

## 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 (*faḍl*) 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-āfāqīyyah*, *al-ni‘am al-anfusīyyah*, goals of Islamic Science.

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### 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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‘Adi Setia is Research Fellow (History and Philosophy of Science) at the International Institute of Islamic Thought and Civilization (ISTAC), Kuala Lumpur, Malaysia; Email: adisetiamuh@pd.jaring.my

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dictionary *Mukhtār al-Ṣiḥāḥ*, “*sakhkharahu taskhīran*” is clarified as “*kallafahu ‘amalan bi lā ujrah*”, “to charge someone with a task without remuneration”; or “*kallafahu mā lā yurīduhu 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.”<sup>1</sup>

In the Qurʾān, *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 Qurʾān concerning *taskhīr*, the following five may be noted:<sup>2</sup>

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 Manzūr, *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 Qurʾānic verses are based on Muḥammad Marmaduke Pickthall, *The Meaning of the Glorious Qur’an* (Mecca: Muslim World League, 1977).

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 revelations, 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 *mufasssir*<sup>3</sup> 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*<sup>4</sup> 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”.<sup>5</sup>

In his *Mafātīḥ al-Ghayb*, al-Rāzī gives a metaphysical explanation of verse 2 of *sūrah al-Ra’d*, 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*).<sup>6</sup> He says that the celestial bodies (*al-ajrām al-falakīyah*), 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*); *mufasssir*, 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-Tabaristanī 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 (*takhṣīs*) of a transcendent determiner (*mukhaṣṣis*) 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-butʿ*) 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 bālīghah*).

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.<sup>7</sup>

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*.<sup>8</sup> 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 subserviency to humanity are for drawing them to attain to the deeper everlasting spiritual benefits of showing gratitude to the Creator.<sup>10</sup>

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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-niʿam al-āfāqīyyah*) and those that are in the human selves (*al-niʿam al-anfusīyyah*). 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.*<sup>11</sup>

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-āfāqīyyah*) and those pertaining to the psychological and physiological selves of a human being (*al-ni‘am al-anfusīyyah*).<sup>12</sup> 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-Jāhīz (d. 255/868) in his *Kitāb al-Dalā‘il wa al-I‘tibār ‘alā al-Khalq wa al-Tadbīr*,<sup>13</sup> and by al-Ghazālī (d. 505/1111) in his *Kitāb al-Ḥikmah fī Makhlūqātīl-Lāh*.<sup>14</sup> 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”<sup>15</sup> 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-Nūrsī (1876/7–1960), who wrote in the light of his own critical assessment of modern scientific discoveries and their philosophical underpinnings.<sup>16</sup>

### ***Taskhīr* in al-Nūrsī**

In *The Supreme Sign: The Observations of a Traveller Questioning the Universe Concerning His Maker*, al-Nūrsī 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. Sükrān Vahide, *Bediuzzaman Said Nursi: The Author of the Risale-i Nur* (Istanbul: Sözlük 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”<sup>17</sup> 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 cooperate with each other in sensitive and conscious fashion, must of necessity be caused to rush to each other’s aid by the power, mercy and command of a Compassionate, Wise and Glorious Sustainer.<sup>18</sup>

In his explication of the verse, *And (in) the disposition of the winds (taṣrīf al-riyāh) and of the clouds held in disciplined order (al-sahāb al-musakhkhar) between the heavens and earth...*<sup>19</sup>, 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....”<sup>20</sup>

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

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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.<sup>21</sup>

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”<sup>22</sup> in al-Nūrsī’s exposition of numerous Qur’ānic verses in many of his treatises in the *Risale-i Nur Collection*,<sup>23</sup> such as the *The Supreme Sign, Nature: Cause or Effect*,<sup>24</sup> *The Key to Belief*,<sup>25</sup> *The Tongues of Reality, Thirty-Three Windows, Man and the Universe*<sup>26</sup> 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”<sup>27</sup> 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.”<sup>28</sup>

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21. *Thirty-Three Windows*, trans. Sükran Vahide (Istanbul: Sözlür Nesriyat, 1991), p. 30–1.
  22. *The Tongues of Reality*, trans. Sükran Vahide (Istanbul: Sözlür Nesriyat, 1991).
  23. Badī‘uzzamān Sa‘īd al-Nūrsī, *The Risale-i Nur Collection*, trans. Sükran Vahide (Istanbul: Sözlür Nesriyat, 1992–97). For the comprehensive Arabic edition, see İh̄sān Qāsim al-Şālīhī, trans., *Kulliyāt Rasā’il al-Nūr*, 9 vols. (Istanbul: Sözlür Nesriyat, 1998).
  24. Trans. Sükran Vahide (Istanbul: Sözlür Nesriyat, 1997).
  25. Trans. Sükran Vahide (Istanbul: Sözlür Nesriyat, 1991).
  26. Trans. Meryem Weld (Istanbul: Sözlür 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,<sup>29</sup> and that when attributed to the Single Maker, all beings become as easy as a single being.<sup>30</sup> This truth is alluded to in many Qurʾānic verses such as: *Your*

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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 Tafṣīr 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, *Bediuzzaman Said Nursi: The Author of the Risale-i Nur*, pp. 389–90.)

*creation and resurrection are naught save as a single soul*<sup>31</sup>; *The matter of the Hour is but as the twinkling of the eye or closer still*<sup>32</sup>; *There is not a thing but hymns His praise*<sup>33</sup>; and *Our commandment is a single act, as a twinkling of the eye.*<sup>34</sup> 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”<sup>35</sup>; 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 constraintment 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

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31. *Luqmān*: 28

32. *al-Nahl*: 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.<sup>36</sup>

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:<sup>37</sup>

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;

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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.”<sup>38</sup> 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.”<sup>39</sup> 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:<sup>40</sup>

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.

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

39. *Ibid.*, p. 170.

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

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 universe who/that is capable of design and of carrying out that design.<sup>41</sup>

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

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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 complexity<sup>42</sup> of life processes at the cellular and molecular level), genetics (specified complexity<sup>43</sup> 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),<sup>44</sup> 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 <sup>45</sup>so many seemingly endless conduits, all in perfect unison.

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."<sup>46</sup> In exposing the conceptual and empirical bankruptcy of the notion of material causality, al-Nürsī 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 which <sup>47</sup>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

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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.”<sup>48</sup> 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.”<sup>49</sup> 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).<sup>50</sup> Moreover, as pointed out by al-Attas, even the “things” themselves are in reality “only mentally posited (*i‘tibārī*).”<sup>51</sup> In short, the scientific evidence points overwhelmingly toward a symbolic (or “existentialist”)<sup>52</sup> 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*).<sup>53</sup>

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48. Yamine Mermer, “Cause and Effect in the Risale-i Nur,” *Third International Symposium on Bediuzzaman Said Nursi*, 24<sup>th</sup>–26<sup>th</sup> September, 1995, Istanbul, proceedings, trans. Sükran Vahide, 2 vols. (Istanbul: Sözlür 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: Sözlür 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.<sup>54</sup> 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.<sup>55</sup> The multiple and diverse natural forms “partake of symbolic existence by virtue of being continually articulated by the creative word of God,”<sup>56</sup> as alluded to in the verses, *His command, when He intended a thing, is only that He says unto it: Be! and it is,*<sup>57</sup> and *As We began the first creation, We repeat it.*<sup>58</sup> 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.”<sup>59</sup> Therefore, everything, from the tiniest particular part to the greatest universal whole, is both *immediately* and *ultimately* caused by Allah,<sup>60</sup> hence *there is not a thing but hymns His praise.*<sup>61</sup> 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

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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-ʿAnkabūt*: 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.<sup>62</sup>

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...”<sup>63</sup> Even more questionable is his citation of the verse *All*

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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.”<sup>64</sup> 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.*<sup>65</sup>

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

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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.*<sup>66</sup>

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

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66. *al-Baqarah*: 229. Al-Nürsī 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.”<sup>67</sup> 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.”<sup>68</sup>

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

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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 <sup>69</sup>God!" for the bounty of belief which has given him this bounty.

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'anic 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

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69. *On Ramadan, Thanks and Frugality*, trans. Sükran Vahide (Istanbul: Sözlür 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.<sup>70</sup>

### 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?*<sup>71</sup>

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

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

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

71. *Ibrāhīm*: 10.

72. *Fuṣṣilat*: 53.

73. *al-Sajdah*: 6–7.

*Such then is Allah, your true Lord: Apart from the Truth, what is there  
save error? How then are you turned away?*<sup>74</sup>

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74. *Yūnus*: 32.