CLASSIFICATION OF SCIENCES AND SCIENTIFIC HERITAGE OF ABU ABDULLAH AL-KHORAZMI

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Abstract
The article scientifically analyzed the scientific heritage and classification of sciences of the great Khorezmian scientist Abu Abdullah al-Khwarizmi. The main work in the field of classification of sciences is "Mafatih al-ulum" (mfatih al-alvm) ("The Key of Sciences"), an encyclopedic work that provides information about the science and culture of the Muslim countries of the East in its time, and contains almost all scientific fields of that time: jurisprudence, philosophy, logic, poetry. , including calculus, geometry, chemistry, and more. The article scientifically substantiates the lunar scientific heritage of Abu Abdullah al-Khwarizmi and his main contributions to science.

Keywords: classification of sciences, science, culture, heritage, scientific heritage, jurisprudence, philosophy, logic, poetry, arithmetic, geometry.

Abu Abdullah Muhammad ibn Ahmad ibn Yusuf al-Khwarizmi (d. 997) was born and raised in Khorezm and was educated (mainly in the city of Kat), then lived in various cities of the Samanid state (Nishapur, Bukhara), minister of the Samanids in Nishapur (977 -982) Abulhasan al- Worked as a secretary in the utbi service [3, p.240]. His knowledge in the field of classification of sciences was formed under the influence of ancient Greek scientists, as well as the works of al-Kindi, Abu Nasr Farabi, Abu Bakr al-Razi, and later he became a major encyclopedist in this direction. 12, p. 144; 1, p. 244]. The main work in the field of classification of sciences "Mafatih al-ulum" (mfatih al-alvm) ("Key of Sciences") is an encyclopedic work that provides information about the science and culture of the Muslim countries of the East in its time, and it covers almost all areas of that time : jurisprudence, philosophy, logic, poetry, arithmetic, geometry, chemistry, etc., in total - 93 chapters. According to the existing tradition, Abu Abdullah divides the sciences into two groups, consisting of "Sharia sciences" and "non-religious sciences" (knowledge of specific sciences in the work of Abu Abdullah al-Khwarizmi "Mafatih al-Ulum" was studied separately in the third chapter of the dissertation).

The work consists of two parts, which, in turn, make up fifteen sections.

In the first part, jurisprudence, speech, grammar, writing, theory of poetry, history; The second part provides information on the fields of philosophy, logic, medicine, arithmetic, geometry, astronomy, music, mechanics and chemistry.

Regarding specific sciences in the works of G. P. Matvievskaya [5, p. 88-96], B. A. Rosenfeld [7, p. 24], M. M. Rozhanskaya [9, p. 28], H. is mentioned in Gasanov's works [13, p. 56]. In his research, R.M. Bahadirov described the fields of calculation, geometry, astronomy, music and mechanics [13, 90-102; 144-b; 1, 94-98, 244].

In the part of "Mafatih al-Ulum" Abu Abdullah al-Khwarizmi, relating to the exact sciences, much attention is paid to theoretical accounting, which occupies four of the five chapters on accounting in this work; the fifth chapter is devoted to practical accounting. Information about the accounts was studied by G.P. Matvievskaya [6, p. 341]. J. Kh. Ibodov translated the chapters on the exact sciences from Arabic into Russian with comments [2, p. 54].

In Mafatih al-Uloom, the part on geometry consists of four chapters: the first chapter is devoted to the theoretical part, the second chapter to lines, the third chapter to flat geometric figures, the fourth chapter to the geometric shapes of bodies. (cube, cone, sphere).

The catastrophic part of the treatise consists of four chapters: 1) the placement of inseparable and fixed stars in the constellations; 2) the position of the luminaries in the sphere of the Universe, the surface of the Earth, its climate and other elements of mathematical geography; 3) basics of astrology; 4) we are talking about the instruments of catastrophes.

When writing the dissertation, manuscripts on specific sciences, stored in the treasury of the Institute of Oriental Studies named after Abu Rayhan Beruni, FA UZR, also served as an important source. Manuscripts related to specific sciences are included in the eleven-volume catalogs of manuscripts of the Institute of Oriental Studies named after Abu Raykhan Beruni [10] and the Catalog of Oriental Manuscripts of the Russian Academy of Sciences. In Russian, it is described in a separate book called Exact and Natural Sciences [11, p. 248] (1998). We have used these publications. In the collection devoted to the philosophical and natural sciences, the manuscripts of the East in Arabic, Persian and Turkish are described in the order of scientific directions. It is also divided into areas of arithmetic, algebra, geometry, astronomy and astrology, astronomical instruments, calendars, geography: the dictionaries are also divided, they also have chapters related to philosophy as well as exact sciences.

Due to the ongoing wars and natural disasters, only a part of the rich scientific heritage of many of our scientists has been preserved in the past. Little is known about their lives. One of our famous scientists is Abu Abdullah al-Khwarizmi. In literature, the full name of the scientist is written as Abu Abdullah Muhammad ibn Ahmad Yusuf Katib al-Khwarizmi. He lived and worked in the 10th century, doing mathematics, astronomy and geography.

According to sources, he worked in Nishapur in 975-991 and was the secretary of the minister al-Utbi. He wrote a work called "Mafatih al-ulum" ("Keys of Knowledge"). There are four copies of his manuscript [4, p. 80]. Three of them are stored in the British Museum under the numbers 7528, 23429 and 2524, and the fourth in the Berlin Library under the number 1051. The English scientist C. Bosworth found out that in Turkish libraries in the 60s of the XX century there are six more copies of this work. They are kept in the libraries of Istanbul.

This work of Abu Abdullah al-Khwarizmi attracted the attention of many scientists as a rare source on the history of the development of sciences in the Middle Ages. The Dutch orientalist Van Vloten was the first to study this source and published it in 1895. Also V. Bartold, K. Brokelman, I. Krachkovsky, E. Wiedemann, G. Sarton, M. Khairullaev, U. Karimov, G. Matvievskaya, H. Gasanov, A. Sharipov, R. Bahadirov and J. Ibodov, who studied the work from different angles.

Abu Abdullah Khorezmi gives the following classification of sciences [1, p. 24; 2, p. 54]:

I. Sharia and related sciences of the "Arabs".

1. Fiqh, that is, Muslim jurisprudence.
2. Word, that is, the foundations of religion.
3. Grammar.
4. Business administration.
5. Poetic presentation.
6. History.

II. "Non-Arab" sciences (Greek and other peoples).

1. Theoretical philosophy:

a) natural sciences - medicine, celestial phenomena - meteorology, mineralogy, al-chemistry, mechanics - astronomy, music;

c) divine, that is, metaphysical;

d) logic.

2. Practical Philosophy:

a) morality - ethics (human management);

b) housekeeping (house management);

c) politics (management of the city, country).

The book "Mafatih al-ulum" consists of two parts, the first part consists of 5, and the second part consists of 9 sections.

The first part has the following sections:

Grammar, colloquial speech, writing, writing poems and poems, stories.

The second part includes the following sections:

Philosophy, logic, medicine, calculus, geometry, astronomy, music, mechanics, chemistry.

Abu Abdullah Khorezmi looks through the book in the accounting section, dividing it into five sections. According to him, arithmetic is the science of numbers. It is divided into even and odd numbers. Odd numbers are such that they are not divisible by two, but even numbers are divisible by two. If an even number is added to an even number, the result is again divided until the division becomes one [8, p. 67].

"Mafatih al-Ulum" by Abu Abdullah al-Khwarizmi [2, p. 54]

The second part of the book is of interest to natural scientists and mathematicians. Chapter 8 is devoted to mechanics, in which the movements of solid, liquid and gaseous bodies, their weights were studied by the ancient scientists of the East.

The geometry section of the work includes problems about terms, lines, surfaces, bodies. Abu Abdullah al-Khwarizmi writes: “The ancient Greeks called this art “Geometry”, this word means “Measurement of the Earth”. He said that the word "geometry" is an Arabized word. In Persian, this word is called model or size. After that, the writing of the "Fundamentals" of Euclid by Katib al-Khwarizmi, its dissemination in the East, among Muslims in general, testifies to the interpretation of Euclid's geometry by some scientists.

Abu Abdullah al-Khwarizmi divides bodies into nine types:

1. Tetrahedron. It is bounded by a regular quadrilateral or four equilateral triangles. It has four sides, four ends and six ribs.
2. The cube is bounded by six squares with equal sides and angles. This body has six sides, twelve edges and eight points.
3. Octahedron is a regular octahedron. It is bounded by eight equilateral and equiangular triangles. The octahedron has eight sides, six triangles and twelve edges.
4. Icosahedron - bounded by twenty equilateral and equiangular triangles. It has twenty sides, twelve triangles and thirty edges.
5. Dodecahedron - limited to twelve regular pentagons with equal sides. It has twelve sides, twenty-three and thirty ribs.
6. A cylinder is a body that starts with a circle and ends with an equal circle. It is limited by the surface.
7. A cone is a body that starts at one point and ends with a circle. It is bounded from below by a circle and then by the surface of a cone.
8. A sphere is a body, all points on its surface are equidistant from one point inside. It is called the center of the sphere. Any straight line from the center of a sphere to its surface is its radius. The line passing through its center and connecting its two poles is called the axis of the sphere.
9. A ring is a body surrounded by a circular surface. There are other sickle-shaped and turnip-shaped bodies.

Conclusion

In Khorezm, in the 10-12 centuries, attention to specific and philosophical sciences increased relatively, it is observed that this was due primarily to everyday practical needs, that is, scientific research in this direction was associated with such factors as the development of irrigated agriculture in Khorezm, the expansion of trade ties, the rise of cultural and spiritual life. Also, disaster monitoring arose from a direct practical necessity and was considered necessary for the proper organization of agricultural work in ancient Khorezm, determining the water content of the Amu Darya, and its effective use. The rich scientific heritage of Abu

Abdullah al-Khwarizmi is of great importance today. It is distinguished by its scientific potential, especially in the study of natural and social sciences.

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