

## SOME DEFINITIONAL TERMS UNDERLYING SOCIO-SCIENTIFIC THOUGHT

### Epistemology

Epistemology means the theory of knowledge. It is an area of critical philosophy that investigates what may be the sources of a body of knowledge being used for a scientific enquiry, how those sources are identified, how knowledge is derived and disseminated from the sources. In the age-long study of epistemology, different premises were assigned for defining knowledge bases, their interpretation and dissemination pertaining to different branches of formal disciplines.<sup>1</sup>

Hence, one finds that there was an epistemology of the sciences, an epistemology of sociology, an epistemology of religion, an epistemology of economics, and so on.<sup>2</sup> The pursuit of such a branch of study since time immemorial, points to mankind's incessant quest for his roots of knowledge acquisition. This is equivalent to the quest for fundamental truth. All knowledge acquisition is essentially a flight from error into higher degrees of certainty in our perception and understanding of the universe around us. Such a better understanding of the universe unfettered by political and cultural overtones, helps mankind to honestly and sincerely reach out for a discovery of truth and universality.

From its perspective on the rational roots of knowledge acquisition, epistemology can be functionally defined as the approach for deriving certain universal relationships using the theory of methods.<sup>3</sup> Epistemology as a study of methods applied to know the real *a priori* nature of things and their relationships with each other is thus broader in scope than the science of symbolic logic. While symbolic knowledge deals with the establishment of consistency among the relationships between rational concepts, epistemology goes further to establish not only such logical relationships but also to find the true *a priori* nature of the subject matter under study.

Since both logic and the quest for the fundamental structure of things are the goals of epistemological enquiry, therefore, there is a rationalistic foundation to it. Here of course arises the complex philosophical question as to what describes the concept of rationality. The idea of substantive rationalism has varied over long periods of time. This comprised the Greek age, the Islamic cosmologists, the scholastics of all ages of scholasticism, the mathematical school of Descartes, Spinoza, Leibniz, the philosophical enquiry by Kant, Hume and the classicists. The concept of rationality has now found its resting place in economic science.<sup>4</sup>

Since the rational elements and logical foundation are the ingredients of the epistemological approach, but because the epistemological enquiry goes further to study the *a priori* nature of things, therefore, it has a challenge for the reconstruction of socio-scientific thought in the modern age. Indeed, without a well-developed epistemology no new foundation of science can be laid.<sup>5</sup>

The idea of the epistemic is different from the epistemological. The epistemic refers to the specific characterization of an *a priori* problem as comprehended in the Kantian sense of metaphysical perception. The purely epistemic has, therefore, no link in the reverse relation leading to the understanding how the *a posteriori* world is formed in perception and mind. Thereby, a strict dichotomy is created between the *a priori* and the *a posteriori* when considering an event as a purely epistemic condition of thought and theory.

### **Evolutionary Epistemology**

Within the study of epistemology there are varied approaches to the philosophical perception on how knowledge is formed and how it evolves. A few of such different viewpoints can be mentioned here.<sup>6</sup>

Kant's *a priori* rationality-based epistemology conjures up perception of reality on the basis of a primordial mental construct.<sup>7</sup> When such a primordial concept is subsequently made to dissociate itself from the realm of the *a posteriori* in perception, it becomes clear that each subset of knowledge must be completely

defined by such a pluralistic view of reality. In Kant the *a priori* premise cannot be treated along with the *a posteriori* premise to establish a linkage between the two, a linkage that could generate a progressive interaction between the two perceptions of reality – of mind and matter. Hence, in such a milieu of knowledge acquisition it becomes impossible to realize an essential advance toward an evolutionary quest for the *a priori* from the *a posteriori* premise. Evolutionary epistemology is a perception of knowledge acquisition that evolves over stages of interaction between the perceptual view and the sensible view of the world. Through the essence of interaction between the primordially constructed world and the knowable world, is created a sequence of evolving scenarios of reality.<sup>8</sup> The premises of the normative and positive views of the world are subsequently bridged together as interactions between mind and matter, the *a priori* and the *a posteriori* proceed.

Popper's idea of scientific refutation is an example of evolutionary epistemology as it leads to a perpetual scope of evolution in scientific thought, with one paradigm supplanting another. In this way, the scientific knowledge is continuously subjected to criticism, external evaluation and growth.<sup>9</sup> Darwinism is another example of evolutionary epistemology where knowledge is shown to be an ordered and selective medium of acquisition in the biological world. Knowledge in the Darwinian theory of natural selection is seen essentially as a perpetuation of growth and reinforcement of well ordered and independently existing organisms.<sup>10</sup> Between the fully determinate patterns of knowledge persistence as presented by Darwin and the purely random form of selection as provided by Popper, are studies on evolutionary epistemologies called hierarchical selection models of knowledge acquisition.<sup>11</sup>

In each of these approaches, and thereby, in evolutionary epistemology as a whole, the idea of evolution, integration and selection suffers of some deep logical problems. In every case of evolutionary epistemology mentioned above there remains a sense of selectivity in the pattern of acquisition and continuity of knowledge. This segmentation of knowledge premises among groups springs from their different group-specific perceptions and their competition by power to grow

and to be sustained. An essential non-interactivity prevails between groups, i.e. inter-systems, although interaction is maximized within groups that are intra-systems.

Non-interactivity between groups contradicts the essence of evolutionary epistemology, which is not simply to explain the theory of knowledge acquisition within separate groups. Rather it also means both acquisition and sustainability of knowledge between groups through the medium of interaction and co-evolution.

Another deep problem of evolutionary epistemology as conceived hitherto is its neutrality, indeed its subservience, to random ways of acquiring knowledge, which may thereafter take up independent hierarchical forms. Such theories thereby form a perception of the world evolving in the midst of endless competition, independence and the chaos of hierarchies. Knowledge cannot be uniquely derived inter-systemically in such evolutionary but chaotic systems.

### **An Analytical Explanation of Non-Interactivity in Evolutionary Epistemology**

A brief technical exposition of this problems of chaos, order and absence of inter-systemic interaction in evolutionary epistemology can be formalized as follows:<sup>12</sup>

Let,  $A_1, A_2, A_3, \dots$  be proper subsets of a grand and uniquely unified knowledge base,  $T_1$ , such that the evolutionary concept implies,  $A_1 \subset A_2 \subset A_3 \dots \subset T_1$ . Likewise, let  $B_1, B_2, B_3, \dots$  denote another sequence of subsets belonging to the knowledge base,  $T_2$ .  $B_1 \subset B_2 \subset B_3 \dots \subset T_2$ . Let the Darwinian view of natural selection, the view of random selection, and the view of ordered selection in the process of advance of knowledge within groups, establish the sequences of A's and B's as two distinct sources of knowledge acquisition.

$$\text{Now, consider } \lim_{(n \rightarrow \infty)} [A_n \cap B_n] = T_1(Z_1) \cap T_2(Z_2),$$

where,  $Z_1$  and  $Z_2$  denote two premises of knowledge. If  $Z_1$  is different from  $Z_2$ , then,  $T_1(Z_1) \neq T_2(Z_2)$ , since perceptions based on the two knowledge bases are different.

Furthermore,  $A_n \cap B_n = (\cup A_i) \cap (\cup B_j)$ ,

i.e.  $A_n \cap B_n = \cup(A_i \cap B_j)$ ,  $i, j = 1, 2, \dots, n, \dots, \infty$ .

Hence,  $\lim(n \rightarrow \infty)[A_n \cap B_n] = \lim(n \rightarrow \infty)[\cup(A_i \cap B_j)]$   
 $= T_1(Z_1) \cap T_2(Z_2)$

$\Phi$ , if and only if,  $A_i \cap B_j = \Phi$ , for each,  $i, j = 1, 2, \dots, n$ . (1.1)

= or

{ not  $\Phi$ , if and only if,  $A_i \cap B_j \neq \Phi$  for some  $i, j = 1, 2, \dots, n$ . (1.2)

In the case of (1.1), we have complete independence of knowledge patterns for the two groups under selection. In the case of (1.2), there may be some independence in the two knowledge domains but such independence is not global.

It can be readily seen that independence if any, can only occur at the initial stages, not at the terminal stages of a process. The reason for this is that if independence between entities (A's and B's) occurs at the terminal stages then,

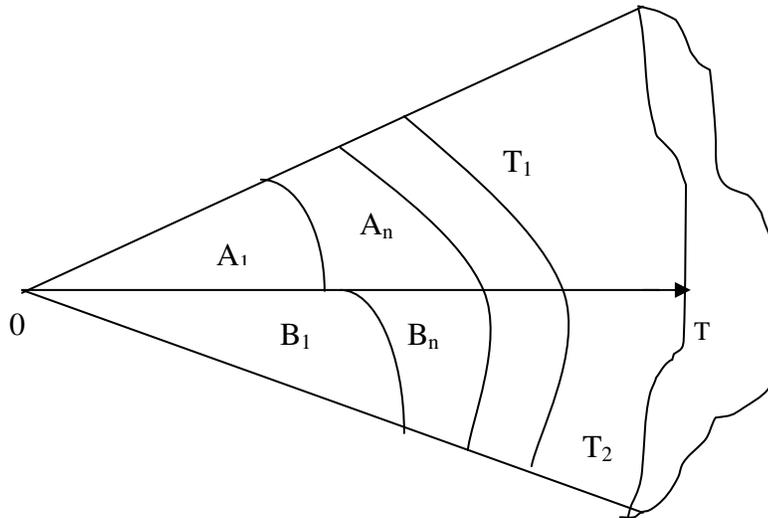
since,  $\lim(n \rightarrow \infty)A_n = T_1(Z_1)$ ;  $\lim(n \rightarrow \infty)B_n = T_2(Z_2)$ ,

therefore,  $T_1(Z_1) \cap T_2(Z_2) = \Phi$ . (1.3)

Hence, there is a contradiction.

In the case (1.2), there must be a correspondence between  $Z_1$  and  $Z_2$ , and hence, between  $T_1(Z_1)$  and  $T_2(Z_2)$ . Let the correspondence be denoted by,  $f: T_1(Z_1) \rightarrow T_2(Z_2)$ , such that,  $f(T_1(Z_1)) \subseteq T_2(Z_2)$ . If  $f(\cdot)$  is a continuous image on all of  $T_2(Z_2)$ , which must be the case in the case of pervasive interaction and co-evolution of knowledge premises between the two groups, then,  $|Z_1 - Z_2| < \epsilon$  (an arbitrarily small quantity). By this continuous and limiting condition on  $T_1$  and  $T_2$ ,  $T_1(Z_1) = T_2(Z_2)$ , for  $|Z_1 - Z_2| < \epsilon$ . Hence, the only limiting non-null condition for  $T_1(Z_1) \cap T_2(Z_2)$  is the unitary vector functional image.

The essential perspective of evolutionary epistemology with the broader condition of interaction between knowledge premises and their convergence is shown in Figure 1.1. It can be seen in this Figure that although initial independence may (but not necessarily so) exist between  $A_1$  and  $B_1$ , yet  $A_n, B_n$  becomes continuities of each other. Now, say with,  $A_n \subset B_n$  and so on, then  $T_1(Z_1)=T=T_2(Z_2)$ , as  $n \rightarrow \infty$ .



**Figure 1.1: Convergence of Knowledge Premises in Inter-Group Interactions in Evolutionary Epistemology**

### **Ontology**

The counterparts of the study of epistemology are ontology and phenomenology. Ontology as the study of existence of being, has been developed in western scientific doctrines as a philosophical means to investigate systemic relations from which the existence and description of phenomena are derived.<sup>13</sup> But in this approach the individualistic and partitioned approaches for studying a universal truth makes the study of ontology subjective in nature. For example, one mathematical premise

would differ from another mathematical premise on grounds of the divergent initial conditions of such two subsets of mathematical enquiry. The ontological relations would thereby generate different and competing worldviews, descriptions and inferences from such divergent initial conditions. Transitivity against intransitivity is an example of such divergent perceptions with opposite ontological consequences.

Let us consider the following intransitive problem of deductive methodology:<sup>14</sup> Let there be logical relations such as,  $p \supset q$ ,  $q \supset r$ . By transitivity relationship ( $\supset$ ),  $p \supset r$ . However, if there are elements,  $x \in p$ ,  $y \in q$ , then,  $p \supset q$ , if and only if  $\exists x, y$ , such that  $x \cap y \subset p$ . But if  $r$  is defined by  $x \cup y$ , then, it is not necessary that  $p \supset r$ , for it is not necessary that  $x \cap y$  contains  $x \cup y$ . Such an individualized perception of existence makes it impossible to attain the foundations of knowledge that is the limiting irreducible level of the truth statement that can be common to all mathematical systems and axioms.

## Ontic

The ontic or evidential is different from the term ontological. Ontic means the empirical evidence of a theory or perception as manifested in the sensate world of matter. In the words of Sherover,<sup>15</sup>

An ontic investigation, then, would be one concerning particular facts, actual specific occurrences, and empirical generalizations from them. An ontological investigation, on the other hand, as a Kantian transcendental investigation, would be directed toward the general, universal, and necessary grounds upon which, or limits within which, any ontic, or empirical, experience can occur. The transcendental or ontological is thus logically prior to, and renders possible, empirical or ontic objects or events.

## Phenomenology

Phenomenology is a research program that aims at integrating the *a priori* and the *a posteriori* elements underlying the comprehension of phenomenon. It is not

necessary for phenomenology to restrict its enquiry to only experimental questions. Its method is equally valid in studies that provide positivistic explanation of purely abstract matters of a scientific nature. An example is of the theory of numbers, which although being a field of abstract mathematics, provides great positivistic input in scientific enquiry. Phenomenology as a study of the mind in its process of defining existentialism suffers from the same type of rationalism with individualism at its core.

Consequently, neither the ontological nor the phenomenological methods of scientific enquiry make it possible to address the scientific research program of discovering the unique root of knowledge that unifies all disciplines of knowledge and perceptions of reality. The ontological and phenomenological approaches remain as methodologies premised on critical rationalism that pertains to segmented sub-systems. The methodologies do not transcend across systems. They are not methodologies that address pervasive interaction between scientific systems by a unique methodology.

### **A Critique of Other Epistemology**

The time of the Greeks, followed later by the Islamic civilization, and then succeeded by the age of enlightenment, moral philosophy, the age of economic and scientific discoveries in the wake of the industrial revolution in Europe until the present day, this was a great watershed of knowledge in all areas. Yet when one examines the central core of epistemological enquiry among the great philosophers of these ages in all branches of knowledge, such enquiries were based on two pivotal points.

On the one hand, the presence of a Creator governing the awe-inspiring universe has always been a universal belief. On the other hand, rationalism caused departures into the areas of perceived knowledge through sense perceptions and individuation. In this latter segmented perception of the knowledge premise no universal generalization was possible. Because of this rationalistic roots of

epistemological inquiry Greek thought influenced the Judeo-Christian scholars more than the Islamic scholars, although Muslim scholastics of rationalism also came into the grips of Hellenic epistemological enquiry.

Epistemological enquiry thus took up personalized and cultural premises that became the groundwork of thought among different rising and declining civilizations. This effect became all the more pronounced when epistemology indispensably took philosophical and religious roots that varied from one people to another. Along with these varying perceptions of the world-systems, inner meanings of existence, the explanation of reality, the foundations of abiding philosophical awakening among different people, the institutionalisation of such epistemological thought in the curricula and the socio-scientific world, came a partitioned view of reality. Pluralism instead of uniqueness by unity of knowledge took hold of the explanation of socio-scientific reality. The essential primacy of truth in socio-scientific study disappeared in the midst of this multiple and segmented view of reality. The essence of unity in our understanding of the grand structure of the universe and the deeper realms of thought processes that unify our investigative search for meaning in that universe was lost to the vagaries of such differentiated thought processes. The pluralistic approach to socio-scientific epistemology failed to establish the common and unifying search for universal truth that could harness all peoples over space and time. Such a force of unity of knowledge is the organic permanence of God and the Divine Laws in both the abstract and the evidential universe.

### **Toward Islamic Epistemology**

The quest for such a uniquely common and primal premise of knowledge for all peoples must lead the faculties away from cultural pluralism and replace it with a worldview. As a worldview, the Islamic knowledge premise must be based on the common plane that is uniquely received by all people. It must be appealing and amenable to reason and senses without a partitioned understanding of reality. The

Islamic epistemology as the worldview must be based on the simplicity of assumptions, understanding and explanation in the mind-matter universe, so that such a knowledge premise is accessible by and useful to everyone. Furthermore, the systems-unifying power of such a uniquely common root of knowledge must be equally meaningful to the explanation of both the animate as well as the inanimate worlds, that is abstraction and ontic evidence.

What can be that unique root of knowledge as the manifestation of truth in all things? The answer lies in nothing else but the incessant and unending quest for the ultimate irreducible limits of truth. This is the Unity of God in the scheme of things. That is to perceive God as the Creator, the Absolute Owner, Cherisher and Sustainer of all the universes from the beginning of time to its end. While the unity of knowledge derives from a functional understanding of this premise of the Divine Laws in action in the field of epistemology, besides, even meanings of duality, multiplicity and pluralism of episteme also derive from Allah (God) and return to Him by way of mathematical complementation of opposites, namely truth and falsehood. In His fold, the partitioned view of the otherwise single unified reality disappears. Such a unique knowledge premise is the Islamic epistemological centrepiece called in the Quran as *Tawhid*, Oneness of Allah. The Quran invokes *Tawhid* as the most evident and common truth that remains immanent across time and space.

The epistemological foundation of the socio-economic and socio-scientific order is thus cast in the quest for the *Tawhidi* root in all disciplines. This epistemology is also cast as an analytical investigation of the grand and masterful plan of creation as explained by the *Tawhidi* root of knowledge. From such an epistemological beginning of knowledge as the worldview for all of mankind unlimited by time and space, the Islamic epistemology takes up its flight.

Only when such a unique and rationally abiding, explained and accepted view of the essential reality is fathomed in the mind-matter complementarities, can there arise the foundation of the revolutionary *Tawhid*-centred socio-scientific worldview. The *Tawhidi* epistemology extends and deepens in all fields of acquired

thought and disciplines. It unifies these various technical disciplines by a common methodology that establishes codes of morality, ethics and the attenuating axioms of the worldview. Islamic epistemology premised on the *Tawhidi* Precept as the essential reality and truth is indeed required for the comprehension of all knowledge processes of the civilization and institutions that spring from such a worldview. In this worldview it is impossible to think of anything that is not of an essentially *Tawhidi* nature in the sense of this unique epistemology. But this assertion must mean that the *Tawhidi* precept must be understood and applied in its broadest possible ways.

Yet in all these, the *Tawhidi* precept of unity of knowledge though simple in meaning, perception and comprehension, is not simple in its detailed analytical entirety. Thus, all human reason centred around the quest for the *Tawhidi* roots of knowledge must at best be a gradual evolution from lesser to higher degrees of certainty in the understanding and application of the *Tawhidi* premise of knowledge. This is the nature of evolutionary epistemology that the *Tawhidi* precept conveys. The universe defined in its broadest and abstract sense is essentially evolving for all times in the midst of a grandly Divine purpose, equilibrium and harmony. Individuals and societies may or may not consciously recognize the *Tawhidi* process at work in this evolutionary knowledge-centred universe. Yet the *Tawhidi* process manifests itself in reality. The conscious grasp of that moment of its unravelling and its conversion into thought is the realization of the *Tawhidi* epistemology in action.

Such an unfailing and masterful realization of the Divine revelation of the *Qur'an* carrying the message of *Tawhid*, was given by God on His chosen messengers from the time of Prophet Adam up to the time of the Prophet Muhammad, when finally Divine revelation was completed in the form of the *Qur'an*. This is the article of Islamic faith. The great prophets were thus great teachers of mankind on the *Tawhidi* epistemology. Islam thus becomes a worldview in the light of the *Tawhidi* epistemology by virtue of its irreducible, unique and common truth as the centrepiece of all the universes -- the animate and the inanimate worlds, that is the abstract and the manifest. All phenomena are explained around

this unique epistemological foundation in terms of the prophetic revelations. The realm of reason revolves around the prophetic revelations and attains bliss when first excited by the latter. This blending of reason with revelation is achieved not through imposition or coercion, but through the natural call of clarity and actualisation.