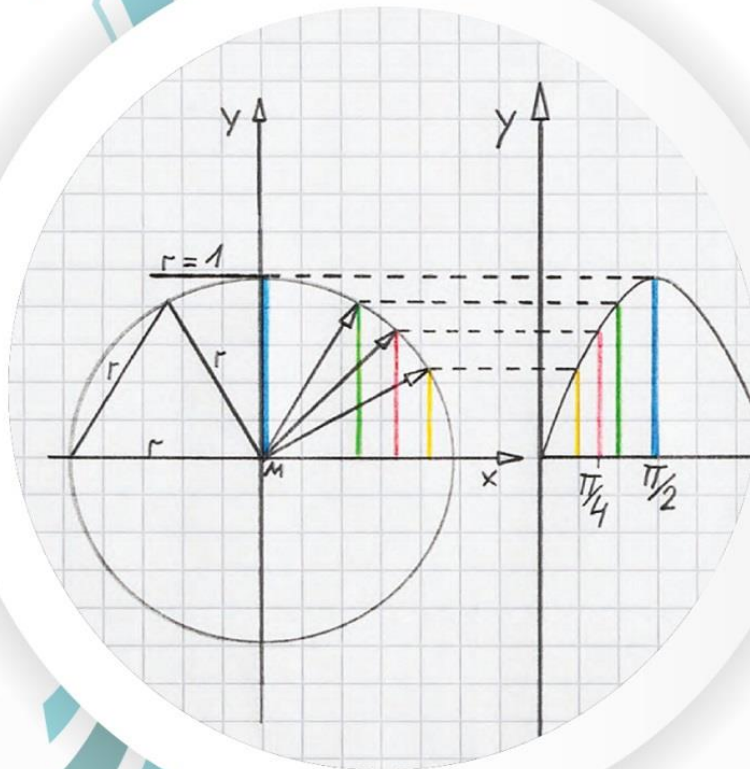
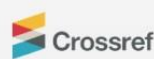


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**SCIENCE IN CENTRAL ASIA: A GREAT SCIENTIST
ABU RAYHAN BERUNI**

N.N.Kurbanov, X.H.Matyakubov

Tashkent State Pedagogical University named after Nizami

Abstract. For centuries, Central Asian regions have welcomed scientists from near and far countries. Dozens of scientists have carried out effective scientific research in Khorezm Ma'mun Academy alone. In this article, we will talk about the legacy of Abu Raykhan Beruni. The rich scientific and spiritual heritage reflected in his research work is significant in that it has not lost its value even in today's modern world.

Keywords: Central Asia, world, history, capital, homeland, great, modern, city, book, scientist, young scientist, ancient, science, culture, science, west and east, upbringing, education, throne, eastern culture , a great scientist.

Introduction. The first renaissance period, which left an indelible mark on the history of our country, took place in the 9th-12th centuries. The Swiss professor Adam Mes called this centuries-long period the "Muslim Renaissance", while the Russian orientalist Nikolay Konrad praised it as the "Oriental Renaissance". During this period, there was an increase in all fields, especially in science, education, culture, economy, medicine, and military fields, new ideas were born. The Samanids, Karakhanids, Ghaznavids, Seljuks, and Khorezmshahs, who ruled the territory of our country, created great opportunities for scientists for the development of science and culture. On the initiative of these rulers, extensive creative work was carried out in cities such as Bukhara, Samarkand, Urganch, Marv, Termiz, and madrasahs and schools, which were considered centers of knowledge of their time, were established. Musa al-Khorazmi, Ahmad al-Farghani, Imam al-Bukhari, Abu Mansur al-Moturidi, Abu Nasr Farabi, Abu Bakr al-Khorazmi, Abu Rayhan Beruni, Abu Ali Ibn Sina, Mahmud az -Scientists such as Zamakhshari, Burhoniddin al-Marginani, Mahmud Koshgari, Yusuf Khos Hajib, Ahmad Yassavi were engaged in scientific activity[11].

We have seen that the soil of our country has been blessed with the education of scholars whose spiritual and scientific views have amazed the world. The scientist we want to study in this article, Abu Rayhan Muhammad ibn Ahmad al-Biruni, is one of the great encyclopedic scholars of the Middle Ages. A number of sciences of Beruni's time: astronomy, physics, mathematics, geodesy, geology, mineralogy, history, etc. He was born in Kat, 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. Besides his mother tongue, Beruni could speak seven other languages. These are Arabic, Sogdian, Persian, Syriac, Greek, and ancient Jewish and Sanskrit languages.

At the age of 22, Beruni was forced to move away from his homeland to the city of Jurjan, at the time when the struggle for the throne began in Khorezm. In Jurjan, he studied with his second teacher, physician, astronomer, philosopher Abu Sahl Isa al-Masih. Beruni started writing the work "Osor al-Baqiya an alqurun al-Khaliya" in



Jurjan and finished it by the year 1000. This work proved to everyone that he is an encyclopedic scholar. In addition, Beruni wrote more than 10 works on the history of astronomy and netrology in Jurjon[9]. Beruni was summoned by the new ruler of Khorezm, Abu Abbas Ma'mun II ibn Ma'mun, to Urganch, the new capital of the country, where he was honored. Beruni continued his work in the scientific center opened under the auspices of Ma'mun in Khorezm and became a close adviser of Ma'mun[7].

After Khorezm was conquered by Mahmud Ghaznavi, Beruni was taken to Ghazna along with all the scholars. Beruni's 1017-1048 years spent in Ghazna were the most productive scientific years in his life. Beruni in his "Famous People of Khorezm", "Tahdid nihiyot al-amonia li tashidi dashat al-masokin" ("Determining the final limits of places to check the distance between settlements" - "Geodesy" (1025)) and "From the art of astrology" "Initial Concepts" (1029) was written in these years [2].

Beruni's famous large-scale work "India" "Tahqiq mo lil-Hind min maquda maquda fil-aql av marzula" ("The Book of Determining the Reasonable and Inconceivable Doctrines of the Hindus") was written in 1030. appreciated by Indian scholars. Beruni, who accompanied the king on one of Mahmud Ghaznavi's campaigns to India, where his thorough study of the Sanskrit language allowed him to get to know Indian culture, literature and Indian scholars of that time, and to create an immortal work about this country [3]. Mahmud Ghaznavi died in the year when "Hindistan" was finished, and his son Mas'ud took the throne in his place. During this period, Beruni's condition improved considerably. He dedicated the work "Masud's Law" on astronomy to Sultan Masud. According to Yakut, one of the scientists of that century, the book "Masud's Law" erased the traces of all books written before that on mathematics and astronomy" [4].

Beruni's life was very productive. He left this world on December 11, 1048 according to the information of his student Abul Fadl as Serakhsi. More than 160 translations, works, and correspondence related to various fields of science were left to the generations after Beruni. In addition to the above-mentioned large-scale works, he created a number of treatises on astronomy, astrology, mathematics, geodesy, geology, mineralogy, geography, arithmetic, medicine, pharmacology, history, philology, and translated from Sanskrit to Arabic and from Arabic to Sanskrit. He was also engaged in writing poems. The scientist's "Introduction to Astrology", "Key to Astronomy", "The Book of the Sun that Heals the Soul", "On the Necessity of Two Kinds of Action", "Principles of Multiplication", "Ptolemy's Almagesti in Sanskrit", "Useful Questions and Correct Answers", " Corrections to Farghani's "Elements", "Caution by the Turks", "Information about White-clothed" and Karmats", "Collection of Poems", "Translation of information about Al-Muqanna", "Correspondence with Ibn Sina" are among these [5].

Beruni was closely familiar with the works of Aristotle, Plato, Ptolemy, Euclid, representatives of ancient Greek science, and the works of Indian scholars, Muslim scholars al-Khorazmi, Farghani, Battani, Razi, Abu Tammam, Ibn Qaysun, Abu



Ma'shar, who made comments, comments, corrections to them. , wrote rebuttals. His scientific heritage is extremely diverse, and his service to the science of medicine and astronomy is very great. In his scientific works, Beruni commented on the motion of the earth: "The motionlessness of the earth is one of the main issues of astronomy, and it is difficult to resolve any doubts about it." Based on the geometric explanation of celestial bodies, Beruni comes to the conclusion that the geocentric system, which recognizes the earth as the center of the universe, and the heliocentric system, which teaches that the sun is the center of the universe, have equal power. In "Geodesia" Beruni openly states that he doubts the correctness of some theories related to geocentrism. Beruniy was one of the first scientists to think about the ellipsoidal shape of the skylights and the trajectory of the movement, and he is an innovator in choosing ways to determine the geographical distance and width of places [6]. By extensive use of trigonometry and geometry, he achieved more accurate results than ordinary astronomers. Beruni's results in determining the geographical width and distance of different places amaze even modern scientists. The great scientist notes that each part of the earth's surface has its own long historical development. Beruni was the first to seriously study the geological development of some regions of Central Asia, including the Amudarya Valley. His conclusions about the geological past of the Amudarya valley and the formation of the Aral Sea are considered to be one of the most successful geological analyzes of that time. The scientist relies on the theory that "Seas turn into land, and lands turn into seas." Beruni's conclusions about the formation of mineral deposits, the importance of rock erosion, and the weathering of rocks are of great scientific importance. He puts forward a theory that interprets the appearance and disappearance of mountains based on natural factors [8].

Beruni's works had a great influence on the recent development of the culture of the Muslim East. In recent works, the works of Bayhaqi, Shahrizuri, Qifti, Yaqut Hamavi, written in Arabic and Persian, provide important information about Beruni. Christian Ioanni Bar Ebrey (1226-1286), a Syrian historian and physician who lived in the 13th century, evaluates Beruni as follows: "In those past years, Abu Rayhan Muhammad ibn Ahmad al-Beruni, who crossed the sea of Greek and Indian philosophy, gained fame as a scholar. He is an expert in mathematics and has written a number of important books in this field. He went to India and lived there for several years, learning from Indian philosophers their art and teaching them Greek philosophy. His works are extremely numerous, mature and extremely reliable. In a word, in his time, after that, and until now, there was no scientist among his colleagues who was so knowledgeable in the science of astronomy and who deeply knew the basis and subtleties of this science. High evaluations and descriptions of Beruni are given in the works of Tabrizi, Suyuti, Qazvini, Tusi, Muhammad ibn Mansur al-Allami, al-Khurasani [10].

Since the 19th century, interest in Beruni's heritage has become more widespread in European and Asian countries. His works were translated into Latin, French, Italian, German, English, Persian, and Turkish languages. Books and translations of European scientists J. Reno, E. Zahau, G. Zuter, E. Wiedemann, K.



Nallino, J. Sarton, R. Wright, M. Meyerhoff, dedicated to Beruni's works, were published. These researchers gave Beruni's work a very high rating[9]. American historian J. Sarton gives the highest value to Beruni's heritage and considers him to be the world's first sage of his time. The famous Orientalist V.R. Rosen notes that his scientific views are surprisingly broad, and that he is characterized by the spirit of real science in the modern sense.

In the years of independence, the study of Beruni's scientific heritage was eagerly started, especially in recent years, great work has been done in this regard. In order to perpetuate the name of the scientist, streets and institutes were named after him, and a state award named after Beruni was established in the field of science. A number of international scientific conferences dedicated to the great encyclopedist Beruni were held in Tashkent, and his valuable works were published by the Academy of Sciences of Uzbekistan in Uzbek, Russian and other languages.

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