

Original Research Paper

# Theoretical Conceptual Issues of Personnel Competence Increasing

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**Abstract:** The present article discusses certain works of the great Central Asian scientist-encyclopedic Abu Reikhan Mohammed ibn Ahmed Beruniy which are becoming more and more accessible to scientists of various specialties and the figure of our famous compatriot seems to be more and more majestic. Beruniy's legacy in various natural sciences has long been the subject of study by many scientists. The very first acquaintance with his works showed that they are of great philosophical significance. The ideological and materialistic worldview of Al Beruniy has been analyzed in the article.

**Keywords:** India, Nature, Idealism, Materialism, Worldviews, Religion, Experiment, Philosophy

## Introduction

The prominent eastern scholar Abu Raikhan Al-Beruniy was one of the brightest representatives among the central Asian scientists who led the process of the "Eastern Renaissance", which lasted for 7 centuries - from 800 to 1500. Scientists of this era were the greatest minds you've never heard of, but achievements that include the principles of algebra and trigonometry, the invention of the algorithm and the astrolabe, the foundations of modern medicine.

Russian scholar A.A. Semenov had written about this side of Beruniy's legacy: "His works were distinguished by deep philosophical thought" (Semenov, 1950).

Academician I. Yu. Krachkovsky and others spoke about Beruniy's great philosophical knowledge. Zakhidov (1950a) article "Beruniy as a thinker" had been devoted to the philosophical views of Beruniy. Some aspects of Beruniy's philosophical views were discussed in the dissertation of (Faizullaev, 1962). Most foreign researchers of recognizing the philosophical significance of his works, heritage Beruniy, see in them only "sincere religious convictions", "which made him a very attractive person".

This position was supported by such authors as Hilali, Kourtois and others and in A. Sprenger's review of Beruniy's "India" published by E. Zachau, the author even claims that Beruniy had been a mystic.

(Al Beruniy's, 1889). Bourgeois scientists, who take idealistic positions, dwell on those aspects of Beruniy's views that most of all correspond to their interests and their worldview. They did not take into account the real contradictions of that time, which were reflected in the views of the great learned thinker and cannot reveal the truly progressive aspects of his worldview. However, even those scientists were unable to completely obscure the enormous progressive significance of the general views of Beruniy, as evidenced by the following statement of one of the American scientists: "Beruniy had been so strict in his belief in reason and his disgust for everything unknown, incoherent, inconstant, or simply isolated, which resolutely turns to natural explanation, which relates an isolated phenomenon to something that includes a number of facts and principles. As a true scholar, al-Beruniy insisted on the need for observation and experiment and had contempt for anyone who had repeated tradition uncritically" (AUP, 1951).

## Religion and Scientific Research of Al-Beruniy

The peculiar features of the Middle Ages, in which Beruniy lived, was that religion and religious institutions found their expression and recognition in all manifestations of social life, "... church dogma was the starting point and basis of all thinking. Jurisprudence, natural science, philosophy are considered to be all the content of those sciences were brought into line with the

teachings of the church” (Marx and Engels, 1962) and our task is to reveal in the views of beruniy that which objectively undermined religious beliefs and dogmas.

### *Beruniy and the Theory of Atomism*

Beruniy was considered to be primarily a naturalist. Studying natural phenomena, material reality, he takes the point of view of a spontaneously materialistic and natural-scientific explanation of them. But this is not surprising. We believe that every scientist, in practice, spontaneously takes the position of a natural explanation of natural phenomena, a materialistic approach to them.

But beruniy was a scientist-thinker. He did not limit himself to the position of a natural scientist, who spontaneously developed an attitude towards the world around him. Unlike such natural scientists, beruniy developed a method of scientific research, which was of great philosophical significance. One of the main provisions of this method was to strictly follow in its generalizations what is established in the process of experience, observation, experiment (Zakhidov, 1950b).

It is natural that, beruniy did not always succeed in adhering to this method in his philosophical research. So, he recognized the existence of God, the creation of the world by God and the perfection of the world and other religious-idealistic provisions that did not at all follow from his scientific research and observations of the surrounding reality. This contradiction was characteristic of many scientists and philosophers of the middle Ages, especially in the countries of Islam. But, Beruniy set himself the task of following what follows from experience, from scientific research, or, in any case, agrees with them and this is the great merit of the great scientist. In his famous work "India" he says bluntly that his method is "inductive."

Beruniy raises the question of the essence of the surrounding world for the first time and had its foundations in his polemic with Ibn Sina. It had been characteristic that he was not a shadow of doubt about the material basis of the surrounding world, of all nature. It follows from Beruniy's statements that he had liked many philosophers and scientists of that time, recognized the existence of four elements that made up the whole nature around us - earth, water, fire, air. In turn, these elements were made up of atoms. Beruniy's atomism, like the atomism of ancient Greek thinkers, was natural-philosophical, i.e., the result of guesses, indirect conclusions, etc. In it, the essentially materialistic aspirations of the scientist in explaining the structure of the world find their expression.

Beruniy considered the doctrine of the infinite divisibility of bodies to be untenable: "Why did Aristotle consider the doctrine of an indivisible particle to be flawed, while the assertion of the divisibility of bodies to infinity is even more flawed" (MH, 1957a). At the same time, beruniy relied on Zeno's famous aporia to

substantiate his position. But, on the other hand, beruniy asserted: "Many [controversial] statements were also inherent in atomists, well known among geometers..." (MH, 1957b).

Indeed, for the atomist philosophers, matter in the form of atoms and emptiness expressed, respectively, the principle of discontinuity (discreteness) and continuity, i.e., they had not yet considered matter from the point of view of the dialectical unity of discontinuity and continuity. Curiously, atomism did not satisfy beruniy because of "[controversial] statements that are well known among geometers." Since for beruniy, geometric concepts were "forms abstracted from matter" (Abu Reyhan Beruniy, 1963), then by "[controversial] statements among geometers" he meant the interpretation of such concepts ("point", "line", etc.) that were not tied up with atomistic theory due to the fact that they assumed the infinite divisibility of bodies. Thus, beruniy was looking for a way out that would solve the contradictions of both theories, both atomism and the theory opposite to it. He objectively had seen the conclusions push him to reject the one-sidedness of the two opposite theories. This in itself had already a great achievement for Beruniy. The fact that he stood on this path, albeit unconsciously, spontaneously, was evidenced by the fact that, being an adherent of the atomistic theory, he considered the existence of emptiness optional, which at first glance does not fit in with the philosophical traditions of that time, since atomism then, as a rule, it assumed the recognition of the existence of emptiness, i.e., what was supposed to be continuity.

This suggests that he followed the path of recognizing two contradictory qualities at the same time material origin, but, of course, beruniy could not finally draw such a conclusion. Only in our time, in the era of the latest science, atomism rejected the emptiness in nature.

Beruniy, apparently, had believed that one of the difficulties of the atomists was the problem of the emergence of a new quality. In this regard, beruniy raised the question of the essence of qualitative transformations. "How do things change and move from one [state] to another: By convergence and interpenetration or by change itself?" Some uniqueness of beruniy's atomistic ideas was manifested in his interpretation of this issue in "Monuments of Past Generations", where Beruniy, speaking about the "transformation of elements", explains various natural phenomena "by changes in the particles of elements and the transformation of some of them into others."

When studying the views of Beruniy, the commonality of his views with the views of another outstanding scientist thinker of the East, Abu Bekr Muhammad ar-Razi, was striking. Ar-Razi adhered to

the atomism of Democritus, i.e., teachings about the existence of eternal and unchanging atoms and emptiness. Beruniy himself had an ambivalent attitude towards ar-Razi, officially condemned as a heretic. On the one hand, Beruniy was forced to call him a heretic and disapproves of some of his alchemical experiments, on the other, he still highly appreciates the scientific activities of ar-Razi (de Beruniy, 1936).

However, in his philosophical views, unlike ar-Razi, Beruniy already rejects the concept of emptiness, the eternal immutability of atoms and thus makes a big step forward in comparison with this scientist. In addition, unlike the latter, which recognized the existence of four elements (earth, fire, water, air), beruniy followed the path of universalizing the elements, proceeding from the idea of the possibility of transforming elements, their transition from one to another. So, unlike Aristotle, whose ether - heavenly fire - was regarded as a special independent element, Beruniy, already in polemics with ibn sina, was inclined to reduce heavenly fire to the essence of earthly fire, which Beruniy also considered not as an independent element, but as a kind expression of the rapid movement of atoms and bodies. It was no coincidence that Ibn Sina had accused beruniy of "the opinion of those who considered the elements of one of four, two or three [basic] substances... like Thales, who saw such a substance in water, Heraclitus, who considered it to be fire... "Beruniy, in his polemic with Ibn Sina, was inclined to consider air as the initial element.

"As for Aristotle," said Ibn Sina, "he believed that none of the four universal [elements] arose from one another and extended this position to their particles."

Beruniy himself had written about "heavenly fire": "As for the heat in contact with the interior [of the heavenly sphere], that is, fire, they claim that it is basic and natural, like earth, water and air and that its shape is round... and in our opinion, [fire arises] from heating the air due to the fact that the sphere of the sky rubs against it and hits and touches it in rapid motion...". (Abu Reyhan Beruniy, 1957) Beruniy "brought down the heavens" by his assertion that the movement of celestial bodies was not circular, as Aristotle believed and saw in this a sign of the special nature of "heavens", but ellipsoidal and the heavenly bodies themselves, according to Beruniy, were also have an ellipsoidal shape. By this, he anticipated those important discoveries that were subsequently made by scientists such as Keppler and the achievements of the latest science in the study of the forms of celestial bodies, in particular the Earth.

The tendency to reduce the elements to one basis led beruniy ("India") to the conclusion: The original, single material basis of all elements is water and for beruniy it is

not so important to emphasize that water is their basis, as the fact that there is a common material basis of things...

"Therefore, it [water] is a tool and a tool of the creator when he wants to create [anything] out of matter" (Beruniy, 1963).

Beruniy had chosen exactly water, since such an understanding could be justified by the saying from the Quran that in the beginning there was Allah and water and further Beruniy notes that it does not matter what is meant by the word water.

From his comparison of this provision of the Koran with the materialistic Indian doctrine of the existence of an eternal material principle of water, it became clear that the main thing for him in this case was to justify the existence of such a material principle with the help of the Koran. Naturally, beruniy's naive form of presentation was caused, perhaps, by his desire to diverge as little as possible, at least in form, from the official dogmas of Islam.

### *Problems of Understanding Nature*

Nature, according to Beruniy, encompasses all natural phenomena, the entire surrounding world, subject to certain laws. He had attracted the concept of "natural" when he wanted to emphasize the subordination of this or that phenomenon to certain laws of nature, when this or that phenomenon could be explained and understood on the basis of a scientific study of its essence. Sometimes in our literature, Beruniy was mistakenly attributed to materialistic statements of representatives of the Indian philosophical system Swanky: "Matter is the creator", etc and although Beruniy did not even express his attitude to these provisions, the whole spirit of his thoughts about nature and matter, in essence, was similar to them... Thus, according to beruniy, nature is endowed with "natural strength". In "Monuments" beruniy sympathetically quotes the words of Abu-Mashar: "Nature is strongest." (Abu Reyhan Beruniy, 2014) Beruniy often said: "Nature creates", or "force doubles its action", etc.

The materialistic idea of Beruniy about many worlds was of great importance, which was later put forward by Giordano Bruno. It is important for us to emphasize that, putting forward this idea, Beruniy had in mind their material unity. If for Ibn Sina the concept of the unity of the world and its singularity are identical, then Beruniy felt that these are different things and on this basis gives an interpretation of the structure of the world, the universe. Therefore, Beruniy, speaking about the multitude of worlds, does not violate their material unity, although he does not directly speak about it. His argumentation boiled down to the following: Other worlds can be of a different nature, or the same as this world. If they are of a different nature, then "we did know nature and the four elements only after we ourselves were convinced of their existence."

There he meant that other worlds can have other elements, which, however, just like ours, could be cognized with the help of the senses, i.e., they are material. "It can also be assumed that the other world has the same natural properties as our world, but that only these properties are created in such a way that the directions of movement in it differ from the directions of movement in our world."

However, beruniy considered the system of numerous worlds to converge at one point, i.e., the center of the world - the earth. But already in the polemic with ibn sina beruniy, unlike his opponent, he had noticed a contradiction in Aristotle's position that the Earth is the center of the world and his arguments are not yet based on the analysis of the motion of the planets and the Earth, but proceed from the analysis of the contradictions of the Aristotelian natural philosophy. "If heat spreads from the center (as Aristotle believed - the author), then why does it reach us, proceeding from the sun?"

Beruniy had no doubt on another important position of Aristotle, namely about the absolute rest of the Earth. "The fact that the earth is at rest and this is one of the initial truths of astronomy, about which intractable doubts arise." "Moreover, the rotational motion of the Earth does not in the least discredit astronomy and the weight of astronomical phenomena equally proceeds in accordance with this motion..."

Thus, we see that beruniy's initial doubts in the Aristotelian and hence in the Ptolemaic system of the world, resulted in the theory of the equivalence of the teachings on the rest and motion of the Earth in the system of other celestial bodies, which was important for the coming triumph of the heliocentric teaching.

Matter in its natural existence could be destroyed. There was no doubt that "natural force" (nature - the author) did not destroy matter when it finds it. "As we have seen, the essence of a number of Beruniy's statements, in particular about water, contains conjectures about the eternal existence of the material principle along with God. In this case, the function of God is reduced, in essence, to the design of matter, i.e., to the creation of the given world from it, the "first impulse". Despite the fact that Beruniy on this issue significantly had formulated to idealistic religious views about the creation of the world and sometimes took openly idealistic positions, his position in the above statements about God carries materialistic elements.

## Discussion

Analyzing astronomical, geological and other natural phenomena, Beruniy comes to the conclusion that, speaking about the time of existence of the Earth and other celestial bodies, "the calculator is not forbidden to talk about thousands of millions of years". Beruniy was

one of the first to analyze various geological phenomena and, on the basis of this, comes to very original conclusions. Even the Pakistani scientist, who had believed that Islam and science were one and the same for Beruniy, wrote: "He (Beruniy - the author) had considered the idea of the eternity of the world. He stands on a purely scientific point of view when he refers on the changes that the Earth has undergone for many centuries, leaving traces of fauna and flora in the layers of mountains and deserts, similar to those recent changes that each of us sees in his time and from reliable stories."

Consequently Beruniy concluded that "...like a modern geologist, Beruniy considered it necessary for a long time for the Earth to go through all these enormous changes." (Baraniy, 1957).

Taking into consideration Beruniy further outlined the content of Beruniy's book: "The next subject of presentation is the evolution of the globe under the influence of natural forces. Here he supports the theory of Aristotle, expressing his own judgments that "in earlier periods of time, the Earth was in a liquid state."

These very vivid philosophical arguments of Beruniy had been analyzed by the English scientist (Krenkov, 1964).

Beruniy, noting that the scriptures and various religious sources gave extremely contradictory information about the time of the existence of the Earth, believes that the main criterion for determining its age was the scientific studied of various phenomena occurring on it.

The keen eye of such an outstanding natural scientist as Beruniy could not help but notice that the idea of nature as something frozen and unchanging contradicts what could be observed in the surrounding world. This view of nature as something constantly moving, changing, Beruniy conducted more consistently and systematically than his great contemporary Ibn Sina.

Beruniy was more decisive in his conclusions arising from experience and observations. The latter gave Beruniy the opportunity to sometimes drew even more radical philosophical conclusions and find contradictions in Ibn Sina's position on certain issues.

In Beruniy's statement about changes on the Earth, it is interesting to note that events "occur either immediately or sequentially." This subtle observation of Beruniy had been concerned the dialectical nature of the development of various processes on earth, the alternation of spasmodic development and gradual evolution.

## Conclusion

Thus Beruniy considered possible the spontaneous generation of various small insects and animals from inanimate matter and argues that this requires certain conditions, namely, when the moisture is affected by "moderate heat", etc. This comes into direct agreement

with the provisions of religion that all kinds of animals and plants were created by God, that only God can "breathe" life into inanimate matter.

Even the "holy of holies" of previous scientists and philosophers - the heavenly sphere - according to Beruniy, undergone certain changes: "Once created, they [stars, cycles of stars] decreased [in magnitude], increasing at the same time in number."

However, contradicting himself, Beruniy noted that "... nature preserves genera and species as they are."

Beruniy in his works often spoke about the theory of the cyclical development of the world. This teaching, if strictly adhered to, can lead to the conclusion that the existence of the world is infinite and, despite the fact that Beruniy proceeded from the recognition of the creation of the world by God, he fully approves of this theory.

So, in "India" he speaks about it as follows: "... Their (Indians - the author) ideas about the cyclical nature of repeated periods of time correspond to what is observed in reality."

Thus, an examination of Beruniy's philosophical views shows how strong the materialistic tendency is in them, despite the idealism of the starting positions. Beruniy's worldview should be studied in its living integrity, in all its contradictions and complexity and not by one-sided highlighting of its weaknesses.

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## Author's Contributions

D.Ernazarov wrote a manuscript. Planned and directed the study and supervised the data analysis.

I.Ergashev worked in archival materials.

M.Atamuratov translated materials from Arabic.

A. Asliddin translated the article into English.

All authors discussed the results and contributed to the final manuscript

## Ethics

Academic ethics were respected by the authors. There is no conflict of interest between the authors. They have no complaints about each other and the editorial board of the Journal.

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