

THE COSMOS AS THE CREATED BOOK AND ITS IMPLICATIONS FOR THE ORIENTATION OF SCIENCE

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Based on the conception of the Cosmos as a grand, created Book consisting of Divine Signs, a conception made possible by the linguistic-conceptual system of the Islamized Arabic, this article deliberates on the orientation of science in Islām by elaborating on two theoretical implications of such a conception: one being the avoidance of secularization as a philosophical program, the most fundamental component of which is the disenchantment of nature; and the other being the appropriation of the tafsīr-taʿwīl method of reading the signs and symbols of the Qurʾān into science.

Keywords: Islamic worldview; natural sciences; philosophy of science; cosmos; nature; universe; secularization; cosmos as a sign of the Creator; al-Qurʾān; *āyāt*; *ʿilm*; *tafsīr*; *taʿwīl*; *muḥkamāt*; *mutashābihāt*.

Introduction

The manner in which knowledge is understood in any given society very much determines the way sciences develop in that society, whereas the way any given society regards knowledge depends on its predominant worldview, or its vision of truth-reality. As a revealed religion which projects a certain worldview, Islam promotes an understanding of knowledge and science which is substantially different from what is prevalent in the other societies and civilizations—including that of the modern West—and which

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gives rise to a particular intellectual tradition and civilization.¹ Therefore, in deliberating the orientation of science within an Islamic state, due attention should be paid to the worldview of Islam and the attendant system of knowledge such a worldview projects. In fact, when one talks about sciences as being “Islamic,” one basically and ultimately refers to the worldview of Islam and its attendant system of knowledge. And one should bear in mind that the difference lies primarily at the level of understanding, at the level of concepts and conception. In short, one is here concerned with a distinct epistemology and intellectual framework.

Science, however, can be understood in a specific sense to refer to any division of the natural sciences as well as in a broad sense to cover any organized knowledge and discipline of study. Insofar as our present discussion is concerned, its focus will be primarily on science in the former sense. Nevertheless, since any meaningful discussion of the orientation of science needs to address *inter alia* its aims and directions, its foundations,

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1. There have been a number of important studies done by Muslim scholars to explain this unique relationship between the worldview of Islam and the attendant system of knowledge and science such a worldview projects, among which are the various works of Syed Muhammad Naquib al-Attas: *Islam and Secularism* (Kuala Lumpur: Muslim Youth Movement of Malaysia [ABIM], 1978); *The Concept of Education in Islam: A Framework for an Islamic Philosophy of Education* (Kuala Lumpur: Muslim Youth Movement of Malaysia [ABIM], 1980); *The Positive Aspects of Taṣawwuf: Preliminary Thoughts on an Islamic Philosophy of Science* (Kuala Lumpur: Islamic Academy of Science [ASASI], 1981); *Prolegomena to the Metaphysics of Islām* (Kuala Lumpur: International Institute of Islamic Thought and Civilization [ISTAC], 1995); and *A Treatise with Important Messages for the Muslims (Risalah untuk Kaum Muslimin)* (Kuala Lumpur: International Institute of Islamic Thought and Civilization [ISTAC], 2001). Similar discussions can also be found in Alparslan Açıkgöç's two works, *Islamic Science: Towards a Definition* (Kuala Lumpur: International Institute of Islamic Thought and Civilization [ISTAC], 1996) and *Scientific Thought and its Burdens* (Istanbul: Fatih University, 2000). Two useful works—one a lengthy study and the other a brief survey—which may help introduce an enthusiastic reader to the system of thought of al-Attas are Wan Mohd Nor Wan Daud, *The Educational Philosophy and Practice of Syed Muhammad Naquib al-Attas: An Exposition of the Original Concept of Islamization* (Kuala Lumpur: International Institute of Islamic Thought and Civilization [ISTAC], 1998); and Adi Setia, “Al-Attas’ Philosophy of Science: An Extended Outline,” *Islam & Science*, Vol. 1, No. 2 (December 2003): 165-214.

concerns and approaches, as well as its position in a certain context—or structure—of relations, our discussion, rather than being conducted in the specific mould of science in the former sense, needs to be interdisciplinary² and, in many instances, falls more into the purview of metascience and philosophy, or what a physicist positively calls “the science before science.”³ That being the case, although our main concern here is with the orientation of *science* in the former sense, since we are equally concerned with its *orientation*, we cannot but deal with science in the latter sense as well. To minimize any confusion that may arise, we shall subsequently use the abbreviation “NS” (meaning, the natural sciences taken as a group) whenever we intend to refer specifically to science in that former sense.

NS, as a branch of knowledge in Islam, can be understood in at least two ways: one is to approach it as a particular human process of knowing and the other is to approach it from the angle of the peculiar object it studies and seeks to know further. The former, in other words, attempts to understand NS as a particular epistemic act of its agent (that is, man), involving necessarily specific methods of study and research deemed appropriate and sufficient to realize the intent of such an act, while the latter tries to grasp it in the context of its subject-matter, or what is being studied by it.

These two approaches, rather than being exclusive, are interdependent and mutually complementary, just like the two sides of the same coin. For, as Islam is characterized by *tawhīd*, this characteristic is also manifested in the approaches and methods of study it propounds. In fact, just as the nature of the object being studied very much determines the most appropriate manner for the subject—or the agent of the epistemic act—to approach it, so does the most suitable epistemological method adopted in

2. An explanation of the reasons why, nowadays, this interdisciplinary approach is very much needed in one's deliberation on science and technology can be found in Elisabeth Beck-Gernsheim, *Technik, Markt und Moral (The Social Implications of Bioengineering)*, trans. Laimdota Mazzarins (New Jersey: Humanities Press, 1995), 1-20. Examples of the application of this approach to science and technology studies can be found in Peter D. Hershock, Marietta Stepaniants, and Roger T. Ames (ed.), *Technology and Cultural Values On the Edge of the Third Millennium* (Honolulu: University of Hawaii Press and East-West Philosophers Conference, 2003).

3. See Anthony Rizzi, *The Science Before Science: A Guide to Thinking in the 21st Century* (Baton Rouge: The Institute for Advanced Physics [IAP] Press, 2004).

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studying a particular subject-matter determine what is known of the object. The unity of these two approaches, therefore, is neither artificial nor enforced from without but arises from within the intimate relation that exists between knowledge and reality-truth.⁴

Dealt with using the latter approach, NS is basically any discipline of study which has, as its object of study, the Cosmos and aims accordingly at knowing its nature or reality. In today's understanding and practice particularly, NS as systematic empirical and intellectual endeavours is primarily focused on man's discovery and understanding of the nature of the various physical dimensions, layers, and parts of the Cosmos. Such endeavours consist basically of observations and experiments, necessarily involving human sensory perceptions and attempts at conceptualization by the human mind, apart from reliance on authentic reports of the scientific community. These dimensions, layers, and parts of the Cosmos are basically what is generally referred to as matter (*māddah*) and its concomitants (*lawāzīm al-māddah*). Such being the main focus and aim of NS, the method(s) adopted in it must necessarily be tailored to its major focus and aim.

As far as Islam is concerned, such focus and aim as well as the method(s) so tailored, if *properly* viewed and applied within the larger context of reality-truth, are not inherently wrong. What is wrong is when NS—particularly physics—is taken to be the model, the prototype, or the benchmark, of true knowledge and science; when knowledge as well as the methods and approaches leading to knowledge and truth are reduced in one's understanding, attitude, and action to NS; when reality and existence is reduced merely to what NS basically seeks to study, that is, the physical dimensions, layers and parts of the Cosmos. In fact, this reductionistic ideology and tendency constitutes what in the modern West is called *scientism*, something that is fundamentally opposed to Islam and its worldview.⁵ In the teachings of Islam, on the contrary, there are generally

4. On the issue of methodology in this context, some of the relevant works for further reference are Wan Daud, *The Educational Philosophy*, especially chapter 2; Osman Bakar, *Tawhid and Science: Essays on the History and Philosophy of Islamic Science* (Penang and Kuala Lumpur: Secretariat for Islamic Philosophy and Science and Nurin Enterprise, 1991), especially chapters 1, 2, and 4; and Muzaffar Iqbal, "Islam and Modern Science: Questions at the Interface," pp. 3-41, in *God, Life, and the Cosmos: Christian and Islamic Perspectives*, ed. Ted Peters, Muzaffar Iqbal and Syed Nomanul Haq (Aldershot: Ashgate, 2002).

5. There are of course other cognate ideologies and tendencies, such as

two levels of cosmic existence: one is the visible world of dominion (*‘ālam mulk wa’l-shahādah*) and the other, the angelic and hidden world (*‘ālam al-malakūt wa’l-ghayb*). In between, according to many authoritative scholars and metaphysicians, is the imaginal world (*‘ālam al-mithāl*) known theologically as *barzakh*.⁶

Therefore, in order to ensure that the sciences—NS included—as developed by the Muslims are *Islamic*, it is important that they be conceived of and caused to unfold in line with the worldview of Islam and its attendant system of knowledge. As the various entities and events constituting the Cosmos are depicted in the Qur’ān and the Prophetic Traditions as *āyāt* (signs or symbols), and since we have decided to approach NS mainly from the angle of its subject-matter, the focus of our discussion shall be on the Cosmos—or the World of Nature—as an open, grand, created Book. Having understood the Cosmos as such, we shall proceed to see what implications such a peculiar understanding of the Cosmos may have so that an intellectual framework for the science agenda of the Muslim Ummah can then be formulated. Such a framework, if rightly imbued and disseminated through proper education, can determine a totally different orientation for the development of science in Muslim societies.

physicalism, materialism, etc., which are actually different yet inter-related manifestations of secularization as a major ideology in the modern West.

6. For further discussions on these other dimensions of the Universe, as understood from the Islamic cosmological perspective, see for instance al-Attas, *Prolegomena*, 167 ff., and chapter 7; our *The Sources of Knowledge in al-Ghazālī’s Thought: A Psychological Framework of Epistemology* (Kuala Lumpur: International Institute of Islamic Thought and Civilization [ISTAC], 2002), p. 52 note no. 16, p. 54 note no. 23, and p. 58 note no. 35; Osman Bakar, *Tawhid*, chapter 2; Seyyed Hossein Nasr, *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*, rev. ed. (Thames and Hudson, 1978), 44-74, 132-165, 197-214, and 236-262; and Mostafa al-Badawi, *Man and the Universe: An Islamic Perspective* (Amman: Wakeel Books, 2002), 3-18. See also Seyyed Hossein Nasr, “The Question of Cosmogogenesis—The Cosmos as a Subject of Scientific Study,” *Islam & Science*, Vol. 4, No. 1 (Summer 2006): 43-59; Muzaffar Iqbal, “In the Beginning: Islamic Perspectives on Cosmological Origins,” *Islam & Science*, Vol. 4, No. 1 (Summer 2006): 61-78; and *idem*, “In the Beginning: Islamic Perspectives on Cosmological Origins—II,” *Islam & Science*, Vol. 4, No. 2 (Winter 2006): 93-112.

Knowledge and the Cosmos as a System of Signs

That Allah taught Ādam the names of everything, as related in the Qur'ān, shows the importance of language in Islam as a system of symbolic forms which is indispensable for human cognitive activities.⁷ The term for "name" in Arabic is "*ism*," a derivative of the root word "*wasm*" or "*simah*," meaning "sign," "mark," or "brand."⁸ It basically functions as an indicator to point to something so that it may be found and subsequently grasped by man's searching mind, so much so that the human process of knowing the various objects of knowledge is almost inconceivable without involving any kind of language. Thus far, the human act of knowing almost always involves man's recognition of the various objects by their names. In fact, scientific discoveries almost always result in naming things with terms that are cognitively befitting.⁹ This cognitive significance of language is further reinforced by the fact that man, insofar as the Islamic intellectual and scientific tradition is concerned, has been essentially considered to be *al-ḥayawān al-nāṭiq* (a rational animal). The term *al-nāṭiq*, signifying a differentia that distinguishes man from other animate beings and itself being a derivative of the root word *nutq*, marks the symbiosis between language and mind. Hence, not only is man, to appropriate today's jargons, *homo sapiens* but he is also *homo loquens*.¹⁰

7. See *Al-Baqarah*: 31.

8. See J M. Cowan, *The Hans Wehr Dictionary of Modern Written Arabic*, 4th ed. (New York: Spoken Language Services, Inc., 1994), s.v. "w-s-m."

9. It is important for us, in this regard, to realize that names and naming get to serve evil purposes as much as they do good. How often have we seen names and naming serving imperialistic ends, at least psychologically? Many a perceptive observer has in fact noticed the strong Eurocentric biases in the predominant tendency among Western sciences of naming anything "scientific" with Graeco-Latin terms. In this respect also, it is to be noted that among the distinctive features of the Islamic intellectual and scientific tradition is the utmost care it gives to the correct and precise use of any one term, especially that with technical and religious imports, in relation to both its connotation and denotation. It is therefore a common phenomenon in this tradition that the *conceptual content* of a science or an art will have its most appropriate *terminological form*, something that is rendered possible largely because of the root system of the main Islamic language, the Qur'ānized Arabic.

10. For further explanation, see al-Attas, *Prolegomena*, 121-122; *idem*, *Concept*, 13ff.; and *idem*, *Positive*, 3ff. See also R. L. Trask, *Language: The Basics* (London and New York: Routledge, 1995), 18.

There are indeed strong grounds, as demonstrated in a number of serious studies, for us to consider the Islamized Arabic—that is, the Arabic language after the revelation of the Qur’ān and as used in the Islamic religious, intellectual and scientific tradition—to be a linguistic-conceptual system that eloquently projects a particular worldview, a particular way of understanding Truth-Reality.¹¹ In this regard, one main characteristic of the Islamic intellectual and scientific tradition is its emphasis on the symbolic content and function in knowledge and knowing, a feature made possible by the scientific nature of the Islamized Arabic, being the linguistic medium of the Qur’ān with its unique characteristics and well-preserved root system.¹²

To briefly illustrate this point, let us consider the word ‘ilm, the most commonly used term in Arabic referring to knowledge, which is in fact part of the basic Islamic vocabulary of the Muslims worldwide. This term

11. Insofar as the Islamized Malay language, as the effective medium of Islamizing the worldview of the Malays and thus defining as well as preserving their identity is concerned, one cannot but read the various writings of Syed Muhammad Naquib al-Attas on this subject for convincing historical and intellectual proofs. His thesis may partly be summarized in the following way: the process involved in Islamizing the Malay language and mind is reminiscent of the process of Islamizing the Arabic language and mind that started with the first revelation to the Prophet Muhammad. See particularly his *Preliminary Statement on a General Theory of the Islamization of the Malay-Indonesian Archipelago* (Kuala Lumpur: Dewan Bahasa dan Pustaka, 1969); *Islam dalam Sejarah dan Kebudayaan Melayu* (Kuala Lumpur: Universiti Kebangsaan Malaysia, 1972); and “A General Theory of the Islamization of the Malay-Indonesian Archipelago,” in *Profiles of Malay Culture: Historiography, Religion and Politics*, ed. Sartono Kartodirdjo (n.p., Indonesia: Ministry of Education and Culture, 1976). See also Wan Mohd Nor Wan Daud, *Masyarakat Islam Hadhari: Suatu Tinjauan Epistemologi dan Kependidikan ke Arah Penyatuan Pemikiran Bangsa* (Kuala Lumpur: Dewan Bahasa dan Pustaka, 2006), especially “Bab 4: Kerangka Keilmuan Tamadun Melayu,” pp. 110-146.
12. This has been sufficiently explained by Syed Muhammad Naquib al-Attas in some of his writings (see especially those in note no. 1 above). Relevant also in this respect are some of Toshihiko Izutsu’s works on the semantics of several Islamic key terms, particularly his *God and Man in the Qur’ān: Semantics of the Qur’ānic Weltanschauung* (Tokyo: Keio University, 1964; reprint., Petaling Jaya: Islamic Book Trust, 2002) and *Ethico-Religious Concepts in the Qur’ān* (Montreal: McGill University Press, 1966), 3-41.

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stems from a root comprising three letters, ‘*l-m*, or ‘*alam*. The basic meaning inherent in that root word is that of ‘*alāmah*, meaning “way sign.” Al-Rāghib al-Iṣfahānī in his *Muʿjam mufradāt alfāz al-Qurʾān* explains that *al-‘alam* is “the trace (or mark) by which something is known” (*al-athar alladhī yuʿlam bihi al-shayʾ*).¹³ As to the relation that may obtain between ‘*ilm* and ‘*alam*, especially in the Arabian context, Rosenthal has made an interesting suggestion,

...the meaning of “to know” is an extension, peculiar to Arabic, of an original concrete term, namely, “way sign.”...the connection between “way sign” and “knowledge” is particularly close and takes on especial significance in the Arabian environment. For the Bedouin, the knowledge of way signs, the characteristic marks in the desert which guided him on his travels and in the execution of his daily tasks, was the most important and immediate knowledge to be acquired. In fact, it was the kind of knowledge on which his life and well-being principally depended. Thus, it is easy to see how in a largely nomadic environment, the general concept of knowledge was able to develop from the concrete process of being acquainted with “way signs.”¹⁴

In addition, ‘*l-m* is also the root for another widely used term, ‘*ālam*, which generally means the World of Nature—the Universe, or the Cosmos—and which covers not only all that is around us, but also whatever is in us, which can be studied and known. It has in fact been an established position in the Islamic intellectual and scientific tradition that there are two interrelated kinds—or better still, modes—of the world: the macrocosm (*al-‘ālam al-kabīr*) and the microcosm (*al-‘ālam al-saghīr*), the former referring to the universe, while the latter pointing specifically to man as a being modelled on the former.¹⁵ In that tradition as well, based upon

13. Al-Rāghib al-Iṣfahānī, *Muʿjam mufradāt alfāz al-Qurʾān* (Beirut: Dār al-Kutub al-ʿIlmiyyah, 1997), s.v. “‘*l-m*.”

14. Franz Rosenthal's *Knowledge Triumphant: The Concept of Knowledge in Medieval Islam* (Leiden: E. J. Brill, 1970), 10. Although we can agree with Rosenthal's suggestion about the particularly close connection between the way sign and knowledge, which takes on especial significance in the Arabian environment, we should not limit that environment simply to that of the Bedouin Arabs, especially when it concerns Islam and the Prophet Muḥammad, as the Qurʾān was revealed to the people whom we may generally deem historically as the urban Arabs.

15. Al-Iṣfahānī relates this view from Jaʿfar ibn Muḥammad who, we may surmise, is the well-known Imām Jaʿfar al-Ṣādiq. See al-Iṣfahānī,

the intellectual framework projected by the Qurʾān and the Prophetic Traditions, all the individual things and events in the universe are considered to be God's *āyāt* (singular, *āyah*), viz. God's signs and symbols.¹⁶ An *āyah* basically means a manifest sign (*al-ʿalāmah al-zāhirah*) which serves to indicate what is hidden, or not directly manifest, in such wise that when the sign is perceived, the other, which cannot be perceived and which is of one predicament as the former, comes to be known.¹⁷ Since *al-ʿālam*, as explained by al-Rāghib al-Iṣfahānī, was a term originally used for anything instrumental and indicative in the obtainment of the knowledge of something,¹⁸ these signs taken as a totality are referred to in the Islamic intellectual and scientific tradition as *al-ʿālam* (the Cosmos; the Universe; the World-of-Nature), theologically defined as “everything other than God which points to Him.”¹⁹

Muʿjam, s.v. “-l-m”; and Suʿād al-ḥakīm, *Al-Muʿjam al-ṣūfī: Al-ḥikmah fī ḥudūd al-Kalimah* (Beirut: Dandarah, 1981), s.v. “insān”; cf. al-Attas, *The Concept of Education*, p. 39, note no. 45.

16. Examples of such Qurʾānic verses are *Āl-ʿImrān*: 190; *Yūnus*: 5-6; *al-Ḥijr*: 16; 19-23; 85; *al-Naḥl*: 3; 5-8; 10-18; 48; 65-69; 72-74; 78-81; *al-Anbiyāʾ*: 16; *al-Naml*: 59-64; *al-Muʾmin*: 61; *al-Mulk*: 2-5; 15; and *Fuṣṣilat*: 53. Al-Imām Muḥammad b. Abū Bakr al-Rāzī notes that when applied to the Qurʾān, *al-āyah* generally means *jamʿāʿatu ḥurūf* (a cluster of letters). See his *Mukhtār al-ṣiḥāḥ* (Beirut: Librairie du Liban, 1989), s.v. “ā-y-ā”; see also Al-Iṣfahānī, *Muʿjam*, s.v. “ā-y-ā”; and al-Sayyid Murtaḍā al-Ḥusainī al-Zabīdī, *Tāj al-ʿArūs min Jawāhir al-Qāmūs*, 10 vols. (n.p.: Dār al-Fikr, n.d.), vol. 10, s.v. “ā-y-ā.”

17. See al-Iṣfahānī, *Muʿjam*, s.v. “ā-y-ā”; cf. al-Rāzī, *Mukhtār*, s.v. “ā-y-ā.”

18. See al-Iṣfahānī, *Muʿjam*, s.v. “-l-m.”

19. See, for example, al-Sayyid al-Sharīf ʿAlī ibn Muḥammad al-Jurjānī, *Kitāb al-Taʾrīfāt*, ed. Ibrāhīm al-Abyārī (Beirut: Dār al-Kitāb al-ʿArabī, 1998, 4th imprint), s.v. “al-ʿalam”; and Saʿd al-Dīn al-Taftāzānī's *Sharḥ al-ʿAqāʾid al-Nasafiyyah* in *Majmūʿat al-ḥawāshī al-Bahiyyah ʿalā Sharḥ al-ʿAqāʾid al-Nasafiyyah*, 2 vols. in 1 book ([Egypt]: Maṭbaʿat Kurdistān al-ʿIlmiyyah, 1329H), 1: 68-69. Even Rosenthal, though himself reluctant to admit that there is a semantic connection between the terms *ʿilm* and *ʿālam*, recognizes that such a connection is something readily acknowledged by the Muslim scholars. He notes,

“As may be expected, Muslim scholars sometimes connected *ʿālam* with *ʿilm* or *ʿalam*. Cf. ʿAbd al-Qāhir al-Baghdādī, *Uṣūl ad-dīn*, 34 (Istanbul 1346/1928, reprinted, n.y., n.p.): “*ʿālam* is everything that has knowledge and sense perception,” but a combination with *ʿalam/alāmah* is preferable. *ʿālam* is “a designation for the angels, the jinn, and the human beings who

It is also important for us to note that physics, which is widely considered as the prototype of NS in its peculiarly modern sense, is called in the Islamic intellectual and scientific tradition “the science of nature” (*‘ilm al-ṭabī‘ah*). The word *al-ṭabī‘ah*, unlike the English word “nature” which seems to imply the eternity of the world, stems from the root word *ṭ-b-‘* or *ṭab‘*, meaning basically “impression left on something” (*ta’tḥīr fī...*), “seal,” or “stamp” (*khatm*), and connoting therefore “a natural disposition or propensity with which a creature was created” (*al-sajjyah allatī jubila ‘alayhā...*). All such meanings assume that there exists a Creator who, in

possess knowledge.” It is “the totality of bodies (substances) and accidents of which the Creator has knowledge.” (cf. *az-Zamakhsharī, Kashshāf*, I, 43). In this case, *‘ilm*, and not *‘alam*, is clearly meant. However, it is *‘alam/‘alāmah* which is adduced by the Imām al-Ḥaramayn al-Juwaynī in explaining that *‘alam* is called *‘alam* because it is an indication set up to indicate the existence of the owner of the *‘alam*. Likewise, the world with its substances, accidents, parts, and particles is a sign indicating the existence of the Lord, the owner of the world, cf. his *Luma‘ al-adillah*, ed. Fawqīyah Husayn Maḥmud, 76 (Cairo 1385/1965). The view expounded by ar-Rāghib al-Iṣfahānī is not quite clear. With great if misplaced ingenuity, probably borrowed from some older source, he combines *‘Ālam* with words of a similar noun formation such as *khātam* and *ṭāba‘*, both meaning “seal,” and interprets it as the “instrument” by which the world with all the substances and accidents it contains “is known” (or does he mean, “is marked,” from *‘alam*?). Thus, the world is instrumental in proving the existence of its Creator, cf. his *Mufradāt* III, 141, *s.rad. ‘-l-m* (Cairo 1322, in the margin of Ibn al-Athīr, *Nihāyah*). At-Tahanawī is even more ambiguous. He also brings *‘alam* together with *khātam* and *ṭāba‘* and derives it from *‘alam/‘alāmah* as the designation for something through which something is known. He presumably did not think at all “is marked,” since he goes on to say that the word came to be used primarily for that “through which the Creator is known” (this would seem to be the only possible translation in this case). “It designates all the *existentia* with the exception of God, that is, the created things whether they are substances or accidents,” which indicate the existence of a Necessary Originator, cf. his *Kashshāf iṣṭilāḥāt al-funūn*, 1053 (Calcutta 1854-62). Notwithstanding all these speculations, however, by and large little was made of the suggestive, if completely wrong, etymology which brings *‘ālam* together with the Arabic root *‘-l-m*.” (Rosenthal, *Knowledge Triumphant*, pp. 19-20, note no. 1.)

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His own way of creating (*sunnatuʿLlāh*), makes “order” and “regularity” inherent in the universe as cosmos—as opposed to chaos—and renders knowledge and prediction possible.²⁰ Predictability being a characteristic of NS is made possible because of the intelligent design and regularity in Nature, the one encapsulated by the Islamic notion, *SunnatuʿLlāh*. This, as Fazlur Rahman rightly points out, is itself miraculous and provides enough ground for man to be filled with the sense of awe.²¹

All that has thus far been discussed, cursory though our discussion may be, relates coherently with another key word in Islam, *khalq* (creation), and such of its cognates as *khāliq* (creator), *makhḷūq* (creature), and *khuluq* [pl. *akhlāq*] (inner dimension of a creature; character). *Khalq* as a root-word, ibn Manẓūr explains, signifies “the creation of something in a form which has no precedence” (*ibtidāʿ al-shayʿ ʿalā mithāl lam yusbaq ilayh*) as well as “the act of giving a definite measure [to something]” (*al-taqdīr*).²² Such being the case, one finds Muḥammad b. Abū Bakr al-Rāzī not only remarking that *ʿalam* is basically synonymous with *ʿalāmah* but also stating that *al-ʿālam* means *al-khalq* (creation).²³

20. Al-Rāzī, *Mukhtār*, s.v. “ṭ-b-”; al-Attas, *Risalah*, 105-107; and John Ayto, *Dictionary of Word Origins*, paperback ed. (New York: Arcade Publishing, 1993), s.v. “nature.” A detailed analysis of the word “nature” can be found in C.S. Lewis, *Studies in Words*, 2d. Canto ed. (Cambridge: Cambridge University Press, 1990; reprint., 1996), “Chapter 2: Nature,” 24-74. Cf. Gilbert Rist, *The History of Development: From Western Origins to Global Faith* (London & New York: ZED Books, 1997), 28ff.

21. See the chapter on Nature in his *Major Themes of the Qurʾān* (Minneapolis and Chicago: Bibliotheca Islamica, 1980); and also Adi Setia, “*Taskhīr*, Fine-Tuning, Intelligent Design and the Scientific Appreciation of Nature,” *Islam & Science*, Vol. 2, No. 1 (Summer 2004): 7-32.

22. See his *Lisān al-ʿArab*, s.v. “kh-l-q.”

23. Al-Rāzī, *Mukhtār al-Ṣiḥāḥ*, s.v. “-l-m.” It can thus be inferred, on justified grounds and with reference to other relevant Qurʾānic verses (such as 25:2; 65:3; 33:38; 13:8; 15:21; 54:49; 36:12; 72:28; and 78:29), that God not only brought all the creatures and events into existence according to a comprehensive design predetermined in His Perfect Knowledge, but also generously sustains and governs all of them (*tadbīr al-amr*). The erudite Fakhr al-Dīn al-Rāzī (d. 604 A.H.), for instance, in commenting upon one of those verses, says: “*Yudabbir al-amr* means that God decrees and foreordains according to the requirement of wisdom and [He also] does that which is done by one whose act is always apposite and who attends to the ends and outcomes of affairs such that nothing unbecoming would ever come

What is even more significant than all that had been discussed thus far is the fact that not only are all the individual entities and events comprising the World of Nature considered by the Qur'ān to be the *ayats* of Allah (that is, God's signs and symbols), but the verses in the Qur'ān are themselves so called. This has indeed led many a scholar in the Islamic intellectual and scientific tradition to draw an analogy between the two, regarding the cosmos as a book in more or less the same manner as the Qur'ān, the main difference between them being that the former is created whereas the latter is Revealed.²⁴ Such an analogousness is greatly reinforced by the semantic field formed by the interrelation of the meanings of the aforementioned key words, projecting thus the notion of the Cosmos being a unified system of Divine signs. For those who subscribe to such an understanding, doing science essentially becomes attempts to read and interpret the Open Book of Nature correctly. And since the Author of the two books is the same, being both One (*wāḥid*) and Unique (*aḥad*) in the Absolute sense, one can rightly infer that the book as a totality also reflects such a unity—being a unified system of signs and meanings—just like the Qur'ān with its unity of message and teachings. Therefore, a scientist cannot but also be attentive to the Revealed Book in his very act of reading the Created Book. All these are among those features that are constitutive of what the Muslims generally call the *taḥwīd* (integrated) approach to all the different and valid branches of knowledge. Sciences developed by Muslims must therefore reflect such features for them to be properly regarded as Islamic.

Some Theoretical Implications of the Cosmos as the Created Book

Syed Muhammad Naquib al-Attas has been one of the very few Muslim

into existence (*ma'nāhu annahu yaqḍī wa yuqaddir 'alā ḥasab muqtaḍā al-ḥikmah wa yaf'al mā yaf'aluhu al-muṣīb fī af'ālihi al-nāzīr fī adbār al-umūr wa 'awāqibuhā kay lā yadkhul fī al-wujūd mā lā yanbaghī*.) See his *al-Tafsīr al-Kabīr*, 32 vols. in 16 books. (Beirut: Dār al-Kutub al-'Ilmiyyah, 1990), 17: 13. His commentary on the other verses can be found in *ibid.*, 17: 70-71, 18: 187, and 25: 150-151.

24. For instance, in his *Mawāqī' al-Nujūm*, Ibn 'Arabī, the great ṣūfī of Islam, as Su'ād al-Ḥakīm noted, had used the term "Great Book" (*al-kitāb al-kabīr*) to refer to the cosmos and, accordingly, "Small Book" (*al-kitāb al-ṣaghīr*) to the Qur'ān. See al-Ḥakīm, *Al-Mu'jam*, s.v. "kitāb." I wish to thank my colleague Mohd Sani bin Badron for drawing my attention to this.

scholars of the present time who, with intellectual rigour, has consistently and systematically expounded on the idea of the Cosmos being the Created Book.²⁵ In an important work of his, he explains,

The world of nature as depicted in the Glorious Qur'ān is composed of symbolic forms (*āyāt*), like words in a book. Indeed, the world of nature is another form of the Divine Revelation analogous to the Glorious Qur'ān itself, only that the great, open book of nature is something created; it presents itself in multiple and diverse forms that partake of symbolic existence by virtue of being continually articulated by the creative word of God. Now a word as it really is is a symbol, and to know it as it really is, is to know what it stands for, what it symbolizes, what it means. If we were to regard a word as if it has an independent reality of its own, then it would no longer be a sign or a symbol as it is being made to point to itself, which is not what it really is. So in like manner the study of nature, of any thing, any object of knowledge in the world of created things, if the expression 'as it really is' is taken to mean its alleged independent reality, essentially and existentially, as if it were something ultimate and self-subsistent, then such study is devoid of real purpose and the pursuit of knowledge becomes a deviation from the truth, which necessarily puts into question the validity of such knowledge. For as it really is a thing is other than what it is, and that 'other' is what it *means*.

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25. A summary of al-Attas's cosmology has been attempted by Adi Setia in his "Philosophy," 179-187. Besides al-Attas, Seyyed Hossein Nasr is another scholar who has deliberated on this idea, directly or indirectly, in several of his writings, some of which are: *Man and Nature: The Spiritual Crisis of Modern Man* (London: George Allen and Unwin, 1976); *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*, rev. ed. (Thames and Hudson, 1978); *Knowledge and the Sacred: The Gifford Lectures, 1981* (Edinburgh: Edinburgh University Press, 1981); and *The Need for a Sacred Science* (Richmond: Curzon Press, 1993). Much earlier than both al-Attas and Nasr, Badī'uzzamān Sa'īd al-Nūrsī (1877-1960) had also dealt with this issue extensively. Several studies on this aspect of his thought have been made, some of which are: Sükran Vahide, "The Book of the Universe: Its Place and Development in Bediuzzaman's Thought" in *A Contemporary Approach to Understanding the Qur'ān: The Example of the Risale-i Nur* (Istanbul: Sözlür Nesriyet, 2000), 466-483; Adi Setia, "Taskhīr," 7-32; and Yamine Mermer and Redha Ameur, "Beyond the 'Modern': Sa'īd al-Nūrsī's View of Science," *Islam & Science*, Vol. 2, No. 2 (Winter 2004): 119-160.

Thus, in the same manner that the study of words as *words* leads to deviation from the truth underlying them, the preoccupation in philosophy and physics with things as *things* leads to the erroneous, common sense belief in their existence outside the mind as aggregations of particles persisting through a certain period of time and moving in space, as if these particles were the ultimate material of the world. Whereas in reality the stuff of 'matter' consists of a series of events (*a'rāḍ*, sing. *'arad*), and physical phenomena are processes whose every detail is discontinuous. A thing like a word is then in reality ultimately a sign or a symbol, and a sign or a symbol is something that is apparent and is inseparable from something else not equally apparent, in such wise that when the former is perceived, the other, which cannot be perceived and which is of one predicament as the former, is known. That is why we have defined knowledge epistemologically as the arrival in the soul of the *meaning* of a thing, or the arrival of the soul at the *meaning* of a thing. The 'meaning of a thing' means the right meaning of it, and what we consider to be the 'right' meaning is in our view determined by the Islamic vision of reality and truth as projected by the Quranic conceptual system.

Thus the phrases...such as the 'true order of reality', the 'just order pervading all creation', the 'levels and degrees', and the 'general order of created things' in our reference to the 'system' of conceptual relations in which the 'proper places' of things are recognized, point to no other than the Quranic conceptual system. Correspondence and coherence as we understand them in connection with reality and truth refer to proper place in the former case and to the Quranic system in the latter case.²⁶

From what al-Attas has succinctly explained pertaining to the similarities, or correspondence, between the revealed Book and the created Book, as partly reproduced above, at least two theoretical implications can be drawn:²⁷

1. Avoidance of Secularization as an Ideology

Secularization as an *ideology* or a *philosophical program*, as explained by al-Attas based on what the leading modern Western intellectuals have them-

26. Al-Attas, *Prolegomena*, 133-134.

27. The major part of such implications, as we shall draw here and unless otherwise stated, consists of our reproduction, reorganization and summary of what al-Attas has himself elucidated in his *Islām and Secularism*, pp. 29-40, and *Prolegomena*, pp. 133-140.

selves admitted, consists of three interrelated and integral components: the disenchantment of nature, the desacralization of politics, and the deconsecration of values.²⁸ In his analysis, the 'disenchantment' of nature is the most fundamental component in the dimensions of secularization as a philosophical program and is most certainly opposed to the Islamic view of Nature. The disenchantment of nature, understood and propagated as such, aims at, as well as, ends up divesting nature of any cosmic significance and severing its symbolical connection with God; depriving man's respect for nature to the extent that he treats nature which he once held in awe with a ruthless sort of vindictiveness; destroying the harmony between man and his environment.

On the contrary, granted the coherent conceptual system centering on the key word "Allāh," formed by the semantic interconnections of a set of Islamic-Arabic key words, some of which have been briefly discussed above, it is inconceivable that someone who adheres to such a system propagates instead a system of knowledge and science which is secular in its orientation. A person with the above mental grasp will surely deal with the objects of knowledge and science differently. At the very least, he is not

28. Al-Attas has pointed out, however, that,

...secularization as a whole is not only the expression of an utterly unislamic world view, but that it is also set against Islam; and yet...the *integral components* in the dimensions of secularization—that is, the disenchantment of nature, the desacralization of politics, and the deconsecration of values—when seen in their *proper* perspectives, indeed become part of the integral components in the dimensions of Islām, for they reflect one of the fundamental elements in the Islamic vision of reality and existence, and characterize Islām in the true and real manifestation in history bringing about the effect that revolutionizes the world view of man.

(*Islām*, 39-40.) Elsewhere he clarifies the process which he calls *Islamization* in the following terms:

The phenomenon of Islām and its impact in the history of world cultures and civilizations did...bring about the *proper* disenchantment of nature, and the *proper* desacralization of politics, and the *proper* deconsecration of values, and hence without bringing about with it secularization. (*Islām*, 38.)

For further elaboration on this, see his *Prolegomena*, 20ff.; and *Islām*, chapters 1 and 2.

going to treat such objects as *mere things* to which he may do as he wishes. For as signs, the various objects are never existentially and epistemologically independent of God, and hence they have to be treated with a sense of responsibility to God. To treat them simply as mere things, as objects-in-themselves with no other point of reference, is to deny the fact that they are signs pointing to God and for the treatment of which we shall be answerable to God. And any scientist who does so while proclaiming to be a Muslim, does not in fact know what he or she is saying. Al-Attas himself makes it clear that

The Noble Qurʾān declares in no uncertain terms that the whole of nature is as it were a great, open Book to be understood and interpreted. The Glorious Qurʾān also says that those among mankind who possess intelligence, insight, understanding, discernment, knowledge, know the meaning of that Book, for nature is like a book that tells us about the Creator; it 'speaks' to man as a revelation of God. The Glorious Qurʾān's description of nature and man—both in their outward manifestation and their inward hiddenness—as *āyāt* (words, sentences, signs, symbols) is self-explanatory in that respect. Nature has cosmic meaning and must because of its symbolical connection with God be respected. Man according to the Glorious Qurʾān is God's vicegerent (*khalīfah*) and inheritor of the Kingdom of Nature. This does not mean that he should be presumptuous enough to regard himself as "copartner with God in creation".... He must treat nature justly; there must be harmony between him and nature. Since he has been entrusted with the stewardship of the Kingdom of Nature which belongs to God, he must look after it and make legitimate use of it, and not ruin and spread chaos over it. If nature is like a great, open Book then we must learn the meaning of the Words in order to discern their tentative and final purposes and enact their biddings and invitations and instructions to beneficial use in such wise that we may come to know and acknowledge in grateful appreciation the overwhelming generosity and wisdom of the incomparable Author. It is true that the Glorious Qurʾān also 'disenchanted' nature from the very moment of its revelation; ... yet...Islam 'disenchanted' nature...only in the sense of, and so far as, banishing the animistic and magical superstitions and beliefs and false gods from nature where indeed they do not belong. Islām did not completely deprive nature of spiritual significance, for it sees in Creation, in the heavens and the earth and what lies between...in every thing in the farthest horizons and in our very selves...the Signs of God.²⁹

29. Al-Attas, *Islam and Secularism*, 35-38.

As far as our present life in the world is concerned, the world in its especially material and physical dimension is known as *al-dunyā*. The word *dunyā* itself is a derivative of the root word *danā* and conveys the meaning of something being brought near. Its being applied to the world signifies thus that the world is that which is *brought near to the sensible and intelligible experience and consciousness of man*. Since the world as “that which is brought near” both surrounds us and overwhelms us, it distracts us from being ever-conscious of our final destination—*al-ākhirah*, or the Hereafter—which is beyond the world and comes after it. Yet, the world, as we have discussed earlier, is also the Signs of God in their totality; as such, it is the Signs of God *that are brought near*. That they have been brought near to us will surely put us in a better position to understand their meanings and is itself proof of Divine Mercy and Loving Kindness. Should the world be so understood and should those signs be known in their true purpose, then not only would it be blasphemous for one to derogate the world but there can also be no excuse for one to involve oneself in any of the following three attitudes toward the world: one who, being awed by those signs, worships them, instead of God to whom they point; or one who, seeing nothing in those signs except distractions in one’s way of seeking God, rejects them; and one who, having denied God, appropriates the Divine Signs for one’s own ends and changes them in pursuit of *illusory* development.³⁰ It is therefore important that Muslims, including the scientists from among them, be cognizant of the reason why the Cosmos is being called *al-‘alam* as well as *al-dunya*. For as far as their attitude to it is concerned, such an understanding will surely prevent them from being extremists in their reception or rejection of the world in all its various forms.

2. Appropriation of the *Tafsīr-Ta’wīl* Method

In the Islamic intellectual and scientific tradition the cosmos is often regarded as the Created Book, somewhat analogous to the Qur’ān as the Revealed Book, hence all the individual entities and events comprising the World of Nature, like the verses in the Qur’ān, are considered by the Qur’ān to be God’s signs and symbols (*āyāt*). Since the Author of the two books is one and the same, being Himself One (*wāḥid*) and Unique (*Āḥad*) in the Absolute sense, the Created Book as a totality is also reflective and indicative of such a unity—in being a unified system of signs

30. For further elaboration on the issue of progress, change, and development, see al-Attas, *Islam and Secularism*, 82ff.

and meanings—just like the Revealed Book in its unity of message and teachings. For those who subscribe to such an understanding, doing science essentially becomes attempts to read and interpret the Open Book of Nature correctly. And as such, a scientist cannot but also be attentive to the Revealed Book in his very act of reading the Created Book.

In reading, one has to deal with the various signs and symbols which are arranged in such a way that they convey a certain meaning or message. Take a verse, for instance. A verse, as in the case of the Qur'ān, is composed of a number of meaningfully related words, each word in turn comprising a number of meaningfully related letters. "A word as it really is," as al-Attas has explained above, "is a symbol, and to know it as it really is, is to know what it stands for, what it symbolizes, what it means." If one were to regard it as if it has an independent reality of its own, then it is being made to point to itself, which is not what it really is, and would cease to act as a sign or a symbol.³¹

Supposing a person while touring an area, comes across a warning sign written in red, "BEWARE OF ROTTWEILER." If he is reasonable enough, he would pay heed to the message by leaving the place, lest he encounters the Rottweiler. But suppose that instead of leaving the place, he spends his time pondering the very composition of the sentence, measuring the shape and size (length, width, diameter, etc.) of each letter and determining its colour and shade, then given the somewhat obvious context, his reason will surely be questioned, at the very least. It is clear therefore that a word, as a sign or a symbol, remains useful as long as it points to the meaning or message it is supposed to convey. Otherwise, being awed by the physical appearance of a certain word, one may spend one's lifetime scrutinizing everything about or surrounding it, yet missing its very meaning which is its *raison d'être*.

Similarly, as the individual entities and events comprising the World of Nature are referred to in the Qur'ān as God's signs and symbols, just as its verses are so called, the study of any of those entities and events as it really is should not be understood solely in the sense of studying it as something ultimate and self-subsistent, as an alleged independent reality, essentially and existentially.³² Moreover, the Qur'ān speaks of its verses, or its signs and symbols, as partly comprising those that are clear and established (*al-muḥkamāt*), and partly comprising those that are obscure and

31. Al-Attas, *Prolegomena*, 133-134.

32. Ibid.

ambiguous (*al-mutashābihāt*). The Created Book then, being analogous to the Revealed Qur'ān, also comprises signs and symbols—which we call 'things'—that are clear and established in their meanings, and those that are obscure and ambiguous. Since to read either book basically involves deciphering its various signs and symbols to grasp their actual meanings or message and since not all of those signs and symbols are clear and established, there must be a correct method to read each book in order to interpret such signs and symbols correctly and thus be able to know their true meaning(s).

In any true epistemic act, however, one cannot start from either what is unclear or what one is ignorant of, using it to grasp what is clear and understandable. As such, knowing as an act has often been formulated as *the progress of one's mind from 'what-has-already-been-known' (al-ma'lūm) to 'what-is-still-unknown' (al-majhūl)*. Therefore, to qualify as a valid form of epistemic act, any correct method of reading to be applied to the Books must reflect such a guiding formula. As *tafsīr* and *ta'wīl* are generally the twin methods of dealing with the signs and symbols of the Qur'ān, and as the *tafsīr-ta'wīl* method reflects the aforementioned formula, al-Attas has proposed that Muslim scientists appropriate this method in their act of doing science.

Ta'wīl basically means getting to the ultimate, primordial meaning of something through a process of intellection. Such being the case, the detecting, discovery, and revealing of the concealed meanings of the ambiguous signs and symbols in the Qur'ān is referred to, in the science of the Qur'ān, as *ta'wīl* (allegorical interpretation). Yet, in order to be valid, such an interpretation ought to be based upon *tafsīr*, meaning the interpretation of those signs and symbols which are clear and apparent. By way of analogy, the interpretation—or the study and explanation—of the obscure and ambiguous aspects of the things of the empirical world must be grounded upon those aspects which are already clear and established. Their being clear and established is understood by virtue of their being considered in their apparent and obvious meanings, pertaining to their respective places within the system of relations, as arrived at by way of common sense; and their places become apparent to our understanding when the limits of their significance are recognized. Yet, one ought to realize that there are bound to be things whose ultimate meanings cannot be grasped by the intellect; and those deeply rooted in knowledge accept them as they are through true belief which we call *īmān*. This is the position of truth; in that there are limits to the meaning of things, and their

places are profoundly bound up with the limits of their significance.³³

Furthermore, there seems to be at least two levels of the application of this *tafsīr-taʿwīl* method in the context of the phenomenal world. At one level, the method is applied to an empirical thing, or a group of such things, in the context of its relation to other such things, or other group(s) of such things. Yet, at this level, the *very natures* of those things as a whole are not considered in their totality. At another level, they are dealt with in totality, whether or not they as a whole are *by their nature* clear and established. With regard to this latter level, as the things of the empirical world are physical in nature, they are all generally ambiguous because they appear to our consciousness to point to themselves, as if they each have an independent, individual, and self-subsistent reality, and not to that of which they are simply signs and symbols.

In other words, considered as a unified whole in the manner a book is supposed to be, the Universe as a grand system of signs and meanings, is more ambiguous and less established than the Qurʾān and its conceptual system. As a result, one's dealing with the former book—which will surely involve study and interpretation—especially with regard to matters of ultimate and absolute significance, ought to be guided by the teachings expounded in the latter book, teachings which, in their conceptual and metaphysical forms, are referred to as the worldview of Islam.

Reading involves thinking in most, if not all, cases. Thinking being an integral cognitive component in science must also be guided and regulated by the same epistemic principle of progressing from 'what-has-already-been-known' to 'what-is-still-unknown'. In fact, it is in the light of this principle that thinking is described in *ʿilm al-mantiq*, the discipline of logic, as "the mental act of (1) putting into a meaningful order (2) what one has already known in order to (3) attain what one is still ignorant of" (*tartīb umūr maʿlūmah li-taʿaddī ilā al-majhūl*).³⁴ As thinking in most

33. For further elucidation on such limits in relation to truth and reality, see al-Attas, *Prolegomena*, 125ff.

34. Al-Jurjānī, *Kitāb al-Taʾrīfāt*, s.v. "al-fikr"; see also Imām ʿAḍud al-Dīn ʿAbd al-Raḥmān b. Aḥmad al-Ījī, *al-Mawāqif fī ʿIlm al-Kalām* (Cairo: Maktabat al-Mutanabbi, n.d.), 22; and its commentary by al-Jurjānī, *Sharḥ al-Mawāqif*, 8 vols. in 4 books (n.p.: al-Haj Muhammad Afandi, 1907), 1: 196. It is clear that there are three central and constitutive elements embedded in such a description. One constituent, marked by (2) above, is the units of knowledge already in one's possession—what one has already known—which is regarded as the "material," or "matter" (*māddah*) of thinking. Another constituent, marked by (1), is

cases involves the mind's attending to signs³⁵ and as signs may take several forms, there is bound to be an intimate relation between the forms of thinking and those of signs. For example, signs may be of the nature of evidence or may assume the quality of effect-indicator, these two by no means being mutually exclusive. Depending on which of those two forms the signs involved are taking, thinking itself may take at least one of its two modes: one being *al-tafakkur* and the other, *al-tadabbur* (or *al-tadbīr*), the former being the mind's attending to the signs-as-proofs, whereas the latter, to the signs-as-ends. In this respect, *al-tafakkur* is more or less a synonym of *al-istidlāl* (inference), which is another term for thinking that concentrates on proofs (*dalīl*).³⁶

Moreover, among those elements which are really necessary and vital

the way one mentally organizes those units of knowledge—the way one mentally relates one unit with another unit, or a group of other units of knowledge, meaningfully—resulting in certain mental patterns, certain arrangements. This second constituent of thinking is thus considered to be the “form” (*ṣūrah*) of thinking. The third constituent represents the noetic progress, the successful movement of one's mind to new units of knowledge (such as deriving right conclusions or making correct inferences) after the first and second constituents above have been obtained. This progress seems necessary once one's mind knows certain facts and manages to relate those facts correctly. In short, thinking is like one putting the right form to the right material so that at last one will arrive at true meaning. As such, defects in thinking may well be due to the defects in its material, or to those in its form, or to flaws in both. For further explanation on this, see our *Sources*, especially Chapters 2 and 3; as well as our other writing, “Logic in al-Ghazālī's Theory of Certitude,” *Al-Shajarah: Journal of the International Institute of Islamic Thought and Civilization* (ISTAC), Vol. 1, Nos. 1&2 (1996): 108-119, and 124.

35. One of the Qur'ānic terms for thinking is *tawassum* (*al-Hijr*: 75), being a derivative of the word *wasm* which is also the root word for *ism* (name), as discussed earlier, signifying thus the mental act of scrutinizing the various signs or marks in the process of knowing.
36. Al-Jurjānī notes that both *al-tafakkur* and *al-tadabbur* (or *al-tadbīr*) are mental acts or dispositions, but while the former is the mental act of looking at the proofs, the latter is that of scrutinizing the ends (*anna al-tafakkur taṣarruf al-qalb bi al-naẓar fī al-dalīl wa al-tadabbur taṣarrufuh bi al-naẓar fī al-ʿawāqib*). See his *al-Taʾrīfāt*, s.v. “*al-tadbīr*”; see also our “*Tadbīr and Adab as Constitutive Elements of Management: A Framework for an Islamic Theory of Management*,” *Al-Shajarah: Journal of the International Institute of Islamic Thought and Civilization* (ISTAC), Vol. 5, No. 2 (2000): 305-335.

for a scientific culture to not only grow but also to endure is the presence of a high level of curiosity among a sufficient number of a country's population. It is this strong desire in a person to know and learn that drives him or her to explore and discover, despite circumstances which may not always be in favour of one's scientific interest. However, a strong desire to know and learn alone will not guarantee the development of a scientific culture. It has to be coupled with a disciplined mind so that what we have at the end is disciplined rather than aimless curiosity, a factor that is crucial for the development of such a culture.

Why is this so? The reason, in our view, lies in the answer to another question: what actually arouses such a desire to know in oneself? The key word is QUESTION(S). It is questions as well as its immediate and powerful relative, PROBLEMS, which gives rise to and constitutes one's curiosity. As one is always searching for the true answer or correct solution to a problem, the very presence of a problem as well as the manner it is addressed provides one's quest or pursuit with both the focus and the direction. But we also know from our experience that in general a question does not arise out of the blue. More often than not, a question arises in our minds together with a set, or a series, of other related questions. There is in fact a logical system inherent in any set or series of questions, involving a certain pattern of logical priority and posteriority. A really scientific manner of dealing with questions and problems, including those pertaining to the various signs in the World of Nature and their structure of relations, demands that one pay due attention to such a system and order. Logic, as a science meant to discipline one's mind and thinking so that one does not commit erroneous reasoning, necessarily and naturally includes the disciplining of one's mind in dealing with questions and problems. Some questions should not be raised unless and until other more fundamental questions have been satisfactorily dealt with first. Or such questions may not even arise in the first place if these other more basic questions were already answered properly. Some questions, or problems, although justifiable, should not have been tackled in a certain science, or field of study, but rather should have been made the proper subject-matter of another discipline, whether more fundamental to that former science or secondary to it. This is what, among others, we should be taught if we are ever serious in nurturing a scientific culture. In other words, we ought to be fully aware of the logic of questions if we are to deal with problems scientifically.

Conclusion

In the worldview of Islam as well as in the attendant system of knowledge such a worldview projects, the Cosmos—or the World of Nature—is conceived of primarily as an open, grand, created Book, consisting of Divine Signs. Such an understanding of the Cosmos has at least two theoretical implications: one being the avoidance of secularization as an *ideology* or a *philosophical program*, the most fundamental component of which is the disenchantment of nature; and the other being the appropriation of the *tafsīr-taʿwīl* method of reading the signs and symbols of the Qurʾān into science, understood essentially to be serious attempts to read and interpret the created Book. These are important elements to be creatively considered in the formulation of the intellectual framework for the science agenda of the Muslim Ummah. It is believed that such a framework, if rightly imbued and disseminated through proper education, can determine a totally different orientation for the development of the natural sciences in contemporary Muslim societies.

TASKHĪR, FINE-TUNING, INTELLIGENT DESIGN AND THE SCIENTIFIC APPRECIATION OF NATURE

‘Adi Setia

The concept of *taskhīr* in the Qur’ān refers to the easily observable fact that nature, in both its cosmic and biospheric dimensions, has been constrained by Allah to render service and benefit unto humankind. In modern cosmological terms, *taskhīr* refers to the high degree of fine-tuning of the design-parameters of the universe for the support of life on earth, and ultimately, conscious and intelligent human life. Through *taskhīr*, the perfection of Allah’s wisdom (*ḥikmah*) is manifested in the phenomenal world, and His Grace (*fadl*) realized for humanity. The service rendered to mankind by the Divine subjugation of nature is ultimately not only physical and material in nature, but also intellectual, moral and metaphysical in its significance: that humanity would be brought to recognize, acknowledge and glorify their Creator, and thus to realize fully the enduring transcendent meaning of their fleeting, phenomenal life on earth. Axiologically, this means that Islamic science is less utilitarian than intellecto-moral, and hence, the “outer” utilitarian dimension of science is to be subsumed under, and guided by, its “inner” intellecto-moral dimension, and not vice-versa.

Keywords: *taskhīr*, intelligent design, fine-tuning, specified complexity, irreducible complexity, *al-ni‘am al-āfāqiyyah*, *al-ni‘am al-anfusiyyah*, goals of Islamic Science.

Introduction: The Concept of *Taskhīr* in the Qur’ān

Taskhīr is the verbal noun of “*sakḥkhara*,” which means to bring something into service, to compel something to be of service to something else, to make something subservient. In the classical

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dictionary *Mukhtār al-Ṣiḥāḥ*, “*sakḥkharahu taskhīran*” is clarified as “*kallafahu ‘amalan bi lā ujrah*”, “to charge someone with a task without remuneration”; or “*kallafahu mā lā yuriduhu wa qaharahu*”, “to charge someone/something with a task not of his/its own accord and to compel him/it to do it.” Thus “anything that submits to you and obeys you, or is ready for you, has most certainly been made subservient to you.”¹

In the Qur’ān, *taskhīr* refers to Allah compelling the heavens and the earth to be of service to humankind that they may consciously appreciate His manifold blessings upon them and thereby give thanks to Him. Among the many verses of the Qur’ān concerning *taskhīr*, the following five may be noted:²

1. *Allah is He who has created the heavens and the earth, and caused water to descend from the sky, thereby producing fruits as food for you, and made the ships to be of service unto you, that they may run upon the seas at His command, and has made of service unto you the rivers, and made the sun and the moon constant in their courses to be of service unto you, and has made of service unto you the night and the day.*
2. *See you not how Allah has made subservient unto you whatsoever is in the skies and whatsoever is in the earth and has loaded you with His favors both without and within? Yet of mankind is he who disputes concerning Allah without knowledge or guidance or a scripture giving light.*
3. *Allah is He who has made the sea to be of service unto you that the ships may run thereon by His command, and that you may seek of His bounty; and that haply you may be thankful; and has made of service unto you whatsoever is in the heavens and whatsoever is in the earth; it is all from Him. Lo! herein are portents for people who reflect.*

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1. Hans Wehr, *A Dictionary of Modern Written Arabic* (Beirut: Librairie du Liban, 1980), p. 401; Muḥammad b. Abū Bakr b. ‘Abd al-Qādir al-Rāzī, *Mukhtār al-Ṣiḥāḥ* (Beirut: Maktabah Lubnān, 1988), p. 122; al-Fayrūzābādī, *al-Qāmūs al-Muḥīṭ*, 2 vols. (Beirut: Dār Iḥyā’ al-Turāth al-‘Arabī, 1997), 1: 571; Ibn Manẓūr, *Lisān al-‘Arab*, 18 vols. (Beirut: Dār Iḥyā’ al-Turāth al-‘Arabī, 1997), 6: 203.
 2. Respectively, *Ibrāhīm*: 32–33; *Luqmān*: 20; *al-Jāthiyah*: 12–13; *al-Ḥajj*: 65; and *al-Ra’d*: 2. All translations of Qur’ānic verses are based on Muḥammad Marmaduke Pickthall, *The Meaning of the Glorious Qur’ān* (Mecca: Muslim World League, 1977).

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4. *Have you not seen how Allah has made all that is in the earth subservient unto you? And the ships run upon the sea by His command, and He holds back the heaven from falling on the earth unless by His leave. Lo! Allah is, for mankind, full of pity, merciful.*
5. *Allah is He Who has raised up the heavens without visible supports, then mounted the Throne, and compelled the sun and the moon to be of service, each runs unto an appointed term; He ordered the course; He detailed the relevations, that haply you may be certain of the meeting with your Lord.*

Taskhīr in al-Fakhr al-Rāzī’s Mafātīḥ al-Ghayb

Fakhr al-Dīn al-Rāzī (544–606/1149–1209) was not only an accomplished *mutakallim* and *mufasssīr*³ but also an eminent philosopher and scientist. As we shall see, al-Rāzī’s holistically rational explication of *taskhīr* is quite sophisticated, rigorous and elegant. He shows a philosophico-scientific approach to the understanding of Qur’ānic verses that can have conceptual and empirical import for re-elucidating the Islamic worldview, or *ru’yat al-Islām li’l-wujūd*⁴ in contemporary intellectual discourse. As expounded by Professor al-Attas, this worldview is “the Islamic vision of reality and truth, which is a metaphysical survey of the visible as well as the invisible worlds including the perspective of life as a whole”; or “the vision of the totality of being and existence projected by Islām”.⁵

In his *Mafātīḥ al-Ghayb*, al-Rāzī gives a metaphysical explanation of verse 2 of *sūrah al-Ra’ḍ*, in which the sun and the moon are mentioned as being “compelled to be of service” by Allah (*wa sakhkhara al-shams wa’l-qamar*).⁶ He says that the celestial bodies (*al-ajrām al-falakiyyah*), including the sun, the moon and the stars, are like all other material

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3. *Mutakallim*, a scholar of Islamic dialectical theology (*kalām*); *mufasssīr*, an exegete of the Qur’ān.
 4. Syed Muhammad Naquib al-Attas, *Prolegomena to the Metaphysics of Islam: An Exposition of the Fundamental Elements of the Worldview of Islam* (Kuala Lumpur: ISTAC, 1995), p. 1.
 5. *Ibid.*, pp. 1–2.
 6. Muḥammad b. ‘Umar b. al-Ḥusayn b. al-Ḥasan b. ‘Alī al-Bakrī al-Tabaristānī Fakhr al-Dīn al-Rāzī, *al-Tafsīr al-Kabīr*, 32 parts in 11 vols. (Beirut: Dār Iḥyā’ al-Turāth al-‘Arabī, 1996), 6 (18): 526-7. This work is also known as *Mafātīḥ al-Ghayb*, which means *Keys to the Unseen*.

bodies (*al-ajsām*) in their receptivity to motion (*al-ḥarakah*) and rest (*al-sukūn*). The fact that the celestial bodies are in perpetual motion when it is equally possible, from the metaphysical point of view, for them to be in perpetual rest, indicates that motion has been *determined* for them, and not rest. Metaphysically, the two physical states, motion and rest, are equally possible of being actualized in the external world, and so, there is no intrinsic reason why one physical state (motion) should have preponderance over the other (rest). The physical, actual fact that the celestial bodies are in a state of motion and not rest, even though both modes of being are equally possible for them metaphysically, is clear indication that their motion is not of their own accord, but of the determination (*takhṣiṣ*) of a transcendent determiner (*mukhaṣṣiṣ*) who has determined for them the state of motion instead of rest.

Furthermore, each of the celestial bodies can be seen to move in a certain manner distinct from those of other celestial bodies, for each has its own particular mode of motion. Each mode of motion has its peculiar slowness (*al-buṭʿ*) and quickness (*al-surʿah*) relative to the motion of other celestial bodies. The fact that each body has its specific mode of motion out of all possible modes also indicates the existence of a transcendent determiner who has determined for each and every body its particular mode of motion according to which it is actually moving in the physical world. Al-Rāzī goes on to point out the fact that the movements of these bodies have been specifically measured out (*muqaddar bi maqādir makhṣūṣah*) such that their orbits in the celestial sphere follow their respective precise spacio-temporal regularities, and this cannot happen except by perfect ordinance (*tadbīr kāmīl*) and profound wisdom (*ḥikmah bālighah*).

The meaning of this verse as elaborated by al-Rāzī can be summarized thus: The celestial bodies are compelled by Allah to move in the way they actually do: they do not move of their own accord. They are compelled to render service to humankind by drawing their attention to their wondrous motions which are indicative of transcendent design and ordinance, thereby bringing them to recognize the existence and greatness of the Creator and to be certain of their meeting with Him. This means that when human beings contemplate the movement of the heavens, they are drawn to affirm the existence of a most wise Creator, and to believe in Him and the Last Day; for He Who has power over the heavens must most certainly

have power over the Day of Judgment.⁷

Al-Rāzī not only explains the service of the heavens and the earth to humankind in terms of its metaphysical dimension as outlined above, but also in terms of its physical significance. In other words, humankind derives both spiritual and material benefits from the way in which creation has been made subservient to them. This understanding of the physical significance of cosmic subserviency to humanity is also apparent in his explanation of verses 32–33 of *sūrah Ibrāhīm* and verse 20 of *sūrah Luqmān*.⁸ The same understanding of *taskhīr* is also obvious in al-Rāzī’s explication of verses 12–14 of *sūrah al-Naḥl*:

And He has constrained the night and the day, and the sun and the moon to be of service unto you, and the stars are made subservient by His command. Lo! herein indeed are portents for people who have sense; and whatsoever He has created for you in the earth of diverse hues; lo! therein is indeed a portent for people who take heed; and He it is who has constrained the sea to be of service that you eat fresh meat from thence, and bring forth from thence ornaments which you wear. And you see the ships ploughing it that you may seek of His bounty, and that haply you may give thanks.

Al-Rāzī says that the night and the day, the sun and the moon, and all the inanimate things (*al-jamādāt*) are governed by Allah in a manner that serves the welfare (*maṣāliḥ*) of human beings, even though it is not inherently necessary for them to do so, nor is it of their own volition. Thus, these totally passive inanimate things are compelled to act only in the particular possible manner specified for each of them, and not in any other possible manner. It is this constraint, or specification and fixation of the parameters of actual physical movement and behavior manifesting an aspect of divine governance that is referred to by the term *taskhīr*. As evident in this verse, the temporal physical benefits of cosmic and terrestrial subservience to humanity are for drawing them to attain to the deeper everlasting spiritual benefits of showing gratitude to the Creator.¹⁰

7. *Mafātīḥ*, 6 (18): 527.

8. *Ibid.*, 7 (19): 96–100; and 9 (25): 123–4.

9. *Ibid.*, 7 (19): 185–7.

10. *Ibid.*

Similarly, in his explication of *sūrah Ibrāhīm*, verses 32–34, al-Rāzī gives an elegant elaboration of the material benefits of *taskhīr* for humankind in which he invites attention to the complex interconnections between the blessings that are in the cosmic horizons (*al-ni‘am al-āfāqiyyah*) and those that are in the human selves (*al-ni‘am al-anfusiyyah*). He says:

When you take a morsel of food into your mouth, you should reflect on what happened before that and what happens after it. As for the happenings prior to it: You should realise that your morsel of bread would not have been complete and wholesome except when this whole cosmos is already established in the best manner. This is because your morsel of bread is derived from wheat which does not grow except with the aid of the four seasons, the arrangement of the physical natures, and the appearance of the winds and the rains. Each one of these would not happen except through the revolutions of the celestial spheres, and through the specific interactions between the movements of the planets with respect to direction, quickness and slowness. Then, when the wheat is ripe, it needs to be milled and baked by the required tools. Such tools in turn can only be realized by the formation of iron in the bowels of mountains. These iron tools in turn would not have been utilized beneficially except by the use of other iron tools that are prior to the former, and so on until the first iron tool invented. So reflect on how all these are formed according to forms specific to each. Yet still, when all these tools are attained, there is need for the four elements, namely, earth, water, air and fire, in order for the flour to be baked into bread. The foregoing pertains to what is prior to the attainment of your morsel of food. As for that which comes afterwards, reflect on the arrangement of your animate living body. This pertains to the way in which Allah has fashioned animate bodies in such manner that they can benefit from the morsel. It pertains too to the manner in which some food may harm animals, and to the specific organs in which such harmful effects occur. It is not possible for you to know these matters even superficially except by knowing the sciences of anatomy and medicine in their totality. Thus it is quite evident from what we have said that the nutritive benefits of a single morsel of food cannot possibly be known except by knowing the totality of natural ordinances. But the minds of humankind fail to encompass even an atom of all these fields of investigation. Therefore by this overwhelming

demonstration, the truth of the Divine word is made manifest,
that: *If you would count the bounty of Allah you cannot exhaust it.*¹¹

In his explication of verse 20 of *sūrah Luqmān*, al-Rāzī also points out the significance of *taskhīr* with respect to divine favours that pertain to cosmic phenomena (*al-ni‘am al-āfāqiyyah*) and those pertaining to the psychological and physiological selves of a human being (*al-ni‘am al-anfusiyyah*).¹² In short, it is through the precise yet artful interplay between the design configurations of the cosmos, the biosphere and the human self that Divine favors are realized for humanity, that they may be thankful to their Lord, and be certain of their meeting with Him.

This elaborate exposition of Divine design in nature in relation to the realization of Divine grace has earlier been undertaken by the great observer of life, culture and nature, Abū ‘Uthmān ‘Amr b. Baḥr al-Jāhiz (d. 255/868) in his *Kitāb al-Dalā’il wa al-I’tibār ‘alā al-Khalq wa al-Tadbīr*,¹³ and by al-Ghazālī (d. 505/1111) in his *Kitāb al-Ḥikmah fī Makhlūqātī’l-Lāh*.¹⁴ Though written long centuries ago in the light of the best scientific knowledge of their time, these critical reflections on the deeper significance of nature “have an amazing contemporary relevance”¹⁵ to the recent remarkable revival of the argument from design in modern science and philosophy. One of the most original, eloquent and effective revivers of the design argument is Badī‘uzzamān Sa‘īd al-Nūrī (1876/7–1960), who wrote in the light of his own critical assessment of modern scientific discoveries and their philosophical underpinnings.¹⁶

Taskhīr in al-Nūrī

In *The Supreme Sign: The Observations of a Traveller Questioning the Universe Concerning His Maker*, al-Nūrī elaborates at length on the

11. Ibid., 7 (19): 99–100; translation mine.

12. Ibid., 9 (25): 123–4.

13. (Aleppo: al-Maktabah al-‘Ilmiyyah, 1928); translated into English by M. A. S. Abdel Haleem as *Chance or Creation: God’s Design in the Universe* (Reading: Garnet Publishing, 1995).

14. Published in Majmū‘ah Rasā’il al-Imām al-Ghazālī (Beirut: 1994).

15. Abdel Haleem, *Chance or Creation*, p. xii.

16. Sükran Vahide, *Bediüzzaman Said Nursi: The Author of the Risale-i Nur* (Istanbul: Sözler Publications, 1992), pp. 23–5, 379–90.

theme of the “universal co-operation visible throughout the cosmos; the comprehensive equilibrium and all-embracing preservation prevailing with the utmost regularity in all things”¹⁷ from celestial bodies to the earth, and from the inanimate atomic elements to the cells of animate beings:

Solid, inanimate and unfeeling objects, that nonetheless co-operate with each other in sensitive and conscious fashion, must of necessity be caused to rush to each other's aid by the power, mercy and¹⁸ command of a Compassionate, Wise and Glorious Sustainer.

In his explication of the verse, *And (in) the disposition of the winds (taṣrīf al-rīyāh) and of the clouds held in disciplined order (al-saḥāb al-musakhkhar) between the heavens and earth...*¹⁹, al-Nūrsī draws attention to the fact that the lifeless and volatile elements of the winds and the clouds do not act of their own accord, but in accordance with the orders of a Powerful and Knowing Commander to serve the function of aiding “all animals to breathe and to live, all plants to pollinate and grow....”²⁰

In the “Tenth Window” of the *Thirty-Three Windows: Making Known the Creator*, al-Nūrsī expounds on the verses 32–34 of *sūrah Ibrāhīm*:

Allah is He who has created the heavens and the earth, and causes water to descend from the sky, thereby producing fruits as food for you, and has made the ships to be of service unto you, that they may run upon the sea at His command, and has made of service unto you the rivers, and made the sun and the moon constant in their courses to be of service unto you, and has made of service unto you the night and the day. And He gives you of all that you ask Him. And if you count the bounties of Allah you cannot enumerate them.

He says:

The mutual assistance and solidarity of beings in the universe and the fact that they respond to one another show that all creatures are trained by a single Instructor. For through an all-embracing law of mutual assistance, the sun cooks the

17. *The Supreme Sign*, trans. Hamid Algar (Istanbul: Sözlür Nesriyat, 1993), p. 89.

18. *Ibid.*

19. *al-Baqarah*: 164.

20. *Supreme Sign*, p. 26.

necessities for the lives of living beings on the earth, and the moon acts as a calendar, and light, air, water and sustenance hasten to the assistance of living beings, and plants hasten to the assistance of animals, and animals hasten to the assistance of human beings, and the members of the body hasten to assist one another, and particles of food even hasten to the assistance of the cells of the body.²¹

This central theme of universal, perfect order, balance and equilibrium, and precise measure observable in the cosmos and the biosphere is emphasized and reiterated as “material proof of divine unity”²² in al-Nūrsī’s exposition of numerous Qur’ānic verses in many of his treatises in the *Risale-i Nur Collection*,²³ such as the *The Supreme Sign, Nature: Cause or Effect*,²⁴ *The Key to Belief*,²⁵ *The Tongues of Reality*, *Thirty-Three Windows*, *Man and the Universe*²⁶ and others.

The aim of his emphasis on observed phenomenal order is to draw the attention of both the discursive reason and the intuitive intellect to the impossibility of blind chance, futile fortuitousness and *care-less* causality having any share in this “purposeful arrangement”²⁷ and regularity, and thereby to the recognition, acknowledgement and adoration of the only direct, immediate and effective Cause, namely, the Most Wise Creator Who “is present with all things and does all things in all things.”²⁸

21. *Thirty-Three Windows*, trans. Sükran Vahide (Istanbul: Sözler Nesriyat, 1991), p. 30–1.

22. *The Tongues of Reality*, trans. Sükran Vahide (Istanbul: Sözler Nesriyat, 1991).

23. Badī‘uzzamān Sa‘īd al-Nūrsī, *The Risale-i Nur Collection*, trans. Sükran Vahide (Istanbul: Sözler Nesriyat, 1992–97). For the comprehensive Arabic edition, see İhsān Qāsim al-Şālihī, trans., *Kulliyāt Rasā’il al-Nūr*, 9 vols. (Istanbul: Sözler Nesriyat, 1998).

24. Trans. Sükran Vahide (Istanbul: Sözler Nesriyat, 1997).

25. Trans. Sükran Vahide (Istanbul: Sözler Nesriyat, 1991).

26. Trans. Meryem Weld (Istanbul: Sözler Nesriyat, 1991).

27. For a biochemical analysis of “purposeful arrangement” as indicative of “intelligent design,” see Michael Behe, *Darwin’s Black Box: The Biochemical Challenge to Evolution* (New York: The Free Press, 1996), pp. 192–6; and for an incisive microbiological refutation of evolution, see Michael Denton, *Evolution: A Theory in Crisis* (London: Adler and Adler, 1996).

28. *Supreme Sign*, p. 136.

***Taskhīr*, Fine-Tuning, Irreducible Complexity and Intelligent Design**

In their exposition of *taskhīr* as an aspect of divine governance, al-Rāzī and al-Nūrsī repeatedly invite our attention to the complex, integral order quite self-evident in observed natural processes in order to press home the point that the universe is in reality an organic, not aggregate, whole. Al-Nūrsī, especially, argues that since all things are interconnected into an integral whole, whatever it is that is responsible for a part of the whole must of necessity be equally responsible for the whole itself; and whatever it is that is responsible for the whole must of necessity be equally responsible for even its tiniest part. For just as the watchmaker is responsible for the finished, integral system of the watch as an accurate time-keeping instrument, so is he equally responsible for all its various components and their purposeful dynamic arrangement. This means that the one who created the atom must also be the same one who created the cosmos,²⁹ and that when attributed to the Single Maker, all beings become as easy as a single being.³⁰ This truth is alluded to in many Qurʾānic verses such as: *Your*

29. *Nature: Cause or Effect*, pp. 19, 29, 36, 47; *Supreme Sign*, pp. 115–25 passim. For al-Rāzī on the argument for God from design and order in the universe, see the useful overview by Yasin Ceylan, *Theology and Tafsīr in the Major Works of Fakhr al-Dīn al-Rāzī* (Kuala Lumpur: ISTAC, 1996), p. 85, in which is also noted Ibn Rushd's view that the observed design and order in nature is the strongest proof for the existence of God.

30. *Nature: Cause or Effect*, p. 47; Colin Turner, *The Risale-i Nur: A Revolution of Belief*, with facing Turkish translation (Istanbul: Risale-i Nur Institute, 1997), pp. 8–10. As for the similitude of the watchmaker: if it is argued that he may not necessarily be directly involved in the actual material fabrication of some of the individual parts and so he cannot be totally responsible, the counter-argument is that his *idea* is necessarily involved in determining exactly how each part should be materially fabricated and fitted into the whole; and since “God’s is the highest similitude” (*wa liʾllāhiʾl-mathaluʾl-aʿlā*), He alone is directly and perpetually involved in creation both in idea and in act. As al-Nūrsī says in the *Twentieth Letter*, “There is no division in His regarding and acting towards the creation.” (See Sükran Vahide, *Bediüzzaman Said Nursi: The Author of the Risale-i Nur*, pp. 389–90.)

*creation and resurrection are naught save as a single soul*³¹; *The matter of the Hour is but as the twinkling of the eye or closer still*³²; *There is not a thing but hymns His praise*³³; and *Our commandment is a single act, as a twinkling of the eye*.³⁴ Both al-Rāzī and al-Nūrsī are essentially arguing for transcendent intelligent design by means of scientific and philosophical inference from the central feature of design—that is, purposeful arrangement and dynamically coordinated systemic interactions—quite self-evident in all observable natural phenomena.

Design, as a noun, has been defined by the American biochemist Michael Behe as “the ordering of a number of separate interacting components in such a way as to accomplish a function beyond the capacity of the individual components”³⁵; or more briefly and comprehensively, as *the arrangement of parts resulting in an integral functional and/or structural whole*. Defined thus, design—including semantically closely related modern scientific notions such as the cosmological “fine-tuning” and Behe’s biological “irreducible complexity”—coheres very well with al-Rāzī’s and al-Nūrsī’s conception of *taskhīr* as the constraint of processes in nature for the ultimate benefit of human life, and corresponds accurately with empirical studies of these processes. As shall be shown below, the concept of *taskhīr* and the argument from design as integral, fine-tuned and irreducible complex order impinge on our understanding of the true nature of causality and of the true goals of scientific research in Islam.

In modern science there are many prominent cosmologists who have become increasingly aware of the extent of design that is apparent in the physical characteristics of the universe. In the words of physicist and cosmologist Hugh Ross:

Astronomers have discovered that the characteristics of the universe, of our galaxy and of our solar system are so finely tuned to support life that the only reasonable explanation for this is the forethought of a personal, intelligent creator whose

31. *Luqmān*: 28

32. *al-Naḥl*: 77.

33. *al-Isrāʾ*: 44.

34. *al-Qamar*: 50.

35. Michael Behe, *Darwin’s Black Box*, pp. 193–4, 215. This definition is actually my synthetic paraphrase of his words.

involvement explains the degree of finetunedness. It requires power and purpose.³⁶

In modern cosmophysical parlance, the existence of life on earth, especially human life, is due to the extremely high degree of fine-tuning in the design parameters of the universe. Without this fine-tuning of design parameters, not only life, but even the physical universe as we know it, would not have come into existence. Among the astronomical evidences for the fine-tuning of the universe invoked by Ross are as follows:³⁷

1. Gravitational force constant:
 - if larger, stars would be too hot and would burn up quickly and unevenly;
 - if smaller, stars would remain so cool that nuclear fusion would never ignite, hence no heavy element production.
2. Ratio of electron to proton mass:
 - if larger or smaller, insufficient chemical bonding.
3. Expansion rate of the universe:
 - if larger, no galaxy formation;
 - if smaller, universe would have collapsed prior to star formation.
4. Entropy level of the universe:
 - if larger, no star condensation within the protogalaxies;

36. Hugh Ross, "Astronomical Evidences for a Personal Transcendent God" in J. P. Moreland, ed., *The Creation Hypothesis: Scientific Evidence for a Intelligent Designer* (Downers Grove: InterVarsity Press, 1994), p. 160. Aspects of the historical and contemporary cosmological argument can be accessed in William Lane Craig, *The Kalām Cosmological Argument* (Eugene: Wipf and Stock, 2000); and George Ellis and Peter Collins, *Before the Beginning: Cosmology Explained* (London and New York: Marion Boyars, 1993).

37. Ross, "Astronomical Evidences," pp. 160–3. See also Richard Swinburne, "Argument from the Fine-Tuning of the Universe" in John Leslie, ed., *Physical Cosmology and Philosophy* (New York: Macmillan, 1990), pp. 154–73. For an extended, critical and more impartial presentation of the "evidence of fine-tuning" see John Leslie, *Universes* (London: Routledge, 1989), pp. 25–65.

if smaller, no protogalaxy formation.

5. Velocity of light:

if larger, stars would be too luminous;
if smaller, stars would not be luminous enough.

6. Average distance between stars:

if larger, heavy element density too thin for rocky planets to form;
if smaller, planetary orbits would become destabilized.

Much more relevant to our discussion here is the further discovery of cosmologists that our galaxy-star-earth-moon system has also been fine-tuned for the support of life. They realized that “only a certain kind of star with a planet just the right distance from that star would provide the necessary conditions for life.”³⁸ Not only are the physical parameters of the system fine-tuned, but they are also fine-tuned within specific limits that are very *confining*. The degree of confinement greatly increases when all these physical parameters must be maintained within such narrow specific limits for the total time span required for the emergence, sustenance and survival of life on earth. The physical conditions for the support of life as we know it have been found to be so stringent that some cosmologists such as Robert Rood and James Tregil have proposed that “intelligent physical-life exists only on earth.”³⁹ The following are some examples of the high degree of fine-tunedness of the design parameters of the galaxy-sun-earth-moon system for the support of life:⁴⁰

1. Number of stars in the planetary system:

if more than one, tidal interactions would disrupt planetary orbits;
if less than one, heat produced would be insufficient for life.

2. Parent star age:

if older or younger, luminosity of star would change too quickly.

38. Ross, “Astronomical Evidences,” p. 165.

39. Ibid., p. 170.

40. Cited in *ibid.*, pp. 165–9 *passim*.

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3. Parent star color:
if redder or bluer, photosynthetic response would be insufficient.
4. Distance from parent star:
if further or closer, planet would be respectively too cool or too warm for a stable water cycle.
5. Inclination of orbit:
if too great, temperature differences on the planet would be too extreme.
6. Rotation period:
if longer, diurnal temperature difference would be too great;
if shorter, atmospheric wind velocities would be too great.
7. Oxygen quantity in atmosphere:
if greater, plants and hydrocarbons would burn up too easily;
if less, advanced animals would have too little to breathe.
8. Oceans-to-continents ratio:
if greater or smaller, diversity and complexity of life-forms would be limited.

The foregoing are clear scientific attestations to the reality that the heavens and the earth have been “constrained” to be “compliant” and “subservient” for the ultimate service of humankind. In concluding his overview of cosmological findings, Ross says that modern cosmologists are confessing that:

...the best, perhaps the only, explanation for the universe we observe is the action of an entity beyond the space-time continuum of the universe⁴¹ who/that is capable of design and of carrying out that design.

As elaborated briefly earlier on, *taskhīr* pertains not only to cosmological phenomena but also to the biological, physiological and psychological phenomena and processes of the human self—phenomena and processes that have been referred to by al-Rāzī with the term *al-ni‘am al-anfusiyyah*. Frontiers of research in various areas of

41. Ibid., p. 171.

life sciences such as ecology (interactive, multi- and inter-systemic complexity of diverse life forms and their environments), microbiology and biochemistry (irreducible complexity⁴² of life processes at the cellular and molecular level), genetics (specified complexity⁴³ of the DNA sequence), cognitive linguistics (the innate biologically endowed conceptual system underlying human speech and its special design properties) and cognitive psychology (mental construction of experience),⁴⁴ have also revealed a high degree of fine-tuning of design parameters in the animate systems of living beings. The Australian molecular biologist and medical doctor Michael Denton graphically presses home to the mind's eye this overwhelming complexity by a vivid analogy:

To grasp the reality of life as it has been revealed by molecular biology, we must magnify a cell a thousand million times until it is twenty kilometers in diameter and resembles a giant airship large enough to cover a great city like London or New York. What we would then see would be an object of unparalleled complexity and adaptive design. On the surface of the cell we would see millions of openings, like port holes of a large space ship, opening and closing to allow a continual stream of materials to flow in and out. If we were to enter one of these openings we would find ourselves in a world of supreme

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42. Behe (*Darwin's Black Box*, p. 39) defines an irreducible complex system as one which is "composed of several well-matched, interacting parts that contribute to the basic function, wherein the removal of any one of the parts causes the system to effectively cease functioning"; for further elaboration, see *ibid.*, pp. 39–48 *passim*.
43. "Specified complexity" as a concept of information theory refers to the high number of non-redundant specific instructions conditioning the occurrence and operation of complex functional structures, whether natural or artificial, animate or inanimate; see Walter L. Bradley and Charles B. Thaxton, "Information and the Origin of Life" in *Creation Hypothesis*, pp. 173–210 on 203–209 *passim*.
44. All these findings at the frontiers of scientific research are surveyed in Moreland, ed., *Creation Hypothesis* *passim*. For the language faculty in relation to the mental creation of experience, see Ray Jackendoff, *Patterns in the Mind: Language and Human Nature* (New York: Harvester Wheatsheaf, 1993).

technology and bewildering complexity. We would see endless highly organized corridors and conduits branching in every direction away from the perimeter of the cell, some leading to the central memory bank in the nucleus and others to assembly plants and processing units. A huge range of products and raw materials would shuttle along all the manifold conduits in a highly ordered fashion to and from all the various assembly plants in the outer regions of the cell....We would wonder at the level of control implicit in the movement of so many objects down so many seemingly endless conduits, all in perfect unison.⁴⁵

This dynamic order, regularity, balance and integrated interactive complexity at each level of animate and inanimate organization from the sub-atomic to the cosmic levels, and the ultimate *total integrated complexity* of all levels, render the notion of linear, gradual and random physical causality not only entirely meaningless, but also entirely inconceivable. As argued by Denton, "It is the sheer universality of perfection, the fact that everywhere we look, to whatever depth we look, we find an elegance and ingenuity of an absolutely transcending quality, which so mitigates against the idea of chance."⁴⁶ In exposing the conceptual and empirical bankruptcy of the notion of material causality, al-Nürsî says:

If all material causes were to gather together and if they possessed will, they could not gather together the being of a single fly and its systems and organs with their particular balance. And even if they could gather them together, they could not make them remain in the specific measure of the being. And even if they could make them remain thus, they could not make those minute particles, which are continually being renewed and coming into existence and working, work regularly and in order. In which⁴⁷ case, self-evidently, causes cannot claim ownership of things.

Accordingly, physicist Yamine Mermer comments that at most, apparent causes are merely conditions for a particular effect, are situated together with that effect within a particular order, and are thus created together simultaneously as the order is actualized, and so

45. *Evolution: A Theory in Crisis*, p. 328.

46. *Ibid.*, p. 342.

47. *Risale-i Nur Collection*, vol. 3: *The Flashes Collection*, p. 308.

“everything is directly a miracle of divine power.”⁴⁸ As the notion of random, gradualistic causality becomes increasingly untenable in the light of the empirical evidence, biochemist Michael Behe is drawn to the serious, empirically compelling consideration that, “Clearly, if something was not put together gradually, then it must have been put together quickly or even suddenly.”⁴⁹ It seems that, ultimately, the “causal” connections between things in nature are only ideal or conceptual (hence discontinuous, transcendent and imposed), *not* material or physical (hence *not* continuous, inherent and essential).⁵⁰ Moreover, as pointed out by al-Attas, even the “things” themselves are in reality “only mentally posited (*i‘tibārī*).”⁵¹ In short, the scientific evidence points overwhelmingly toward a symbolic (or “existentialist”)⁵² rather than an essentialist interpretation of nature, and therefore, as al-Nūrī puts it, nature has a meaning that is “other-referential” (*ma‘nā ḥarfī*), *not* “self-referential” (*ma‘nā ismī*).⁵³

48. Yamine Mermer, “Cause and Effect in the Risale-i Nur,” *Third International Symposium on Badiuzzaman Said Nursi*, 24th–26th September, 1995, Istanbul, proceedings, trans. Sükran Vahide, 2 vols. (Istanbul: Sözler Nesriyat, 1997), 1: 49.

49. *Darwin’s Black Box*, p. 187.

50. *Ibid.*, pp. 43–5. Behe makes a distinction between a physical precursor and a conceptual precursor in his analysis of complex transformations in nature, and points out that if a system is irreducibly complex, it can have no (horizontal) functional precursors.

51. S. M. N. al-Attas, *The Positive Aspects of Taṣawwuf: Preliminary Thoughts on an Islamic Philosophy of Science* (Kuala Lumpur: Islamic Academy of Science [ASASI], 1981), pp. 6–7; see also *Prolegomena*, p. 291.

52. al-Attas, *Positive Aspects of Taṣawwuf*, p. 7n7.

53. *Mesnevi-i Nuriye*, 46, cited in Sükran Vahide, “The Book of the Universe: Its Place and Development in Bediuzzaman’s Thought” in *A Contemporary Approach to Understanding the Qur’ān: The Example of the Risale-i Nur*, proceedings of International Symposium, Istanbul 20–22 September 1998 (Istanbul: Sözler Nesriyat, 2000), pp. 466–83 on 471. A fuller discussion of *ma‘nā ḥarfī* and *ma‘nā ismī* in relation to causation and causality and the synthetic interpretation of nature is Yamine B. Mermer, “The Hermeneutical Dimension of Science: A Critical Analysis Based on Said Nursi’s *Risale-i Nur*” in *The Muslim World Review*, Special

In outlining his philosophy of science, al-Attas affirms that nature is a symbolic form perpetually manifesting divine creativity at the level of phenomenal reality.⁵⁴ Nature consists of discontinuous events, processes and relations which in reality are but perpetually renewed manifestations of an underlying, abiding spiritual reality of existence that both includes and excludes them.⁵⁵ The multiple and diverse natural forms “partake of symbolic existence by virtue of being continually articulated by the creative word of God,”⁵⁶ as alluded to in the verses, *His command, when He intended a thing, is only that He says unto it: Be! and it is,*⁵⁷ and *As We began the first creation, We repeat it.*⁵⁸ Consequently, things in the world are not independent, self-subsisting, self-organizing essences having persistence in absolute time and space, but rather they perish upon coming into existence and are continually being recreated by the Creator, thus “the absence of a necessary relation between cause and effect.”⁵⁹ Therefore, everything, from the tiniest particular part to the greatest universal whole, is both *immediately* and *ultimately* caused by Allah,⁶⁰ hence *there is not a thing but hymns His praise.*⁶¹ The feature of integral structural and functional order in nature is self-evident enough to indicate that such a philosophy of science is not merely a speculative, fact-free

Issue: *Said Nursi and the Turkish Experience*, LXXXIX: 3–4 (July–October 1999), pp. 270–96 *passim*.

54. *Islām and the Philosophy of Science*, p. 3; *Prolegomena*, p. 113; *Positive Aspects of Taṣawwuf*, pp. 6–8, 11–12.

55. *Islām and the Philosophy of Science*, pp. 21, 28, 33; *Prolegomena*, pp. 128, 134, 140.

56. *Islām and the Philosophy of Science*, p. 27; *Prolegomena*, p. 133.

57. *Yā Sīn*: 82.

58. *al-Anbiyāʾ*: 104; similarly, see also *al-Ankabūt*: 19 and 20: *See they not how Allah originates creation, then repeats it?...Travel in the land and see how He did originate creation, then Allah did bring forth the later production.*

59. *Islām and the Philosophy of Science*, p. 28; *Prolegomena*, p. 134.

60. *Supreme Sign*, pp. 115–21 *passim*.

61. *al-Isrāʾ*: 44. It can be said that in philosophico-scientific terms this verse alludes to the logical and empirical fact that given any integral system, if the *ultimate* efficient cause for it exists, then this same ultimate cause has also, of necessity, to be its *direct and immediate* efficient cause.

metaphysical dogma, but is truly and accurately descriptive of the fundamental systemic nature of reality, as well as grounded in that reality, both through direct intuitive experience and discursive logico-empirical arguments.

***Taskhīr* and the Goals of Scientific Research in Islam**

The foregoing consideration of al-Rāzī’s and al-Nūrsī’s explication of the Qur’ānic concept of *taskhīr* and of its conceptual and empirical affinity with the modern scientific concepts of fine-tuning and irreducible complexity has wide-ranging implications for our conceptualization of the general goals of scientific research in Islam. Current empirical discoveries in modern science bring into renewed and refined focus the concept of *taskhīr* as referring to the fine-tuning of the design parameters of the cosmos and the biosphere, including human life. The physical configurations of the cosmos and the biological configurations of living things have been fixed in such a precise manner that they ultimately serve the function of rendering service to humankind as the epitome of divine creativity.

The service that is rendered unto humanity through the fine-tuning of the physical parameters of creation has two aspects: an aspect that pertains to material or physical self, and an aspect that pertains to spiritual or metaphysical self. With respect to the former, *taskhīr* has to do with fulfilling the biophysiological need of human beings for nourishment, shelter and clothing, and their psychologico-emotional need for sociocultural interactions with fellow human beings. With respect to the latter, *taskhīr* has to do with bringing humanity to acknowledge the perpetual divine presence and wisdom manifested in all things, and to show gratitude (*shukr*) to Him. Such acknowledgement and gratitude on the part of humanity as the epitome of creation facilitate in them the attainment of spiritual peace and satisfaction, and make perfect and whole their spirit. Al-Nūrsī says:

The All-Wise Creator of the universe made the universe like a tree with conscious beings as its most perfect fruit, and among conscious beings He made man its most comprehensive fruit. And man’s most important fruit, indeed the result of his creation, the aim of his nature, and the fruit of his life are his

thanks and worship.⁶²

In other words, the whole of creation together with all its mutually dependent and interacting components have been created and ordered for the purpose of making possible the biological, cultural and spiritual life of human beings. To put it even more succinctly, *creation has been made perfect for human life to be existentially possible and spiritually meaningful.*

If creation with all its harmoniously interacting components has been perfected by the Creator for humankind, then the scientific endeavor in Islam cannot be about overpowering, dominating and controlling an “imperfect,” “capricious” and “hostile” nature in order that it may be “readjusted” and “manipulated” for human welfare. There can be no such thing as human beings making “improvements” on the workings of nature by unlocking its “laws” and manipulating them to serve the “betterment” of human civilization by furthering its “development” and “progress.” From the Islamic point of view, domination, control and exploitation of nature can never be the true goal of scientific research, since only the Creator has the knowledge and the power, and hence the right to subjugate nature. Nature is not something to be dominated, controlled or manipulated by human beings precisely because *it has already been divinely constrained to be of service to them.* From this perspective then, it is quite clear that the modern incessant urge to unlock the “secrets” of nature in order to “subdue” it smacks of a pathological dissatisfaction with, even denial of, divine bounty (*fadl*), and an utter ignorance of its ultimate significance.

I think it would be appropriate here, in view of the foregoing, to comment briefly on a dangerous misconception of *taskhīr* discernible in the writings of some Muslim authors, such as C. A. Qadir, for instance. Since the Qur’ānic concept of *taskhīr* clearly means *God’s* subjugation of nature for man, and *not* man’s subjugation of nature for himself, then it is problematic to say, as Qadir does, that “The Quran requires Muslims to subjugate the forces of nature for the good of mankind....”⁶³ Even more questionable is his citation of the verse *All*

62. *Nature: Cause or Effect*, p. 41.

63. C. A. Qadir, *Philosophy and Science in the Islamic World* (London: Routledge, 1988), p. 15.

that is in heaven and earth has been subjugated to man, to lend support for his further assertion that “Knowledge is power, in the sense that it is through knowledge that one can dominate nature and make it subservient to one’s will.”⁶⁴ The literal meaning of the verse he cites does not support his assertion, and if there are Qur’ānic commentators who concur with him, he does not cite them. A deeper reflection on this verse and other verses of similar import will go a long way toward warding off a Baconian infiltration of Islamic philosophy and science through the back door.

To resume, one may say that Nature has been created for the service of human beings since they are the *raison d’être* for its existence. Instead of viewing nature as a foe or an adversary to be overcome and subdued to realize some narrow, ill-conceived short-term “utility,” it should instead be viewed as a precious gift in the form of a ready and able companion or helpful friend who deserves to be treated with respect, understanding and a strong sense of responsibility and appreciation, as a precious divine bounty to be held in trust for all posterity. Any tampering with the subtle and delicate design parameters of nature would most certainly reduce its capacity to be of service to humankind, and may even prove destructive, not only to human life, but also to the biosphere as a whole:

*Corruption doth appear in the land and sea because of what the hands of men have wrought, that He may make them taste a part of that which they have done, in order that they may return.*⁶⁵

Both rough and ready common sense and scientific observations (especially in the field of ecology and environmental science) have shown that the forces of nature on earth have been dynamically and harmoniously balanced for the continual sustenance and generation of life in all its organized interlocking multiplicity, diversity and complexity. This holistic scientific fact or reality should have a strong bearing on our assumptions about what should be the proper immediate (horizontal) and ultimate (vertical) goals of scientific research. Humans, as self-conscious, intelligent and moral beings, have been endowed with the cognitive capacity to uncover regulating

64. Ibid., p. 22. The verse is Qadir’s own rendition.

65. *al-Rūm*: 41.

patterns and design parameters in nature, including the manner in which these are mutually dependent and fine-tuned for life to exist and prosper. At the same time they have also been endowed with the will and ability to manipulate and tamper with these patterns and parameters. They can create and have created artificial environments in which the configurations of these design parameters can be altered for specific purposes, despite their very limited understanding of the profound overall dynamic interdependency and interaction of these parameters, and the unknown, even unknowable, consequences of such flippant meddling in the workings of nature.

Now this is where the danger lies. If nature is viewed as being already made perfect for the ultimate service of humankind, then there is a *limit* to the extent of human manipulation of natural laws. Nature consists of dynamically interconnected elements and compounds with specific structures and functions having design-parameters fine-tuned to very confining ranges of values that cannot be transgressed without bringing about unforeseen, unforeseeable and probably disastrous consequences for human life and for the natural environment as a whole. When an integral constituent of a holistically functioning system is reconfigured, all other constituents of the system will be affected in one way or another, and will have to be reconfigured accordingly in order for the system to continue functioning smoothly and efficiently. But obviously, in view of the *total complexity* of the cosmos and the biosphere, human beings certainly do not have the knowledge, hence nor the right, to take on the great responsibility of readjusting the way nature works. Therefore, it is quite clear that the scientist's very uncovering of the fine-tunedness of design parameters in nature compels them *morally* to work within the narrow confining limits of these parameters, and never to transgress nor alter them. For, *these are the limits imposed by Allah, and so transgress them not; for whoso transgresses Allah's limits, such are the wrongdoers.*⁶⁶

On the other hand, if nature is somehow viewed as "imperfect" for realizing some shortsighted ideals of human "comfort," then naturally

66. *al-Baqarah*: 229. Al-Nūrsī calls the Laws of Nature "the *Shari'ah* of Creation" or the "Greater *Shari'ah*" by analogy to the Laws of Religion; see *Nature: Cause or Effect*, pp. 33–4; and Sükran Vahide, "The Book of the Universe," p. 482.

scientists will tamper with the physical limits of these design-parameters. Such an attitude will clearly be an outgrowth of selfish intellectual arrogance expressing itself in the view that nature is not sacred, but only a lifeless automaton that can be taken apart and put together in endless new ways to fulfill someone’s vague notions of the “good life.” Such a philosophy of science which strips nature of any transcendent significance by viewing it as a result of “blind chance” instead of intelligent design, deprives it of any meaning save as an object of the scientist’s and technologist’s absolute domination, mastery and control, or even as a plaything of idle curiosity to be studied “disinterestedly” for its “own sake.” Such a study of nature is “devoid of real purpose and the pursuit of knowledge becomes a deviation from the truth, which necessarily puts into question the validity of such knowledge.”⁶⁷ Ultimately, a particularly tiny minority of people—those with privileged access to scientific information, technical expertise, political power and economic leverage—will cooperate to strive their utmost to manipulate nature and exploit “natural resources,” including other “lesser” people, i.e., “human resources,” in order to achieve their destructive self-serving objectives universalized as “global development and progress.”⁶⁸

Precisely because the Creator has already made nature to be subservient unto humans, humans in turn, as a matter of moral logic, have to render sincere worship and give thanks to Him. Al-Nūrsī says:

...men are observers, sent by the Pre-Eternal Sovereign to contemplate and study the wonderful, strange miracles of power

67. al-Attas, *Islām and the Philosophy of Science*, pp. 27–8; *Prolegomena*, pp. 133–4; *Positive Aspects of Taṣawwuf*, p. 6.

68. For an excellent historical, ideological and political-economic critique of development and progress as “collective delusion” see Gilbert Rist, *The History of Development: From Western Origins to Global Faith*, trans. Patrick Camiller (London and New York: Zed Books and Cape Town: UCT Press, 2000); and for a good specific case study in the Malaysian context, see Colin Nicholas, *The Orang Asli and the Contest for Resources: Indigenous Politics, Development and Identity in Peninsular Malaysia* (Copenhagen: International Work Group for Indigenous Affairs IWGIA & Subang Jaya, Malaysia: Center for Orang Asli Concerns [COAC], 2000).

displayed in the exhibition of the universe. And that after receiving their marks and ranks in conformity with the degree they have grasped the value and grandeur of those miracles of power and the degree to which the miracles point to the grandeur of the Pre-Eternal Sovereign, they will return to the Sovereign's realm. So he will say: "All praise be to God!" for the bounty of belief which has given him this bounty.⁶⁹

Thus the study, use and enjoyment of nature can never be an end in itself, but it must be for the purpose of creating and maintaining a socio-cultural ambience conducive to human beings' adoration of their Creator. It follows then that one of the central goals of scientific research in Islam is to uncover, understand and appreciate as much and as truly as possible the many ways in which nature has been constrained by the Creator to be of service unto humankind, and thus to ascend in the knowledge, recognition and appreciation of His Wisdom and His limitless, unending Grace. Obviously, such a goal is more intellecto-moral than utilitarian. This means that the "outer" utilitarian dimension of science must be subsumed under and guided by the "inner" intellecto-moral one, and not vice-versa. From this perspective, the vision of science in Islam—as projected in the Qur'ānic conception of *tashkīr*—can be understood as *the conceptual and empirical investigation of the phenomenal manifestations of the underlying enduring spiritual reality of existence, by which investigation belief in that reality can be founded on verified experiential certainty, and thus freed from doubt and blind dogmatic imitation of false beliefs*. Such a conception of science leads the scientist to uncover the ontological unity between the natural and spiritual order, and ultimately brings him to affirm the Unity and Oneness of the Creator. In the insightful words of Yamine Mermer:

It is a great crime for believers to leave this meaningful, wise, and purposeful universe to the hands of the materialists and turn a blind eye to their condemning it to meaninglessness, purposelessness, chance and coincidence under the name of "scientific study." The believer should take the universe in his hand, see it as a book, and under the guidance of the Qur'an, "which teaches the meaning of the book of the universe," read it

69. *On Ramadan, Thanks and Frugality*, trans. Sükran Vahide (Istanbul: Sözler Nesriyat, 1994), p. 83.

in the name of his Sustainer. This is “scientific study” for the believer. In whatever field of knowledge he works, it is the duty of every believer who follows the Qur’an to open up that long distance between cause and effect and to see the Most Beautiful Divine Names which show themselves clearly in that space, and to display them.⁷⁰

Conclusion

The concept of *taskhīr* in the Qur’ān refers to the easily observable fact that nature, in both its cosmic and biospheric dimensions, has been constrained by Allah to render service and benefit unto humankind. In modern cosmological terms, *taskhīr* can be said to refer to the extremely high degree of fine-tunedness of the design-parameters of the universe for the support of life on earth, and ultimately, conscious and intelligent human life. Through *taskhīr*, the perfection of Allah’s Wisdom (*ḥikmah*) is manifested in the phenomenal world, and His Grace (*faḍl*) realized for humanity. The service rendered to mankind by the divine subjugation of nature is ultimately not physical in nature, but metaphysical in its significance: that humanity would be brought to recognize, acknowledge and glorify their Creator, and thus to realize fully the enduring transcendent meaning of their fleeting, phenomenal life on earth. Axiologically, this means that Islamic science is less utilitarian than intellecto-moral, and hence, the “outer” utilitarian dimension of science is to be subsumed under, and guided by, its “inner” intellecto-moral dimension, and not vice-versa.

*Can there be any doubt concerning Allah, the Creator of the heavens and the earth?*⁷¹

*We shall show them Our portents on the horizons and within themselves until it becomes manifest to them that it is the truth.*⁷²

*Such is the Knower of the invisible and the visible, the Mighty, the Merciful, Who has perfected all things which He created...*⁷³

70. Yamine Mermer, “Cause and Effect,” p. 53.

71. *Ibrāhīm*: 10.

72. *Fuṣṣilat*: 53.

73. *al-Sajdah*: 6–7.