

# Science in Medieval Islam



Aminul Mortaza  
Editor

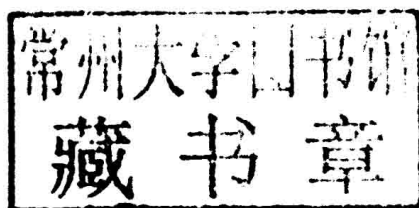


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# **Science in Medieval Islam**



## Preface

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Science in the medieval Islamic world, also known as Islamic science or Arabic science, is the science developed and practised in the Islamic world during the Islamic Golden Age (c.750 CE – c.1258 CE). During this time, Indian, Assyrian, Iranian and especially Greek knowledge was translated into Arabic. These translations became a wellspring for scientific advances, by scientists from the Islamic civilization, during the Middle Ages.

Scientists within the Islamic civilization were of diverse ethnicities. Most were Persians, Arabs, Moors, Assyrians, and Egyptians. They were also from diverse religious backgrounds. Most were Muslims, but there were also some Christians, Jews and irreligious. Through the Umayyad and, in particular, the succeeding Abbasid Caliphate's early phase, lies the period of Islamic history known as the High Caliphate. This era can be identified as the years between 692 and 945, and ended when the caliphate was marginalized by local Muslim rulers in Baghdad – its traditional seat of power. From 945 onward until the sacking of Baghdad by the Mongols in 1258, the Caliph continued on as a figurehead, with power devolving more to local amirs. During the High Caliphate, stable political structures were established and trade flourished. The Chinese were undergoing a revolution in commerce, and the trade routes between the lands of Islam and China boomed both overland and along the coastal routes between the two civilizations. Islamic civilization continued to be primarily based upon agriculture, but commerce began to play a more important role as the caliphate secured peace within the empire. The wars and cultural divisions that had separated peoples before the Arab conquests gradually gave way to a new civilization encompassing diverse ethnic and religious backgrounds. This new Islamic civilization used the Arabic language as transmitters of culture and Arabic increasingly became the language of commerce and government. Over

time, the great religious and cultural works of the empire were translated into Arabic, the population increasingly understood Arabic, and they increasingly professed Islam as their religion. The cultural heritages of the area included strong Hellenic, Indic, Assyrian and Persian influences. The Greek intellectual traditions were recognized, translated and studied broadly. Through this process, the population of the lands of Islam gained access to all the important works of all the cultures of the empire, and a new common civilization formed in this area of the world, based on the religion of Islam. A new era of high culture and innovation ensued, where these diverse influences were recognized and given their respective places in the social consciousness. The pious scholars of Islam, men and women collectively known as the ulama, were the most influential element of society in the fields of Sharia law, speculative thought and theology. Their pronouncements defined the external practice of Islam, including prayer, as well as the details of the Islamic way of life. They held strong influence over government, and especially the laws of commerce. They were not rulers themselves, but rather keepers and upholders of the rule of law. Conversely, among the religious, there were inheritors of the more charismatic expressions of Christianity and Buddhism, in the Sufi orders. These Muslims had a more informal and varied approach to their religion. Islam also expressed itself in other, more esoteric forms that could have significant influence over public discourse during times of social unrest. Among the more worldly, adab – polite, worldly culture — permeated the lives of the professional, the courtly and genteel classes. Art, literature, poetry, music and even some aspects of religion were among the areas widely appreciated by those of a more refined taste among Muslim and non-Muslim alike. New trends and new topics flowed from the centre of the Baghdad courts, to be adopted both quickly and widely across the lands of Islam. Apart from these other traditions stood *falsafa*; Greek philosophy, inclusive of the sciences as well as the philosophy of the ancients.

The author has proved on basis of sound and substantial arguments that religion and philosophy, (science included,) are complementary to each other and philosophy is the ‘foster sister’ of religion of Islam. Ibn Rushd bring an important jurist of Islam himself, has proved judgement about the affinity of philosophy and science to Islam.

—Editor

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# Chapter 1

## Science in Pre-Islamic Arabian Society

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After the research we have made into the religious and political life of Arabia, it is appropriate to speak briefly about the social, economic and ethical conditions prevalent therein.

### **Social Life of the Arabs**

The Arabian Society presented a social medley, with different and heterogeneous social strata. The status of the woman among the nobility recorded an advanced degree of esteem. The woman enjoyed a considerable portion of free will, and her decision would most often be enforced. She was so highly cherished that blood would be easily shed in defence of her honour. In fact, she was the most decisive key to bloody fight or friendly peace. These privileges notwithstanding, the family system in Arabia was wholly patriarchal. The marriage contract rested completely in the hands of the woman's legal guardian whose words with regard to her marital status could never be questioned.

On the other hand, there were other social strata where prostitution and indecency were rampant and in full operation. Abu Da'ud, on the authority of 'Aishah [R] reported four kinds of marriage in pre-Islamic Arabia:

The first was similar to present-day marriage procedures, in which case a man gives his daughter in marriage to another man after a dowry has been agreed on. In the second, the husband would send his wife – after the menstruation period – to cohabit with another man in order to conceive. After conception her husband would, if he desired, have a sexual intercourse with her. A third kind was that a group

of less than ten men would have sexual intercourse with a woman. If she conceived and gave birth to a child, she would send for these men, and nobody could abstain.

They would come together to her house. She would say: 'You know what you have done. I have given birth to a child and it is your child' (pointing to one of them). The man meant would have to accept.

The fourth kind was that a lot of men would have sexual intercourse with a certain woman (a whore). She would not prevent anybody. Such women used to put a certain flag at their gates to invite in anyone who liked. If this whore got pregnant and gave birth to a child, she would collect those men, and a seeress would tell whose child it was. The appointed father would take the child and declare him/her his own. When Prophet Muhammad [pbuh] declared Islam in Arabia, he cancelled all these forms of sexual contacts except that of present Islamic marriage. [Abu Da'ud-The Book of marriage]

Women always accompanied men in their wars. The winners would freely have sexual intercourse with such women, but disgrace would follow the children conceived in this way all their lives.

Pre-Islam Arabs had no limited number of wives. They could marry two sisters at the same time, or even the wives of their fathers if divorced or widowed. Divorce was to a very great extent in the power of the husband. [Abu Da'ud-The Book of marriage]

The obscenity of adultery prevailed almost among all social classes except few men and women whose self-dignity prevented them from committing such an act. Free women were in much better conditions than the female slaves who constituted the greatest calamity. It seemed that the greatest majority of pre-Islam Arabs did not feel ashamed of committing this obscenity. Abu Da'ud reported:

A man stood up in front of Prophet Muhammad [pbuh] and said: "O Prophet of Allah! that boy is my son. I had sexual intercourse with his mother in the pre-Islamic period." The Prophet [pbuh] said:

"No claim in Islam for pre-Islamic affairs. The child is to be attributed to the one on whose bed it was born, and stoning is the lot of a fornicator." [Abu Da'ud-Chapter "The child is to the one on whose bed it was born] With respect to the pre-Islam Arab's relation with his offspring, we see that life in Arabia was paradoxical and presented a gloomy picture of contrasts. Whilst some Arabs held children dear to their hearts and cherished them greatly, others

buried their female children alive because an illusory fear of poverty and shame weighed heavily on them. The practice of infanticide cannot, however, be seen as irrevocably rampant because of their dire need for male children to guard themselves against their enemies. Another aspect of the Arabs' life which deserves mention is the bedouin's deep-seated emotional attachment to his clan. Family, or perhaps tribal-pride, was one of the strongest passions with him. The doctrine of unity of blood as the principle that bound the Arabs into a social unity was formed and supported by tribal-pride. Their undisputed motto was: "Support your brother whether he is an oppressor or oppressed" in its literal meaning; they disregarded the Islamic amendment which states that supporting an oppressor brother implies deterring him from transgression.

Avarice for leadership, and keen sense of emulation often resulted in bitter tribal warfare despite descendency from one common ancestor. In this regard, the continued bloody conflicts of Aws and Khazraj, 'Abs and Dhubyān, Bakr and Taghlib, etc. are striking examples.

Inter-tribal relationships were fragile and weak due to continual inter-tribal wars of attrition. Deep devotion to religious superstitions and some customs held in veneration, however, used to curb their impetuous tendency to quench their thirst for blood. In other cases, there were the motives of, and respect for, alliance, loyalty and dependency which could successfully bring about a spirit of rapport, and abort groundless bases of dispute. A time-honoured custom of suspending hostilities during the prohibited months (Muharram, Rajab, Dhul-Qa'dah, and Dhul-Hijjah) functioned favourably and provided an opportunity for them to earn their living and coexist in peace. We may sum up the social situation in Arabia by saying that the Arabs of the pre-Islamic period were groping about in the dark and ignorance, entangled in a mesh of superstitions paralyzing their mind and driving them to lead an animal-like life. The woman was a marketable commodity and regarded as a piece of inanimate property. Inter-tribal relationships were fragile. Avarice for wealth and involvement in futile wars were the main objectives that governed their chiefs' self-centred policies.

## **The Economic Situation**

The economic situation ran in line with the social atmosphere. The Arabian ways of living would illustrate this phenomenon quite

clearly. Trade was the most common means of providing their needs of life. The trade journeys could not be fulfilled unless security of caravan routes and inter-tribal peaceful co-existence were provided – two imperative exigencies unfortunately lacking in Arabia except during the prohibited months within which the Arabs held their assemblies of ‘Ukaz, Dhil-Majaz, Mijannah and others.

Industry was alien to the Arabian psychology. Most of available industries of knitting and tannage in Arabia were done by people coming from Yemen, Heerah and the borders of Syria. Inside Arabia there was some sort of farming and stock-breeding. Almost all the Arabian women worked in yarn spinning but even this practice was continually threatened by wars. On the whole, poverty, hunger and insufficient clothing were the prevailing features in Arabia, economically.

### **Ethics**

We cannot deny that the pre-Islam Arabs had such a large bulk of evils. Admittedly, vices and evils, utterly rejected by reason, were rampant amongst the pre-Islam Arabs, but this could never screen off the surprise-provoking existence of highly praiseworthy virtues, of which we could adduce the following:

1. Hospitality: They used to emulate one another at hospitality and take utmost pride in it. Almost half of their poetry heritage was dedicated to the merits and nobility attached to entertaining one's guest. They were generous and hospitable on the point of fault. They would sacrifice their private sustenance to a cold or hungry guest. They would not hesitate to incur heavy blood-money and relevant burdens just to stop blood-shed, and consequently merit praise and eulogy.

In the context of hospitality, there springs up their common habits of drinking wine which was regarded as a channel branching out of generosity and showing hospitality. Wine drinking was a genuine source of pride for the Arabs of the pre-Islamic period. The great poets of that era never forgot to include their suspending odes the most ornate lines pregnant with boasting and praise of drinking orgies. Even the word ‘grapes’ in Arabic is identical to generosity in both pronunciation and spelling. Gambling was also another practice of theirs closely associated with generosity since the proceeds would



always go to charity. Even the Noble Quran does not play down the benefits that derive from wine drinking and gambling, but also says,

“And the sin of them is greater than their benefit.” [Al-Quran 2:219]

2. Keeping a covenant: For the Arab, to make a promise was to run into debt. He would never grudge the death of his children or destruction of his household just to uphold the deep-rooted tradition of covenant-keeping. The literature of that period is rich in stories highlighting this merit.
3. Sense of honour and repudiation of injustice: This attribute stemmed mainly from excess courage, keen sense of self-esteem and impetuosity. The Arab was always in revolt against the least allusion to humiliation or slackness. He would never hesitate to sacrifice himself to maintain his ever alert sense of self-respect.
4. Firm will and determination: An Arab would never desist an avenue conducive to an object of pride or a standing of honour, even if it were at the expense of his life.
5. Forbearance, perseverance and mildness: The Arab regarded these traits with great admiration, no wonder, his impetuosity and courage-based life was sadly wanting in them.
6. Pure and simple bedouin life, still untarnished with accessories of deceptive urban appearances, was a driving reason to his nature of truthfulness and honesty, and detachment from intrigue and treachery.

Such priceless ethics coupled with a favourable geographical position of Arabia were in fact the factors that lay behind selecting the Arabs to undertake the burden of communicating the Message (of Islam) and leading mankind down a new course of life.

In this regard, these ethics per se, though detrimental in some areas, and in need of rectification in certain aspects, were greatly invaluable to the ultimate welfare of the human community and Islam has did it completely.

The most priceless ethics, next to covenant-keeping, were no doubt their sense of self-esteem and strong determination, two human traits indispensable in combatting evil and eliminating moral corruption on the one hand, and establishing a good and justice-orientated society,

on the other. Actually, the life of the Arabs in the pre-Islamic period was rich in other countless virtues we do not need to enumerate for the time being.

## The Lineage and Family of Muhammad

With respect to the lineage of Prophet Muhammad [pbuh], there are three versions: The first was authenticated by biographers and genealogists and states that Muhammad's genealogy has been traced to 'Adnan. The second is subject to controversies and doubt, and traces his lineage beyond 'Adnan back to Abraham. The third version, with some parts definitely incorrect, traces his lineage beyond Abraham back to Adam [AWS].

After this rapid review, now ample details are believed to be necessary.

The first part: Muhammad bin 'Abdullah bin 'Abdul-Muttalib (who was called Shaiba) bin Hashim, (named 'Amr) bin 'Abd Munaf (called Al-Mugheera) bin Qusai (also called Zaid) bin Kilab bin Murra bin Ka'b bin Lo'i bin Ghalib bin Fahr (who was called Quraish and whose tribe was called after him) bin Malik bin An-Nadr (so called Qais) bin Kinana bin Khuzaiman bin Mudrikah (who was called 'Amir) bin Elias bin Mudar bin Nizar bin Ma'ad bin 'Adnan.

The second part: 'Adnan bin Add bin Humaisi' bin Salaman bin Aws bin Buz bin Qamwal bin Obai bin 'Awwam bin Nashid bin Haza bin Bildas bin Yadlaf bin Tabikh bin Jahim bin Nahish bin Makhi bin Aid bin 'Abqar bin 'Ubaid bin Ad-Da'a bin Hamdan bin Sanbir bin Yathrabi bin Yahzin bin Yalhan bin Ar'awi bin Aid bin Deshan bin Aisar bin Afnad bin Aiham bin Muksar bin Nahith bin Zarih bin Sami bin Mazzi bin 'Awda bin Aram bin Qaidar bin Ishmael son of Abraham [AWS]. [Rahmat-ul-li'l'alameen 2/14-17] The third part: beyond Abraham [AWS], Ibn Tarih (Azar) bin Nahur bin Saru' bin Ra'u bin Falikh bin Abir bin Shalikh bin Arfakhshad bin Sam bin Noah [AWS], bin Lamik bin Mutwashlack bin Akhnukh [who was said to be Prophet Idris (Enoch) [AWS]] bin Yarid bin Mahla'il bin Qainan bin Anusha bin Shith bin Adam [AWS].

## The Prophetic Family

The family of Prophet Muhammad [pbuh] is called the Hashimite family after his grandfather Hashim bin 'Abd Munaf. Let us now speak a little about Hashim and his descendants:

**Hashim:** As we have previously mentioned, he was the one responsible for giving food and water to the pilgrims. This had been his charge when the sons of 'Abd Munaf and those of 'Abd Ad-Dar compromised on dividing the charges between them. Hashim was wealthy and honest. He was the first to offer the pilgrims sopped bread in broth. His first name was 'Amr but he was called Hashim because he had been in the practice of crumbling bread (for the pilgrims). He was also the first man who started Quraish's two journeys of summer and winter. It was reported that he went to Syria as a merchant. In Madinah, he married Salma — the daughter of 'Amr from Bani 'Adi bin An-Najjar. He spent some time with her in Madinah then he left for Syria again while she was pregnant. He died in Ghazza in Palestine in 497 A.D. Later, his wife gave birth to 'Abdul-Muttalib and named him Shaiba for the white hair in his head, [Ibn Hisham 1/137; Rahmat-ul-lil'alameen 1/26, 2/24] and brought him up in her father's house in Madinah. None of his family in Mecca learned of his birth. Hashim had four sons; Asad, Abu Saifi, Nadla and 'Abdul-Muttalib, and five daughters Ash-Shifa, Khalida, Da'ifa, Ruqyah and Jannah. [Ibn Hisham 1/107]

**'Abdul-Muttalib:** We have already known that after the death of Hashim, the charge of pilgrims' food and water went to his brother Al-Muttalib bin 'Abd Munaf (who was honest, generous and trustworthy). When 'Abdul-Muttalib reached the age of boyhood, his uncle Al-Muttalib heard of him and went to Madinah to fetch him. When he saw him, tears filled his eyes and rolled down his cheeks, he embraced him and took him on his camel. The boy, however abstained from going with him to Mecca until he took his mother's consent. Al-Muttalib asked her to send the boy with him to Mecca, but she refused. He managed to convince her saying: "Your son is going to Mecca to restore his father's authority, and to live in the vicinity of the Sacred House."

There in Mecca, people wondered at seeing Abdul-Muttalib, and they considered him the slave of Muttalib. Al-Muttalib said: "He is my nephew, the son of my brother Hashim." The boy was brought up in Al-Muttalib's house, but later on Al-Muttalib died in Bardman in Yemen so 'Abdul-Muttalib took over and managed to maintain his people's prestige and outdo his grandfathers in his honourable behaviour which gained him Makkah's deep love and high esteem. [Ibn Hisham 1/137, 138]



When Al-Muttalib died, Nawfal usurped 'Abdul-Muttalib of his charges, so the latter asked for help from Quraish but they abstained from extending any sort of support to either of them. Consequently, he wrote to his uncles of Bani An-Najjar (his mother's brothers) to come to his aid. His uncle, Abu Sa'd bin 'Adi (his mother's brother) marched to Mecca at the head of eighty horsemen and camped in Abtah in Mecca. 'Abdul-Muttalib received the men and invited them to go to his house but Abu Sa'd said: "Not before I meet Nawfal." He found Nawfal sitting with some old men of Quraish in the shade of Al-Kaaba. Abu Sa'd drew his sword and said:

"I swear by Allah that if you don't restore to my nephew what you have taken, I will kill you with this sword." Nawfal was thus forced to give up what he had usurped, and the notables of Quraish were made to witness to his words. Abu Sa'd then went to 'Abdul-Muttalib's house where he stayed for three nights, made *'Umra* and left back for Madinah. Later on, Nawfal entered into alliance with Bani 'Abd Shams bin 'Abd Munaf against Bani Hashim. When Khuza'a, a tribe, saw Bani An-Najjar's support to 'Abdul-Muttalib they said: "He is our son as he is yours. We have more reasons to support him than you." 'Abd Munaf's mother was one of them. They went into An-Nadwa House and entered into alliance with Bani Hashim against Bani 'Abd Shams and Nawfal. It was an alliance that was later to constitute the main reason for the conquest of Mecca. 'Abdul-Muttalib witnessed two important events in his lifetime, namely digging Zamzam well and the Elephant raid. In brief, 'Abdul-Muttalib received an order in his dream to dig Zamzam well in a particular place. He did that and found the things that Jurhum men had buried therein when they were forced to evacuate Mecca. He found the swords, armours and the two deer of gold. The gate of Al-Kaaba was stamped from the gold swords and the two deer and then the tradition of providing Zamzam water to pilgrims was established.

When the well of Zamzam gushed water forth, Quraish made a claim to partnership in the enterprise, but 'Abdul-Muttalib refused their demands on grounds that Allah had singled only him out for this honourable job. To settle the dispute, they agreed to consult Bani Sa'd's diviner. On their way, Allah showed them His Signs that confirmed 'Abdul-Muttalib's prerogative as regards the sacred spring. Only then did 'Abdul-Muttalib make a solemn vow to sacrifice one of his adult children to Al-Kaaba if he had ten.