

MIRZO ULUGBEK'S CONTRIBUTION TO UZBEK AND WORLD SCIENCE

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Abstract. Mirzo Ulugbek was one of the unique people in the Timurid dynasty, who made an invaluable contribution to the development of science and culture. Mirzo Ulugbek was the son of Shahrukh and the grandson of the great Tamerlane (9 April 1336 – 17–18 February 1405) who was a Turco-Mongol conqueror founded the Timurid Empire in and around modern-day Afghanistan, Iran, and Central Asia, becoming the first ruler of the Timurid dynasty. [1;23] The main goals and objectives of the article are formulated. Based on the observation, Ulugbek is not only an astronomer, but also a mathematician, enlightener, poet and historian. The study shows the scientific and cultural heritage in the Timurids era and to create the invaluable work “Star tables of Ulugbek” that causes admiration and surprise of the whole world.

Keywords: Mirzo Ulugbek, Temurids dynasty, historical heritage, astronomy, observatory, sextant, madrasa, Academia, patron of science and culture, “Star tables of Ulugbek”, scientific research.

“Religion is scattering like fog, kingdoms are being destroyed but the works of scientists remain forever” (Mirzo Ulugbek).

Mirza Muhammad ibn Shahrukh ibn Temur Ulugbek Quragani (1394-1449) was a great astronomer and mathematician, famous scholar of his time, statesman, grandson of the famous ruler and master Amir Temur, who ruled Movaraunnahr from 1441 to 1449. Ulugbek (Muhammad Taragay) was born on March 22, 1394 in the city of Sultaniye in present-day Azerbaijan. In 1394, Amir Temur laid siege to the Mordin fortress in Iraq. At this time, Ulugbek was born in the Sultan's residence of Sahibkiran. Historian Sharafiddin Ali Yazdi writes in his work “Zafarnoma” that the envoy came to Amir Temur and told him good news about the birth of Ulugbek and that astrologers predicted that this grandson would become both a scientist and a ruler in the future. Sahibkiran with joy stops the siege of the Morda fortress and cancels the ransom

imposed on his people. In 1405, after the death of the great master, who created a vast empire covering the entire territory of the Near and Middle East, from Central Mediterranean to North India, with the exception of Central Asia, all the inherited property clay and passes on to grandchildren. At the head of the Timurid kingdom sat Shahrukh, the son of Timur, who was elected at the residence of Herat. The rule of Mavaraunnahr was handed over to Ulugbek, the eldest son of Shahrukh, the grandson of Amir Temur. In 1409, Ulugbek was proclaimed governor of Samarkand, and after the death of his father Shahrukh, in 1447 he became the head of the Timurid dynasty. As a young man, Ulugbek showed great interest in science and art, especially mathematics and astronomy. The rich library that his father and grandfather amassed became the basis for his expansion of his intellectual outlook, where he spent much of his time. Ulugbek was very well educated at that time. He had a great memory, was fluent in Arabic and Persian, was well versed in Turkish poetry, literary styles, and participated in literary debates. He also wrote poetry. Ulugbek's mentor was a well-known scientist, the famous mathematician and astronomer of the Timurid court, Qazizoda Rumi. He showed nine-year-old Ulugbek the ruins of a famous observatory in Maragha. This is exactly what he did in his youth his memories may have determined the future of the future astronomer. During the reign of Ulugbek, Samarkand became one of the centers of science in the Middle Ages. In Samarkand, in the first half of the 15th century, around Ulugbek, a whole scientific school was established, uniting such well-known astronomers and mathematicians as Giyosiddin Jamshid Kashi, Qazizoda Rumi, Ali Kushchi. At that time, Samarkand was inhabited by historian Hafiz Abru, who wrote a wonderful work on the history of Central Asia, the famous physician Mavlon Nefis, poets Sirojiddin Samarkandi, Sakkoki, Lutfi, Badakhshi and others. They were the forerunners of their time, believing in the power of the human mind and science. [2;34]

In 1417-1420, Ulugbek built a madrasah in Samarkand and became the first architectural ensemble in Registan. Ulugbek invites many astronomers and mathematicians from the Islamic world to this madrasa. The other two madrasahs were built in Gijduvan and Bukhara. Ulugbek The madrasahs built by the university served as a university. The inscription on the roof of the madrasah built by Ulugbek in Bukhara reads, "The pursuit of knowledge is obligatory for every Muslim". [3;4] But Ulugbek's greatest passion was astronomy. The meaning of Ulugbek's life and astronomers such as Qazizadeh Rumi, Jamshid Giyosiddin al Kashi, and Ali Qushchi inspired the construction of the observatory.

According to research scientists, the construction of the observatory was completed in 1428-1429. The observatory was a unique building of its time. The rocky

foothills of Kuhak Hill have been selected for the earthquake-resistant building. The main instrument - the sextant (angle gauge) - is designed along the meridian lines from south to north. In addition to the main instrument, the observatory had other astronomical instruments.

When Ulugbek was 8 years old, he accompanied his famous grandfather Amir Temur during the military campaign to Asia Minor and Syria. Once, in the city of Merag, young Ulugbek saw the famous Maragin Observatory, which existed until the middle of the XIV century and was the largest astronomical observatory of its time. About 400 thousand manuscripts were stored there and more than 100 scientists-astronomers worked in this observatory. It is said that since that time Ulugbek had been passionately keen on astronomy. Thanks to the vast knowledge and power of the ruler, Mirzo Ulugbek was able to create the most equipped astronomical centre of that time. [4;2] The observatory was round in shape, its diameter reached 46 meters, and the height was at the level of a ten-story building. Although the structure was three-story, each floor was ten meters higher. Inside, along the line of the meridian, Ulugbek built a quadrant – a large 64 meters long instrument, located at an angle of 90 degrees. Before the invention of the telescope, such a quadrant served as a tool for measuring the height of the stars above the horizon and for determining the coordinate of the point from which the measurement was carried out. Ulugbek’s quadrant was the largest in the world at that time, and therefore the most accurate. The observatory consisted of two parts, and the one that was underground had been preserved.

Mirzo Ulugbek spent days and nights at his observatory. The result of the work was the “Gurgan Zij”, a star catalog, in which the astronomer described 1018 stars and divided them into 38 constellations. Mirzo Ulugbek was able to calculate the stellar year length with unprecedented accuracy – 365 days, 6 hours, 10 minutes, 8 seconds, and the error was less than a minute. He determined the inclination of the Earth’s axis. During his lifetime, the scientific works of Ulugbek were known all over the world. Chinese wrote and talked about him and used the astronomical calculations of Ulugbek. After 200 years, the British scientists were engaged in the discoveries of Ulugbek. His scientific works were translated into Latin. [5;18]

Ulugbek is not only an astronomer, but also a mathematician, enlightener, poet, historian. In the XV century, he urged the people to education: “the Muslim men and women must possess knowledge”. Ulugbek was very strong in his endeavor to enlighten the people. He built madrassas in Bukhara and Samarkand for this purpose. One of the most famous is included in the ensemble on the Registan Square in Samarkand. Passion for science at that distant time turned out to be a dangerous affair. Mirzo Ulugbek set religious leaders against himself, and the lack of military victories

shook his authority. As a result, an uprising, led by the eldest son of Ulugbek, Abdulatif, was organized. The decisive battle between father and son took place near Samarkand. Ulugbek's troops were defeated and he had to surrender. With the consent of Abdulatif, Mirzo Ulugbek went to Mecca, but along the way, the traitors seized Ulugbek and beheaded the ruler. [6;4] This happened on October 27, 1449. After the death of Mirzo Ulugbek, the observatory worked for another 20 years, but it was soon closed and the building was gradually destroyed. The opening of the observatory occurred in 1908. Archaeologist Vyatkin, using the documents, was able to find Ulugbek's observatory in Samarkand.

The Samarkand marble sextant, which has survived to this day, was considered the largest of all known before it in the East. It is no exaggeration to say that the Ulugbek Observatory was the prototype of modern astronomical institutions. It also housed the largest library, the book collection of which numbered more than 15 thousand books covering almost all branches of science. Under Ulugbek, Samarkand became one of the world centers of medieval science. It is known that about a hundred qualified astronomers and mathematicians worked at his Observatory. Here, in the first half of the XV century. There was a whole scientific school. At the same time, Ulugbek always remained the leader of his "astronomical Academy".[7;3] It is he who has the idea of creating the main instrument of the Observatory and conducting his own observations of the stars.

According to the well-known economic historian Professor Andrew Gunter Frank, Central Asia has indeed been an important link between different parts of the continent, as well as Asia and Europe, for centuries. It defines the status of the region by using the expression "Centrality of Central Asia" - the centrality of Central Asia. German scholar Adam Metz also notes that the humanism of the medieval European Renaissance would not have been possible without the early explosion of the study of philosophy on our earth. [8;16]

As a final point, for a long time this ancient land remained a hotbed of education and science, one of the centers of world civilization, and the desire for knowledge has always been an integral part of the mentality of our people. The greatest merit of the thinkers of the middle ages is that they expressed ideas about universal, social and state development based on the ideas of humanism, enlightenment and mutual respect. These scientists were distinguished by high academic mobility and played a significant role in the formation of sciences in various countries of the East, the expansion of interchange between regions and continents, and the development of world civilization as a whole.

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