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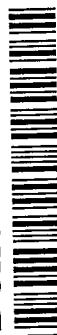
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International System

Magnitudes of stars in the North Polar Sequence, a group of stars near the north celestial pole.

See also MAGNITUDE SYSTEM

Ionian Cosmology

See EARLY GREEK COSMOLOGY

Islamic Cosmology

Islam appeared with the revelation of the Koran to the prophet Muhammad in the early seventh century. Within 300 years the religion had developed a flourishing intellectual tradition that was heir to much of that of the ancient world, especially Greece, Persia, Babylonia, and Egypt. The Koran brought with it views of the cosmos that reflected cultural elements shared with ancient Semites, Jews, and early Christians. As Islam spread to adjacent lands and beyond, sophisticated and refined cosmological teachings were developed on the basis of both the Islamic sources and the various indigenous worldviews of the preIslamic societies. What makes Islamic cosmology specifically Islamic is the fact that an underlying Koranic perspective integrates and harmonizes the borrowed concepts. Architecture and art offer analogous phenomena on the formal level.

The expression "Islamic cosmology" can be understood broadly to mean the worldview set down in the Koran and the Hadith (the sayings of the Prophet) and accepted explicitly or implicitly by most Muslims. More narrowly, it refers to the various theories of the universe gradually developed by Muslim thinkers. What is feasible in the present survey is to suggest some of the underlying premises of Islamic cosmological theories, with the understanding that the scheme outlined will not necessarily be found in any specific author. No attention will be paid to secondary aspects of cosmological teachings such as astronomy and cosmography, as discussed for example by al-Suyûfî (cf. Heinen 1982). Nor will any attempt be made, in contrast to most studies of the history of Islamic thought, to bring out constituent elements and sources or to establish historical relationships with the modern West. Instead, following S.H. Nasr (1964, p. xix), we will try to describe the Islamic cosmos as it was perceived by those who cultivated cosmology in Islamic civilization.

Most of the authors who discussed cosmological teachings can be classified as philosophers or Sufis. These two groups are differentiated from other Muslim thinkers in that they provide overarching theories that

integrate everything in reality into a unified perspective. They differ from each other in their basic approach to acquiring knowledge. The philosophers stress the power of reason, whereas the Sufis emphasize "unveiling" (*kashf*), or direct, God-given intuition of the nature of things. The philosophers leaned heavily on Greek wisdom, while the Sufis preferred to seek inspiration from the Koran and the Hadith.

Many of the important figures in the cosmological tradition combine the perspectives of philosophy and Sufism in varying degrees. One of the earliest major sources for cosmological teachings, the Ikhwân al-Şafâ' or "Brethren of Purity" (flourishing in the tenth century), inclined toward a Sufi interpretation of the Islamic worldview while borrowing heavily from the Pythagorean and Neoplatonic currents in Greek thought. Various Ismâ'îlî thinkers fit roughly into the same category. Avicenna (Ibn Sînâ, died 1037), who marks the high point of the Islamic Peripatetic tradition, was deeply influenced by Neoplatonism and expresses Sufi teachings in some of his writings. Suhrawardî (died 1191) founded the "Illuminationist" school of philosophy by combining Avicenna's perspective with Sufism and Zoroastrian mythology; his visionary treatises, written in exquisite Persian prose, present the cosmos as a tapestry woven of symbols (Thackston 1982). The most prolific cosmologist of the Islamic tradition was Ibn al-'Arabî (died 1240), called by the Sufis the "Greatest Master." His many works provide a grand vision of the universe, based on the Koran, the Hadith, his own unveilings, and the teachings of the intellectual tradition. Ibn al-'Arabî marks a watershed; after him most expressions of Islamic cosmology refine or develop various ideas set down in his writings.

Although there is no commonly used Arabic expression that can be offered as a direct translation for the word "cosmology," philosophy has sometimes been defined as the study of existence qua existence, while "physics" (i.e., the study of nature) is considered one of philosophy's subdivisions and deals with many issues that would be classified today as cosmology. Whatever they may call

their discipline, religious scholars, philosophers, Sufis, and theologians all have a great deal to say about the "world" or "cosmos" (*al-'âlam*).

The word *'âlam*, or cosmos in Arabic, is derived from the same root as *'ilm* (knowledge), *'alam* (track, trace), and *'alâma* (mark, sign). Islamic thinkers understand the primary significance of the term to be "that by means of which one knows" and, by implication, "that by means of which God is known." Typically, Muslims have looked on the cosmos as a place wherein God displays his activities, thereby providing intimations of his own reality. Many scores of Koranic verses refer to the phenomena of the natural world as "signs" (*âyât*) of the divine. The cosmos is frequently defined in terms of God simply by differentiating it from him; hence it is called "everything other than God" (*mâ siwâ Allâh*).

Most Muslim intellectuals studied cosmology with a view toward relationships, not discrete things or entities. The phenomena of the universe were viewed inasmuch as they are connected to God and to other phenomena. Entities and things are not known in themselves, but in their qualities, and these are relationships. When something is large or small, moving or still, luminous or dark, or exterior or interior, a specific relationship with other things is necessarily kept in view.

In general, Muslim cosmologists view the cosmos from two basic and intertwined standpoints: its relationship with God and its relationship with the human being. In the second case, the terms *al-'âlam al-kabîr* or macrocosm (= cosmos) and *al-'âlam al-şaghîr* or microcosm (= human being) are often employed. For the most part, questions that we would recognize as "scientific" in the modern sense remain secondary, since the study is directly correlated with the total human situation; hence it embraces physical, moral, spiritual, and divine dimensions. People learn about the cosmos in order to bring themselves into harmony with that reality that transcends the cosmos but displays its "signs" within it. The underlying concern is soteriology.

God and the Cosmos

By and large, the cosmologists accepted the theological dogma that God created the cosmos out of nothing, although many of them interpreted this idea in ways that did not sit well with the more literal-minded theologians. Their basic concern was to show what "creation" and "nothingness" imply. Explanations varied, but most philosophers and Sufis understood "creation" in terms reminiscent of Neoplatonic emanationism: the cosmos is the self-disclosure (*tajallî*) or self-manifestation (*zuhûr*) of the "Real" (*al-haqq*). They frequently compared the creative process to light shining forth from a sun that is in no way diminished by its rays. In this perspective, the "nothingness" from which things are created is their situation before they become differentiated within the cosmos. Although they are "nothing"—no existent thing—they are known by God, who gives them existence on the basis of his knowledge when the appropriate time arrives. In more abstract terms, they are the individual possibilities embraced by the all-possibility of ultimate reality.

Muslim cosmologists devoted relatively little attention to the origin of the cosmos, since they were more interested in analyzing the nature of the relationship between God and the cosmos at the present moment. Frequently they approached this question by studying the nature of *wujûd*, which is usually translated as existence or being. The Peripatetics such as Avicenna, along with most later Muslim authorities, called God inasmuch as he is *wujûd* "necessary *wujûd*," since he cannot not be. In contrast, the cosmos is "possible *wujûd*," which is to say that it may or may not exist, depending on the will of God. God as *wujûd* is a primary and autonomous reality, while the cosmos as *wujûd* is secondary and derivative. Since *wujûd* is somehow shared by God and the cosmos, analyzing its characteristics informs us of the nature of both. Discerning the exact relationship between the two basic modes of *wujûd* has remained central to Islamic philosophy down to modern times.

Wujûd as such cannot be known, but *wujûd* inasmuch as it is determined and defined by

qualities can be known. For the cosmologists who anchor themselves in Koranic terminology, the fundamental qualities of *wujûd* are delineated by the names of God, to which the Koran refers on numerous occasions and which are traditionally said to number ninety-nine. Among these are Alive, Knowing, Desiring, Powerful, Speaking, Compassionate, Just, Forgiving, Vengeful, Merciful, and Wrathful. All these qualities are found fully and absolutely in real and autonomous *wujûd*, but only their traces and signs are found in the existent things of the cosmos, which are the manifestations or self-disclosures of real *wujûd*.

All Muslim cosmologists see the cosmos as a hierarchy. Just as they distinguish between God and the world, the Necessary and the possible, the One and the many, the Eternal and the temporal, the Absolute and the relative, the Real and the unreal, so also, on the cosmic level, they distinguish between those qualities that reflect these fundamental distinctions. Hence they usually describe two basic worlds. These are commonly called the invisible and visible realms, or heaven and earth, although several other sets of terms are also employed. The first domain is "spiritual" and possesses such characteristics as luminosity, life, awareness, and power. The second is "corporeal" and in itself lacks the attributes of spirit; hence, it is dark, dead, unaware, and incapable. Spirits are high and subtle, bodies low and dense. However, as S. Murata has illustrated in ample detail, the cosmologists do not take these qualities as cosmic absolutes. Hence, a spirit is called "luminous" or "aware" only when contrasted with a body. If it is contrasted with God, its luminosity and awareness are derivative and unreal, so it is dark. In the same way, a body is dark in relation to a spirit but luminous in relation to absolute nothingness.

In short, the cosmos is differentiated into two worlds to show that some of its parts are qualitatively closer to the Real and some more distant from it. But this is only the initial stage of the explanation, since things cannot simply be divided into two groups, the "near" and the "far"; in fact, there is a vast spectrum of differentiation ranging from the nearest to the farthest. And every quality

of *wujûd* can be seen as revealing itself within a corresponding spectrum of intensities. For example, God is "Knowing." This means that God alone has absolute knowledge or awareness, whereas things in the cosmos possess knowledge to a relative degree. Hence we have a hierarchy ranging from the apparent unawareness of inanimate things, through plants, through various kinds of animals, to a vast diversity of human levels, and finally to suprahuman beings such as archangels. The absolute quality of divine knowledge stands completely outside the cosmic hierarchy, but it determines its nature.

Given this spectrum of qualities from least intense to most intense, it is not surprising that Muslim cosmologists frequently talk about many more than two hierarchical worlds, especially when they want to highlight the "distance" between the absolutely Real (which possesses all positive qualities absolutely) and the inanimate, corporeal world (the domain in which the traces of these qualities can barely be found). However, the most common scheme, especially from about the thirteenth century onward, is probably that which pictures the whole cosmos as three worlds: On the two extremes are situated the world of spirits and the world of bodies, and in between is found a vast world of "imagination" (*khayâl*) or "similitude" (*mithâl*). The fundamental characteristic of this domain is that, like an image in a mirror, it possesses the qualities of both sides and hence occupies an inherently ambiguous situation.

On the macrocosmic level, the existence of the world of imagination can explain the nature of those beings that the Koran refers to as "jinn" (etymologically signifying the "concealed ones"). Satan is one of their chiefs. They are made of fire, in contrast to the angels, who are made of light, and bodily things, which are made of clay. Fire combines the qualities of light and clay, just as imagination brings together the characteristics of spirit and body. "Imaginal" (not "imaginary") things are thus situated in an indefinable intermediate realm between the pure and luminous awareness of the angels and the almost unmixed darkness and ignorance of bodily things. From here it is only

one step to the idea—frequently expressed by Ibn al-'Arabî and his followers—that everything in the cosmos is imaginal, since all existent things stand in an ambiguous and indefinable domain between the absolutely Real and absolute nothingness.

Two Arcs of Existence

Most cosmologists describe the relationship between God and the cosmos in terms of the "origin" (*mabda'*) and the "return" (*ma'âd*), or the two "arcs" (*qaws*) of creation, the descending and the ascending. Here they are analyzing the ever present stages whereby the perceived universe comes into existence and then returns to its origin. This discussion allows our authors to situate any given reality of the cosmos within a vast panorama of cosmic unfoldment and reintegration. One version of this teaching, inspired mainly by Ibn al-'Arabî's works, can be simplified as follows (cf. the diagrams in Chittick 1990, pp. 72-79).

God first creates the Intellect, also known as the Supreme Pen, which manifests God's knowledge of the cosmos in an undifferentiated, spiritual form. Then, by means of the Intellect, God creates the Universal Soul, also called the Guarded Tablet. When the Pen writes in the tablet, or the Intellect marries the Soul, two children are born: Prime Matter and Nature. These in turn give birth to the Universal Body, which fills the Void. The Body marks the outer limits of the corporeal domain, which includes the imaginal world, since images have subtle and luminous bodies. The Universal Body has "spatial" characteristics; hence, along with it appears time, space's complement. The first distinct entity to appear within the Body is the Throne of God, which comprehends the corporeal universe and becomes manifest to us as the ninth or starless sphere. The Throne, as the Koran tells us, is the place where the "All-merciful" sits, so the Throne's primary quality is mercy (which, in one respect, is identical with the blessing of existence). Below, the Throne God creates the "Footstool," whose image appears to us as the eighth sphere, the heaven of the fixed stars. Here mercy's opposite, wrath, enters

the picture, for God has two "feet," which he lets down in the Footstool. One of the feet is pure mercy, while the other is mercy mixed with wrath. This explains why everything in the visible cosmos undergoes generation and corruption: mercy brings it into existence, but wrath destroys it. Nevertheless, as the Prophet reported, "God's mercy precedes his wrath." Ibn al-'Arabî and others take this to mean that mercy is the most basic reality of existence whereas wrath is secondary and ephemeral. All things enter into the cosmos through mercy and return only to it.

The duality that appears in the two feet goes back to the contrasting names of God, which are divided into two categories: the names of mercy or beauty, and the names of wrath or majesty. The Real has two kinds of names because it does not have the same relationship with each thing in the cosmos; if it did, there would be no differentiation. The diversity of relationships at any given moment brings about the diversity of the cosmos. And over time, the Real's relationship with any specific thing changes, so each thing undergoes constant transformation. On the cosmic level, these changing relationships are symbolized by the interaction of God's two feet or, in another scheme, God's two hands.

By means of the duality of principles represented by the feet, God next creates the earth, which contains everything that is relatively low, dark, and distant. Then, from the parts of the earthly creation that tend by nature toward elevation, luminosity, and intelligence, he creates the seven planetary spheres. It needs to be kept in mind here that many if not most of our authors held that the seven sources of light known as the planets were merely the physical signs of the real heavens. The fundamental Islamic map of the celestial hierarchy is provided by the Prophet's ascent (*mi'râj*) through the spheres into the presence of God, an ascent that is not understood to have taken place in the physical universe, even though it is described in terms of the planets. For Ibn al-'Arabî and his followers, all such visionary events occur in the imaginal world.

Between the seven planetary spheres and the earth are found the spheres of the four elements: fire, air, water, and earth. Again, for most authorities these do not represent the discreet realities that go by these names in this world, but invisible, "simple" (i.e., noncompound), and nonmanifest realities whose qualities are found in everything in this world, since all things are "compounded" of the four elements, including the earth, air, fire, and water that we perceive. Different kinds of corporeal things are differentiated by the specific mixtures of the elemental qualities within them.

The four elements are sometimes called mothers, since they give birth to the three "children": inanimate things, plants, and animals. Once the bodily realities of the children become manifest, the universe reaches its furthest degree of corporeal complexity. Everything that is found in undifferentiated form in the First Intellect is now displayed outwardly in indefinite variety and differentiation in the world of the three children.

The Arc of Descent embraces all things that come into existence from the First Intellect down to the elemental level; it represents a movement from unity to diversity. The Arc of Ascent begins at the inanimate level and represents a movement from diversity and differentiation back to unity. The qualities that bring about unity are those that pertain to the "precedent attribute" of the divine realm (i.e., mercy). Mercy is associated with such attributes as nearness, balance, harmony, equilibrium, sameness, and unity. Mercy's opposite, wrath, is associated with distance, difference, disequilibrium, difference, and multiplicity. Hence the divine names that dominate over the Arc of Descent are those of wrath, while the names of mercy exercise their greatest effect in the Arc of Ascent. This does not suggest that either arc is empty of the opposite qualities, since it is simply a question of predominant characteristics. The opposite qualities are also present in each arc, but not in such an apparent way.

The movement toward unity proceeds by way of the increasing intensity of those divine qualities that bring about nearness to God and unity within the three children. The

presence of these qualities, which pertain more to the invisible than to the visible dimension of reality, is illustrated by the ascending hierarchy of powers and faculties possessed by inanimate things, plants, animals, and human beings. The specific characteristic of the human state, which distinguishes it from that of the other animals, is centrality or equilibrium. The remainder of the ascending arc, back to the Presence of God, pertains to the process of human spiritual perfection, whereby all the qualities of God are actualized and intensified in perfect balance.

Human Beings in the Cosmos

The Muslim cosmologists do not see human beings as in any way peripheral to the cosmos. On the contrary, they are an integral and essential part of it, so much so that the cosmos cannot be conceived of without them. This does not mean that there cannot be a time without human beings; the view here is rather teleological or "anthropic." Human beings are the fruit and the ultimate goal of the cosmos; without humans in view (or beings who are functionally analogous), God would never have brought the universe into existence.

Although human beings are in one respect parts of the cosmos, they are in another respect its equals or even its betters. This results from the fact that they are microcosms. The Islamic concept of the microcosm/macrocosm relationship can best be pictured in terms of the divine names, or the qualities that are reflected in the universe by the fact of its existence. The cosmos as a whole displays the full range of ontological possibilities in indefinite differentiation and deployment; here the cosmos is pictured in all its dimensions, including the spatial (deployment in every direction), the temporal (beginning to end), and the "vertical" (the hierarchy of created worlds that extends "upward" toward the absolutely Real [e.g., the corporeal, imaginal, and spiritual worlds]). In contrast, the human being brings together these same qualities in a single, concentrated whole. Both the universe and the human being are made in the image of real *wajûd*, but

the first is God's differentiated (*mufaṣṣal*) image, and the second his relatively undifferentiated (*mujmal*) image.

The macrocosm considered in its entirety is the perfect locus of manifestation for all the divine names, since every possibility is actualized within it. But each microcosm has to be considered individually. A distinction must be drawn between those who actualize within themselves all the names and attributes of God and those who do not. Only the first group can truly be called human, since they alone have fully realized their own nature as divine images.

In general, the microcosm is described as possessing the same qualities as the macrocosm, except for the distinction between differentiation and undifferentiation. For example, the three worlds of the macrocosm correspond to the microcosm's spirit (*rûh*), soul (*nafs*), and body (*jism*). As in the case of the macrocosm, these terms do not refer to discrete and autonomous realities; on the contrary, they designate qualities that become manifest within human beings. The term *spirit* alludes to luminosity, intelligence, subtlety, and nearness to God. In contrast, the body in itself lacks these qualities, a fact that is seen most clearly when it is a corpse. The soul, which is identified with the empirical ego or the locus of awareness and personality, shares in the characteristics of the two sides. It is neither pure intelligence like the spirit nor total unawareness like the body. It is neither luminous nor dark, powerful nor weak, subtle nor dense. Hence the soul stands in a constant state of flux, depending on the proportions in which the two sides—spirit and body—exercise their influence upon it. And spirit, soul, and body are in fact a single reality; no dimension of the human being can be studied in isolation from any other. Even when the physical body is shucked off at death, a "subtle" body remains that plays a corresponding role in the next realm of existence.

The human spirit is frequently described as a divine light or a divine breath that possesses latently all the attributes of God. Through soul and body, the spirit finds the means to display its own divine characteristics. Without these two, the spirit would not

be differentiated from other spirits. Among the spirit's inherent characteristics is its strict indefinability, since, as the outward expression of the totality of all ontological attributes, it cannot be identified with any specific attribute. The spirit's indefinability reverberates within the soul as a relative freedom of choice and a vast range of possible modes of development. Every choice, of course, eliminates some possibilities and differentiates others. And human becoming over a lifetime normally entails the carving out of a specific personal identity on the basis of actualizing certain ontological qualities and avoiding others. The possibilities of human becoming are in effect infinite, just as the possible things found in the macrocosm are in effect infinite. However, in any given situation, specific limitations (environment, heredity, etc.) will be present. In actualizing various qualities of the spirit within their own souls, people remain outwardly human in this life, but inwardly they can become practically anything at all. They can take on qualities proper to minerals or plants or to any variety of animals, or they can take on any sort of specifically human condition (such as compassion, heroism, literary or mathematical genius, diplomatic prowess, and so on).

Most people will fail to actualize the full range of divine qualities latent within their spirits. Hence they will become specific and determined realities that must take up relatively confined places of residence in the next stages of existence, such as one of the eight degrees of paradise or the seven levels of hell. Only a small number of individuals will actualize the indefinability of the spirit within the soul, so that, in effect, they will possess all perfections without being defined by any specific perfection. In the next world, they do not enter those paradises that are determined and shaped by the divine acts or the divine names, but rather the paradise that is indefinable and ineffable in keeping with the divine Essence (*al-dhât*).

Most of the Sufis employ the Koranic term *vicegerent* (*khalîfa*) to refer to those persons who have actualized their full human nature. Philosophers tend to speak of the sage (*hakîm*) or sometimes the prophet (*nabî*). Ibn al-'Arabî

and his followers often employ the term "perfect human being" (*al-insân al-kâmil*). All these terms allude to the fully developed human being who has actualized the qualities latent in the spirit and thereby has become a living image of God's fullness.

One of the most popular schemes for representing human perfection, developed in the wake of Ibn al-'Arabî's teachings, is known as the "Five Divine Presences," or the five ontological levels in which God becomes manifest in his fullness. A typical scheme represents these five presences as God's knowledge (of himself and the cosmos), the spiritual world, the imaginal world, the corporeal world, and the perfect human being, who brings together God's knowledge and the three worlds in a comprehensive unity.

On a slightly more mundane level, the discussion of the human role in the cosmos is inseparable from the science of ethics (*akhlâq*). Modern scientists and cosmologists have difficulty finding any direct relationship between the object of their study and the norms that govern social and spiritual life. In contrast, Muslim cosmologists have always found that their study has a direct and explicit bearing on these issues. The basic goal of cosmology is to show how the divine qualities become manifest in both the macrocosm and the microcosm. These qualities are those of *wujûd* or existence itself—although they are not necessarily manifest in any specific existent thing. Among them are mercy, compassion, love, generosity, forgiveness, justice, truth, gratitude, patience, and forbearance. If *wujûd* is to become fully manifest, these qualities must find appropriate receptacles within which to be displayed. Although such qualities can appear in a more or less metaphorical sense in plants and animals, they can attain full flowering only in human beings and in the context of human society—which is another way of saying that human (or analogous) beings are demanded by the very nature of existence. Hence the human being cannot be a detached observer, looking upon the cosmos from the outside as if his observations had no connection with his personal life. Social relationships, morality, and virtue cannot be differentiated from the "objective" world.

These remarks on the inseparability of the “scientific” and the “moral” help explain why many Muslim cosmologists tell us that our world will not come to an end as long as there are perfect human beings within it. But if human spiritual perfection is no longer attained, the divine qualities no longer have a place in which to appear. The gradual disappearance of these qualities will be marked by the progressive dissolution of the social order and the natural world. Once a certain extreme is reached, our world will have to be transmuted into a form appropriate to the manifestation of the missing divine qualities. This is the “Last Day” promised by the Koran, when the fruits of having lived in this world come to be manifest for this humanity in new forms in the next world. Although the discussion of life after death and eschatology belongs, strictly speaking, to cosmology (since the various domains of the next world are also parts of the cosmos), these matters will not be pursued further here.

See also AVICENNA; IBN AL-‘ARABĪ; MEDIEVAL COSMOLOGY

[W.C.C.]

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