

that it would be necessary to go and examine the site somehow, to which I replied that I would write back and, when we had time, certainly go and look at this site. It is very unfortunate that these plans could not be fulfilled because of our busy schedules. The last time we met in Almaty was 2018, when I handed him our publication following a conference in Bishkek. We never met again, though occasionally exchanged emails, the last of which was in June 2019.

My concluding memories of Bulat are of how I highly appreciated him as a colleague and friend, but paid too little attention to him, which I regret very much. However, I take comfort in the fact that he

remains in my heart and memory as an intelligent, strong, and bright man in which fate brought me together for which I am grateful.

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## PRACTICAL FIELD SCIENTIST AND RESEARCH THEORIST

*“There are people who are like stars....  
The man is gone, but his heart, which burned  
during his life, continues to spread its  
life-giving warmth, its pure immortal light...”*

THESE WORDS by the great Russian writer Konstantin Paustovsky are so close to the image of my friend that I want to begin my tribute with them. I was brought together with Yerbulat Smagulov through my scientific investigative trip to the medieval Kazakh city of Sauran. I was tasked as a specialist to study and evaluate the *kariz*<sup>1</sup> of Sauran, as there was no hydrological data concerning them<sup>2</sup>.

The desolation of the once flourishing city of Sauran occurred because of the ordeal that fell to the Kazakhs during the Dzungar invasion (18th century). The evacuation of the population and the accompanying disrupted interregional economic ties led to the death of a number of Turkestani cities. Imme-

diately upon arrival in Almaty, Y. A. Smagulov, who was responsible for the archaeological investigation, briefed me about the area under study. From our first acquaintance, I realized I had met a bright, distinguished historian and a widely recognized authority in the field of agroecology. Our discussions and communication took a very interesting form. I remember well the respect with which those present treated Yerbulat Smagulov. He was not only a connoisseur of medieval history but also a very sensitive, affable, and quite unique scholar. We had hours-long talks not only about kariz, but also about the need for scholars and practitioners to understand each other and respect their opinions. He had a gift of listening attentively to his interlocutor, to think logically, discussing critically and philosophically on a given topic.

Through this research, first, I accumulated direct and indirect data concerning the groundwater in this area, especially on the upper side of Sauran, where the zone, which played a key role in feeding the kariz, is located. Second, some elements of the kariz hydrological system during this period were determined. Third, we conducted a brief visual analysis of the kariz systems in Sauran. Most significantly we clarified some issues and ways to rehabilitate the kariz in Sauran. Until our study, the Sauran kariz had not been

<sup>1</sup> **Ed. Note:** A kariz is a Persian term that describes an irrigation canal, often underground, that was first developed in the localities of Iran and Iraq dating as far back as the first millennium BC. In many Turkic sources, the word kanat is used.

<sup>2</sup> Guliev A. G., Kerimov A. M. (2017). Znachenie, ispol'zovanie i ohrana kyarizov v Azerbajjane (The Significance, Use and Safeguarding of Kariz in Azerbaijan), in: *Mezhdunarodnaya nauchnaya ronferentsiya, posvyaschennaya Godu ekologii, selo Solenoe Zaymische (Proceedings of the International Scientific Conference Dedicated to the Year of Ecology. Solyonoe Zaimische Village), Astrakhan, 18-19 May*. P. 252-255 (in Russian).

studied in terms of their hydrology and were missing necessary hydraulic data. Apparently, after the destruction of Sauran, the kariz were left to the mercy of nature until the present day. Due to the impact of the overlying groundwater, even at present, they are in danger of collapse. For an extended period, all the wells which the kariz accessed were filled with various sediments and buried by collapsing structures. These were known as *kyrk pilleh*, meaning “forty inclined steps.” These structures, as their name implies, form inclined stepped chambers and are characteristic of all medieval kariz. These underground chambers were used to direct water from the kariz to private households. The *kyrk pilleh*, were found in residential quarters (*mahalla*) or near mosques, were built of simple materials, whereas those in private properties at times had intricate architectural elements depending on the financial status of the owner. They were also used for refrigeration (maintaining a constant temperature of about +8° C), where they stored meat, dairy products, and vegetables. Such structures have survived to the present day in Azerbaijan and Iran<sup>3</sup>.

Vegetation serves as indicators of collapsed well sites which indicate the presence of groundwater. The current groundwater level is above the karez tunnels (known as *kure* or *lagym*). This makes it impossible to survey the kariz systems from the inside. The water galleries in this area also apparently lie below the modern groundwater level. Therefore, currently, medieval Sauran's water supply systems prove difficult to study. Without the use of special equipment, it is impossible to study these kariz archaeologically. However, it is assumed the “*kyrk pilleh*” chambers may contain the most valuable cultural materials<sup>4</sup>.

Investigation around the Mirtobe fortress revealed several kariz branches along various ravines and channels. The lines of kariz run along the east and west sides of the fortress. Closer to the city are numerous outlets of kariz wells, which often branch out in various directions. Four of them were thoroughly investigated with measurements taken of their water tables. The existence of underground streams were determined by the presence of vegetation.

Surface visibility identified the kariz branching into two directions. They were clearly identified lying the north of the current railroad. Enclosed pastures with taller grass allowed for the identification of the probable continuation of these two kariz channels.

The first and main branch proceeded in a straight line to the north corner tower. The second branch ran in a slightly curved line from the south side of the identified mosque to the fortress wall. This branch of the kariz extended onto the site of Sauran's shahristan (central ruling district) at right angles to the fortress wall. Inside the fortress walls, several deep and recent ditches were discovered, presumably on the site of wells or *kyrk pilleh*, with a gravel pit located next to one of them. Dozens of sunken, shallow hollows were noted on the site's territory. According to Y.A. Smagulov, this implied the presence of an extensive network of kariz within the city which provided each house, residential district, and public places with drinking water.

As a fellow scholar, I can say that the analysis in Turkestan, along with all this labor-intensive work would not have occurred without the presence my late friend, Yerbulat Smagulov. Long conversations concerning disputes about the cultural heritage of the Turks made it possible to clearly distinguish between empirical and theoretical approaches in both geology and history.

Our joint research with Yerbulat proved that a practitioner and a theoretical researcher are not enemies, but friends who cannot exist separately. Their strength lies in their mutual complementary knowledge. One skillfully supplies facts, and the other just as skillfully summarizes these facts.

My tribute is to this true Turkologist, who unforgettably loved his homeland.

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<sup>3</sup> Guliev A. G., A. M. Kerimov (2017b). Kyarizy kak al'ternativnyi istochnik presnoy vody (Kariz as an Alternative Source of Fresh Water), in: *Minarodna naukovopraktichna Internet-konferentsiya (International Scientific and Practical Online Conference. Dubliani, 7-9 August. P. 299-306 (in Russian).*

<sup>4</sup> Kasimov E. A. (1992). *Vodosnabzhenie srednevekovykh gorodov Azerbajdzhana IX-XV vv. (Water Supply to Medieval Cities of Azerbaijan, 9th-15th Centuries).* Author's abstract. Baku (in Russian).