

About Jamshid Koshi and His Work “Ziji Khaqaniy”



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ABSTRACT: Although the name and works of Jamshid Koshi, one of the great scholars of the Timurid dynasty, are known to many, many aspects of his life and work remain secret.

The full name of the scientist is Ghiyasiddin Jamshid ibn Mas'ud ibn Mahmud Tabib al-Koshi (al-Koshani), born in the city of Koshan in northern Iran. The exact year of his birth is not known. It is believed to be before 1360. Because it is known that Qazizada Rumi (about 1360-1430)[1], who was born around this year, respectfully mentioned his name as “Mawlana”. Ghiyasiddin is his nickname. Grandfather Mahmud was a doctor and knew many sciences. Jamshid Koshi received his initial knowledge in his hometown of Koshan.

KEYWORDS: Ziji Khaqaniy, manuscript, Mawlana, Jamshid Koshi, improvement, scientist, Khaqan.

INTRODUCTION

Some research scholars indicate the time of Jamshid Koshi's arrival in Samarkand as 1416-1417, and “Ziji Khaqaniy” (Full name: “Ziji Khaqaniy dar takmili Ziji Elkhani”, i.e. “Khaqaniy Ziji on the improvement of Elkhani Ziji”) was written to Shahrukh in 1413-1414 it is believed that the work was donated to the library of Mirzo Ulugbek after the scientist came to Samarkand [2]. In fact, this idea was first put forward by V.V. Bartold. He said so:

“Хакан” для которого был написан этот труд, по всей вероятности, Шахрух; вероятно, автор до прибытия в Самарканд прожил некоторое время при гератском дворе. Астрономические таблицы Гияс ад-Дина Джемшида не дошли до нас, и потому остаётся неизвестным, насколько они отличались от труда Улугбека”. [3] Translation: “This work is dedicated to “Khaqan”, according to a more accurate assumption, it must be Shahrukh. Probably, the author lived in Herat palace for some time before coming to Samarkand. Astronomical tables of Jamshid Koshi (called “Zij” - A.B) have not reached us, so it remains unknown how different it is from “Zij” of Ulugbek.

This is what Bartold writes about Jamshid Koshi's arrival in Samarkand: *“Время поступления последнего (Жамшид Коший назарда тутилмоқда. А.Б) на службу к Улугбеку приблизительно определяется двумя датами: в месяц зу-л-када 818 г. (январь 1416 г.) им написан небольшой трактат об астрономических инструментах для султана Искендера (вероятно, представителя династии Кара-Коюнлу), следовательно, в то время он ещё не находился на службе у Улугбека; 3 джумада I 830г. (2 марта 1427г.) им закончено составленное для библиотеки Улугбека математическое сочинение. Следовательно, он был вызван в Самарканд после 1416 и до 1427г.* Translation: “The time of the arrival of the last one (meaning Jamshid Koshi. A.B) to Ulugbek's service is approximately determined by two dates: in the month of Zulqada 818 (January 1416) by the author to Sultan Iskandar (probably a representative of the Black Qyunli dynasty) about astronomical instruments A small pamphlet was written. It follows that at this time he was not in Ulugbek's service; the author completed writing his mathematical work (“Miftah al-hisab” - A.B) for the Ulugbek library in the month of Jumad al-Awwal 830 (March 2, 1427). It follows from this that he was recalled to Samarkand between 1416 and 1427.”

THE MAIN FINDINGS AND RESULTS

Currently, 20 manuscript copies of “Ziji Khaqaniy” have been found [4].

As a result of the research of two copies of “Ziji Khaqaniy”: the first, manuscript number 2692 kept in the library of Hagia Sophia in Istanbul, and the second, manuscript number 2232 in the library of the India office of the British Museum in London, and searching using other sources, circumstances were found that cast doubt on the above Barthold's opinion.

First of all, neither the capital of Khurasan, Herat, nor the name of the ruler Shahrukh Mirza is found anywhere in the work.

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Secondly, in the introduction of the work, it is noted that it is directly dedicated to Mirza Ulugbek. The author says that he started writing “ziji” earlier, and that the opportunity to finish it was blocked, but Sultan Ulugbek suddenly called him to Samarkand. And finally, he notes that he wrote his work and dedicated it to the Ulugbek library [5].

Thirdly, these points are stated in the preface of the work, and at the end of the manuscript it is noted that the work was written in 816/1413-1414 [5. 166]. So, it turns out that Jamshid Koshi came to Samarkand in 1413-1414.

Fourthly, this opinion was confirmed by Haji Khalifa (1609-1657) in “Kashf az-zunun”, he said: “This poem was written by Jamshid Koshi after he came to Samarkand at the invitation of Mirza Ulug’bek” [6].

Fifth, Jamshid Koshi gives an interesting information in his letter to his father. In Samarkand, scientists want to make an astrolabe (usturlob) based on “Ziji Elkhani”. However, the calculation of the paths of the stars is not accurate. This problem, when transposed to Cauchy, immediately corrects two errors. After that, Koshi said to his father: “So, this work was given to the poor guy and I finished it.” Here, Jamshid Koshi did not mention Ziji Khaqaniy, his reworking of Ziji Elkhani, when the observation results based on Ziji Elkhani turned out to be wrong. In the course of the letter, the scientist tried to explain to his father that there really are mistakes in “Ziji Elkhani”, as the scientist praised his potential to his father, he mentioned this work and of course his father must have read it, so this situation was still at that time. means that the work is not written. The scientist said: “The inconsistencies that are now known exist because of the inaccuracies that have accumulated over the years since the writing of “Ziji Elkhani” until now” [6. 286]. We think that after this incident, Mirzo Ulug’bek assigned him to revise “Ziji Elkhani” again.

Sixth, in his letter, the scientist tried to explain the reasons why astronomical observations were not completed in one year, but lasted for 10-15 years [6. 289]. So, from this we can know that it has been 15 years since he came to live in Samarkand. If we consider that the letter was written at the end of Koshi’s life, when the Ulugbek observatory was about to be completed, it turns out that he came to Samarkand in 1413-1414. Because, in the letter, it was stated that the observatory was finished [7].

Seventh, the treatise mentioned by Barthold above is a small astronomical work dedicated to Sultan Iskandar (in fact, Sultan Iskandar began to rule 4 years after 1416, i.e. in 1420 [8]) no, it is known that it was written in Samarkand (in January 1416) in the name of Iskandar Mirza, Ulug’bek’s cousin.

Eighth, it is known that Ulugbek “Zij” was completed in 1444 [9]. However, the theoretical part of the work was translated into Arabic by Jamshid Koshi. Astronomical tables consist of 30 lines. The reason for this is that one complete rotation of Saturn along its orbit takes 30 years. So, if we take into account that 30 years have passed between the completion of the observation results and the translation of the theoretical part of the work into Arabic, it turns out that Jamshid Koshi was already living in Samarkand in 1413-1414.

To sum up, Jamshid Koshi spent 15-16 years of his scientific career in Samarkand. This is also confirmed by the above evidence, that is, the scientist explained in a letter to his father the reasons for the extension of observation work for 15 years.

Jamshid Koshiy was one of the most active scholars of the madrasa founded by Mirzo Ulugbek. He determined the size and dimensions of the necessary astronomical equipment for the famous observatory (a special facility where astronomical observations are carried out). Because the scientist saw them in the Maroga observatory (the famous observatory of Nasiruddin Tusi). However, the great scientist died on the eve of the completion of the construction of the observatory [10].

CONCLUSION

Jamshid Koshi created a blessing. We inherited about 30 works from him. So far, 26 works of the scientist have been found. Most of them are related to mathematics and astronomy. Alloma’s life and scientific activity have not yet been fully studied. The study of his works is important in studying the activities of the Ulugbek Academy and the history of the famous observatory. Although Jamshid Koshi’s mathematical work “Miftah al-hisab” (“The Key of Arithmetic”) has been studied and translated into Russian, his astronomical works, especially “Ziji Khaqaniy”, have not been studied. By studying this work, it will be possible to know how high scientific accuracy astronomical observations were in Samarkand.

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