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The Relationship between Language, Epistemology and Science: How to Preserve our Scientific Language?*

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Abstract
Human behaviour has a direct correlation with its mental stimulator(s). Every mental construct is a network of concepts which are in turn linguistic entities. Therefore, there is a necessary correlation between human conduct and human language. The intensity of this correlation may vary from lesser degrees in actions that are not knowledge-bound and thus result more from our biological nature to greater degrees in actions that depend on mental planning or conception. This article examines one human action that is directly bound with knowledge: scientific activities. It concentrates on two major issues: 1. the nature of language; 2. the nature of science and scientific activities.

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Once the two are clarified, the correlation between sciences and language becomes transparent. The conclusion concentrates on the idea that science depend on concepts that are developed in human language and then turned into technical terms in scientific inquiry. This means the less a language is developed, the less it will support a scientific inquiry. Vice versa, the less progressive the scientific inquiry, the less developed the language. Thus, to preserve their languages, Muslims need to pay more attention to science without putting emphasis as to which is more important than the other. Similarly, to progress scientifically, they need to develop their languages further.

Keywords
Theory of language, scientific language, scientific tradition, Islamic scientific terminology.

Introduction

A scientific tradition reflects the characteristics of the civilisation in which it emerged; characteristics which carry the colour of the worldview dominant within that civilisation. Scientists are trained in the scientific mores and technical terms of this tradition. We should not be deceived by the global scientific activities today and try to judge past scientific traditions. In the past, every scientific tradition developed its own concepts and technical terms. Of course, by way of influence, they borrowed concepts from each other as well. But primarily, the nomenclature of each scientific tradition characteristically belongs only to that tradition and thus also reflects the characteristics of the worldview dominant within its civilisation. Additionally, similar terms can still exist. This is because of the human knowledge system which has universal characteristics and also the subject of scientific study which may also be the same in certain cases, especially if the case of study is the cosmos. In such a case, epistemology determines

scientific activities from two sides: 1. The human knowledge system, which characterises the knower as subject; 2. The object which characterises the subject of study as subject matter. Since both of the two correspond to each other, thus they are to be held as "universal." Hence, the many similarities between scientific traditions. In other words, it is because of the universal character of the knower and the known that similarities exist. As such, how are the differences among scientific traditions to be accounted for?

Indeed, the human epistemology is based on the knowledge system which functions like other systems in the human body, such as the digestive and nervous systems. The former is universal and the food utilised are, like objects of knowledge, universal too. But foods utilised in nutrition, namely, the culinary cultures, are not universal, which means that universality of the subject and object does not lead to the universality of the outcome. Hence, there will be different scientific traditions which are characterised by especially their language which is the instrument of scientific concepts and nomenclature. In this article, the concern is the terminology of Islamic scientific tradition and how we can preserve such a terminology in today's global scientific tradition dominated by the Western civilisation.

Everyday language is the source of all technical vocabularies which are used in all sciences. However, this does not mean that the language of sciences is everyday language because everyday language becomes scientific after undergoing a certain process in scientific traditions. Through such a process, the everyday meaning of a word may change and acquire a scientific meaning. That is why a lay person will have a hard time understanding a scientific statement. In emphasis, a feature of language in such a process dominates our thoughts to a certain extent in scientific thinking; even in certain cases, it may determine significantly our thought. This makes language paramount to scientific inquiry. To illustrate this point, some features of the human language need to be discussed. In fact, the epistemology of language is needed to

explain how a term comes to signify something in reality. A brief attempt will ensue to outline the epistemology and show how and why language is important in scientific thought and inquiries. This endeavour will also lead to a theory of language.

Just as there is a system in which the human stomach works, in the analogy between digestive system and knowledge system, there is in the same way a system in which the human mind operates. The system in which the human stomach works is our system of digestion and the system in which human mind operates is the system of knowledge. One part of such a system is the operations of the human mind to form a system of communication called "language". Therefore, human language is perceived as a part of the system of knowledge. Hence, this leads to the conclusion, at the same time, that language has a particular epistemology which makes it possible. This is the foundation of a theory of language which consists mainly of the explanation of the origin of language and its nature within the knowledge system. Thus far, the introductory remarks have established a relation between language and the knowledge system as well which will be explained further. Indeed, the conventional theories of language both in Islamic civilisation and Western civilisation concentrate on how language appears within societies. This approach is clearly visible in the classification of languages by linguists. However, this article is not aimed at such an approach which will be made clear in the discussions that ensue.

If we examine in the same way the nature of scientific inquiry, we shall see that all scientific activity is a search for knowledge with a certain method. In fact, "science is primarily the organised body of knowledge named through scientific consciousness and thus consisting in a well-defined subject matter, a certain method and an accumulation of theories some of which are proved and thus turned into (scientific) knowledge." It is the naming of that organised body of knowledge that gives it a unity as a discipline and as such enables us to perceive it as an independent area of study which we call "science". This naming alone is sufficient by

itself to show the relation between science and language. For, the process of scientific inquiry takes place through a naming process which is only one way in which our mind operates. It is then the aim of the article to show this claim and try to offer a solution about the problem of preserving language. The discussion is divided into three sections: The first shall discuss the theory of language based on human knowledge system which is indeed its foundation; next, to identify the relationship between science and language; and finally to offer solutions to preserve scientific language.

A Theory Of Language

Despite the title of this article which alludes to developing a theory of language, the aim is mainly to show the epistemological origin of language. The purpose concerning a theory of language will be explained in a different manner: A language comes to emerge first internally, then externally. This means that language as practised in a society is the external manifestation of what is going on within the knowledge system. Therefore, the roots of all human languages are exactly the same, but its outward emanation as sound manifest in an abundant difference. This article is not concerned with the outward emanation as a theory of language. Rather, it concentrates on the internal basis to show the correlation between the sciences and language; then an elaboration on the relationship between language, epistemology and science to show how scientific language can be preserved. Hence, a brief discussion on some significant theories concerning the external origin of language follows.

External Theories of Language

According to Ibn Jinnī (d. 1002) "language consists of sounds through which every community expresses their intentions."[1]

1. Abu'l-Fath Uthmān Ibn Jinnī, *Al-Khasā'is*, ed. Muḥammad 'Alī al-Najjār, 3 vols. (Cairo: n.pub., 1952–6), 1: 15.

Ibn Jinnī is one of the first philosophers of language in Islām to discuss language theories. However, the first thinker who came up with such a theory is ʿAbbād ibn Sulayman (d. 864) who developed a naturalistic account of language. According to his theory, language has its origin in the "natural affinity *(munāsabah ṭabīʿiyyah)* between expressions (*alfāẓ*) and the things they signify."[2] However, Abū Hāshim al-Jubbāʾī (d. 933) opposed ibn Sulayman's theory and instead developed the conventionalist theory of language. According to Abū Hāshim's theory, language is a social agreement to assign the same sound for something particular. Since there is no set rule in the absolute sense for this, the sound is assigned by convention *(biʾl-iṣṭilāḥ)*.[3] Al-Rāzī gives the details of Abū Hāshim's argument against the naturalistic theory and against the revelationist theory which was then developed by al-Ashʿarī (d. 935-6). But he does not give Abū Hāshim's argument for defending his theory. The third grand theory then belongs to Abū ʿAli al-Jubbāʾī (d. 915-6), Abuʾl-Qāsim al-Kaʿbī (d. 931) and al-Ashʿarī which can be named "revelationist theory."[4] According to this theory, language is granted *(tawqīfī)* by God as attested by the verse, "He taught Adam all the names."[5] Abū Hāshim levels a dialectical argument to refute this theory. It is a detailed argument and it is based on interpreting the word "*al-asmāʾ*, the names.[6] Mustafa Shah states that,

> …reports attributed to this figure and others on the subject of *tawqīf* and *iṣṭilāḥ* is preserved in

2. Bernard G. Weiss, "Medieval Muslim Discussions of the Origin of Language," *Zeitschrift der Deutschen Morgenländischen Gesellschaft*, 124 (1974): 34.
3. Fakhr al-Dīn al-Rāzi, *Al-Tafsīr al-Fakhr al-Rāzī al-Mushtahir bi-Tafsīr al-Kabīr wa Mafātih al-Ghayb*, 32 vols. (Beyrut: Dār al-Fikr. 1981), 2: 191.
4. Al-Rāzī calls this "*tawfīqī*". See ibid.
5. *Al-Baqarah*, (2): 31.
6. Al-Rāzī summarised this complicated argument in his commentary on the verse *al-Baqarah* (2): 31. Both revelationist and conventional theories are discussed by Mustafa Shah in his article, "Classical Islamic Discourse on the Origins of Language: Cultural Memory and the Defense of Orthodoxy," *Numen* 58 (2011) 314–343.

> theological, philological, exegetical, and legal literature, particularly those texts devoted to the principles of jurisprudence in which scholars pored over the epistemological preliminaries of language as a prelude to defining the theoretical bases of law.[7]

This is indeed interesting that most theories of language in Islamic civilisation are discussed in *uṣūl al-fiqh* literature. In Islamic civilisation, there are primarily three theories of language: Naturalist, conventionalist *(iṣṭilāḥ)* and revelationist (*tawqīfī*). Some other scholars tried to offer theories by utilising more than one of these theories which may be called composite theories. However, as can be seen, all of these theories are concerned with explaining how words are formed in a language and then how they are combined for meaningful semantic units used for communication in social life. Most theories of language in Western civilisation also offer in the same direction. George Yule summarises all of these theories very well and classifies them. The first theory is based on the Darwinian theory of evolution:

> In Charles Darwin's vision of the origins of language, early humans had already developed musical ability prior to language and were using it "to charm each other." This may not match the typical image that most of us have of our early ancestors as rather rough characters wearing animal skins and not very charming, but it is an interesting speculation about how language may have originated. It remains, however, a speculation. We simply don't know how language originated. We do know that the ability to produce sound and simple vocal patterning (a hum versus a grunt, for example) appears to be in an ancient part of the brain that we share with all vertebrates, including fish, frogs, birds and other mammals. But that isn't human language. We

7. Ibid., 319–20.

> suspect that some type of spoken language must have developed between 100,000 and 50,000 years ago, well before written language (about 5,000 years ago). Yet, among the traces of earlier periods of life on earth, we never find any direct evidence or artefacts relating to the speech of our distant ancestors that might tell us how language was back in the early stages.[8]

The second theory is also based on the Bible as the revelationist theory, that is, the same as explained in Islamic civilisation. Yule reports an experiment by a Pharaoh of Egypt as told by Herodotus:

> The Greek writer Herodotus reported the story of an Egyptian pharaoh named Psammetichus (or Psamtik) who tried the experiment with two newborn babies more than 2,500 years ago. After two years of isolation except for the company of goats and a mute shepherd, the children were reported to have spontaneously uttered, not an Egyptian word, but something that was identified as the Phrygian word bekos, meaning "bread." The pharaoh concluded that Phrygian, an older language spoken in part of what is modern Turkey, must be the original language. That seems very unlikely.[9]

The same story is also reported about King James the Fourth of Scotland. But this time, it is said that the children spoke Hebrew. These can be called "fictitious theories of language." Even though there may be more of such theories, none is of concern for the present discussion. Thus, leaving out the fictitious theories, the naturalist theory of language will be considered as the third theory developed in the West too which

8. George Yule, *The Study of Language*, 4th. ed. (Cambridge: Cambridge University Press, 2010), 1. The evolutionary theory is discussed in detail by William Foley, *Anthropological Linguistics* (New York: Blackwell, 1997), 41–78.
9. Ibid, 2.

is similar to the one developed in Islamic civilisation. In fact, many of its claims had been already put forward by earlier Muslim thinkers. The theory claims that humans imitated natural signs at the beginning to express certain meaning and then they articulated the sounds to form them into well-developed logical language.

The human biological structure is also suitable in developing language, such as teeth, lips, mouth, larynx and pharynx. The human biology should be assumed as suitable for developing language. Yet the claim based on biology acquired from birth that language is an innate ability cannot be made. For, if it were so, then we would be able to speak a language without any humans around us. Also, the fact that every human learns the language spoken in the environment in which he/she is born shows that language is not developed innately.

These theories more or less are expressed in a variety of forms until the 19th century. Thus, works of analytic philosophy for theories of language in the West should be looked into. Among those that stand out are by two German philosophers: Friedrich Ludwig Gottlob Frege (1848–1925) and Ludwig Wittgenstein (1889–1952), as well as others such as Russell, Searl and many other analytical philosophers. However, a careful examination of their theories of language show that they are not concerned with the origin of language. Rather, they mainly concentrate on meaning and other related problems.[10] Based on these discussions all the way from ancient times until the modern day, the three Islamic theories of language seem to be also proposed as attested in the following study by W. S. Allen:

10. Discussions concerning language on this issue are maintained in the West primarily in the area of philosophy of language. See, for example Bob Hale, Crispin Wright and Alexander Miller, ed., *A Companion to the Philosophy of Languag*e, 2 vols. (Oxford: John Wiley & Sons Ltd., 2017); Otto Jespersen, *Language: Its Nature, Development and Origin* (London: George Allen & Unwin Ltd., 1954); W. S. Allen, "Ancient Ideas on the Origin and Development of Language," *Transactions of the Philological Society* 47 (1948): 35–60.

> Ancient speculations on the subject show the existence of two main schools of thought, supporting the respective theories of a "natural" and of a "conventional" origin: one school, that is to say, considers that in giving names to things primitive, man was automatically inspired by some innate quality or psychological effect of the thing itself, whilst the other school maintains that names were evolved on a more or less fortuitous basis, and so have only an arbitrary, symbolical connection with their objects. The Greek terms for the two theories are *phusei* "by nature", and *thesei* "by convention", translated into Latin by *natura* and *positu*: a parallel distinction is also found in Sanskrit, where the terms most frequently employed are *nityatvât* "by permanence" (i.e. "by inherent connection") and *sâmayikât* "by convention."[11]

Moreover, he states that the ancient theory of revelationist claim also existed: "The theory of a divine origin represents a more primitive level of thought than the others, since it calls for no intellectual speculation and simply treats language as one of the many gifts of a beneficent creator; we may therefore conveniently dispose of this theory first."[12] The most interesting expression of the conventionalist theory is defended by Aristotle who stresses the symbolic nature of language. He claims that "rational discourse is a cause of instruction in virtue of its being audible, which it is, not on its own right, but incidentally (namely by convention); since it is composed of words, and each word is a symbol, but by convention; for speech consists of words, and every word is a symbol".[13] Moreover, in the *De Interpretatione*, Aristotle claims that the symbolical nature of words is similar to that

11. Allen, "Ancient Ideas," 36.
12. Ibid, 37.
13. Aristotle. *The Complete Works of Aristotle*, ed. Jonathan Barnse, "*Sense and Sensibilia*" I, 437 a 10–15 (Princeton, New Jersey: Princeton University Press, 1984), I: 694; explanation in parenthesis is my interpretation added to the translation.

of the letters. He then makes a significant indication to the epistemological origin of language saying that "spoken sounds are symbols of affections in the soul, and written marks are symbols of spoken sounds."[14] It seems that Aristotle defends the conventional theory by arguing that "every sentence is significant, not as a tool but, as we said, by convention."[15] Next, Allen gives some other theories of language which are based on social acceptance and evolutionary development of speech:

> Some later writers lay stress on the social and evolutionary nature of linguistic origins. Diodorus Siculus draws an imaginative picture of primitive man seeking the companionship of his fellows in a common fear of wild beasts; the planning of their protection demands some form of symbolism, and their first confused mutterings evolve gradually into articulate speech. In a similar account of primitive civilization, Manilius suggests that language arose by a process of trial and error.[16]

Apparently, in the West and ancient times as well, similar theories are advanced concerning the origin of language. In modern times, one more thinker, Rousseau, devoted a complete work on the topic and also defended the conventionalist theory in his well-known essay.[17] Thus far, a summary of theories of language offered by many previous thinkers is furnished. As seen, all of them offer a theory which tries to explain how a word is assigned for something or to something to turn it into a speech for communication. But none explains the process before this assignment whatever it may be, natural, conventional, social or revelational. Other than Aristotle's

14. Aristotle, *The Complete Works*, see "*De Interpretatione*" I, 16 a 1–15. I will give the page numbers for this edition as I: 25.
15. Aristotle, *The Complete Works*, *De Interpretatione* IV, 17 a 1; 1: 26.
16. Allen, "Ancient Ideas," 42.
17. Jean Jacques Rousseau, *Essay on the Origin of Languages and Writings Related to Music*, translated and edited by John T. Scott (Hanover and London: The University Press of New England, 1998).

scanty hint to the epistemological foundation of language, no significant discussion emerges such as the following.

Epistemological Origin of Language

As indicated above, the purpose of this section is to inquire into the nature of human faculties and to find out the internal origin of language. Such an inquiry is necessary to understand at the same time how humans are conceptually affected by language. Therefore, this inquiry shall start from investigating into the human nature. Human nature has been defined as "rational animal" since the ancient times.[18] This rationality includes also meaningful speech, which means communication with articulate sound based on human logic commonly known as "language". Such an approach brings out three characteristics of human language: rationality, articulate sound and logic. All of the characteristics are combined in the structure of every human language with varying proportions. The characteristics are given to the human language within the process through which impressions of objects or entities received in the mind are converted into symbols. In fact, all mental operations are carried out through symbols. When something, whether concrete or abstract, is perceived by the mind, it is converted into a mental entity or item which is the mental symbol. The mind is able to convert everything that it perceives into its own nature which we call "mental entity" (*maʿnā*). If the mental perception cannot be converted into a mental item or entity, it cannot be processed by the knowledge system. Certain things have the characteristics of being turned into mental items. Just as there are certain things which can never be perceived, there

18. The earliest definition in this case is provided by Aristotle who discussed the problem of how to define man in his work, *Topics*, Book VI, Ch. 3 & 4. See *The Complete Works of Aristotle*, I: 240. But his complete discussion of human nature is in his psychology, see *On the Soul*, I: 641 ff. For a critical discussion of this, see Ernest Sosa and David Galloway, "Man Rational Animal?," *Synthesis* 122, no. 1–2 (2000): 165–178.

are also certain things that the mind is unable to convert into mental items. The former is utterly unknown, hence it cannot even be talked about, while the latter is the utterly subjective experiences which are able to be developed but not converted into mental items. Such impressions are not communicable, and hence, no human language is available concerning them. In other words, since the mind is unable to convert them into mental entities, concepts are also unable to be assigned that can express experiences as words with sounds in language. As such, they are characterised as non-communicable. Next, a discussion follows on which level language originates.

When something is perceived by the mind, immediately an impression of it is formed. This impression is variously termed either as "(mental) representation" because it represents the thing in the mind; or as "mental impression" since it is impressed upon the mind by the thing; or "mental entity or item" since it is converted into something mental. If the impressions received through the faculty of experience whether they are the five senses, emotions or the conscience, they cannot be mentally perceived if they are not converted into a mental item (entity). The mind receives all the data of experience through one of its faculties called "mental consciousness," which is the faculty that converts impressions of things into mental entities, which are thus retained in the memory. The mind has another faculty called "imagination" which creates images, namely mental copies of the entities. Images are symbols of mental entities, and in turn, are the picturesque symbols of the concrete objects perceived. The faculty of the mind which assigns notions, ideas or concepts corresponding to the images is called "intellect." The intellect is then able to think mental entities even though it needs the faculty of will to produce a judgment. Indeed, for all these processes, language "*with articulate sound*" is not necessary because concepts alone are sufficient to provide a base for thinking, judging and inferring. If we were able to communicate only through our minds, we would be able to communicate

with silent language. Indeed, the silent language is universal and if it can be used, every human being can communicate with one another. Only some humans would have richer silent symbols in their minds than those of other cultures because they may not have developed as many silent mental symbols. Definitely, they would be able to learn them fast enough through mental communication. However, languages with sounds as verbal symbols of silent mental symbols are necessary to communicate and pass all the processes to other fellow human beings. Hence, language is specifically for human communication in this material world. Importantly, where the human language is connected in our mind, then it can be seen how it is established on human thinking which carries the marks of rationality and human logic. The articulate sound is needed only for verbal communication. But to produce the sound, further process in the mind is needed. If the process is understood, then its internal origin can be deciphered.

In the process of acquiring knowledge as we have seen, when the impression of an object or an entity is received, it is converted into a mental entity by the mental consciousness. The conversion creates an *entity* or an *item* in the mind as a Vague Symbol for the object or entity perceived, which is ready to receive the "*first symbol*." The *entity* is only a vague mental item that is devoid of shape and form, hence, identified as the "vague symbol." It is only a mere mental conversion called the first conversion which is the impression received from our faculty of experience. The mind needs the conversion to put the object or entity perceived into the process of mental operations. The first operation it may receive after the first conversion achieved by the mental consciousness is dressing it with its proper form and shape which converts it into an image. It is this image that is identified as the "first symbol" because it is in the true sense a symbol of the object represented in the mind. However, in the true sense, the first symbol is the mental entity which is identified as "vague symbol." But since it is not ready yet to be an item of mental operations, it would simply

be called "vague symbol." The faculty that provides the dress of shape and form for the vague symbols is "imagination," and thereby converts them into images. The result of the conversion is called "first symbol" because the object or the entity is represented more vividly at this level in the mind for the first time. The mental preservation is carried out by the memory at all levels, where the first mental conversion of impressions is into mental entities, then into a symbol by the imagination and the operations thereafter. The memory can preserve all these operations so that those that become mental contents are available for further mental operations.[19]

Such a deduction leads to a new theory which, as far as this author is concerned, has not been used in any epistemology. The memory registers and preserves all the results of our mental operations. In other words, it is the archive of human knowledge system. But the memory registers all operations and their results, such as mental entities, images, concepts, ideas, doctrines and so on, in an orderly manner forming thus an architectonic coherent whole, which is called "worldview." This unity is preserved in the mind through memory, but as each mental entity emerges, it is placed in its logical place, and then, its logical relations are established in the mind. Through these logical relations, conceptual unities are formed; each unity is thus making up a web of concepts and even ideas and doctrines depending on their development. These logical relations are shown with thin lines connecting each concept and idea (Table 1). With its epistemological significance, the next section will elaborate further the process of the emergence of worldview in the mind (see also Table 3).

19. It is clear that this discussion presupposes a theory of knowledge. This author had tried to give an outline of this theory in the first chapter of his book *Scientific Thought and its Burdens* (Istanbul: Fatih University Press, 2000), 19–59.

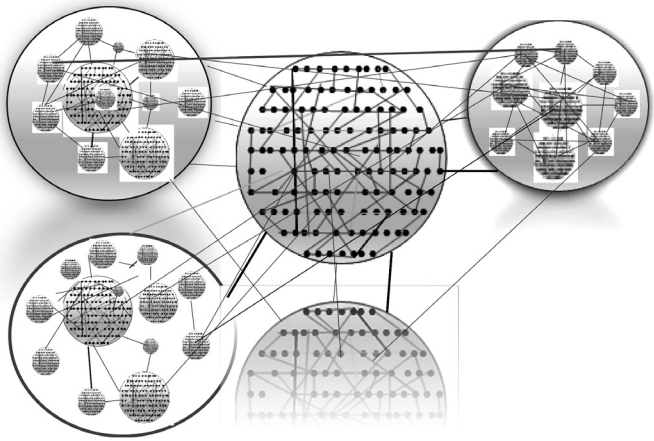

Table 1. The formation of a mental architectonic unity as worldview in the mind[20]

The next operation is at the level where the intellect begins to interfere. At this level, with the help of the imagination, the image is converted into a "concept," which is called the "second symbol." This operation of the mind is identified as the "second conversion." Just as the first symbol is a sign of the mental entity which in turn is a sign of the object or the entity received into the mind, the second symbol is also a sign for the first. All of these signs refer primarily to the object or the entity perceived by the mind. They are signs referred secondarily

20. Each dot represents a concept which is connected to its prior most logically related concept in primary manner, then to others in accordance with the intensity of logical relation. So, in these logical connections, concepts that are related primarily form a cluster, which reflects an idea or a doctrine in the mind of the person. The clusters are also connected with each other to form higher clusters of concepts in such a way that they may form a mental structure. The totality of these structures makes up our worldview through which we view existence, i.e., the world, our world. This will be referred in the treatment of how language monitors attitude.

to their previous levels. For instance, the second symbol refers primarily to its object or entity perceived by the mind, and it refers secondarily to the first symbol and then only to the mental entity, i.e., the first (mental) conversion which is an operation of the knowledge system. This operation is called "conversion" as the object or the entity perceived is converted into something *mental*. Our mental consciousness converts the first impressions of the object or the entity into a mental entity, and thus making it the first conversion. Then, the imagination converts the mental entity into the first symbol which is a (mental) image, and hence, the second (mental) conversion. Then, imagination at the level of intellect converts the image into a concept called the second symbol which is then the third (mental) conversion. Through these conversions, the intellect is able to think of the object or the entity perceived by the mind through concepts. The genesis of language begins at this level. But the process of conversions have been described into the conceptual reality for concrete objects. Indeed, such a process is different for abstract entities and concepts such as existence, unity, justice and goodness. Such terms have to be classified in a manner Hume had done.[21]

Concepts are the basis of human language. To turn concepts into language, namely linguistic items, they need to be assigned another symbol called the "third symbol." In a language, the third symbols are called "words." A word is, therefore, a sound representing a concept as a symbol. The generation of a sound referring to a concept, namely a mental symbol of an object or an entity, is a very complex phenomenon. Until the level of the third symbol, the process is totally epistemological. This epistemology is the mental and thus, the rational basis of the human language. However, the process in which attempts were made to decipher in this

21. As the present discussion concerns the process of the emergence of language, thus, further elaboration on the classification of terms is best left for another article.

context on epistemological grounds is only the process of how words emerge. On the other hand, as language is known to not consist of only words; there are sentences formed by words with the aid of connectives and other parts of speech. Moreover, the passage from the second symbol to the third is not only an epistemological process, but also, an everyday experience, and hence, requires an empirical analysis as well. As the empirical analysis is not the purpose of the present article, therefore, after language is formed, it will continue to be shown to be related to the human activities, perhaps, and above all, to the scientific activities

After the level of the second symbol, we are able to use our ability to form articulate sounds to represent a concept by our voice. The voice is the third symbol called *word*. By logical combinations of words, we are able to generate language. But this process is what is called above "external theory of language" whose process is of no relation to the present scope. The process is already clarified through the summary of such theories in Greek, Islamic and Western civilisations as presented in the previous section. A fourth symbol for words is called "writing." The invention of writing is also similar to the invention of language. Yet, this level of symbolisation is of no concern in this article. How concepts lead to words and words into a language which may be sufficient for this purpose in this context may be briefly pointed out. A concept calls in the mind for its object or entity. This call is gradually combined with its impressions which may be physical sounds or actions. It is much easier to form first the physical aspects of things whose impressions are received in the mind. From the physical impressions, the sounds are able to be formed to refer to them and these sounds are words which are linked in the mind to their concepts. Sounds certainly are not generated without a link to their corresponding concepts. This means that we first form the concepts of concrete objects and only then, gradually we form the concepts of abstract entities. In a similar way, we first form the articulate sounds of the concepts of concrete

objects. It is perhaps through this way that human language emerged gradually. This process as an explanation of the external origin of languages in human history through which human language came into existence is an empirical research as pointed out. The historical process is obviously based on the epistemological process outlined very briefly in this section. It is also this epistemological process that determines the correlation between science and language (Table 2). Hence, that correlation in this epistemology will belooked for.

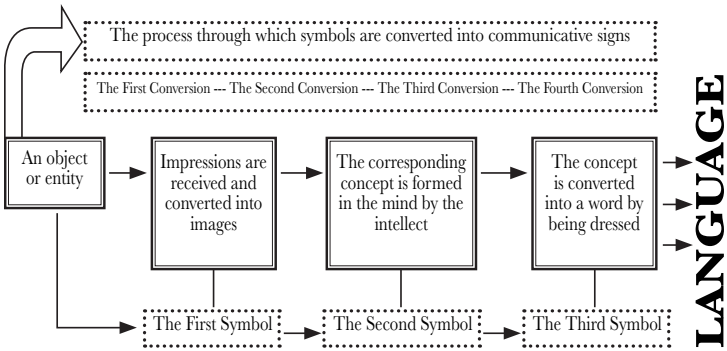

Table 2. Theory of language

The Correlation between Science and Language

There is a direct correlation between human behaviour and its mental stimulators. Every mental construct is a network of concepts which are in turn linguistic entities. Therefore, there is a necessary correlation between human conduct and human language. Schreyer expresses this very well in the following way:

> This sketch does no justice to any particular theory or author, but it shows, nevertheless, the intricate connection postulated between man's natural

> endowments and his artificial accomplishments, the most important of which is language. Without language, the progress of thought, knowledge and the whole of civilisation was unthinkable.[22]

The intensity of such a correlation varies depending on the nature of the activity. Clearly, since scientific activity is an epistemological process, namely activity of acquiring knowledge, then as seen, at the basis of language is also an epistemological process, and as such, the intensity of the correlation between science and language will be very high. This intensity needs to be identified on the basis of the epistemology of science.

That mental framework out of which *naturally* and/or *actively* follows a human activity can be identified as the "epistemic ground" of that activity. Knowledge proceeds from a mental framework *naturally*, if it arises purely out of the capacities of the faculties. Therefore, if an activity follows only naturally from the epistemic ground, then it depends totally on the general process of knowledge. But since we acquire knowledge as active agents, that means we also contribute to the process of knowledge. Hence, knowledge proceeds, from the accumulated mental content which is acquired through both education and using the natural capacities of the mind. Such kind of knowledge acquisition process is called "active." If knowledge is acquired only through the natural capacities of the mind, then knowledge is acquired *passively*, namely *naturally*. In this case, our interference in the knowledge process is minimal. The knowledge process takes place in the system called "knowledge system" through which all knowledge is

22. Rüdiger Schreyer, "The Origin of Language: A Scientific Approach to the Study of Man," *Topoi* 4, no. 2 (1985): 182. For a detailed discussion of this issue, namely the language and behaviour correlation, see Steven Pinker and Ray Jackendoff, "The Faculty of Language: What's Special about it?," *Cognition* 95 (2005): 201–236. A more detailed study may be found in Steven Pinker, *Language, Cognition, and Human Nature* (Oxford: Oxford University Press, 2013).

acquired. Such an acquisition is called "knowledge process." This system may be likened to other operative systems such as the digestive system and respiratory system. The complete system of knowledge needs to be analysed to fully explain how it works; in other words, its analysis is also the analysis of the complete knowledge process. Rather than attempting a full analysis now, relevant aspects will be shown as to how the scientific activities are correlated to language.

All knowledge is processed through the system of knowledge-faculties and thus, every kind of knowledge can somehow be related to the other. Thus, to conclude, there is a general framework through which all knowledge proceeds; a framework that provides an epistemic ground for faculties of knowledge to operate. In fact, not only mental operations follow from this general framework, but also daily activities, and indeed all of man's behaviour. Since this general framework is an epistemic ground, it is possible for certain human activities to emerge not directly but indirectly from the general framework. But even in such a situation, the mind immediately forms another mental framework as an extension of the general ground. This secondary and somewhat more concrete framework can be termed the "inner framework." If the human activity is a highly cognitive activity, such as scientific activities, it will require another more specific mental framework. Therefore, it can be claimed that every scientific activity emerges out of three frameworks: a general, an inner and a specific framework. To avoid confusion, a brief explanation on what exactly a framework is has to be given. This is in fact the epistemology of science which is the application of the above pure epistemology to scientific activities. The epistemology needs to be utilised to show the correlation between science and language. Studies on the vital relation between cognitive semantics and scientific knowledge are available. In fact, Kertesz points out that recent studies try "…to extend the scope of the cognitive theory of metaphor to scientific, philosophical and mathematical concept

formation."[23] This shows the dynamic correlation between science and language. The discussion of frameworks within mental conceptions ensues.

A framework is an epistemic ground through which things are viewed; as such it is a mentality on which conceptions are based. Many concepts which are utilised here to explain the epistemological function of worldviews carry the same meaning but emphasise different aspects of identical meanings. The concepts are epistemic ground, framework and mentality. Thus, it is claimed that as soon as a human being begins to form any mental conception of a natural experience, which he has had from babyhood onwards, he will begin to act no longer out of his natural instincts alone, but also out of the mental content that he has acquired. This mental content forms a unity of concepts which can be called "life structure." As pointed out, clusters of concepts form structures within our minds. Life structure is the first cluster of concepts which are formed in the mind after birth. The more sophisticated the life structure is, the more conceptual the experience becomes. Thus, the more we act out of our mental frameworks. In such a conceptual life structure, we may be able to distinguish certain elements, which are called "mentality." A mentality is actually an understanding or conception of certain things, living types, facts of life and the world. As humans grow, these mentalities are developed according to our personality, mental abilities and the kind of education we receive. Each mentality is like a structure, and thus, can be termed "sub-structure." The mentalities are so coherently related to each other that together they form the totality of the life structure. Then, our lives are arranged according to our life structures, which are the totality of the contents of our mind. Since, as a total unity, the mind reflects all of our ideas, its contents as the Life Structure will

23. Andras Kertesz, *Cognitive Semantics and Scientific Knowledge: Case Studies in the Cognitive Science of Science* (Amsterdam, Philadelphia: John Benjamins Publishing Company, 2004).

also reflect attitude for life and understanding of the universe in general; as such, it is termed "worldview," which is referred to in the above discussion. At what stage a life structure can be termed "worldview" is an interesting investigation; but the empirical topic will hardly be a concern here. Instead, since worldview, as a word, refers to the way one views the world, it can be said that if a life structure is able to reflect the person's conception of the universe, such as the meaning of life, the origin of existence, human destiny and so on, it can be termed "worldview" no matter at what stage of life it emerges.

It must have become clear that since any person not only acts according to his/her worldview, but he/she also thinks according to it; in fact, a worldview is the domain that executes its operations within the process of knowledge. It is clear, therefore, that the concept of worldview is taken only as an epistemological term. Since, in this sense, the worldview acts as a general scheme of all of our mental and physical activities, it is termed the "general framework." It is also this general framework out of which our scientific activities also spring. At this juncture, how science is correlated to language is observed. The concept of worldview is being developed to show epistemologically that all human conduct is ultimately traceable to a worldview; a conclusion which is sufficient in itself to manifest the significance of worldview not only in individual and social life, but also in our scientific activities. Hence, from the epistemological perspective, a worldview is far more significant than all the other elements of human behaviour, because it is the most general framework within which the human mind can fully operate to attain knowledge. Based on this conclusion, the function of worldviews will be shown as the general framework of scientific activities, namely, the epistemic ground of scientific activities. For, this will be the epistemology of science which can also exhibit the correlation between science and the human language.

A worldview is formed by the individual in a casual manner out of his daily dealings as he/she grows up from

infancy to adulthood; a process which never ends until the death of the person. In this sense, its disclosure is a natural process, rather than a conscious effort to build an architectonically whole framework. For, a worldview is, in fact, a mental framework through which the individual views everything. Therefore, no one can evaluate any question or a problem without first assuming a worldview of a sort. In fact, the human mind works only within the context of such an architectonic whole. It is clear, therefore, that on epistemological grounds, no science is possible except from a general perspective which the mind forms for itself, and which we have identified here as "worldview." This point can be illustrated by simply assuming a worldview in which there is no concept of science or any other related concepts; obviously, no scientific knowledge is possible within such a *conceptual environment*. The same conclusion is valid with regard to the worldview that already has all these concepts, but remain buried under the debris of history without any clarification whatsoever, which is the case with the kind of worldview Muslims acquire today, i.e. the contemporary Islamic worldview, if it can be called as such. Within such an epistemic ground, no significant scientific activity can flourish.

Thus, the continual combination of experiences by the mind has been shown according to its rules and principles that gradually forms a framework which is first identifiable as the life structure, and then as it further develops to such an extent that it can manifest certain mentalities, and hence, termed "worldview." The worldview, thus, becomes the mental *environment* within which the mind operates, and without which it cannot function at all. In our early life, our worldview consists of only the life structure and as such the life structure is our worldview for a certain early period of our life. However, later in life gradually grows out of the life structure certain conceptions concerning the world we live in; first, certain fundamental questions arise in the mind, such as the meaning of life, from where we have come and to where

we are going. In trying to answer, or find answers to these fundamental questions, a conception concerning the world and things around is formed. As this conception begins to be more sophisticated, it gradually forms a clearly discernible structure in the mind, which can now be distinguished from the life structure, and thus can be termed "world structure." As soon as this new structure is established within the worldview, it begins to function in conjunction with the life structure and vice versa. Since the world structure is sophisticated, it is more abstract and conceptual. This characteristic of Life Structure in a worldview brings us to the concept of knowledge itself because abstraction is a clear sign of knowledge. This way, the mind will arrive at this concept and begin to elaborate it. In fact, as Aristotle points out, we are naturally inclined to *learn*, namely, curiosity is the major stimulation for knowledge. Such a concept has to be thought from its broader perspective. That is why as the worldview acquires sophistication, the concept of knowledge will begin to emerge as a doctrine, and thus, a new structure will emerge on the basis of this doctrine. This may be called "knowledge structure" which is, in fact, a direct extension of the world structure. Then, either the world structure or the knowledge structure, or the combination of the two, plus the life structure will eventually lead to a sophisticated concept of morality, which can be discernible as the "value structure." From the composition of such a sophisticated worldview, it is possible to infer a fifth structure as well, which is referred to as the "man structure." In the value structure, moral concepts and/or ideas, doctrines, and depending on the kind of worldview, religious and legal conceptions may be found. In the man structure, on the other hand, are conceptions of ourselves, as well as of the society and the societal organisation.

Indeed, the process of knowledge above has been pointed to with the emergence of mental entities. As seen, each structure of a worldview is actually a web of concepts, the totality of which reflects an outlook. The outlook provides a background for the combination of concepts which is, thus,

the foundation of language, too. For example, when three or more concepts are combined in accordance with the logical regulations of the mind, they together begin to project "an idea" which can be expressed by the combination of these concepts to which already an articulate sound is assigned. This is then the beginning of sentence formations as well. As such, worldview formation is also related to the genesis of language. Next, the structures of a worldview are elaborated.

So as to clarify structural understanding of worldviews, the Islamic worldview will be used in this instance. Since the life structure is grounded in human biology, it will have the most common elements with all other worldviews, and as such, the life structure of the Islamic worldview is its aspect that is most dominant in the Islamic cultural activities. The world structure is that aspect of the Islamic worldview which includes the most fundamental elements, such as the idea of God, prophethood, resurrection and the ideas of religion and the hereafter, *al-ākhīrah*. This does not mean that these are the only fundamental concepts of the Islamic worldview because each structure by itself represents a doctrinal element which includes within itself other fundamental Islamic key terminology. But the extensions of these key concepts and terminology constitute substructures; hence, there lie many substructures within the basic structures of the Islamic worldview which may not be so fundamental, and as a result, differences of opinion in those substructural elements can be allowed. As an extension of the World Structure, Knowledge Structure is also a fundamental doctrinal element, which is represented by the umbrella term *ʿilm*. This structure includes within itself the key scientific terminology of Islamic science, and as such, is extremely important in this context. The network of the key scientific Islamic terminology is called the "Islamic scientific conceptual scheme." It is in this network of concepts that the correlation between science and language is found because as seen above, concepts are the second signs of objects or entities that may be subjected to human knowledge.

Since words are the third symbols, this is where language is connected necessarily to scientific activities. Thus, other structures in the Islamic worldview will be explained in the following paragraphs.

The value structure in the Islamic worldview includes moral, ethical and legal practices. But since the concept of law in the early Islamic worldview is closely linked with the World Structure, it naturally included religious law, which cannot be devoid of moral content. Hence, law, religion and morality are manifested as an integral part of one structure. The conceptual understanding of law, religion and morality never brought about a sharp distinction among the three. Finally, the man structure is represented within the Islamic worldview by the concepts of *khalīfah* and *ummah*. As such, this structure manifests the Islamic understanding of man and society, which is totally grounded in the world structure because, again, even the conceptions themselves are derived from the concepts of *tawḥīd*, prophethood, religion and *al-ākhīrah*. [24]

Each structure in a worldview, therefore, has a specific function in life and in human activities. This point can be explained from another perspective as well; assuming that a worldview in which the knowledge structure is not discernible as a manifest mentality. In such a case, the individual having such a worldview cannot develop and/or actively engage in any scientific activity. For, there will not be in that person's worldview any scientific concept that can form a scientific framework for the mind to work in. As a result, there will be no scientific attitude, nor any scientific tradition that can support such activities. In fact, if there is no knowledge structure within a worldview, then that worldview can only be analysed into its life and world structures. For it is the scientific activity which manifests other structures as analysable units of a worldview.

24. As conceptions of Islām are beside the ongoing discussions, hence, their exposition is not included. Only their nature so far as it is related to the concept of worldview as is explained here is sufficient.

If there is no such activity, the structures cannot be developed to such an extent that they become manifest in their respective worldviews. All the structures of a worldview operate in relation to each other. None can operate independently. Hence, the treatment of them independently is only a logical analysis of a worldview. Otherwise, it is not intended to establish each structure independently. That is why our concept of worldview does not claim that a worldview without a manifest knowledge structure lacks a value system, or a man structure that acts as the ground of social and political activities. On the contrary, all the activities will be carried out and regulated by a world structure that may acquire a degree of sophistication within its respective worldview. But it cannot acquire the level of sophistication manifested in such scientific worldviews that can adequately be analysed into their knowledge, value and man Structures. Hence, the claim that proper environment for the rise of science is only the adequate worldview within which there is a possibility for the flourishing of science. Such a worldview is the one in which, first of all, a sophisticated Knowledge Structure has emerged. Then, as a result, a sophisticated network of key scientific terms, called "scientific conceptual scheme," is established by the early scholars of the society in which the worldview predominates. This leads to the conclusion that although scientific activities ultimately derive from worldview, they do not directly follow out of it. For, there is a need for another framework which directly supports such activities. Since the second framework is within the worldview itself, and as an extension of it, depends on the knowledge-structure, it shall be termed the "inner framework of scientific activities." (see Table 3).

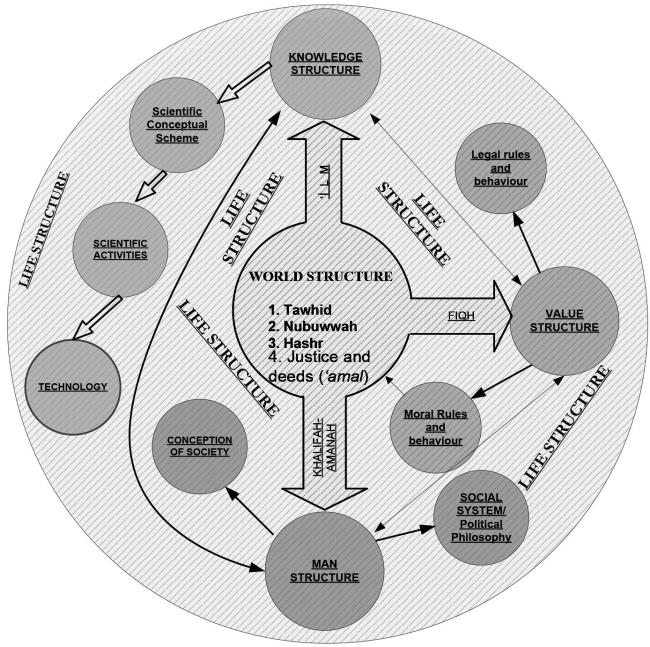

Table 3. The Islamic worldview with its structures

The concept of knowledge then is the fundamental doctrinal element in any scientific scheme. But when the past scientific activities are examined, the concept of knowledge yields the concept of truth, for the primary aim is true knowledge, which in turn leads to the concept of method, that is, *how* such true knowledge can be attained is shown. Therefore, knowledge, truth and method are three essentially interconnected concepts that must be developed first as a general sketch within the knowledge-structure, and then as a fundamental scientific theory in the scientific conceptual vocabulary. Moreover, as scientific activities continue, scholars will gradually begin to make a distinction between "personal opinions" and "scientific opinions," as a result of which, emerges the concept of *theory*. It is these four fundamental concepts that yield in the mind of scholars a consciousness

that the activity they carry out actually constitutes a discipline because it leads to an organised and systematic body of knowledge, which eventually yields the concept of *science*.

The body of general scientific nomenclature, therefore, developed by scientists and scholars, constitutes what is called "scientific conceptual scheme," and as such, it includes in general, five fundamental concepts: knowledge, truth, method, theory and science. They are general concepts that every scientific tradition in history has so far developed, but besides the concepts, each scientific tradition developed in its scientific conceptual scheme many other such concepts. The following are examples from the Islamic case, without discussing them in this context: *ʿilm*, *uṣūl*, *raʾy*, *ijtihād*, *qiyās*, *fiqh*, *ʿaql*, *qalb*, *idrāk*, *wahm*, *tadabbur*, *fikr*, *naẓar*, *naẓariyah*, *ḥikmah*, *yaqīn*, *waḥy*, tafsīr, *taʾwīl*, *ʿālam*, *kalām*, *nuṭq*, *ẓann*, *ḥaq/q*, *bāṭil*, *ṣidq*, *kidhb*, *wujūd*, *ʿadam*, *dahr*, *ṣamad*, *sarmad*, *azal*, *abad*, *khalq*, *khulq*, *firāsah*, *fiṭrah*, *ṭabīʿah*, *ikhtiyār*, *kasb*, *khayr*, *sharr*, *ḥalāl*, *ḥarām*, *wājib*, *mumkin*, *amr*, *īmān*, and *irādah*.

When scientific activities are examined from an epistemological perspective, it will be observed that they emerge primarily from the constitution of the mind which works within three frameworks that it has built for itself. The first two frameworks have been discussed as the worldview (the general framework) and the scientific conceptual scheme (the inner framework). The third one is also a scientific conceptual scheme but one that is used in a specific discipline, and as such, it can also be called "specific scientific conceptual scheme." This scheme that is also identified as "specific framework," includes in itself the nomenclature of a specific science. Obviously, without such a nomenclature, no science can be developed. For example, the network of the technical terms and scientific concepts used in Aristotle's physics constitutes its specific framework. The general scientific conceptual scheme as the inner framework of his physics is the network of scientific concepts and the way they are conceptualised within the Greek scientific tradition of his time; the general framework,

as his worldview, is the Aristotelian system. Another general example from the Islamic scientific tradition is the following: the technical vocabulary and the theological concepts utilised in kalām are the specific scientific conceptual scheme of kalām; the web of the general scientific vocabulary that is utilised in all Islamic sciences is the scientific conceptual scheme as the inner framework of *kalām*; and finally, the Islamic worldview is the general framework of it.

With respect to the inner framework, scientific activities are totally dependent on the concepts developed in the mental framework which leads to the organic correlation between science and language. It is the same with respect to the Specific Framework because what such a framework means is a unity of concepts which may also be called *conceptual unity*. Such a unity is nothing but a derivation from language. Indeed, this conclusion has implications and this is taken as a contemporary problem of Muslims with respect to their languages.

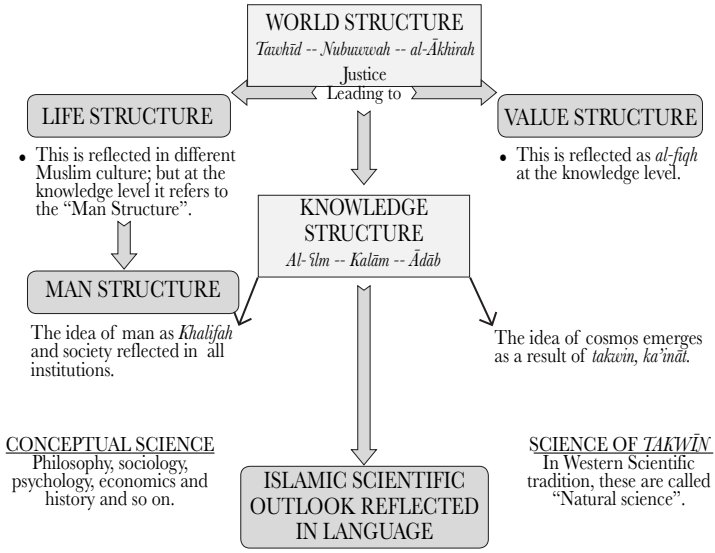

Table 4. The Islamic worldview leading through its structures to their respective behaviour.

The Solution to Preserve our Language

The theory of language as presented combined with the epistemology of science defended in this context has significant implications. First of all, since the scientific conceptual scheme is made up of the unity of concepts, this unity can be communicated only with what is called the third symbols which are actual words. This brings language to the heart of the epistemological framework of sciences. In fact, since scientific activity is a continuous process, the continuity is maintained only with words. For, science flourishes if it establishes a tradition in which there is a scientific community that is carrying the work for the next generation of scholars. But this is possible if there is a verbal communication between scientists which is possible only through language. Hence, language is necessary for scientific thought.[25]

Indeed, the epistemology of science presented here correlated with the human language has another implication which can be briefly put in the following manner. As concepts are formed in the mind, verbal symbols need to be assigned to them so as to make them available in human communication. Both concepts and their verbal symbols are chosen within the worldview of the individual, and thus carry its characteristics. An example from the Greek and Islamic sciences is as follows: If we try to compare *kalām* with Aristotelian theology, for

25. Details on this are restrictive due to the scope of the present discussions. But existing studies in this area are the following as a representative list: Patrick Suppes, *Representation and Invariance of Scientific Structures* (Stanford, CA: Center for the Study of Language and Information, 2002); David Banks, *The Development of Scientific Writing: Linguistic Features and Historical Context* (London and Oakville, CT: Equinox Publishing Ltd., 2008); Miles MacLeod, Rocío G. Sumillera, Jan Surman and Ekaterina Smirnova, eds. *Language as a Scientific Tool: Shaping Scientific Language Across Time and National Tradition* (New York and London: Routledge, 2016); Maurice Crosland, *The Language of Science: From the Vernacular to the Technical* (Cambridge: Lutterworth Press, 2006); Richard Rorty, *Philosophy and the Mirror of Nature* (Princeton: Princeton University Press, 2009).

example, we will see fundamental differences. The differences come primarily from the Islamic worldview and the Islamic scientific conceptual scheme. When sciences of different civilisations are compared and contrasted in this way, it is possible to trace most differences to their respective general frameworks; the lesser differences will be traced back to their respective scientific conceptual schemes; and finally, the least differences will be found in their specific scientific conceptual schemes, which means, with respect to their specific schemes, they will have the most similarities. This is because if the worldviews of both scientific traditions exhibit many differences, this will be reflected on the scientific work itself; but if the two respective worldviews are not so much diversified, obviously, the differences in their respective sciences will also be proportionately less.

In Aristotelian theology, theories that are in conflict with Islamic worldview are found. Aristotle argues that God is not a creative agent because the cosmos co-exists with Him; hence, there is no need for creation. But matter needs causes to move in an orderly manner so that there will be an order in the universe. So, the matter in the world moves through the love of perfection which is found in God Who is Pure Thought and as such, He is also the Source of Love. Moreover, nature is also perceived as a creating agent by Aristotle and as it moves towards God, it is not a conscious movement because God does not perceive the universe. Therefore, He does not ask for prayers and so on. Even if we pray to Him, He will not hear us. Thus, these are against the Islamic worldview and hence, such theories in the theology of Muslim philosophers can never be found.

Clearly, scientific language reflects its broad framework as shown in the epistemology of science to be worldview. Hence, a one-to-one correspondence between worldview and scientific language exists. If the dominant worldview in a society is not developed sufficiently, there cannot be meaningful scientific activity in the society. Moreover, if there

is no meaningful scientific activity in a society, the language of the society cannot develop fully. This means that the worldview of the society also cannot progress along with scientific ideas if scientific activities in the society are not sufficient. With this argument, the conclusion is that science is a significant factor in preserving one's language and this gives a signal as to the direction to take if language is to be preserved.

Conclusion

The epistemology defended in this article shows the importance of scientific activities in the development of language. In fact, a scientific theory brings in more concepts as it generates more knowledge in its way. This means that scientists are forced to assign more linguistic symbols for the newly-discovered concepts which in turn means the development of the language. Every concept expressed linguistically carries with it the impressions of its worldview. As such, a term expressed in a certain scientific tradition cannot be translated exactly into another language. This means that if Muslims want to preserve their languages, they should not borrow terms from other traditions. Instead, they need to develop science and contribute to the scientific knowledge significantly so that they can develop their languages. An attempt to show this somewhat indirectly has been made by explaining how a language is formed on the basis of human epistemology. Rather than explicating the historical origins of language, this article has explored the inner epistemology upon which human language is based.

However, one more problem arises: the global world of today and most scientific activities are carried out with the cooperation of other scientists who come from different background of worldviews. Indeed, such a problem can be overcome even though many terms and concepts are shared with other scientists mainly by focussing on making use of a language and inactive terms. In expressing a cosmic event

when using a language and active concepts, the very use of one's own language leaves no room for the existence of God. The use of our own terms is allowed and certainly, by active usage, other scientists will get used to our concepts, too. An example: the concept of "nature" which has extremely active meaning in English. Commonly, usages such as "the gift of mother nature", or "this is given by nature" are heard. A word of caution, though, when using such a concept. Early Muslim scholars, such as al-Farābī, for example, invented two words to express this concept: whenever it is used in Greek scientific tradition in the active sense, Muslim scientists used the terms "*ṭab ʿ*", meaning the "created physical constitution," or "created nature" for which actually the philosophers of kalām tradition used the Qur'anic word "*fiṭrah*." But whenever the term "nature" had an inactive signification, then they used the term *"ṭabīʿah*," for which again the scientists of *kalām* tradition preferred the term *"kāʾināt*," which is another Qur'anic term. Therefore, in preserving our language, one needs to understand the worldview with its proper terminology so as to survive culturally and scientifically in today's globalised scientific tradition which is indeed based on the atheistic world conception of the contemporary Western scientific tradition.

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