

## **Abu Rayhan Beruni Encyclopedist Scientist**

**Radjapova Marguba Zakirovna**

Senior lecturer of the Department of History of Uzbekistan, Faculty of History, Andijan State University

**Abstract:** The article talks about Abu Rayhan Beruni's great contribution to the world civilization and the development of science, as well as his unique theories and hypotheses in every field of science. Opinions were expressed about the productive activity of scholars in science and art.

**Key words:** astronomer, astrologer, mathematician, geologist, geographer, local historian, biologist, physician, botanist, mineralogist. historian, source scholar, religion scholar, literary scholar, philosopher, sociologist, logician, theologian, poet, explorer, forecaster.

### **Introduction**

Spirituality is a part of the human spiritual world, a concept related to a person taken separately. But a person loses his humanity outside of society, therefore, spirituality makes a person relate to other people, society, and the whole being. A person's level of perfection is determined by his understanding of his place in society. Today, our people enjoy spiritual heritage, high values, historical memory, traditions and customs, the heritage of ancestors, which are the basis of national revival and national development.

Russian academician V. Bartold in his work entitled "Report on Turkestan trip" about our nation, which has the heritage of our ancestors, high culture and spirituality: "...we have so far conquered the lands of peoples whose cultural level is lower than ours. In the case of Turkestan, we are facing the opposite situation. The Turkictons recognized our military superiority, but they did not recognize us spiritually," he writes [1:49].

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1. The period before the introduction of Islam;
2. The period after the introduction of Islam.

The period after the introduction of Islam to our country, the theories of understanding the truth of our ancestors' existence based on reason and thinking, the philosophy of the word, the understanding of monotheism based on reason and logic, the deep understanding of the verses of the Qur'an, the development of specific and natural sciences, the classification of sciences, "Ikhvan-us- "Safa" group (Abu Nasr Farabi, Abu Abdullah Khorazmi, Abu Rayhan Beruni, Abu Ali ibn Sina [3:22]) appeared, with the development of Turkic-Persian literature and comparative linguistics, the emergence of "truth seekers" and their ideas, Sufism sects. be characterized by etc. Abu Rayhan Beruni is also a representative of this era. His full name is Abu Rayhan Muhammad ibn Ahmad Beruni - a great encyclopedic scholar of the Middle Ages. He is simultaneously an

astronomer, astrologer, mathematician, geologist, geographer, local historian, biologist, physician, botanist, and mineralogist. He was a historian, source scholar, theologian, literary critic, philosopher, sociologist, logician, theologian and poet[4:37].

He is also a discoverer and a prophet. In the words of Krachkovsky: "It is easier to show the field in which he was not involved than to list the fields of science he was engaged in"[3:20]. The scientist was born in Kot, the ancient capital of Khorezm, and his interest in science grew from a young age. Beruni later studied under the famous scholar Abu Nasr Mansur ibn Iraq. Ibn Iraq wrote a number of works on astronomy, geometry, mathematics and dedicated 12 of them to Beruni. In addition to his mother tongue, Beruni learned several other languages: Arabic, Sugdian, Persian, Syriac, Greek and ancient Yiddish, and later Sanskrit in India. At the age of 22, he was forced to leave his homeland and for some time lived in exile in the city of Jurjan on the southeastern coast of the Caspian Sea.

Then he went to the ancient city of Ray, after 998 he came back to Jurjan, where he met his second teacher, physician, astronomer, philosopher Abu Sahl Isa al-Masikhi, and received education from him. Beruni began to write the work "Osor al-Baqiya an al-Qurun al-Haliya" ("Monuments left by ancient peoples") during the emigration period in Jurjan and finished it in 1000. "Osor al-Baqiya" brought great fame to Beruni, showing him to be a great scientist interested in all fields of science. Beruni's work "Famous People of Khorezm" was also created during this period. His important astronomical-geographical work "Tahdid nihiyot al-amonia li tashidi disat al-masokin" ("Determining the final limits of places to check the distance between settlements" - "Geodesy") was completed in 1025. Beruni's work "Basic Concepts of the Art of Astrology" was also written in Ghazna in 1029. Persian and Arabic copies of the work have reached us. It contains important information about several sciences related to the astronomy of that time.

Beruni's famous large work "India" "Taqiq moli-l-Hind min ma'quda maquda fi-l-aql av marzula" ("The Book of Determining the Reasonable and Unreasonable Doctrines of the Hindus") was written in 1030, this masterpiece is famous and Eastern scholars, including those highly valued by modern Indian scholars. Academician V. R. Rosen assessed that "among the entire ancient and medieval scientific literature of the East and the West, there is no equivalent work" [5:105].

After compiling the list of his works, Beruni wrote two more important books. One of them is Mineralogy. For its time, this treatise is considered the best, unparalleled work in the field of mineralogy in Central Asia and the Middle East, and even in Europe. The manuscript of Beruni's last work, "The Book of Medicinal Plants", was found in Turkey in the 30s of the 20th century. The work is known as "Saidona".

In it Beruniy Sharq gives a full description of the medicinal plants that grow in Central Asia in particular. Beruni served under the Ghaznavids until the end of his life. According to the famous judge and calligrapher Ghazanfar al-Tabrizi, who lived in the second half of the 13th century, the scholar died in Ghazna on December 13, 1048, on the 3rd day of Rajab 440 Hijri.

Abu Rayhan Beruni is a great scientist who made a significant contribution to the development of world civilization with his great scientific discoveries.

He was the first to make a globe. All geographers and intellectuals can enjoy this invention even today. Beruni made a great contribution to the field of astronomy. Although he approaches the structure of the universe from Ptolemy's geocentric system (which assumes that the Earth is at the center of the universe), he approaches this issue in an original way, that is, as a moving system of the Earth. Such a view was a scientific feat that contradicted the dominant views of the time, which considered the Earth to be motionless.

Beruni writes in the work "India": "The rotation of the earth does not contradict the calculations of the science of astronomy, but the phenomena that occur on earth. it continues smoothly along with its movement. This idea embodies the idea of inertial systems. Galileo Galilei (1564-1642) came to this idea 600 years after Beruni. In his work entitled "On different methods of preparing the desired astrolabe", Beruni wrote about the astrolabe of Abu Sa'id al-Sijzi: "I consider it a very wonderful discovery because it is not based on the movement of the sky, but on the movement of the Earth."

Beruni is one of the scientists who made a great contribution to the development of mathematics. He was the first to analyze trigonometry as a separate independent science. In his work "Masud's Law", he described flat and spherical trigonometry and created linear and quadratic interpolation rules of trigonometric functions. Beruni also made a significant contribution to the sciences of geography, geodesy, and geology. The works "Geodesy" and "Mineralogy" are directly related to the above-mentioned disciplines. In his work "India", the thinker focused on the structure of the Earth's surface, the ratio of sea and land, and wrote: "A quarter of the Earth is the administration.

The administration is surrounded by the Mediterranean Ocean (Atlantic and Pacific Ocean) from the west and east. This Mediterranean Ocean separates the prosperous part of the earth on two sides (west and east) from the land or inhabited islands that may be on the other side of the seas.

In conclusion, it can be said that Beruni, based on a mathematical calculation, predicted that the present American continent could be around 450 years before Columbus. Beruni proved that the Atlantic and the southern part of the Pacific Oceans were connected to each other. He hypothesized that there should be ice-covered land on the southern side of the globe.

It is said that the method he used to calculate geographic latitude was discovered by Tycho de Brage in the 16th century, although Beruni used this method 6 centuries before him. Geological origin of rocks, land to sea. Beruni also developed theories of seas turning into land. Beruni was the first to put forward the idea of the force of attraction of bodies towards the center of the Earth. Beruni also made a significant contribution to the sciences of mineralogy and climate science.

Beruni also developed ideas about the structural structure of minerals, the phenomenon of crystallization, and the nature of the melting of crystals under the influence of light. Beruni promoted the philosophical idea of the multiplicity and diversity of worlds. This idea was expressed 600 years later by Giordano Bruno (1548-1600) and was burned at the stake of the Inquisition because of this idea. External social phenomena, the role of the social environment in the development of society, the influence of geographical climate on the nature and appearance of people, the role of labor tools in the development of society. for the first time sociologically analyzed people's material needs, property and inheritance.

Beruni's heritage has also interested Russian scientists in every way. I. Yu. Krachkovsky, S. P. Tolstoy, A. A. Raynov, A. M. Belenitsky, A. A. Semyonov, B.A. Rosenfeld's works dedicated to him were published. The famous Oriental scholar I. Yu. Krachkovskii highly appreciates Beruni's legacy, saying that "it is easier to list the fields of science that he is not interested in than the fields of science that he is interested in." Beruni's work is also being paid a lot of attention in Uzbekistan, his homeland. X. M. Abdullaev, I. M. Mominov, V. Yu. Zohidov, U. Karimov, S. A. Famous scholars like Bulgakov have created a number of pamphlets and works about Beruni's work.

The poems preserved from the scientist's legacy were first published in their entirety by the Oriental scholar A. Rasulov. In his work, Abu Rayhan Beruni uses literature as a scientific document, a necessary source of evidence for science. The scholar's books "Al-Jawahir" and "Saydana" are valuable for their wealth of poetic examples. In the work "Al-Jawahir" he cites 740

verses of more than eighty poets in order to prove a certain point. In addition, Beruni recognized God as the first creator. But he believed that the universe will develop naturally [6:104]. The scientist praised Allah Almighty and his last Prophet Muhammad (pbuh):

"In the name of the Merciful and the Merciful, praise is given to the God who stands above (all) those who are likened to be compared. May God's mercy be upon Prophet Muhammad (PBUH), the greatest of all people, and upon his family, the guides of the right path and truth" [7:39].

Islam mandated Muslims to walk on the path of development and encouraged people to learn. Because nothing other than knowledge can guide a person's personality on the right path and cannot achieve progress [8:48].

Regarding interest in knowledge, Allah says in Surah Zumar of the Holy Qur'an: You: "Would those who know and those who do not know be equal?!" say. Verily, only the wise remember" (verse 9). In the verse of Surah Mujadala, it is clearly stated that knowledgeable people stand higher than others in the presence of God: "Allah raises the ranks of those of you who believe and are given knowledge" (verse 11). In the verse of Surah Al-Imran, Allah has testified to His Oneness even among learned people, "Allah has testified with justice that there is no god but Him."

And so are the angels and the possessors of knowledge. There is no god but Him. He is the Exalted and the Wise" (verse 18). In this verse, Allah has equated the testimony of learned people with the testimony of angels. This shows how high the respect of learned people is in the presence of Allah. The Holy Qur'an criticizes the ignorant. Allah Almighty says in Surah Rum: "This is how Allah seals the hearts of those who do not know" (verse 59). The Qur'an also states that there is no limit to knowledge. It is said in Surah Yusuf:

"There is a knower over every possessor of knowledge" (verse 76). The meaning of this verse is that scientists should not be proud of their knowledge and stop working on it, they should always be prepared for someone to criticize them. The Qur'an calls upon Muslims to always be in the field of knowledge in order to know the truth of everything [9].

Our ancestors lived on the basis of the call of this holy book and achieved great achievements. Abu Rayhan Beruni, in the words of European Beruni scholars, accomplished things that even the entire research institutes could not do [2:47].

Our great compatriot Abu Rayhan Beruni devoted his whole life to science. Raised various fields of science to a higher level. The great services of the scientist in astronomy are the methods of determining the geographical longitude and latitude of places, the development of the determination of astronomical measurements, the determination of the apogee of the Sun and the proof of its variability, and the confirmation of the idea of heliocentrism. He also did great work in solving geodesy problems.

He developed a method for determining different distances and azimuth on the ground, measured the size of the earth, raised geodesy to the level of a special science. He also carried out extensive research in the field of mathematics. Euclid's teaching was enriched by the achievements of Indian mathematics, Beruni's services in the fields of geometry and trigonometry were enormous, he developed a table of sines and tangents. Beruni also spoke a new word in the science of geography, especially in the theory of the seas, he realized that Ptolemy's established opinion was a mistake. He was the first in the world to create an image of the earth, that is, a globe. He put forward amazing ideas in geology as well - alluvial layers, underground water, continental drift, he put forward hypotheses proving that the shape of the earth is changing, and many other hypotheses confirmed by modern science. In mineralogy, he was the first in the world to develop the method of determining the weight of minerals and ores.

In the field of pharmacognosy, the services of the scientist are also incomparable - he determined what medicines are made of, what can be used instead of them, and their names in different languages. Beruni's services are also significant in the field of philology. He also created studies on classical Arabic poetry and Indian poetry, translated Persian legends into Arabic, referred to the works of many poets whose names have been forgotten.

The American scientist J. Beruni who appreciated Beruni's work the highest and most truthfully. It was cancer. He called our great compatriot the wisest thinker in the world in his time [10:245].

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