

## **The Relationship of Natural Scientific views in the Works of Abu Rayhan Beruni's "Kanuni Masudi" and Umar Al-Chaghmini's "Mulaxhas Fi-L Khay'a"**

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### **ANNOTATION**

This article discusses the natural-scientific and social-philosophical heritage of Mahmud ibn Muhammad Umar al-Chaghmini and Abu Raihan al-Beruni who played significant role in the development of natural-scientific, philosophical sciences in medieval Eastern philosophy.

**KEYWORDS:** Universe, celestial body, trigonometry, Mamuna Academy, "Canon Masuda", "Mulaxhas fi-l hay'a".

In the formation of Chaghmini's scientific-philosophical views, the contributions of Movarounnahr scholars who lived and created before him are very great. Among them, Abu Rayhan Beruni should be highlighted. He wrote works related to natural and scientific sciences - astronomy, mathematics, as well as geology, social humanitarian sciences. His biggest work is "Kanuni Masudi". This work is considered to be the most valuable work in natural sciences, and it is a work that stimulated the development of natural sciences not only in the East, but also in the whole world. The value of this treatise is that it contains important ideas that led to innovations and discoveries related to astronomy and mathematics. describing his thoughts about the landscape and the Earth, he says: No matter where people stand, they see only half of the sky. It is visible in the form of an existing dome. The situation of people on earth is not the same everywhere. Latitude and longitude are used to define places. If you count from north to south, it is latitude, and if you count from east to west, it is longitude. Ether has seven planets. Accordingly, it is divided into seven spheres. In the eighth sphere above them are the fixed stars. The spheres move eastward.

The first of these spheres from the left side is the sphere of the Moon. The Moon is a round solid body, and the light falling on it from the Sun is reflected on the Moon. Therefore, it appears as if it is a source of light. After the sphere of the Moon comes Atorud (Mercury) and then the planet Venus. Above these two planets is the Sun. The sun's place in the sky is like the king's place in the center of the country. The movement and condition of all the planets depend on the sun and are measured by the movement of the sun. Earth, Mercury, Venus are the inferior planets. Among the planets whose spheres are higher than the Sun, Mars is the closest to the Sun, and Saturn is the farthest. Between them is Jupiter.[1]

It is surprising that Beruni put forward theories that have been proven in modern science even in those times. The above heliocentric ideas of Beruni had a great influence on the views of European scientists of the new era. These theories motivated the formation of astronomical ideas of Nicolaus Copernicus, Giordano Bruno, Galileo in Europe.

Even before them, this influence was clearly felt in the work of many scientists of Central Asia. For example, Beruni had a great influence on the works of the Persian scientist,

astronomer, poet and philosopher Omar Khayyam (1040-1123), the famous Azerbaijani astronomer Nasriddin Tusi (1201-1272), al-Chaghmini, the famous astronomer and scientist, ruler Mirzo Ulugbek (1394-1449).

We can see similar thoughts to Beruni's ideas about the movement of the Sun and other planets in Chaghmini: "The brightest of the planets is the Sun. The Sun can be called the center of the radiating planets.

Planets radiating from themselves include the following: Moon (Moon), Earth (Arz), Mercury (Atorud), Venus (Zuhra), Mars (Mirrih), Jupiter (Mushtari), Saturn (Zuhal) and other shells.[2]

In the above work of Beruni, there are many proofs about the roundness of the earth. It is also mentioned that the shadow of the earth on the moon during the lunar eclipse is circular in shape. "Kanuni Masudi" consists of several sections, these sections are called articles. The second article of this work deals with periods used in different nations. In his article, Beruni talks about relations between periods, customs and holidays of different peoples. This information is a different interpretation of the information in the book "Relics of Ancient Peoples".

The third article is devoted to mathematics. It covers geometry and trigonometry issues necessary for spherical astronomy. This article can be said to be a mathematical tool used to perform the tasks given in the following articles and to carry out the intended calculations (P.G. Bulgakov's opinion)

The fourth paper deals with the quantities of arcs and angles, the determination of points on the surface of a sphere and their various positions, and other similar works.

The fifth article deals mostly with things that are used as weapons to show the actions of the luminaries.

In this article, Beruni describes the method of determining the location of settlements by observing the lunar eclipse.

A large table is attached to the fifth article. It shows the climates and the location of some cities.

The sixth article tells about the movement of the sun.

The seventh article deals with the movements of the moon.

The eighth article deals with solar and lunar eclipses.

The ninth article is about the stars.

The tenth article tells about the movements of the planets Saturn, Jupiter, Mars, Venus, and Mercury.

The eleventh article is devoted to issues such as the diameter of the celestial spheres, the movements of the luminaries, their location, and their relative movements.

In "Kanuni Masudi" Beruni critically analyzed the knowledge of astronomy before him, identified and corrected the innovations in them: he solved many problems related to astronomy. As a naturalist, Beruni follows a deistic principle in his understanding of the world and nature.

“God creates the world as a whole and gives certain laws from the beginning.”[3]

It proves the need to recognize the eternal existence of the material world.

We can see that Beruni's views on natural science have deep scientific essence in all aspects from his criticism of Aristotle's views on natural science.

The influence of this great encyclopedist of the Middle Ages on Chaghmini is incomparable. Umar al-Chaghmini is considered Beruni's compatriot, and he is the scholar who continued his heritage of naturalism in the later period.

We can see the obvious influence of Beruni in Chaghmini's work. For example, the structure and movement of heavenly bodies in the second part of Beruni's work, the position of the planets relative to each other, scientific theories about the interaction of the Sun and the Moon with other planets, views close to Chaghmini's “Mulakhas fi-hay'a” ” expressed in the text of the first part of the work consisting of five chapters. In the first article of “Kanuni Masudi”, Beruni tells about the creatures in the universe and their general forms.

According to Beruni, the universe is a round body. A piece of it is motionless. Surroundings of the immobile part move around in space along the “true axis” - the “true center of the Earth”, the sum of all existing bodies is called the universe..[4]

In Chaghmini's work on astronomy, “Malakhas fi-hay'a”, mentioned above, there are ideas very close to Beruni's above structure of the Earth and its movement. For example, “All celestial bodies are spherical in shape. All the shells and all the bodies on the earth form the general picture of the universe. The structure of the world view consists of a concentric ring.”[5]

Beruni and Chaghmini's views on celestial bodies and planetary movements are very close to each other. It can be understood from this that Chaghmini learned many scientific theories from his teacher Beruni and expressed his independent views on some of his ideas.

Beruni's research in the fields of astronomy, mathematics, history, and mineralogy was aimed at understanding the human mind and the objective world, its laws.

According to Beruni, nature is an independent entity, it consists of natural processes and events, and it has its own essence, and it manifests itself in everything. Matter is the basis of everything. When describing matter figuratively, he says, it is clothed with accuracy. With these views, Beruni put forward the idea that matter is based on certainty and manifests itself in one or another thing. Beruni is the organizer of things. Matter cannot exist without motion. "Being," he says, "is in constant change and movement."[6]

Beruni's thoughts about the creative properties of matter can be seen from the following: "All movements are characteristic of matter. Matter is inextricably linked with the development and change of things and their forms.

From this we can know that matter also has the power of creativity..[ 7]

Beruni rejects religious views of the world and states that religion should not destroy scientific work. Religion, he says, helps science only when science fails to find the right way.[8]

Beruni made a great contribution to the development of natural sciences in the Eastern and European Renaissance with his works on natural sciences.

## References

1. Berunii A.R. Selected Works T., 1957, p. 7
2. Sirajiddinov Kh.S. From the history of the exact sciences in the medieval Near and Middle East. Sidykov Kh.S. On the scientific work of Chagmini T., "Fan", 1972, pp. 203-204
3. Sidykov H.S. On the scientific work of the Khorezm astronomer and mathematician of the XII-XIII centuries. Chagmini. T., "Fan", 1972, p. 204.
4. Berunii A.R. Monuments of ancient peoples T., 1957, page 287
5. Berunii A.R. KANUNI Masudiy T., "Science", 1976, book 2
6. Кули Заде Зумруд Аликули кизи Закономерности развития восточной философии XII-XIII вв. Баку, "ЭЛМ", 1983, стр.203.
7. Materials on the history of progressive socio-philosophical thought in Uzbekistan, 2nd ed. Under. Ed. Muminov I.M. and Khairullaev M.M. T., 1976, p.378