ISSN: 0974-5823 Vol. 6 (Special Issue, Nov.-Dec. 2021)

International Journal of Mechanical Engineering

Jabir Ibn Hayyan: The Precursor of Modern Chemistry

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Abstract

The alchemy was infect being practiced about five or six thousand years ago in Egypt where the priests knew how to make pure copper, tin, lead, silver and gold from the earth and rocks. The first alchemical writing, at least in the western world, dated from the 3rd or 4th centuries A.D. but they already represented a flourishing science and it is though that the early alchemists were active during the first century. And no doubt that alchemy originated in the Hellenistic culture of Alexandria in Egypt. Geber, who was famous during the Middle Ages under the Arabic name Abu Musa Jabir Ibn Hayyan of 'Tus' or 'Tartus', credited with a vast knowledge of occult sciences. Very little is known about his life but many distinguished scholars claim that he lived at Kufa, presently in Iraq about 776 AD. Muslims made progress in chemistry as applied to medicine, in dying and in the art of cleaning. Al-Kindi, besides others, wrote about coloring Matters, glass-making, the processes of removing stain from cloth, and other similar subjects.

Keywords: Alchemy, Jaber, tannery, chemistry, discovery

Introduction:

Number of Personality say this world goodbye and go into oblivion forever, but a few of them resurrect from their hibernation with the passage of time. There are people who never die even after their formal death; they remain in the sub-consciousness of the human minds and remind the glorious past. Jabir Ibn Hayyan, a great son of the Arab soil belongs to the latter category. Though, he is not with us but narrates a glittering past of the Arab in the field of so called chemistry. Whether or not the world accepts his contributions, the fact remains unchanged.

That is, a perhaps, he was the one who paved the way for the smooth sail of chemistry in the domain of natural science. It is very difficult to determine exactly the share of the Muslims in the progress of chemical discoveries. According to a Western scholar Bon Carra De Vaux:

" the discoveries which Western tradition has described to Geber, those of aqua regales, of sulphuric acid, nitric acid and nitrate of silver, are not found in the Arabic works placed under these alchemist's name, but only in some Latin pamphlets at the end of the 13th century it seems, therefore, that the admiration affected by the Western peoples of Muslims alchemist is due to so much to their real worth, as to the general custom of looking to the East to the masters, Especially of the occult sciences."[2]

*The word "alchemy" brings to mind images of Perso-Scientists huddling over bows of liquids, dabbling in the occult. However, the true goal of alchemy was nothing less than the transmutation of the "base" (i.e. more reactive metals into gold). Alchemy also sought a single cure for all apparent impossibility, has overshadowed the very real contributions of alchemy has made to modern science. (David W. Tchanz, Jabir Ibn Hayyan and Arab Alchemists: maker of modern chemistry, 02/08/2001, website, www.google.com) the name "alchemy" appears in Islamic culture, hence it passed to Latin. It evolved from the Greek "chemei"(art of melting metals) or "chymos" (juice) (Roudgelet's philosophy of Encyclopedia, vol. 1 p. 155). The definition given by II. J. Sheppard, Alchemy is the art of liberating part of the Cosmos from temporal existence and achieving perfection which, for metals, gold, and for man, longevity, than immortality and finally redemption." And no doubt that alchemy originated in the Hellenistic culture of Alexandria in Egypt. (Encyclopedia Britannica, Vol.

1, p. 535). Western alchemist arose about 100 A.D. in the meeting place of Greek and Oriental culture, Alexandria in Egypt (Encyclopedia Americana, Vol. 1, p. 510).

The area of Arabs contribution to chemistry perhaps he has rightly been pointed out by the above scholars as observed:

"Muslims made progress in chemistry as applied to medicine, in dying and in the art of cleaning. Al-Kindi, besides others, wrote about coloring Matters, glass-making, the processes of removing stain from cloth, and other similar subjects."[3]

Life sketch of Jabir:

Geber, who was famous during the Middle Ages under the Arabic name Abu Musa Jabir Ibn Hayyan of '*Tus*' or '*Tartus*', credited with a vast knowledge of occult sciences. Very little is known about his life but many distinguished scholars claim that he lived at Kufa (Presently in Iraq) about 776 AD.[4]

Jabir was very intelligent in his childhood. Curiosity was his main quality of life. He was one of those who trouble the elders by questioning and sometimes it was so complex that a intellectual could dare to open his mouth but tactfully.

When his father was assassinated due to anti-Umayyad sentiments, Jabir became helpless. The family shifted from 'Tartus (Syria) to 'Tus' (Iran), where he found a suitable atmosphere of learning.

To test his metal, his relatives sent him to the prominent teacher of 'Tartus, ' Harabi al-Hamiri under whom he studied mathematics, astronomy, astrology, philosophy and religion within a short span, he acquire the mastery over these subjects. Then he inclined towards chemistry.

During his stay at 'Tus', he went to the Imam Jafar al-Sadiq who was bosom friend of his father. He started learning from this great teacher and obtained the knowledge of science and jurisprudence. He took great interest in astronomy and chemistry. Imam Ja'far al-Sadiq gave him the book – *"Kitab al-Qaratis"* (Book of Papers), from which he benefitted much and came to know the secrets of chemistry.

With the Abbasids coming to power, Jabir came to the city of Kufa, (the early capital of Abbasids) and settled there. He opened a shop of drugs as his father did in 'Tartus', and chemical laboratory.

When the Abbasid caliph Abu Ja'far al-Mansur took rein of the government after Abul Abbas , he found the city of Baghdad, where a great number of scholars, physicians, and literatures migrated from different parts of the country. Jabir also migrated with his family and set up his laboratory, and visited throughout the Abbasid Caliphate and finally he came close to the Barmakites.[5]

The Barmakites are considered to be among the successful viziers of the world. Perhaps without the success of Abbasids would have been a dream and did not find a practical expression. A Persian family, which produced the first Persian Ministers of the Caliphate Barkmak was a personal name but denoted the rank of hereditary chief Priest in the temple of Nawabahar in Balkh. This Temple belonged to the Buddhist community as it appears from the name "Nawabahar" means new monastery in Sanskrit. And the original word was Nav-Vihar. In their last days they were at loggerheads with the Abbasid Caliph Haroon al-Rasheed, which let to their assassinations.[6]

Jabir also developed and intimacy with the king Haroon al-Rasheed. But with the assassinations of the Barkaites he took to his heel to 'Tus' apprehending the same date for himself. However, he was bestowed an amnesty by the king and took his last breach in 803 AD.[7]

The firs eminent Arab author who shot to prominence in the domain of alchemy was Umayyad Prince, Khalid bin Yazid (d. 704 A.D.) he was the disciple of a Syrian monk Morienus and said to have dedicated a treatise to this master. Similarly, he was enlightened with the ideas of Imam Ja'far al-Sadiq on the subject.

Several other alchemists also ventured the alchemical activities during 859 AD. They can be narrated as Dhul-Nun al-Mishri (d.859 AD.), who's real name was Abul Fayd Thawhan bin Ibrahim, Dhul Nun. The people of Egypt, among who he lived, looked upon him as *Zindiq* (free thinker). According to Fihrist he was among those philosophers who discoursed on alchemy, and Ibnul Qifti considers medicine like Paracelsus, he combined alchemy in magic.

Moslem Ibn al-Wahshiya (c.870 AD.) wrote the book Nabatean Agriculture (*Kitab al-Falahat al-Nabatiyya*), in 904 A.D. It is known that he has translated it from the Chaldaean Language.[8]

In the 10th century A.D. another renowed medical philosopher, Abu Bakr Muhammad Bin Zakaria al-Razi, known in the West by Razez was an enthusiastic student of alchemy. He dedicated a famous book in medicine al-Mansuri to his patron Abu Salin Mansur. He also presented him the book " Kitebithab al-Kimiya". His another book on this field as "Kitab al-Asrar" (the Book of Secret) . He died in 320 A. H.

Another important writer, Maslama al-Majriti i.e. Madrid, (1004 AD.). He traveled extensively throughout the East and collected many famous works of the "Brethern of Purity", the alchemical works during his journey and brought to this native country. He had great skill in the area of alchemy. His book of alchemy is known as *"Kanz al-Fa'iil*" (Treasury of Accomplishment).

Tughrai, who died about 515 A.H. was the vizier of Seleucid Sultan Masu'd at Mosul (In Syria). He is credited to have many alchemical works and become famous as an alchemist. He wrote on alchemy *"Jamil al-Asrar*" (Compendium of Secrets), an article on the "Philosopher's Stone', and a commentary of Geber's "Book of Mercy".

Ghazzali, the famous philosopher of 11th century believed in alchemy, He wrote a number of articles in the field of chemistry, one of them is *"Maqala al-Fauz"* (The Lecture of Prevention).[9]

Jabir's Works:

Whoever of all contemporaries who expressed enough potentially in the domain of alchemy ultimately bowed down in front of the famous works of Jabir Ibn Hayyan, who produced more than hundred treatises concerning alchemy. Although most of them have vanished by the cruel hands of the time but a few of them have already existed in the Western libraries. They are the excellent witnesses of Jabir's production in the field of alchemy. A large number of books included in Jabir's corpus. Among them the book *"Kitab al-Kimya"* (The Book of Chemistry) and *"Kitab al-Sabeen"* (the Book of Seventy) were translated in to Latin and various other European Languages. Form centuries these works of Jabir served as the ultimate authority and guideline to the European scientists, including Boger Bacon (1214-94), Arnold F. Villanova (1240-1313) and Albbertus Megnuns (1193-1280)and these translatin of Jabir's work remained popular in Europe for several centures which have widened the alchemical thinking among the then scientists and paved the way tfor the evolution of modern chemistry.

Among the books of Jabir how many of them are still existing in Arabic and how many of them are translated into Latin is to my mind yet to be ascertained. However, the available works of Jabir in Arabic included – *"Kitab al-Sabeen"* (The Book of Seventy) and *"Kitab al-Mizan"* (The Book of Balance).

Also around the year 1300 AD. Another Jabir's book – "Summa Perfectionist Magesterii" (Sum of Perfection) translated into Latin. This book is contained with four treatises, which are also translated from Arabic. They are as, "De Investigation Perfectinis" (The Investigation of Perfection) "De Inventione Fornacum" (Testament), "De Inventione Veritatis" (The Book of Vrity) and "Liber Fornacum" (The Book of Fornaces).[10]

The historian Ibn Halun doubted the authenticity of the works of Kalid bin Yezid. To him, a Bedouin Arab cannot perform such an excellent work it has to be ascribed to somebody else.[11]

Achievements:

The achievement of Jabir include almost every branch of science. His works cover all subjects including philosophy, linguistics, astronomy, magic, cosmology, theology, metaphysics, liberal arts, medicine, agriculture, technology, but alchemy is the main stream of his achievements.

During his early age he started investigation, experimentation and intensive search in the field of chemistry and established many laboratories in "Tartus", Kufa and Baghdad in his lifetime. Jabir was the first to introduce the **fireproof dress** and the **"*Mizan al-Hawa*"** (The Balance of winds). Again he invented the skin purifier chemical by which skin could easily be purified and is used for the wearing dress. Introduction of **tannery** is the best example of his contribution in the of skin industry. According to Muhammad Fathi Sabri of "Jabir Ibn Hayyan: Abu al-Kimya", Jabir was the first to think about **human cloning**, which is now become the attractive and successful invention of the Western scientists.[12]

He introduced number of scientific techniques and confirmed his position in the field .He concentrated on crystallization, distillation, calcinations, sublimations, evaporations, and updating pertaining to various instruments regarding alchemy. It goes without saying that the primary development of chemistry was the

efforts of the Arabs only and none else. Discovery of mineral and other acids are the extraordinary practical achievement of Jabir.

Besides, he has numerous other things for which he has to be credited. He tried to see different properties of deferent elements and their reactionary processes, and he came out with varied results. He developed a number of applied chemical processes. His achievements include preparation of various metals, development of steel, dying of cloths, preparation of rusting tattering in gold, identification of paints, greases etc.

He devoted his whole life in experimental thinking and to achieve the new elements from the nature. During the course of these practical endeavors, he also developed Aqua Regina to dissolve gold. The alembic is the great invention, which paved the way for process of distillation.

According to Jabir the elements are of these types. To him, the first is sprit i.e. those which vaporize on heating. Like camphor, arsenic and ammonium chloride; the second is metal, for example gold, silver, lead, copper, iron and the third is, compounds, which can be converted into power. Thus, he paved the way for later classification as metals, non-metals and volatile substances.

Although Jabir is known as an alchemist, he did not care of the preparation of noble metals as an alchemist. Instead, he devoted his time an energy to the promotion of basic chemical methods and to study the major chemical reactions that way he introduced he introduced the method of evolution of chemistry as a science from the legends of alchemy. He emphasized that in chemical reaction the definite qualities of various substances are involved.

The development of alchemy in the Middle Age had a strong bearing with the Aristotelian theory of the composition of metal. According to Aristotle, all matters from woods, rocks, to plants and the human beings were composed of four irreducible elements; water, earth, fire and air.

Jabir though of sulfur mercury and various metal compositions and he spent much times to explain the metallic properties. He had a great faith in alchemy and though to use elixir in transmulating base metals into gold.

Jabir played a great role in modification of Aristotelian concept of four elements. He also adopted the Chinese alchemical concepts of a “Philosopher’s Stone” and the Egyptians “Elixir of life.”

He is also the first to analyze the preparation of **cinnabar, resinous oxide, alum, alkalis, antimony, saltpeter, mercury oxide** and **lead**.

He prepared for the first time, the acids like **nitric**, **hydrochloric, citric,** and **tartaric acids** and he took great interest in their systematic experimentations,, and these can justly be regarded as the precursor of modern chemistry.[13]

Conclusion:

Looking at his works and the achievements of a great Arab scientist like Jabir, one can hardly doubt the authenticity of this works and his immortal contributions to the chemistry. Almost tit has become a traditions of the world that the man is recognize after his demise and it remembered for irrefutable achievements. Keeping in view, this tradition as a world phenomenon. One can hardly wonder at the controversies and defense of opinions revolving around Jabir.

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