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Item Type	Preprint
Authors	Ali Engineer, Asghar
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Download date	2026-07-15 18:27:35
Link to Item	http://hdl.handle.net/20.500.12424/182669

SCIENCE, WEST AND ISLAMIC ORIGIN OF SCIENCE

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(Islam and Modern Age, December, 2009)

Recently I came across an excellent monograph in the form of a small book *Is Science Western in Origin?* By Prof. C K. Raju, professor of philosophy who has written earlier a book on *Time* – a thick volume on philosophy of time. The later work is also of high academic standard. This monologue on origin of science is a significant contribution which tries to shatter the myth that science is western in origin.

We would throw more light on it little later but to begin with it would be quite relevant to discuss whether Islam and science go together or, as many believe Islam is against science. Of course one can say this debate about Islam and science was more relevant to 19th century when the Muslim theologians (Ulama) opposed science as against Islam. What is its relevance today? Ulama no longer oppose science and its discoveries. This is largely true but still there are several problems in this debate which need to be discussed. Also, still some western scholars believe that Islam happens to be inherently opposed to scientific progress.

Recently I came across a book *Lost in the Sacred – Why the Muslim World Stood Still* by Dan Diner published by Princeton and Oxford and the main theme of the book is how Islam and Muslims oppose progress. That is why it is necessary to throw light on Islam and modern science and the monograph by Prof. Raju tries to prove that science originated from India and the Arab world and the west simply imitated it and then cleverly manipulated and interpolated to show that modern science is of Greek origin.

I

Does Islam oppose science? Qur'an is the main source of Islam and hence we would like to first see what Qur'an has to say about this. In fact pre-Islamic Arabs both settled in urban areas like Mecca or Madnia or Bedouins who were basically nomads were not interested in knowledge. In fact according to Tabari, the noted historian, there were only 17 persons in Mecca before Islam who could read and write. What they were proud of was their pedigree which they knew by heart for several generations. Learning and knowledge was for them hardly of any use .and hence pre-Islamic period was rightly referred to as period of *jahiliyyah* (ignorance).

Qur'an, therefore, laid great emphasis on '*ilm* (knowledge) precisely because Arabs were not only ignorant but also looked at learning with contempt. What mattered to them was their distinctive origin, not learning. As it has been repeatedly pointed out the revelation to the Prophet (PBUH) began by the word *iqra'* (recite or read). Thus the Qur'an says, "Read in the name of thy Lord who creates. Creates human being from a clot." (96:1-2)

Now this statement itself that read "in the name of the Lord who creates and creates from a clot" is an important scientific statement also as modern studies have developed how fertilization of man's semen and woman's eggs result in creation of human being. This science has developed

now tremendously through modern technology. Of course the Qur'an is a book of moral guidance and basic knowledge. It is certainly not the book of science. However, it does invite the believers to reflect and think about the creation and about our universe.

Knowledge, according to the Qur'an, is very basic if one wants to know ones God (*Rabb*, Allah) one has to have knowledge of this Universe as he is the creator of this universe. Thus the Qur'an says, "Those of His servants only who are possessed of knowledge fear Allah." Lest one should think this knowledge Qur'an is talking about is knowledge of theology or *deen* the preceding verse makes it clear it is knowledge about the creation. It says, "See you not that Allah sends down water from the clouds, then We bring forth therewith fruits of various hues? And in the mountains are streaks, white and red, of various hues and (others) intensely black" (35:27).

Also, in the second chapter it is stated that the believers believe in the unseen *ghayb*. Generally the theologians say that this unseen *ghayb* is all about the other world the world which begins after death. Well, that may be one of the interpretations and in those days when knowledge had not developed much it was perhaps the best available interpretation. But then divine scriptures use metaphorical and symbolic language which admits of multiple interpretations.

Ghayb can also mean potential knowledge which is hidden from those who live in a particular period. But continuously developing knowledge keeps on bringing forth what was not known to those who lived in previous times. It was *ghayb* (hidden) for them. And what is known to us today, may be is quite advanced compared to what was known to our predecessors, may appear to be quite primitive to coming generations. Thus that is all *ghayb* to us. But Allah is described in the Qur'an as '*Alim al-Ghayb*' as He has knowledge of all that is to come but to us – His servants – it is just *ghayb*.

Thus what was known to the world when Qur'an was revealed to the Arabs, was quite primitive than what developed with few centuries during the Abbasid period and subsequently during the Fatimid period in Egypt. Great philosopher, mathematicians, chemists, geographers, astronomers and others discovered many things which was nothing more than *ghayb* just before two centuries.

Thus requiring believers (*mu'minin*) to believe in knowledge of *ghayb* Qur'an inspired Muslims to continuously develop knowledge. Allah's knowledge is without limits and so the believers should constantly pursue knowledge to infinity. No knowledge is final and more knowledge develops more one is bewildered about limitlessness of knowledge. The Prophet rightly said that a moment's reflection by an '*Alim*' is more meritorious than praying whole night.

The Qur'an invites all believers to reflect about this universe and an ignorant person cannot be true believer. An ignorant person knows nothing about this universe created by Allah. If one tries to know this universe she/he realizes how wonderful this universe is and only she/he then realizes the greatness of the Creator of this universe. Today scientists, physicists and astronomers tell us how bewilderingly large are the dimensions of this universe.

There is no single solar system as earlier believed. There are hundreds of solar systems each billions of light years away from each other. The age of our universe was fixed by some

Christian theologians in sixteenth century as about 4,000 years. It was all *ghayb* for them then. Today the scientists fix the age of our universe as at least 20 billion light years. Every now and then new stars are discovered billions of light years.

The Greek knowledge was basically deductive in nature and hence its limitation in understanding of the universe. The science develops with inductive knowledge i.e. through observations over a large period of time. Thus Iqbal points out in his lectures *Reconstruction of Religious Thought in Islam* that Qur'an lays emphasis on inductive knowledge and he quotes Francis Bacon to the effect that modern science developed through inductive logic.

The Qur'an repeatedly invites believers to reflect over the creation of Allah and this itself could inspire believers to develop knowledge about this universe and for a period of time they did and contributed richly to the knowledge about this world. The first impulse came when the Abbasids started **Darul Hikmah** (House of Wisdom). By the way Qur'an lays great emphasis on Hikmah (wisdom). It is Allah's name (Hakim) and Qur'an describes *hikmah* as *khayran kathira* (i.e. goodness in abundance).

Thus the Qur'an says, "He grants wisdom to which He pleases. And whoever is granted wisdom, he indeed is given a goodness in abundance." (2:269). Thus *hikmah* has great importance in the Qur'an because hikmah is not possible without knowledge and the Abbasids rightly called the place where books of knowledge from various countries as House of Wisdom. According to Prof. Raju this house of wisdom became epicenter of science and what we call western science today could not have developed without this house of wisdom.

Thus it is not true that Islam ever came in the way of development of modern knowledge or science. In fact it was the springboard, if we believe Prof. Raju, of development of modern science. Prof. H.G. Wells, in his *The Short History of the World* calls the Arabs as foster fathers of modern knowledge. But it is only partly true. The Arabs were much more than foster fathers. Their own contribution was quite rich as we will discuss shortly.

It is true after 13th century there was stagnation in the Muslims world and for reasons not to be discussed here, the Muslim world was taken over by superstitious beliefs until the western colonization again awoke them from their slumber. The Muslim theologians also contributed to this stagnation a great deal. In order to maintain their hegemony they opposed great philosophers and scientists like Farabi, Ibn Sina (Avicenna) or (Averroes) (Ibn Rushd) and others and even condemned them as heretics.

Also, persons like Ghazzali, had very different approach to knowledge which was based on certainty rather than uncertainties of philosophy and constant quest for knowledge of science and hence he also opposed philosophers like Averroes and there was great debate between the two. But after the attack of Hela in 1258 the Abbasid Empire which was already on decline, collapsed and Baghdad ceased to be the centre of learning and development of science. Though other empires like that of Fatimid in Egypt survived a bit longer but it did not help much. Ghazzali's approach of inner certainty found now much greater resonance and Muslims now began concentrating on '*ulum al-Din* (i.e. religious sciences) which goes on until today.

Ghazzali's *Ihya al-'Ulum al-Din* (i.e. Revivification of Religious Sciences) indeed became symbolic of this revival.

II

In this background we would like to discuss here briefly the monograph of Prof. C.K.Raju *Is Science Western in Origin?* In this learned monograph Raju tries to show the science is certainly not western in origin but it owes much more to India on one hand, and Islamic centres in Baghdad and Spain. This monograph is part of the dissenting knowledges pamphlet series.

According to Prof. Raju it is a sheer myth to say that science is of Hellenic origin. He says that "The story of the Greek origin of science postdates the Crusades. Before the Crusades, Christendom was in 'Dark Age'" Prof. Raju also says that it was Roman Christian Emperor ordered burning down of the Great Library of Alexandria and he also says it was Justinian who ordered closure of all philosophical schools in 529 CE. In the footnote Raju refers to Edward Gibbon who discusses in his *The Decline and Fall of the Roman Empire* and dismisses the canard that burning down the Great Library might have been the work of Caliph Omar, or that it might have happened during a fire started at the time of Julius Caesar's attack.

Dr. Raju also makes an interesting observation that "Ironically, this Christian Dark Age coincided with the Islamic Golden Age." Then he goes on to say that in sharp contrast to the book-burning tradition of Christendom, the Abbasid Caliphate had established in Baghdad House of Wisdom by the early 9thc. This led to such an explosion in the demands for books that, along the lines of the *hadith* to seek knowledge even from China, paper-making techniques were imported from China to set up a paper factory in Baghdad, which had a flourishing book bazaar.

It is not true, according to him that books were brought only from Byzantine but also from Persia and India. Baghdad had scholars from all these countries and it became an important centre of intellectual debates and House of Wisdom, centre for transferring knowledge from these sources into Arabic. He also points out that apart from the contrast in knowledge, there was also striking contrast in wealth between Christendom and Islamic Arabs, Charlemagne's emissaries were dazzled by the splendor of Haroun al-Rashid's court, and the gifts they brought back were avidly imitated, and became models of Carolingian art.

It was only post-Crusades that the Church realized the importance of non-Biblical knowledge. In sharp contrast to earlier behavior Church preserved the magnificent library at Toledo in the Muslim Spain when it was conquered during the proto-Crusades in 1085. Now the non-Biblical knowledge was accepted at the highest levels of the Church.

Prof. Raju also points out that India had very advanced knowledge of arithmetic's and astronomy. He says that while the Arabs valued the 'theology of Aristotle' for arithmetic, they turned to India, not to Greece. Arabs imported various Indian arithmetic texts, notably those of Aryabhata, Brahmagupta and Mahavira. These were digested and transcreated in the Bayt al-Hikma, by al-Khwarizmi, and became famous as Algorismus after his Latinized name. These 'Arabic numerals' use the place-value system which makes it very easy to represent large numerals. It also makes arithmetic very easy through 'algorithmus'. In fact the legendry

Barmakids (derived from barmak- pramukh), the viziers of Abbasides were instrumental in importing knowledge from Persia and India.

Initially many texts in Baghdad came from Persia where the same practice of collecting world-knowledge was followed. But, even in Persia, knowledge of astronomy (translated as Zij-i-Shahryar) was imported from India. Raju then dwells on how of the secular knowledge nothing was available from Rome as otherwise Khusrau to him Justinian was paying him a hefty tribute for non-aggression would have imported it from there, not from India.

Prof. Raju also exposes the myth of Euclides as the writer of Geometry *Elements* he points out nothing is known about Euclids as to who he was. He quotes to this effect the leading authority on *Elements*. Interestingly he also points out that the word Euclides is derived from Arabic *iklid* or *klid* which means key or here ‘key to geometry’. It could be because in Toledo translations were done either by those who knew Arabic but not the subject or those who knew Latin but not the subject and hence such howlers were common.

Raju also throws light on Copernicus who is considered as having revolutionized the knowledge of astronomy. Thus Raju points out that Copernicus’s mathematical model is a carbon copy of an earlier astronomical model by Ibn as-Shatir of Damascus (d.1375). Ibn Shatir used a technique due to Nasiruddin Tusi (whose advice to Melagu led to the downfall of Baghdad, and who was rewarded with the Maraghah observatory). The Maraghah school raised new questions, and offered novel solutions. Copernicus mimics both the questions and answers. Copernicus’s lunar model is identical to Ibn as-Shatir’s. The question therefore is not whether, but when, where, and in what form he learned of Maragha theory.”

Prof. Raju of course provides answers to these questions though it is too technical for us to throw light on that. But suffice it to say that Copernicus is hailed as father of modern astronomy and in turn on it depends our knowledge of universe today. All further developments in the knowledge of universe, of stars, of solar system and so on, depends on Copernicus’s revolution.

Prof. Raju raises one more important question and says, “The key questions, however, have never been asked: *Could* Copernicus have openly acknowledged his Islamic sources? Had he done that wouldn’t someone have denounced him as a heretic? Would that have helped his case for theological correctness? So, Copernicus followed the tradition: he used Islamic sources, but refused to acknowledge them.”

However, according to Dr. Raju the western scholars have manipulated evidence in such a way as to hide this fact that Copernicus imitated the model of Ibn as-Shatir and maintain that it was original work by Copernicus. After quoting the sources that Ibn as-Shatir’s manuscript was present in the library of the Church, he observes, “Note a further subtle way in which the rules of evidence are being juggled. The appropriate standard of evidence for history is balance of probabilities, and there is ample circumstantial evidence that Copernicus’ model was entirely derived. So, the onus of proof is on Western historians to *supply* solid evidence that Copernicus did not see that text! Instead, they shift the onus of proof, and demand further evidence! So the great Copernican revolution is better called the great Copernican Quibble!”

The pamphlet discussed here by Prof. Raju though, small in length, is much larger in significance. And more scholars would work on these lines. It is highly learned in its contents and unfortunately our universities do not have departments of history of science to carry on study on these lines. In the west history of science is an important area of study and it is high time we also carry on work in this important field.

In conclusion I would like to say though what has been discussed here is historical truth Muslims should not only celebrate this but use it an occasion for serious reflection that though west borrowed much from the Muslim world, why Muslim world is in such pathetic condition today. For them Islam is nothing more than a set of rituals and only an instrument for *najat* (emancipation) for the other world and not for achievements in this world?

Today Muslims are far behind western countries and depend entirely on the west for scientific knowledge. As the Christendom was passing through dark age when Islamic world was at its height of glory and achievements in the fields of science, mathematics and astronomy. Now it is just the reverse. Now the west (or Christendom) is at its height and the Muslim world is passing through dark age. The Muslim world now at best excels in religious knowledge (*'ulum al-Din*).

Ilm (knowledge) must be taken in its most comprehensive sense as this word has been used in the Qur'an and it should not be confined only to religious knowledge. The 'Ulama should not mean only those who specialize in *diniyat* but all those who have expertise in modern secular sciences (all its branches). The 'Ulama who have no knowledge of modern sciences have no right to lead us. Only those who have knowledge of modern world along with that of Islam have right to show us the way. Otherwise the 'ulama would be nothing more than what Iqbal alled them *do rak'at ka imam* (leader of prayer).

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