



## ARTÍCULOS

UTOPIA Y PRAXIS LATINOAMERICANA. AÑO: 24, n° EXTRA 5, 2019, pp. 13-18  
REVISTA INTERNACIONAL DE FILOSOFÍA Y TEORÍA SOCIAL  
CESA-FCES-UNIVERSIDAD DEL ZULIA. MARACAIBO-VENEZUELA.  
ISSN 1315-5216 / ISSN-e: 2477-9555

### Complexity of archaeological research and natural scientific studies in identifying the location of Ashlama-Saray, the country palace of the Crimean Khans

*Complejidad de la investigación arqueológica y estudios científicos naturales para identificar la ubicación de  
Ashlama-Saray, palacio de los Khans de Crimea*

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#### ABSTRACT

The article dwells on the results of the search for the archeological site – Ashlama-Saray – the country palace of the Crimean Khans. The palace was built in the second half of the 17th century. At the end of the 18th century, the main buildings of the palace were reconstructed. Currently, the ruins of the palace are not identified on the surface. The location of this monument was determined by a general plan of Bakhchisaray city. During the series of archaeological and natural-scientific works carried out in 2015–2016, this palace was precisely localized in the valley of Ashlama-Dere.

**Keywords:** Archeological, Ashlama-Saray, Bakhchisaray, Natural-Scientific.

#### RESUMEN

El artículo se centra en los resultados de la búsqueda del sitio arqueológico - Ashlama-Saray - palacio de los Khans de Crimea. El palacio fue construido en la segunda mitad del siglo XVII. A finales del siglo XVIII, los principales edificios del palacio fueron reconstruidos. Actualmente, las ruinas del palacio no están identificadas en la superficie. La ubicación de este monumento fue determinada por el plan general de la ciudad de Bakhchisaray. Durante la serie de trabajos arqueológicos y científicos naturales llevados a cabo en 2015-2016, este palacio fue localizado precisamente en el valle de Ashlama-Dere.

**Palabras clave:** Arqueológico, Ashlama-Saray, Bakhchisaray, Natural-Científico.

Recibido: 05-09-2019 • Aceptado: 19-10-2019



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## INTRODUCTION

In 2015-2016 exploratory archaeological excavations were carried out by the archaeological expedition "Kaffa" of the A.Kh. Khalikov Institute of Archeology of the Academy of Sciences of the Republic of Tatarstan, as part of the state program of the Republic of Tatarstan "Preserving National Identity of the Tatar People (2014–2016)". The aim of that initiative was to identify the location of the country palace of the Crimean khans of Ashlama-Saray in the valley of Ashlama-Dere (Bocharov: 2016).

Currently, the ruins of the Ashlamay-Saray palace are not exposed to the surface. The location of this palace was determined after the analysis of the cartographic source from the end of the 18th century. The palace is marked on the only non-dated plan of the city (Russian State Military Historical Archive). The Ozzi Explorer program enabled combining the cartographic source of the end of the 18th century with the modern maps and satellite images. It was possible to find out what remains of the palace should be found in the southwestern outskirts of Bakhchisaray city under the eastern slopes of the Chufut-Kale mountain in the valley, which today is called Ashlama-Dere, 2.0 km to the east of the end of Basenko Street, Staroselye micro-district, Bakhchisaray city (Baran: 2015, p.31; Akkuzova et al: 2018).

The only written description of the palace buildings was left by the 17th-century Turkish traveler Evliya Çelebi ibn Mehmed Zilli Dervish (Bakhrevsky: 2008, pp.88–90). It can be concluded from the detailed description that the Ashlamay-Saray palace was set up inside a large garden with significant irrigation facilities and consisted of several summer wooden architectural complexes erected in different styles (Kizilov & Prokhorov: 2011, pp.437-452; Kumari & Alexander: 2018).

Another Ottoman manuscript, the author of which is unknown, has the reference to Khan Arslan Gerai (1748–1756, 1767), who made into the Crimean history as a khan-builder, as he was engaged in restoring the country palace of Ashlam-Saray (Negri: 1844, p.392). It is mentioned that the Crimean Khan Kyrym Gerai (1758–1764, 1768–1769), during the first reign, built a new country palace in the valley of Ashlama-Dere (Nepomnyashchii: 2015, pp.113-142). However, most likely, it was a large-scale reconstruction of the old palace complex. Both Christians and Muslims served their duties at the construction site. They were engaged in the delivery of stones, tiles, lime, and other building materials. Khan also forced non-Muslim communities (Greek, Armenian, Karaite) to send daily free of charge from 70 to 300 people to the construction site. (Report of the Russian Resident Nikiforov: 1844, p.377).

In 1783 Prince G.A. Potyomkin-Tavrichesky sent an order (dated October 12, 1783) to Count Otto A. Igelstrom with the recommendation to bring the decaying palace of Ashlama-Saray to its former condition with the preservation of architecture and decor. For this purpose, it was supposed to bring masters that would have been paid corresponding allowance (Korzhenkov et al.: 2017, pp.244-259). The palace complex should be protected, and all the trees in the palace garden must be preserved. The reconstruction of the palace should be carried out in the shortest time possible (Murzakevich: 1881, pp.285–286). But in 1784, due to the beginning of the preparation of the journey of Empress Catherine II to the south of Russia, G.A. Potyomkin-Tavrichesky sent an order (dated May 28, 1784) to Otto A. Igelstrom with instructions to disassemble the Ashlamay-Saray palace and reuse its stones as building material for the construction of the "en route" imperial palace in Ak-Mechet (Simferopol). The soldiers were sent there to deconstruct palace buildings (Murzakevich: 1881, pp.301-302, 303).

Academician P.S. Pallas, who visited Bakhchisaray in 1794, gives a disastrous portrait of Ashlamay-Saray as it was a place of the complete destruction of the palace complex and Khan's garden (Nauka: 1999, p.33; Gavriilyuk: 2014, pp.262-265). In 1928 U.A. Bodaninsky the director of the Bakhchisaray Palace-Museum, initiated archaeological excavations on the territory of the palace complex (Bodaninsky: 1930, p.9). In 1935–1936, this monument was completely destroyed, and the stones (the foundation and walls of the palace) were used in the construction of household facilities of the nursing home, located on the territory of Zyndzhyrly madrasah (Abibullayeva & Seitumerov: 2016, p.19).

## 2. METHODS

Before the beginning of excavations and ground research in 2015-2016, Archaeological Geophysics Laboratory conducted a comprehensive geophysical (georadar and magnetometric) study of the Ashlama-Saray site (Kazaryan: 2017). The objective is to identify anomalies that may be associated with the remains of the palace complex with the help of magnetometry and ground-penetrating radar (GPR). For the magnetometric study, a POS-2 processor sensor was used in its gradiometric (two-channel) modification. The vertical gradient (2m) of the earth's magnetic field was measured at the site under study. The measured value is the vertical gradient of the Earth's magnetic field, i.e., the difference in the values of the Earth's magnetic field measured simultaneously (synchronously) by the upper and lower sensors and divided by the distance between the sensors above the assumed site (Kançal-Ferrari: 2017, pp.85-123). The distance between the gradiometer sensors is 2 meters; the height of the lower sensor above the daylight surface is 0.2 m. The average magnetic field of this region is 49,000 nT. The research technique is a continuous survey; the time of each physical observation is 1/2 sec. This technique made it possible to record the values of the magnetic field gradient with a satisfying accuracy of  $\pm 0.1$  nT / 2m. Within the limits of the land plots, the profiles are located at a distance of 0.5 m, the measurement interval along the profile is about 0.5 m.

The result of the analysis is presented in the form of a magnetic field gradient distribution within the study areas, in different colors. Single-channel 300MHz GPR was used for ground-penetrating radar studies (Bilyayeva & Ersoy: 2008, p.39). The operation principle of the device is the emission and reception of a reflected electromagnetic wave. 300 MHz GPR consists of a transmitting and receiving antennas, a control, and a power unit, as well as a computer control complex. The listed units, except for the computer, are integral elements of the antenna unit. The radar unit was carried on foot. The recording of electromagnetic pulse values for every profile is no more than at every 5 cm, with a rate of system travel being 1 m / s (Akchurina-Muftieva: 2017, pp.108-120; Cota et al: 2017).

## 3. RESULTS

The choice of location and configuration of geophysical survey sites depended on the availability of open spaces in the territory presumably occupied by the palace. The surface of the selected areas was flattened out, but it required additional preparation (cutting down the area overgrown with trees and some bushes). The sections of magnetometry were marked with a compass aligned to magnetic north: section No.1 - (30 x 50 m), No. 2 (18 x 50 m). A dirt road passes through these plots of land. The total area of the magnetometric study is 2400 square meters. The studies were carried out with a network of passages' profiles with the rate of 0.5m, registering of magnetic field values along the profile was carried out no less than every 0.5m. The surveying began at the southeast corner of every section. There were made 10747 physical observations. The accuracy of measuring the magnetic field gradient is  $\pm 0.1$  nT / 2m. The result of magnetometric studies is presented in the form of a magnetic field distribution within the boundaries of the sites under study. Magnetometry allowed recording certain structures in areas No. 1 and No. 2 (Khrapunov & Khrapunova: 2013, p.166).

## 4. CONCLUSION

After processing the obtained data, radarograms showed the distribution of the electromagnetic pulse for every GPR profile. They were combined into layer-by-layer maps (planigraphic sections scaled for different calculated depths of analysis). Layered maps are given in the order of their penetrating the surface of the study consistently, to the calculated depth. The dielectric permeability of soil was not determined at the time of the study. Because of the high moisture of soil, there was introduced a tabulated value of epsilon – 20. It is

difficult to interconnect the relative depth of the layered maps to a physical depth. It can be assumed that the lower layered maps are given in the range of true physical depths up to 1m from the surface.

Further archaeological research will help to bind them to the true depths more accurately. GPR recorded remnants of structures at a depth of electromagnetic pulse penetration. Within the land plots, below the surface, there were identified several structures.

According to the results of geophysical studies and its office processing, there were identified areas where archaeological exploration could be as effective as possible. In 2015 - 2016, there were made nine pits (dimensions 1,00 x 2,00 m) and one excavation (dimensions 4,00 x 4,00 m) on the territory presumably occupied by Ashlama-Saray, the country palace of the Crimean khans. The total area of the exploratory excavations was 34 square meters. m. The depth of cultural layers ranged from 0.86 to 1.62 m. In the process of archaeological research, there were obtained data confirming written information about the complete disassembly of the majority of the palace buildings at the end of the 18th century for further usage of its stones as building material (Bocharov: 2016, p.227). The research allowed identifying the presence of archaeological, cultural strata, and archaeological finds of the 17th – 18th centuries in the studied area.

A substantial archeological collection consisting of processed limestone stones of the building arch, fragments of Western European glass vessels, fragments of water pipes, and original roof tiles covered with green glaze used as the roof of the palace decorative pavilions was obtained (Fisher: 2014). At a depth of 0.5m from the level of the daylight surface, a pavement of one of the palace courtyards, made of limestone tiles was revealed. For the first time, there were archaeologically recorded traces of the plowed up land (Bocharov: 2017, p.169), which was a part of the agro-technical activities carried out before planting a late medieval garden within the palace complex.

Archaeological studies confirmed the accuracy of the localization of Ashlama-Saray, the country palace of the Crimean khans, in the studied area.

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## **ACKNOWLEDGMENTS**

The work is performed according to the Russian Government Program of Competitive Growth of Kazan Federal University.