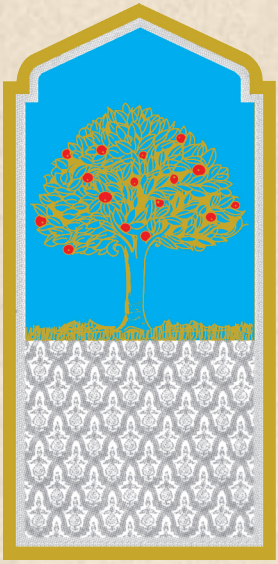

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INVESTIGATING THE UNDISPUTED SCIENTIFIC REALISM IN THE ISLAM-MODERN SCIENCE DISCOURSE

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Abstract

In the Islam and science discourse, the philosophical discussion on the nature and reality of scientific knowledge is mostly missing. Almost the whole discourse sustains its validity and relevance from a strong scientific realist stance that is the de facto position within this discourse. However, going by the Sunnī epistemological standards, since only conclusive or certain knowledge (Wilm qatʿī or yaqīnī) counts as proof (burhān) in Sunnī theology (kalām), scientific knowledge due to its layers of theoretical presuppositions, is probable and limited; a claim also substantiated by the history and philosophy of science. Scientific propositions cannot be beneficial for theological pursuit such as knowing and appreciating divine attributes or used as a basis for either affirming or questioning and reinterpreting scriptures. In the current Muslim discourse on Islam and modern science, uncritical, unacknowledged, and undefended acceptance of scientific realism has led to the unwarranted use of modern scientific knowledge for such theological and religious purposes.

Keywords: Islamic epistemology, scientific realism, instrumentalism, Sunnī theology, Islam-Science discourse

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Introduction

Within the Islamic intellectual tradition, the rationale, objectives and scope of learning and practicing science, as well as the development of appropriate research questions, methodologies, and programs, are to be informed by the fundamental principles of theology (*uṣūl al-dīn*). The epistemological standards, present within the Sunni theological (*kalām*) tradition, which is metascientific, therefore need to be used to establish the nature and status of scientific theories, models, and explanations within the Islamic hierarchy of knowledge. Establishing the status and position of scientific theories based on the theological standards and categories of knowledge is a prerequisite for developing the Islamic justification for the scientific enterprise and the arbitration of the ends and goals toward which modern scientific knowledge should be directed by and for Muslims. Joseph Lumbard discusses the same necessity that:

> The reality is that so long as Muslim society does not find the way towards developing its own concepts or reformulating the concepts of others as if they were ab initio its own, there is no hope of escaping this intellectual perplexity that afflicts the minds of those within it.[4]

Since modern science is an essential component of modern education, an average educated Muslim needs to know their theological-epistemological position with regards to the scientific methodology and scientific theories (their relation (or non-relation) to Muslim understanding of Reality (*al-Ḥaqq*), and whether scientific knowledge could inform Islamic theology in any substantive manner in addition to its other pragmatic social functions of tentative explanation, prediction, and problem-solving. Lots of debates within the educated Sunni Muslim polity and attempts to reconcile every new scientific theory with Islamic theology and scriptures emerge due to the non-availability of any such theological-epistemological position regarding the epistemic status of scientific theories

[4] Joseph E. B. Lumbard, "Islam and the Challenge of Epistemic Sovereignty," *Religions* 15, no. 4 (2024): 406, https://doi.org/10.3390/rel15040406, p. 5.

according to the standards of knowledge consolidated within the Sunni theological tradition.

To ascertain the Islamic position regarding scientific theories by assessing them through the Sunni *kalām* standards of knowledge, the limits of those scientific theories in conceptualizing and studying the phenomena need to be determined. It needs to be understood from within the discipline of the philosophy of science whether scientific theories are, by and large, capable of, and developed for the purpose of, revealing reality (partially or wholly) or providing explanations of apparent phenomena or whether their goal is to solve problems within a certain research paradigm. The objective of capturing, conceptualizing, or representing reality that lies beyond appearances is metaphysical, whereas the goal of explaining and predicting phenomena and solving problems that come in the way is pragmatic or instrumental. Islamic understanding of knowledge encompasses both; classifying the scientific theories and, hence, scientific knowledge under the pragmatic objective could still make it a valuable social enterprise. This, however, would not allow scientific knowledge to be used for understanding, explaining, verifying, or refuting theological doctrines or claims, which can only happen on the assumptions of Scientific Realism - henceforth referred to as SR.

In the discourse on Islam and science, in recent years[5] the discussion on the nature and reality of scientific knowledge, as discussed in the philosophy of science, seems to be mostly missing. Most of the questions asked in such conversations concerning the reconciliation of Islamic theology and modern scientific knowledge sustain their validity and relevance only from a strong Scientific Realist position, which is the unquestioned *de facto* position in these conversations. Mehdi Golshani, editor and task force member of one such project, has mentioned that "the challenge for Muslims has been the philosophical interpretations of modern science, not science *per se*"[6] In the same project, however, recourse to the philosophy of science is absent. Another pertinent example is a three-part article[7]

[5] Golshani et al., *Muslim World Science Initiative Report of İhsanoğlu Task Force on Islam and Science*. (London and Islamabad, 2016).

[6] Golshani et al. *Muslim World Science Initiative Report*, 2016, p. 59.

[7] Mohammad Daneshgar, "The Quran and Science, Part I: The Premodern Era,"

on the Quran and science, published recently, which does not include any such analysis from the standpoint of contemporary philosophy of science.

The central problem this paper identifies is that "scientific realism" is being adopted by Muslim theologians and academics without much critical analysis. Subsequently various scientific terms and ideas get mapped onto Islamic theology, which means the attribution of scientific entities and theories to God and His ways of interacting with or acting upon the physical world - which ultimately results in asking the questions of the compatibility or incompatibility of the scientific assumptions with the scripture. For instance, Basil Altaie, despite maintaining a distinction between laws of nature and laws of physics, does not look closely at the status of scientific realism itself within the philosophy of science.[8]

The way scientific realism has been conceived and received has changed, so it is necessary first to try to understand the nuances of its meanings and, subsequently, the implications of whether this position enjoys as high an epistemological status that could guarantee the truth and reality of the scientific theories and their associated entities and processes as to make them theologically relevant. This paper takes up the question of scientific realism and whether science as a body of knowledge can raise or answer theological questions, such as about the possibility or impossibility of God creating and running the universe through scientifically conceptualized and theorized entities[9]and processes such as atoms, quarks, cells, genes,

Zygon 58, no. 4 (2023): 952–69, https://doi.org/10.1111/zygo.12931.; Mohammad Daneshgar, "The Qur'ān and Science, Part II: Scientific Interpretations from North Africa to China, Bengal, and the Malay-Indonesian World," *Zygon* 58, no. 4 (2023): 970–1004, https://doi.org/10.1111/zygo.12932; Mohammad Daneshgar, "The Qurʾān and Science, Part III: Makers of the Scientific Miraculousness," *Zygon* 58, no. 4 (2023): 1005–28, https://doi.org/10.1111/zygo.12930.

[8] Basil Altaie, *God, Nature and the Cause: Essays on Islam and Science* (N.p.: Kalam Research & Media, 2016); Basil Altaie, *The Divine Word and the Grand Design: Interpreting the Quran in the Light of Modern Science* (N.p.: Beacon Books, 2019).

[9] The possibility for God to have created the processes on the ontological level in a certain manner, which is unknown to us (part of the *ghaybiyyāt*), while at the same time giving us the observable trends to show us a process and structure, which leads us to an appreciation of God's power and might, is something that is discussed under *taskhir* in the final part of the paper.

chromosomes, photosynthesis, respiration, evolution, etc. Such an interface of theology with science becomes justified only on the pretext of assuming the certainty or definitiveness (*yaqīn* or *qaṭʿīyat*) of scientific propositions. However, the certitude of scientific (theory-based) propositions is neither supported by the Sunnī epistemological standard for determining the definitive propositions (*qaṭʿīyat*) nor by the history of scientific development and theory change, which has shown that scientific theories are not certain or conclusive in their claims but are somewhat limited in many aspects by the respective scientific methodologies.

Another factor worth highlighting is that the SR espoused by contemporary Muslim theologians undergirds much more certainty than the one championed by the philosophers of science or even practicing scientists. The Muslim discourse conceives some semblance of ontological reality for the theoretical entities of science. The kind of ontological realness (no matter to whatever degree) presumed and granted by the Muslim theologians to the scientifically arrived entities and processes differs greatly from the kind of verisimilitude or approximation to truth that is, in principle, fallible, proposed, and debated within the philosophy of science under the umbrella of scientific realism. This paper asks that, if this is the case, then whether a dialogue between science and Islamic theology is warranted at all. For instance, the same concern (that science should not inform theology) is echoed in this paper,[10] but then the author, in his other works, uses scientific claims of evolution to reinterpret the Quranic creation story[11] or develop Islamic theological position on extraterrestrial beings[12]

[10] Shoaib Ahmed Malik and Nazif Muhtaroglu, "How Much Should or Can Science Impact Theological Formulations? An Ashʿarī Perspective on Theology of Nature," *European Journal of Analytic Philosophy* 18, no. 2 (2022): (Si8), 5–35, https://doi.org/10.31820/ejap.18.2.9.

[11] Shoaib Ahmed Malik, "Adam, Eve, and Human Evolution: Is There a Conflict?" in *Islamic Philosophy of Religion: Essays from Analytic Perspectives*, ed. M.S. Zarepour (1st ed.; Routledge, 2023), pp. 261–81, https://doi.org/10.4324/9781003327714.

[12] Jörg M. Determann and Shoaib A. Malik, eds., *Islamic Theology and Extraterrestrial Life: New Frontiers in Science and Religion* (N.p.: Bloomsbury Academic, 2024), pp. 139–58.

The structure of the paper is as follows: It will first display SR's permeation in the Islam-Science discourse and then briefly elucidate the concept of scientific realism from within the discipline of philosophy of science. This will include its definitions and the main challenges it faces, primarily due to its strong claims regarding the contents and mechanisms constituting reality (metaphysical or ontological) and our scientific understanding of that (epistemological). Then, the paper will discuss how the instrumentalist position, on the one hand, shows the weaknesses of SR yet does not suffer from such weakness primarily due to its limited epistemological claims. Then it will state the standards that exist in the Sunnī *kalām* (theological) tradition with regards to knowledge propositions that are certain (*yaqīnī*), conjectural (*ẓannī*)[13], self-evident (*badīhī*) as well as discuss the status of scientific unobservables as to why they do not fall under their category of senses (*ḥissiyyāt*) or experience (*mujarrabāt*). Both are required to be intersubjectively and widely shared amongst all human beings instead of being based on the observations and experiences of a select group of experts or scientists whose observations are colored and mediated by both theoretical presuppositions and sophisticated technological instruments.

The Sunnī theological understanding will be used as a standard metric to analyze what constitutes *ʿilm* in the Sunnī tradition. The framework of this paper is thus conceptual and not school or scholar-based. The criterion of knowledge that is present in the later consolidation of Sunnī position, such as Taftazani's work that serves as a compendium of theological doctrines, would be used as a standard to assign science's epistemic worth. The paper will end by expanding on the Quranic notion of *taskhīr* (subjugation) to explain the instrumental success of scientific theories.

[13] Within *ẓann*, there is (1) *al-ẓann al-rājiḥ* (when a proposition has a high probability of being true. (2) *al-ẓann* (when a proposition is likely to be true). (3) *al-shakk* (when a proposition can be equally true or false). (4) *al-wahm* (when a proposition is more likely to be false than true) (5) when a proposition is false. What moves a person along this spectrum is the nature and the weight of evidence. These categories are relevant in *fiqh* (Islamic Law) but since the orientation of this paper is theological and only certain knowledge is used in theology, it won't discuss these categories.

Science-God Mapping in the Muslim Imagination

The mapping of scientific theories, entities, and processes onto God (His attributes and forms of acting) assumes the acceptance of these with some degree of scientific realism, which is mainly a metaphysical position regarding the ontological existence of scientific entities, processes, and relations. Using scientific knowledge for any discourse within theology, in a scientific realist spirit, means elevating science to a level that connects directly to God. The paper argues that Muslims cannot hold a scientific realist position regarding the truth or approximate truth of scientific theories within the philosophy of science yet consider them outside the realm of theology since anything considered real in science would acquire theological significance and carry implications for theological beliefs. Likewise, using scientific theories for theological understanding and debate reflects a subscription to strong SR, even if it is unconscious and indeliberate. Scientific concepts, evidence and conclusions being imported into theology without rigorous assessment is thus problematic.

Following are a few examples of the central problem that this paper highlights:

> …science has benefited and transformed our lives tremendously. Being in contradiction with such a respected discourse, or more broadly with empirical reality, is not something a genuine religion can afford. After all, religion is here to interpret the world, not to replace or contradict it. The genre of scientific miracles of the Quran has been immensely popular among contemporary Muslims precisely because it aims to disclose such crucial harmony between the Qur'an and science.[14]

And

> In the absence of any unequivocal textual evidence

[14] Isra Yazicioglu, "Perhaps Their Harmony Is Not That Simple: Bediuzzaman Said Nursi on the Quran and Modern Science," *Theology and Science* 11, no. 4 (2013): 339–55, https://doi.org/10.1080/14746700.2013.836888, 352.

> describing Adam's earliest descendants in detail, there would be no way to gauge the extent or rate of genetic and phenotypic change that has taken place among Adam's later progeny. Therefore, scriptural evidence cannot be used by theologians to indicate whether Adam's earliest descendants would have been classified biologically as Homo sapiens or possibly as some earlier human species.[15]

And

> This book seeks to explain how scientific confirmation of life elsewhere in the cosmos might impact Islamic theology and thus affect its 2 billion adherents.[16]

SR is implicit in these instances, which in turn creates a tension between Islam and science, demanding reconciliation. It gives an impression that scientific theories are equivalent to "empirical reality"; otherwise reconciliation would not have been needed. Linking genetic and phenotypic change to Adam's progeny or referring to science as an empirical reality reveals this position of SR. The use of concepts like "mutations", "DNA", and "homosapiens" is itself indicative of an understanding that has submitted to the truth of these concepts and seeks to situate it within the Muslim theological framework. Determann and Malik assume and then assert that scientific confirmations about extraterrestrial life are epistemologically strong enough to impact theology. This is in direct contradiction with his own earlier position that science should *not* dictate theology at all[17]

Scientific Realism and Scientific Instrumentalism propose alternative interpretations of science as a whole, yet critical Islamic analysis of these positions in the recent Islam-Science project remains absent. The uncritical SR makes the interlocutors of

[15] David Solomon Jalajel, *Islam and Biological Evolution: Exploring Classical Sources and Methodologies* (Western Cape: University of the Western Cape, 2009), 164.

[16] Determann and Malik, *Islamic Theology and Extraterrestrial Life*, 5.

[17] Malik and Muhtaroglu, "How Much Should or Can Science Impact Theological Formulations?" (Si8)5.

Islam-Science engagement consider scientific knowledge as "established knowledge", to the extent that the Quranic verses (and hence theology) can be subjected to reinterpretation in order to be aligned with this "established knowledge".

> Further, he explained that the Quran can be subjected to *ta'wīl* (interpretation away from apparent meaning) when its verses are related to "established knowledge". Nadim Al-Jisr (1897 –1980), son of Hussein Al-Jisr and Grand Mufti of Tripoli, wrote in *Qissat al-Iman* [The Story of Faith]. When such certain rational evidence establishes the existence of the human being by way of evolution, it is possible to reinterpret these texts and reconcile them with certain evidence. This does not contradict the beliefs of the Muslims in any way, as long as the underlying principle with them remains that God is the Creator of the human being in any evento.[18]

Such an articulation of "a Quranic paradigm of science" betrays a "hegemonic culture of science and the ideological outlook that accompanied the rise of modern science."[19] That is why it is not found in the premodern times. This paper problematizes the assignment of truth or realism to scientific knowledge that necessitates attempts (past and current) to reconcile the scientific knowledge with the scripture.

Methodology

This paper argues for the paradigmatic differences between the two epistemological frameworks of science and theology that make way for holding the two separate in their spheres, subscribing to an indifference model. This indifference is different from Barbour's independence since the independence model only highlights the different roles of religion and science, the former answering the why and the latter how.[20] However, the explanation offered by scientific

[18] Golshani et al. *Muslim World Science Initiative Report*, 2016. 74.

[19] Ahmad S. Dallal, *Islam, Science, and the Challenge of History* (New Haven, Conn.: Yale University Press, 2010), 133.

[20] Ian G. Barbour, *Issues in Science and Religion* (N.p.: Prentice-Hall, 1966).

theories cannot be equated with the howness or modality of the divine action and therefore cannot be taken as absolute. The theoretical explanations represent how the scientists conceptualize and see the various connections in the phenomena. Establishing the epistemic status of the knowledge of the created world generated by the scientific method becomes imperative. The paper seeks to assign a place to scientific knowledge using the Sunnī *kalām* (theological) epistemological framework. Accordingly, Islamic theology and modern Science, as bodies of knowledge, represent two different standards of what constitutes knowledge. There are no common definitions and sources of knowledge, truth, and certainty shared by both, so they could neither be competitors nor partners striving toward a single body of knowledge.

Scientific Realism: A Brief Introduction

Scientific realism means that the entities or theories that undergird scientific processes and methods are real and that scientific explanations of phenomena represent what actually occurs in the universe. This has layers of approximation, but a scientific realist does believe in the truth value of scientific theories. This issue is hotly debated within the philosophy of science but gains more significant currency for those seeking to situate the scientific enterprise in a theological context. The "realness" of science determines its treatment.

Scientific realists generally adhere to three types of realist commitments: metaphysical, epistemic, and semantic.[21] The paper addresses the issues within semantic and epistemic realism. Metaphysical realism in the Islamic theological paradigm is not contested since it affirms and asserts the mind-independent universe and the existence of metaphysical reality, including supra-sensible beings mentioned in the revelation. Semantic realism is the notion that "claims about scientific objects, events, processes, properties, and relations, whether they be observable or unobservable, should be construed literally as having truth values, whether true or false."[22]

[21] Anjan Chakravartty, "Scientific Realism," *Stanford Encyclopedia of Philosophy*, last modified 2011, https://plato.stanford.edu/entries/scientific-realism/.
[22] Chakravartty, "Scientific Realism."

Tied closely to this is the concept of epistemic realism holding that the knowledge obtained through the scientific enterprise constitutes knowledge about the underlying reality of the world. Epistemic and Semantic Realism claims the quasi-absolute truth of scientific theories and statements involving unobservable entities, objects, events, processes, properties, and relations between them. Their claim needs to find support in the Muslim theological epistemology.

Sunnī *kalām* (theology) has its own understanding of the seen and unseen realms of reality, where the unseen beings, such as God and angels, act behind the apparent phenomena in unknown and unknowable ways. Adopting the SR position inevitably assumes that God interacts with the seen world through the actions of these scientifically known entities and that the scientific processes and laws are God's processes and (natural) laws. For instance, interpreting gravity as God's way of operating in the natural world assumes that humans have understood completely why an object falls to the ground, and how God operates in the cosmos. According to the Sunnī theology, the way phenomena exist for creation, it doesn't for God. There is a difference between saying, "the mind has conceptualized an atom and created a model" versus "Allah Created the atom in this manner". The latter elevates scientific knowledge to a point where it makes a theological claim. At the same time, the paper does not claim that "Allah did not create atoms", all it asserts is that any theological declaration based on science (even in opposition to it) is not justified.

There are places in the Qur'an where Allah (SWT) invites the reader to think and contemplate upon nature, which is deemed to be an *āyah* (sign) of God. The basic thrust of this Quranic argument is phenomenological or experiential – to contemplate nature and how it is suited to and beneficial for humans. In other words, the non-scientifically mediated experience of a tree in its wholeness and existential situatedness within its extended nature is available to scientists and laypersons alike. It inspires a kind of awe about the Creator, unlike the scientifically understood tree in its abstraction, performing abstract, scientifically understood processes of "photosynthesis" or "respiration", understood only by a scientifically trained mind.

> Therefore, the ultimate purpose of reflection is to establish the limitations of human knowledge and our inability to comprehend creation, not to establish a scientific fact and demonstrate its correspondence with the Qur'an. The contemplation that the Quranic text calls for is outside the text in nature and does not move back to the text, nor does it follow or correspond to any particular Quranic scheme. The commentaries share this understanding of contemplation. Thus, contemplation does not imply a correlation between science—whether natural philosophy, astronomy, or medicine—and the Qur'an.[23]

The thinking that occurs within restrictive scientific categories robs an active conscious mind from accessing the world around it as an *āyah* (sign) of Allah (SWT). Instead, the world is reduced to a set of lifeless, empirically tested, and verifiable objects.

Scientific Realism and its Challenges within the Philosophy of Science (POS)

The main tenets of SR consist of the following:

1. The existence of the objects or entities of scientific knowledge is independent of the minds or acts of scientists. This is an ontological claim.
2. Scientific theories assert the truth about that extra-mental or objective world. This is an epistemological claim.[24]

Despite the agreement on the two postulates above, diverse and multifaceted understandings of SR have existed throughout the history of science on how SR as a concept has evolved and how SR is understood differently by those who use it. One does not find one strong SR position; instead, many weak versions exist. Even amongst

[23] Dallal, *Islam, Science, and the Challenge of History*, 137.
[24] Chakravartty, "Scientific Realism."

the various strands of SR, there is disagreement about what is "real" within the scientific theories. [25]

Historically, scientific realism has been challenged in a variety of ways. The first is that scientific theories are always subject to revision. Even if a theory has solid evidence, it may be replaced by one with better evidence. Second, scientific theories may be inaccurate or incomplete. Third, the real world may not be the way the theory predicts. Finally, scientific theories may be based on false assumptions. If a theory is based on false assumptions, it is incorrect even if the evidence supports it. These three challenges to scientific realism are known as pessimistic induction, the problem of falsifiability, and the problem of scope.[26]

An SR position asserts that if an atomic theory sufficiently explains the empirical data obtained through the observational framework (in a given domain), then that is reason enough to believe in the existence of atoms. Otherwise, it is hard to explain how the theory explains the dataset, generates new entities, and accurately predicts experimental results. It is at this juncture that scientific realism and instrumentalism part ways. For an instrumentalist, a theory's explanatory power does not imply belief in the scientific entities. The data only points to the fact that the theory works; it is silent about the actual "existence" as these theories are used only to make sense of the data. In science, only those theories that are empirically adequate survive, and if they can explain the data, then they are considered sound. The logical error in the above SR argument is that the need for a theory is equated with the existence of theoretical entities. This is an ontological commitment that cannot be justified via empirical adequacy, that is, predicting and explaining empirical data without invoking any entities. Instrumentalism can hence avoid burdening scientists with an ontological commitment to the unobservable entities invoked in such explanations, properly

[25] Stathis Psillos, "Realism and Theory Change in Science," ed. Edward N. Zalta, *Stanford Encyclopedia of Philosophy*, Metaphysics Research Lab, Stanford University, 2018, https://plato.stanford.edu/entries/realism-theory-change/.

[26] K. B. Wray, *Resisting Scientific Realism* (N.p.: Cambridge University Press, 2018).

claiming that such commitments are not licensed, nor required, by the activity of science,

> Copernicus' theory of planetary motion and the late Renaissance version of the Ptolemaic theory of planetary motion were both predictively accurate. In fact, the two theories were roughly equally accurate with respect to the predictions they generated, erring by as much as 5 degrees with respect to some predictions but often predicting with far greater accuracy. Rather, its predictive success was a consequence of the fact that it employs eccentric circles, epicycles, and different circles. These were strategically and deliberately built into the planetary models to ensure that the theory was as successful as the contemporary Ptolemaic theory. In short, these were ad hoc adjustments.[27]

This is an example of how a result-based approach cannot be used to judge the realness or truth value of theories. The question of "what makes a theory work" is still largely unanswered. It is unnecessary to allocate the burden of truth or reality to such theories when they can deliver results as *instruments*.

The instrumentalist is non-realist in being agnostic, emphasizing the impossibility of humanly knowing the reality of such entities. It suits Sunnī theological position in being limited in its claim[28]. Denying the reality of scientific objects in an absolute manner, like the other versions of antirealism, would mean an absolute knowledge claim about the unobservable or unseen reality, which is not informed by the revealed sources, hence theologically not preferable. Holding an Instrumentalist position also allows for the

[27] Wray, *Resisting Scientific Realism*, 2018,p.169.

[28] Whether Allah (SWT) can grant human beings the knowledge of His divine actions and how He executes them, according to the Sunnīcreed, is beyond the comprehension of human faculties since divine action cannot be subscribed within time and space. All observations that humans make are due to the divine actions beyond the veil of time and space, and the effects of His actions are observed by us in all the observable natural entities and processes, but not His actions or ways of bringing those about which belong to the *ghayb* (unseen or transcendental realm).

metaphysical realism found in Sunnī theology without necessitating a subscription to scientific realism.

To conclude this section, the question remains whether the "realness" lies in the truth (or approximation to truth) of theories, their empirical success, their research output, or their problem-solving capacity. Whether the realness is claimed for the theoretical entities, equations, or relations is uncertain. The weakness of SR within the history and philosophy of science has been apparent as shown in its many recently compromised versions.[29] Despite its compromised stance, when assumed and employed within a theological discourse, it makes specific demands on the notion of God and His workings within the seen universe. Its weaknesses and limitations are not fully appreciated when employing it in Islamic theology. Suppose the idea of reality is extremely reduced or negated as in some versions of SR, such as structural realism, then they are incapable of making any demands on theology, whether positive or negative.

The *Kalām* Epistemological Framework

The primary task of any science in the Sunnī *kalām* tradition is to provide unequivocal proofs for all its claims.[30] Therefore, scientific propositions need to reach this level of proof to have high epistemic worth within the *kalām* epistemic hierarchy. But how can this definitive proof be provided? In other words, what are the sources of knowledge and how is knowledge classified?

Knowledge propositions in the traditional classification are divided into two types: *badīhī* (self-evident) or *fiṭrī* (innate) or *ḍarūrī* (necessary) statements that are non-inferential and hence *yaqīnī* (certain) and *nazrī or muktaṣab* (inferential) statements.[31] The first

[29] Psillos, "Realism and Theory Change in Science."

[30] Sa'ad al-Din Masud Ibn Umar Ibn Abd Allah al-Taftazani, *Sharh al-Maqāṣid*, 2nd ed. (Beirut: 'Aalam al-Kutub, 1998), 1:174.

[31] Ali Ibn Muhammad Jurjani, *Sharh al-Mawaqif*, 2nd ed., 8 vols. (Beirut: Dar al-Kotob al-Ilmiyah, 2012), 1:98; al-Taftazani, *Sharh al-Maqāṣid,*, 1:210–13; Carl Sharif El-Tobgui, *Ibn Taymiyyah on Reason and Revelation: A Study of Dar' Ta'arud al-'Aql wa-l-Naql* (Netherlands: Brill, 2020), pp. 270–89; Abu Abdullah Qutbuddin, *Al-Qutbi* (Karachi: Maktabat-ul-Bushra, 2021), pp. 57–58.

kind is the one which is direct and requires no further evidence, or better yet, it does not have further evidence. The second kind of knowledge is indirect or inferential knowledge. These statements are not self-evident and, therefore, carry the possibility of uncertainty. The knowledge propositions belonging to the first category are ones based upon logical truths or *al-awwaliyat* (first principles), *al-mahsusat* (observation based on sense perception) - whether *ẓāhirī* (external sensation) or *bāṭinī* (internal sensation or innate knowledge), *al-majarrabat* (experience), *mutawātir* (mass transmitted) reports, and *al-ḥadsiyyāt* (intuitions).[32] In addition to the revealed knowledge (Quran and Sunnah), these *badīhī* (self-evident) propositions are considered irrefutable or certain (*yaqīnī*) beyond doubt. These categories of necessary or axiomatic propositions ward off epistemological skepticism and provide firm foundations for certain knowledge within the Islamic theological tradition. These propositions are known to be true and do not need further proof; hence, ordinary human reason can affirm their certainty.

1. First Principles or Self-Evident Logical Truths (*awwaliyyāt*): These are *a priori* rational truths that are *ḍarūrī* (necessary), such as a person's knowledge of their own existence, the existence of others, the existence of the external world and the existence of God. These include the logical truths, for example, the whole is greater than its parts, qualities are distinct from the thing which is qualified and mathematical truths such as 2+2 = 4.
2. *Ḥissiyyāt* or *Maḥṣūṣāt*: These are empirical propositions that are known through the external senses or sense-perception. An example would be: The Sun emanates light, and Zayd is standing near a tree.

It should be understood, though, that when we say that evidence for the existence of *ḥissiyyāt,* or observable entities is our being able to sense them, this does not mean that senses are

[32] Jurjani, *Sharḥ al-Mawāqif,* 2:36-42; al-Taftazani, *Sharḥ al-Maqāṣid,* 39-42; El-Tobgui, *Ibn Taymiyyah on Reason and Revelation*, pp. 148, 256.

independent means of attaining certain knowledge; this is certainly not the case according to what *al-Iiji* has stated in his *Mawāqif*:

> ...the intellect doesn't attain certainty [in the domain of *ḥisiyyāt*] through the use of the senses only, [neither in terms of universal statements nor particular statements], due to the fact that the senses can neither experience universals nor are they infallible in terms of particulars, but in fact, the intellect needs something else to attain certainty [although we aren't sure about what those things are or how they arise.[33]

3. *Mujarrabāt*: These are also empirical propositions, but these are based on the observed causal connections between experiential objects gained through repeated observations such as fire burns, or water quenches thirst.

4. *Mushāḥadāt al-bāṭinah*: These are propositions based on the sensing of one's inward states. Examples are: I feel pain, I am tired, and I feel happy.

5. Intuitions: These are the propositions generated from intuition (*al-ḥadsiyyāt*). As explained in one of the glosses of *Sharḥ al-maqāṣid,*

> *Al-Ḥadsiyyāt* (Intuitions), in the terminology of the philosophers and the *mutakallimīn* (theologians), are statements that are granted by the intellect by way of intuition. An intuition is the coming together of ordered premises [leading to a conclusion] in the mind without any will or action. Thus, if the statement emerges from a strong intuition that drives away all doubt and leads to certainty, it is considered certain knowledge (*qaṭʿī*). For example, knowledge of the encompassing Knowledge of the Creator is because of the perfection of his actions: When we observe that the actions of Allah (SWT) are inexorable and perfect, we intuitively understand He is

[33] Jurjani, *Sharḥ al-Mawāqif,* 1:152

> All-Knowledgeable. Similarly, when we observe the different phases of the Moon when it is at different positions with respect to the Sun, we intuitively understand that the light of the Moon comes from the Sun. And if the statement does not emerge from a strong intuition, it is considered probable knowledge.[34]

Intuitive propositions are direct and non-inferential. They are neither observed (*mushāhadāt* or *maḥṣūṣāt*) nor experienced (*mujarrabāt*) by the human subject. These could be metaphysical, as in the case of intuitive knowledge about Allah's absolute knowledge, or refer to natural phenomena such as the Sun and Moon. There can also be intuitive certainty regarding the application of a universal, such as a human being, to a particular person. One intuitively knows that someone belongs to the category of human beings without inferential reasoning, especially in cases where the person in question does not fall under the standard definition of a human being, such as a dead person. Unlike previous examples of intuitive propositions, which might not be accessible to everyone, this kind of intuition is universal and shared by all people.

6. *Mutawātirāt*: These are mass-transmitted successive reports that cannot be considered a lie, such as Antarctica is the coldest place on Earth.

Scientific propositions can potentially fall under the *maḥṣūṣāt* or *mujarrabāt*, but since the propositions we are concerned with involve unobservable entities, they cannot fall under any of these categories of certain knowledge, including the *maḥṣūṣāt* or *mujarrabāt*. Some academics[35] have suggested that the category of intuitions can be applied to scientific (biomedical) propositions, and hence scientific (biomedical) knowledge hardly seems to be the case since intuition in the Islamic epistemology is direct, non-theoretical and non-inferential, totally unlike scientific propositions at hand,

[34] al-Taftazani, *Sharḥ al-Maqāṣid,* p. 71

[35] O. Qureshi and A.I. Padela, "When Must a Patient Seek Healthcare? Bringing the Perspectives of Islamic Jurists and Clinicians Into Dialogue," *Zygon* 51 (2016): 592–625, https://doi.org/10.1111/zygo.12273, p. 608.

which involve multiple levels of theoretical presuppositions and formal inferences. This category has been used within Islamic tradition to explain the direct, experiential knowledge of Allah (SWT) and His divine presence. This is a private, direct, and non-rational category, totally in contrast to scientific knowledge, which is public and rationally defensible through theoretical assumptions and inferences drawn from them.

The following quote in Ghazali's *Miʿyār al-ʿIlm fī al-Manṭiq* (2013) supports this.

> And similar to the experimental (*mujarrabāt*) is intuited knowledge (*ḥadsiyyāt*). This is where things are known, starting with an intuition of the soul (the place where the locus of knowledge is located) that occurs due to the clarity and strength of the mind and its ability to testify to things so that the soul accepts it and believes in it so that it cannot doubt it. But if a disputant disputes it, truly believing the opposite or simply a skeptic, you cannot have the disputant recognize the truth unless his intuition is strengthened. This is like our knowledge that the light of the Moon is derived from the Sun and that the reflection of its ray to the world is similar to the reflection of the mirror's ray to all other objects opposite it, due to its different shapes when its distance from the sun varies. Whoever practices any subject acquires many examples of this kind of knowledge through intuition and deliberation that he cannot prove, nor can he doubt them, nor can he share them with others by teaching them, except by showing the student the path he has taken and followed so that if he takes the path himself, that path will lead him to that same belief if he has the necessary intellectual aptitude. You should not aspire to silence every disputant with this type of claim because some beliefs are so certain that we cannot teach them to others by way of proof unless we participate in practicing them in order to share the knowledge derived from them. In such a case, it is said: "He who has not

> tasted does not know, and he who has not arrived does not realize.[36]

Scientific propositions do not fall under this category, where propositions have experiential certainty and are neither provable nor teachable. Instead, scientific knowledge is public knowledge, and every effort is made to prove its claims to both scientists and non-scientists. A set of theoretical presuppositions and auxiliary assumptions is at work, without which scientific propositions cannot make sense. Scientific knowledge is made public, and then the proofs and counterproofs are given via complex inferential reasoning.

An interesting observation regarding all the above categories, except intuition, is their universal and intersubjective nature. The concepts or entities that fall under these are such that all human beings, regardless of their educational background or training, have access to and clear undisputed understanding of them simply because of the *badīhī* (self-evident) nature of these entities and propositions. Since all human beings share their common and essential human nature (*fiṭrah*), the innate (*fiṭrī*) understanding of such propositions as being certain is shared in virtue of that. Scientific propositions do not possess the same status since they are theoretical and inferential (*naẓrī*) and not innate (*fiṭrī*) or self-evident (*badīhī*). The inferences are primarily drawn from hypothetical theoretical assumptions as seen in the previous sections. Universal and certain propositions are thus ones that have non-inferential self-evident (*badīhī*) referents that require no pondering to be known. Scientific propositions, in contrast, are inferential, and the concepts they employ, such as atoms, quarks, cells, genes, etc., are also inferential (*naẓrī*). This is the case because scientific theory-based inferences refer to abstract and unobservable physical entities. The premises in scientific inferences, whether inductive or deductive, are thus not self-evident (*badīhī*). The referents used by the Qur'an, especially pertaining to the signs of Allah (SWT), are also (*badīhī*) and hence non-inferential; according to Said Nursi, it is in these ordinary events, which everyone can observe, that the Qur'an wants to show us the signs of the Wise

[36] Abu Hamid Mohammad bin Mohammad al-Ghazali, *Miʿyār al-ʿIlm fī Fann al-Manṭiq*, ed. and researched by Dr. Sulaiman Dunya (Egypt: Dar al-Maarif, 1961), 192.

Creator.[37] That is why, within the Sunnī *kalām* tradition, the epistemological standards that qualify the truth or veracity of any proposition are not just stringent but also rate collective intersubjective human experience to be certain. Conversely, scientific abstractions are not universally intersubjective but are arrived at by a set of science experts working within the limitations of the scientific methodology.

The Status of Unobservable Scientific Entities

In Sunnī epistemology, the existence (*wujūd*) of *ḥissiyyāt*, those entities belong to the physical world and are experienceable by the senses, is self-evident, which is to say that one does not need theoretical argumentation or inferential reasoning to know that a certain physical entity exists. For example, the statement "the sun exists" require no evidence to ascertain its veracity. This is simply because there is no actual evidence for their existence apart from our sense perception (*maḥsūsāt*) of these *ḥissiyyāt* (observable or sensible objects). It is also important to note that the knowledge of the existence of any observable entity is epistemologically prior to forming any judgment about its qualities. Thus, it is not the case that a certain theoretical understanding of the sun or moon is developed first and then verified whether something similar to these "theoretical" entities exists in *al-khārij* (extramental reality) or not. Instead, everyone talks about the sun and the moon after understanding they exist.

In contrast to observable entities like the sun or the mountains, scientific entities like electrons are not directly observable or sensible. Hence they require two (or maybe even three) levels of theoretical inference or interpretation to merely prove their existence. These unobservable entities are first theorized as part of some overarching paradigm, and then, different instruments are built - again relying on the theoretical construction - to detect those entities. What is then detected through these instruments is interpreted (again based on interdependent theories) as either an affirmation or

[37] Isra Yazicioglu, *Understanding the Quranic Miracle Stories in the Modern Age* (N.p.: Pennsylvania State University Press, 2015), 135–36.

falsification of the initial hypothesis (the theorized entity). Even if, after all the theoretical interpretations, it is affirmed that the said entity does exist, its existence would have been proven by experiments laden with theoretical assumptions and not by virtue of it being self-evident. This is in stark opposition to the *kalām* (theological) criterion that certain knowledge about the existence of physical entities should be self-evident.

Strong SR considers the unobservable entities constituting a scientific theory to be physical entities like the everyday objects that we interact with. Thus, a bacterium is ontologically no different from the table in a room. The level of existence of both lies on the same plane, which is physical existence. The only difference is that a quark is hidden from ordinary human perception, unlike a table. In *Taymiyyah* terms, the table and the quark are *ʿayn* (self-standing entities), the former being a real *ʿayn* and the latter a potential *ʿayn*. Furthermore, for Ibn Taymiyyah the primary question is an ontological one,

> .. it is primarily because for him [Ibn Taymiyyah], to know is first and foremost to know of what exists "out there" as independent, self-standing entities in the external world (*aʿyān qāʾima bi-anfusihā fī al-khārij*). Only after accounting for the ontological question of what exists can we consider the epistemological question of how precisely we come to know what exists.[38]

The atom or quark – if it exists – is a physical entity like other physical entities, and this is an ontological claim. But how do we know if it exists (or not) since it does not exist in the external world the way a chair or table does? This is clearly, a question of epistemology. This paper does not question the possibility of the existence of an unobservable entity like the quark. Our question, instead, is whether humans can ever come to know whether these entities ontologically exist or not with absolute certainty, like the other *badīhiyyāt*. Thus, it is an epistemological question. To further explicate, discussing the functions or causal effects of a quark

[38] El-Tobgui, *Ibn Taymiyyah on Reason and Revelation*, 235.

implies that one believes in its physical existence. When quantum physics is exported to Islamic theology[39] and then used to make claims about God, the strong SR is assumed whereby quarks are assumed to have ontological realness and not only theoretical abstractions. The probability of being real is present, but the certainty is not, and hence, it is improper to use those as established facts to be then used as *badīhiyyāt* in theology. Thus, scientific conclusions are inferential judgments that do not possess the rational necessity of either the first principles or other *badīhī* propositions. These potentially fallible theoretical (*naẓrī*) conclusions are unlike ordinary *maḥṣūṣāt* and *mujarrabāt,* and cannot falsify, question or call for reinterpretation of revealed knowledge. Due to their inferential and, therefore, potentially falsifiable nature, they cannot even serve to explain the revealed knowledge.

Instrumentalism: Old and New

There is a well-known passage in al-Jurjani's *Sharḥ* on al-Iiji's *al-Mawāqif* which has been received as a realism vs instrumentalism debate[40] with al-Iiji taking a strictly anti-realist or instrumentalist position concerning astronomical models, while al-Jurjani taking a more nuanced realist position. According to al-Iiji,

> And these [models] are fancied/imagined constructions [of the mind] which have no existence in the extramental world nor is there any prohibition about these [scientific] activities; nor do they have any relation to belief and doctrine; nor can they be affirmed or negated...thus when you see these mere imaginary entities weaker than a spider's net the sounds of these hollow words [from astronomy and its likes] should not frighten you in any way.[41]

[39] Altaie, *The Divine Word and the Grand Design*, 2019.
[40] F. Jamil Ragep and Alī al-Qūshjī, "Freeing Astronomy from Philosophy: An Aspect of Islamic Influence on Science," *Osiris* 16 (January 2001): 49–64, 66–71.
[41] Al-Jurjani, *Sharḥ al-Mawāqif,* 7:109.

This passage shows that al-Iiji had a clear position about astronomy and its models: they are nothing but supposed entities - a construction of the mind - which may be useful for different tasks but have no correspondence to extramental reality. Al-Iiji also, interestingly, states that the reader should not be frightened by the complications and sophistication of astronomy because these are "hollow words", which means that they are no representatives of reality. Thus, if at any time the reader feels that astronomical models contradict something in revelation, they should remember that these models do not aim for truth (therefore they are neither affirmed nor negated). Instead, they are mere tools constructed with the aim of empirical accuracy.

Abdul Hakeem Siaalkooti - who has a *ḥāshiyyah* (gloss) on the *Sharḥ al-Mawāqif* - says about the above passage.

> ...the correct recording of the movements of heavenly bodies is dependent on the accurate construction of observational instruments and placing them exactly on the meridian, then observing the celestial bodies when they reach the [expected] position with a very keen eye without any negligence and without any mistake in the calculation; [clearly] the unification of all these conditions is improbable; Nay! Impossible…. Yes,the astronomers have made every possible effort to obtain the correct readings, but do they know them (the movements of the celestial bodies) as they truly are in *nafs al-amr*? Absolutely not![42]

Al-Jurjani, in his commentary of *Mawāqif, Sharḥ al-Mawāqif,* crafted a case for the mathematical part of astronomy as being real and apodictic and not imaginary. He was an astronomer himself and wanted to show that the glory of God's creation could be revealed through astronomy.

Ragep's estimation was metaphysically neutral astronomy, which affirms the reality of mathematical astronomy only and not its underlying metaphysics and physics. Astrology came to be categorized as a part of natural philosophy (or physics), whereas

[42] Al-Jurjani, *Sharḥ al-Mawāqif,* 7:109.

astronomy (which became known as *ʿilm al-hayʾah*) was categorized as a strictly mathematical discipline".[43] Al-Ghazali had also accepted apodictic mathematics as certain knowledge and hence the mathematical part of astronomy without its physics. Al-Qushji, unlike al-Jurjani, pretty much accepted al-Iiji's instrumentalist or conventionalist interpretation. Such a non-realist approach provided more flexibility in terms of experimenting with novel theoretical models such as the rotation of the earth.[44]

When it came to astronomy, al-Iiji, who was well acquainted with the basic picture of Ptolemaic astronomy, held that the orbs were "imaginary things" (*umūr mawḥūmā*) and more tenuous than a spider's web (*bayt al-ʿankabūt*). However, al-Iiji did not conclude that astronomers' constructions were to be censured or condemned. Instead, he insisted, echoing al-Ghazali, that "[religious] prohibition does not extend to them, being neither an object of belief nor subject to affirmation or negation."[45]

This freedom from realism provided more constructive room for growth in astronomy for astronomers like al-Qūshjī,and al-Khafri. Al-Qūshjī, being a scientist himself like al-Jurjani, according to Ragep, wanted to have a position more sophisticated than al-Iiji, a theologian who was not interested in glorifying God with science. Al-Jurjani and al-Qūshjī, knew that without proving astronomical knowledge to correspond with reality, it could not be used to praise God's subtle wisdom in his wondrous creation since instrumental knowledge or theoretical conventions/constructions could not glorify God. Al-Qūshjī, tried to strike a balance in rejecting the realist position by mentioning that "the correspondence between our human constructions and external reality is itself a source of wonder"[46] This position of al-Qūshjī, coincides with the position promulgated in this paper, especially the upcoming section where it will be argued that the correspondence between human scientific (and common-sense) constructions and external reality despite being probable, fallible,

[43] Ragep and al-Qūshjī, "Freeing Astronomy from Philosophy", 52.
[44] Ragep and al-Qūshjī, "Freeing Astronomy from Philosophy", 49-64, 66-71.
[45] Ragep and al-Qūshjī, "Freeing Astronomy from Philosophy", 55.
[46] Ragep and al-Qūshjī, "Freeing Astronomy from Philosophy," 63.

uncertain, and falsifiable conjectures, is a blessing from God and is part of the *taskhīr* mentioned in the Qur'an. Thus, two incompatible scientific theories informed by the same observational data (underdetermination) and providing similar predictions and pragmatic efficiency reflect God's marvel in allowing this to happen for human convenience.

While stating the premodern Muslim discourse on the realist or instrumentalist nature of scientific theories, it needs to be pointed out how the features of the discourse have shifted. First, the Muslim discourse of the post-classical period only involved astronomy that was highly dependent on mathematics, which was considered apodictic knowledge or part of *awwaliyyāt* (apodictic knowledge), unlike the physical entities of modern science like atoms, cells, quarks, viruses, etc., which are considered sensible entities residing in the external, physical world, hence unplaceable within the category of *awwaliyyāt* (apodictic knowledge). On the other hand, this paper is concerned with scientific constructs and physical or non-mathematical processes such as atoms, quarks, bacteria, etc. Al-Jurjani's realist account was meant only for mathematical knowledge propositions that he considered part of *awwaliyyāt* (apodictic knowledge), residing in the *nafs al-amr* (thing in itself) only. Another significant difference lies in the fact that the history of modern science in the past two centuries has generated a philosophy of science that is much more cognizant of the fallible and instrumental nature of scientific theories and which has been used in this study to understand the nature of scientific theories and scientific propositions. The earlier Muslim astronomers and scientists were not witness to this long history of refutation of working and successful scientific models and concepts, which, if they had been, would have made them more easily side with instrumentalism.

Expanding on the Quranic Notion of *Taskhīr*

One of the SR arguments against instrumentalism is the "No Miracles Argument". It asserts that without claiming ontological reality for scientifically known entities, their pragmatic efficacy, workability and repeated applications can only be considered a miracle. Since it is unscientific to attribute the success of all those theories to miracles

alone, scientific realism is the only way to go. The theories are producing results because the theoretical entities must exist without question. Since Sunnī theology affirms that Allah (SWT) has a direct and active involvement[47] in the phenomenal world, it makes the situation even more complex at the level of intelligibility since, behind the empirical aspects, there is the divine creative agency. The exact mode of that agency lies beyond human comprehension simply because Allah (SWT) is above the spatio-temporal categories and is not bound by the categories of scientific terms and language. If, according to Sunnī creed (theology), there will always be many unknowable aspects of the phenomena, how can human beings make accurate predictions?[48]

This is answered with the concept of "*taskhīr*"[49] (subjugation). The purpose of subordinating water under humans and, likewise, surrendering the boats under them, as referenced in the Quran, meant they could exercise control over them and travel distances for their needs. It is Allah (SWT) who makes these natural forces yield to humans. The question arises as to in what ways they come under human control. One is the physical control that human have over domestic animals, which allows them to milk and slaughter those for food. Another way we can understand *taskhīr* (subjugation) is through the various theoretical models that allow us to explain, predict, and control various external phenomena. Allah (SWT) has subsumed the universe to human beings in such a way that they can derive benefits even without comprehending it completely. The fact that these natural occurrences are directly controlled by divine power, and that reality eludes human understanding, yet the various theoretical models apply to the external world allowing a good deal of prediction and control over the external world, is something that requires explanation and theological reconciliation.

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[47] Quran Qur'an, 14:32-33; Quran Qur'an, 31:20; Quran Qura'n, 45:12-13; Quran Qur'an, 22:65.

[48] We find a similar, though not the same, characterization of theistic intelligibility that does not endorse SR in Robin Collin's idea of Theistic Non-Reductive Intelligibility (TNRI). Robin Collins, "Contributions from the Philosophy of Science," in *The Oxford Handbook of Religion and Science*, ed. Philip Clayton and Zachary Simpson (Oxford: Oxford University Press, 2009), 338–42.

[49] Quran 2:164.

It is proposed that the working of scientific theories as instruments is made possible by God's generosity, wisdom, and power, Who allows those explanatory models to work in the sense of explanation, prediction and application without being the true mirrors or representations of the Ultimate Reality (*al-Ḥaqq*). Our feeble attempts at models, equations, and theories are all granted empirical adequacy and reliability by the *Faḍl* (Grace) of Allah (SWT). This explains why obsolete theories that employed phlogiston and ether could work consistently, as well as the various incompatible and incommensurate theories we find in the history of scientific practice.

Although this is a novel appropriation of the concept of *taskhīr* (subjugation), it doesn't significantly differ from the traditional interpretation that are present in the *tafsīr* (exegesis) literature.[50] First, it needs to be understood that every single thing that exists in the world is subjected to serve human needs, and thus whatever processes are observed in the world are actually "miracles", in the sense that no one can completely explain why these natural phenomena work the way they do unless they concede to the fact that God's Knowledge, Power, and Mercy are behind all these occurrences.

It is also equally important to state what is not meant by *taskhīr* (subjugation). The paper does not state that "the world has been subjugated (*musakhkhār)* through science by Allah" - this would be a profound misunderstanding. Scientific theories or models of the universe - though not necessarily real or true - have been granted workability and empirical success by Allah (SWT). The limited predictions about the universe work not because of all the science that has gone into them but because Allah (SWT) chooses them to work for human beings. The natural world works as we expect it to, and those expectations are generated using scientific or non-scientific (common sense) explanations.

Conclusion

Regarding theology *(ʿilm al-kalām)*, it is important to understand that the only knowledge that is useful in this domain is certain

[50] Quran 45:13.

knowledge- the sources of which have been outlined and explained[51]. If modern scientific knowledge doesn't reach the level of self-evident (*badīhī*) and certain (*yaqīnī*) knowledge, then it can never contradict the scriptural texts (*nuṣūṣ*), since even an apparent or surface-level contradiction can only arise out of two statements of equal epistemic value - let alone a true contradiction. Nor can scientific knowledge become evidence for or against theological or doctrinal claims and arguments.

According to the Sunnī theologians and logicians, only the revealed knowledge (Qur'an and Sunnah) and the six categories of *badīhiyāt* (self-evident) propositions that are established beyond doubt or dispute, enjoy the status of being irrefutable. Only these propositions that are certain (*yaqīnī*) or definite (*qat'ī*) are capable of becoming theological evidence where those are based upon revelation (*waḥy*), logical truths or first principles (*awwaliyyāt*), sense perception (*maḥṣūṣāt*), inward states (*mushāhadāt al-bāṭinah*), experience (*mujarrabāt*), widely transmitted (*mutawātir*) reports, and intuitions (*al-ḥadsiyyāt*)

The propositions belonging to these six categories are known to be true, and understanding their meaning does not require further proof. Ordinary human reason knows its truth without making a recourse to further far-removed assumptions and speculations, which is what scientific propositions require and depend upon. This compromises the epistemic worth of scientific propositions that are based on theoretical speculations. Scientific knowledge, therefore, does not meet the requirements of certain, definite (*yaqīnī* and *qat'ī*) knowledge. It falls, at best, under the category of *zannī* (probable knowledge) - a claim that has been substantiated by the history and philosophy of science. Consequently, scientific (theory-laden, hence fallible) knowledge, despite having its benefits as practical art (*fann*), can neither be used in theology as evidence- whether it be fine-tuning arguments or anything else- nor can any of its theories, for instance evolution, purport to challenge or revise any theological pre-understanding. By the standards of Sunnī *kalām* epistemology, scientific knowledge is *ʿilm* only in a limited sense; in reality,

[51] al-Taftazani, *Sharḥ al-Maqāṣid*, 39-42.

modern science is a practical art (*fann)* of explaining, predicting, and problem-solving.

In the ongoing debate of scientific realism and anti-realism, instrumentalism is the position that can be appropriated from within the Sunnī theological epistemic framework to arrive at a theological position about the status of scientific knowledge. Used as instruments, the various probable (*zannī*) conceptual schemes, categories, and explanatory models could in principle be applicable to the horizontal causal explanation of the world and its day-to-day affairs, thus contributing to the *maṣlaḥa* and *manfaʿa maṣlaḥah* and *manfaʿah* i.e., well-being of humanity. This is, however, possible only if the consequences of that scientific knowledge and understanding do not transgress the Islamic ethical boundaries and do not abuse the Islamic vision[52] of well-being (both human and environmental) at the practical level.

[52] Principally, the Islamic theistic metaphysical view could have informed contemporary Muslim scientific pursuits. That could have tailored the kind of questions that Muslims would have asked and the type of research programs they would have initiated, using the same scientific method. For instance, the very questions asked within the theistic framework would have been, why the leaves of a certain tree have a certain shape and size and not some other. This is theistic because this is informed by the belief that Allah (SWT) is Wise and there is a purpose (teleology) in the way He has created everything. Out of innumerable contingent possibilities if He has the leaves to be of a certain type it must have been the best for that tree or fruit etc. This question of what would have happened had something been designed differently could have been asked within all scientific disciplines, and the various possibilities explored with the conclusions on how adversely a different design or system would have affected the very purpose of a thing or a system. Such a teleologically informed research paradigm would have interpreted the telos of one thing or system to be interconnected with everything else. The methodology to study alternatives could have been different, not lab isolation but perhaps a study in nature requiring all the affecting variables to be there. Developing such a theistic scientific paradigm from scratch is practically impossible due to the globalized hegemony of one way of doing science worldwide despite its limitations and biases.

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