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From ancient times, large cities such as Toprak-Kala and Koykyrilganqala emerged in the territory of Karakalpakstan. These cities were important centers of the economy and culture. During the Middle Ages, remarkable scholars who became known throughout the world lived and worked in the territory of Karakalpakstan. The works of the historian and scholar Sergey Pavlovich Tolstov are of great importance in the study of these cities. The archaeologist and scholar, who devoted his life to Khorezm, spent his life studying history with great dedication and skill. According to the research of S. P. Tolstov, Koykyrilganqala was built in the 4th century BC, according to a pre-planned design. It consisted of two geometric, circular defensive structures, one located inside the other. Archaeological research conducted at the site in 1951–1957 established the existence of a two-story central temple resembling a tower. Its inner circumference was 44.4 meters, its outer circumference was 87.5 meters, and its height was 9.5 meters. Along the outer wall stood defensive walls with nine towers positioned at certain intervals. In terms of architectural construction, this city is considered one of the oldest cities in Central Asia. The height of the round central tower of the city was 8 meters. The building on the lower level was illuminated through windows located in the corners of the walls. The depth of the window recesses reached 7 meters. This was because the strong wall surrounding the tower, whose total circumference was 44.4 meters, was very thick. The structures located in the center were surrounded, at a distance of more than 15 meters from the outside, by a circular defensive wall with nine towers.

S. P. Tolstov carefully studied a five-window room intended for astronomical observations and, based on certain surviving equipment, presented evidence that there had been an observatory here. An observatory appeared at Koykyrilganqala earlier than in many other parts of the world, and the study of space developed there. We know that the observatory was based on such disciplines as arithmetic, mathematics, geometry, trigonometry, physics, natural science, and astronomy. Therefore, based on the existence of an observatory at Koykyrilganqala in the 4th century BC, we can conclude that the disciplines mentioned above were widely developed during this period.

A large number of iron tools and objects, including an iron sickle, several knives, an iron hook, and arrowheads, were found in the uppermost cultural layer of the city. The periods in which these monuments were created and the people responsible for them are described in the book *Ancient Khorezm* by the well-known Russian archaeologist and scholar S. P. Tolstov. The scholar expressed the opinion that nomadic Massagetae tribes had a strong influence on the construction of this city. As a result of the work of the Khorezm Archaeological Expedition conducted here, the appearance of the city was photographed from an airplane.

At the initial stage of the formation of the Khorezm state, Koykyrilganqala appears to have served as a center where its officials, military commanders, and scholars lived. By the

4th century BC, the Khorezm state had developed considerably. We may conclude that Koykyrilganqala was the scientific center of this state.

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