Islamic Science: The Making of a Formal Intellectual Discipline

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The term "Islamic science" can be defined as the scientific way of defining and corroborating the uniquely monotheistic concept of *tawḥīd* (unity), a concept that can serve as an epistemological manifold for intellectual inquiry and development. In this context, science is taken as a systematic way of looking at things or, in other words, as both a philosophy of knowledge as well as an empirical methodology. When taken in its entirety, science includes the whole spectrum of human inquiry ranging from ontology to epistemology, from causality to cosmology, and from the natural and social sciences to technology. It may be noted that beyond an axiomatic application based on a metaphysical definition of *tawḥīd*, there has been no scientific attempt to analyze and substantiate this concept.

This axiomatic application of *tawḥīd*, especially when dealing with an analysis of developments in knowledge, raises certain epistemological questions. As it does not scientifically define or discuss the very premise—*tawḥīd*—on which the analysis is being based, this is to be expected. Furthermore, for example, the axiomatic application of *tawḥīd* to purge the corpus of knowledge of its secular elements and then reconstruct it within the *tawḥīdī* framework cannot be fulfilled, as it is unable to furnish a *tawḥīd*-based scientific temperament without first providing scientific corroboration of the concept itself. It is from such an epistemological viewpoint that we find the contributions of Muslims to various fields of learning tend to be more sentimental than scientific.

The need to develop Islamic science also arises from the fact that most modern scientists are known to be secular, as they have consciously evaded the issue of the existence of a Creator. This is the result of their

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view that such a notion cannot be empirically substantiated. Thus it is even more necessary first to furnish a secular-free scientific justification of Islamic monotheism that could help direct the course of human intellectual inquiry.

Our thesis is that the malaise of the modern world, ironically, can be traced to its preoccupation with the monumental success in the applied sciences and technology. It is this very success which has, by and large, seriously impaired its epistemological acumen, one example being the outright rejection of the ontological necessity for the existence of a Creator of the universe. The fact that human beings are prone to succumb to secularism, as a result of the degeneration of their epistemological acumen despite their advancement in knowledge, is most poignantly pointed to the Prophet: "He taught man by means of pen; (He) Taught man what he knew not. But, indeed, man does transgress; He regards himself self-sufficient" (Qur'an 96:4-6).

It is this very epistemological impairment that requires the formulation and development of the proposed discipline of Islamic science. Its main goals are to reverse this epistemological decline in modern times and, at the same time, to establish *tawḥīd* in terms of an ontological necessity of the Creator's existence and then corroborate it in a scientifically justifiable manner.

Science proceeds only through ontological insights and epistemological rigor. This is exemplified by Einstein's reconstruction of Newtonian physics by freeing it from the inertial frame of reference based on Euclidean geometry, and the notions of absolute space and absolute time (Einstein 1955). Since science is the only mode in which the human mind functions meaningfully vis-à-vis the understanding of reality, any religion not characterized by a theology that is amenable to scientific study cannot be taken seriously. Islam meets this requirement, as the Qur'an continually exhorts Muslims to think, ponder, and avoid speculation.

In this sense, one may consider the modern world to be unscientific, for it has committed certain serious ontological omissions and exhibited equally serious epistemological lapses. The most outstanding example is its rejection of the notion of the Creator of the universe on the ground that it cannot provide any relevant empirical and scientific evidence. A recent survey of outstanding authorities in various scientific disciplines testifies to this malaise of the modern world (Rayl and McKinley 1991).

The objective of Islamic science is to establish an ontological necessity for the existence of the Creator and to provide an epistemologically sufficient ground for a scientific corroboration. We maintain that unless Islamic science can discuss and debate the concept of *tawḥīd* in concrete scientific terms, use of the term "science" is unjustified.

It is important to note that the stand of the modern scientists is itself opposed to the scientific methodology. Science admits and thrives on purely abstract notions (i.e., entropy and infinity), in the absence of which the entire edifice of science would collapse instantly. Although most of these intangible and highly abstract notions cannot be subjected to any empirical proof, except indirectly or only theoretically as some mathematical function, no scientist would dare disown "belief" in them. In fact, science proceeds only through theoretical constructs of both tangible and intangible phenomena. Perhaps the best argument why a scientist cannot reject the concept of a supernatural, unseen Creator is provided by the observations of the famous scientist Wilhelm Roentgen.

One day, Roentgen was conducting experiments on the behavior of an electric current passing through a vacuum tube. At the end of this experiment, he discovered that a set of unused photographic films that had been enclosed in a black envelope and placed in the drawer of a wooden table located in a corner of his laboratory, were all exposed. Let us analyze his reaction to this incident.

Being a scientist, Roentgen did not dismiss the incident as a matter of chance or negligence on his part. On the contrary, he became curious and repeated the entire experiment under identical conditions. To his great surprise, these photographic films were also exposed. His scientific spirit did not regard the recurrence of the rather "supernatural" incident as something mystical and therefore not subject to examination by science just because there was no "tangible" means to explain the situation. On the contrary, he hypothesized that some kind of rays were emerging from his experiment which, although intangible and imperceptible to human senses, could penetrate his desk and the envelope and thereby affect the concealed photographic films. Since nothing more could be known about those unseen rays, Roentgen called them "X-Rays," meaning some unknown rays.

It is important to note here that the ontological insight demonstrated by Roentgen in accepting the existence of an unseen phenomenon, as well as his equally sharp epistemological rigor in formulating the hypothesis of X-Rays, constitutes pure science according to the principles and norms of modern science. If he had heedlessly suppressed his scientific curiosity, along with his ontological urge and epistemological acumen, dismissing the incident as something beyond empirical corroboration, humanity and science would have missed a highly significant discovery.

In the above example, Roentgen was engaged in experimental or applied science. His use of logical and inductive rigor to devise a hypothesis concerning the observed phenomenon and constructing a concept constituted science in the real sense. It is this epistemological acumen to

hypothesize, as well as the role of cognitive capability to form a concept, that have been studied in our recent research into neuropsychology, or what we call "cognitive kinematics" (Husain 1989).

Cognitive kinematics comprises two central issues. Once these are understood, it is then possible to explain the human cognitive process in general and to furnish both a theoretical as well as an empirical corroboration of *tawḥīd* in particular. These two fundamental postulates are:

One: Human cognition proceeds by employing a concept as the basic functional unit.

Two: Human cognition proceeds, at the noumenal level, as a "point syntax," as distinguished from the familiar linear syntax, employed in human communication using a natural language.

At the noumenal level, we define a sense-sound continuum as four-dimensional (i.e., auditory, visual, somatosensory modalities, and sound) non-Euclidean space. On the sense-sound continuum, we define a unified cognitive field comprised of three fundamental cognitive forces: syntactics, semantics, and semiotics. Syntactics, unlike syntax in linguistics, is defined as a fundamental cognitive field signifying human consciousness. Semantics, the second fundamental cognitive force, manifests itself as the emergent meaning of a concept, as a cognitive event, in terms of the eventual geometry of the syntactical field. The third fundamental cognitive force, semiotics, is defined as a neurosonemic field capable of assigning adaptively a semantically coextensive representation to concepts, teleologically, in a causal fashion.

The syntactical field—the field of consciousness—has been fully corroborated by the monumental work by Edelman (1989). Through his theory of neuronal group selection (TNGS) and, in particular, the development of global mapping via an ingenious neuronal information processing mechanism (which he calls reentry) between various neuronal group selections, temporally, in response to signals from the spatiotemporal sense-experiences, he has both logically and empirically demonstrated the biological basis of human consciousness. His ontological explanation of the eventual perceptual categorization, due to "reentrant cortical integration," can be seen, teleologically, to lead to conceptual categorizations. The above ontology of concepts empirically corroborates our point syntax postulate. Earlier, Tsan (1934) and Whitfield (1979) furnished empirical evidence that the animal mind (in general) and the human mind (in particular), as a result of spatiotemporal sense experience, essentially proceeds by formulating concepts as the scientific object.

This fact amply corroborates our second hypothesis: human cognition proceeds in terms of concepts as the fundamental functional units.

As expounded in our point syntax postulate, a concept not only remains an invariant semantic entity, as required for effective communication, but also maintains its identity, independent of linguistic syntax, to convey its meaning. From this communicative equivalence of concepts, which manifests itself independently of the respective intertial syntactic frames of reference pertaining to different natural languages, we have propounded a universal syntactical principle (syntactical in the sense of the field of consciousness as defined above). This principle defines the syntactical field as covariant with the geometry of the sense-sound. Further, as can be readily seen by virtue of the point syntax and the universal syntactical principle, the syntactic invariance of a cognitive event can be defined ontologically, as a Riemannian fundamental tensor ($g\mu\nu$), which is known to exist independent of a frame of reference (Riemann 1953). The above model of human cognition can be conveniently defined, after Einstein (Jammer 1954), in terms of unified cognitive field equations, as:

$$S\mu\nu + Sg\mu\nu = H\mu\nu$$

In this unified cognitive field equation, the Riemannian tensor ($g\ \nu$) represents the syntactical field, such that the metrical structure, determined by the neurosonemic tensor ($S\mu\nu$) is related at every point of the sense-sound continuum to the concept-information tensor ($H\mu\nu$).

Cognitive kinematics postulates that syntactical activity, reaching higher levels of human consciousness as a result of human observation of the awesome variety and regularity of all spatiotemporal phenomena, may grow, under certain intellectually plausible conditions, to amazingly high levels of intensity. Such outbursts of cognitive activity may cause a catastrophic implosioning of concepts, in turn giving rise to certain causal structures, what we call a "cognitive event horizon" or episteme, heralding the birth of an academic discipline. The resulting epistemes, which are highly compact cognitive events, are so packed with extremely high syntactical intensity that any concept in any episteme can simply be absorbed by another without disturbing its own intrinsic epistemic character. This fact is evident from the highly interdisciplinary nature of today's knowledge. In this respect epistemes, which may be called Bright Holes, seem to behave like the Black Holes in Einstein's cosmology. The epistemes, therefore, are capable of acheiving a time-independent steady state as epistemologically valid and stable disciplines with well defined academic boundaries, in defiance of the second law of thermodynamics.

Epistemologically speaking, it follows from the unified cognitive field theory that the syntactic intensity of a cognitive event horizon may teleologically grow to its ontological fulfillment—a *tawḥīdī* episteme or Islamic science—signifying a uniquely monotheistic Creator. The *tawḥīdī* episteme so defined is unique by virtue of the fact that it proceeds in a non-Euclidean space as a Riemannian (or Raḥmānian) tensor independent of any interval frame of reference of an immediate sense-experience, whether dogmatic or anthropomorphic, to define the concept of Creator. In the absence of a non-Euclidean approach to this concept, the human mind is prone to degenerate into a Euclidean space, which is typically manifested by a variety of pantheistic as well as polytheistic models of God.

Although the sense-sound is fundamentally anchored in the space-time continuum, the *tawḥīdī* episteme remains in a time-independent steady state and continues to have an unlimited capacity to absorb concepts from any other discipline. The *tawḥīdī* episteme, which is the culmination of observations based on the entire range of existing epistemes, signifies the highest cognitive achievement. It is this state of human consciousness and awareness of the unique and un-caused Creator that entitles the believers to be described as the "best evolved nation, that enjoins good and forbids evil" (Qur'an 3:110) or the "highly exalted ones, if they are true believers" (Qur'an 3:139).

The significance of Islamic science as an epistemologically valid academic discipline lies in its ability to furnish a scientific means to corroborate the *tawḥīdī* episteme. This science's impact on restructuring the existing corpus of knowledge and on directing the course of emerging knowledge within the *tawḥīdī* episteme's all-encompassing manifold can be readily seen. It is this scientific approach of Islamic science that may be acceptable to modern scientists in both the East and the West, as both belong to the Creator: "Say, the East and the West belong to Allah. And He guides whom He wills to the straight path" (Qur'an 2:142).

As observed by Ibrahim (1990):

> The purpose of developing a contemporary philosophy of Islamic science is not simply to satisfy some intellectual curiosity, or to glorify Islamic scholasticism, or to aggrandize its superiority. Its ultimate purpose is to help Muslim scientists construct a global foundation for contemporary Islamic knowledge and science, to develop a pragmatic philosophy, a philosophy that takes the ethical concerns of Islam into the laboratory.

From this empirical viewpoint, a field test was designed and conducted through an actual implementation of the *tawḥīdī* episteme. Under-

taken in collaboration with Cleveland State University's Department of Psychological Counseling, the *tawḥīdī* episteme was employed as a cognitive frame of reference and as an empirical tool to inculcate and ensure responsible socioethical and moral behavior among college students (Hussain and Yates 1992).

At the present time, the Islamic Research and Development Council is actively engaged in designing a curriculum of studies in Islamic science as a formal undergraduate- and graduate-level academic discipline.

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