



## THE PLACE OF THE HERITAGE OF SCIENTISTS ANUSHTEGINID-KHOREZMSHAH IN THE EDUCATION OF THE THIRD RENAISSANCE GENERATION

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Article history:	Abstract:
<b>Received:</b> 11 <sup>th</sup> December 2021 <b>Accepted:</b> 10 <sup>th</sup> January 2022 <b>Published:</b> 22 <sup>th</sup> February 2022	The article analyzes the rich scientific heritage of Najib Bakran, Abu Ali al-Hasan ibn Haris al-Khububiy, Fahriddin al-Razi, Mahmud ibn Muhammad ibn Umar al-Chagmini, scientists of the Anushteginid-Khorezmshah period. The rich scientific heritage of these scientists plays an important role in the education of the heirs of the Third Renaissance.
<b>Keywords:</b> heritage, exact sciences, natural sciences, geography, geodesy, cartography, astronomy, maps, geographical methods, astronomical observations.	

Muhammad ibn Najib Bakran was one of the scientists who lived in the kingdom of Anushteginid-Khorezmshahs and worked in the field of mathematical geography (more precisely, geodesy and cartography). [145-148 b., 3, B-20; 6-9 b.]. Najib Bakran made extensive use of mathematical and geographical methods in compiling his map of the world. More precisely, according to Jahonname, it contains meridian lines representing geographic length and parallels representing latitude. In other words, the map is one of the elements of mathematical geography - a degree grid. The degree network was of practical importance in determining the location of cities.

Abu Ali al-Hasan ibn Haris al-Khububiy, a mathematician and jurist who lived and worked in Khorezm in the tenth and eleventh centuries, about whom we know very little. With al-Khububi's treatises on mathematics by J.H. Ibodov was engaged in [4, p. 29-31].

One of the greatest thinkers of Central Asia was Fahriddin ar-Razi (1149-1209). According to sources, he was born in Rey, came to Khorezm in his youth and received his primary education here. Later he visited Mecca, Medina and Baghdad, where he studied with famous scientists, returned to Khorezm and continued his scientific research.

Many works of Fahriddin ar-Razi have not been preserved. In the book «Historical Literature of Iran», published in Tehran in 1336/1917, it is indicated that the number of works written by Fahriddin ar-Razi is more than thirty.

Introducing the work of the scientist «Jami al-Ulum» («Jame al-Ulum») wrote: When I wrote this book, I followed the path of science, I agreed with my mind, I argued, and then I had to write like that, I was in debt. As a result, I decided to write a book under this title. In it, I tried to reveal complex, closed things. I tried to convey the secrets of many sciences such as mathematics, astronomy, medicine, music, chemistry, physics, animals, history and plants. I have led the ignorant with this book.»

The book is divided into 60 chapters and covers a range of disciplines such as arithmetic, geometry, history, music, chess, logic, medicine, language, and ethics.

Zh.Kh.Ibodov studied the chapters of specific sciences in the Uzbek language through translation based on comments [5, p. 29-31, 6, p. 118-119].

According to the Iranian orientalist Jalal Khumai, Fahriddin ar-Razi wrote his book in 1178 in Gurganch, the ancient capital of Khorezm, this book is dedicated to Sultan Takash ibn Arslan (1172-1200).

Khorezmshah Takash believed in victory in the struggle for dominance in the eastern part of the Muslim world and was not afraid of difficulties. He continued the policy of his grandfather Muhammad Khorezmshah Atsyz (1127-1156) on the foundation and development of Khorezm.

During the life and work of Fahriddin ar-Razi, political changes took place in the country. He writes: "Since I became interested in science, nothing else interested me. I was just trying to achieve this goal. At the time of writing this book, I have stopped all housework and devoted all my attention to this book. I finished writing «Jome al-Ulum» in three years in Khorezm. I wrote this book for the benefit of the Khorezm kingdom and other nations. This pamphlet is a book that reveals the secrets of the heart and makes the ignorant know. It is unique among the books known to people until now.

The scientist continued: "What is meant by science? What sciences are suitable for our purpose? Such questions were mentioned by scientists before us in their works, and I wrote them. My goal is to summarize them. Let people be encouraged to read them. He who discusses these sciences reads them, studies them, enjoys them, and

easily explains difficult things to people. If a person is interested in science, he can find anyone in this book, and, like me, he can remember the author and tell people. That's why he wrote in his book, which he called «Jome' al-Ulum» («Code of Knowledge»), which covers all sciences.

During the reign of Anushtegin-Khorezmshahs, especially during the reign of Muhammad Khorezmshah, Khorezm grew in all directions, where all branches of crafts, trade, science, culture, natural science were developed, madrasahs, mosques and libraries were built in large cities.

In addition to religious sciences, mathematics, astronomy, geography, and medicine were also considered in the madrasah. Achievements in the field of exact sciences were achieved at a time when administrative, economic, cultural buildings and structures were of direct practical importance.

The scientific achievements of the Khorezm Academy of Mamun, in particular the works of Abu Raykhan Beruni, had a great influence on the development of the exact sciences during the reign of Anushtegin-Khorezmshahs. In particular, in the field of astronomy this tradition was continued by Mahmud Chagmini.

He noted that Mahmud ibn Muhammad ibn 'Umar al-Chagmini, the Sidaism of Muqaddim in his treatise *Al-mulahkhas fi-l-khai'a* (mllkḥṣ fi alkhyy't), was a village in Khorezm [8, p. 38]. In studies, his name is also written in the form Abu-l-Fazl Mahmud ibn Muhammad ibn Umar al-Chagmini [1, p. 163-175]. This information may be sufficient to conclude that Chagmini lived and worked in Khorezm. The year of the scientist's death is recorded in the manuscript of his book «Al-mulahas fi-l-hai'a» in the Leiden Library as 618/1221. This date may have been entered into the manuscript during the editing process or by a calligrapher.

Some sources and studies on the life of Mahmud Chagmini include a commentary by P.G. Bulgakov to the catastrophe of Kazizade Rumi in Chagmini, i.e. the commentary in Russian quoted at the beginning of the word [1, p. eight]. P.G. Bulgakov in his article about the work of Kazizade Rumi «Sharh al-mulahkhas fi-l-hay'a» [8] He also commented on Chagmini.

It is also said that Mahmud Chagmini was a teacher in the field of science in a madrasah in the capital Gurganch, based on his scientific heritage.

The well-known European historian of mathematics D. Sarton (1881–1956) in his book "Introduction to the History of Science" Chagmini wrote:

1. «Count to nine.»

2. He wrote that he had a pamphlet entitled «Review of Calculation Methods in the Distribution of Heritage» and that it was in the Oriental Manuscripts Fund, Princeton University, USA.

In the treasury of the Institute of Oriental Studies of the Academy of Sciences of the Republic of Uzbekistan named after Abu Raykhan Beruni there are 5 manuscripts of the work of Chagmini «Al-mulahhas fi-l-hay'a» and they are stored in the following numbers: 7761/III, 8796/II, 10417, 10417/XII, 11599/ III. Two of them - 7761/III and 8796/II in the sixth volume of the catalog «Collection of Oriental Manuscripts» [9, p. 70-71] and two more - 10417 and 11599/III in the volume of this catalog dedicated to the exact and natural sciences [10, p. 248]. Information about these manuscripts is as follows:

1) No. 10417. It was written in the Nasta'liq script during the Timurid period, more precisely, in 839 AH (1435 AD) in Mashhad it was copied by the calligrapher Burkhan ibn Muhammad ibn Usman. There are drawings. Size 103 sheets (1b - 103b);

It consists of a booklet, which has been repeatedly commented on, an introduction, and two books. The first is the sphere of the planet, the Moon, its movement, the equator, the ecliptic, the latitude of the place, the azimuth, and so on. The second is to determine the Earth, Equator, Qibla, Moon and Sun. Written in nasta'liq script, tables of the catastrophe are given.

2) No. 7761/III. This is written in the Nastalik letter. Only the first part of the work is devoted to the catastrophe. There are drawings. Transferred to the XU century. Size 11 sheets (52 b-62 b);

3) No. 8796/II. This is written in the Nastalik letter. It was written on page 198a in 1238 AH (1822-1823 AD). This manuscript contains information about the movement of the planets and the moon. Size 17 sheets (257b - 273a);

4) No. 11599/III. It was copied in a Nasta'liq script around the 19th century. It gives a brief account of the work of Mahmud al-Chagmini, which consists of the two books mentioned above. Size 18 sheets (121b - 138 b).

One of his manuscripts «Al-mulahas fi-l-hai'a» (في الحى في الملل) was found in 1967 in Urgench. This manuscript was copied by Hadi Muhammad ibn Ali ibn Ibrahim Astrobodi, a student of Ali Qushchi (died 879/1474), a great representative of the scientific school of Ulugbek, in 949 AH (1542 AD). It is embroidered on the bedspread with the inscription «Al-mulahas fi-l-hai'a». This manuscript of al-mulahas fi-l-hai'a is much older and written in Naskh. H. Siddikov provides information about this brochure in his article on the scientific heritage of Mahmoud Chagmini and published in the libraries of the world (Berlin, No. 5673; Gotha, No. 1387; Leiden, No. 1083; Algiers, No. 1453; Oxford, No. 2905; British Museum, No. 133); Paris, No. 2330, No. 2502; Cairo, No. 224, No. 225), as well as Saltykov-Shchedrin in St. Petersburg, Kazan University, the Foundation of Oriental Manuscripts of the Academy of Sciences. Azerbaijan, the Foundation of the Institute of Oriental Studies of the Academy of Sciences of Uzbekistan named after Abu Raykhan Beruni-i-hai'a is also preserved" (الملك في الحى) [11, p. 180-185, 199].

The researchers who wrote about the manuscripts of the treatise, in addition to emphasizing the large number of copies, also noted that they were not fully engaged in scientific research and did not create a critical text of the work [2, p. 37].

Research shows that the oldest copy of the manuscript is number 2141/II (year of copying - 1246 AD), which is currently kept in the Lolali Library in Istanbul.

Although Mahmud Chagmini's treatise «Al-mulahas fi-l-hay'a» (الملك في الحي) has been studied, there are very few works in this direction in the Uzbek language. When we talk about the history of the study of a work, we consider it expedient first of all to dwell on the comments and translations into other languages written to it. Information about this is available in existing studies [2, p.37, 8, p. 7-11, 3, p. 9-16,].

In the history of science, there are many comments on Chagmini's treatise «Al-mulahas fi-l-hay'a» (الملك في الحي). Some of them belong to representatives of the exact sciences who lived in the 14th century, the first of which was Shamsiddin Muhammad ibn Mubarakshah Mirak al-Bukhari (died 1340). There are also Kamoliddin at-Turkmani, Ali ibn Muhammad Sayyid Sharif Jurjani (1340-1413) and Abdulvahid ibn Muhammad (second half of the 14th century), who lived in the middle of the 14th century.

One manuscript of the commentary by Ali ibn Muhammad Sayyid Sharif Jurjani is stored in the fund of the Institute of Oriental Studies of the Academy of Sciences of the Republic of Uzbekistan named after Abu Raykhan Beruni under the number 52655/III. Rewritten in the 17th century. in a beautiful Naskh letter of 52 pages (221 b - 272 a) [9, p. 80-83, 10, p. 248].

Kazizoda Rumi (761/1360 - 840/1437), a prominent representative of the scientific school of Mirzo Ulugbek (1394-1449), wrote a commentary on the Chagma catastrophe of 1412. It is called "Sharh al-mulakhshas fi-l-hay'a" (الملك في الحي). Kazizade Rumi's commentary on Zero Chagmini's treatise is more perfect than previous comments on this work in terms of the demand for specific sciences. In it, the text of «Al-mulahas fi-l-hay'a» is given in full, and Kazizade's additions are placed inside the text and underlined. There are many manuscripts of Kazizade's commentary in the world's book treasures [7, p.218-241].

In the fund of the Institute of Oriental Studies of the Academy of Sciences of the Republic of Uzbekistan named after Abu Raykhan Beruni there are 20 manuscripts «Sharh al mulakhshas» (الملك في الحي) by Kazizade Rumi: No. 8217; 3935/II; 10504/I; 2655/II; 8392; 8607/II; 1162/i; 9592; 7672; 7376/I, 117921; 5607; 9783/2; 3049/i; 8947/III; 9346/II; 5619/I; 2984I/IV; 1341; 6627 [10, p. 80-83]. The oldest of these, number 8217, was copied in AH 986 (1578 AD) by the calligrapher Muhammad Mumin ibn Muhammad Qasim. However, it has some shortcomings: the copied sheets are found in later periods, and the first eight sheets are copied later. Among them, 3049/I (rewritten in 1229/1813-1814, outlines are clearly drawn) and 2655/II (rewritten in 1070/1659, with a mixed naxsuls script) are distinguished by comparative completeness and quality. On the basis of these two manuscripts, "Sharh al-mulakhshas fi-l-hay'a" (الملك في الحي) was translated into Russian by P. G. Bulgakov and published [1, p. 216].

From the history of the Anushteghni-Khorezmshah period, it is known that during the reign of Muhammad Khorezmshah, along with the economy, various branches of science, including the exact sciences, developed in Khorezm. Mathematics, astronomy, geography, and medicine were taught in educational institutions. For this reason, there was a great need for textbooks. The successes of the exact sciences were of practical importance in the economic sphere as well.

"Mulahxas fi-l hay'a" (الملكا في الحي) was published in 1961 by the Foundation of Oriental Manuscripts of the Azerbaijan Academy of Sciences, the next one was transferred in 1637. It gives geometric figures corresponding to spherical trigonometry.

The book consists of three chapters, but neither the first nor the second chapters have come down to us. The volume of the third section of the manuscript is 70 pages.

### CONCLUSIONS:

1. The use of chess by Fakhriddin ar-Razi, who worked during the reign of Anushteghni-Khorezmshahs, is important in the effective organization of students' leisure, especially when preparing for exams. Because chess sharpens the mind and expands the worldview.

2. The work of Mahmud al-Chagmini «Mulakhkhas fi-l-hay'a», created during the reign of Anushteghni-Khorezmshahs, is an important contribution to the development of world natural science.

3. The work of Chagmini «Mulakhkhas fi-l-hay'a» served as a textbook in world science and served as an important source for the formation and development of scientific and philosophical thinking.

4. The issues of division of inheritance by Haris al-Khububi today serve as a program practice in resolving fiqh relations.

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