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UNIVERSAL GENIUS OF THE CENTRAL ASIAN RENAISSANCE (TO THE 1050TH ANNIVERSARY OF ABU RAYKHAN AL-BERUNI)

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ABSTRACT. The article reveals the significance of the activities of the great scientist of the Central Asian Renaissance, Abu Rayhan Beruni (973–1048), whose anniversary is being widely celebrated in 2023 around the world. The phenomenon of the Renaissance itself proved to be unique, being characterized by a humanistic orientation and an unprecedented prosperity of science, philosophy, medicine, and education. Al-Beruni belonged to a galaxy of outstanding thinkers of that time, such as al-Farghani, al-Khorezmi, al-Farabi, Ibn Sina, etc., and was an encyclopedist whose interests extended to literally all spheres of knowledge. Al-Beruni's advanced methodology of scientific knowledge and his development of the empirical inductive method of knowledge enriched philosophy. He was familiar with the works of the great representatives of Greek philosophy and science: pre-Socratic natural philosophers, Plato, Aristotle, Ptolemy, Euclid, Neoplatonists and Neo-Pythagoreans, with the works of Indian, Byzantine and Muslim scientists, as evidenced by comments, explanations, judgments and polemics with fellow scientists in his works. As a natural philosopher, he had a deistic view of the universe. Al-Beruni was one of the thinkers who stood at the origins of comparative religious studies. Analyzing religious teachings, he undoubtedly gave preference to Islam and noted its superiority, however, we can admit his deep knowledge of other religions, the desire to understand them rather than prove them wrong, and to express admiration for other cultures. His thought was characterized by scientific objectivity and accuracy of observations. Al-Beruni's writings also reflected ideas about morality. He drew attention to the need to develop such qualities as honor, dignity, friendship, partnership, conscience, and justice.

KEY WORDS: Central Asian Renaissance; Abu Rayhan Beruni; Mamun Academy; philosophy; Beruni cognitive method; religious studies; spiritual and moral education.

УНИВЕРСАЛЬНЫЙ ГЕНИЙ ЦЕНТРАЛЬНО-АЗИАТСКОГО ВОЗРОЖДЕНИЯ (К 1050-ЛЕТНЕМУ ЮБИЛЕЮ АБУ РАЙХАНА АЛЬ-БЕРУНИ)

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РЕЗЮМЕ. В статье раскрывается значение деятельности великого ученого центрально-азиатского Возрождения Абу Райхана Беруни (973–1048), чей юбилей широко отмечается в 2023 году по всему миру. Феномен центрально-азиатского Возрождения был уникальным явлением, характеризовавшимся гуманистической направленностью и небывалым расцветом науки, философии, медицины, просвещения. Аль-Беруни принадлежал к плеяде выдающихся мыслителей того времени, таких как аль-Фергани, аль-Хорезми, аль-Фараби, Ибн Сина и других, и был ученым-энциклопедистом, интересы которого распространялись буквально на все сферы знания. Передовая методология научного познания аль-Беруни, разработка им эмпирического индуктивного метода познания обогатили философию. Он был знаком с трудами великих представителей греческой философии и науки: досократических натурфилософов, Платона, Аристотеля, Птолемея, Евклида, неоплатоников и неопифагорейцев, с работами индийских, византийских и мусульманских ученых, о чем свидетельствуют комментарии, разъяснения, суждения и полемика с коллегами-учеными в его работах. Как натурфилософ, он склонялся к деистическому взгляду на мироздание. Аль-Беруни был одним из мыслителей, стоявших у истоков сравнительного религиоведения. Анализируя религиозные учения, он, несомненно, отдавал предпочтение исламу и отмечал его превосходство, однако надо признать глубокое знание им других религий, стремление скорее понять их, чем доказать неправоту, выразить восхищение другими культурами. Его мысль характеризовалась научной объективностью и меткостью наблюдений. В сочинениях аль-Беруни также нашли отражение представления о нравственности. Он обращал внимание на необходимость развития таких качеств, как честь, достоинство, дружба, товарищество, совесть, справедливость.

КЛЮЧЕВЫЕ СЛОВА: центрально-азиатское Возрождение; Абу Райхан Беруни; академия Мамуна; философия; метод познания Беруни; религиоведение; духовно-нравственное воспитание.

Abu Rayhan Muhammad ibn Ahmad Beruni (973–1048) was a great medieval encyclopaedist and humanist who left his intellectual mark in astronomy, mathematics, philosophy, geography, ethnography, anthropology, geology, botany, medicine, pharmacology and many other sciences (Fig. 1). He was an outstanding cross-cultural historian who researched the traditions, morals, and religions of different peoples.

His scholarly horizons are truly immense. Al-Beruni's scientific legacy (about 150 works) touches almost all branches of the exact, natural and human sciences of his time. His works, which were translated into German, English, Russian and other languages, are still relevant today. The 1050th anniversary of Al-Beruni is being widely commemorated in 2022–2023 in many countries according to UNESCO's decision. Events dedicated to the anniversary (symposia, conferences, scientific round tables and student Olympiads) are held not only in Uzbekistan, the scientist's homeland, but also in Iran, Tajikistan and Turkey, where the memory of the great scientist is particularly cherished. Numerous scientific events dedicated to the remarkable date discuss the role of Beruni's scientific heritage and creativity in the development of world science, and emphasize the importance of studying the scientist's works and historical sources. An international scientific symposium entitled "Abu Rayhan Beruni — Discoverer of the Mysteries of Nature" was held in Tajikistan (Dushanbe) on 9 and 10 October 2023 in cooperation with UNESCO. In September 2023, an In-

Fig. 1. Abu Rayhan Beruni

Рис. 1. Абу Райхан Беруни

ternational Scientific and Practical Conference on 'The Role of the Scientific Heritage of Abu Rayhan Beruni in the Development of World Science' was held in the Republic of Uzbekistan (Tashkent). The range of issues discussed here testifies to multifaceted nature of al-Beruni's genius. The following topics were considered: "The role of applied sciences in the scientific heritage of Abu Rayhan Beruni", "Abu Rayhan Beruni and social and humanitarian sciences", "Modern approaches to the scientific heritage of Abu Rayhan Beruni", "Contribution of Abu Rayhan Beruni to the development of world civilization" and many other issues related to the life and work of the famous scientist. Our university was not left aside from such a significant scientific event and presented a report on "The relevance of Abu Rayhan Beruni's heritage in the humanitarian education of students of St. Petersburg State Paediatric Medical University (SPbSPMU)".

Abu Rayhan al-Beruni was a representative of the Central Asian Renaissance of the IX–XIII centuries, a historical phenomenon which was center in modern Uzbekistan. Its center was the historical and cultural region of Maverannahr and Khorezm, characterized by the intensity of intellectual life and the depth of intercultural ties, in particular, since ancient times Khorezm had trade relations with Kievan Rus, the Volga region and other countries [8]. It was a time of unprecedented cultural growth, flourishing of science, philosophy and enlightenment, which gave the world a whole pleiad of outstanding thinkers, such as al-Ferghani, al-Khwarizmi, al-Farabi, Ibn Sina, Omar Khayyam, Mirza Ulugbek, al-Rumi, Navoi and others. One of the representatives of this Pleiad was Abu Rayhan Beruni, a great scientist from Khorezm, who mastered almost all sciences of his time.

The largest educational institutions in the land of Uzbekistan — Mamun's Khorezm Academy (XI century) and Ulugbek's Samarkand Academy (XV century) — played a huge role in the development of culture at that time. In 1004, the enlightened ruler of Khorezm, Shah Ali ibn Mamun invited al-Beruni to participate in the organization of the academy. His contribution to Mamun's academy was significant, as he headed it throughout the years of its existence until 1017 and was the organizer and active participant of institution's scientific works. In addition, al-Beruni was both the organizer of the scientific work of the Academy and took an active part in researches himself. Many scholars from different countries were also invited here, thus creating an effective model of scientific community called "Mamun's Academy". The environment for scientific work created in the Gurgaj Academy encouraged scientists to write brilliant works in various fields of science. Among those attracted to the Academy was Abu Ali ibn Sina (Avicenna, 980–1037). His philosophical, natural-scientific and medical views were formed here, and this is where he began to create his famous work "Canon of Medical Science". Observations and ideas of the Academy's scientists nourished science all over the world for centuries to come. Mamun Academy's motto — "Science for the benefit of people", confirms the humanistic orientation of the scientists' research.

While working at the Mamun Academy, al-Beruni had a scientific polemic with Ibn Sina on the structure of the universe. As a result of this polemic, al-Beruni questioned the Aristotelian doctrine of the existence of the heavenly world and criticized the idealistic elements of Aristotle's natural philosophy. This correspondence, as well as other works of al-Beruni, testify to versatility of the great scientist from Khorezm.

Beruni is called the founder of geodesy and geology, a profound mathematician and astronomer, and a geographer. For the first time in the Middle East, al-Beruni expressed an opinion about the possibility of the Earth's movement around the Sun and determined the length of the Earth's circumference.

Al-Beruni's contribution to medicine is also significant. His unfinished work "Pharmacognosy in Medicine", a book on medical remedies, which he began writing at the end of his life (1046–1048), is very interesting. This capital work is extremely important even in our time. The work described in detail more than a thousand medicinal plants and about 880 herbal remedies. The book contains information not only about medicinal properties of various substances, but also ways of preparing medicines from plants, animal organs and minerals. Al-Beruni also contributed to establishment, formation and harmonization of medical terminology. He collected and explained about 4500 Arabic, Greek, Syriac, Indian, Persian, Khorezmian, Sogdian, Turkic and other names of plants; these synonyms are important for the modern study of the history of pharmacognosy. In another work named "Minerology", al-Beruni showed the effectiveness of moomiyo (shilajit) for treating wounds and skin diseases. His recommendations regarding moomiyo were widely used by physicians of that time and subsequent periods.

Al-Beruni's philosophical views are also interesting. The scientist lived in the period when the Arab-Muslim culture flourished in Central Asia, and Arab philosophy was actively developping (Arabic — falsafa). There was a "combination of Abrahamic, Judeo-Christian-Muslim relativism (from the Latin revelatio — revelation) with ancient pagan intellectualism, which later inspired the classics of Jewish and Christian theology, such as Maimonides (d. 1204) and Thomas Aquinas (d. 1274)" [5]. This was the "golden age" of Islamic mathematics and natural science. The natural scientific picture of the world began to form during that time under the influence of the naturalistic philosophy of the Greeks. "During the period of the highest blossoming of science (IX–XI centuries), Arab philosophers and scientists proceeded in their research, like the Greeks, from the principle of the unity of nature and the integrity of science'' [9]. While Western European scholasticism was steadily moving towards more and more abstract theorizing and detachment from empirical reality, science in the East managed to avoid the acute conflict between abstract theoretical systems and cognizable reality. Scientists of medieval East realized the importance of empirical cognition without absolutizing it, they never forgot that in order to comprehend the essence of phenomena, their connections and interactions, it was necessary to move to a higher level of scientific cognition, namely theoretical and metaphysical ones. Science is "a certain way of being, which requires existential conditions and prerequisites" [4]. Scientists in the East had a splendidly organized educational system (Mamun's academy). Thus, they managed to create a scientific entity much earlier than scientists in Western Europe. Here a number of individual elements (experimental data, equipped laboratories, support of sponsors, translations and publications, cultivation of a teaching succession, etc.) formed a scientific picture of the world which was different from the scholastic one, which predetermined the impressive success of Eastern medieval science. Moreover, Eastern science immediately began with a reflection and reassessment of the most important assumptions in the form of Aristotelian philosophy as the unshakable authority of that time, as well as with distinctions between subjects of theology and science. That was another factor of the Eastern science success. Abū Reyhan Muḥammad ibn Ahmed al-Berūnī was one of the originators and intellectual heroes of this scientific revolution. "Before Khorezm was finally conquered by Mahmud Ghaznavi, all sciences were developing rapidly in Gurganj, and the main figures of scientific life in Khorezm were Ibn Sina and Beruni" [7].

Critical attitude to pagan authorities was a distinctive feature of al-Beruni's curious and independent mind. He was familiar with the works of great representatives of Greek philosophy and science: pre-Socratic natural philosophers, Plato, Aristotle, Ptolemy, Euclid, Neoplatonists and Neopythagoreans, with the works of Indian, Byzantine and Muslim scientists, as evidenced by comments, explanations, judgements and polemics with fellow scientists in his works. The philosophical form of al-Beruni's work, just as Plato's work, for example, can be characterized as syncretism — the combination of heterogeneous philosophical principles within one system. His philosophical views are scattered throughout his scientific works, from which they can be partly reconstructed. Unfortunately,

several special philosophical treatises by al-Beruni, mentioned by researchers of his work, have been lost. The thinker was characterized by close interrelation between concrete scientific knowledge in the field of mathematics, physics, astronomy and philosophy. Beruni linked the clarification of ontological questions of space and time, motion and prime mover, essence and existence with the understanding of the structure of the universe being, while his ethnographic research was intertwined with comprehension of social and cultural concepts as well as anthropological and ethical problems. The popularity of Peripatetic philosophy did not prevent him from criticizing Aristotle's views, for which Ibn Sina criticized al-Beruni himself: "Your manner of presenting Aristotle's words as unreasonable is vicious and unworthy" [3]. Ibn Sina, answering al-Beruni's questions about Aristotle's book "On the Sky" in a famous correspondence, reports on his (al-Beruni's) natural philosophical views: "...Anaximander asserts the same thing as you, namely, that the original element is air. When the quality of coldness acts upon it, it is (according to him) converted into water; but if it is heated by the motion of the celestial sphere, it becomes fire or ether" [3]. The natural philosopher al-Beruni inclined to a deistic view of the universe. Without questioning the Creationist idea of God's creation of the world, he allowed the further development of nature according to his own laws. Al-Beruni, for example, agrees with the Indian opinion stated in the "Vishnupurana", which says: "Matter is the primary basis of the world. Its action arises from natural impulse... by free choice..." [2]. On his own behalf, al-Beruni adds that God is exalted above matter, and also, "Through God, matter becomes an acting force that labors for him as a friend who unselfishly labors for his friend" [2]. In general, al-Beruni's ontological views can be characterized as hyleomorphic universalism, as he agrees with the view that all substances, with the exception of God, are formed from matter and form. The greatest contribution to philosophy, in our opinion, was al-Beruni's advanced methodology of scientific cognition and his development of the empirical inductive method of cognition, but this is a vast topic requiring a separate study. He developed an essentially modern methodology of scientific cognition based on observation and experiment. Al-Beruni is one of the earliest, if not the earliest representative of experimental and pragmatic science, the aim of which is to apply the results of research in a practical way, in full accordance with the motto of the Mamun Academy — "Science for the benefit of people". Abu Rayhan Beruni headed this illustrious scientific school in Gurgenj, the capital of Khorezm, at the beginning of the XI century.

The name of the scientist is widely known, first of all, for his contribution to natural sciences. The intellectual world is less familiar with the fact that al-Beruni was one of the thinkers who pioneered comparative religion. His works "Monuments of Past Generations", "India" and "Geodesy" contained extensive information about religious views, holidays and rituals of various peoples — ancient Egyptians, Greeks, Romans, Jews, Christians, Zoroastrians, Indians and others. Describing religions, he undoubtedly favored Islam and noted its superiority: "We have described these things for the reader to be able to compare how much higher are the institutions of Islam and how clearly this contrast reveals all the customs that differ from those of Islam in their impurity" [13]. Nevertheless, in reaching his conclusions, he directly quoted the sacred texts of other religions, tried to understand them rather than prove them wrong and, at times, enjoyed expressing admiration for other cultures. The above-mentioned works demonstrated a generally uncharacteristic example of scientific objectivity, keen observation and critical approach to the sources used. In introductions to his works, the author clearly formulated the principle that still underlies religious studies: to accurately reproduce the views of adherents of various doctrines, for which "it is necessary to purify one's soul from the [bad] qualities that spoil most people and from the reasons that make a person blind to the truth" [1]. When reconstructing the worldview of a representative of another religion, one should cite his own words, "since this is his faith" and "it is better seen and understood by him" [2]. The famous Russian orientalist V.R. Rosen, characterizing the work of al-Beruni as a master of religious studies, wrote that he "breathes the spirit of impartial criticism, quite free from religious, racial, national or caste prejudices and preconceptions, criticism cautious and prudent. He brilliantly mastered the most powerful tool of the new science, i.e. the comparative method. He reflects critics which clearly understands the limits of knowledge and prefers silence to conclusions based on insuffi-

ciently numerous or insufficiently verified facts, as well as a width of views which are truly remarkable — in a word, he reflects the spirit of real science in the modern sense of the word" [10]. Al-Beruni's works which were related to various cultural and religious traditions, contained an intension of respectful, open-minded and tolerant attitude towards alien beliefs, customs and convictions. The thinker pointed out that every culture had a universal element that made all cultures distant relatives, no matter how alien they seemed to each other, and therefore the different and unfamiliar required further studying and understanding, not blind denial or violent eradication [12]. This approach, which was unique at the time, has become prevalent today. An important task that modern researchers of cultural phenomena set for themselves is to show the unity in diversity; the commonality of ethical principles and humanistic attitudes characteristic of different religions; the need for attentive and respectful attitude towards representatives of other faiths.

The unique heritage of the outstanding thinker Abu Rayhan Beruni presents not only valuable ideas about science, philosophy, religion, medicine, but also wise thoughts about spiritual and moral upbringing and education of the younger generation. Al-Beruni saw the cause of ignorance and injustice of the social system in human vices, which must be eliminated, because they spoil society and cause a threat. Believing that "violence, perjury, breach of fidelity, seizure of other people's property by deceit, stealing" negatively affects the upbringing of the younger generation, he urged people in his numerous works to be kind, sensitive, attentive, show sympathy and help each other [2]. At the same time, al-Beruni recognized that man's acquisition of negative moral qualities is influenced by external circumstances, because his nature is constantly striving "to win as much praise and approval as possible, for hearts are made to love this and the opposite" [2]. Al-Beruni was sincerely convinced that spiritual and moral perfection of a person consists, first of all, of acquiring such virtues as wisdom, activity, gratitude, patience. Achievement of perfection, as Abu Rayhan Beruni noted, can be attained in the process of widespread introduction of intellectual and moral norms in the process of upbringing and education. The great thinker, pointing to a number of positive human qualities, singled out the most important of them — the desire for justice and truth. Al-Beruni wrote that without it, it is impossible to bring up high moral traits — to be fair, sociable, demanding, persistent and frank. He assumed that the virtues recognized in society, as well as knowledge, can liberate people from ignorance [11]. Among the highest spiritual virtues of a human being, al-Beruni included the pursuit of knowledge, which is the essence of man, the basis and peak of his spiritual and moral perfection. In al-Beruni's opinion, knowledge gained as a result of diligence, great patience and hard work ennobles a person, makes him kind, generous and reasonable, directs him to the right path. To achieve the greatest success in education, al-Beruni recommends methods of both encouragement and punishment, and he attached great importance to persuasion and various conversations on a variety of topics. According to al-Beruni, spiritual and moral education should be based on the following elements of educator's activity: great interest and love for pupils, enthusiasm for teaching profession, observation, sociability, fairness, organizational skills, exactingness, persistence, frankness, striving for realization of spiritual and cognitive needs and interests, intellectual activity. Abu Rayhan Beruni also described an aim of pedagogical proficiency: "The aim is not to prolong time, but to prevent monotony, because looking at the same things for a long time, will lead to fatigue and kill patience" [6].

The analysis of spiritual and moral views of al-Beruni allows us to state that his spiritual heritage has not only not lost its significance at present, but also acquired a special sound. His idea that it is not enough to be just a highly educated person and know the rules of decent moral behaviour, it is necessary to be able to use this knowledge in practice is interesting and extremely important from the modern point of view. Al-Beruni attached primary importance to such concepts as honour and dignity, friendship and companionship, goodness, justice and conscience. It should be noted that even today these concepts have not lost their significance in the modern social reality and are used with great success in the process of upbringing and educational activities of the younger generation.

The ideas of the great scientist are still relevant not only in the field of natural sciences, but also in the field of humanitarian research and humanitarian education. They are in harmony with modern ideas and correspond to the current scientific approach, which requires accuracy and objectivity.

The name of Abu Rayhan al-Beruni is not forgotten and is heard, among other things, within the walls of SPbSMPU in the context of the conversation about Muslim philosophy and medicine of the Medieval East.

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