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"KITAB SURAT UL-ARD", BY MOSES AL-KHWARAZMI, CONTAINS INFORMATION ON THE HISTORICAL GEOGRAPHY OF THE FERGANA VALLEY AND THEIR ANALYSIS

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Abstract
The article presents information about the Fergana Valley as well as their analysis, as presented in al-Khwarazmi's "Kitab surat ul-ard".

Keywords: "Kitab surat ul-ard", al-Khwarazmi, Fergana Valley, Khojand, Akhsikent, Syrdarya, Stone Tower, Khazars, coordinate.

Introduction

The Arabic translation of Ptolemy's "Geography" was based on the "Kitab surat ul ard" of Muhammad ibn Musa al-Khwarazmi (C.783-C. 850), a mathematician and astronomer active in the "Bayt al – hikma" in Baghdad, which reached us. It is a reworking of Ptolemy's work, from which the idea of systematizing information and dividing the Earth's surface into the so-called climatic (intellectual) is based, accordingly, the information in each part is ordered by climate. Khwarazmi's data was interpreted in the form of zij – tables. In this respect, it is likely that attempts have been made to reflect some of the changes and additions to the information contained in Ptolemy's work in the form of a table. This change and additions recorded in I.Y.Krachkovsky and B.A. Rosenfeld's works [1-2]. Al-Khwarizmi's work" the book of the picture of the Earth "("Kitab surat al-ard") was published by I.Yu.Krachkovsky writes in his monograph on arab geographers that he was also known by other names [1: 93]. It was not until the 19th century that the work "Book of the picture of the Earth" was published in Europe only by the German Orientalist, who at that time was the director of the Cairo Khadiv (now National) Library V.Spit is revealed after acquiring the only manuscript that has arrived to this day. About this treatise in Cairo preliminary studies are published by V. Spit (1879, 1882).

The manuscript, on the other hand, is now bequeathed to the University of Strasbourg and the library of Land (now the Region) [2: 221]. After his articles on al-Khwarazmi's "Kitab surat al-ard", which V.Spit wrote, the famous Italian arabologist K.A.Nallino sets out to study the work. K.A.Nallino in his large paper "Al-Khwarazmi and his attitude to Ptolemy's geography "[3] identified many of the geographical names listed in the "Kitab surat al-ard", with Ptolemy's work and modern editions [3: 458-532]. Khwarazmi's work on geography was published by E.Honigmann in his book "Seven climates and important cities" [4], I.Yu.Krachkovsky also studied in the articles "Mathematical geography among Arabs from Al-Khwarazmi to Ulughbek" and in the monograph "Arabic geographical literature from al-Khwarazmi to

Ulughbek" [1]. Although Europeans only came to know the "Kitab surat al-ard" in the 19th century, the influence of this treatise on the East is difficult to assess. This book was the first Arabic geographical work known to us, and the countries of the near, Middle East and Central Asia had an incomparable impact on the development of geographical knowledge. The text of the Strasbourg manuscript of Al-Khwarazmi is attributed to published by G.Von Mzik [5]. In his monograph "Muhammad al-Khwarazmi" prepared by P.G.Bulgakov, B.A.Rosenfeld and A.A.Ahmedov, Al-Khwarazmi's geographical work was compared with the data of the geography section of the "Laws of Mas'ud", Ptolemy's "Geography", and Yaqut Hamawi's "Mu'jam al-buldon", from Al-Beruni's Pen [2: 122]. The monograph is dedicated to the work and brochures of Al-Khwarazmi, a khwarezmian-born atakali mathematician, astronomer, geographer and historian scholar, who created it in Baghdad in the first half of the 9th century. Fanda Al-Khwarazmi's authorship of 12 works is recorded by haqia. We will not list all of his works, because they are not within the framework of the issue that we are moderating. In our study, we will consider the essay "book of the picture of the Earth of cities, mountains, seas, Islands and rivers", which was written by Abu Ja'far Muhammad ibn Musa al-Khwarazmi based on Ptolemy's "Geography".

As for the work of Ptolemy and the Arabic translations of the "Picture of the Earth" made by al-Khwarazmi, it is not clear whether al-Khwarazmi used the Greek or Greco-Syriac variant. It is only possible to guess where Ptolemy used his data when writing the work of Horace. Many later scholars have concluded that al-Khwarazmi's work does not provide a translation of Ptolemy's work, but is not a Greco-Syrian variant of "Geography", but was composed with the aim of explaining a map composed directly in Greek. The beginning of the image of the Earth in the work of Al-Khwarazmi is undoubtedly drawn from ancient astronomical and geographical literature. For geographers who relied on astronomical observations, it was clear that the Earth was spherical.

Al-Khwarazmi follows Ptolemy in this regard. Under the influence of Greek knowledge, al-Khwarazmi adopted the theory of dividing the Earth's settlements into seven climates – wide meridians, regions, areas starting from the equator and running parallel to it in a south-to-North direction [1: 22]. For Al-Khwarazmi, the Earth is a sphere that is attached in the center of the universe and is powered by the same pressure from all sides of the cosmic ether (النيم). Al-Khwarazmi's work shows the coordinates of the geographical objects described. The presence of such indicators makes it possible to determine the boundaries of territories well known to the Muslim world in the middle of the 9th century. In this, there is also information related to the Fergana region that we are researching.

Al-Khwarazmi's work contains indicators on the geographical coordinates of 2402 points, which are combined into sections of cities, mountains, seas, islands and rivers. Cities, mountains and rivers were divided into seven "climates" by the addition of areas south of the "first climate" and north of the "seventh climate". The "Earth picture book" can be divided into 6 large parts. The first part describes the cities in the inhabited part of the Earth according to the climate, showing their geographical coordinates. As for references to the Fergana Valley, al-Khwarazmi reflects it very badly in his work. But after him, Arabic geographical literature takes the knowledge of Fergana precisely from his work. For the region of interest to us, al-Khwarizmi cites the Longitude and latitude coordinates of the cities of Fergana, which are:

stone tower (Buruj al-Hajar) – 101° 55/41° 5', Khojand – 92° 30/37° 10', Akhsiket – 96 ° 30/36° 40'. It should be noted that this information is the first description of the cities of the Fergana Valley in Arabic geography [2: 199]. The coordinates of some cities are for the purpose of determining how precisely they were given by al-Khwarazmi, as indicated by al-Khwarazmi: Khojand(Leninabad, now Khojand) - 69° 6/40° 27', Akhsiket (Farghana) — 71° 77/40° 11' [6]. Table 1.

№	City	Al-Khwarazmi coordinates	Length / width in WAD, 1998)	Difference (length/width)
1	Khujand	92° 30/37° 10'	69° 6/40°27'	+23°+24/-3°-17'
2	Akhsiket (Fergana)	96° 30/36°40'	71°7/40°11'	+25°-27/-4°+29'

This can be seen from Table 1, where al-Khwarazmi showed incorrect coordinates for the area we studied longitudinally. Latitudinal deviations are negligible, which allows us to say that coordinates are shown close to real distances on Earth. Al-Khwarazmi described the large river of Central Asia that interests us – Syrdarya.

Since there is a certain way to calculate coordinates on Earth, difficulties in determining the coordinates of cities and mountains are not noticeable. But the situation is different with how al-Khwarazmi determined the coordinates of the source of Syrdarya. It is not clear why the source of the Syrdarya (Norin River) was reached to measure individual cordinata. Al-Khwarazmi quotes the detailed coordinates of Sirdarya (nahr Tawil). Al-Khwarazmi has the coordinates of the beginning of the river – 44° 5' longitude, 97° 20' latitude, while its coordinates on earth are– 41° 84' / 77° 60' [6], with its discharge coordinates of 46° 5' longitude and 117° 0' latitude, as well as 50° 30' and 107' respectively, the river passes near the city of Khazars (unnamed), and its confluence coordinates are 41° 30' longitude and 90° 5' latitude, written on Earth at -46° 11/60 ° 77', respectively.

A complete translation of the description of this river basin is given in the work "Muhammad al-Khwarazmi" [2: 207]. Information about the source of the mystery lacks clarity. The question arises as to how correctly Al-Khwarazmi gave the coordinates of the source of Syrdarya. The difference in degrees and minutes between the stone tower (Buruj al-Hajara) and the source of the Syrdarya is 3° 0' lengthwise according to al-Khwarazmi, 4° 35 ' wide. The coordinates of the stone tower (Tashkent) according to the map are on the surface of the Earth– 41° 35' /69° 26' and the source of the Syrdarya (Norin River) – 41° 84/77° 60' is marked [6].

In the table of the km lengths of the parallel arcs and meridians, the length of the arc at one degree in length of 68.6 is 84.1 km, respectively, 1.4 km per minute. [7]. The difference in minutes in longitude coordinates between these two points is 49', which is about 41 km. An arc of 69 and 77 latitudes at one degree along the meridian is about 111.55 km long, the difference in degrees and minutes between these two points being 8° 34', respectively, which is about 953.7 km, and this is not consistent with current exact measurements, i.e., the actual distance in the area from Tashkent to the source of the Norin River.

According to the map, about 780 km between Tashkent and the source of Syrdarya. The difference in length and width between the Al-Khwarazmi data and the modern map is large, which makes it possible to conclude that the coordinates of the source of Syrdarya are incorrectly indicated by the author. It is possible that al-Khwarazmi mistakenly referred to other, such as Olabuqa, Kichik Norin, Otboshi rivers as coordinates of the sources of Syrdarya. Because the above rivers can also be taken as the source of the Syrdarya, but they also do not correspond to real, even approximate coordinates.

In conclusion, as a reason for the lack of accuracy in the coordinates of the cities and territories of the Fergana Valley, which is presented in the work of al-Khwarazmi, we can say that the science of geography is still in the formative stage in the Muslim East, and this work is the forerunner of the works created at this stage.

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