

## (.The Scientific Progress during the Time of Imam Reza (A.S

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The time of Imam Reza, peace be on him, was called the Golden Time. It was the most brilliant and wonderful of all the times in Islamic history. That is because building prospered; agriculture developed; the Islamic state dominated most regions of the world as well as Baghdad became the capital of Islamic world; rather the capital of the world, for it was the greatest city to which scholars and diplomats from everywhere in the world came in order to obtain an office in the state or to present the needs of their countries in the fields of administration, economy, and science.

We must mention the affairs of that time, for there is a close relationship between them and the research on the life of Imam Reza, peace be on him.

### **The Scientific Life**

The scientific life in the time of Imam Reza bloomed, and its activities in all kinds of science grew. That was the most developed kind of civilization progress which the 'Abbasid state reached in all periods of its reign. We will briefly present some aspects of this scientific progress as follows:

### **The Satellite of Ibn al-Muqanna'**

Among the most marvelous inventions of that time was the satellite which was made by 'Ata' al-Khurasani, better known as Ibn al-Muqanna'. That satellite appeared and the people saw it from a two-month distance, and then it disappeared from them, and concerning it Abu al-'Ala' al-Ma'arri has said:

Be watchful! The satellite whose head is masked is error and enticement just as the satellite of al-Muqanna'.<sup>[1]</sup> The poet Abu al-Qasim Hibat Allah b. Sana' al-Mulk has referred to it in a poem, saying:

To you, the satellite of al-Muqanna' when rising is not more charming than that of the turbaned one.<sup>[2]</sup> However our references have not mentioned how that satellite was made and its apparatuses as well as they have not referred to the country where the satellite was made. More likely, it was made in Baghdad, the Capital of the 'Abbasid government in that time, any how, the making of that satellite is regarded as the greatest scientific achievement in those times.

Yet another example of the scientific achievements in those times was the usage of crystal in making ships. This has been mentioned by some historians.

### **The Institutes and Libraries**

The 'Abbasid government established institutes and libraries in Baghdad, that Islamic and non-Islamic sciences might be studied therein. The Government founded therein thirty marvelous schools; the most famous of them was al-Nizamiya.[3] Moreover it established therein public libraries the most important of which is:

### **The Depository of Wisdom**

Harun al-Rashīd brought to it his personal library and added to it the books which were collected by his father al-Mahdi and his grandfather al-Mansur. Then al-Ma'mun asked the Emir of Siqliya for some philosophical and scientific books. He added these books to the Depository of Wisdom (Bayt al-Hikma) after he had received them as well as he brought to it many books from Khurasan. Wherever he heard of a book, he brought the book to it.[4]

Sahl b. Harun b. Rahbun was a scribe in the Depository of Wisdom, and then he was appointed by al-Ma'mun as a keeper of the philosophical books which were brought from the Island of Cyprus. When al-Ma'mun made peace with the leader of the Island, he asked him to send him the books which were collected by the Greeks in a house and which none came to know except them. So the leader of the Island gathered his retinues and men of opinion and counseled with them about carrying the books to al-Ma'mun, and they advised him not to carry them to him except one archbishop who said to him: "I think that you should be quick in sending the books to him, for if these sciences enter a state, they will corrupt it and sow division among its scholars; therefore, send them to al-Ma'mun." Al-Ma'mun became delighted at them and appointed Sahl as a keeper over them.[5] It is worth mentioning that Ghaylan al-Farisi was the general keeper of the library and was scribe of al-Rashīd and al-Ma'mun.

This library continued supplying researchers and scholars with various kinds of science. When Hulagu, the Mongol shedder of blood, occupied Baghdad, he destroyed the library, and hence Islam world lost its most important heritage.

### **The Translation of Books**

Among the aspects of the development of the cultural and scientific life in that time was translating books from foreign languages into Arabic including medical, mathematical, astronomical books as well as philosophical and political sciences. In his book al-Fihrist, Ibn

al-Nadīm has mentioned many names of these books. Hanīn b. Ishaq was the head of the Translation Department. Ibn al-Nadīm narrated: "Al-Ma'mun exchanged letters with the Romanian King. He turned to him for help, wrote to him, and asked permission to send him what he chose of the old books stored in Rome. He (the Romanian King) responded to him after a refusal. Accordingly, al-Ma'mun delegated for that a group of persons including al-Hajjaj b. Matar, Ibn al-Batriq, Salam (the keeper of the House of Wisdom), and others. They chose books from what they found. When they brought them to al-Ma'mun, he ordered them to carry the books to the Depository of Wisdom.[6]"

Of course, the books translated into Arabic developed Arab and Islamic thought and, in addition, they contributed in improving sciences in Islamic world, for many students worked in studying and understanding them.

### **The Maps and Observatories**

Among the aspects of the scientific progress of that time is that al-Ma'mun ordered a world map to be drawn and it was called al-Ma'mun's Map (al-Sura al-Ma'muniya), and it was the first world map to be drawn during the 'Abbasid time, as well as he ordered an observatory to be established, and it was established at al-Shammasiya, a district in Baghdad.[7]

### **The Dominating Sciences**

As for the sciences which dominated that time, they were the sciences of the Qur'an, which are as follows:

#### **1. The Interpretation of the Qur'an**

This science means interpreting the verses of the Holy Qur'an, clarifying their meanings, distinguishing the abrogating verses from the abrogated, the unlimited verses from the limited, the general from the specific, and so on. The interpreters followed two ways in their interpretations: A. Interpreting the Qur'an according to transmitted traditions, by this we mean interpreting the Holy Qur'an according to the traditions transmitted from the Prophet, may Allah bless him and his family, and the good Imams; this method was followed by most Shi'ite interpreters such as the Interpretation of al-Qummi, al-Burhan, al-'Askari, and others. The argument of Shi'ites concerning this method of interpreting is that it is the Imams who were singled out for the knowledge of the Qur'an, and that it is they who were knowledgeable in interpreting it. Imam Abu Ja'far al-Baqir, peace be on him, said: "None can claim that he has knowledge of the surface and deep meaning of the Qur'an except the testamentary trustees

(i.e. the Imams).[8]"

Shaykh al-Tusi, Shaykh of the Shi'ite Sect, said: "It is not permissible to interpret the Qur'an except with the authentic traditions transmitted from the Prophet, may Allah bless him and his family, and the Imams whose statement is an argument like that of the Prophet, may Allah bless him and his family.[9]"

B. Interpreting the Qur'an according to opinion, by this we mean interpreting the Qur'an according to the approved, rational considerations. This method was followed by the interpreters from among the Mu'tazilites and the Batiniya who did not take care of the traditions reported from the Imams of guidance, peace be on him, concerning the interpretation of the Holy Qur'an, who interpreted the Qur'an according to their approved, rational considerations only.[10] As for interpreting the Qur'an according to the surface meanings, it is not regarded as a method of interpretation, but it is not objected.

It is worth mentioning that the first school to be established in Islam for interpreting the Qur'an according to the transmitted traditions was at the time of Imam 'Ali, the Commander of the faithful, peace be on him, for he was the first interpreter of the Qur'an, and under him studied 'Abd Allah b. 'Abbas, the scholar of the community, and other prominent companions (of the Prophet). Then, after him, the pure Imams began, through their lectures, interpreting the Qur'an, the causes of the revelation of the Qur'an, and the excellence of reciting its verses.

## 2. The Hadith (Tradition)

Among the sciences which dominated that time is the science of the hadith, by this we mean the traditions transmitted from the Prophet, may Allah bless him and his family, or from one of his testamentary trustees, the pure Imams, namely their words, their actions, their justifications, for they are part of the Sunna, and in the Sunna - just as in the Holy Qur'an - there is the general, the specific, the unlimited, the limited, and the like.

The Shi'ites were the first to write down the traditions, for the Imams of guidance urged their companions to do that. In this connection, Abu Basir narrated, saying: "I went in to Imam Abu 'Abd Allah al-Sadiq, peace be on him, and he said: 'What has prevented you from writing down (our traditions)? You will not memorize (our traditions) unless you write (them).

A group of the Basrans asked me about something, wrote them down, and departed.[11]" A group of the companions of Imam Reza, peace be on him, collected the authentic traditions in big, comprehensive books which are the first comprehensive books of the Imami Shi'ites and regarded as the foundation of writing down the four comprehensive books by the three Muslim Shaykhs.[12]

#### **4. Science of Islamic Jurisprudence**

Science of Islamic jurisprudence is the greatest of all Islamic sciences and most distinguished of the them, so it was widespread in that time and the rest of times. This honorable science is responsible for rendering knowledge of required, religious duties imposed on the bounded who are responsible before Allah for following and putting them into practice.

The Imams of the members of the House (ahl al-Bayt), peace be on him, played an active role in establishing a jurisprudence school which included the eminent jurists and scholars such as Zarara, Mohammed b. Muslim, Jabir b. Yazid al-Ju'fi, Abu Hanifa, and the like. These jurists and scholars recorded what they had heard from the pure Imams in their fundamentals which they are about four hundreds, and which were rectified and gathered in the four books to which the Imami jurists refer for concluding lawful precepts.

The Shi'ites are regarded as the first to record jurisprudence. In this regard Mustafa 'Abd al-Razzaq said: "The Shi'ites were the quickest of the rest of the Muslims in inclining to writing down jurisprudence. It is rational that the Shi'ites were the quickest in clinging to recording the lawful rules because their belief in the infallibility or semi infallibility of their Imams urged them to write down their legal decisions, their formal and legal opinions.<sup>[13]</sup>"

#### **4. Science of Fundamentals**

Among the sciences which were studied in those times and the like was deriving religious decisions (ijtihad); this science was founded by the greatest Imam Abu Ja'far Mohammed al-Baqir, peace be on him.<sup>[14]</sup>

#### **5. Grammar**

Grammar was among the sciences which played an important role during the 'Abbasid time, for some of its matters and researches were the object of heated argument at gatherings held in the palaces of the Caliphs; disputes and heated arguments concerning some of its matters took place among the leading grammarians in the presence of the 'Abbasid Caliph. A group of great figures specialized in this science; at their head were al-Kisa'i, al-Farra', Sibawayh, and this science was established by Imam 'Ali, the Commander of the faithful, peace be on him, the pioneer of wisdom and knowledge in Islam.

#### **6. Theology**

As for theology, it was widespread in that time. The scholars and the theologians discussed important researches on this science in order to defend their beliefs. On the top of the

theologians was Hisham b. al-Hakam, the student of Imam Ja'far al-Sadiq, peace be on him, who disproved the beliefs of his opponents and established with his definite proofs the creed of the members of the House (ahl al-Bayt), peace be on him, which Allah has chosen for His servants.

Some Sunni famous theologians were Wasil b. 'Ata', Abu al-Hudhayl al-'Allaf, Abu al-Hasan al-Ash'ari, and Hujjat al-Islam al-Ghazali.

## **7. Medicine**

Medicine was widespread during that time. Imam Reza, peace be on him, was at the head of the scientists in this science, and his dissertation in medicine is regarded as the most marvelous medical research, hence it has been called the Golden Dissertation (al-Risala al-Dhahabiya). The 'Abbasid kings encouraged people to study this science and spent a lot of money on the specialists in it such as Gabriel b. Bakhtishu', the skillful doctor.

## **8. Chemistry**

Chemistry was among the most important sciences which attained great care in that time. Jabir b. Hayyan, the pride of the Arab east, was specialist in it; he received his researches from the greatest figure of Islamic thought, Imam Ja'far al-Sadiq, peace be on him, whom some western scholars called the thinking brain of humanity, for it was he who established this science.

## **9. Architecture and Civil Engineering**

Architecture and civil engineering reached zenith in that time, for the architects were creative in their designing the palaces of the caliphs whether in Baghdad or in Samra'. Those palaces were the largest building throughout history. An example of the marvelous architectural designs is the ponds which were made in Samra', which the poets adored, and which astonished the minds of the scholars, in addition to that there were wonderful paintings and the Hanging Gardens the like of which has not been made even in this century when architecture and technology have reached top.

## **10. Astronomy**

Astronomy was among the dominating sciences in that time. Al-Ma'mun, the 'Abbasid, was one of those who were specialists in it. These are some sciences, which dominated that time, and which represented intellectual freedom and technology in the time of the Imam, peace be

on him.

### **The Scientific Centers 1. Baghdad**

Baghdad was one of the cities of knowledge in Islamic world, for it was, as we have mentioned before, the capital of the supreme authority and of knowledge; various kinds of culture dominated it; in it spread institutes, schools, the Depository of Wisdom, public and private libraries.

### **2. Yathrib**

As for Yathrib (Medina), it was the most important scientific center in Islamic world, for the school of the members of the House (ahl al-Bayt), peace be on them, was established wherein, and it included the leading jurists and religious scholars who took care of recording the traditions of the Imams of guidance, peace be on them, especially as it concerns their traditions on jurisprudence, which is the most perfect system in Islam. The school of the next generation (tabi'in) was also established therein; it was the school which took great care of the jurisprudence which was narrated on the authority of the companions (of the Prophet).

### **3. Kufa**

Kufa was more important than Yathrib, for in it was the greatest mosque (al-jam' al-A'zam) which was a public center for Islamic studies and, in addition, there were seminars including hundreds of students who studied under professors specialist in Islamic sciences such as jurisprudence, the interpretation of the Qur'an, the hadith (tradition), and Arabic. The school of Kufa objectively took care of the sciences of the members of the House (ahl al-Bayt), peace be on them. Al-Hasan b. 'Ali al-Washsha reported, saying: "I met nine hundred shaykhs in this mosque (i.e. the mosque of Kufa) and all of them said: 'Ja'far b. Mohammed related to me (traditions).'[15]"

Important families of knowledge graduated from the mosque of Kufa. They are as follows: the family of Hayyan al-Taghlubi, the family of A'yun, the children of 'Atiya, the house of the children of Darraj, and others.[16] A grammar school was established in Kufa; one of its prominent teachers was al-Kisa'i, whom (Harun) al-Rashid entrusted with teaching his two sons, al-Amīn and al-Ma'mun.[17]

### **4. Basrah**

As for Basrah, it was an important center of grammar. Abu al-Aswad al-Du'ali, the student of

Imam 'Ali, the Commander of the faithful, peace be on him, was the first to establish this school. This school competed with the school of Kufa (for Arabic Grammar). The Basran grammarians were called the men of logic in order to distinguish them from the Kufans grammarians. Among the leading grammarians of this school was Sībawayh, who compiled Kitab Sībawayh (the Book of Sībawayh) in grammar, which is the ripest of Arabic books and the best of them in depth and originality. Daybur said: "If we look at the book of Sībawayh, we will find it a ripe work and great effort to the extent that the later authors said: 'The book must be the fruit of cooperating efforts of many scholars just like the Law (qanun) of Ibn Sīna.'<sup>[18]</sup>" Basrah was not only an important center of grammar but also was a school of the science of interpreting the Holy Qur'an. Among the prominent scholars in this science was Abu 'Amru b. al-'Ala'. Besides Basrah was the school of prosody and linguistics. Among the specialists in these two sciences was al-Khalīl b. Ahmed, the author of the book al-'Ayn, which is the first linguistic dictionary written in Arabic.<sup>[19]</sup>

These are some aspects of the cultural and scientific life of that time; generally speaking, Imam Reza, peace be on him, was the first pioneer of the scientific movement, for the scholars and the jurists gathered around him in order to study his pure sciences, as well as sessions were held in the 'Abbasid palace including the great scholars whom al-Ma'mun summoned in order to test Imam Reza, peace be on him, but they went out of the palace and announced the Imam's excellence and mentioned with admiration his many scientific abilities.

#### Sources:

- [1] Al-A'lam, vol. 5, p. 29.
- [2] Ibn Khullakan, Wafayat al-A'yan, vol. 2, p. 426.
- [3] Rihlat Ibn Jubayr, p. 208.
- [4] Hayat al-Imam Mohammed al-Jawad, p. 197.
- [5] Tamhīd Li Tarīkh al-Falsafa, p. 47.
- [6] Ibn al-Nadīm, al-Fihrist, p. 339.
- [7] 'Asr al-Ma'mun, vol. 1, p. 375.
- [8] Al-Tibyan, vol. 1, p. 4.
- [9] Hayat al-Imam al-Baqir, vol. 1, p. 181.
- [10] Ibid.
- [11] Hayat al-Imam al-Mohammed al-Jawad, p. 194.
- [12] Muqaddamat al-Muqni' wa al-Hidaya, p. 10.
- [13] Tamhīd Li Tarīkh al-Falsafa al-Islamiya, pp. 202-203.



[14]Hayat al-Imam al-Mohammed al-Jawad, p. 195.

[15]Hayat al-Imam Musa b. Ja'far, vol. 1, p. 82.

[16]Tarikh al-Islam, vol. 2, p. 338.

[17]Hayat al-Imam Mohammed al-Jawad, p. 191.

[18]Tarikh al-Falsafa fi al-Islam, p. 39.

[19]Hayat al-Imam Mohammed al-Jawad, p. 192.