

ABU RAYKHAN BERUNI - ENCYCLOPEDIA SCIENTIST

Oktamov Tohirjon Gayrat oglu,

3rd Year Student, History Department Namangan State University

E-mail: oktamovtohir2@gmail.com.

Abstract

This article provides information about the life and scientific work of Abu Rayhan Beruni, one of the great encyclopedists of his time. Information is provided about the creation of Abu Rayhan Beruni's works and their study.

Keywords: Ubaydullo Karimov, Abu Rayhan Beruni, Kat, Ibn Iraq, Ptolemy, Jurjan, Qabus ibn Washmgir, Sahib ibn Abbad, Ghazna, Mas'ud Ghaznavi.

Al-Biruni is the Leonardo da Vinci of the 9th century.

J. Sarton

Introduction

Abu Rayhan Muhammad ibn Ahmad Beruni was born on 3 Dhu al-Hijjah 362 AH (9 September 973 AD) in the ancient capital of Khorezm, the city of Kat. Some sources say that Beruni was born outside the city of Kat, which is why the nickname "Beruni" was added to his name. Abu Sa'd Abdulkarim as Samani writes in his work "The Book of Genealogies": "The name Beruni refers to the outside of Khorezm (i.e. the city of Kat, the capital). Whoever was born outside the city is called "so-and-so Beruni." [7: 38]

Beruni scholar Ubaydullo Karimov says the following about the name Beruni: "His name is Muhammad, his father's name is Ahmad, and Beruni is a name that indicates his lineage, that is, his origin and lineage. "Beruni" is derived from the Persian word "Berun" (outside), meaning someone born outside the city or living there. Abu Rayhan is his kunya, that is, his nickname, which means "Rayhan's father" in Arabic.

Very little information has come down to us about Beruni's family members. According to Beruni, his mother earned her living by collecting firewood. Beruni was thirsty for knowledge from his youth. Beruni recalled his youth: "I asked a scholar who had come from Greece what the Greek names of various plants were, and he wrote them down in detail in a notebook. "I would memorize them." [7:38]

During Biruni's childhood and adolescence, the last representative of the Iraqi dynasty, the Khorezmshah Abu Abdullah Muhammad ibn Ahmad ibn Iraq, was the governor of the city of Kat. Abu Nasr Mansur ibn Ali ibn Iraq, the son of his uncle Ali ibn Iraq, was Biruni's first teacher. Abu Masr ibn Iraq was one of the famous scholars of his time, and wrote many works. In particular, he wrote a commentary on Menelaus' "Spherica", the work "Almajista" dedicated to the Khorezmshah Ali ibn Ma'mun, corrections to Abu Ja'far al-Khaziz's ziji, and "On the art of making an astrolabe", "On determining the arcs of the sphere", and 13 articles of "Fundamentals". [2: 8]

Ibn Iraq was 25 years old when Biruni was born. Abu Nasr ibn Iraq was a famous mathematician and astronomer of his time. Al-Biruni mentions this teacher with respect in many of his works.



Ibn Iraq also had a strong affection for Al-Biruni. He dedicated 12 works on astronomy, geometry and mathematics to his student Al-Biruni. Ibn Iraq introduced Al-Biruni to Euclidean geometry and Ptolemy's astronomical teachings. Ibn Iraq noted that his student was extremely talented and wrote that Al-Biruni had been conducting independent astronomical observations since his youth (994-995), and had even invented a special astronomical instrument for this purpose. [6: 123]

In 985, the 12-year-old Al-Biruni reached adulthood. Al-Biruni secretly read Abu Mashar's "Book of Science about the Stars". Through this work, Al-Biruni gained information about the movement of celestial bodies, which was important to him. Through Ptolemy's Almagest, he analyzed the movement of celestial bodies in more depth and came to the most important conclusion, namely, that the Earth is spherical. Based on the Habash Marwazi table, he determined the spring and autumn equinoxes for Khorezm. On the advice of Ibn Iraq, Biruni began to build a spherical model of the Earth. He approached Ptolemy's method through the Jaikhani method. In 995, Biruni built a globe in the form of a circular hemisphere. [4: 10]

By 995, political unrest began in Khorezm. The conflict between the Khorezmshah Abu Abdullah and the Gurganj emir Ma'mun ibn Muhammad intensified. The struggle for the throne escalated, and Ma'mun ibn Muhammad deposed Abu Abdullah, and Ma'mun ibn Muhammad took the throne. The Afrigid dynasty was deposed in Khorezm, and the Mamuni dynasty came to power. Ma'mun ibn Muhammad put everyone close to the Afrigid dynasty to the sword. Ma'mun ibn Muhammad's soldiers also raided the house of Ibn Iraq. Ibn Iraq's house was turned upside down. The house was burned down. The globe made by Biruni was also destroyed. Ibn Iraq and Biruni hid in the house of a nobleman from Khorezm. Biruni left Khorezm and reached Ray. The minister of Ray, Sahib ibn Abbad, had created a rich library of books on astronomy, mathematics, mechanics, music, logic, and medicine. When Biruni left Khorezm, he was left with a couple of dinars sewn into the hem of his robe. In Ray, Biruni lived in the house of the merchant Abu Karim from Isfahan. Abu Mahmud Hamid ibn al-Khidr Khojandi, the court astronomer of Fakhr ud-Dawla, the successor of the governor of Ray, Sahib ibn Abbad, was happy to receive the Khorezm master Abu Rayhan Biruni in his house. Meanwhile, news also arrived from his master Ibn Iraq. He reported that the situation in Khorezm had eased somewhat. His master had sent his work "The Book of Azimuths" along with the letter. Biruni learned the Pahlavi dialect from the masters of the Banu Sasan workshop in the Ray bazaar. Among Abu Karim's books, he found the Sasanian ode of Abu Dulaf al-Khazraji and translated it into Arabic. Biruni presented Khojanfdi with his work "Determination of a slight deviation and the width of cities". In 997, the governor of the city of Rai, a representative of the Bundi dynasty, Fakhr ud-Dawla, died. Biruni, having collected books in Rai, set off on camels to the city of Jurjan. [4:11] Biruni went to Jurjan, where he met and studied with his second teacher - the physician, astronomer and philosopher Abu Sahl Isa bin Yahya al-Masih al-Jurjani (died 1010). At this time, the famous representative of the Ziyari dynasty, Qabus ibn Washmgir (928 - 1012), was ruling Jurjan. This ruler invited Biruni to the post of minister, but Biruni refused this position and continued to engage in science. [7: 40]

Here, Beruni made new friends. One of these friends was Marzuban ibn Rustam. He was a great commander, and thanks to his services, Qabus ibn Washmgir took the throne of Jurjan. Beruni received information about the Manichaeen religion and the Samanids from Marzuban ibn



Rustam. The Jewish scholar Yaqub ibn Musa Nikrisi told Beruni about the biblical narratives. From the Khorezm scholar Abulhasan Azarhun, who settled in Jurjan, Beruni learned about the Persian name for leap years. As an expression of gratitude, Beruni gave Marzuban ibn Rustam the book "The Key to Astronomy", written on thick Sogdian paper and covered with soft leather, consisting of 150 sheets. [4: 13]

In 1000, Beruni wrote the work "Osar ul baqiyya al-qurun al-holiya" (Monuments of the Ancient World) dedicated to Qabus ibn Washmgir, known as "Shams ul-maoliy". In this work, Beruni comparatively studied the eras of Bukhtunassar, Philip, Alexander the Great, emperors Augustus, Antoninus, Diocletian, and the era of ancient Khorezm. This work was unlike any other work written before. The work was written in a comprehensive manner, combining mathematical calculations, astronomical observations, and calendar theories. The valuable part of this work for us is that it contains information about the ancient Sogdian and Khorezmian calendars. [4: 14] This work was published in Leipzig by the German scholar and Beruni scholar Eduard Zachau in 1876-1887. [6:128]

Beruni returned to Gurganj in 1004. At that time, the ruler Mamun II was patronizing all scholars. During his time, many scholars gathered in Gurganj. In 1005, Ibn Sina also came to Khorezm. He lived in Khorezm until 1011, traveled throughout Khorasan and Tabaristan in 1012-1014, and from 1014 he worked at the court of the Iranian rulers. [2: 15]

In 1010, Mamun II ordered Beruni to be brought to Gurganch. Mamun II considered Beruni to be his teacher. Beruni also described the good qualities of Mamun II in his work "Mashohir Khaworizm" (Famous People of Khorezm). Beruni worked at the Khorezm Mamun Academy founded by Mamun II until 1017. During this period, he wrote the work "Kitab al-jamohir fi ma'rifat al-jawohir" ("Collection of Information on the Recognition of Precious Stones"). In this work, the author explained more than 300 minerals and their physical, chemical, and physical properties. This work of Beruni was published in Russian by the Moscow orientalist M. Belinsky in 1963 at the USSR Academy of Sciences. [6: 129]

In 1017, the ruler of the Ghaznavids, Mahmud of Ghaznavids, conquered Khorezm. He ended the Mamun dynasty that ruled Khorezm. He appointed Hajib Altintash as his viceroy. Khorezm became a province subordinate to the Ghaznavids. [4: 17] Together with Beruni, he took many scientists who were working in Khorezm with him to the city of Ghazna. Beruni now carried out his further scientific activities in Ghazna. Beruni began writing his work "Geodesy" ("Tahdid nihayot il-amokin li tas'hih masofot al - masokin") in Ghazna. Al-Biruni states his purpose in writing this work as follows: "My general purpose is to determine the coordinates of a city chosen at random on Earth, that is, to describe its distance between the east and west, its latitude between the north and south poles, and the methods for determining the distances between cities and the azimuth of one relative to the other." [2: 29]

Al-Biruni completed this work on October 20, 1025 [4: 21] In 1022, Al-Biruni accompanied Mahmud Ghaznavi on his campaigns to India. During these campaigns, Al-Biruni studied India. He learned the culture, customs, and Sanskrit language of the Indians. In 1030, Al-Biruni completed his famous work "India" ("Tahqiq mo lil hind min ma'qula maqbula fil aql aw marzula" - "Determining the teachings of the Indians that are reasonable and unreasonable"). [6: 129] This work of the scientist consists of 80 chapters and contains information about the achievements of the Indian people in the exact sciences, literature, philosophy, ethnography,



customs, and religion.

On April 29, 1030, Sultan Mahmud of Ghaznavi died of pneumonia. According to the Sultan's will, his son Muhammad was to be the heir to the throne. However, his eldest son Mas'ud in Isfahan learned of this and began to fight for the throne. Mas'ud received a charter from Caliph Qadir and declared himself sultan in 1030. Mas'ud of Ghaznavi began to patronize Beruni. He created good conditions for Beruni to carry out his scientific activities. Beruni dedicated the work "Qanuni Mas'udi" to Mas'ud of Ghaznavi. This work of the scientist consists of 11 articles.

- The first article is devoted to the general picture of the world and the foundations of chronology,
- The second article is devoted to chronology and calendar issues,
- The third article is devoted to surface and spherical trigonometry,
- The fourth article is devoted to celestial astronomy,
- The fifth article is devoted to geography,
- The sixth article is devoted to the movement of the sun,
- The seventh article is devoted to the movement of the moon,
- The eighth article is devoted to the eclipses of the sun and the moon and the natural states of celestial bodies,
- The ninth article is devoted to stellar astronomy,
- The tenth article is devoted to the movement of the planets,
- The eleventh article is devoted to astronomical methods used in astrology. [4: 25]

At the end of his life, Biruni wrote the work "Saydana" ("Kitab asa saydana fit tib" - Book about medicinal plants). This work of Biruni consists of 1116 chapters. In this work, the scientist discussed 750 medicinal plants, 101 animals, 107 minerals, and 30 complex drugs. Al-Biruni's health deteriorated and he died in Ghazni on December 11, 1048. [4: 27]

In conclusion, Beruni wrote more than 160 works during his life. In 1035-1036, Beruni compiled a list of his works and in this list he names 113 works. Of these works, 70 are on astronomy, 20 on mathematics, 12 on geography and geodesy, 3 on mineralogy, and 4 on cartography. [6: 147] Today, many works are being carried out to immortalize the life of Abu Rayhon Beruni. The creators of the Uzbekfilm studio created a 2-part film "Abu Rayhon Beruni" (1974), and the Uzbek people's poet Uygun wrote the play "Abu Rayhon Beruni" (1973). In Tashkent, the Institute of Oriental Studies of the Academy of Sciences of the Republic of Uzbekistan, one of the metro stations in Tashkent, a district and a city in the Republic of Karakalpakstan, Urgench State University in the Khorezm region, schools and streets are named after Beruniy.

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