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THE ROLE AND SCIENTIFIC LEGACY OF MIRZO ULUGBEK IN THE DYNASTY OF AMIR TIMUR

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Annotation. Mirzo Ulug‘bek was one of the most prominent representatives of the Timurid dynasty and a famous astronomer of the medieval period. This article analyzes his political role within the dynasty founded by Amir Temur and highlights his scientific achievements. Particular attention is given to the establishment of the scientific school in Samarkand and the construction of the Ulug‘bek rasadxonasi. The importance of his astronomical work **“Zij-i Jadid-i Guragani”** for the development of world astronomy is also discussed.

Keywords: Timurid dynasty, astronomy, Samarkand, observatory, scientific heritage.

Input. Mirzo Ulugbek was born on March 22, 1394, in the city of **Tughra**. He was the grandson of the great commander Amir Timur and the son of Shahrukh Mirza, who was interested in science from a young age. He was engaged in mathematics, astronomy, history, and poetry. From a young age, he studied historical and political tasks, became acquainted with state administration and diplomacy. In 1411, he was appointed governor of Maverannahr by Shahrukh Mirza. In 1447-1449, he participated in the campaigns against Balkh and Herat. After the death of Shahrukh Mirza (1447), Ulugh Beg initially achieved victory and marched towards Herat. However, Alouddavla's brother, Abulqasim Babur Mirza, came to his aid and defeated Ulugh Beg. As a result, he was forced to return to Balkh and reorganize his territory. During Ulugh Beg's reign, internal strife also intensified: His eldest son, Abdulatif Mirza, rebelled in Samarkand. Ulugh Beg was expected to gather an army on the banks of the Amu Darya, waiting for his son, but upon hearing of the unrest in the city, he returned to Samarkand without a fight. As a result, Abdulatif captured Samarkand, imprisoned his father, and later killed Ulugh Beg in 1449.

Political significance: Ulugh Beg's political activity shows that: Managing power struggles within the Timurid dynasty: Ulugh Beg campaigned on Balkh and Herat, attempting to capture cities and territories. Maintaining dominance and protecting heritage: Attempts to lead his own armies to stop internal conflicts. Disputes within the

dynasty and rebellions of sons: These events are a clear example of the problems of state governance in the history of the Timurids.

Mirzo Ulugbek played an important role not only in the development of science and culture, but also in the management of political stability and internal conflicts in the Timurid dynasty. He tried to strengthen his political position through the campaigns of Balkh and Herat, suppressing internal uprisings, and political negotiations with dynastic figures.

Architecture and cultural heritage. During the reign of Ulugh Beg, Samarkand flourished. Major monuments he built:

• 1417 - Bukhara madrasah

• 1420 - Samarkand Madrasah

• 1433 - Gijduvan Madrasah.

Bibi-Khanym Mosque, Gur-Emir Mausoleum, Shahi-Zinda Ensemble

• Caravanserais, bathhouses, chorsu and charitable institutions

These works not only developed the city's infrastructure but also contributed to the advancement of science and culture.

Scientific school and scientists: Ulugbek created a scientific school in Samarkand, where the largest scientists worked:

• Ali Kushchi - his closest student in astronomy

• Qozizoda Rumi - scientist of mathematics and astronomy

• Ghiyasuddin Jamshid al-Kashi - one of the main scientists of the observatory

Studying in madrasas, combining scientific observations and experience, transformed Samarkand into a center of science.

Astronomy and Mathematics. Mirzo Ulugbek was interested in science from a young age and paid special attention to astronomy and mathematics. His scientific works occupy a unique place in the history of science in Central Asia and throughout the world.

Astronomical works: Ulugh Beg's most famous astronomical work is "Zij-i Jadid-i Guragani."

In this work, the positions of 1018 stars were determined and their longitude and latitude coordinates were given.

Ulugbek calculated the duration of the year as 365 days, 5 hours, 49 minutes, and 15 seconds, which was accurate up to 25 seconds.

The work also perfectly records the movements of the Sun, Moon, and five planets.

Mathematical works: Mirzo Ulugbek left a great scientific legacy not only in astronomy but also in mathematics. His mathematical works played an important role in the accurate conduct of astronomical observations and the compilation of star tables. The mathematical and astronomical works of Mirzo Ulugbek occupy an invaluable

place in the history of science not only in Samarkand, but also throughout the world. Through the construction of the observatory and scientific works, he developed mathematics both practically and theoretically, creating advanced methods for astronomical observations.

Chronology and Calendars: In the first section of the Zij, various calendar systems - the Hijri, Syriac, Greek, Jalali, and Persian ancient calendars - are compared.

Star Tables: Chapter 13 - "Positions of Fixed Stars by Longitude and Latitude"27 The star was included from other sources because it was not visible from Samarkand.

Ulugbek Observatory: Construction: Built in 1428-1429 on the *Choponota* hill in Samarkand.

Structure: Three-story cylindrical building, height 30.4 m. Inside the observatory, there were special astronomical instruments for observing the Sun, Moon, and planets.Information: The observatory had a library where scientists conducted scientific work on astronomy and mathematics.Through the activities of the observatory, Ulugbek established the Samarkand Scientific School. Famous scholars such as Ali Qushchi, Qazizada Rumi, and Ghiyasuddin Jamshid Kashi worked in this school.

Observatory and astronomical instruments: Construction: The observatory was built in 1428-1429 on the Choponota hill in Samarkand. Structure: Three-story building, 30.4 m high, cylindrical.

Instruments: Inside the observatory, special astronomical devices are installed to observe the Sun, Moon, planets, and stars. With the help of these instruments, Ulugbek and his students carried out precise astronomical calculations.The observatory was a unique scientific center that combined mathematical calculations and astronomical observations.

Works of Ulugh Beg 1. Zij-i-Jadid Guragani: the longitude and latitude coordinates of 1018 stars are given. The duration of the year was calculated as 365 days, 5 hours, 49 minutes and 15 seconds - this calculation was considered the most accurate result in medieval astronomy. The movements of the Sun, Moon, and five planets were precisely recorded.

2. Treatise on determining the sine of one degree: Trigonometric tables and methods of calculating sine. This treatise served for the application of mathematics in practical and astronomical problems.

3. Risolayi Ulugbek:Dedicated to astronomical observations and stellar movements.Scientific source used by observatory students and scientists.

4. Tarihi arba' ulus (History of the Four Uluses): A work on the history of the Timurid dynasty, illuminating statehood and political events.

Scientific significance: Mathematical tables and sine calculations ensured the accuracy of astronomical observations.Calculations carried out through the

observatory influenced the science of Central Asia and Europe.Ulugbek's scientists - Ali Kushchi, Qazizada Rumi, Giyasiddin Jamshid Kashi - based on his mathematical works, trained the next generation of astronomers and mathematicians.

Conclusion. Moreover, Ulugbek's scientific works and observatory activities, along with strengthening the scientific heritage of the Timurid era, transformed Samarkand into a medieval scientific center. Through his mathematical works, he made a significant contribution to the development of science, ensuring the accuracy of astronomical observations.

Mirzo Ulugbek is one of the most enlightened rulers of the Timurid dynasty who contributed to the development of science. The work carried out through his scientific school and observatory is of great importance in the history of world science. Although Mirzo Ulugbek managed political and state affairs as a ruler, his mathematical works and astronomical observations are considered the highest level of medieval scientific heritage. Through his observatory, star catalogs, and trigonometric treatises, he laid a scientific foundation not only for scientists of his time but also for scientists of subsequent centuries. Therefore, Ulugh Beg's mathematical works are valued both historically and practically as a rare and unique heritage. That is why Ulugbek's name has been preserved forever.

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