CHAPTER TWO

And these are the Signs
The Qur’ân and the Order of Nature

Islam shares its cosmos with the other two monotheistic religions; in all three Abrahamic faiths, God is the originator of everything that exists. In Islam, this creative act of God, through a simple command, Kun (Be), became the subject matter of Islamic cosmogony which elucidates the modalities of creation. The Qur’ânic creation theme, let us note, includes the physical as well as non-physical worlds—all ontologically linked and existentially dependent upon God. This intrinsic nexus between various levels of existence transforms the multiplicity of appearances into a unity. The ultimate foundation of their interrelatedness at the level of cosmic existence is their ontological dependence on God. Hence the world of nature is related to all other levels of creation. This common ontological foundation made it possible for the Islamic scientific tradition to forge links and share a language of discourse with other disciplines of knowledge which were all arranged in a hierarchy.

The unity of existence is a recurrent theme of the Qur’ân which relates it to its central concept of Tawhîd, the Unicity of God. Thus linked ontologically with the realm of the divine, the realm of nature becomes more than the mere physical entity that it is; it becomes a sign (‘ âya, pl. ‘âyâ), pointing to a transcendent reality beyond itself. This transcendence is semantically linked to the verses of the Qur’ân which are also called ‘âyāt. But this elegant nexus between the world of nature and the word of God is much more than mere semantics; it is an essential feature of the Qur’ânic metaphysics of nature which establishes an inalienable link between various levels of created things by relating them to an All-Encompassing (al-Mu‘âk) and All-Knowing (al-‘alîm) God who is above and beyond all human conceptions; His transcendence can only be defined via negativa, by erasing

1. Q. 56:61.
from the mind any impurity foreign to the idea of pure divinity (τυλιχνε). It is through this intense and systematic weeding out of every description, adjective (ṣifā), and image (ṣūra) suspected of directing our understanding (ma'rifā) or imagination (waḥm) to a created object (shay, pl. ashyā) other than God that we can arrive at the Qur'anic conception of the Creator: He is not like anything, neither engendering nor engendered. All that God has us know positively about Himself is His singular uniqueness, His extreme remoteness from everything else.

Since all things exist through and because of God, their ontological dependence on the Creator simultaneously ennobles them by raising their status from being mere things to signs (dīyā) of a transcendent Real (al-Haqiq), who, nevertheless, remains beyond them. Thus rather than being mere dialectical utterances, the “sign verses” of the Qur'ān have an irresistible urgency which draws our attention to that which lies beyond the phenomena being mentioned. It is this ennoblement that makes the rhythmic alteration of the day and the night and the regularities in the movement of the sun, which traverses its course by the decree of the All-Knowing; and the moon—[for which God] has made stations [to traverse], till it becomes like an old [and withered] stalk of date-palm. The Qur'ān asserts that commonly observable natural phenomena, such as the orderly movement of the planets, are, in fact, due to the design of the Creator. It draws the attention of its readers to the fact that the sun does not catch up to the moon and the night cannot outstrip the day; [rather] each revolve in their own orbit, and asserts that this is not merely the result of certain laws of nature, rather these are “signs” for those who reflect. In fact, the concept of “Laws of Nature”, independent of a Law-Giver, is essentially a secular concept because it makes “nature” a law-giver; in Islam, the authority to make laws rests with God alone.

Thus seen from within the Islamic tradition, sciences which explore various aspects of the natural world actually explore one aspect of the

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3. Q. 42:11: La iṣa ka-mihliḥi shey'ūn (Nothing is like unto Him).
4. 112 of the Qur'ān contains, in a highly condensed form, this definition via negation: Say: He is Allah, the One; Allah—the Everlasting (ṣamad); neither endgendering nor engendered; and none is His equal.
5. So called because of a refrain that occurs in these verses in various forms such as: And in this is the sign for those who reflect (Q. 16:11), or And in this is the sign for those who listen (Q. 16:65).
6. Q. 2:164.
8. Q. 33:40.
Qur'ānic cosmos. This cosmos is made up of both the physical as well as non-physical beings according to a grand scheme, conceived and executed by the Creator. The ultimate destination of this created cosmos is a secret that God shares with none. However, the Qur'ān insists that humans discover the modalities through which nature works. It draws attention to the regularities, beneficence and design of various observable natural processes through concrete examples drawn from the world of nature. These processes fall in the domain of various scientific disciplines such as astronomy, physics, mathematics, geology and botany. But when studied in their proper metaphysical context, these processes become means to gain knowledge of that which lies beyond the laws that govern them. This Qur'ānic invitation to reflect on these natural processes is repeated with such urgency that the spatiotemporal plane which contains the world of nature seems to form the very background of the Qur'ānic universe.  

These intrinsic links make the high drama of creation, existence and the moral response to revelation out of human volition an integrated whole uniquely anchored in the metaphysical realm though operating in a historical setting. But it must be understood that this varied data—ranging from the natural to the historical—that the Qur'ān presents to its faithful reader is not without an internal plan. This concentrated disposition of material permits the directing thought to shine forth from behind the broad narrative at every instance, from the implicit to the explicit; it emerges by itself, like a design in the midst of the weave; this was one of the most immediate facts recognized by the first Arabs who heard this unearthly text which was neither poetry nor prose but which transcended both. It was this narrative par excellence that would provide pattern to the theologians for fashioning their dialectical process (ṭariqa ḥadāēyya) which starts with a positive hierarchy, established a priori between the two facts considered (taqaddum, afdalīyya). It passes from the “trunk” to the “branch” (far), and concludes a fortiori. And it brings back the solution of new question to that of the general problem thus resolved (radd al-ghāib ilā al-

9. These so-called scientific verses of the Qur'ān have been the subject of a large number of modern scientific commentaries. The Egyptian exegete Tantawi Jawharī (1862-1940) claimed to have counted all the verses which refer to natural phenomena; he fixed this number at 750 (with many others having indirect relevance to the physical universe). He also compared this number to the verses pertaining to legal matters which were “no more than 150”. This is, however, highly problematic. See chapter ten for more details.
shāhid). This method, so poignantly used by the Qurʿān,\textsuperscript{10} was taken as a standard and employed by al-Shāfīʿī, (burhān inni, istidāl, deduction), Ibn Ḥanbal and others who showed that the meaning (maʿnā) of the root (aṣḥāb) had to coincide in every way with the meaning of the branch, so that the deduction might be valid. These linkages become immediately apparent when the sign verses are seen in the context of the creation theme of the Qurʿān—a context that provides us a fundamental framework of inquiry for what Nasr has called the religious order of nature.\textsuperscript{11}

**Creation and the Order of Nature**

One of the names of God, The Originator (al-Bāḍīʿ), is derived from verse 117 of the second sūra of the Qurʿān, “The Cow”: *He is the Originator (Bāḍīʿ) of the heavens and the earth. Whenever He wishes a matter, He merely says ‘Be’ and it becomes.* This is *creatio ex nihilo*, a concept that Islam shares with the other two monotheistic faiths. But how did the universe come into being? Through what modalities? What is it made of? When did it come into existence? What are the laws that govern it? These, and similar questions formed the core of Islamic cosmogony which we will explore in the next chapter.

The creation theme of the Qurʿān is one of the simplest in the sense that it relies on self-evident fundamental facts. The modalities of creation are not explained anywhere in the Qurʿān. It simply states the basic facts: the creation of the seven heavens, placed one above the other, in perfect order; the lowest of these adorned and bejeweled and placed above our earth which is the chosen place for human habitat. Then there is the sun, the celestial spheres, the mountains, the stars and a small number of named plants, animals and even insects—all uniquely and seamlessly blended into a whole that springs forth from the same Divine source which gave birth to the first human being. The cosmos (ʿālām) came into existence as a sign (ʿālāma). The order of nature is, therefore, an evidence and a pointer for that which lies beyond nature: the very source of that order. *Verily, in the creation of the heavens and the earth; in the alternation of the night*

\textsuperscript{10} For example, Q. 14:24: *Hast not thou seen how Allah sets forth a parable that a good word is like a good tree, whose roots are firm and its branches extend to the sky; it brings forth its fruits all the time, by its Sustainer’s leave; Allah sets this parable for people that perchance they may be mindful.

\textsuperscript{11} This subject was the central theme of Nasr’s 1994 Cadbury Lectures at the University of Birmingham. Published in 1996 as *Religion and the Order of Nature*, Oxford University Press, New York.
and the day; in the ships that sail in the ocean with what profits humankind; and in
the water which Allah sends down from the skies, giving life therewith to the earth
after it had been lifeless and in the beasts of all kind that He disperses on earth; and
in the change of the winds and the clouds which are driven between heaven and
earth—surely in these are signs for people who understand.\(^{12}\)

The Qur'\(\text{\textsuperscript{a}}\)\(\text{\textasciitilde}n\) also makes specific mention of the bee which received
revelation (Q. 16:68-9); the spider whose "house" is described as the
"frailest of all" in a parable narrating the state of those who take protectors
other than God (Q. 29:41); Solomon's hoopoe who carried his message to
the Queen of Sheba (Q. 27:28); the raven who taught Q\(\text{\textasciitilde}b\)\(\text{i}l\) how to bury his
brother whom he had slain (Q. 5:31); the she-camel who was a sign to the
people of Tham\(\text{\textasciitilde}m\)\(\text{\textasciitilde}d\) (Q. 91:13); the ant who told her fellow ants to protect
themselves from the army of Solomon (Q. 27:18); Jonah's fish (Q. 37:142);
the wolf that did not eat Joseph (Q. 12:15); the donkey whose braying is the
worst of sounds (Q. 31:19); the fly that the false gods could not create
(22:75); the frogs, lice, and locusts that appeared in the plagues of Egypt
(Q. 7:133); and the mosquito that God does not hesitate to cite as a parable
(Q. 2:26). Among the plants and fruits mentioned by the Qur'\(\text{\textasciitilde}n\) are the
olive tree, which is blessed (Q. 95:1), dates, grapes, and pomegranate (Q.
55:68).\(^{13}\)

This physical cosmos observes a Divine Law just as humans are
supposed to. Thus, the Qur'\(\text{\textasciitilde}n\) tells us about the revelation sent to the bee
(Q. 16:68); it mentions the submission of the heavens and the earth to God
(Q. 41:11); it celebrates the glorification of God by all that exists in nature
(Q. 59:1; 61:1; 62:1; 64:1); it unifies the whole of creation in a grand order
and establishes the source and origin of that order and then, in a sweeping
manner, states that all of this is destined to exist merely for a short duration
after which all will perish—that is, all except God. This emphasis on the
transient nature of the created world reverberates throughout the Qur'\(\text{\textasciitilde}n\)ic
text as a reminder that none other than God is to be worshipped, for all
except Him are mere creatures who owe their existence to His Will.

Within this broad creation theme, the sign verses of the Qur'\(\text{\textasciitilde}n\) establish
a nexus between the physical cosmos and the metaphysical realm by
making the physical entity a projection of the unseen wherein resides its
sustaining and governing principle. A fundamental characteristic of these
verses is that they do not always refer to the natural phenomena; historical

\(^{12}\) Q. 2:164.

\(^{13}\) The list is not exhaustive.
events are also spoken of as signs with the same rhetorical embellishment and with the same urgency that is characteristic of those verses which mention natural phenomenon.\textsuperscript{14} This establishes a further link, this time with the temporal realm and completes the spatiotemporal domain that is the necessary condition of existence.

Thus the natural world is placed in a created order in space and time. But then these verses make a metaphysical leap into the very heart of the Qur’\textsuperscript{ā}nic message: the unique Oneness of the Creator: \textit{Is He not the One who made the earth a stable abode and created rivers flowing through it, the Qur’\textsuperscript{ā}n asks rhetorically, [the One who] created the mountains therein and created a barrier between the two seas? Is there, then, another god than Allah? Yet, most of them do not know.}\textsuperscript{15} In addition, in the general sweep of its narrative, the Qur’\textsuperscript{ā}n mentions the rain-bearing clouds and vegetation kingdom; it specifically cites the case of “dead earth” which is revived by God after it has been dead.\textsuperscript{16}

The Qur’\textsuperscript{ā}nic creation theme specifies the Divine realms and then unites all forms and levels of existence into one organic whole. This unity is then projected on to the human intellect (\textit{fahm, ‘aql}) which is endowed with the power to comprehend that which lies beyond the realm of the five internal senses: \textit{hiss mush\textsuperscript{ā}rik} (the sense that gathers all impressions); \textit{khay\textsuperscript{ā}l} (knowledge of the sensient kind); \textit{wahima} (perception of particular significations: evaluative, estimative); \textit{h\textsuperscript{ā}f\textsuperscript{ī}za} (sensitive memory) and \textit{mutakhayy\textsuperscript{i}la} (intellective reason).\textsuperscript{17} This characteristic is what distinguishes humans (\textit{ins, sing. ins\textsuperscript{ā}n}) from other created beings—an ability acquired through the knowledge given to Adam, the first human being.

This knowledge was bestowed upon Adam by none other than the Creator Himself, by teaching him names, \textit{asm\textsuperscript{ā}}. Created on the best of

\textsuperscript{14} For example Q. 2:248 (the example of the Ark); 2:252 (the case of J\textsuperscript{l}\textsuperscript{ā}t); 2:259 (the case of the man with a donkey who was put to sleep for a hundred years and then brought to life) and many more.

\textsuperscript{15} Q. 27:61.

\textsuperscript{16} Q. 36:35: \textit{A Sign for them is the earth that is dead; We give it life, and produce grain therefrom of which ye eat; and We caused to grow in it gardens of palms and vines, and We caused springs to gush forth therein; that they might eat fruits; although it is not their hands that wrought this; will they not, then, give thanks?}

\textsuperscript{17} For a useful table of concordance between the principles of K\textsuperscript{ā}l\textsuperscript{ā}m and the philosophical principles borrowed from the I\textsuperscript{m}\textsuperscript{ā}m\textsuperscript{ī}tes and the Hellenists before the fourth century Hijra, see Massignon, L. (1982), vol. 3, p. 70.
patterns (fi ahsan al-taqwîm), from a clot of blood, externally a body (jism), a weak vessel made of clay, infused with spirit (ruh), endowed with an inner organ, heart (qalb), which is a regular oscillation in the central inner void (jawf), the secret and hidden place of conscience (sîr) whose secrets will be laid bare at the Judgment, this created being also has a soul, (nafs), an aggregate of sensations and actions, an incoherent and obscure mass—thoughts, illusions, desires, feelings—flowing through the body, the principle (âsl) which unites the reprehensible qualities.

The Qur’ân seizes human beings in the very act of their creation, ennobles them through an eternal covenant (mithâq) and knowledge bestowed upon them by God. It raises humanity above all other creation because of the trust placed on the humankind by the Creator and because among all the created beings, it was only man who chose to bear the supernatural trust (amâna) which was refused by the heavens, the earth and the mountains as being too heavy a burden. The re-discovery of this covenant through remembrance (dhîr) acts like a flash of lightening which removes the veils from the nafs, unifies and transfigures it, makes it coherent and tranquil. It is this tranquil self, al-nafs al-mu’tama’mna, to which is said, O soul at peace, return to thy Lord, well pleased, well pleasing. It is this unified self which can understand signs spread throughout the cosmos and within its own being: We shall show them Our signs in the utmost horizons and in themselves, so that it will become clear unto them that this [Qur’ân] is, indeed, the truth; is it not enough that thy Sustainer is witness unto everything?

The Qur’ân treats as given the basic enigmas of life: birth (described as an embryogeny in several stages (Q. 23:12-14; 40:69); death, resurrection and life after death. It gives humans (and jinns) the moral choice of accepting or rejecting its message, prescribes the legal limits of human activity and gives humans the freedom to choose between the two paths. The Qur’ân also does not treat of abstract essences or types; it mentions particular, concrete and singular things and efficient names, asmâ’ (sing. ism) such as the All Powerful (al-Qadr), the Irresistible (al-Jabbâr), the

23. Q. 41:53.
24. Q. 2:256: Lâ ikhrâ’ha fi’l-dîn (There is no compulsion in religion).
25. Q. 90: 10: Wa hadaina hun najdäin (And guided him about the two paths).
Owner (al-Mālik).

It was left to the Kalām tradition to formulate, in precise terms, the mode of existence of things. And it was the function of the Islamic cosmological sciences to explain how these things came into existence and how they were related to each other as well as to the whole. The mutakallimūn, the philosophers (ḥulūfiyyūn) and the mystics (ṣūfīs) formulated various cosmogonies to elucidate modes of existence. Because all of these traditional cosmogonies addressed the same questions, though from different vantage points, they are all valid within the framework of the Qur'ānic revelation; this is the basis of the existence of multiple cosmogonies in the Islamic tradition; they all sought to explain the cosmos in the light of revelation, in particular, in the light of the doctrine of al-
Tawḥīd, the Unicity of God, which made it impossible for two cosmic orders to co-exist.

This fundamental principle acted as a prism through which all theories were passed in order to test their validity. It was this powerful doctrine, situated at the very heart of the Qur'ānic message, that made it possible for the Muslim scientists and scholars to transform those Greek theories about nature which conflicted with revelation. But it was not an arbitrary act of faith; rather, it was a consistent operative factor that derived its primary kinetic energy from the Qur'ān and then branched out in various spheres. It was through the inherent power, simplicity and uniformity of this principle that was operative in all realms of knowledge that a coherent Islamic worldview appeared. Through this operation, even the materia prima could be appropriated into the Islamic cosmogonies. Abū Īsāq Ibrāhīm b. Sayyār bin Ḥāni' al-Nazzām (d. between 220/835 and 230/845), for example, reconstructed the problem of the materia prima by proposing that "God created all of the primary elements (ṣuhūr) at once, with knowledge; all individual beings which appear progressively (ṣuhūr) existed in this beginning in potentiality (kumūn)".  

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26. In order to elucidate the hierarchical order of this materia prima, various schools of thought formulated various theories: The Emanationists construed their answer in terms of the five eternal principles of Plotinus (ca. 205-70) and of the Harrānians: the creator, the reason (‘aql), the soul (nafs, or ḥayāla, matter), the void, the plenum; the Hellenistic solutions were produced by dividing and subdividing the five principles into three aspects, three worlds: the horizons (afāq), interlocking spiritual spheres of influence, the material world and the five senses placed between the two; al-Fārābī (b. ca. 258-339/870-950) regarded the four logical causes as typifying the order of self-
The Qur’ān and Science Nexus

It is also noteworthy that the Islamic scientific works, profoundly influenced by the Qur’ānic worldview as they were, seldom mention the so-called scientific verses of the Qur’ān in any direct sense. Numerous examples can be cited. For instance, the *Algebra* of al-Khwārizmī (ca. 184-256/800-850), the pioneering work in its field, 27 neither refers to any Qur’ānic verse in the text of the book, nor uses a verse like *God set all things in numbers* 28 as invocation at the beginning of the book; its purpose is purely practical. Even in Ibn Sīnā’s *magnus opus, al-Qānūn fi l Ṭibb*, known to the Latin West as *The Canon*, where one would expect such direct references, they are remarkably absent. In the “Preface” (*Khuṭba tul Kitāb*) of the book, Ibn Sīnā simply seeks Divine help in the task of writing the book, as was customary, and starts the book. 29 The same is true for a vast majority of other scientific works from the classical period of Islam. However, when the purpose of the book was different, there was a free use of the Qur’ānic material. A case in point is al-Bīrūnī’s *Kitāb al-Jamāhir fi Ma’rifat al-Jawāhir* (*The Most Comprehensive Book on the Knowledge of Precious Stones*) which frequently quotes the Qur’ānic verses in relation to the various stones and minerals. But this work is not merely a scientific treatise on stones, as its title suggests. Rather, it is an amazing collection of scientific facts, ancient poetry, historical anecdotes, meditations and critique of various theories then current. It is also a repository of the author’s life-long observations on the state of human beings and matter.

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27. The full title of al-Khwārizmī’s work is *Kitāb al-Mukhtaṣar fi Ḥisāb al-Jabr wa’l Muqābala*; original Arabic text has been published with the poorly translated 1831 English version of Frederic Rosen by Pakistan Hijra Council (Islamabad, 1409/1990). In spite of its reliance on Rosen’s inaccurate translation, this is still a useful book because it contains the original Arabic text, a long “Introduction” by the Turkish historian of science Aydın Saylî, and enrichments and some corrections to Rosen’s notes by Malek Dossay. See note 27 to Saylî’s introduction where he mentions Julius Ruska’s critique of Rosen’s translation; also see Rashed, Roschdie, “L’idée de l’Algèbre selon Al-Khwārizmī”, *Fundamenta Scientiae*, vol. 4, no. 1, p. 95.


29. This *khutba* is merely a page and a half long. See *al-Qānūn fi l Ṭibb* (1999), ed. by Sa’id ‘I-Lahḥām, Dār al-Fikr, Beirut.
Likewise, during the entire period of Islamic scientific activity which lasted well into the fifteenth century, we see no evidence of any scientific research program directly motivated by the desire to "prove" the scientific verses of the Qurʾān through science. There is no record of such profane uses of the Divine Book. This is so because the cultural milieu that gave birth to the Islamic scientific tradition was so thoroughly infused with the Qurʾānic worldview and the cosmologies based on its message that there was no need for any artificial and external imposition of the Qurʾānic verses on the scientific works. When al-Ghazālī mentions various natural sciences in relation to the Qurʾān, his method, context and purpose is entirely different from the twentieth century extraneous and ornamental use of the Qurʾān as a way of Islamization of modern science, as we will see in more detail in chapter ten. Suffice it to say here that the birth of the scientific exegesis (al-tafsīr al-ʿilmī) of the Qurʾān is a purely twentieth century phenomena. No one thought of writing such an exegesis during the time when scientific activity was at its peak in the Islamic civilization; the roots of scientific tafsīr should be traced in the Muslim encounter with the modern West. Since the last quarter of the twentieth century, the Qurʾānic verses which refer to various natural phenomena have become popular departure points for proving that the Qurʾān is, in fact, the word of God because modern science has established the accuracy of certain verses, or because it contains "scientific truths" which were unknown at the time of its revelation. This approach is inherently flawed for it stretches the meanings of the verses to superimpose them on various scientific theories now current, or it merely attempts to prove a revealed Book through human endeavor which itself remains under constant revision. In both cases, there is little to be gained; it amounts to a gross injustice to both the Qurʾān and science. We will return to this subject in more detail in chapter ten.