man is described in a book of anatomy. Then in another treatise we shall describe the quality of the Soul of the world and how its powers run into the bodies in this world from the most

[84] These remarks, which have been drawn from a general study of medieval cosmological texts, are emphasized over and over by the Ikhwān throughout the *Rasā'il*.

[85] For an exposition of the doctrine of the Universal Man and its function in cosmology, see R. A. Nicholson, *Studies in Islamic Mysticism* (Cambridge, England, 1921), chapter on "The Perfect Man"; also *De l'homme universel* (Paris, 1975) by 'Abd al-Karīm al-Jīlī, trans. T. Burckhardt.

high sphere of *Muḥīṭ* to the lowest point which is the center of the earth.[86]

Our study of the heavens and earth, the three kingdoms, and finally man as the microcosm will fully demonstrate how this analogy exists. Often in their study of the Universe, the Ikhwān give analogies from the microcosm to illustrate an otherwise difficult concept concerning cosmology. For example, the relation of the Universal Soul to the Universe, described above, becomes concrete and vivid when compared to the human soul and body. Or the comparison of the death of the Universe to human death makes what appears as a far-away event a very "real" one. But the Ikhwān also apply analogies in the reverse sense, explaining the constitution of the human being by correspondences drawn from the heavens and earth, again in order to make vivid and "real" some aspect of man, and, what is more important perhaps, to demonstrate his cosmic qualities and significance. We shall explore this aspect fully in the chapter on man as the microcosm, which begins with the statement: "Our end consists of showing here how man can be considered as a small world".[87] This implies that the knowledge of man's soul is essential to a knowledge of the external world.

In making analogies between various parts of the cosmos and man, the part of the cosmos above the Moon, which is the most beautiful and perfect part of the Universe, is compared to the Universal Man (*al-insān al-kullī*),[88] while the sublunary region, where change occurs and where good and evil souls are mixed together, is compared to the particular man (*al-insān al-juz'ī*). The human being is created between the Universal and particular man and takes part in the nature of each.[89] Also, particular man is created from the Universal Man just as in the creation of the world the sublunary region is generated from the heavens and is always passive and obedient with respect to them.[90]

The cosmological chain, starting from Unity, which symbolizes

[86] « اعلم ايها الاخ ان معنى قول الحكماء العالم انه يعنون به السماوات السبع والارضين وما بينهما من الخلوق اجمعين . وسموه ايضا انسانا كبيرا لانهم يرون انه جسم واحد بجميع افلاكه واطباق سماواته واركان امهاته ومولداتها ... »
R., II, 20.

[87] *R.*, II, 318.

[88] The Ikhwān use a different term for Universal Man from that of the Ṣūfīs, the latter usually using *kāmil* rather than *kullī*, although the term *kāmil* is also known to the Ikhwān.

[89] *Jāmi'ah*, I, 612–615.

[90] « ... في معرفة الانسان الكلي الكامل ، الذي من اجله خلق الانسان الجزئي ... »
Jāmi'ah, I, 610.

the Creator, up to the number 9, which is the domain of the three kingdoms, already contains the basis of the chain of being. The chain of being essentially means that all beings in the Universe exist according to a continuous hierarchy which is ontological as well as cosmological. A particular entity has a position in the great chain of being depending upon the degree to which it participates in Being and Intelligence; or, one might say, upon the degree to which it possesses the perfections and virtues which in the absolute sense belong only to Pure Being, or God, who is transcendent with respect to the chain. The Ikhwān, like the Ṣūfīs, make the hierarchy of being dependent upon the degree to which anything possesses beauty or, in other words, participates in the Absolute Beauty which is an inner attribute of God.

Starting from the highest heaven, which is nearest to the Divine, the hierarchy of being descends through the heavenly spheres—symbolizing the angels—and down to the world of the four elements, of which the heaviest, the earth, is the one farthest away from the pure light of heaven. The elements then are mixed to various degrees by the Soul which from them forms the three kingdoms. The process terminates with man, who is the final term of the effusion: "The unity and complexity of his soul and body respectively make him 'the antipode of God.' "[91] By virtue of this position, man is the central link in the great chain; below him stands the animal kingdom, and above, the world of the angels, and he is connected to one domain as well as to the other.[92]

According to the Ikhwān, the qualities and perfections belonging to the various levels of the hierarchy of being are not in any way "subjective" or "anthropomorphic," but, being a part of their ontological status, are completely independent of the whims and fancies of the "thoughts" of men. In the three kingdoms of mineral, plant, and animal, good and evil (*maḥmūd* and *madhmūm*) souls are mixed independently of human will. The beautiful and good qualities of these kingdoms are manifestations of the good souls, while what is ugly is due to the evil souls, which the Ikhwān call "satanic forces" (*shayāṭīn*).[93] These qualities, being an inherent part of each object,

[91] *R.*, III, 3–5. 'Awā, *L'Esprit critique* . . ., p. 172.

[92] « ولما كان آخر مرتبة الانسان متصلا بأول مرتبة الملائكة ، وآخر مرتبة الحيوان متصلا بأول مرتبة الانسان ، وجب ان يكون الانسان مجموعا من العالمين متوسطا بينهما . »
Jāmi'ah, I, 342.

[93] *Jāmi'ah*, I, 367ff.

are transmitted along with that object. For example, if a plant possesses certain good qualities, it transmits them to the animal that eats it. Or if the flesh of a particular animal has evil qualities, these qualities affect the man who eats that flesh. This effect, however, is not just physical; rather, the soul of man is also affected by it.[94] One can derive from this view of the Ikhwān the reason for the dietary prohibitions existing in various religions like Islam and Judaism, each of which is established in conformity with the spiritual and psychological "economy" of a segment of humanity.

In the three kingdoms, each end member is connected to the first member of the next domain.[95] Minerals are connected below to water and earth, and their lowest types are alum, hyacinth, and vitriol, which are very close to earth. Red gold, on the other hand, stands highest among the minerals and approaches the world of the plants. Among plants, moss is the lowest order approaching the mineral kingdom, while the palm tree, which already has a differentiation of sexes, stands between the plant and animal worlds. Among animals, the snail is mentioned as being closest to the plant world and the elephant—being highest in intelligence among the animals—nearest to man. Inasmuch as this hierarchy is based on the degree of intelligence and the development of interior faculties rather than on external similarities, we find that the Ikhwān name the elephant rather than the monkey as the animal closest to man. This is a good example of the difference between the traditional idea of gradation which is based on interior qualities and ontological status and the modern theories of evolution which are based on the physical behavior and the external similarities of creatures.

The whole chain of being, the cosmos and man, the qualities of the Universe and its parts, as well as of man, the prophets and kings, the three kingdoms and the angels—all this is summarized by the Ikhwān in a diagram which conceptualizes their relation with each other. In the diagram of Figure 1 the viewer is faced once more with the unicity of Nature and the interrelatedness of all things from the "highest of

[94] *Jāmi'ah*, I, 379–382.

[95] « واعلم يا اخي بان اوّل مرتبة الحيوان متصل بآخر مرتبة النبات وآخر مرتبة الحيوان متصل بأول مرتبة الانسان كما ان اوّل المرتبة البنية متصل بآخر المرتبة المعدنية واوّل المرتبة المعدنية متصل بالتراب والماء ... »

R., II, 143.

the high" to the "lowest of the low," which is a constant theme of the medieval cosmological sciences.[96]

The chain of being described by the Ikhwān possesses a temporal aspect which has led certain scholars to the view that the authors of the *Rasā'il* believed in the modern theory of evolution.[97] From what we have discussed thus far, however, the divergence of the Ikhwān from modern theories of evolution should be clear. First of all, according to the *Rasā'il* all changes on earth occur as acts of the

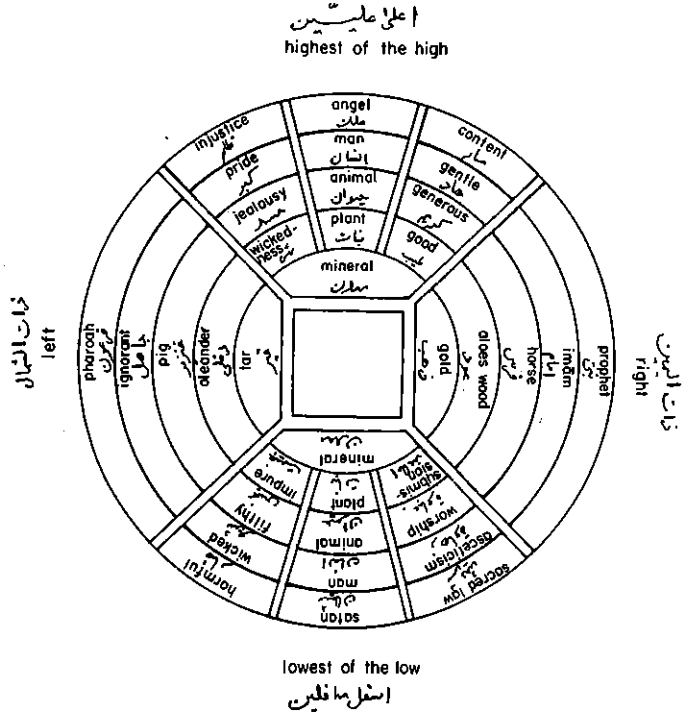

Figure 1. The cosmic hierarchy according to the Ikhwān al-Ṣafā'.

Universal Soul and not by an independent agent acting within bodies here on earth. Secondly, according to the Ikhwān this world is a shadow of another world more real than it, and the "idea" of everything in this world actually exists in the other, so that there is no

[96] *Jāmi'ah*, I, 488.

[97] Dieterici, *Der Darwinismus im X. und XI. Jahrhundert* (Leipzig, 1878). De Boer correctly refutes Dieterici's thesis and asserts that the Ikhwān imply a gradation and not evolution in its modern sense. Tj. de Boer, *History of Philosophy in Islam* (London, 1933), p. 91.

question of a species changing into another, because the "idea" of each species is a form which is beyond change and decay. In the words of the Ikhwān:

> The species and genus are definite and preserved. Their forms are in matter. But the individuals are in perpetual flow; they are neither definite nor preserved. *The reason for the conservation of forms, genus and species, in matter is the fixity of their celestial cause* because their efficient cause is the Universal Soul of the spheres instead of the change and continuous flux of individuals which is due to the variability of their cause.[98]

The distinction between the traditional doctrine of gradation and the modern theory of evolution is clearly stated in these words of the Ikhwān themselves.

There do exist, however, certain similarities between the views of the Ikhwān and modern theories in that both believe that the date of the beginning of the terrestrial existence of plants precedes that of animals, just as minerals precede the plants. Also, the Ikhwān believe in the adaptation of organisms to their environment, much in the manner of the authors of the nineteenth century, but the authors of the *Rasā'il* consider it from a different perspective. Their whole conception of Nature is, of course, teleological. Everything exists for a purpose, the final purpose of the cosmos being the return of multiplicity to Unity within the heart of the saints. It is only in this context that the appearance in time of each kingdom is considered. As the Ikhwān write:

> Plants come before (*taqaddama*) animals in the series of beings and serve them as material for the forms of animals and food for the nutrition of their bodies. From this point of view, plants would be like a mother who eats raw food, digests it, assimilates it and transforms it into pure milk which is absorbed very gently by those who drink it. The plants subsequently present this to the animals considered as their sons . . . Plants occupy an intermediate position—necessary and salutary—between the four elements and the animals. All the parts of the vegetables which the animals consume such as seeds, leaves, fruit, and so on, come from the four elements digested and transformed by the plants . . .[99]

As minerals serve plants and plants animals, so do animals in turn serve man, who therefore comes to this world later than all of them, since each has come after the kingdom upon which it depends.[100]

[98] Quoted in Carra de Vaux, *Les Penseurs de l'Islam* IV, 107 (italics ours).

[99] *R.*, II, 154.

[100] «واعلم يا اخي بان الحيوانات كلها متقدمة الوجود على الانسان بالزمان.»

R., II, 55. The Ikhwān also subdivide the kingdoms according to the order of creation.

The Ikhwān imply in their writings, without always stating it clearly, that the coming into being of the sublunary region after the heavens, the mineral after the elements, the plants after the minerals, the animals after the plants, and finally, man after the animals, is temporal as well as *in principio*. But since the gradation from the elements to minerals and higher realms is a return toward the heavenly perfections, there is no question of an indefinite gradation of physical forms. Once the origin has been reached again, there is no further step to be taken. In the perfect man, who has realized his Divine Origin, the process has come to an end. Man's "evolution" is therefore inward; God does not create something after man as he created man after the animals, because man, by virtue of being able to return to his origin, fulfills the purpose of the whole of creation. All other orders of beings were created in order that this final stage of reunion might take place. Once the reunion has occurred, there is no metaphysical necessity for another form to be created.

Man is the link between the three kingdoms and the heavens and therefore the channel of grace for the terrestrial environment; the three kingdoms depend upon him, and man in turn has the right to make use of them.[101] In the section of the *Rasā'il* called "Dispute between Man and the Animals" at the end of the treatise on zoology, the members of the animal kingdom complain to the king of the *jinn* for man's cruelty against them. In the trial, none of man's boastings about his own beauty, wit, learning, reason, science, or art can overcome the virtues of the animals. At the end, the only point which justifies the domination of man over the animal kingdom is that among men there are a few who become angels on earth, that "among men there are a few saints and sages who have the natures of cherubim."[102]

In the Universe, where the wisdom of the Creator is to be seen everywhere, every occurrence has its reason and shows the wisdom

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For example, marine animals are said to precede land animals, while among land animals those with more perfect sexual organisms come after those that lay eggs, which in turn come later than those generated in putrescences. *R.*, II, 155ff.

[101] «فصار الانسان واسطة بين الحيوان وبين عالم الافلاك يفيض عليه مما يفاض عليه، وصار الحيوان خادما للانسان بحسب حاجته اليه، وصار النبات بين الانسان والحيوان.»

Jāmi'ah, I, 419–420.

[102] Ikhwān, *Dispute between Man and the Animals*, trans. J. Platts, pp. 226–227.

of God, so that each creature possesses those faculties which conform to its needs. With respect to the animals, the Ikhwān write:

> Providential wisdom stipulates that an animal be given no other organs than these. If it were otherwise the animal would be hindered and its safety and continued existence endangered.[103]

"Adaptation to the environment" is not the result of struggles for life or "survival of the fittest," but comes from the wisdom of the Creator, Who has given to each creature what corresponds to its need. In the deepest sense, what separates all these ideas of the Ikhwān from their modern counterparts is that for the Ikhwān the hands of God were not cut off from creation after the beginning of the world—as is the case with the deists. On the contrary, every event here "below" is performed from "above" by the Universal Soul, which is God's agent. Consequently, the purpose of the study of Nature is to see these "vestiges of God"—the *vestigia Dei* as the medieval Latins used to express it—so that, thanks to the analogy existing between the Universe and man, the soul through this knowledge of cosmic realities can come to know itself better and ultimately be able to escape from the earthly prison into which it has fallen. "Thy soul, oh Brother, is one of the pure forms. Use your efforts then to know it. Thou willst succeed probably in saving it from the ocean of matter to raise it from the abyss of the body and deliver it from the prison of Nature."[104]

[103] *R.*, II, 144. [104] *R.*, II, 17.

CHAPTER 3

The Individual Cosmological Sciences

Astronomy and Astrology

In the Islamic sciences, as in Greek and Latin astronomy where *astrologia* and *astronomia* are often used interchangeably, there is no clear distinction between the words signifying astronomy and astrology; the term *nujūm* can mean one as well as the other. For the Ikhwān, also, the two studies are closely bound together, because not only are the heavenly bodies moving objects whose motions and periods can be studied and measured, but they are also the seats of the various faculties of the Universal Soul, which is the cause of all change in the world of generation and corruption. Astrology, then, must be considered always in the light of the metaphysical principles which underlie the cosmology of the Ikhwān. However, since astronomy and astrology are studied separately today, we shall try as much as possible to separate the science of the constitution and movement of the heavens from the study of both their symbolic and spiritual qualities and their influence on earthly phenomena. The Ikhwān themselves divide the science of *nujūm* into three parts: (1) the science of spheres, stars, their dimensions, movements, and so on (*'ilm al-hai'ah*), (2) the science of astronomical tables (*zīj*), and (3) judicial astrology (*'ilm al-aḥkām*). Our separation of astronomy and astrology, therefore, can perhaps be partially justified by their own views, although general astrology, which includes more than just judicial astrology, also enters into the first category.

In the *Rasā'il* great importance is attached to the study of the heavens, a subject which enters every branch of natural science because of the influence of the heavens upon all sublunar events. Also, the ancient character of the history of astronomy is fully realized and, in fact, this science is considered to have been originally not a purely human form of knowledge, but a science revealed to the prophet Idrīs or Hermes Trismegistus who "journeyed to Saturn" in order to