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## The Analytical Revisiting of the Structure Known as Ilkhanid Bathhouse in Rab'e Rashidi, Tabriz

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### Abstract

**Statement of the problem:** “Rab’e Rashidi” or “Rashidiyya” is an architectural complex. According to “Mostowfi”, the author of “Nuz’hat al-Qulub”, it was a cultural and academic town, in the northeastern Tabriz at the foot of Mt. Sorkhāb. It was planned and founded in the reign of the Ilkhanid “Sultan Muhammad Öljeitü” by “Khawāja Rashid al-Din Fazl- Allah”. According to the “Endowment Deed”, the town encompassed several public buildings including a bathhouse. Therefore, it was expected that excavations reveal the ruins of an Ilkhanid bathhouse. The outdoor building in the southeastern quadrant of the site was thus overtly introduced as the Ilkhanid bathhouse of the complex by the former excavators. The underlying question of the present paper was the nature and function of this alleged bathhouse.

**Objectives:** A precise understanding and systematic apperception of the nature, function and identity of a historical/archaeological construction is an essential and challenges facing those preparing any restoration plan are inevitable. No restoration master will then be able to restore a building precisely and systematically without gaining correct insights into that building and its archaeological structure.

**Methodology:** Analytical review of the architectural plan, internal spaces, and building materials of the building allegedly designated as the Ilkhanid Bathhouse showed evident discrepancies with those of the known historical bathhouses in Iran.


**Results:** Based on the falsifiable hypothesizing approach, the purported Ilkhanid Bathhouse could not serve such a function, and indeed there was no evidence to support its Ilkhanid date. The authors proposed the falsifiable hypothesis of a dying workshop or a tannery.

**Keywords:** *Rab’e Rashidi in Tabriz, Ilkhanid bathhouse, Architectural analysis, Analytic logic, Falsifiable hypothesis.*

### 1. Introduction

The legendary Islamic doctrine “cleanliness is next to godliness” represents a major cultural stereotype in Muslim societies, and it received so much attention in the Iranian urbanism during the Islamic area so that

bathhouses as public constructions rivaled different buildings such as mosques and schools in the urban planning in status and it played a major role in the genesis and future development of the cities over time (Kermani, 2016). In the Islamic urbanism, this public amenity was generally located at points with

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easy access and high traffic (Fakhar Tehrani, 2009: 248; Akşit, 2011). Hence, in the massive architectural complexes in Azerbaijan from the Ilkhanid period, which marked the heyday of designing, building and expansion of such complexes as the “Arch of Alishāh”, “Takht-e Soleyman”, “Maragheh Observatory”, “Ghāzāniyya”, and “Rashidiyya”, disposition of a bathhouse next to mosques, schools and mausoleums of political and religious personages (Ajourloo, 2013).<sup>1</sup> “Rab’e Rashidi” or “Rashidiyya” is an architectural complex or, as “Mostowfi” reports in his “Nuz’hat al-Qulub” (1340), it is a cultural and academic town, in northeastern Tabriz at the foot of Mt. Sorkhāb, planned and founded in the reign of the Ilkhanid “Sultan Muhammad Öljeitü” by his vizier “Khwāja Rashid al-Din Fazl- Allah”; in “History of Öljeitü” “Abu’l- Qāsem Kāshāni” also puts (1318) that its water was drawn from the Sorkhāb Mountain itself. According to the “Endowment Deed” composed by Rashid al-Din Fazl- Allah, the town involved multiple public premises: summer and winter mosques, a library “Dār al-Masāhef wa Kutub al-Hadith”), a classroom for education (Bayt al-Ta’lim) of orphan children, a hospice (Dār-al-Ziāfa), a hospital (Dār-al-Shefā), a mint (Dār-al-Zarb), a residence for Hajjis (Dār-al-Hujjāj), a residence for Sayyeds (Dār al-Siyāda), a quarter for crafts (Dār al-Sanāye’), a Quranic center (Dār al-Quran), a monastery, a residence for Quran reciters (Dār-al-Hoffāz), the mausoleum of Khwāja Rashid al-Din Fazl- Allah and caravanserais as well as a bathhouse (Ajourloo, 2013). Excavations were thus expected to reveal the ruins of an Ilkhanid bathhouse. In the excavations of the third season, an outdoor building was uncovered in the southeastern quadrant of the site (Fig. 1), and it was explicitly introduced by the excavators as the Ilkhanid bathhouse of the complex (see Ruhangiz, 2007: 257).

État de la Question: The underlying question in the present work is the nature and function of what was described by the earlier excavator as the “Ilkhanid Bathhouse” as its architectural plan, internal spaces, and building materials show evident discrepancies with those at the known historical bathhouses in Iran.

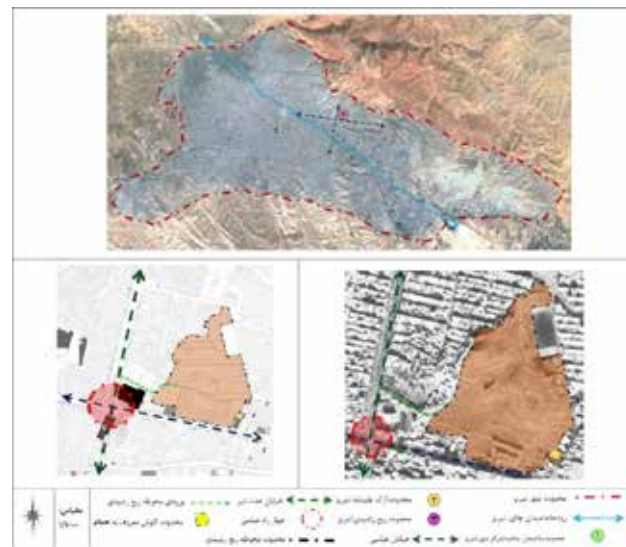


Fig. 1. The setting of architectural structure in the Rab’e Rashidi, so-called as the Ilkhanate bath, in the archaeological site of Rab’e Rshdi, Tabriz and the Mehranrood River. Source: Authors.

It goes without saying that a precise understanding and systematic apperception of the nature, function and identity of a historical/archaeological construction is an essential and inescapable and challenges facing those preparing any restoration plan are inevitable. No restoration experts will thus be able to restore a building precisely and systematically without gaining correct insights into that building and its archaeological contexts and features (Ajourloo and Nemati Babayloo, 2013). In this context, a falsifiable hypothesis was tested using an architectural analysis approach: Did the outdoor building in the southeastern quadrant of Rab’e Rashidi use to serve as a bathhouse? To answer this question, the falsifiable hypothesis is that supposed Ilkhanid bathhouse was not a bathhouse and was not able to perform such a function, and even the available archaeological evidence fails to support an Ilkhanid date for that building.

Limited literature exists on the archaeological and architectural identification of this problematic construction, and its excavator in the 2000s merely designated it a bathhouse without offering further details or arguments (e.g. Ruhangiz, 2007). Moreover, knowledge of the modern scholars of the historic bathhouses of Rashidiyya is simply restricted to the historical allusions, particularly those in the Endowment Deed of Rab’e Rashidi and Nuz’hat al-

Qulub with the exceptions of some research (e.g. see Ruhangiz, 2007; Oskoui, Kay'nejad & Noqreh'kar, 2010: 69; Habib, 2010; Kaynejad & Oskoui, 2011; Saeednia, 2000, 2002; Omrani, Aminian, & Asadzadeh, 2013; Behboodi, Kiani, & Heydari, 2011; Amirkhani, Leylian, Pourjafar, Khanloo & Zamani, 2010).

**Methodology and Data Analysis**

Our analytical and hypothesizing framework were underpinned by the falsifiability of Karl Popper's analytic philosophy of science (Popper, 2000; Ruse, 2014; Irzik, 2014; Oddie, 2014; Algin & Sober, 2017) and the emphasis was put on objective examination of material culture instead of subjective reliance on historical texts (e.g. Matthews, 2012). It should be emphasized that the historical texts, in particular the Endowment Deed and Nuz'hat al- Qulub, both authors of which did personally live in Rab'e Rahsidi for a while, do not shed light on details of the bathhouse. Therefore, these texts won't be of any help in the re-identification and re-thinking of the alleged bathhouse because they are the mere interpretation of a bathhouse based on historical evidence. Such interpretation will be a sort of methodological fallacy.<sup>2</sup>

To re-identify and reevaluate the bathhouse, this comparative study adopted an architectural analysis approach and compared the architectural features of the building with those of Iranian historic bathhouses ranging from 1300-1900.

**Architectural Features of the "Ilkhanid Bathhouse"**

Based on -the excavation report (Ruhangiz, 2007), in the southeastern corner of the excavated area at a point 5 meters below the reference point, there was a masonry and brick- made building about 100 square meters in area whose functions were defined in connection to ceramic pipes. And three features of the building made it similar to small ponds, with the latter one served as enough evidence attesting to a bathhouse (Fig. 2). Indeed, the report made no mention of any lime working, and in fact no relevant evidence were also present (Fig. 3). Though the building used to be a bathhouse, some contradiction can be seen in the architectural physical features of the

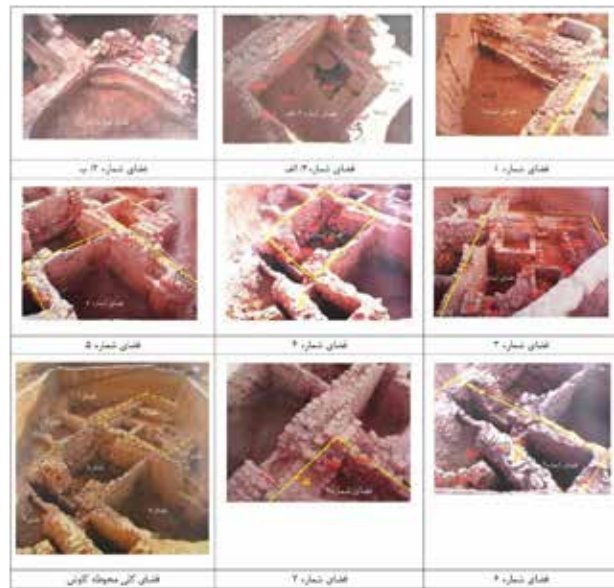


Fig. 2. The interior spaces in the unearthened architectural structure in the Rab'e Rashidi, so-called as the Ilkhanate bath. Source: Ruhangiz 2007; Re-design after the authors.



Fig. 3. The plain walls with no lime working traces in the architectural structure of the Rab'e Rashidi, so-called as the Ilkhanate bath. Source: After the authors.

building. These features can be detailed as follows.

• Plan

The exposed plan evidently lacked geometric order, access hierarchy, and a specific orientation to the extent that, for example, none of the architectural features characterizing a bathhouse, i.e. entrance, vestibule, and apodyterium, were identifiable. Even the two pond-like structures that underpinned the original bathhouse hypothesis were by no means functionally related, and their function in the consistent plan of the building continued to elude us (see Figs. 2-4). Moreover, at some points of the building, masonry of a dry-laid wall were placed directly on a loose pit (Fig. 5), hence the wall lacked a firm substructure



Fig. 4. The plan of interior spaces in the architectural structure of the Rab'e Rashidi, so-called as the Ilkhanate bath. Source: Authors; on the basis of Ruhangiz 2007.



Fig. 5. Some walls of the architectural structure of the Rab'e Rashidi, so-called as the Ilkhanate bath, are based on a level of pit. Source: Authors.

needed to effectively supporting a roof.

• Water Supply and Sewage Disposal

The nearest and easiest water source for the alleged bathhouse was presumably the two in-filled wells seen next to the building (see Ruhangiz, 2017). The six clay pipes, a single stone-lined canal, and the four brick-lined canals were found within the building area and were interpreted as parts of a water supply system. In 2007, three ponds were also unearthed, two of which had irregular forms (Table 1).

• Building Materials and Architectural Ornaments:

Flagstones of varying sizes were the main load bearing materials in lower levels and foundations as well as the two stone-lined conduits, and stone

is indeed more resistant to water than brick. The applied stones ranged in thickness from 20 to 60 cm. Bricks, measuring 20 × 20 × 5 cm on average, were used in the construction of walls between 15-55 cm in thickness, floors, benches—e.g. a curved one in Room 2—and partition walls. They were also used in the construction of 4 conduits (see Fig. 2). The 2007 report mainly referred to the application of clay mortar (in masonry walls), clay-plaster mortar (in brick walls) rather than lime plaster; and while the same report mentioned 3 to 11 layers of a lime-based plaster in the flooring and walls, no traces of such plaster or tile work or stuccowork were visible (see Fig. 3). It was also said in the report that the internal spaces of the “Ilkhanid Bathhouse” produced 15,000 fragments of turquoise tiles and ceramic sherds of celadon, sgraffito, lajvardina and lustre wares.

• Structure

The plan of the structure revealed only two types of brick and masonry bearing walls. In fact, no structural elements were perceptible except for a stone grooved half-column 90 cm in length in Room 1 and the remains from a brick vault in Room 2 (b). It should also be emphasized that no traces of fallen roof debris, covering of internal spaces, and joints were discernible and not-reported (see Ruhangiz, 2007).

**Spatial Characteristics and Design of Iranian Historical Bathhouses**

Engineerical ways of addressing the problem of temperature and moisture regulation, water provision and sewage disposal, and abiding by the tenet of general access in the urban context, all played a role in designing the structures of bathhouses in the history of Iranian architecture (Fakhar Tehrani, 2009). In addition, spaces used to be designed to maintain and control the temperature and moisture of each space (Saremi & Gorji, 2015). The architect had also to take into account the three principles of constant access to running water, separation of pure from impure sections, and thermal adjustment (Najafi, 2009). The plans of historical bathhouses in Iran follow the pattern of three linearly arranged sections

Table 1. Water Supply and Sewage Disposal of the alleged bathhouse of Rab'e Rashidi. Source: Authors.

	Space No.	Direction	Some remarks	
<b>The pottery pipes</b>	1	East → West	Remained length & width: 70x15 cm.	
	2 (A)	Vertical standing on the floor	Bounded by 50x50 cm. bricks	
		East → West	On the south wall. The height from the floor respectively 20 & 30 cm.	
	3	West → East	Remained length & width: 70x14 cm.	
<b>The channels</b>	6	East → West	Remained width: 15 cm.	
	3	East → West	Remained carved stones, length & width: 260x70 cm.	
	4	West → East	Remained bricks, length & width: 70x18 cm.	
		East → West	Remained arched bricks, length & width & height: 253x54x82 cm.	
	6	West → East	Remained pebble stones, length & width & height: 500x45x80 cm.	
	6	West → East	Remained bricks, length & width: 500x25x90 cm.	
	6	East → West	Remained bricks, length & width: 66x20x33 cm.	
<b>The ponds</b>	Space No.	The Geometric form	The sewage	Some remarks
	3 (A)	Asymmetric		
	3 (B)	Asymmetric		
	2 (A)	Rectangular		Height from the floor 30 cm. Depth 30 cm.

(Fig. 6). To meet technical requirements and privacy, the artists designed it in a way that entering from the frontal entrance below the ground level requires going through the apodyterium (Sarbinā), the medial hall (Miāndar) and the caldarium (Garmkhāna). Indeed, the reason for strict adherence to these rules on the part of the architect was to prevent uncontrolled temperature exchanges (Fig. 7). The bathhouses of Nobar in Tabriz (Ajourloo & Nami Germi, 2014), "Haj Agha Naghi" in Ardebil, "Ganjali Khān" in Kerman, "Shah" and "Gholi Agha" in Isfahan, "Golshan" in Lahijan and "Kordasht" in Jolfa are but few examples of the application of these principles in the regions with extremely diverse climates (see Fig. 6).

The shared characteristics and doctrines reflected in the structure of the historical bathhouses are as follows.

- Tripartite Linear Plan

The typical linear layout consists of the three major

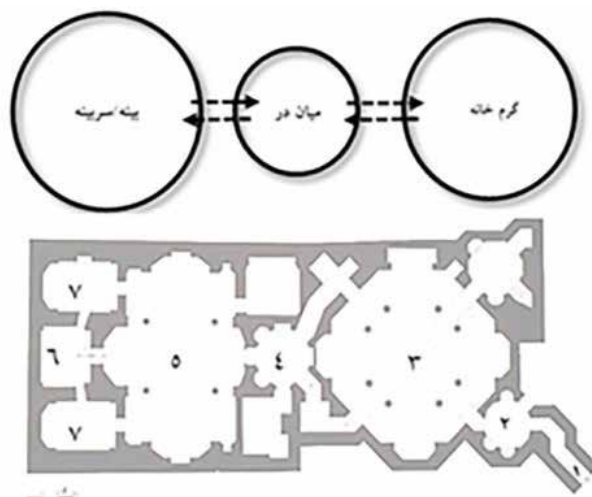
parts of Apodyterium, caldarium and the medial hall in between. Apodyterium is the vestiaries surrounded by benches all around and covered with a vault to facilitate ventilation. It usually is adorned by architectural ornamentation. It is accessible through a short passageway beyond the entrance and the vestibule. The medial hall resembles a vestibule and is a curved passageway that separates the apodyterium from the caldarium to prevent heat loss (see Figs. 6-7). Doors to the service areas such as shaving rooms and lavatory also lie in this hall. The bathing quarter, the hot and cold water tanks, and the hot plunge bath constitute the caldarium (Pirnya, 2013; Saremi & Gorji, 2015).

- Interaction with Surrounding Environment

Eliminating heat loss and keeping the cold air away from the internal bathhouse necessitate a closed structure, preferably with a vaulted covering. It is because a sudden change in ambient and body



Fig. 6. The presentation of the three spaced structure derived from 9 Iranian historical public bathes. Source: Haji Ghasemi, 2004.



اجزا تشکیل دهنده حمام تاریخی:  
 ۱- ورودی ۲- هشتی ورودی ۳- ینه/سرینه ۴- میان در و نشااهی  
 ۵- گرم خانه ۶- خزینه ۷- خلوت

Fig. 7. The three spaced structure at a historical public bath from Kuradasht, Azerbaijan. Source: Haji Ghasemi, 2004.

temperature jeopardizes human health. Thus, to address the problem of the direct and abrupt flush of moist and cold air, the architects would make use of curved passageways (Rahimi Mehr, Motedayen & Mehrbani, 2017), and notwithstanding the climatic differences, this was a countrywide practice. As a consequence, the external climate had no direct impact on the temperature and air circulation within

the bathhouse or on the design of its structure and internal spaces (Ghobadian, 2013). Yet, the total area and height of the bathhouse were definitely influenced by the climate. Thus, in cold regions and uplands, the structures were of smaller dimensions, lower height, and embedded into the ground to facilitate temperature and heat maintenance and control. However, in the warm dry climates of the central parts of Iran, the relevant buildings were more elongated and taller and sat above the ground (Tabasi, Ansari, Tavooosi & Fakhar Tehrani, 2007; Najafi, 2009). Varying elevations and gradients led to a situation in which not a single pair of bathhouses throughout Iran happen to display a comparable external appearance, though the tripartite linear plan outlined above characterizes them all (ibid). The extent to which the structure sunk into ground is directly related to the level of local water table. The need for using the running water from Qanāts and taking advantage of a ground slope to direct water into the canals and clay pipes in the most economical way represent other impacts of nature on the bathhouse design (Najafi 2009; Fakhar Tehrani 2009). Indeed a caldarium at a lower level than the apodyterium and entrance, or occasionally even sunken into the ground, will catch the water from Qanāt much more easily (Fig. 8). Historical bathhouses at the Palace of the “Shirvānshāhs” in Baku are striking examples of this strategy, which assisted water inflow and wastewater disposal (Fig. 9).

• Bathhouse Installations

At such localities as Rab’e Rashidi where rivers or Qanāts are closely nonexistent, a so-called “bull-well” will be necessary. Water fetched by bulls from this well is collected in a pond, wherefrom it is directed through clay pipes into the bathhouse reservoir. To provide the required power, the animal walked down a sort of ramp generally termed as “bull way” (Ghobadian, 2013). Thus, a bull way, a pond by the well, and a clay pipe system linking these to the caldarium were some vital prerequisites. Also a sewerage was required, and in the absence of such a system, as it was the case with the historical bathhouses in Isfahan, the wastewater used to directed into a well specifically built for that

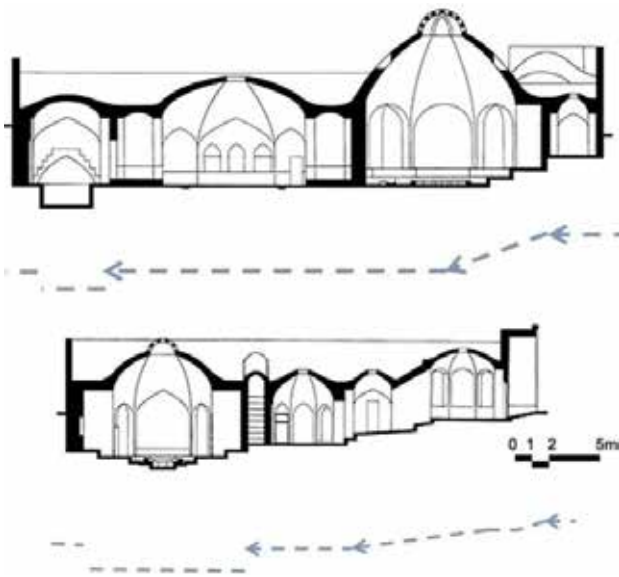


Fig. 8. The profile of level decreasing presented at the historical public bath of Golshan, Yazd. Source: Haji Ghasemi, 2004.

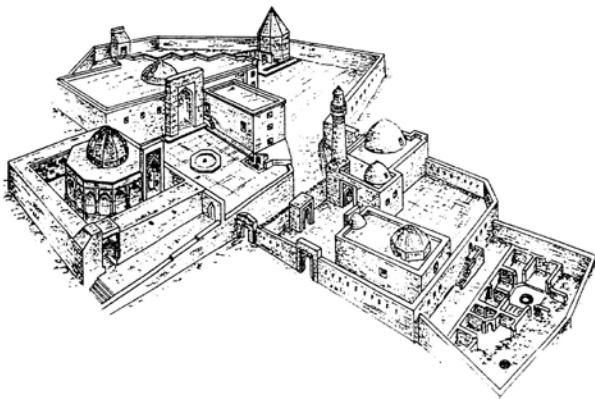


Fig. 9. The step by step level decreasing presented at the historical palatial bath of Shirvanshahs, Baku. Source: Golombek & Wilber, 1988.

purpose (Fakhar Tehrani, 2009). The Endowment Deed stipulates however that the wastewater from the bathhouses of Rab'e Rashidi must be kept away from the rivers and other pure and fresh waters.

The heat was produced at a furnace next to the caldarium, and the resultant smoke and heat passed through a complex of flues running beneath the furnace and caldarium, termed as catwalk, before finally exiting the building (Moradi & Akhtarkavan, 2008).

- Structure and Materials

Building materials in the foundations of a bathhouse used to be selected based on local climatic conditions, soil mechanics, and water table (Tabasi, Ansari, Tavooosi & Fakhar Tehrani, 2007). Water table had

a direct bearing on the size and amount of masonry and lime mortar, and the foundations were invariably topped by sleepers (Zomorshidi, 2016). Brick and stone were used in vertical elements of bearing walls and columns, respectively, while arched coverings, vaults and ribbed vaults of the Apodyterium and caldarium were constructed in brick and in "Kalambu" and "Kārbandi" style (Najafi 2009; Tabasi & Hayeri, 2016). For walls, the architect preferred a brick upper part and a stone base with an eye for enhanced load transmission and reduced moisture permeation (Zomorshidi, 2016). The floor had to be paved with alabaster (marble) or charred stones, while tile work was preferred in insulation of wall bases (Fakhar Tehrani, 2009).

- Architectural decorations

Historical bathhouses in Iran are marked by two "structural" and "applied" utilitarian ornaments (Najafai, 2009). Kārbandi and Rasmibandi are examples of structural category, and tile works, "saruj" works and "muqarnas"es epitomize the applied or attached category (Najafi, 2009; Zomorshidi, 2016). These adornments served two simultaneous and interrelated roles of embellishment and insulation.

## Discussion and Conclusions

The underlying principles of the logic of scientific analysis in Popper's philosophy of science are analytic objectivities and the falsifiability of hypotheses. Simply put, the researcher and the critic must try first and foremost to opt for and explore analytical objects to demonstrate the falseness of the research notions. In other words, an unfalsifiable hypothesis is not in essence logical, analytic, and scientific. In the discussion of the falsifiable hypothesis on the function of the alleged Ilkhanid Bathhouse of Rab'e Rashidi in the introductory section of the present study, the three problematic falsifiable objective aspects, namely interior spaces, installations, and archaeological evidence, are marked more conspicuously.

The study found that the building with its total area of 100 square meters lacked the typical tripartite linear layout, and apart from the fact that the location of

the three recovered “ponds” within the tripartite plan was unknown, and cannot even be established with any certainty, the irregular forms of two of them fail to prefigure their functioning in a bathing context.

The ground slope and the remoteness of the northern tributary of the Mehrān Rood River from the building in question (see Fig. 1) coupled with the total absence of archaeological evidence for a south-north oriented water supply system ruled out the river as a possible water source. Similarly, Abu'l-Qāsem Kāshāni's statement in his History of Öljeitü showed that “Rab'e Rashidi obtained its water from the northern branch of Mt. Sorkhāb.” Taking advantage of the gradient of the mountain base in the Valiān'Kuh district of Tabriz in transferring water from the Sorkhāb through a Qanāt system and canals appears an outstanding engineering idea; and feeding the supposed bathhouse with water via this system appears viable. It is worth mentioning that no Ilkhanid Qanāt system or a system of canals has been identified in the area separating the “bathhouse” from the Sorkhāb base, and the logic of analytical archaeology can never replace an objective archaeological inference with a subjective hypothesis to substantiate a historical narrative. So far no Ilkhanid Qanāt or a network of channels has been recovered to support the idea of transferring the salty water of the Talkheh River (Āji Chāyi) from the Sorkhāb to the alleged bathhouse. Some might argue that the two in-filled wells, the exact dates of which are of course yet to be established, might have served this purpose. This is not also a tenable hypothesis as Islamic jurisprudence emphasizes the flowing nature of the water used for the ritual body washing or ablution (Ghusl). What is more, such features as bull well, bull path, and a pond for directing the fetched water to a clay pipe system have not been excavated and reported. Evidence such as six clay pipes and two canals will by no means supply required archaeological justifications for a bathhouse and bathing hypothesis, because aside from the problem of water procuring and transferring, the problem of wastewater disposal must be tackled objectively.

However, in the Endowment Deed Khwāja Rashid al-Din proscribes discharging the sewage into river and pure water bodies, archaeological and architectural indications of a foul sewer in this part of the site are still awaiting. Even if one proposes that the two in-filled wells acted as injection wells, then the idea of drawing water from a bull well will again face serious challenges and a logical paradox will arise.

Also, to put a dry-laid wall of flagstones on a loose pit, as is evidenced at some points of the building in question, is quite implausible both from archaeological and engineering and architectural perspectives and warrants contemplation. No collapsed debris is discernible to suggest the existence of structural embellishments such as Kārbandi, Rasmibandi, tile working, lime working, and muqarnas. Apart from such spaces as antechamber and a furnace chamber, the exposed building also lacks architectural decorations and/or evidence of tile work, sāruj work, marbling, and stone pavement. The dense concentration of turquoise tile fragments and ceramic sherds in celadon, sgraffito, lajvardina, and lustre wares within the building reflects their disturbed and off situ context, because no architectural relationship is discernible between these pieces and the building, and even the stratigraphic association of celadon sherds with lustre and sgraffito pieces entails an anachronism caused by the relocation of contexts, which even rules out a relative dating in the Ilkhanid period for the building.

Identifying the building uncovered in the southeast quadrant of the excavated area in Rab'e Rashidi as a bathhouse is logically short of causal independence and, subsequently, invalid as it derives from a historical subjective assumption rather than archaeological or architectural objective facts. Also, if this interpretation has so far remained as a mere hypothesis, in terms of the analytic logic hypotheses are inherently propositional functions and are in abeyance, and cannot logically supersede a conclusion. Hence, a subjective hypothesis can never serve as a basis for a restoration plan for any building of historical interest.



At the end, regarding the nature and function of the building, regardless of its date, the authors propose the falsifiable hypothesis of a dying or tanning workshop in light of the pond-like features, clay pipes, and the stone conduit. A falsifiable analytic discussion of this hypothesis is of course beyond the scope of this paper and requires a separate analytical study.

### Acknowledgement

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### Endnote

1. Based on the report by the archive of the Cultural Heritage Deputy of East Azerbaijan Cultural Heritage, Handicrafts and Tourism Directorate, even traces of bathhouse architecture have been encountered in the Muzaffariya Complex, more generally known as the Blue Mosque, in Tabriz in the course of a restoration and tracing work in the 2000s (see also Kabir Saber, Mazaherian & Peyrovi, 2014).
2. On the fallacies and sophism in historical research, see also Trueman 2010.

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