

Jabir Ibn Hayyan and His Contributions to Science

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The history of the world is witness that the ultimate power of a people lies in the possession of knowledge and learning at their disposal. Historically all societies and nations once they acquired the power of knowledge, it led to acquisition of political power. The proof of this hypothesis lies in the fact that at the at the times of existence of Aristotle and Socrates in the Greece, Alexander the great, the disciple of Aristotle, was also there who established political power of the Greeks all around. Similarly, in recent past the British Empire spread so far and wide that the sun would never set in its Kingdom on the strength of it becoming a knowledge society. Even in contemporary times the super power status of the U.S. today rides at the back of it being the fountainhead of new knowledge. Since Islam is the religion of knowledge and learning thus its advent in seventh century brought in a new revolution in the thinking. Philosophy and knowledge base of the Arab world and catapulted its political power to spread to Africa and Europe. Islam lays great emphasis on acquiring knowledge, we find so many instances when the Prophet inspired Muslims to obtain knowledge. The first Ayah of the Quran begins with the command for reading, which is the key to acquire knowledge. Allah says:

“Read in the name of your Lord who has created (all that exists). He has created man from a clot, read and your Lord is the most generous, who has taught (the writing) by pen. He has taught the man that which he knew not (Al-Alaq, 96:1-5)”. In Islam, knowledge comes before action. There can be no action without knowledge. So, the Islam changed the Arab society and guided them to a path which led them to take the responsibility to develop human society and do for the betterment of mankind by way of spreading knowledge in the world. Thus after the rise of Islam the centre of knowledge shifted from Greece to Arabia. The Arabs began to encourage learning of all kinds. The academic and scientific activities which began in the Umayyad period reached a peak in Abbassid period when Abbassid caliphs too took a keen interest in all these activities and invited scholars from outside Arabia without distinction of nationality or creed to translate books from other languages into Arabic. Greek, Latin, and Sanskrit manuscripts were acquired in large numbers and were studied and translated.

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Consequently, Arabia produced a very good number of great scholars in various sciences, who did a commendable job in the promotion, expansion, and spreading of knowledge, thus paving the way for future generations to further develop the sciences. Jabir Ibn Hayyan is one of those great scholars who played a very important role in the development and promotion of sciences. Jabir, who is known to the west as Geber, is called father of chemistry. Abu Musa Jabir was the son of Hayyan who belonged to al-Azd tribe of Kufa. He carried on the business of a druggist at Kufa. He was among the followers and supporters of the Abbassid family. Hayyan was sent as an Abbassid emissary to Persia for political propaganda against the Umayyads and in favor of the Abbassids. It was while he and his wife were at the town of Tus in Khorasan, near the modern Mashhad, that his son Jabir was born probably in the year A.D. 721 or 722.

Shortly afterwards, Hayyan was arrested by agents of the Umayyad caliph and was subsequently executed. His family fled back to Yemen where Jabir grew up and studied the Quran, mathematics, and other subjects under a scholar named Harbi Al-Himyari. Later, he also came into contact with Imam Jafar Al-Sadiq and became his disciple, who inspired his interests in Alchemy. He mentions his teacher's name at many places, sometimes he says my master Jafar ibne Muhammad told me, sometimes he says, my master ordered me, etc etc. Imam Jafar Al-Sadiq was famed for his depth of knowledge. In addition to his knowledge of Islamic sciences, Imam Jafar was well informed about natural sciences, mathematics, philosophy, astronomy, anatomy, chemistry, and wrote several books on this topic.

After the Abbassids took over the power Jabir went back to Kufa, where he spent most of his career. Ibn Al-Nadeem informs us that Jabir used to stay in a lane called Golden lane (Darb Al-Dhahad), in Bab Al-Sham area in Kufa, where he established a laboratory and used to prepare elixir. This laboratory was rediscovered two centuries after his death during the reign of Izzuddaulah bin Muizzuddaulah, when the demolition of some houses was carried out in the quarter. Among other things brought to light were a mortar and a large piece of gold (Al Fihrist p 499). Some scholars have raised doubts about the authenticity of books attributed to Jabir. In this regard Ibn-Al-Nadeem states that after taking so many pains in reading and writing a book who would attribute that book to other person, it is sheer foolishness. Ibn Al-Nadeem categorically says that Jabir wrote a large number of books on Alchemy and other sciences. He gives the names of around 300 books which he himself saw, these include books on Alchemy, medicine, astronomy, morphology, and syntax, fiqh, philosophy, logic, poetry etc (Ibid p 500).

It seems from the list of books provided by Ibn Al Nadeem that while Jabir's main interest lays in chemistry, he was a widely read scholar and wrote on many

subjects. He was thus a man of culture and scholarship. He paved the way for most of the later Islamic alchemists including Al-Razi Al-Tughrai, and Al-Iraqi who lived in the 9th, 12th, and 13th centuries respectively. His books strongly influenced the medieval European alchemists. Paul Kraus has compiled his twenty treatises in the name of Mukhtar Rasail Jabir Ibn Hayyan, and published in 1354 AH in Cairo. The first treatise has 31 articles on various topics. Similarly, every treatise comprises of several articles. In one of the articles from Kitab al Khawas, Jabir narrates a story about effectiveness of elixir: “Yahya Ibn Khalid possessed a very valuable maid, unequalled in beauty and perfection and deportment and intelligence and accomplishments. One day she fell ill and though she drank medicine, it failed to cure her and she rapidly grew worse and finally became delirious. A messenger came to Yahya with the news and he asked me, what I advised? I had not seen her and thought she might be poisoned, so I recommended the application of cold water. This treatment was of no avail, so I ordered them to apply heated salt on her abdomen and to cover her feet. As she grew worse, Yahya at last asked me to go and see her, and I found her at the point of death from some obscure disease. Now I had a certain elixir with me, so I gave her a draught of two grains of it in three ounces of oxymel, and by Allah and by the rightness of my master the sickness departed from the damsel, and in less than half an hour she was well as ever. And Yahya fell at my feet and kissed them but I said Do not do so O my Brother and he asked me about the uses of Elixir and I gave him the remainder of it and explained how it was employed, there upon he applied himself to study of sciences and preserved until he knew many things, but he was not so clever as his son Jafar.” (Mukhtar Rasail p 303)

This story also shows his closeness to Bermakides. It is said that due to his intimate terms with Bermakides he was brought into relation with Caliph Haroom al- Rashid and later these connections cost him dearly. In A.D. 803 Haroom Rashid finally got rid of Bermakides who had grown so powerful as to be a continual menace to him and executed one of them and banished the rest. Jabir fled to Kufa from Baghdad where he spent the rest of his life. According to Hamzah al Umaayrah, during the last days of Jabir Mamun Al-Rashid along with Izuddin once visited him in Kufa. Jabir donated all his books to Mamun for Bait Al-Hikmah. He died at the age of 95 in AD 814/AH 194 while performing his fajr prayers. Caliph Mamun al Rashid along with a good number of scholars and disciples of Jabir attended his funeral. (Qissah Hayat Jabir Ibn Hayyan <http://www.lazemtefhan.com/2016/03/Jabir-Ibn-Hayyan-full-biography.html>).

Abu Bakr Al-Razi, the second most important figure in chemistry after Jabir, says in Sir Al-Asrar that Jabir was one of the genius persons of Arabia and the first scholar in Alchemy. Al-Razi always mentions him as Al-Ustaz Jabir Ibn Hayyan. Eric John, a famous historian, chemist and Arabist, in his book Makers of

Chemistry, elaborates on the evolution of Chemistry from the very beginning until modern times. In this work, he states that Islamic chemistry is in fact a base for modern Chemistry. He talks about several Muslim scientists, including Jabir ibn Hayyan. He names Jabir as father of Chemistry. According to Eric John, 'the peculiar characteristic of Jabir is, however, that in spite of his leanings to mysticism and superstition, he more clearly recognized and stated the importance of experiment than any other early chemist, and made noteworthy advance in both the theory and practice of chemistry. One of his chief contributions to the theory of chemistry lies in his views upon the constitution of the metals . . . on the practical side, Jabir was acquainted with the usual chemical operations such as crystallization, calcination, solution, sublimation, reduction, etc, and often describes them.' He further says, 'Jabir describes processes for the preparation of steel and the refinement of other metals, for dyeing clothes and leather, for making varnishes to water proof cloth and to protect iron, for the preparation of hair dyes and so on. He gives a recipe for making an illuminating ink for manuscripts from golden marcasite to replace the much more expensive one made from gold itself and he mentions the use of manganese dioxide in glass making. He knew how to concentrate acetic acid by the distillation of vinegar and was acquainted with citric acid and other organic substances. It is, indeed, abundantly evident that his experimental work was skillful and extensive, and that he realized the importance of experiment in chemistry. Perhaps his most useful discovery was that of nitric acid, the preparation of which is described for the first time in one of his books titled 'The chest of Wisdom' (Makers of Chemistry pp 56-59). Francis Bacon, the English philosopher said that Jabir was the first person who taught alchemy to the world and he is the father of alchemy (Al-Zirkali, Al-Aalaam Vol II pp 90-91). The renowned scholar of chemistry Marcelin Berthelot, who translated some of Jabir's books says that place of Jabir in Alchemy is that of Aristotle in Logic. (Idem). Jabir wrote so many books on various topics, including Alchemy, Astronomy, Medicine, Fiqh, etc. Some of them were translated in Latin and other European Languages. Some of these books are as follows:

- Kitab Al-Kimiya, translated by Robert of Chester
- Kitab Al-Sabeen, translated by Gerard of Cremona
- Kitab Al-Zaibaq (Mercury) and Kitab Al-Mizan, translated by Marcelin Berthlot
- Kitab Al-Zohra
- Kitab Al-Ahjar
- Kitab Al-Qamar
- Kitab Al-Shams
- Kitab Al-Khamair
- Kitab Al-Fiqh
- Kitab Al-Ardh
- Kitab Al-Khawas

- Kitab Al-Tabiah
- Kitab Al-Sanaah etc.

In short, Jabir was undoubtedly the greatest scientist produced by the Arab world who laid the foundation of Alchemy and paved the way for future generations of the world chemists to further develop the science of Chemistry. In the last but not the least, I would like to ask one question to myself and to others, that earlier Islamic seminaries (madaris) produced a good number of great scientists like Jabir, Al-Razi, Al-Tughrai, Al-Khwarizmi, Abu Ali Sina, and Al-Beruni etc, but now, why are madaris not able to produce even a single student of science?