

## Part II

In part I we examined the prominence of the school of the Imam Ja'far as-Sadiq in the religious sciences, and discussed the reasons for its pre-eminence. Now we shall see how it also contributed to other branches of knowledge, those of the natural sciences.

(a) *CHEMISTRY*. Jabir b. Hayyan (the Geber of the Latins), who has been called one of the 'fathers of chemistry' and 'the most famous Arabic alchemist'<sup>1</sup>, was one of the students of the Imam Ja'far, as-Sadiq. The quantity of Jabir's output is quite staggering: besides his writings in chemistry, he wrote 1,300 treatises on mechanics, 500 on medicine, and 500 against Greek philosophy, not to mention other subjects.

The number of his books which have been printed in Latin, French and German since the 17th century comes to thirty, if we count his '500 booklets' as one book. There are 36 known manuscripts of his works in the British Museum, the Biblioteque Nationale in Paris and in other libraries in Germany, Egypt, Iran and Turkey. The extent to which he is indebted to the Imam Ja'far as-Sadiq in his research and teachings may be judged from the fact that in many of his books we find: 'My master and *mawla*. Ja'far. peace be upon him, told me that ...', and in his book, '*al Manfa'a*' he explicitly says: 'I acquired this knowledge from Ja'far b. Muhammad, the leader of the people in his time'<sup>2</sup>.

George Sarton, referring to Jabir's untranslated work, writes: 'We find in them remarkably sound views on methods of chemical research; a theory on the geologic formation of metals; the so-called sulphur-mercury theory of metals ...; preparation of various substances (e.g., basic lead carbonate; arsenic; and antimony from their sulphides).

Jabir deals also with various applications, e.g., refinement of metals, preparation of steel. dyeing of cloth and leather, varnishes to waterproof cloth and protect iron, use of manganese dioxide in glass making, use of iron pyrites for writing in gold, distillation of vinegar to concentrate acetic acid. He observed the imponderability of magnetic force<sup>3</sup>. He also discovered that each metal and material had a basic weight; he called this 'the knowledge of weights, '*ilm al-mawazin*'<sup>4</sup>. He was, in the words of Sarton: 'a very great personality, one of the greatest in mediaeval science'<sup>5</sup>.

Several of his writings have been translated by scholars such as M. Berthelot, Octave Houdas, E. J. Holmyard, Ernst Darmstaedter and Max Mayerhoff. Berthelot wrote in his 'History of Chemistry': 'The name Jabir holds the same place in the history of chemistry which the name of Aristotle holds in the history of logic<sup>6</sup>.' Holmyard wrote: 'Jabir was the student and friend of Ja'far as-Sadiq; and he found in his incomparable Imam a supporter and helper, the trustworthy guide and helmsman whose direction is always needed. And Jabir wanted to free chemistry, through the direction of his teacher, from the myths of the ancients which had held it in shackles since Alexandria; and he succeeded to a great extent in this aim<sup>7</sup>.'

(b) *ANATOMY*. A Hindu physician attached to the court of al-Mansur once asked the Imam Ja'far as-Sadiq if he wanted to learn something in this field from him. The Imam said: 'No. What I have is better than what you have.' Then began a very interesting discourse, in which the Imam asked the physician questions like these: Why is the head covered with hair? Why are there lines and wrinkles on the forehead? Why are the eyes shaped like almonds? Why has the nose been placed between the eyes? Why are the hair and the nails without life (sensation)? These questions moved from the head downwards, till he ended up by asking: Why do the knees fold backwards, and why is the foot hollow on one side?

To all these questions, the physician had only one reply: 'I do not know.' The Imam said: 'But I do know.' Then he explained all the questions, showing the wisdom and power of the Creator. The hair is created over the head so that oil may reach inside, and heat may go out through it, and so that it may protect the head from heat and cold. There are lines and wrinkles on the forehead so that sweat from the head does not reach the eyes. giving the person a chance to wipe it away.

The eyes are almond-shaped so as to make it easy to put medicine inside them and remove dirt from them. Had they been square or round, both would have been difficult. The nose is put between the eyes as it helps to divide the light equally towards both eyes. The hair and nails lack sensation to make it easier to cut and trim them. If there were life in them it would have hurt a person to cut them. The knees fold backwards because human beings walk forward, and the foot is hollow to make movement easier.' The physician became a convert to Islam<sup>8</sup>.

A booklet which was dictated by the Imam Ja'far as-Sadiq in four sessions to his disciple Mufaddal b. 'Umar was widely narrated, and has been widely studied and copied to the present day; al-Majlisi copied the whole book into the second volume of his '*Bihar al Anwar*'<sup>9</sup>. In this book, the Imam explained the wonders of creation, showing at every stage how all of it is inter related and could not have come into being by chance. In the first session, he explained the creation of man, his organs of perception, the power of his mind, his gradual development. and all the functions of body and mind.

In the second session. he explained the animal world and its common features; then he divided animals into groups: carnivorous and herbivorous animals; birds and reptiles; and so forth, explaining every group's special characteristics. In the process of doing this he described the donkey. the dog, the

elephant, the giraffe, the monkey, domestic mammals, reindeer, the fox, the dolphin, the python the ant, the spider, the chicken, the peacock the pheasant, the flamingo, the sparrow, the owl, the bat, the bee, the locust and fish.

The third session was devoted to geography. geology. astronomy (not astrology) and other related subjects, such as minerals, trees and medicine. In the last session the Imam dealt with the most common objection made by atheists: If there is a Creator, then why is there so much suffering in the world? The Imam answered this with the same attention to detail as he had shown in the previous sessions, with systematic arguments. This book is a treasure of knowledge, written to refute the ideas of atheists. Everywhere the Imam draws attention to the wisdom and power of the Creator.

Two examples will be given here at random. 'Allah created eyesight to perceive colours; had there been colour but no eye to see it, there would have been no use for colour. And He created hearing to perceive sounds: had there been sounds but no ear to hear them, there would have been no reason to have them. The same is true for all kinds of perception. and the same is true in the opposite sense: had there been eyesight but no colour to see, eyesight would have been useless; and if there had been ears, but no sounds to hear, ears would also have been useless.

Now, see how Allah has gauged everything to fit with everything else. For every organ of perception he made something for it to perceive, and for every sensory phenomenon something to perceive it. Not only that. but He created the medium between the organs of perception and their objects, without which perception could not take place; for example, light and air: if there were no light eyesight could not perceive colour; and if there were no air to carry sounds to the ear, it could not hear them. Can someone with a sound mind who observes all these interconnected phenomena fail to admit that they could not exist without the Will and Measuring of a Merciful, All-Knowing Creator?[10](#)

At one point Mufaddal said: 'O My Master! Some people think that all this was made by nature ' The Imam dictated: 'Ask them about this nature. Is it a thing which has the knowledge and power for such work? Or is it without knowledge and power? If they say that it has knowledge and power, then why should they disbelieve in a Creator, because these [i.e., knowledge and power] are His attributes. And if they think that nature does it without knowledge and will, and yet there is so much wisdom and perfection in these works, they must admit that it could come only from a Wise Creator. [The fact is that] nature is only [a name for] the system in creation which operates as He has made it operate[11](#).'

There is an interesting aside in the fourth day's session, where the Imam said: 'The name of the universe in Greek is *qusmus* (kosmos), and it means 'adornment'. This name was given to it by their philosophers and wise men. Could they have named it so except because of the order and system which they found there? They were not content to call it a system; they called it an 'adornment' to show that the order and system found therein has the highest degree of beauty and splendour.'

[1](#). G. Sarton. Introduction to the History of Science, vol. 1. Baltimore. 1927. p. 532

[2](#). 'Abdullah Nima. Falasifat ash Shi'a, Beirut, 1966. p. 196. This book is an excellent source for those who wish to examine

the contribution of Shiah scholars to philosophy and science. The author discusses Jabirs life and contribution between pp. 184 and 231.

[3.](#) G. Sarton. op. cit., p. 532. For the Imam Ja'far as Sadiq. see, ibid.. p. 508

[4.](#) Quoted by Abdullah Ni'ma. op. cit., pp. 61. 187.

[5.](#) G. Sarton. op. cit., p. 532

[6.](#) Quoted by 'Abdullah Ni'ma. op. cit., p. 187

[7.](#) Quoted by 'Abdullah Niima. ibid., pp. 193–4

[8.](#) ash-Shaykh as-Saduq, Ilal ash shari'a, n.p., 1311. p. 44

[9.](#) al Majlisi, Bihar al Anwar. new ed.. vol. 111, pp. 57–151

[10.](#) ibid.,p.69.

[11.](#) ibid., p. 67. 34. ibid., p. 146

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