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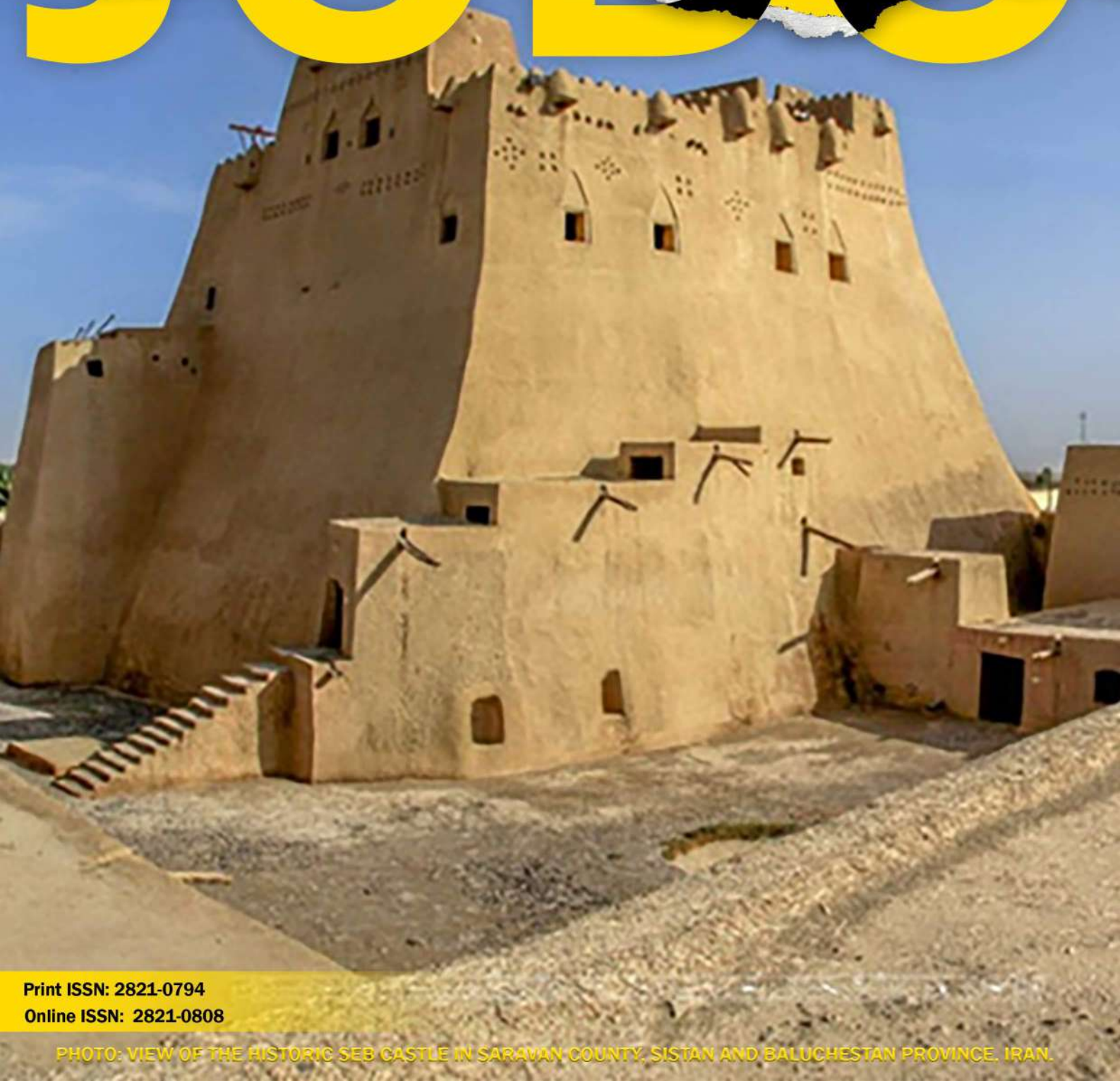

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PHOTO: VIEW OF THE HISTORIC SEB CASTLE IN SARAVAN COUNTY, SISTAN AND BALUCHESTAN PROVINCE, IRAN.

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Guide for Authors

Preface

The ***Journal of Sistan and Baluchistan Studies (JSBS)*** is devoted to South-Eastern Iran and welcomes articles in various areas of the world with a Sistan and Baluchistan legacy, especially adjacent areas such as Afghanistan, Pakistan, India, Oman, the Persian Gulf, and Central Asia with a chronological span from Paleolithic to Modern times. Contributions must be original and have not previously been published elsewhere. Please be ensure that there are no conflicts between the authors before submitting. Before being published, manuscripts submitted to the ***Journal of Sistan and Baluchistan Studies (JSBS)*** are critically reviewed. The purpose of the review is to reassure readers that the papers have been approved by competent and unbiased professionals. Manuscripts should be written in English, with the use of one spelling style throughout the entire manuscript. Both British and American spelling will be accepted. The manuscript should be submitted only via the ***Journal of Sistan and Baluchistan Studies (JSBS)*** the Editorial System (http://www.jsbs.uoz.ac.ir/). All papers are available free of charge at the Journal's webpage.

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Structure of Articles

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Short communication consists of title page, text, acknowledgments, and references with figure and table captions.

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The title page must contain the title that should be clear, intelligible to experts in different disciplines, and represent the substance of the article. Moreover, full name(s) of the author(s),

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Provide three – seven keywords, covering the most precise phrases in the article. They should explain the subject and results and should not be the same as the terms used in the title.

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State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results.

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Results should be clear and concise.

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The main conclusions of the study may be presented in a short Conclusions section, which may stand alone or form a subsection of a Discussion or Results and Discussion section.

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Curtis, J. (2012). *The Oxus Treasure*. London: British Museum Press.

Piperno, M. and Salvatori, S. (2007). *The Shahr-I Sokhtya graveyard (Sistan, Iran): excavation campaigns,1972-1978*. Roma: ISIAO.

Chapter in an edited book

Vidale, M. (2020). Chlorite Containers from the Oxus civilization between technical choices and iconographic codes. In: B. Lyonnet, and N. A. Dubova, (eds.), *The World of the Oxus Civilization*. London: Routledge, pp.293-332.

Journal paper (electronic)

Perrot, J. (2008). Jiroft iv. Iconography of Chlorite Artefacts. *Encyclopædia Iranica*, 14, pp.656–664. [Online]. Available at: https://www.iranicaonline.org/articles/jiroft-iv-iconography-of-chlorite-artifacts [Accessed 25 August 2021].

Journal paper (printed copy)

Sajjadi, S. M. S. (2007). Wall painting from Dahaneh-ye Gholaman (Sistan). *Ancient Civilizations from Scythia to Siberia*, 13(1-2), 129–154.

Jarrige, J. F., Didier, A. and Quivron, G. (2011). Shahr-i Sokhta and the chronology of the Indo-Iranian regions. *Paléorient*, 37 (2), 7–34.

Website

Shahr-i Sokhta - UNESCO World Heritage Centre. [Online]. Available at: http://whc.unesco.org/en/list/1456/ [Accessed 25 August 2021].

Thesis

Shirazi, R. (2008). *Etudes typologiques et comparatives des représentations humaines en terre crue, en terre cuite et en pierre de l'Asie centrale et de l'Iran oriental du Chalcolithique à l'âge du Bronze (4000-1800 av. J.-C.).* Ph.D. Thesis. Panthéon-Sorbonne University.

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dates: 1980-1985, not 1980-85

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following/s: f./ff.

centimeter/s: cm

meter/s: m

etcetera: etc.

circa: c.

videlicet: viz.

exempli gratia: e.g.

volume/s: Vol./Vols.

chapter: Chapt.

column: Col.

folio/s: Fol./Fols.

translator: transl.

second [II] century: 2nd century, etc.

century and millennium: never abbreviated

before Christ: BCE

after Christ: CE

plate/s: only when referring to author's plates within one's own text: Pl./Pls.

figure/s: only when referring to author's figures within one's own text: Fig./Figs.

fig./figs., pl./pls. in all other cases

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IDENTIFICATION AND ANALYSIS OF THE ARCHITECTURAL SPACES AND FEATURES OF THE HISTORIC SEB CASTLE IN SARAVAN COUNTY, IRAN

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Abstract: Qajarid residential-governmental settlements found in Baluchistan have a unique architecture due to the security concerns that resulted from adjacency with the borders of the neighboring countries, in addition to the special climatic and environmental conditions of the region. The concepts behind the architecture of the Qajar era had certain shared grounds that were rooted in the sociopolitical issues of that historical period and can still be observed in many Qajarid castles. This study analyzes these concepts in the architectural features of Seb Castle in Saravan County, with the aim of reviewing the architecture of the castle and identifying its spaces. The architecture of Seb Castle, which was a residential-governmental site, reflects the cultural, climatic, and geographical conditions of the region, as well as the builders' knowledge of the local materials. In this research, which is partly historical-interpretive and partly descriptive-analytical, the prominent architectural features and ornaments of Qajarid castles in Saravan County, especially Seb, are discussed with the aim of examining the major factors that have affected the structure of these fortified buildings. The results show that the sociopolitical conditions of that era had a great impact on the structure of Qajarid castles. In addition, the study of the prominent features of Seb Castle shows that it has a special mastaba structure and that it has been constructed with the clay-alyssum mixture, a local material once commonly used in the region. Unlike other Iranian historic buildings in which common ornaments included decorative plasterwork, tile-work, mosaic, and mirrors, the interior and exterior of Seb Castle have been decorated using clay and mud.

Keywords: Qajarid architecture, Qajarid castles, Saravan, Seb Castle.

چکیده: شناسایی و الویت سنجی سکونتگاه‌های مسکونی- حکومتی دوره قاجار در منطقه بلوچستان علاوه بر شرایط اقلیمی و محیطی، بدلیل هم مرز بودن با کشورهای همسایه و شرایط خاص امنیتی منطقه معماری مخصوص به خود را دارند. در این خصوص مفاهیم به کار رفته درآرایه‌های معماری دوره قاجار دارای معانی مشترکی است که معلول مسائل اجتماعی و سیاسی دوره خود بوده‌اند و در بسیاری از قلعه‌های به‌جای مانده از آن دوران دیده می‌شود. مقاله حاضر با محور قراردادن این مفاهیم مشترک و تحلیل آن‌ها در آرایه‌های قلعه سبِ سراوان، در صدد معرفی معماری به‌کار رفته در این قلعه و شناخت ویژگی‌های فضاهای موجود در آن است. معماری به‌کار رفته در قلعه سب که یک قلعه مسکونی- حکومتی بوده است نشان از فرهنگ، اقلیم، شرایط جغرافیایی و فرهنگ استفاده از مصالح بومی منطقه دارد. در این پژوهش که بخشی به روش تاریخی- تفسیری و بخشی از آن توصیفی- تحلیلی می‌باشد به ویژگی‌های بارز معماری، تزئینات و گچ بری‌های قلعه‌های دوره قاجار در شهرستان سراوان، به‌ویژه قلعه سب پرداخته شده و عوامل تأثیرگذار بر ساختار کلیدی قلعه سب مورد بررسی قرار گرفت. نتایج تحقیق نشان می‌دهد که فضای سیاسی و اجتماعی آن دوران، تأثیر فراوانی بر ساختار این ابنیه داشته است. همچنین بررسی ویژگی‌های بارز قلعه سب نشان داد که ساختار آن دارای شکل خاص هرم مصطبه بوده، مصالح به‌کار رفته در این قلعه از ملات بومی، مقاوم و خاص "گل رس- توتری" است و تزئینات داخلی و خارجی به‌کاررفته در آن، برخلاف دیگر بناهای تاریخی ایران که در آن‌ها از تزئینات گچبری، کاشی‌کاری، معرق، آینه‌کاری و سایر الحاقات تزئینی استفاده می‌شده است، با استفاده از ملات خشت و گل به زیبایی انجام گرفته است.

کلمات کلیدی: معماری دوران قاجار، قلعه‌های دوران قاجار، سراوان، قلعه سب.

I. Introduction

One of the important ways to know the history of our ancestors is to study the historical monuments and relics left by them (Davtalab et al. 2021). In any historical period, governments devised certain strategies to defend their lands and properties. Constructing castles was a basic strategy to achieve that goal. A castle is an enclosed area with strong walls and towers, which can house soldiers or residents. During wars, people took refuge inside castles to stay safe from enemy attacks. The food stored inside castles could often feed the dwellers for several months (Tashakkori, 2013). Many castles were built in Iran during the Qajar era, and many of these castles were used for residence, especially by local rulers (Rezalou, Eslami Nasab, and Dadkhah, 2014). A large number of historical castles can be found throughout Sistan and Baluchistan (an eastern province of Iran), especially in Saravan County. Belonging to the Qajar era and located in Seb Village, Seb Castle is the most prominent historic building in Saravan. Seb Village is located 10 kilometers southeast of Sib va Souran County and 45 kilometers southwest of Saravan County. According to the Dehkhoda Dictionary, Seb means "the place of many springs". Seb Castle, which is also known as Sib Castle and Kalaseb, is the tallest clay and mud building in Iran and has been dubbed the most beautiful earthen castle in the country. It is a remnant of the constructions carried out in the Islamic era of Iran and falls into category 27 of the historic monuments of Sistan and Baluchistan Province. Seb Castle was the center of governance for all regions in Saravan County, such as Kont, Hidouch, Souran, Zaboli, Paskouh, Gosht, and so on. It was politically important during many different historical periods. According to the available documents, when Nasser al-Din Shah decided to take control of the Baluchistan

region in 1878, he sent his forces directly to Seb Castle. This historic castle is one of the most intact buildings that were constructed during the Islamic period of Baluchistan, and it was registered as a national monument of Iran under number 1751 in 1996. The building itself is 23 meters high and stands on a small hill with height of four meters (27 meters in total). Despite its significance, this national historical monument has seen little scholarly attention. In addition to being the tallest earthen castle in Iran, Seb Castle has many outstanding features, which highlight the necessity and significance of this study.

This article introduces the architectural spaces and features of Seb Castle and answers the following questions:

- What are the prominent features of Qajarid castles in Saravan County?
- What are the prominent features of Seb Castle compared to other castles in Saravan County?
- What factors have affected the physical structure of Seb Castle in Saravan County?

II. Research background

The rather small number of studies carried out about the architecture of Qajarid castles shows that this subject has not yet received the scholarly attention it deserves. Farhad and Kashani (2010) examined the determinant factors of the architecture of the Qajar era and concluded that a new style of architecture was developed in the Qajar era. While Qajarid architects mostly emulated the works of Safavid architects, there were some differences in the architecture of the Qajar era, which resulted from the different political and religious tendencies of that period during Iran's history. Kamali (2009) has studied the status and standing of the Qajarid architecture throughout the course of the history of Iranian architecture prior to the new era. In their case study of Vali Castle in Ilam province, Rasouli and Ahmadi (2021) reviewed the construction of Iranian castles in the pre-Islamic and post-Islamic eras of the country based on the political, economic, and geographical requirements of each era. They categorized the castles into two groups: (1) castles built on mountains (for military and defensive purposes), and (2) castles built on plains (to protect caravans and house soldiers). Varmaghani (2015) examined the characteristics and morphological changes of fortifications from the beginning of the Median era to the end of the Qajar era and the factors that affected the military and defensive considerations in the construction of Iranian cities. Sharifi Kazemi, Anani, and Mohammadian (2015) suggested that security was the most influential factor in the formation of the structure of the castles built in Boshrouyeh City. Zarei and Heidari Babakamal (2014) examined the significance of the castles of the Shahdad region in providing security across the western section of the Lut Desert. They compared the function of these castles with that of other castles built inside and outside Kerman and the central areas of Iran. Keikhaei (2021) suggested that the castles that were built in Sistan and Baluchistan during the pre-Islamic and Islamic periods of Iran reflect the developmental trend of defensive constructions during the two eras. Keikhaei (2021) also proposed that what distinguishes Seb Castle from Kont Castle are the unique technical features in its architecture and the prominent indigenous decorations of the castle. Jangizehi and Ghorbaniparam (2017) explained that clay and mud were used to construct Seb Castle due to their accessibility and inexpensiveness and associate the durability of Seb Castle with its pyramid-like structure, and the use of the sticky mortar consisting of straw, mud, alyssum, and eggs.

III. Research methodology

This study was conducted using a combination of the interpretive-historical method and the descriptive-analytical method. The required data were collected via documentary, field, and library research. The data obtained from Iran's Cultural Heritage, Handicrafts, and Tourism Organization were also used during this study. Examination of the spatial structure of the architecture of Seb Castle can be seen as a part of systematic studies. Understanding the organized components and features of architecture requires a general comprehension of the structural-spatial characteristics of the mass and space, and how they are connected. This would allow the researcher to understand its physical-perceptual and physical-functional structures.

IV. Discussion and results

IV.1. Study area

Saravan County is in the southeast of Sistan and Baluchistan Province. It borders Khash County from the northwest, Sib va Souran County from the west and Pakistan from the east and southeast. It is located at the easternmost point of Iran. Saravan County has the highest number of castles (54) in the Baluchistan region (Fig. 1). The most important historical castles of Saravan are Seb Castle, Dezak Castle, Khairabad Castle, Kont Castle, and Paskouh Castle.

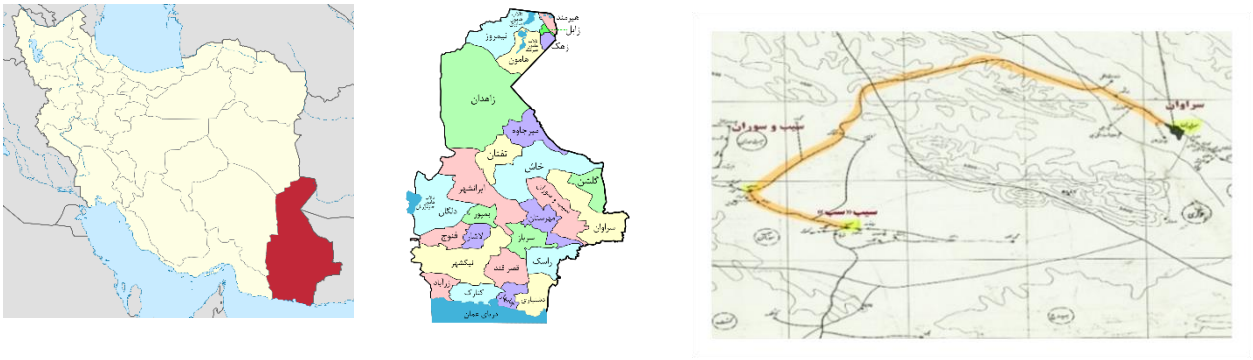


Figure 1. The location of Sistan and Baluchistan Province in Iran (left), the location of Saravan County in Sistan and Baluchistan Province (center) and the location of Seb Castle in Saravan County (right) (by Authors).

IV.2. Architectural features of Saravan's castles during the Islamic-Qajarid period

Finding the answer to the first research question, which is about the prominent features of Qajarid castles in Saravan County, required the identification of the features of the architecture of the Qajar era and then the examination of these architectural features in Saravan's castles. The NW-SE direction of houses, the central and introvert yards of buildings, observance of the hierarchy and significance of spaces, Karbandi decorations of the ceiling of vestibules (Hashti), the hall as the most important space on the northern side of the house, water pools and gardens were among the common architectural features of the Qajar era. Direct observations and available maps showed that some of these architectural features are present in the Qajarid castles of Saravan County as well, especially Seb Castle and Kont Castle. In addition to the above-said features, decorations, and ornaments are among the prominent architectural features of these castles. The decorations of these castles are mainly on the building face overlooking the courtyard and in the interior spaces, while the facade and the outer walls are rather simple and unadorned. However, battlements and towers break the uniformity of the exterior and can be considered a type of decoration. Most decorations in Qajarid castles were done using plaster. This material has been used in almost all of these castles to cover most of the interior spaces and to do plasterwork (plain shapes or floral motifs). Brick decorations with geometric or simple designs have also been used. Decorative shapes created by bricks were particularly common ornaments in their curved sections. Decorative niches and arches were often used to add visual variety to the different surfaces of these castles and were a common means of decorating them. While these castles were not all adorned to the same degree, there are some common decorations that have recurred in most of them (Table 1).

Table 1. The geographical and historical location of castles in Saravan.

Name of castle	District/village	Era
Seb	Sib va Souran / Sib va Souran	Islamic-Qajarid
Kohneh Qaleh	Central	
Kouhak	Bamposht / Kouhak and Esfandak	
Gosht	Central / Gosht	
Khairabad	Central / Suburban	Mongolian
Sarjouvshastan	Central / Suburban	Islamic
Hoshak	Central / Suburban	
Bamposht	Bamposht / Bamposht	
Hitak	Central / Suburban / Hitak	
Dezak	Central / Suburban / Davarpanah	
Esfandak	Bamposht / Kouhak and Esfandak	
Dehak	Central / Dehak	
Kallegan	Jalgh / Kallegan	
Nahouk	Jalgh / Nahouk	
Zaboli	Jalgh / Kallegan	
Paskouh	Sib va Souran / Paskouh	
Kont	Sib va Souran / Hidouch	
Bolgheis	Central / Suburban	
Cheshmeh Nemak (Joushan)	Central / Gosht	
Hidouch	Sib va Souran / Hidouch	
Bakhshan	Central / Suburban - Bakhshan	

IV.3. Seb Castle

As mentioned before, Seb Castle is a Qajarid building located in Saravan County, with its name derived from Sib Village. The term Seb also refers to ancient tribes in Saravan.

Seb Castle is considered to be the most politically historic section of Saravan County. According to historical documents, it was the first area in eastern Baluchistan, where Nasir al-Din Shah's forces were deployed in 1878 to monitor movements in the whole region. The origin of this castle, which is a royal fortress, dates back to the pre-Qajar era, namely the Safavid period, during which nobles began its construction. It was later expanded by the subsequent governments. This castle became a residence for rulers in the post-Safavid era and was one of the main headquarters of Nader Shah in the Afshari era. Seb Castle was home to the Barkzaei and Mirmoradzehi tribes until 1965, but it was later abandoned.

Regarding the factors that have influenced the formation of the main structure of Seb Castle, research shows that the sociopolitical atmosphere of that era had a great impact on the structure of all defensive buildings. In fact, examining the structure of these castles is not possible without knowing the concepts behind them. Security and defense have always been top priorities and major concerns for different societies throughout history. Similarly, the construction of spaces with a defensive approach has become an integral part of the historical culture of Iran (Sharifi Kazemi, Anani, and Mohammadian, 2015). As such, Seb Castle has been built on a natural feature to be taller (one of the main features of the castle). In fact, Seb Castle is the tallest mud-brick building in Iran (Fig. 2). Another main structural feature of Seb Castle is its mastaba (pyramid-like) structure for security reasons. The mastaba shape of the castle makes it more robust and prevents the drift of its thick and high walls. Another main structural feature of Seb Castle is its secret passages, especially hidden staircases, built to increase security during important meetings.

Figure 2. Seb Castle (by Authors).

Despite its age and the torrential rains of the Baluchistan region, Seb Castle has not deteriorated, which can be attributed to its construction materials. The local architects used a certain mixture to make a strong mortar with high adhesiveness. This has made the castle resistant to torrential rains and wind erosion.

IV.3.1. Layout of Seb Castle

Regarding the prominent features of Seb Castle compared to other castles in Saravan County, first, the general characteristics of Seb Castle will be described. Then its prominent features will be discussed in this section. The total area of Seb Castle is 4,000m2, and its built-up area is 900m2. The castle is 23 meters high and has been constructed on a hill. The base of the main building is a 36*25m rectangle. The building has two stories, and its size decreases as it rises, taking the shape of a mastaba. The castle's pyramid-like building has increased its stability and prevented its thick and high walls from drifting (Fig. 2). The castle has 14 towers, and the keep itself has four towers. The southeastern stairs are the only way to reach the castle. Beyond the gate, there is a passage that reaches the castle's threshold, which is located in the middle of the eastern wall. A steep corridor allows access to the central courtyard. This type of architecture makes entering the castle rather difficult and thus increases its security. A high curtain wall surrounds the castle, on which there are sections (locally known as Gholamgard) from which the guards could shoot arrows and create a defensive barrier against invaders.

The castle's building has two stories (locally known as Ashkoub). A chamber was reserved for the ruler at the highest point of the castle (locally known as Shahneshin) to provide a commanding view of the surroundings. This part of the castle has inlaid doors, among its unique features. A rather difficult-to-see, narrow, and steep staircase provides access to this

section. These characteristics helped keep the ruler's chamber away from stranger's eyes. The castle has ten rooms, which are built around the central courtyard (Fig. 3 (left)). There are also six rooms on the second floor, some of which were built by order of the last ruler (Fig. 3 (right)). There are niches in most rooms used to store objects and tools. The Baluch people call these niches Darig. The castle also has stables and a space probably used as a prison.

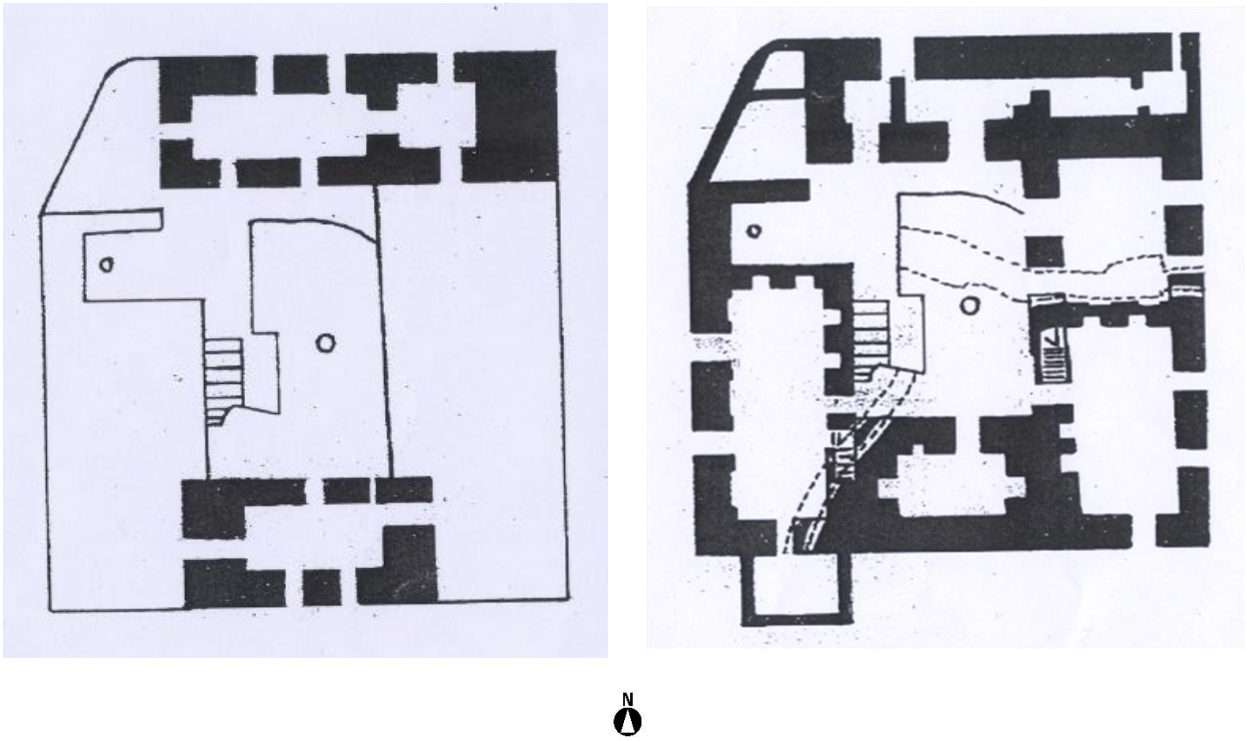


Figure 3. The layout of the first floor (left) and the second floor (right) of Seb Castle (Cultural Heritage, Handicrafts and Tourism Organization of Sistan and Baluchistan Province).

The castle's owner resided on the western side, a relatively large area. The eastern side, with a length of 11m and a width of 4m, has a flat roof and was probably used as a prison. The remains of a tandoor can be seen on the western side of the courtyard, which was used for baking bread for the castle's inhabitants. A mud-brick staircase in the southeastern room leads up to the watchtower. A well in the central courtyard provided easy access to drinking water. This well was dug into the rock on which the castle has been built. There is also another smaller well in the castle. Clay pipes carried the well's fresh water to the upper part of the castle. About 10 meters around the main have been paved with stones.

For better analysis of the characteristics of Seb Castle, the structure, the materials, and the decorations have been discussed separately.

IV.3.2. Structure

The architecture of Seb Castle is cubic and simple. It is symmetrical in shape, similar to the other castles in the region. The first section of the castle was reserved for elites and the ruler's close companions. Servants resided in the second section of the castle, and the ruler lived in the third section. The prison was located inside the stables. The castle has a total of 35 rooms. In general, the castle's various spaces consist of the curtain wall, a set of rooms built into the wall in two stories along three sides of the castle, the ruler's chamber as the most important part of the castle, unroofed sections, and security stations (Fig. 4).

Figure 4. The layout of Seb Castle (by Authors).

Curtain wall: The whole area of the castle, measuring 3,200 m^2, is surrounded by a six-meter-tall rectangular curtain wall. This protective wall has four quadrilateral towers at its four corners, which were not used for security or defensive measures; rather, they merely served to strengthen the joints of the wall's four sections. These towers are an integrated component of the structure of the curtain wall. The inner spaces of the curtain wall do not come to an end at the towers; rather, they continue and merge into the inner space of the towers. The structure of these towers is easily

perceivable in the outdoor landscape of the castle. Unlike the other castles in the region, there is only one entrance into Seb Castle, which is located on the southern wall. This increased the castle's security and made commuting from and into the castle much easier to control (Cultural Heritage, Handicrafts and Tourism Organization of Sib va Souran County, 2016).

Rooms along the curtain wall: A number of rooms have been built in two stories along the curtain wall, except for the tower at the center. The stables and the prison are located in the lower story on the northeastern side. The dark winding corridor of the difficult-to-access space of the prison is behind the stables. The stables served as a place for keeping animals and torturing prisoners. Above the stables and the prison, some rooms with decorations (Fig. 5) overlooking the courtyard. This section was reserved for the ruler.

Figure 5. The stables (first floor) and prison (ground floor) of Seb Castle (by Authors).

The rooms on the eastern, western and southern sides of the castle are all on the ground level, with the upper floor housing the guard chambers. In addition to providing shelter for the servants, these undecorated rooms were used as storehouses and kitchens. The height of the outer wall of these rooms is about six meters on the outside of the castle, and they occupy a total space of about 100m2. A well dug into the rock at the center of the central courtyard provided fresh water to the castle's inhabitants. This feature is unique to Seb Castle in the region. A total of 10 small, and large rooms have been built around the central courtyard.

Ruler's chamber: The most important section of the castle is the ruler's chamber, which takes up about 900m2 of the castle's area. The chamber is a 25*26m rectangle with its walls leaning inward as they rise, forming a mastaba. The reason for the incline of the walls is probably the strength and stability of such walls compared to vertical walls. Another reason might be security and prevention of access to the upper sections (Litkouhi, 2011).

The ruler's chamber has two floors. The ruler's seat, located at the highest point, was added later. The wooden doors and windows once had elaborate decorative carvings. The niches and shelves are decorated as well, with zigzagged arched frames. Similar to the exterior of the building, the inner spaces have been coated with cob. The ruler's chamber is located at the highest point of the hill and the first floor of this chamber is on the same level as the upper floor of the other sections within the castle's walls. This section of the castle is a large mud-brick trapezoid, which has been decorated with unique arrow slits (Pirnia, 2008). The ruler's chamber has only one entrance for security reasons, which sits 2.5m above the courtyard's level. The entrance's staircase, located on the southeastern side of the courtyard, leads to an inlaid 0.5*1.5m double door with a thickness of 0.7m. Immediately beyond the door, there is a space in which the guards stand watch. This space is similar in form to a certain space in the traditional houses of the region where the elderly rest on two platforms on both sides of the door (Fig. 6).

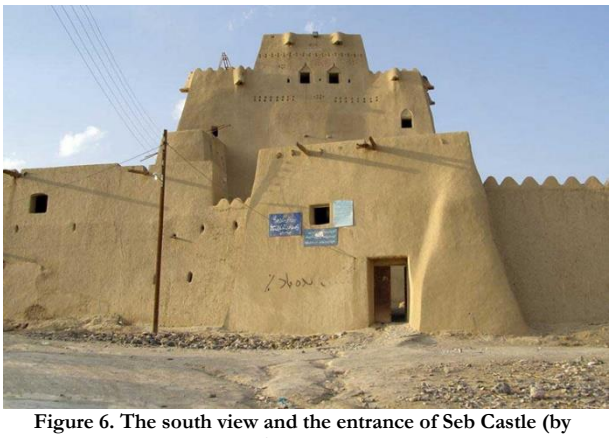
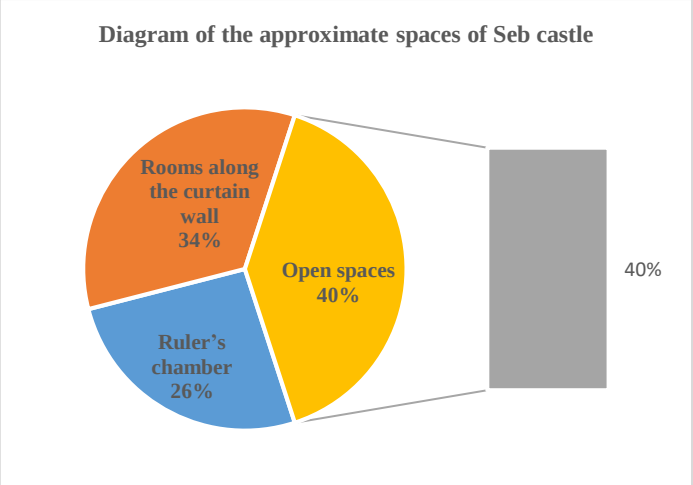


Figure 6. The south view and the entrance of Seb Castle (by Authors).

Open spaces: The remaining portion of the castle, which is approximately 1,300m2, consists of open spaces, such as unroofed corridors, inner yards, water wells, passages, and staircases (Fig. 7).

Security spaces: A three-meter-tall wall has been raised around the castle, which has four towers and certain areas for standing watch and shooting arrows. With dimensions of 48*74m, this wall encloses the castle in a rectangular shape. The southeastern stairs are the only entrance into the castle. Arrow slits can be seen in different parts of the building, including the walls of the courtyard of the first and second floors. These slits can also be seen on both sides of the upper section of the watchtower and next to its windows.



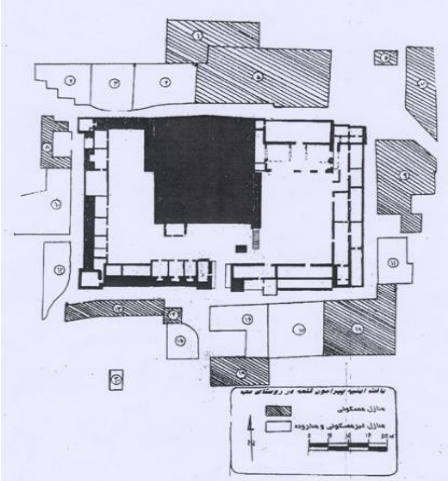


Figure 7. The spatial chart and the layout of the surrounding fabric of Seb Castle (Authors, produced based on the figures obtained from the Cultural Heritage Organization of Sistan and Baluchistan Province).

IV.3.3. Construction materials

For centuries, cob and mud-brick have been the main construction materials used in hot and dry climates. These inexpensive materials are very accessible and can be used with ease. The bright color of these materials reflects the radiant heat of the region. In addition, the heat transfer rate of mud-brick is desirable in hot and dry climates (Tavassoli, 2002). Mud-brick is made by mixing clay and water. Clay is made by adding water to the soil, kneading the mixture, and finally letting the moisture dry. Air-cured mortars and the clay have been used in Seb Castle to bond the mud-bricks and rubble. The constituting components of these mortars are clay, water, and lime to increase their strength. The coating used in Seb Castle is an air-cured cob made by mixing clay, straw, and alyssum. The mortar created by these three components is viscous and very resistant against heavy rains. The one-meter-thick walls and palm trunks have further added to the stability of the roof. The salt added to the straw has prevented the wheat grains from germinating. Half-calcined plaster commonly prepared in the Baluchistan region has also been used for coating the castle's surfaces. The builders of Seb Castle have utilized the local knowledge of architecture and climate to a considerable degree. The cut trunks and branches of palm trees, as well as mats made of Nannorrhops ritchiana (short wide palm tree), were often placed on the roofs and were then coated with cob. The local environment provided the architects with abundant amounts of mud and clay. As a result, the entirety of Seb Castle has been skillfully constructed with these materials. The roofs have also been built using local materials such as palm trucks, palm leaves, and leaf mats. All the different sections of Seb Castle have been constructed using mud-bricks and cob-alyssum mortar (Table 2).

Table 2. The materials used in Seb Castle and their application.

Material	Components	Application
Mud-bricks	Clay and water	Building the walls
Stones	Rubble	Strengthening the foundation
Clay mud mortar	Straw (wheat and barley) + clay mud + lime + water + salt	Bonding the mud-bricks and coating the roofs
Air cured mortar (clay mud - alyssum)	Clay + medium-sized straw + alyssum seeds	Coating the building's exterior surfaces and roofs
Coating mortar	Half-calcined plaster	Coating the building's interior surfaces
Tree trunks	Palm	Coating the roofs
Mats	Nannorrhops ritchiana plant	Covering the palm trucks placed on the roofs

IV.3.4. Decorations

Seb Castle was the residence of rulers. Constructed based on the principles of castle building in Iran, it has battlements that adorn its mud-brick visage. Geometric shapes decorate the niches and shelves. The doors and windows were once ornamented with carvings. The wooden gate has been covered with a metal sheet and wooden studs for added protection. Each iron sheet has two horizontal rows of studs with two studs vertically connecting the two rows. The studs have been wedged from the inside, and their iron nails have been bent to prevent them from loosening. The drawbar has been fastened to the door from the inside via these studs. The hinges rotate around wooden pieces overlaid with metal sheets to increase their durability. A piece of carved wood can be seen on the doorpost. The decorations consist of geometric shapes that form zigzagged parallel lines, triangles, and diamonds (Fig. 8).

Unlike the other Iranian historic buildings, which are ornamented by plasterwork, tile-work, mosaic, mirrors, and other types of common decorations both on the exterior and the interior spaces, all the decorations in Seb Castle have been made using mud mortar. Appendix A shows the various spaces, prominent features, and structural characteristics of Seb Castle.

Figure 8. The decorations of Seb Castle (by Authors) .

V. Conclusion

As a historic building belonging to the Qajar era, which served as the center of authority for the whole region, Seb Castle has not seen much scholarly attention. The aim of this study was to provide a better understanding of the spaces and prominent features of the castle's architecture by combining the interpretive-historical and descriptive-analytical methods for the identification and analysis of the features. The results concerning the first research question, which was about the prominent features of Qajarid castles in Saravan County, showed that decorations and plasterwork were among the prominent characteristics of Iranian castles built in Saravan during that era. The decorations of these historic buildings can be seen mainly in their interior spaces and on the exterior surface that overlooks the courtyard. The facades of these buildings are rather simple and devoid of any ornament. Battlements and towers, however, break the uniformity of the exterior and can be considered a type of decoration. In addition, geometric patterns and decorative shapes created by bricks, as well as ornamental niches and arches, further adorn the various spaces of these castles. Regarding the factors that have influenced the physical structure of Seb Castle, the results showed that the sociopolitical conditions of that period had a great impact on the structure of these buildings. Territorial security and defense were major concerns and priorities for the residents of these lands. As a result, many buildings were constructed with a defensive approach as part of the historic Iranian culture. These buildings were often raised on natural features to increase their height, which is also a key structural feature of Seb Castle. Another key structural feature of Seb Castle is its mastaba shape implemented for safety and security reasons. The mastaba shape of the castle makes it more robust and prevents its thick and high walls from drifting. Another key structural feature of Seb Castle is its secret passages, especially hidden stairs, built to increase the security of its residents when holding important meetings. Regarding the prominent features of Seb Castle compared to those of other castles in Saravan County, analysis of the castle's features in terms of building, structure, construction materials, and decorations showed that its spaces can be grouped into five categories: (1) curtain wall, (2) open spaces, (3) roofed spaces reserved for the ruler, (4) roofed spaces inside the wall (5) security spaces. The trapezoid shape of the section reserved for the ruler, which crowns the castle and is decorated with unique arrow slits, distinguishes Seb Castle from the other castles found in the region.

In terms of construction materials, the interior surfaces of the castle have been covered by cob. The expansion joint in the main building and the castle's construction materials such as clay, straw, palm wood,

and inlaid doors are among the prominent features of this monument. Unlike other historic Iranian buildings in which plasterwork, tile-work, mosaic, mirrors, etc., have been used for decoration, all ornamental features of the interior space and exterior surfaces of Seb Castle have been made using mud mortar.

Acknowledgements

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Appendix A

The various spaces, prominent features, and structural characteristics of Seb Castle (by Authors)

No.	Space	Image	Features
1	Outer wall		In Seb Castle, vertical structural components often have multiple functions. In addition to separating spaces, enclosing areas, and providing cover, they form a strong barrier. The curtain wall of Seb Castle, onto which the walls of the inner rooms are perpendicular, provides additional stability to the castle's walls.
2	Battlements		The battlements are located on the second floor and above the tower. Three areas have been designated for standing watch. These areas overlook all around the castle. To the north, the houses next to the castle, the plain, and Mount Apatan are easily visible. To the east and west and beyond the main courtyard, the whole village and a few kilometers beyond that can be seen.
3	Arrow slits		Arrow slits have been dug all over the castle, from the walls of the courtyard to the main building on the first and second floors. In addition, dedicated spaces have been constructed for guard duty. These arrow slits provided the archers with sufficient visibility and protected them from enemy projectiles.
4	Gate		Seb Castle has three gates on its western and northern sides.
5	Mastaba shape		The foundation of Seb Castle is solid rock, and it has been built on the natural stones of a 20-meter-tall hill. Rock foundations can withstand high amounts of pressure and are highly resistant to subsidence and water seepage.

6	Corridor		The corridor is very narrow and long and has a short roof. Beyond the entrance, mud platforms have been built on both sides for the gatekeepers to sit.
7	Ruler's chamber		A relatively large area has been created on the western side of the courtyard, which was probably inhabited by the Khan or the owner of the castle. The second floor has a total of six rooms with varying sizes based on their application. The first room is a hall built by Mir Mahmoud Khan in the western section. This room was later used as a private meeting room. Most rooms have niches for safekeeping objects.
8	Stables and prison		On the eastern side of the castle, a space with a length of 11 meters, and a width of four meters was built, which was used as a prison. Since this prison is similar to a dungeon, the prisoners had little hope of escaping. It has very thick walls, and the entrance is in the stables.
9	Well		There is a water well, in the middle of the courtyard, around, which has been paved with stones. There is also a well in the ruler's chamber, located on the upper floor. Unlike many other castles that have moats, Seb Castle lacks one because the layers of stone on which the castle has been constructed have added to the height, thus making it secure enough.
10	Windows		Windows overlooking the courtyard provide light for the interior spaces. In addition, the openings dug into the walls of the ruler's building help lighten the interior spaces.

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COMPARATIVE STUDY OF TROGLODYTIC ARCHITECTURE IN KAL-E JENNI REGION OF TABAS WITH OTHER SIMILAR STRUCTURES OF TABAS CITY, IRAN

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Abstract: After introducing the examples of the 'Troglodytic caves' architectural structures in Iran and paying more attention to this type of ancient architecture, two valuable examples of which are Kandovan and Meymand village, studies on this type of architecture became common in all parts of Iran. We see different types of Troglodytic architecture from north to south and east to west of Iran due to the geological structure. The authors of this article provide a structural study of the Troglodytic caves in the Kal-e Jenni area of Tabas city. This structure, known among the locals as Gabri House and also as Mehr Kadeh, was carved out of a very cohesive sand bed of the river wall that dried up millennia ago, conveying a kind of principles of architecture that are still in use with different functions in our modern world. Regarding the library and field studies on this area, there are similarities and differences in the architectural structure of this edifice with others found around the city of Tabas. It is a building with a corridor entrance attached to a vertical corridor moving upwards and then in the building a corridor ending in five small rooms on both sides. The existence of a well in this building is important.
Keywords: Troglodytic architecture (Dast-Kand), Tabas, Kal-e Jenni.

چکیده: در حوزه معماری دست‌کند بعد از معرفی بسیاری از سازه های ایران و توجه بیشتر به ساختارشناسی این گونه معماری که دو نمونه ارزشمند آن روستای دست‌کند کندوان و دیگری روستای میمند هستند، مطالعات بر روی این گونه به تمام نقاط ایران رسیده است. از شمال تا جنوب و شرق تا غرب ایران با توجه به ساختار زمین‌شناسی شاهد گونه‌های مختلف معماری دست‌کند هستیم. نگارندگان این مقاله به بررسی سازه‌ای در منطقه کال جنی در شهرستان طبس می‌پردازند. این دست کند که در بین مردم به خانه گبری و همچنین به مهرکده معروف است در بستر ماسه‌ای بسیار منسجم در جداره دیواره رودخانه‌ای که هزاره‌ها قبل خشک شده است حفر شده و به نوعی اصولی از معماری را رعایت کرده که در دنیای مدرن نیز با کاربری مختلف ساخته شده‌اند. این بنا با توجه به مطالعات کتابخانه‌ای و میدانی در این منطقه، تشابهات و تفاوت‌هایی در ساختار معماری این دست‌کند با دیگر دست‌کندهای موجود در اطراف شهرستان طبس وجود دارد. سازه‌ای با یک ورودی دالان شکل و در ادامه یک راهرو عمودی رو به بالا و بعد در ساختمان یک راهروی کشیده که در دو ضلع آن پنج اتاق کوچک تعبیه شده است و وجود یک چاه در این دست‌کند حائز اهمیت است. می‌توان با مقایسه ساختار معماری و تطبیق آن با سازه های مشابه در منطقه به این امر دست یافت.
کلمات کلیدی: معماری دست‌کند، طبس، کال جنی.

I. Introduction

The life of cavemen and the existence of natural cavities in their environment were certainly the first ideas to build the first houses as primitive shelters that gradually became means of advanced architecture. Early humans used natural spaces for temporary residence or even permanent life. The existence of natural caves in prehistoric and Neolithic periods and later in historical periods and the continuation of this process to the contemporary world to human life today has shown the stability of these settlements and ideas suitable for humans. The word Dast-kand in Persian means digging with hands applied to the underground building created or expanded by human hands. We use the Troglodytic Cave or Hand Made Cave with the same meaning. There is also another term in English spelled Troglodytic. A similar term in French is Troglodytique. The main root of this word is taken from Greek literature, which is Troglodyta, with two parts: the first part means pit, and the second part means penetrating the ground by human hands (Bloch and Wartbutg, 1989). The word Troglodyta is also used in Italian literature but is better known by the word Rupesre. Another term used for such buildings is rock architecture. A similar term in English is Rock Cut Architecture (Kempe, 1988), in French Architecture Rupesrtre, and in Italian Architettura Rupestre.

This type of architecture is mentioned in the studies conducted by Iranian researchers as creating a hole in the rock and expanding it for the use of human life, both during life and after death, and is a kind of human struggle against the rock (Homayoun, 1975: 65). These cavities are formed in the heart of the rock in the form of tombs or perhaps temples used for rituals, along with the real-life function as habitat in parallel (Shekari Nairi, 1992: 19). In the Islamic period, especially in the 6th to 8th centuries, special attention was given to the rock architecture for two reasons (Shekari Nairi, 1992: 22): 1- Dervishes and mystics resorted to the natural and artificial caves in order to choose seclusion and purify their souls, following the cave-dwelling times of the Prophet of Islam. There was a sect of Sufis called Ashkaftiyeh, who lived in caves and mountain crevices (Kiani, 1992: 86). 2- There are obvious references in the history book written by Yamini that indicate the expansion of rock architecture from the 6th century onwards. It is narrated in this book that in the year 582 AH, a great terror had taken over the people's minds, stating that the resurrection would be promised in these years, and a terrible storm would sweep across the earth.

Many of the people of wisdom and companions of blessings and wealth thought to take shelter and shelter in the caves and some of them built strong avenues and arranged strongholds in the gorges and entrances of the earth (Jorfadghani, 1978: 421). In this way, some, thinking they would be safe from the terrible storms of the Day of Judgment, started digging in rocks to build houses (Shekari Nairi, 1992: 22).

The importance of this type of architecture can be considered in its diversity and primitiveness. Architecture is defined by the volume used to build and search for empty spaces. This kind of architecture is a kind of returning to the caves and enduring the cave-dwelling lifestyle. However, this is true only for the rural contexts of primitive civilizations, and the rest of the cave dwellings were either a kind of refuge or the use of tombs or shrines. The special shape, breadth of the structure, and the difficulty of digging the rocks multiply the value of these buildings.

Also, a kind of Troglodytic architecture called Taq Tavileh is very common in Iran. These usually are hovels that shepherds spend hours in. These structures also provide shelter for livestock and poultry in severe climatic conditions like heavy rain and snow. In some works, the structure of the caves is in the form of the Byer (Momeni, 2015: 703). The special attention given to this type of architecture in different periods indicates the constant use of this building style. The existence of rural habitats, such as Kandovan near Tabriz (Osuli Mahmoudi and Baybordi, 2012) and the village of Meymand in the city of Kerman, shows the value, importance, and familiarity of Iranians with this type of architecture. So far, limited studies have been done on the Troglodytic architecture in Iran. Sarokhani (Sarukhani, 2006) and Ashrafi (Ashrafi, 2011) analyzed the typology of Troglodytic architecture. Ashrafi dealt with the protection of these sites (Ashrafi, 2015). Soleimani also considered Bumkan (underground Barn) as a kind of Troglodytic architecture (Soleimani, 2015). Kabiri also introduced the aqueduct as a type of HCC (Kabiri *et al.*, 2015). Among the architectural collections, we can mention Meymand Rock village in the northeast of Babak city of Kerman (Homayoun, 1972, 1975), Lanjroud Cave, an artificial cave or Dastkand, which has been dug as a shelter in times of insecurity (Gharib, 1990), Kija Kerchal Cave in Doab Savadkooh (Dan *et al.*, 2016: 81-88; Pazouki, 1997: 154), Darab Fars Stone Mosque (Khanipour, 2019), Kandovan Rock Mosque, Imamzadeh Hashem Rock Mosque, Varjudi Rock Shrine Near Maragheh city, and Abazar temple in Nair city of Ardabil province (Shekari Nairi, 1992: 13). Most of these buildings can be used as places of worship and other buildings can be used as temporary living and shelter. The focus of this article is on Iran and the special context of Troglodytic architecture in one of the hottest regions of Iran called the Tabas desert.

Given the importance of the subject of this research, the question is what are the architectural features of Kal-e Jenni? Compared to all the similar structures and compositions, what function can be attributed? What we have identified from this Troglodytic construction in Tabas city, which is popularly known as Mehr-kadeh or Gabri House, displays a simple structure that, according to its architectural elements, can be a shrine or temple that needs further study. Conducting the comparative study as the first approach to investigating all the constructions they display being parts of old facilities functioning as an aqueduct, this structure should be part of the regulating system within the water path in the aqueduct.

II. Geography and the history of Tabas city

The city of Tabas, based on official documents and historical evidence, is called "Tabas Khorma", "Tabas Gilaki", "Tabas Golshan", "Tabasin", or Tabas alone, located in the west of South Khorasan province of Iran. This city was previously part of Yazd Province, which joined South Khorasan Province in 1912. Before 2001, Tabas was part of the Great Khorasan Province. The city of Tabas, with an area of 55,461 square kilometers, includes a large area, most of which is formed in the desert environment. Kavir-i Namak and Dasht-i Kavir in the northeast to northwest direction, and Lut desert in its southeastern neighborhoods. There are mountain ranges called Camel Mountains in this city. These mountains are the highest barrier against more or less seasonal rainy clouds that come from the southwest, and as a result, many floods flow on their eastern and western sides. These waters give rise to settlements that exist on both sides of this mountain range. The most important of them are Tabas, Crete on the western slope, and Boshrouyeh on the eastern slope. The city of Tabas is located at a distance of about 30 km on the western slopes of the Camel Mountains (Fig. 1). The city of Tabas is located in the hot and dry regions with regard to its annual climatic conditions. However, due to its proximity to the Camel Mountain range and the present moisture in the winds and short-lived rainfalls, it has become a special part and its climate has become much more moderate than the holes and depressions around it, so its rainfall was recorded in a 16-year census between 1975—1960 at 73.6 mm (Daneshdoost, 2017: 6).

III. Historical background of Tabas city

We know little about the historical past of the pre-Islamic city of Thebes or Tabas, to the extent that it is impossible to have a clear depiction of its background. Tabas in the post-Islamic era, when the historiography was silenced by many rulers for three centuries. From the third century onwards, first, the historical events of the beginning of the Islamic era considered important were documented. Then the other narratives gradually

were written in Arabic. In Post-Islamic periods, too, not all events were recorded, perhaps due to the remoteness of Tabas, the fact that historians remained unaware of the historical events of Tabas, and the lack of historians in Tabas due to its small size and lack of large population. Thus, there is not enough recorded data relating to the history of this city (Daneshdoost, 2017: 18).

In the book Fatuh al-Baldan Blazeri, written in the third century AH, the following lines mention Tabas: Tabasin has two forts, one called Tabas and the other Crane. It is tropical and has many groves, and those two forts are on the way to Khorasan.

The Iranian geographer Jeyhani, in his book called "Ashkal al-Alam" written in the second half of the fourth century AH, to introduce Tabas, calls it Krete Tabas in his description; this is a part of Tabas located near Krete. "Crete is a city smaller than Qaen and is one of the tropical regions. There are many palm trees, it is fenced and old forts and their water comes from the aqueduct. There are more groves there than in Qaen Gardens".

Heinrich von Poser is the first European whose traveling route to the eastern parts of Iran can be traced back to Tabas, passing through the Birjand region located in the eastern neighborhoods of Tabas. Fan Poser mentions Tabas as the "royal castle", and the goodness of this place made him stay there for a few days (von Poser, 1621 AD = 1031 AH). Major General Sir Charles Metcalfe MacGregor, after describing the citadel and the city wall, writes: "Neither this wall nor the city itself matters as a military fortress because it is surrounded by trees and houses that cannot fire from and its walls are made of a fragile material that cannot withstand three hours of artillery". "The most pleasant part of Tabas is Khizaboon (street). This wide boulevard continues from Golshan Gate to the hills" (Fig. 2).

Figure 1. Location of Tabas city (Google Earth 2021).

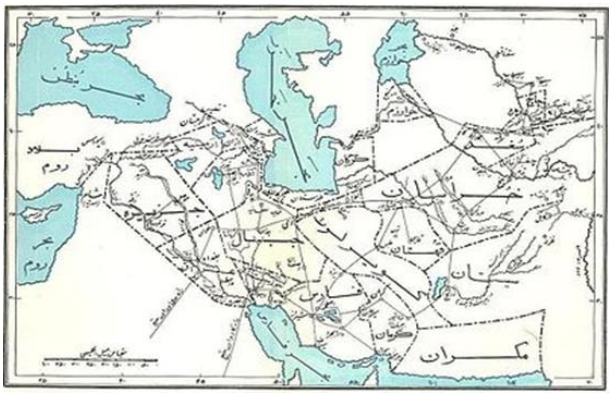

Figure 2. The position of Tabas on the map of Iran during the Abbasid caliphs (Le Strange, 2011).

IV. Troglodytic Architecture in Tabas

Unfortunately, comprehensive accurate information on the architectural structures in this area is not yet available, except for the research done by Mr. Daneshdoost, who has studied the architecture of these structures in the book "Tabas was a city" (Tabas Historical Monuments). According to previous studies on these structures, we encounter two relatively different types of Troglodytic architecture. The first species are cavities that are scattered and irregularly located perpendicular to the surface of the Kal-e Jenni area and seemingly created to move and transfer river water to the other side of the mountain or to direct water through the aqueduct to human settlements. By examining some of these structures that were easier to access, the movement and flow of water inside them were known. On the other hand, examining the aerial photo of the trajectory of the aqueducts created from the valley to the city strengthens this theory (Fig. 3). The second type of these structures has a regular pattern, and in almost all of them, there is an entrance near the riverbed, and the second hole is located at a distance of about 9 to 12 meters above the entrance, which seems to be an opening window or observation post. As a case study, one of the Gabri houses on the eastern side of the mountain was studied, where the Ghalaat peak is located. To enter the Gabri house, you have to enter a tunnel that is about 1 meter above the riverbed, and this high altitude is probably due to the natural erosion of the riverbed. The route of access to these structures is not clear, but what is available from the available evidence, such as the presence of palm logs in both this valley and in Kal-e Jenni, as well as stepped cuts in the vertical body of the walls can be how to access the entrance (Fig. 4). After the entrance of the structure, there is a horizontal channel that is carved to a depth of 4.4 meters and a height of about 1.2 meters inside the mountain. There is a vertical well at the end of this tunnel, and it is completely similar in structure to the wells created for digging aqueducts.

In order to access the space above the well, cuts are made in the wall, and by placing the foot inside these

points, it is possible to move upwards. In the middle of the well, a belt with a depth of about 2 meters and an angle of nearly 90 degrees has been dug into the entrance tunnel axis, which induces a recessed space. It is probable, except for the security of the occupants inside the structure, who had full control over the well; it is a recess space for temporary rest and then continuing to move throughout the path of the well. After climbing up the well, there is a corridor 11.5 meters long. The arched roof of the corridor is more similar to the arches of the Sassanid period in terms of form. There are four ledges on both sides of the corridor, and the door of some rooms opens to it. A room is located at the end of the corridor. The height of the corridor in the middle of the arch is about 3 meters. The gates lead to 6 rooms and a narrow corridor with holes. Some rooms have niches and closets, and two rooms have pre-entrance edges that may have been used to store food. The type of the roof and some niches are the same as the forms of the Sassanid period. In the main corridor and next to the vertical well, a narrow corridor is separated from it in a curved shape, which has a lower height compared to the main corridor, and its use cannot be determined correctly. The provision of natural light inside the corridor is mainly by means of a hovel that has been cut in the vertical surface of the wall, which has also been used as a window and place for observation (Daneshdoost, 2017: 295-298).

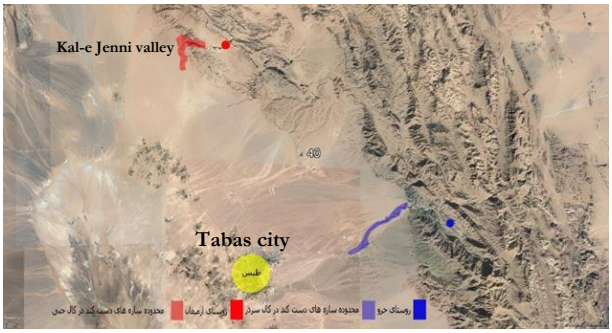

Figure 3. Location of the set of Troglodytic structures (Google Earth aerial photo, 2021).

The Troglodytic caves of Mehr Kadeh in Kal-e Jenni valley are made in a sandy bed on natural walls (Fig. 5). This building has an entrance in the east-west direction. Its main elements include as follows: 1) the entrance, 2) Two corridors, one horizontal and one vertical, 3) A central corridor with a window facing west, 4) A well in the main corridor and near the entrance of the vertical corridor of this building, and 5) At the end, two rows of 10 rooms in the symmetrical position face each other in the north and south of the corridor. Comparing the existence of similar buildings in the Kal-e Jenni area and other areas, such as the Kharo Valley in Tabas and similarities in the type of route design and access to the inside of these buildings, Kal-e Jenni is slightly different in terms of the plan in the symmetries in all existing structures. It can be said that this building is the most symmetrical one in this area.

Figure 4. Kal-e Jenni Valley (Photo by Keshavarz Divkolaee, 2009).

Figure 5. The arrow indicates the location of a Troglodytic building called Mehr Kadeh in the Kal-e Jenni valley. (Google Earth aerial photo, 2021).

V. Architecture

The building known as Mehr Kadeh in Kal-e Jenni has a special design. Although this handicraft is ancient and historical, it appears in a simple, modern, and contemporary architectural structure. The entrance of this building opens to the old riverbed or the Kal-e Jenni valley westwards, about two meters above the ground (Fig. 6). As we were about to climb these two meters, we saw a piece of palm tree stump below the entrance functioning as a staircase.

The structural issue can be considered: First, the sand bed of the western and eastern walls of the valley makes it difficult to understand the existence of stairs in

the past to enter this handicraft building. This may be considered a hypothesis that there may have been several steps below the entrance.

Second, they reduced the height by using escalators or wooden tools such as tree stumps in the area. You have to look carefully at the dense texture of the natural wall of this part of the valley to find the remains of the fallen stair components. The height of the entrance is about one meter and seventy centimeters, which is east of the wall in the heart of the structure and continues in the sand texture of four meters, making a narrow corridor. The height of this narrow corridor, like the entrance, is about one meter and seventy centimeters. The width is about one meter, which at the end leads to a vertical corridor that leads us upwards, like the design of an elevator in today's world. The width of this section differs from one meter to one meter and twenty centimeters, the height of which reaches ten meters (Fig. 7).

In this corridor, there are places for hands and feet to go up and down, like hollows made for digging wells and aqueducts. In the end, this passageway leads to the main corridor of this structure in the initial part of the building on the western side.

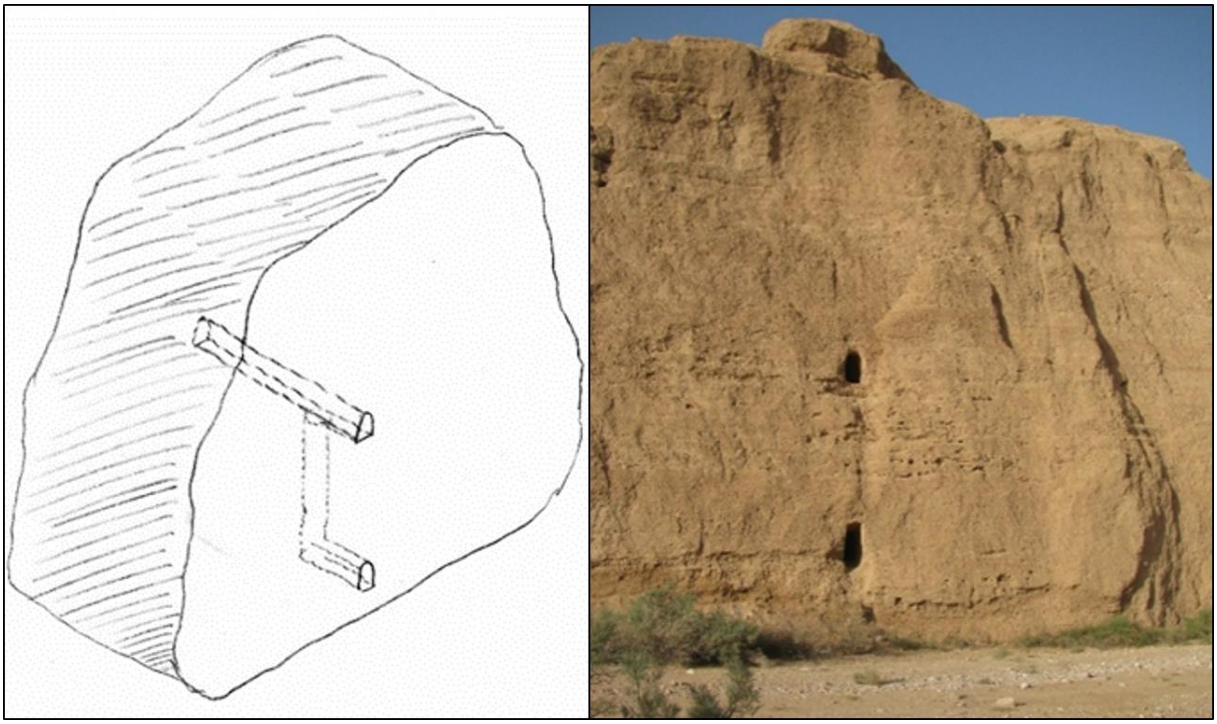

Figure 6. A view of the entrance and window and the three-dimensional image of the access path to the building of Mehr Kadeh in Kal-e Jenni, Tabas (Photo and drawing by Keshavarz Divkolaee).

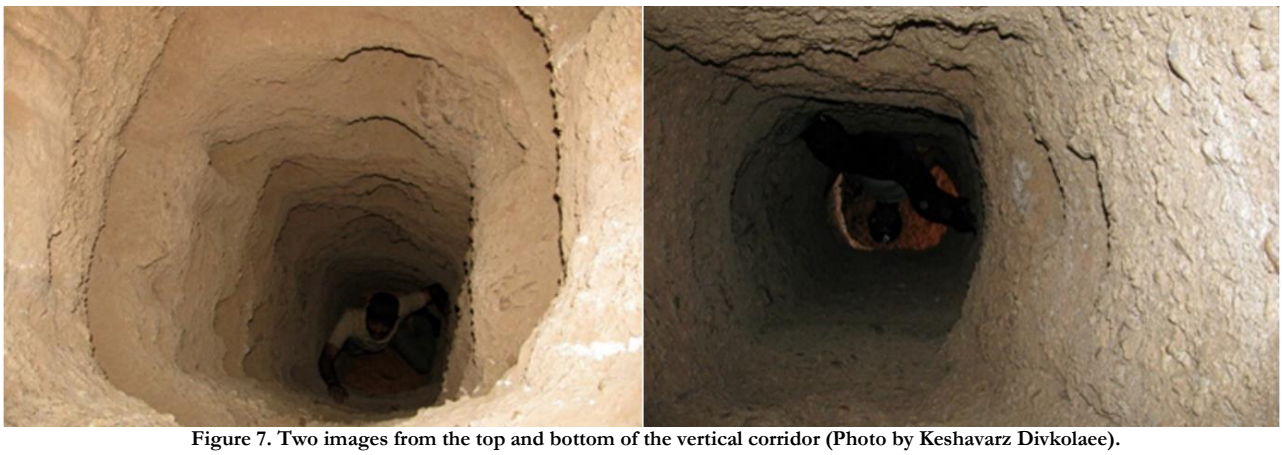

Figure 7. Two images from the top and bottom of the vertical corridor (Photo by Keshavarz Divkolaee).

After passing through the two mentioned corridors, we reach a corridor that stretches east-west. The width of this corridor is two meters and eighty centimeters, and its length is fourteen meters. On the western side, a window opens outwards, about one meter in length and width. Like the entrance, the window shows no special order and accuracy in its arch, and it is a little like a curve. This entrance and window can be considered

similar to the maze structure. Next to the circular entrance of this structure, there is a well on the western front, the diameter of which is between sixty centimeters and seventy centimeters.

The existence of this well can be a great help in understanding the use of this building. In this corridor moving eastwards, the structure in the north and south walls ends in ten rooms divided into two rows. The entrance width of each one is one meter, a small space in which only an ordinary human can be accommodated. The length and depth of each room are about one meter and sixty centimeters.

Figure 8. The right photo shows the window on the western side of the main corridor, and the left photo shows the corridor and some of the rooms at the eastern side of the building (Photo by Keshavarz Divkolaee).

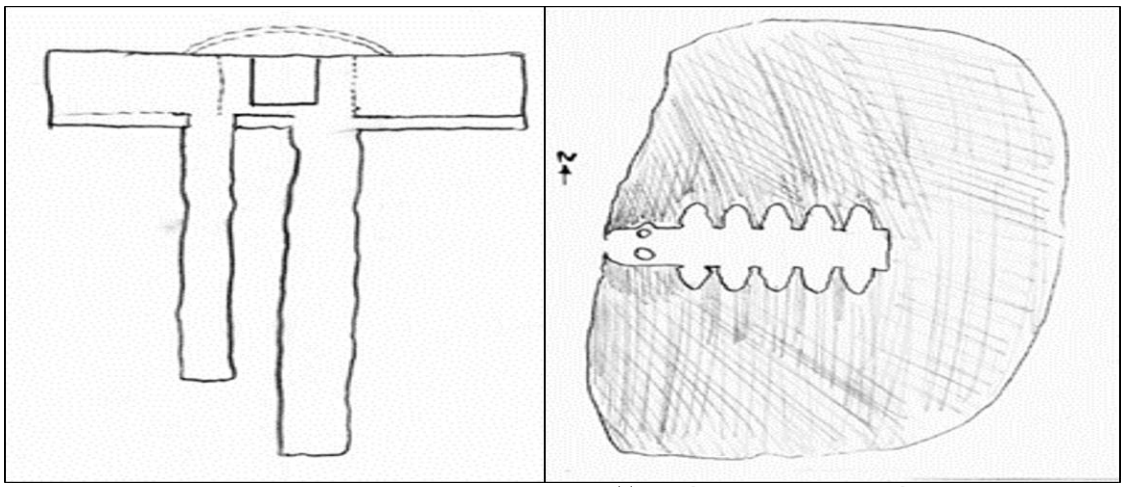

Figure 9. Plan and section of the building of Mehr Kadeh in Tabas (Drawing by Keshavarz Divkolaee, 2009).

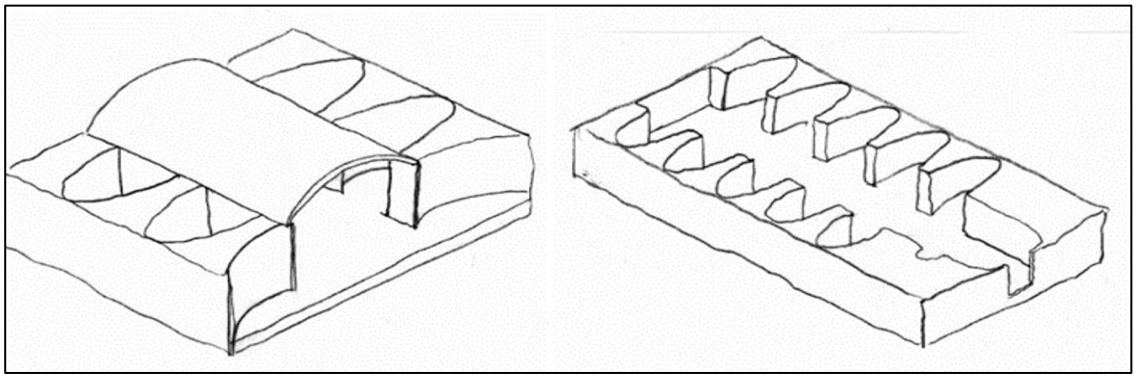

Figure 10. Three-dimensional depiction of the architecture and the curved form of the roof of Mehr Kadeh in Kal-e Jenni (Drawing by Keshavarz Dioklaee, 2009).

VI. Comparative study of the Troglodytic structures in Kal-e Jenni and Kal Darresar regions

In this section, the architectural components of the studied structures are examined, and the differences and similarities between the two structures are introduced. The entrance of the Kal-e Jenni building is about 2 meters distance from the riverbed, while the entrance of the Gabri house is about 12 meters above the riverbed. This difference in their height may be the lowering of the riverbed at the head of the valley and the natural erosion of the bed (Fig. 11).

Figure 11. Right: Mehr Kadeh entrance, Kal-e Jenni, (Photo by Keshavarz Divkolaee), Left: Gabri house entrance, Kal Darrehsar (Daneshdoost, 1997).

The length of the entrance corridor in the Kal-e Jenni building is 4 meters, its width is about 1 meter, and its height is about 1.70 meters. The length of the entrance hall in the building of the Gabri house is 4.4 meters, and its height is 1.4 meters. In both buildings, the similarity of the appearance, form, and dimensions of the entrance and the corridor, is evident. The first signs of architectural proportions can be seen in the entrance structure, which in terms of security allows only one person to enter both buildings (Fig. 12).

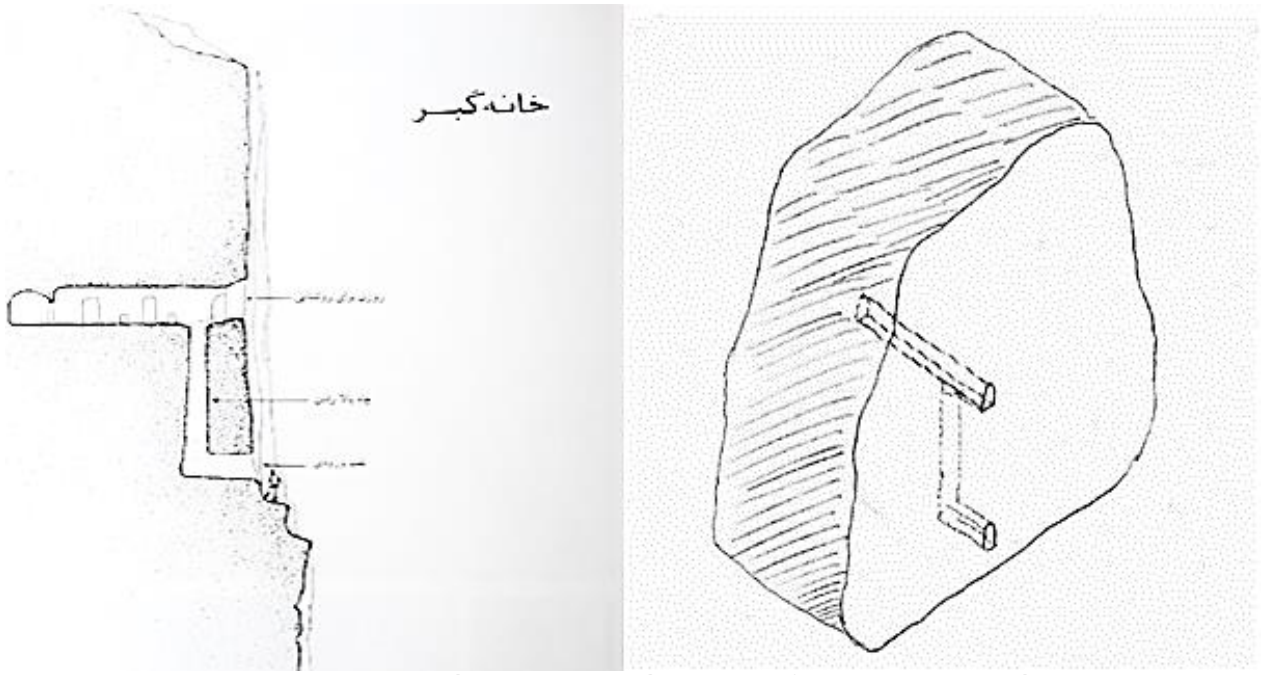

Figure 12. Right: Mehr Kodeh entrance hall (Drawing by Keshavarz Divkolaee), Left: Gabari house entrance hall (Daneshdoost, 1997).

After passing the entrance route, there are ascending wells in both buildings (Fig. 13).

The dimensions of the well in the Kal-e Jenni building are 1.20 meters wide and 10 meters in height. The Gabri house well is about 9.60 meters in height. In both wells, there are holes prepared for hands and feet to climb up, with the difference that in the well of Gabri, in the upper half of it, a pause was dug to a depth of about 2 meters, which was probably for temporary rest.

Figure 13. Right: vertical well in Cal Jeni Mehr Kadeh. (Photo by Keshavarz Divkolaee), Left: vertical well in Cal Darresar Gabri house. (Daneshdoost, 1997).

Crossing the vertical well, we enter the corridor that exists in both buildings, and the access route to the rooms of the building is through these corridors. The width of this corridor in the Kal-e Jenni building is two meters and eighty centimeters, and its length is fourteen meters, while the same space in the Kal Darresar Gabri house has a length of 11.5 meters and a height of about 2.3 meters. On the northern and southern walls of Kal-e Jenni, there are ten rooms divided into two rows of five, which have a regular rhythm and symmetry in terms of construction. The width of the entrance of every room is one meter, and the length and depth of each room are about one meter and sixty centimeters. The form of structure of the Gabari house is different.

Inside the main corridor, there are four niches on both sides and doors leading to the rooms. There are six rooms in this structure, one of which is located at the end of the main corridor. Some rooms have niches and closets and are different in size. The roof form in both structures is an arch reminding the Sassanid forms (Fig. 14 and 15).

Figure 14. Right: Main corridor of Kal-e Jenni Mehr Kadeh. (Photo by Keshavarz Divkolaee), Left: Main corridor of Kal Daresar Gabri house. (Daneshdoost, 1997).

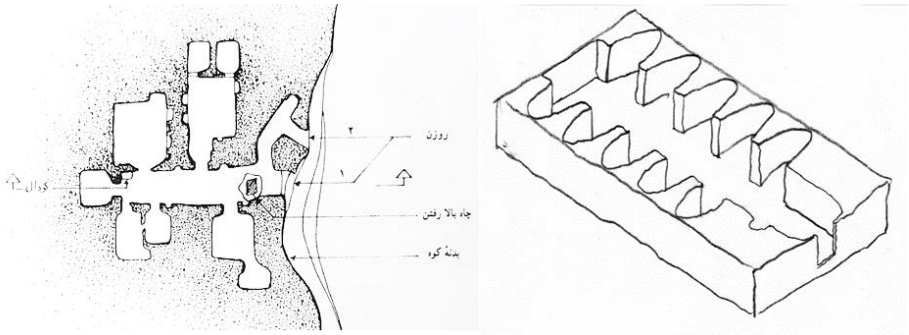

Figure 15. Right: Position of rooms in Mehr Kadeh by provided (Drawing by Keshavarz Divkolaee, 2009), Left: Location of rooms in Gabri house (Daneshdoost, 1997).

In both structures, there is a hole in the main corridor as a skylight or window, and in addition, in the Gabri House, there is another hole connected to the main corridor by a narrow corridor.

VII. Investigation of the method and causes of construction and emergence of Tabas Troglodytic structures

Although the name, Troglodytic architecture, is a new term in the archaeological literature and restoration of Iranian architecture, some different definitions, typologies, and analyses related to this form of architecture are presented by researchers. The diversity and dispersion of such structures in the geographical area of Iran require more extensive studies and research to identify, analyze, and introduce these handicrafts. Different hypotheses have been proposed in the analysis to explain the existence and method of these architectural samples. For example: "In the construction of Troglodytic architecture, there is no difference in the way a space is expanded, starting from the floor, the ceiling, or simultaneously from both spaces because in terms of creating the overall body of Troglodytic spaces, there is no systematic approach to produce the carved out spaces. Therefore, in order to construct the necessary space in Troglodytic architecture, only digging and cutting the rocks and emptying the separated masses would provide the new spaces" (Mohammadifar and Hemmati, 2016: 100). At first glance, such descriptions may seem correct generally, but this description is not true about the collection of sites located in Tabas for the reasons that will be mentioned in the following lines. In fact, it seems that the production of residential space was a mindful act and with a previous plan (Fig. 16).

VII. 1. The first reason

As mentioned in the historical background of Tabas, the history of this region has always been involved in various wars and conflicts, and their inhabitants and settlements were the most vulnerable in these conflicts.

It is natural to assume, based on the available archaeological information and historiography of the region, whether the structures are related to the Sassanid period or the arrival of Islam in Iran, that people have changed their settlement and way of life to avoid the invasion of foreigners. With their inherited knowledge from the creation of residential architectural forms by Sassanid Architects, they began to build this complex in the heart of the mountains and in the valleys to minimize access for invaders.

VII. 2. The second reason

Rituals related to places of worship have always played an important role in the beliefs and lives of the Iranian people. From the times of Mithraism and the ancient Zoroastrian rituals to the Islamic periods, the existence of permanent rivers in this desert region and fertile soil for agriculture has made this location the best place to settle and live. On the other hand, the presence of seasonal floods in this area has not made it possible to create such structures on the riverbed or at low altitudes. The followers of Mithraism believed that "Mehr" was born in a cave or from a rock (Vermaseren, 1963: 91). Also, natural caves were the first temples used to worship "Mehr", and in the absence of a natural cave, they made artificial caves and made their entrances look like natural caves (Razi, 2006: 269).

VII. 3. The third reason

Remains of ancient aqueducts in Kal-e Jenni and Kal Darresar routes, knowledge of aqueduct digging styles in the historical memory of the inhabitants of these regions, the existence of Troglodytic structures with water conduction function to make the aqueduct, similarity of local structures in the design structure of aqueducts with the architectural plan of the studied complexes, applying the architectural proportions producing these Troglodytic structures and also the regulation of living conditions in them, our current knowledge of how architects and people used to construct their buildings in the past using the reverse plan, prior designing of the arches on the ground and then implementing in the structure and other similar cases can be evidence that Troglodytic structures whether in terms of its function to direct water, being a place of worship or a place of residence; It has a detailed and pre-designed plan (Fig. 17).

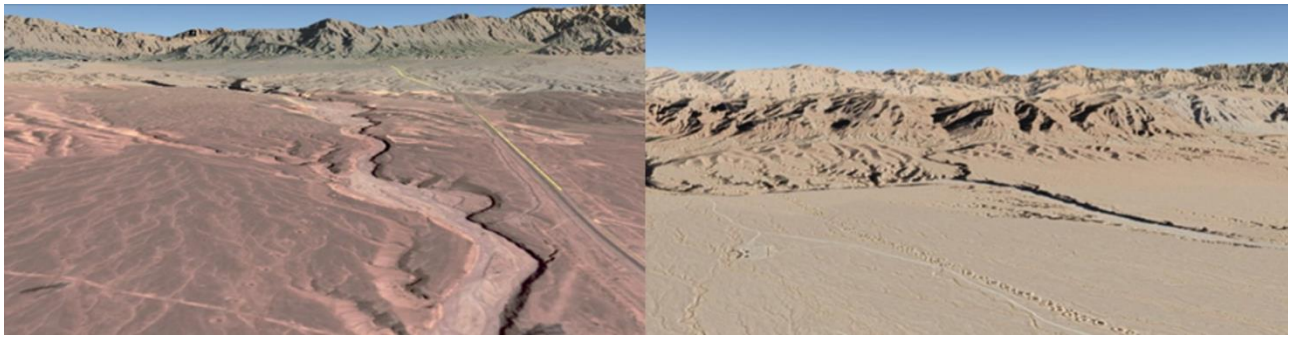

Figure 16. Right: The location of the aqueduct in Kal Darresar, Khoro village, Gabari house structure, and the camel mountains, Left: The location of the aqueduct in Kal-e Jenni, Azmighan village, Mehr Kadeh structure, and the camel mountains (Google Earth, 2021).

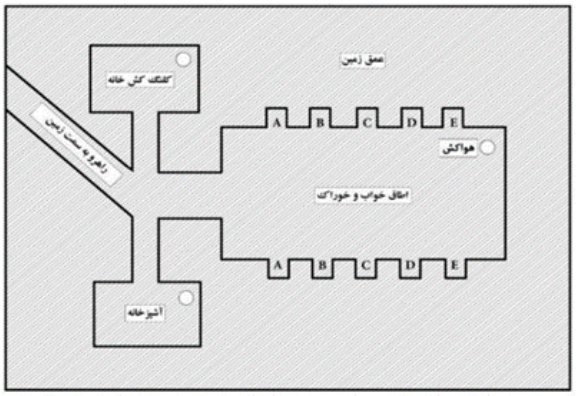

Figure 17. Horizontal section and different parts of a barn along an aqueduct around Yazd (Soleimani, 2015).

VIII. Conclusion:

In line with the research process, there were several issues before the authors, including the distinction and similarity between the building of Mehr Kadeh and the Gabri house. From the chronological point of view, all the Troglodytic caves were built coincidently. Was the main function of the building residential, ritual, or aqueduct? In order to address these questions, the authors needed a coherent structure for research. Therefore, this descriptive-analytical structure of the research was based on surveying, reviewing, and field studies, referring to documents and related library studies, and attending interviews with experts related to handicraft structures. Considering the vastness and dispersion of the Troglodytic caves in Tabas and also the difficult access route to some of these buildings, a comparative study applied to examining two buildings in two stages. The first building was Mehr Kadeh in Kal-e Jenni, which was picked up and studied by authors, and the second building was known as Gabri House in Kal Darresar. By examining all the data obtained from the sum of the two mentioned places, three types of Troglodytic buildings with different functions were observed in these two locations:

1- The first type is residential structures, most of which are known in Kal Darresar as Gabri houses and are very similar in terms of the type of plans and internal components. Determining the exact chronology requires detailed archaeological experiments. However, to commence the first postulates according to the form and method of cutting, many similarities in both buildings are observable, and the formation of arches is close to the forms of the Sassanid era.

2- The second type is structures with hydraulic function or water transfer and conduction, which are manually drilled in dense sand and scattered along valleys and along the river.

3- The third type is structures with ritual functions related to Mithraism and rites related to the Sun, the case study of which was examined in Mehr Kadeh.

The extraordinary importance of this collection of handicrafts in the Tabas region makes it necessary to create an archeological database focusing on the handicraft samples discovered from the eastern parts of the Tabas region. In order to preserve and introduce them, designing an archaeological museum is a necessary decision. The identified and collected handicrafts can bring prosperity to the region by means of the tourism industry attracting domestic and foreign tourists. This can help researchers in conducting field surveys of all valleys leading to the Camel Mountains, hiding yet unidentified handicrafts of the Tabas region. The recognition, analysis, and providing the pathology of buildings to register, protect, and restore them as a unique heritage is a priority.

Acknowledgments

We thank Mohammad Moghadam, a member of the Iranian Documentary Association, who introduced the Kal-e Jenni region in 2008. Thanks to the staff of the Central Library of the General Directorate of Cultural Heritage, Handicrafts, and Tourism of Khorasan Razavi for their unwavering cooperation.

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BEVELED RIM BOWLS OF THE EASTERN HALF OF THE IRANIAN PLATEAU: EXAMINATION AND ANALYSIS

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Abstract: During the Uruk period, which was almost the same as Susa II, many economic, social, and technological developments took place. One of the most significant advances of this era was the production of a distinct type of pottery called the *Beveled Rim Bowl* (BRB). It is of paramount importance to the archaeology of Southwest Asia owing to the wide range of distribution, abundance, and variety in shape and size. During this period, this type of pottery was discovered in the most important areas of southwestern Iran and the plains of Susiana, Deh Luran, and Ramhormoz from the beginning of the fourth millennium to the beginning of the third millennium BC. Cylindrical seals, clay tablets, counting systems, Banesh trays, tubular and nose handle jars, multicolored pottery, and BRB appeared first in the Southwest and then in other parts of the Iranian plateau. This evidence is among the important features of the analysis of trans-regional relations between Iran and Mesopotamia in the fourth and third millennia BC. The authors of the current research have sought to examine the general distribution of BRB on the eastern half of the Iranian plateau, the purpose of which would be to provide the answer to one fundamental research question, that is, the manner of and the reason for the current distribution of BRB in Tepe Yahya, Tal-i-Iblis, Shahr-i Sokhta, Tepe Langar, Konar Sandal, and Kaleh Kub Sarayan regions, and the relationship between their production and distribution in this region, and their original production in southern Mesopotamia and south-western Iran. Although a vast range of scholars has employed a superficial approach to declare the cultural, economic, and commercial interactions between these areas and other parts of Iran, including the eastern and south-eastern regions, as the reason for the current distribution of this type of ceramic, specialized research on the temporal differences of the emergence of BRB in different parts of the Iranian plateau has remained elusive. It may be attributed to the fact that the cultural and social developments of Susa II, including the production of BRB in the eastern and south-eastern regions, have chronologically occurred later. This postponement may be explained by the decline in trade routes of the Central Plateau of Iran in the second half of the fourth millennium BC. From the end of the fourth millennium BC and especially from the beginning of the third millennium BC onward, the east, southeast, south, and southwest of Iran became the main corridor for cultural and commercial interactions with Mesopotamia. Furthermore, the authors seek in this study to comparatively examine the BRB discovered from the areas of the Susiana plains and the semi-eastern areas of the Iranian plateau and those of the original birthplace of Southern Mesopotamia in terms of shape, size, application, frequency, and chronology. The findings indicate that the bowls discovered in the mentioned areas have differences and similarities in shape, dimensions, volume, weight, frequency, and function.

Keywords: Eastern Half of Iran, Beveled Rim Bowls, Bronze Age, Susiana, Southern Mesopotamia.

چکیده: در دوران اوروک که تقریبا همزمان با شوش II است، تحولات اقتصادی، اجتماعی و فناوری زیادی صورت پذیرفته است. یکی از تحولات خاص این دوران، تولید سفالی شاخص به نام کاسه لبه واریخته است. کاسه‌های لبه واریخته به دلیل گستردگی دامنه پراکنش، میزان فراوانی و همچنین تنوع در شکل و اندازه، دارای جایگاهی ویژه در باستان‌شناسی آسیای جنوب غربی هستند. این گونه سفالی در این بازه زمانی که از اوائل هزاره چهارم تا اوائل هزاره سوم ق.م را در بر می‌گیرد، در اغلب محوطه‌های شاخص جنوب غرب ایران و دشت‌های شوشان، دهلران و رامهرمز کشف شده است. مهرهای استوانه‌ای، الواح گلی، نظام‌های شمارشی، سینی‌های بانشی، کوزه‌های چهاردسته‌ای (دسته دماغی) و ظروف سفالی چندرنگ به همراه این سفال، ابتدا در جنوب غرب و سپس در سایر نقاط فلات ایران ظهور یافتند. شواهد مذکور در شمار شاخصه‌های مهم تحلیل ارتباطات فرا منطقه‌ای بین ایران و بین‌النهرین در هزاره‌های چهارم و سوم ق.م هستند. نگارندگان مقاله حاضر، ضمن بررسی گستره پراکنش سفال لبه واریخته در نیمه شرقی فلات ایران، به جستجوی پاسخ این پرسش اساسی پرداخته‌اند که پراکنش آن در این منطقه که در تپه یحیی، تل ابلیس، شهرسوخته، تپه یحیی، تپه لنگر، کنار صندل و کله¬کوب سرایان کشف شده‌اند، چرا و چگونه انجام گرفته و رابطه بین تولید و توزیع آن در این منطقه با مراکز اصلی ظهور آن در جنوب بین‌النهرین و جنوب غرب ایران چیست؟ اگرچه اغلب باستان‌شناسان در بیانی عمومی، برهم‌کنش‌های فرهنگی، اقتصادی و بازرگانی میان مناطق یادشده و سایر نقاط ایران از جمله مناطق شرقی و جنوب شرقی را دلیل گسترش این گونه سفالی دانسته‌اند ولی بحث خاصی درباره تقدم و تأخر زمانی ظهور کاسه‌های لبه‌واریخته در بخش‌های مختلف فلات ایران نکرده‌اند. به بیان دیگر، تحولات فرهنگی و اجتماعی شوش II از جمله تولید کاسه‌های لبه‌واریخته در مناطق شرقی و جنوب شرقی، دیرتر روی داده است. این تأخیر را شاید بتوان با کم رونق‌شدن راه‌های تجاری بازرگانی فلات مرکزی ایران در نیمه دوم هزاره چهارم ق.م تبیین کرد. از اواخر هزاره چهارم ق.م و به ویژه از ابتدای هزاره سوم ق.م به بعد، شرق، جنوب شرق، جنوب و جنوب غرب ایران مسیر محوری و اصلی برهم‌کنش‌های فرهنگی و تجاری با بین‌النهرین شدند. مطالعه تطبیقی و بررسی شباهت‌ها و تفاوت‌های کاسه‌های لبه‌واریخته‌ی مکشوفه از محوطه‌های دشت‌های شوشان و محوطه‌های نیمه شرقی فلات ایران از نظر شکل، اندازه، کاربرد، فراوانی و گاهنگاری با یکدیگر از یک سو و با خاستگاه آن‌ها در بین‌النهرین جنوبی از سوی دیگر، از دیگر اهداف مقاله است. این مطالعه نشان داده است که کاسه‌های مکشوفه از محوطه مناطق مذکور از نظر شکل، ابعاد، حجم، وزن، فراوانی و کارکرد دارای تفاوت و بعضاً تشابهاتی هستند.

کلمات کلیدی: نیمه شرقی ایران، کاسه‌های لبه واریخته، عصر مفرغ، شوشان، بین‌النهرین جنوبی.

I. Introduction

After the collapse of Susa I, Southwest Iran befalls an era known as the beginning of Elamite or Susa II. During this period, the culture of the south-western region of Iran experienced some essential shifts. The dramatic increase in cultural interactions between Uruk and Susiana is one of the greatest events of this period. This settlement was formed into large hubs, small centers, villages, and hamlets. The main hubs of the settlement above included Susa, Abu Fanduweh, and Chogha Mish. Although autonomous in governance, the Susiana Plain was under the supervision of a well-established, properly managed, and strictly controlled system that became the origin of the old urbanization (Fig 1). The widespread application of numerical tools, clay balls, seals and seal impressions, tablets, and other evidence related to administrative management and political development eventually led to the emergence of writing and script later in the period. Another technology of this period is the production of multicolored pottery and various other ceramics. During the Susa II, four-handled jars were first manufactured, which were often decorated with distinct geometric motifs. The production of this type of pottery gained further momentum during Susa III. These small handles were placed parallel to each other on the four sides of the narrow top of the ceramic and seemed to have more of a decorative nature. The discovery of tools such as bronze needles and rods, gold and silver beads, and metal containers and figurines made using molding methods indicates the progress of metalworking in this period.

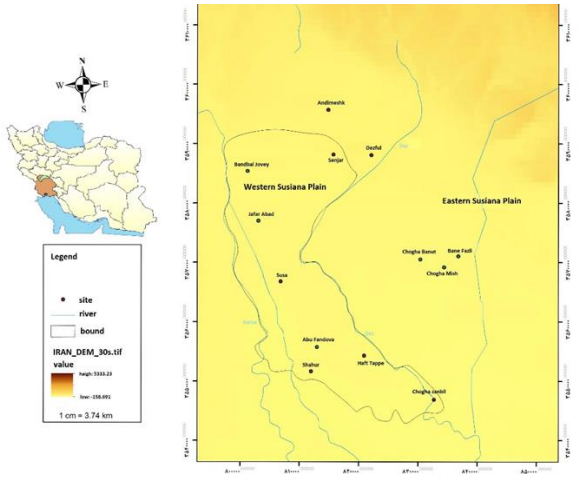

Figure 1. East and West Susiana Plains (Authors).

During the Susa II, simple rough pottery, made with a paste mixed with fine mineral particles, called the BRB, became increasingly prominent (Fig.2 and 3). This pottery appeared on the hill of Susa from layer 22, the frequency of which incrementally increased up to layer 17 (Le Brun, 1978). Evidence suggests that they were probably produced using molding methods. Nearly 39% to 56% of all the ceramics discovered in the Susiana plains are similar (Abdi, 1999).

Figure 2. Example of a beveled rim bowl (Kaercher, 2009).

This pottery was first discovered by De Morgan in Susa in 1897, long before being introduced as Uruk pottery in the ancient world. Then, during the excavation of Tepe Musiyan by Gautier and Lamper, several samples of these ceramics were discovered. In 1928, numerous Beveled Rim Bowls (BRBs) were discovered from Susa excavations (De la Fuya *et al.*, 1928). Le Brun published a list of 16 sites in the plain of Khuzestan and its outskirts, from which BRBs were obtained (Le Brun, 1980). In 1999, this number increased to 45 sites (Abdi, 1999) and Potts has mentioned 107 archaeological sites in 19 regions in Iran and Pakistan as well (Potts, 2009). Outside of the Susiana Plain, this pottery was first reported by Ghirshman in Tepe Sialk (Ghirshman, 1938). The abundance of this pottery in all archaeological sites such as office buildings, religious buildings, cooking places, and industrial structures such as kilns, graves, private houses, and yards and alleys is of paramount inquiry interest (Alizadeh, 2021).

Concerning their application, they have been reportedly employed as child burial symbols (De Mequenem, 1943), bread baking molds (Burton-Brown, 1946; Baumgartel, 1947; Schmidt, 1982; Millard, 1988), containers for separating cheese from whey, plates for giving vows and offerings (Delougaz, 1952), containers for the storage of burnt aromatic substances near burial (Buchanan, 1967), disposable tableware for storing Uruk's aristocratic banquets (Forest, 1987), symbols for manifesting the religious or administrative domination of the Uruk era (Zagarell, 1986), and the standard of employment for workers in different regions (Rothman, 2004). These containers were produced in more or less certain sizes, and their capacity was 90%, 65%, and 45% of one liter. Their certain, somewhat standardized size and their abundance have led to the theory that these dishes were ration plates, which was probably set by the local administrative organization for workers of different ages (Nissen, 1970; Johnson, 1973).

Figure 3. Example of a beveled rim bowl (Alizadeh, 2021).

The most important point in this regard, which is also the main topic of the present article, is the close affiliation of this pottery with Uruk culture and the so-called Uruk expansion (Butterlin, 2003; Algaze, 2005; Stein, 1999; Collins, 2000; Rothman, 2001; Postgate, 2002). Its discovery in some ancient sites of Iran, Turkey, Syria, Levant, and even in the eastern parts of the Iranian plateau in areas such as the Miri Qalat site (Besenval, 1994) in Pakistan, without any prior evidence, may be indicative of the cultural affiliation of these regions with those of the Uruk.

II. BRBs in the southwestern region of Iran

The three prehistoric periods of Susa are identified in the following order: a) Susa I, which consisted of layers 27 to 23; b) Susa II, which consisted of layers 22 to 17; and c) Susa III, consisted of layers 16 to 14B. The study of administrative management documents and seal impressions resulted in the following chronological affiliation of Susa II with Uruk: layers 22 to 19 with old Middle Uruk, layer 18 with new Middle Uruk, and layer 17 with new Uruk (Pittman, 2001). In Susa, a large number of BRBs have been obtained. On Acropolis 25 to 22, rough bowel-shaped potteries with protruding edges have been discovered in Susa. Production of this type of pottery in the standard form of BRB continued until the 18th layer. The BRBs discovered in Layer 17 are almost identical to those discovered in Layer 18. However, it should be stated that significant potteries such as water jugs and wide-mouthed urns with carvings have also been found from this layer. From the settlement context of the northern part of the Susa, it can be concluded that it was a completely administrative application. In this section, large quantities of BRBs, small pots, goat and sheep bones, burnt remains of objects, and artifacts such as numerical beads and seal impressions were discovered (Wright, 1985).

Tappeh Jafarabad, 7 km from Susa, along the Shahour River and the Andimeshk-Ahwaz Road, was excavated in 1930, 1934, and 1969-1974 (Dollfus, 1975). This site was deemed one of the first settlements in western Susiana. The first period of Jafarabad coincided with the period of the historical era of Chogha Mish (Early Susa III) and Chogha Sefid (end of the transition phase of Chogha Mami). A pottery workshop has been found from the second period, which coincides with the Middle Susa III era. The final phase of this period also coincided with the expansion of Chogha Mish as the first large center in Eastern Susiana. The third period of settlement in Jafarabad (Susa A) belonged to a small community that probably existed similarly in other parts of western Susa, such as Bandbal, and these communities depended on a large new center. During this period, Susa came into being, while Chogha Mish gradually lost its significance. Layers 1 and 2 of this area are exactly at the same time as layers 25 to 17 of Susa. Pottery, stone tools, calculi, seals, small figurines, perforated rings, and large decorative studs from this period indicate exchanges with adjacent regions. Large and bulky buildings, seals and seal impressions, buff ware, light gray or very light brown pottery, small cups, large and tall saucers, small bowls, and round and oval crockeries were among the most significant discoveries of the final period of Jafarabad, which were obtained along with BRBs.

The next stage of the development of civilization in the plain of Susa is characterized by cultural interactions between the plains of Susa and southern Mesopotamia, which the Sumerians occupied at that time. The first motifs found from Chogha Mish and Tepe Jouvi closely correspond to those of southern Mesopotamia, hence signifying the beginning of an industrial upturn in the region, which was probably the center of pottery production for subsequent distribution in these lands. The population of the region also increased, as a collective result of which Susa expanded as the largest urban center at the end of the fifth millennium BC.

Chogha Mish is the largest site in eastern Susiana between the two great rivers of Dez and Karun and is located in the south of Dezful (Fig. 4). Regular and extensive excavations have been carried out in 11 seasons (Delougaz *et al.* 1996). The stratigraphy of the Chogha Mish can be cited based on the chronology of the Susiana plain presented by H. J. Kantor and modified by A. Alizadeh (Delougaz *et al.*, 1996). About 250,000 pieces of BRBs were obtained in just two seasons of excavation in Chogha Mish (Alizadeh, 2021). Chogha Mish has an area of 29 hectares in its widest dimension (Alizadeh, 2008).

Figure 4. East Susiana, Chogha Mish (Personal archive of Mr. Seyyed Kamal Asadi Ojaie, 2015).

Many BRBs have been obtained from the layers of the fourth millennium BC in Chogha Mish (Fig. 5 and 6), especially in one of the buildings that was probably a pottery workshop (Alizadeh, 2008). In addition to tokens, a significant number of stamp seals have also been retained from the corresponding excavations. Overall, direct evidence of the manufacturing of BRBs has been attained in archaeological sites of Iran, including Chogha Mish, around pottery kilns (Delougaz and Kantor, 1996). The discovery of examples of these bowls in a kiln at Tal Abuchizan east of the Gargar River in eastern Khuzestan is of high academic interest (Moghaddam, 2007). Tappeh Jouvi in the north of Tappeh Jafarabad and Bandbal in the north of Tappeh Jafarabad, northeast of Tappeh Jouvi, and on the left side of Andimeshk-Ahwaz Road are other areas in which BRBs have been recovered. Tepe Sharafabad is located in the central part of the north of the western Susiana plain, 15 km northeast of Susa (Schacht, 1975). Most of the evidence is obtained from Uruk structures and buildings that remain in three small areas (Wright *et al.*, 1980). Tepe Sharafabad is located in the central part of the north of the western Susiana plain, 15 km northeast of Susa (Schacht, 1975). Most of the evidence is obtained from Uruk structures and buildings that remain in three small areas (Wright *et al.*, 1980).

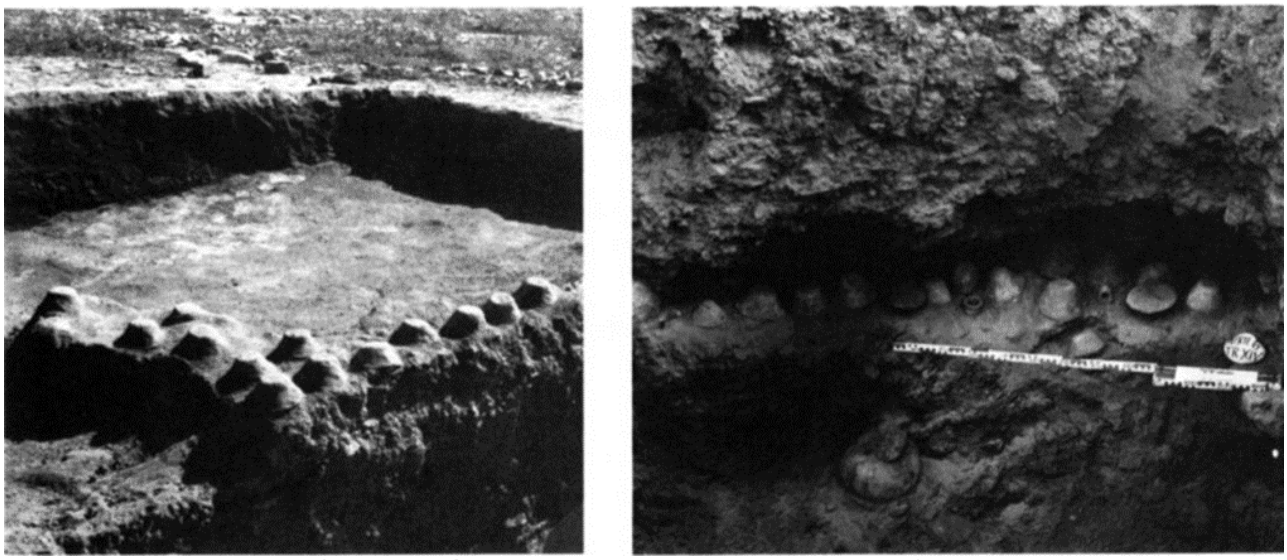

Figure 5: Chogha Mish, Discovery of beveled rim bowls during excavation (Alizadeh, 2008)

Figure 6: Chogha Mish, Discovery of beveled rim bowls during excavation (Alizadeh, 2008)

III. BRBs in other regions of the Iranian plateau

In north-western Iran, BRBs have been obtained on the surface of 5 sites, including Lavin Tepe (Nobari *et al.*, 2012), Tepe Goman, Tepe Ghalat-e-Walev, Tepe Badam Yar, and Molawosu in the Zab River Basin (Fig. 7 and 8). Although Tepe Badam Yar was chronologically attributed to the Chalcolithic, fragments of BRBs have been discovered therein. The evidence for BRBs, amassing a total of 350 pieces, can be deemed a clear indicator of the culture of the Susa II and Uruk periods. Overall, in the mentioned five areas, BRBs cover various shapes and forms, yet most are shallow and exhibit many similarities with their counterparts in Godin V (Binandeh, 2016).

Figure 7: Tappeh Badamyar, beveled rim bowls (Abdi *et al.*, 2019)

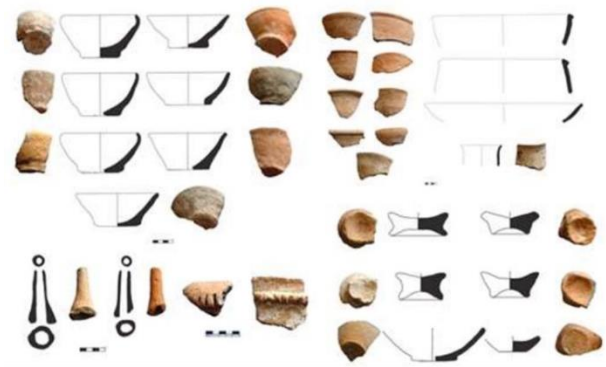

Figure 8: Tappeh Badamyar, beveled rim bowls, and other Uruk pottery (Abdi *et al.*, 2019)

BRBs were first excavated from inside the Iranian plateau in 1933 through the excavations of Tepe Sialk (Ghirshman, 1938; Amiet, 1985). In addition, BRBs have also been discovered at the heart of the Iranian plateau in Arisman, in the west of Iran, and the central Zagros in Godin Tepe. It is also noteworthy that discovering this type of pottery in the Central Plateau region of Iran has caused a lot of controversies. Rather Weiss and Young suggested that Godin V was an Uruk community in the western Zagros, which may have housed small groups of merchants instead of highly developed urban centers. In line with this theory, Zagarell stated that this might not be the case for Tepe Yahya and is more applicable to the Zagros area (Zagarell, 1986). Nevertheless, Algaze introduced the findings of Uruk Godin V and Sialk IV as evidence of the Uruk border base in the surrounding areas and did not believe that they were imported from Mesopotamia or Khuzestan (Algaze, 2005). Evidence of late Uruk has been obtained in Godin VI and V in the Kangavar and Mahidasht valleys and most western parts in general. At the end of Godin VI, an architectural site with an oval wall was discovered in Godin, parallel to layers 17 and 18 of the Susa yet deemed contemporaneous with layer 17 in the Uruk. This building seemingly was of administrative, political, and economic nature. A total of 43 intact or broken tablets from the fifth period were obtained therefrom. Although Godin V has produced many similarities in writing methods between Mesopotamia and Susiana, Godin tablets resemble Susa tablets more closely than Mesopotamian tablets in terms of shape, visual signs, and numerical style (Levine and Young, 1987). A large deal of evidence suggests that Godin-style cylindrical seals were highly similar to the contemporaneous seals of Susa. To these, one can probably add the production of BRBs and large four-handled jars since the frequency of discovered BRBs in Godin is very large, and the transportation of these large bowls from the Susiana plain to Godin was seemingly challenging. As such, it is safe to perceive that local potters were able to produce BRBs and four-handled jars in Godin. These bowls are of Mesopotamian origin (Gopnik and Rothman, 2008).

BRBs have also been reported from the Sialk IV period, which corresponds to the beginning of urbanization. BRBs have been recovered from Tepe Ghabrestan and other distinct pottery (Fig. 9).

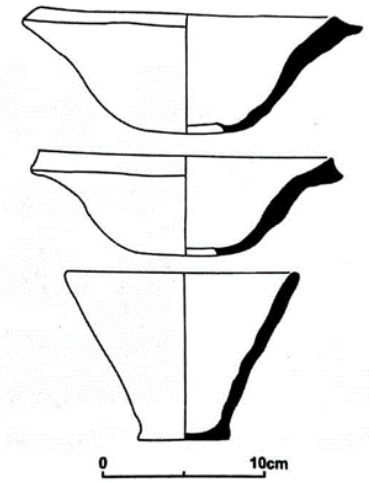

Figure 9: Old Bronze Age beveled rim bowl (Sialk IV) in Tepe Ghabrestan (Majidzadeh, 2008)

Majidzadeh believes that the cultural relations between the Tepe Ghabrestan and Tappeh Godin indicate that the BRBs must have been brought here from the Kangavar Valley. Elsewhere, he suggested that the Tepe Ghabrestan and Tappeh Godin inhabitants may have had similar cultures at the time. Following in the footsteps of Young and Weiss, he considers Godin V to be the main commercial center of the Susa (Majidzadeh, 1976). Although the number of these bowls in the Tepe Ghabrestan is rather small, they still indicate the connection between the Tepe Ghabrestan and Mesopotamia in the Uruk period. The profits and incomes of the inhabitants of the Central Plateau of Iran, those who had access to copper resources and thus could trade with distant communities, may have been received in BRBs (Matthews and Fazeli Nashli, 2004). As previously mentioned, Algaze refers to Sialk IV as the Uruk border base, suggesting that the presence of Uruk BRBs and conical cups on the Tepe Ghabrestan

was a hence by-product of copper mining by Uruk communities along the Khorasan Road (Algaze, 2005).

Along with other ceramics, BRBs have also been reported in Tappeh Shoghali in the east of Dasht-e Rey on the Varamin plain, near the Salt Lake and the communication route Khorasan Bozorg Road in Dasht-e Rey and near Pishva city (Hesari and Akbari, 2007). Moreover, on a particular inscription, three circular prominent crafts best indicate some economic content (Hesari and Akbari, 2007). Arisman was among the most significant centers for the production of pottery and metalwork in the fourth millennium BC on the central plateau of Iran. Arisman has not only been a site for metal mining, smelting, and casting; it also holds evidence of burial and settlement (Matthews and Fazeli Nashli, 2004). In area C in Arisman, several cylindrical seals similar to those discovered from the Sialk and Jemdat Nasr have been reportedly recovered. Despite discovering several tokens, inscriptions are yet to be reported in Arisman. In area C, BRBs and buff wares, painted pottery, and gray pottery have been obtained (Nokandeh 2004). Some of the pottery discovered from Tel Bakun, especially the late Bakun in Fars, are very similar to the vases found from the prehistoric sites of the eastern and western Susiana plain, where various motifs have been observed similar to those of late Bakun dishes in Chogha Mish, Jafarabad, and Bandbal. These include potteries that are very rough in nature and whose rims are beveled.

IV. BRBs in the East and Southeast of Iran

While BRBs have been reported in Susa, Tappeh Godin, Tal Malian, and Tepe Yahya, they are far more scattered from Mesopotamia to the east of the Iranian plateau (Haerinck, 1987). In a similar fashion to the collection of pottery found in layers 22-17 of Susa (Le Brun, 1971), examples of BRBs (Fig. 10 and 11) have been observed in Tepe Yahya, varying in size from small to large (Lamberg-Karlovsky and Tosi, 1973; Potts, 1977).

In 1967, Joseph Caldwell conducted various examinations on Tal-i-Iblis and Tepe Sialk and stated that the presence of BRBs, among other types of pottery, indicated a connection with Mesopotamia, further emphasizing the significance of the Iblis VI as being affiliated with Sialk IV, late Uruk and Jemdat Nasr (Caldwell, 1967). Ghirshman stated that Sialk IV was formed following the expansion of the Elamite government. Evidence strongly suggests the presence of BRBs as a reflection of the connection between the Iranian plateau and Uruk. In a preliminary report on Tal-i-Iblis, Caldwell and Shahmirzadi (1966) argued that the presence of BRBs may have been related to the export of copper from Iblis to Mesopotamia. Algaze (2005) questioned this theory by arguing that the copper resources of the Tal-i-Iblis and south-eastern Iran were available to the Uruk communities in Khuzestan.

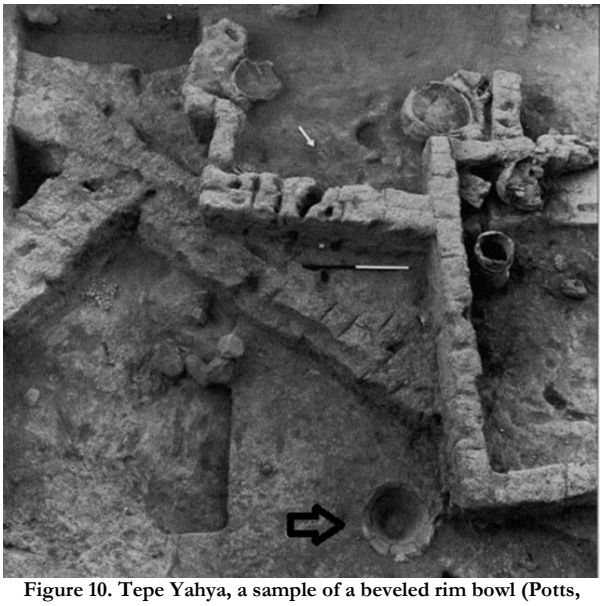

Figure 10. Tepe Yahya, a sample of a beveled rim bowl (Potts, 2001)

He established a relationship between several broken pieces of BRBs of the Tepe Yahya to the exploitation of Kerman copper mines by the Uruk communities of Khuzestan through the South-Central Zagros routes and the Kor River basin (Algaze, 2005). Algaze considers beveled rim bowels as a clear and common symbol of Uruk in Mesopotamia or Khuzestan on the plateau of Iran.

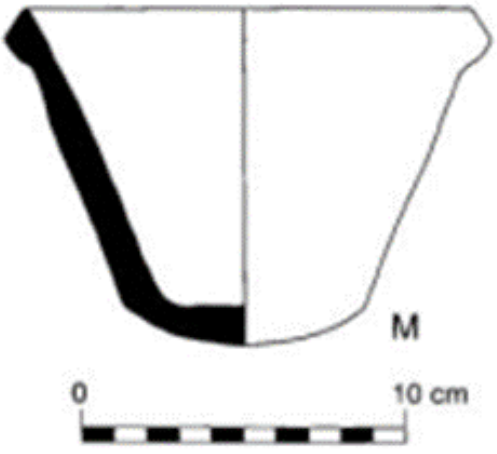

Figure 11: Tepe Yahya, a sample of a beveled rim bowl (Potts, 2001)

Recent surveys and excavations in different parts of Iran have yielded findings that indicate the relationship between south-western Iran and other regions of the Iranian plateau. The Khorasan Highway was a route through which raw materials such as lapis lazuli, agate, and steatite were sent from the east of the Iranian plateau, mines of Afghanistan, Neishabour region, and

around Mashhad, to the major urban centers of the lowlands of Khuzestan and ultimately to Mesopotamia. The raw materials of some cities located along these trade routes, such as Shahr-i Sokht, Tepe Yahya, and Hesar, were processed and hence transferred as semi-finished goods to urban centers in Susiana plains and southern Mesopotamia. In this area with such an extent, only in Tappeh Farhadgerd (near Fariman) a rough piece of this pottery has been discovered. It has been since classified as a beveled rim bowl and has been considered a sign of a commercial base in this region (Vahdati, 2015).

However, recent excavations at Kaleh Kub, in Sarayan of South Khorasan, revealed that this ceramic distribution seems more geographically extensive than previously thought (Fig. 12 and 13).

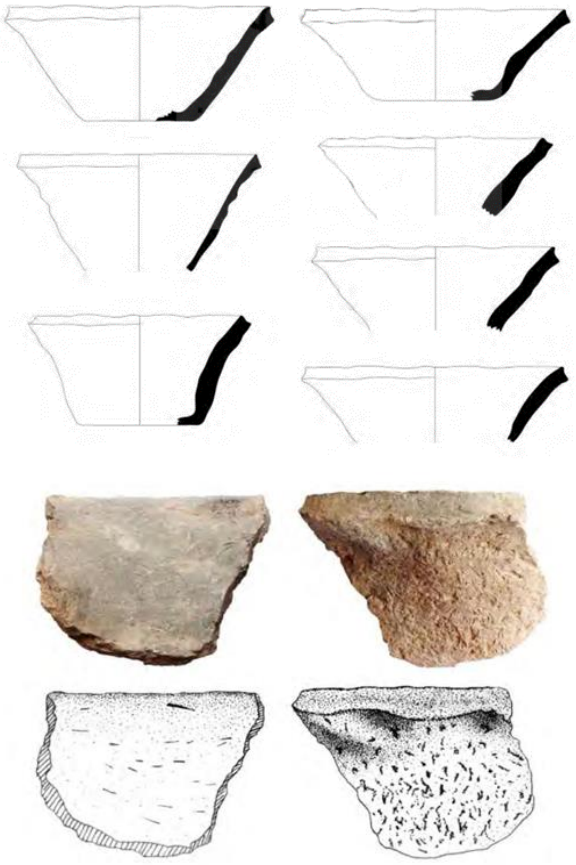

Figure 12: Sarayan, Kaleh Kub site, beveled rim bowls (Azizi Kharanaghi *et al.*, 2020)

This site is located east of the Iranian plateau, about 200 km from the modern Iranian-Afghan border (Azizi Kharanaghi *et al.*, 2020). The distribution of BRBs indicates the widespread of this pottery among the rivers and plateaus of Iran from southern Turkey to southwestern Pakistan (Mutin, 2013).

Overall, in terms of form, color, and motif, the pottery of the fourth millennium BC obtained from Kaleh Kub can be divided into several categories: BRBs, rough Banesh trays, tubular pottery, nose handle jars, string-cut base bowls, gray pottery of the fourth millennium BC, and buff wares with simple black and brown patterns (Azizi Kharanaghi *et al.*, 2020).

Figure 13: Sarayan, Kaleh Kub site, beveled rim bowls (Azizi Kharanaghi *et al.*, 2020)

V. Discussion and Conclusion

A brief study of BRBs reveals that they were produced in more or less predetermined sizes and the capacities of these bowls were 90%, 65% and 45% of one liter. Considering the hypothesis of their use as a rationing container, the capacity of these bowls respectively pertained to a complete ration, three-quarters of ration and a half of a ration. Nevertheless, subsequent quantitative analyses by other researchers, such as Thomas W. Beale, cast doubt on the three-model ration bowl hypothesis (Beale, 1978). Based on what Beale considered the degree of volume or size variability in the samples, Anne Miller suggests this correlation in volume and size concerning the pottery found in Foroukhabad (Miller, 1981). Interestingly, the variation in the volume of the BRB is more consistent with the evidence discussed earlier, and therefore their actual size remains unclear (Englund, 2001).

On the other hand, the variation in the volume of pottery, which was previously considered a result of different manufacturing methods, corresponds closely to the grading in the grain measurement system. Suppose the hypothesis put forward by Englund, in that the bowls were used as measurement containers for pouring rations into plates or bowls, is to be accepted. In that case, other assumptions must be discarded as inadmissible.

Nevertheless, the exact usage of BRB is yet to be determined, and different researchers have proposed different theories based on the use and application of this pottery. Overall, BRB were daily utensils that ordinary workers made rather than professional potters (Gopnik and Rothman, 2008). In sites such as Godin, Sialk, and Tepe Yahya, where BRB remains are found more than in other sites, the hypothesis of them being used as measurement containers seems more reasonable. Considering that the first site was a production and industrial workshop, and the second was a site that extracted ore, they could have been ration

containers. In this regard, Johnson suggested an efficient system for the production of these bowls in the found areas based on the evidence of the production of BRB in the main urban centers, especially in southwestern Iran during the fourth millennium BC (Johnson, 1973). However, in Iran, evidence of applying these potteries as baking utensils or other applications remains inconclusive and requires further analysis.

The abundance of this pottery has led researchers to consider them disposable utensils in ancient times (Alizadeh, 2021). BRB outside the Susiana plains, and particularly in Marvdasht (Tal-e Malyan, Tal-e Koreh and Tol-e Gap Kenareh) (Sumner, 1986; Khanipour *et al*., 2015; 2017), when found, are either sparsely populated or evenly distributed in the area. Anomalies in their distribution, however, can be deceptive. While the presence of BRB has been reported in Susa, Godin, Tal Malian, and Tepe Yahya, they seem to be far more scattered in eastern Mesopotamia than previously thought (Haerinck, 1987). As noted above, Caldwell (1967) has generally stated that the presence of BRB, among other ceramics in areas other than Susa, suggests an association with Mesopotamia. BRB has been found in such abundance in the southern areas of Mesopotamia and the Susiana plains that Alizadeh (2021) has used the proverb "a finger in every pie" to refer to them. Even though areas such as Chogha Mish alone contain 250,000 pieces of BRB, areas such as Tepe Yahya in Kerman have only 5% of this type of pottery, an issue that requires extensive follow-up examination.

According to the excavations carried out in the southwest and the Iranian plateau and considering the findings achieved from diggings in different areas, the presence of BRB in the different archeological sites is indicative of the relationship between the Iranian plateau and the Uruk in the fourth millennium BC (Caldwell and Shahmirzadi, 1966). In the VI and V periods of Godin, in the Kangavar and Mahidasht valleys, and most western regions, there has been extensive evidence from the late Uruk indicating the presence of the people of the low, i.e., the Susiana plains and Mesopotamia, in the highlands. Evidence includes Godin cylindrical seals that mimic seals from the Susa II, BRB, and large four-handled jugs. These bowls first appeared in the Early Banesh phase and, of course, have been observed to a lesser extent in the Middle Banesh phase (Nicholas, 1980), which is perceived to be of the same era as that of the Susa II. In Foroukhabad, BRB was common in the Middle Uruk but continued until the late Uruk and eventually declined during the Jemdet Nasr Period (Wright, 1981). Although some of the characteristic pottery forms of Susa II appear in the Middle Banesh phase, similar Middle Banesh forms appear only in Susa IIIA. The date is strongly substantiated by the inscriptions and seals (Nicholas, 1980; Sumner, 1986).

Ghabrestan IV4-6 is equal to Sialk 6-7III (Majidzadeh, 1981). The similarities of the pottery found in Ghabrestan IV4-6 can be affiliated with the Godin VI and VI/V horizons (Young, 1969). On the other hand, Algaze called Sialk IV an Uruk border base and has deemed the reason for the presence of BRB and Uruk conical cups on the Tepe Ghabrestan to be the involvement of people from the low plains (southwest of Iran and Mesopotamia) in exchanges and trade via Khorasan Road, further arguing that such bowls are a clear symbol of Uruk elements from Mesopotamia or Khuzestan from the era of Susa II (Algaze, 2005).

Now the main question persists as to whether such a connection can be established between the presence of these bowls in the eastern and south-eastern areas of the Iranian plateau and even beyond such borders with such a system, although the connection of Uruk features, including BRB with the administrative and labor management system. The rational response would be that, given the current evidence, establishing such a connection would be bordering on the impossible. Although the east and southeast of the Iranian plateau hold various metal mines and precious and semi-precious stones that confirm the existence of a management system in establishing a production chain and employing different workers to extract and process the relevant mines and raw materials, the corresponding office-related administrative, numerical tools, and office recording supplies are so few and far between that it simply makes it impossible to back this theory for these areas. However, future discoveries in these areas should seek to analyze the presence of BRB regardless of other evidence.

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INVESTIGATION OF TRANS-REGIONAL RELATIONS OF QASR-E GOLCHEHREH IN TORBAT-E JAM BASED ON TYPOLOGY OF HISTORICAL POTTERY

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Abstract:
Torbat-e Jam Plain in the east of Great Khorasan due to fertile soil, two seasonal rivers such as Harirud and Jamrud, and branches of the Silk Road in this region, was a suitable area for cultural settlements during the history. Therefore, studying in this area provides researchers with valuable information about economic, commercial, and even cultural and artistic history. Meanwhile, Qasr-e Golchehreh is one of the archaeological sites in the east of Great Khorasan in Torbat-e Jam Plain, 2 km southeast of Langar village, which has always been a suitable environment for settlements due to its favorable climatic and communication routes. The presence of pottery and brick walls on this site points to the richness and human settlements in this historical site. Unfortunately, so far, this site has just been identified and introduced to the list of historical monuments. Therefore, it is necessary to study this very important site in Torbat-e Jam Plain, which has not been addressed so far, and also to determine the date of its settlement. Accordingly, this research, which is carried out with a descriptive-analytical approach, has attempted to answer the following research questions: 1- According to the Ceramic chronology which period does this site belong? 2- With which regions has it had the most cultural interactions? Accordingly, after selecting the diagnostic shreds and conducting a typological and comparative study, the following results were obtained: the pottery shreds belonged to the Parthian, Sassanid, and Middle Islamic periods. Most of the trans-regional connections of this region can be considered with the northeastern regions of Iran such as Dargaz, Sarakhs, Neyshabur, and Tous, and in the east with Birjand, and in the southeast with Sistan and Makran.
Keywords: pottery, Torbat-e Jam, Qasr-e Golchehreh, Typology, Chronology

چکیده: دشت تربت‌جام در شرق خراسان بزرگ، به دلیل خاک حاصلخیز و وجود دو رود مرزی و فصلی هریرود و جامرود و همچنین وجود شاخه‌هایی از جاده ابریشم در این منطقه، محل مناسبی برای استقرار مراکز فرهنگی در طول تاریخ بوده است. بنابراین مطالعه در این منطقه اطلاعات ارزشمندی در زمینه تاریخ اقتصادی، تجاری و حتی فرهنگی و هنری در اختیار پژوهشگران قرار می‌دهد. در این بین محوطه قصر گلچهره در ۲ کیلومتری جنوب شرقی روستای لنگر در دشت تربت‌جام یکی از مناطق باستانی خراسان بزرگ است که به سبب برخورداری از شرایط اقلیمی و ارتباطی مناسب همواره محیطی مطلوب برای استقرار بوده است. وجود سفالینه‌ها و دیوارهای خشتی به جای مانده، نشان‌دهندهٔ استقرارهای انسانی و غنای فرهنگی در این محوطه تاریخی است، اما متأسفانه تاکنون محوطه مذکور تنها در حد شناسایی و معرفی در فهرست آثار تاریخی باقی مانده است. بر این اساس، هدف از انجام این پژوهش که به شیوه توصیفی– تحلیلی انجام می‌پذیرد، پاسخ به این پرسش‌ها می‌باشد: ۱- این محوطه در چه دوره‌ای دارای استقرار بوده است؟ و بیشترین بر همکنش فرهنگی این محوطه با کدام مناطق بوده است؟ براین اساس، پس از انتخاب سفالینه‌های شاخص و انجام مطالعات گونه‌شناسی و مطالعه تطبیقی مشخص شد که سفال‌ها متعلق به دوره‌های اشکانی، ساسانی و اسلامی میانه هستند و همچنین بیشترین ارتباطات فرامنطقه‌ای این محوطه را می‌توان با منطقهٔ شمال‌شرقی ایران: درگز، سرخس، نیشابور و توس، منطقهٔ شرق: بیرجند، و منطقهٔ جنوب شرقی: سیستان و مکران مطرح نمود.
کلمات کلیدی: سفال، تربت‌جام، قصر گلچهره، گونه‌شناختی، گاهنگاری.

I. Introduction

Torbat-e Jam County with an area of 8879 square kilometers is located in the geographical area of East Khorasan. The center of this county is Torbat-e Jam city. It has a strategic and special location because this Plain is located on the communication routes of three countries: Iran, Afghanistan, and Turkmenistan.

According to archeological studies, this area has been the habitat of ancient tribes for thousands of years, and the banks of Harirud, Kashafrud, and Jamrud rivers have preserved traces of the passage of immigrants and invaders, which show that this area has been inhabited since prehistoric periods (Karimian Kozgooh, 2018: 45). According to Ghirshman, a branch of the Aryans discovered the north strait of Kashafrud at the beginning of the second millennium BC, crossed the southern passage that leads to the banks of Jamrud, and gradually spread throughout the ancient land of Iran. The high wall located on the bed of Harirud in the east of a deep valley that separates the two mountain ranges of Binalood in the west and the Hindu Kush in the east has made human movement impossible from this point. According to the available evidence, the Harirud coast is probably one of the crossings of ethnic migration that came to Iran from the northeast in the early second millennium BC (Ghirshman, 2015: 52-53). The favorable agricultural, military, and economic situation of this plain has hosted different human cultures in the past and has played an important role in the cultures of the Near East from prehistory to the present. Plain of Jam is bounded on the north by Farhadgerd and Tous, on the east by the Harirud River (border of Iran and Turkmenistan), on the west by the Binalood and Bakharz plains, and on the south by the plain of Taybad and the border of Iran and Afghanistan. Torbat-e Jam County is the largest human settlement in the plain of

Jam and was formed on the shores of Jamrud. (Khodadoost, 2015: 110). According to Alireza Ghiamati (a member of the researchers of the ECO Cultural Institute), Qasr-e Golchehreh is the most valuable and oldest monument in the history of Khargerd, which is over 2,000 years old and dates back at least to the Parthian and even the Achaemenid period. Its geographical area from Hajiabad village to Taghiabad is under the historical hills of Khargerd. There are about 11 km of historical cemeteries, which shows the high antiquity of this region. The hills around the village of Langar, which cover the ancient city of Khargerd, indicate the history of the region (Ghiamati, 2017, interview with Quds Online). Meanwhile, Qasr-e Golchehreh is a historical mound located in the village of Langar, 20 km southwest of the Torbat-e Jam county, which is next to Jamrud and near the historic town of Khargerd, along the old Silk Road, and one kilometer southeast of Mahmudabad castle. This castle is very important because of its antiquity. In addition, the discovery of part of a wall to the south of the mound shows that it contains a huge architectural structure. The mound belongs to the pre-Islamic (historical) and Islamic periods and has been repeatedly looted by illegal diggers (registration file). Qasr-e Golchehreh mound was nationally registered on 7/03/2006, Number 14314 with historical antiquity (information base of Torbat-e Jam Cultural Heritage Office). What is important in this research is the chronology of the historical potteries of this hill and its connection with other areas. Accordingly, after surveying in Qasr-e Golchehreh, from among the pottery collected in the study, only 10 pieces of diagnostic pottery that provided the most information to researchers were selected, which were studied typologically and comparatively. The purpose of this research, which is done in a descriptive-analytical approach and with a historical nature, is to be aware of the settlement periods and cultural relations of this region with other regions. Since no one has dealt with this so far, the need for research becomes self-evident.

II. Research method

This is a basic research with descriptive-analytical method. The studies were conducted in the form of field and library research. In the field method, after referring to the Qasr-e Golchehreh mound, the authors recorded the characteristics of this site and then systematically collected the shreds of pottery needed for study in this research from the surface of the site. After being transferred to the cultural heritage center, all potteries were washed, labeled, and drawn.

III. Research background

Numerous scientific studies have been carried out in the field of recognizing and introducing the historical sites of Dasht-e Jam. The following archaeological excavations can be mentioned. 1- Survey of the Germans in 1983, 2- Archaeological survey of the area by the Archaeological Research Institute under the direction of Rajabali Labbaf Khaniki in 1985, which led to the identification of important sites from prehistoric times, especially Bronze Age and Islamic Period, 3- Ariaee and Tibalt (Arie and Thibault, 1975) studies led to the identification of important sites from the Paleolithic period in the northern part of the Torbat-e Jam County near Kashafrud.

Other studies in this region include the study of Anbazak mounds: New findings from the Achaemenid and Parthian periods in East Khorasan - Torbat-e Jam by Javad Khodadoost (2015) .Regarding the research background of the Qasr-e Golchehreh site, it should be acknowledged that Qasr-e Golchehreh site was nationally registered in 2005 only as the ancient site in Torbat-e Jam, the report of which was presented by Hossein Asghari. No study and chronology was done on the potteries of this area for the periodization and cultural connections of this area with other areas. In 2021, by order of the cultural heritage of Torbat-e Jam County, the authors surveyed and collected the potteries of Qasr-e Golchehreh site for typology and chronology.

IV. Geographical location of Qasr-e Golchehreh mound

Qasr-e Golchehreh mound is located in the village of Langar. The village is part of the county Torbat-e Jam, which leads from the north to Sarakhs county, from the west to Fariman and Torbat-e Heydariyeh, from the south to Taybad, from the east to the Harirud River and to the border between Afghanistan and Turkmenistan (Fig. 1). In fact, this village is located 25°23'25.4"N and 60°26'.12"E. (Asghari, 2005: 8).

The climate of the county is mountainous in the north and plains and flatlands in the south and west. The altitude of the Jam area is 928 meters above sea level. This county leads from the north to the Shahneshin and Dal mountains and from the south to the Bazd mountain range. The eastern margin of county Torbat-e Jam is limited to the Harirud border river and is located between Jam Plain and the seasonal Jamrud River, which runs from west to east and joins Harirud at the Khatun Bridge.

Jam Plain is very fertile thanks to Jamrud sediments. A line of the historic and famous Silk Road that connected the ancient city of Neishabour to Herat crossed the river and connected several habitats and cultural centers, the remains of which are now in the form of ancient monuments and mounds. The village of Langar is located near the historic town of Khargerd, on the Silk Road, one kilometer southeast of Mahmudabad Castle (Fig. 2).

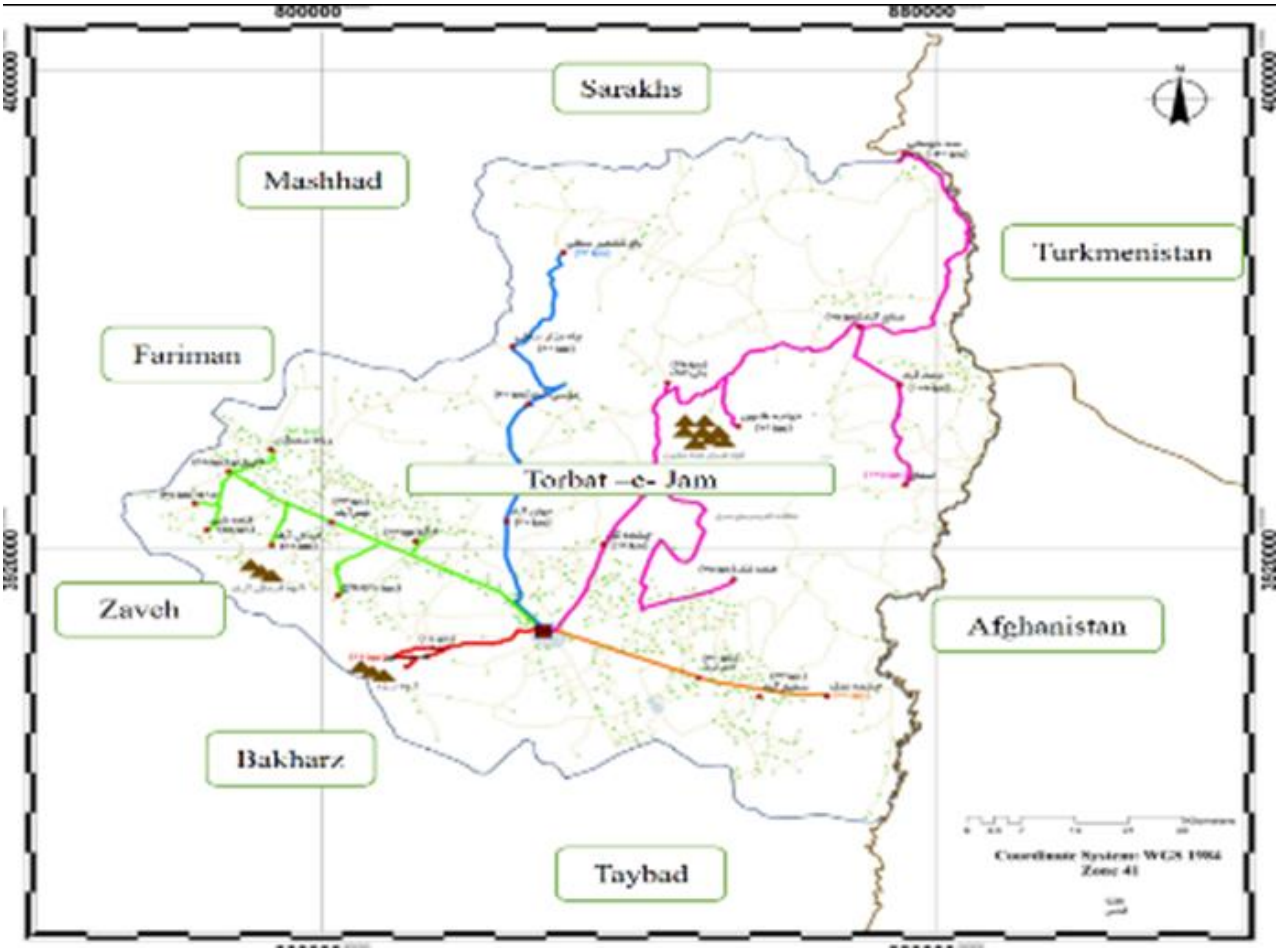

Figure 1. Geographical location of Torbat-e Jam (http://torbatjam.razavichto.ir/torbatjam.aspx).

Figure 2. The location of the village of Langar in Torbat-e Jam County (https://earth.google.com/).

In describtion for the archaeological hill of Qasr-e Golchehreh, we can say that the general shape of the mound is oval. It consists of two adjacent parts and is 90 meters long in the northeast to southwest direction

and 40 meters wide in the west to east direction. This hill is 18 meters high from the surrounding land. The site is a series of hills from south to east and west and leads to agricultural lands from north and northeast. In fact, agricultural lands are located between Jamrud and Tepe. The distance from the river to the hill is about 800 meters. The historic town of Khargerd is located 1 km west of the hill (Fig. 3). The closest source of water in the past could only be the Jamrud because there are no springs or qanats near the hill (Asghari, 2005: 8). Illegal excavations have been carried out on the hill at several points and also the southern part of the mound has been dug, where a part of an architectural structure has been discovered (Fig. 4).

This structure is a wall made of mudbrick and rubble in the lower layers. The mudbricks are 40 cm long and 10 cm in diameter. The mortar used was mud (Fig. 5).

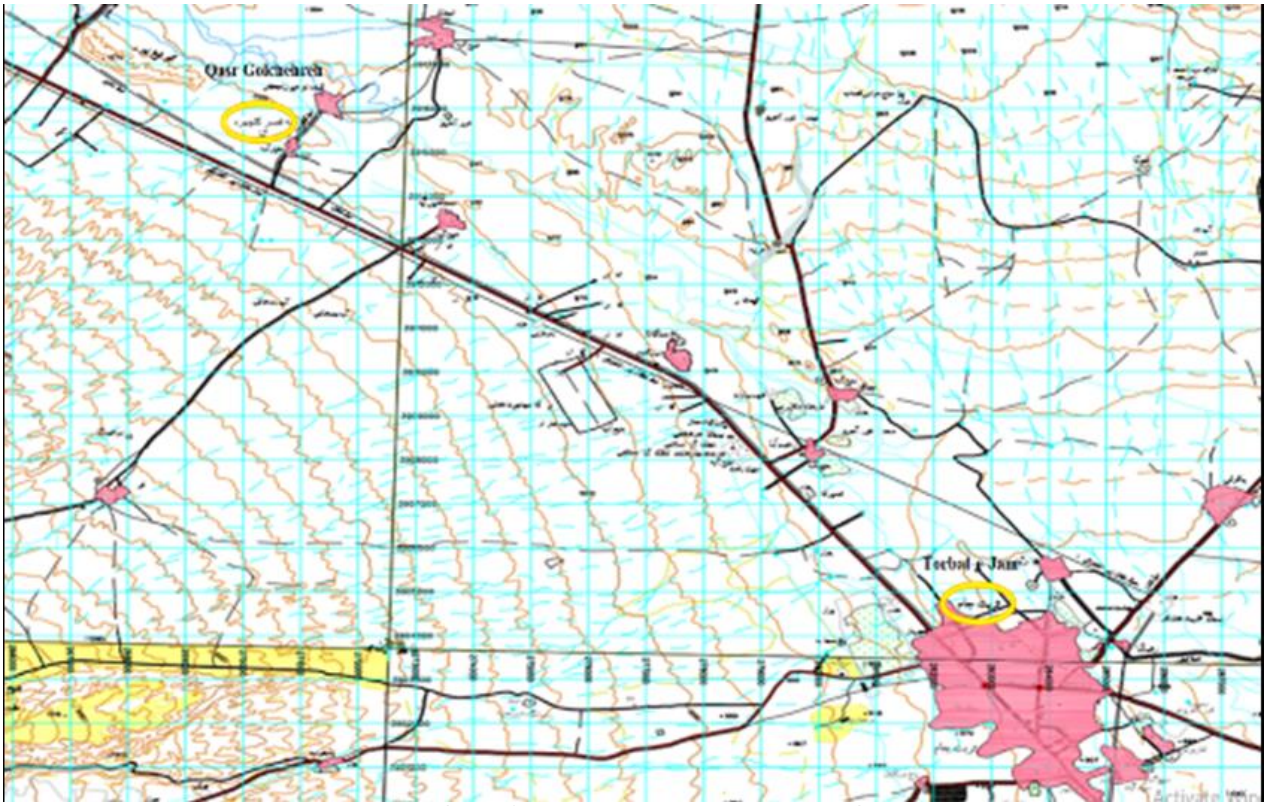

Figure 3. Location of Qasr-e Golchehreh mound (Khorasan Razavi Cultural Heritage).

Figure 4. Views from the south of Qasr-e Golchehreh mound(Authors).

V. Typology and comparative study of Qasr-e Golchehreh potteries

V.1. Technical features

All cultural materials collected from the Qasr-e Golchehreh mound are limited to a number of potteries. Although there is not much variety in them, even these small data can be very valuable. Unfortunately, due to illegal excavation, a lot of potteries has been scattered on the surface of the hill, especially in the northern and northeastern part of the hill. In the process of study, 76 pieces were collected, of which 10 pieces were selected for typology and comparative study. Accordingly, the potteries obtained were all wheelmade. It seems that their temper was from the surrounding soils because the soil and sand particles are in it. Also, the lime particles were observable in the constituents of potteries, which is disturbed in contact with moisture and has caused pores on the body of potteries. The potteries obtained from this hill are simple and unglazed, except a bottom of one of the pieces from Islamic period which is glazed (Table 3, number 10). The paste of potteries is made of clay. Clay is actually a material that consists of the decomposition of feldspar rocks and has aluminosilica and in

combination with water and other materials can be used to make pottery (Naghshineh et al., 2013: 75). The general variety of colors in the potteries of this area was buff, buff-yellow, buff-orange, brick, and brown colors. In terms of firing rate, the pottery had sufficient firing and adequate heat. These potteries were wheelmade in terms of the type of construction technique. All of the potteries have clay slip or clay wash and in one piece belonging to the Islamic period, the outer surface has been glazed.

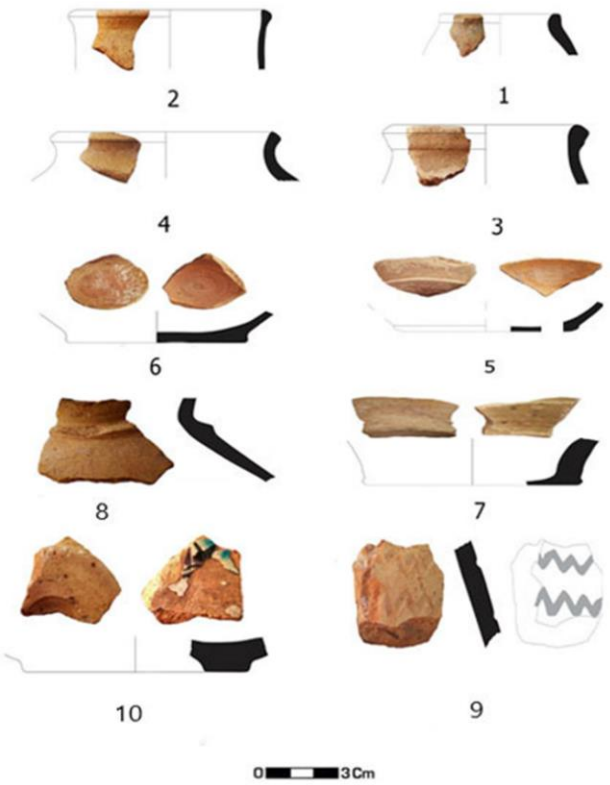

Figure 5. Photos and drawings of Qasr-e Golchehreh mound potteries.

V.2. Forms of studied potteries

V.2.a. Flagons

One of the most common forms obtained was flagons with round rim (Fig. 2: 1). This pottery with Parthian pottery of the Sistan region (Roostaei, 2012: No. 236), pottery of the Bakharz region of Malin site (Khodadoost et al., 2017: fig. 4 No. 11), Sassanid pottery of Tous area and Toope Derakht site (Kouhestani, 2016: 158, plan 16) has been comparable.

V.2.b. Jug: The jugs studied in this study were divided into two categories, one is jug with neck and the other is without neck that has several kinds of rim. Thus, we classified and did a typology analysis of potteries in this way.

V.2.c. Jugs with neck: The jugs with neck studied in this study have a simple rounded rim (Fig. 5: 2), which corresponds to the Sassanid potteries of the Tous area of the Dastgaran site (Kouhestani, 2016, plan 1, number 1).

V.2.d. Jugs without neck

Jugs without neck have two kinds of rims, one is simple grooved (Fig. 2: 3), and the other is diagonally (Fig 5: 4).

Potteries with a simple grooved rim in terms of form and surface color are consistent with the shreds of Parthian potteries of the Nokhandan area of Dargaz (Mohammadifar and Fallah Mahneh, 2015: 13, Table 1- No. 8) and Sassanid pottery obtained from Sharshar tepe in Tous (Kouhestani, 2016: plan 6). The pottery with a diagonal rim is comparable to the sample of Makran Parthian pottery (Alizadeh, 2012: plan 110) and the pottery of the Kahour Langar area of the Persian Gulf coast (Khosrozadeh, 2006: plan 3: 7).

V.2.e. Bottoms of dishes

During the studies, 4 types of bottom were obtained, of which 3 samples belong to the historical period and one number belongs to the Islamic period. The shape of the bottoms is as follows: 1- Flat bottoms with a diagonal edge - convex body (Fig. 5: 5) correspond with a sample of Sassanid floors from the area of Sharshar in Tous (Kouhestani, 2016: p. 96 - No. 5, plan 4-7). 2- Flat bottoms with a rounded edge - convex body **(**Fig. 5: 6) correspond with a sample of bottoms belonging to the late Parthian period of Sistan Plain (Roostaei, 2012: 109- No. 258) and Tepe Gori of Sistan (Mehrafarin, 2007: 192- No. 016). 3- Flat bottoms with rounded edge and body close to vertical angle (Fig. 5: 7) correspond to the Sassanid pottery sample of the Dastgaran area in Tous and Kohandej of Neishabour and Bandian Dargaz (Kouhestani, 2016: 133 - No. 6 - Plan 4-1).4- The last bottoms belong to the Islamic period, which has a base (Fig. 5: 10), and can be compared with an example of Islamic pottery in the Malin region in the Bakhazr county (Khodadoost et al., 2017: p. 13, No. 62), the sample of Islamic pottery in the area of old Zahedan of Sistan (Mousavi Haji, 2004: p. 75, number 43), and the sample of Islamic pottery in the southern Makran region (Nikshahr and Chabahar) (Zour, 2012: 201, number 157).

VI. Decorations of the studied pottery

Examining the potteries, only 3 types of decoration were visible: 1- added design, 2- carved pattern, 3- and potteries with painting and glaze sprinkled under the transparent glaze. Pottery with added design: In explaining this method, it can be said that after making pottery, the desired decoration is made separately and when the pottery is semi-dry, it is attached to the body of the vessel (Kambakhsh Fard, 2010: 457). This technique in the pottery studied in this study is in the form of an added strip (Fig. 5: 8), which is comparable to the sample of Parthian and Sassanid pottery in areas such as Dastgaran (Kouhestani, 2016: 84, fig 1-4 No. 2),

Abderaz area in Sarakhs Plain (Behroozifar et al, 2020: fig 13) Bardsir Kerman (Khosrozadeh and Aali, 2005: second chapter B, plan 4: 2), Khajeh Sistan mountain (Mehrafarin et al., 2011: fig. 11, No. 2), and Eddor of United Arab Emirates (Lecomte, 1993: fig. 10: 4).

Carved pottery: This is another widely used pottery motif in this area. In this technique, which has been one of the most common decorations in pottery workshops, potters created the desired designs using sharp tools (Tohidi, 1390: 25). The designs of carved pottery in the studied pottery are as follows: Parallel and wavy carved lines (Fig. 5: 9) which are comparable to the samples of Parthian and Sassanid pottery in areas such as Dastgaran area (Kouhestani, 2016: 84, Plan 4-1 No. 6), Turang Tape and Qoms region (Kambakhsh Fard, 2010: Plan 9), Malin area (Khodadoost et al., 2017: 167, No. 17), Tepe Maud A (Behdad, 2012: Table 23 No. 94) and the area of Khajeh Sistan mountain (Mehrafarin et al, 2011: fig. 10, No. 5). Pottery with painting and glaze sprinkled under clear glaze: In this method, the pottery is baked and then painted on the pottery and then the surface is covered with transparent glaze and colorless or colored (Mousavi Haji et al., 2013: 129). This pottery has a black pattern and is sprinkled with turquoise or glazed turquoise on a white background (Fig. 5: 10). They are comparable with the example of medieval Islamic pottery belonging to Marlin area in county Bakhezr (Khodadoost et al., 2017: 167, number 67) and old Zahedan of Sistan (Mousavi Haji, 2004: 627, fig 23), Tous (Reza Nejad, 2001: 218, design 17), and Islamic pottery of Tarough Rajab (Fehervari, 2000: 80, No 95).

Table 1. Typology and chronology of the studied potteries.

No.	No. plate	Type of piece	Historical period	Measurement criteria				Comparison	
				Form	Decoration	Design	Glaze color		
1	1	edge	Parthian - Sassanid	*				Sistan Malin Tous Toop Derakht	(Roostaei, 2012: No. 236), (Khodadoost et al., 2017: fig 4 No. 11), (Kouhestani,2016: 158, plan 16)
2	1	edge	Sassanid	*				Dastgaran-Tous	(Kouhestani, 2016, plan 1, number 1)
3	1	edge	Parthian - Sassanid	*				Nokhandan - Dargaz Sharshar -Tous	(Mohammadifar and Fallah Mahneh, 2015: 13, Table 1- No. 8), (Kouhestani, 2016: plan 6)
4	1	edge	Parthian	*				Makran Kahoor area	(Alizadeh, 2012: plan 110)
5	2	bottom	Sassanid	*				Sharshar	(Kouhestani, 2016: p. 96 - No. 5, plan 4-7)
6	2	bottom	Late Parthian	*				Sistan Plain Tepe Gori	(Roostaei, 2012: 109- No. 258), (Mehrafarin, 2007: 192- No. 016
7	2	bottom	Parthian - Sassanid					Tous Khandaj Neishabour and Bandian Dargaz	(Kouhestani, 2016: 133 - No. 6 - Plan 4-1)
8	3	body	Parthian - Sassanid		*			Dastgaran Abderaz Bardsir Kerman Khajeh Mountain Eddor of United Arab Emirates	(Kouhestani, 2016: 84, fig 1-4 No. 2), (Behroozifar et al, 2020: fig 13) (Khosrozadeh and Aali, 2005: second chapter B, plan 4: 2), (Mehrafarin et al., 2011: fig. 11, No. 2),
9	3	body	Parthian - Sassanid		*	*		Dastgaran Toorang Tepe and Ghoms Malin Tepe A mod Khajeh Mountain	(Kouhestani, 2016: 84, Plan 4-1 No. 6), (Kambakhsh Fard, 2010: Plan 9) (Khodadoost et al., 1396: 167, No. 17), (Behdad, 2012: Table 23 No. 94)
10	3	bottom	Middle Islamic	*				Old Zahedan Malin South of Makran	(Mousavi Haji, 2004: 75, fig 43), (Khodadoost et al., 2017: 13, number 62), (Zour, 2012: 201, No. 157)
11	3	bottom	Middle Islamic		*	*	*	Malin Tous Old Zahedan Tarough Rajab	(Mousavi Haji et al., 2013: 627, fig 23), (Khodadoost et al., 2017: 167, number 67), (Reza Nejad, 2001: 218, design 17), (Fehervari, 2000: 80, No 95).

VII. Chronology and analysis of trans-regional cultural connections of Qasr-e Golchehreh mound

As we know, Khorasan, as the first birthplace of the Parthians, had suitable environmental, biological, cultural, geographical and even political components. This created special settlement conditions for this geographical region in the Parthian, Sassanid, and even later in the Islamic period. Qasr-e Golchehreh mound in Torbat-e Jam is also one of the historical sites of ancient Iran, which shows the settlement of ancient peoples in this area. Typology and comparisons show that this hill was established in the Parthian, Sassanid, and Middle Islamic periods. Although it is not possible to attribute some pieces to a specific period (Parthian-Sassanid), it can be seen that the pottery does not belong to before the Parthian period. In the pottery of the Islamic period, pottery that is from the 1st to the 3rd century AH has not been found.

By comparative study of this pottery with Islamic pottery of Tous, Malin, old Zahedan and southern Makran, a history between the 4th and 10th centuries AH can be attributed to them. According to the typological comparisons and location of places based on aerial maps, it can be seen that this area had the most trans-regional connections with ancient sites in northeastern and eastern Iran such as Dargaz, Sarakhs, Neishabour, Tous, Ghaen, Bakhazr, and Birjand (Fig. 6) and from the southeast with Sistan and Makran South (Fig. 7).

In terms of the type of construction, form, and execution of technique, although they were made like other large pottery centers of ancient Iran, in terms of quality, they are lower and have been imitated and built locally.

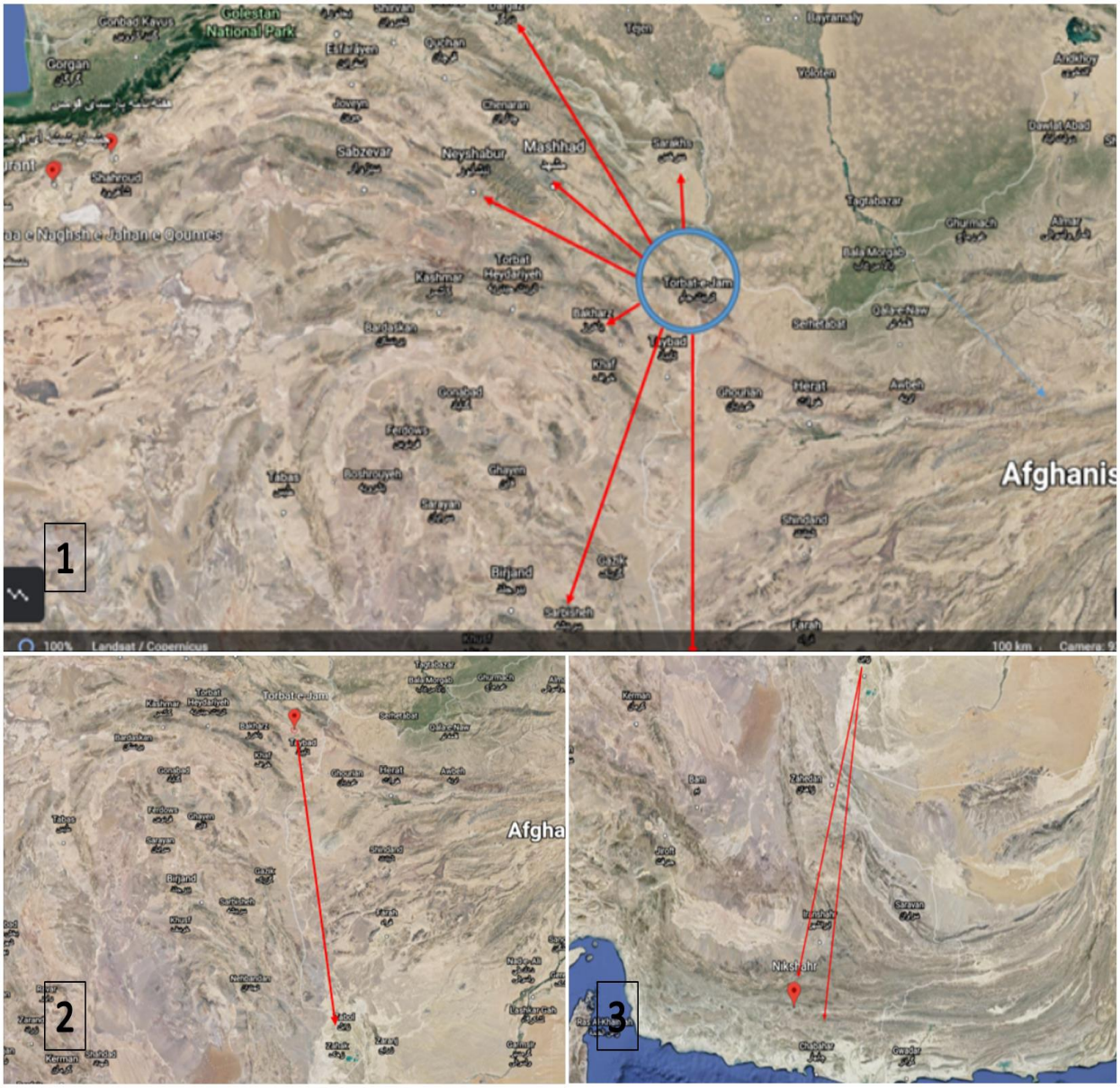

Figure 6. Map of trans-regional connections of Qasr-e Golchehreh area with northeastern and eastern regions of Iran (Google Earth).

Figure 7. Map of trans-regional relations of Qasr-e Golchehreh region with the southeastern regions of Iran (Google Earth).

VIII. Conclusion

Qasr-e Golchehreh mound is one of the historical sites of Dasht-e Jam, on which no specialized studies have been done so far with the aim of typology and chronology. Accordingly, in this research, in accordance with the research questions and objectives, chronology, determination of pottery species, and trans-regional relations of this area were studied and analyzed. Accordingly, at first, a methodical study was performed to collect pottery and study them. In this regard, after collecting pottery, only ten pieces of flagship pottery that provided the most information to the authors were studied. At first, the pottery was identified based on the type of form (edge and body), type of glaze, and type of decoration and then based on characteristics such as paste type, chamotte type, construction type, surface color, etc. Then, based on typological comparisons, the settlement periods and cultural relations of the Qasr-e Golchehreh mound were determined. Based on this, it can be said that this area belongs to the Parthian and Sassanid periods and no pottery that is characteristic of the Achaemenid or Seleucid period has been obtained. Also, according to the painting technique and glaze sprinkled on a white background under the transparent glaze, it is probable that this area was also established in the Middle Islamic period. In terms of trans-regional cultural relations, it had the most connections with the northeastern, eastern, and southeastern regions of Iran, especially Sistan and southern Makran (Nikshahr and Chabahar).

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A RESEARCH ON HORMIZD IV SASANIAN COINS MINTED IN ANCIENT SAKASTAN

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Abstract: The reign of Hormizd IV (AD 579-590) faced many battles in a series of unending conflicts with other neighboring states and tribes, mostly on the western front. Thus, all the government's attention was focused on the western neighborhoods. Sakastan was one of the most important states of ancient Iran during the Sassanid period, where a member of the king's family was always elected to rule Sakastan. Although minting the royal coins was very active since the beginning of the Sassanid period after the reign of Khosrow I, coinage with the abbreviation SK became common and continued until the Islamization shift that changed all of their ancient symbolism. In the Hormizd IV period, Sakastan was considered a state far from the center of power and was out of the focus of attention. Studying the issue of coinage in this region is important because coins are considered a valuable document in describing the archaeological identity of a region. Therefore, relying on the library resources, the central issue of this research was to identify and prepare a list of coins minted in Sakastan by Hormizd IV, the Sassanid Emperor. The results of this study reveal the fact that during the 13-year reign of Hormizd IV, coins were minted in only four separate years, namely years 3, 5, 10, and 12 of Hormizd IV, and possibly to meet the economic needs of the region.

Keywords: Hormizd IV, Sakastan (Sistan), Numismatics, Sassanid, Dirham.

چکیده: دوران شاهنشاهی هرمزد چهارم ساسانی (۵۷۹–۵۹۰م.) را باید دورانی پر از جنگ و درگیری با سایر دولت‌ها و اقوام همسایه دانست، به همین علت تمام توجه حکومت به غرب کشور معطوف بود. سکستان یکی از مهمترین ایالت‌های ایران در دوره ساسانی بود که همیشه عضوی از خاندان شاه برای حکومت آنجا انتخاب می‌گردید. هرچند از ابتدای دوره ساسانی ضرابخانه سکستان بسیار فعال بوده، اما از دوره شاهنشاهی خسرو اول ضرب سکه با علامت اختصاری «سک» (SK) در آن معمول گردید و تا اسلامی شدن کامل سکه‌ها و حتی کمی پس از آن امتداد یافت. از آنجا که سکستان در دوره هرمزد چهارم، ایالتی دور نسبت به مرکز حاکمیت تلقی می‌شد و از دایره توجه خارج بود، مسأله ضرب سکه در آن اهمیت پیدا می‌کند چرا که سکه‌ها را می‌توان سندی ارزشمند در هویت باستان‌شناختی هر منطقه‌ای دانست؛ بنابراین مسأله کانونی این پژوهش بر شناسایی و تهیه فهرستی از سکه‌های ضرب شده در سکستان از دوران هرمزد چهارم ساسانی، با تکیه بر منابع کتابخانه‌ای قرار گرفت. برآیند این پژوهش مشخص ساخت که در طول دوران ۱۳ ساله شاهنشاهی هرمزد چهارم، فقط در چهار سال پراکنده، یعنی سال‌های ۳، ۵، ۱۰، و ۱۲ هرمزدی، و احتمالاً برای رفع نیاز اقتصادی منطقه، به ضرب سکه پرداخته شده است.

کلمات کلیدی: هرمزد چهارم ساسانی، سکستان (سیستان)، سکه‌شناسی، ساسانیان، درهم.

I. Introduction

Hormizd IV was crowned after the death of Khosrow I while he was consulting for a peace treaty in Byzantium (Menander Protector, 1985: 153). The personality traits of Hormizd IV distressed everyone; as Sebeos said: "Hormizd was more prominent than his paternal ancestors and just as terrifying as his maternal ancestors" (Sebeos, 1904: 18). He curbed the aristocrats to control them using extreme violence, defamation, and even execution. Hence, he gave great importance to the lower classes under his rule and was able to surpass his father, dignifying the labors. However, his goodwill turned to the opposite, and the lower class labor revolted against him (TheophylactSimocatta, 1986: 3, 8-13, 16). Khosrow, I died while Iran was at war on the western border with Eastern Rome. The last months of Khosrow I's life coincided with the peace negotiations with Emperors Tiberius II (AD 574-578) and Justin II (AD 578-582). However, the negotiations were abruptly halted when Hormizd was enthroned because he was not content to give up his father's conquests. With the outbreak of the war between Iran and Rome and its intensification, the Khazars invaded Azarbaijan, Arabs looted several western cities, and the Turks occupied Balkh and its environs (Pourshariati, 2008: 124). One of the most important events was the annexation of the eastern provinces of the Sassanid Empire by Turkish invaders. However, Bahram VI, the famous Persian general, defeated them with great difficulty. This incident made Bahram famous, which eventually aroused the envy of the Emperor, and he removed his title, the Espahbodi (Major-General). Hormizd's decision angered Bahram VI, and he revolted against the Emperor. Since he was a military man, the Sassanid soldiers also sided with the general against the Emperor, and Bahram set out for Ctesiphon. Before his arrival, Vistahm and Vinduyih, probably with the help of Khosrow II, blinded Hormizd and killed him (Shahbazi, 2004: 466-467). Sakastan was one of the late Sassanid states in ancient times, which was located in the southern division (Kost Nimruz), and today part of it is in Iran (Sistan and Baluchestan), and the other part, in Afghanistan and Pakistan. This province was bordered by Kerman in the west, Sepahan in the northwest, Kushanshahr in

the northeast, and Turan in the southeast. This state was very important in the Sassanid period, to the extent that members of the royal family were appointed as its governors, and they were called Sakanshah, in charge of minting coins by order of the Emperor. From the time of Khosrow I, coins were minted in Sakastan engraved with the acronym SK, and their coinage continued until the end of the Sassanid era. During the Hormizd IV rule, Iran was involved in many wars and tribal conflicts among various ethnic groups, and most of his attention was focused on the western lands. This study intends to examine his coins minted in a province far from the western borders and to determine the proper chronology regarding the coinage in this part of ancient Iran.

II. Research method

To study the coins of this research, numismatic sources of the Sassanid period were used, the research background of which will be presented. In 2002, two large numismatic databases were used to obtain the current images of these coins. The Oriental Coin Database was created in 2005. Its website was also designed (https://www.zeno.ru/), in which countless oriental coins, especially Iranian coins, were uploaded. Also, the Coin Auction Institute named Sixbid was created in 2011 (https://www.sixbid.com/en/), which contains information about all the best-selling coins, medals, and other valuables in the world with all the details.

III. Research background

There are many opinions about the classification of the Sassanid coins from the historical evolution approach; each of which has a unique advantage. William Valentine was the first person who classified the Sassanid coins according to the historical evolution approach. His classifications were very brief and limited to three periods, which are not applicable today and can only be considered as part of the history of research (Valentine, 1921). The next person to classify Sassanid coins was F. Paruck. He designed his proposed classification of coins for each king specifically and prepared the historical evolution of coins in a linear form (Paruck, 1924). This work is far better than Valentine's work, and it is even called the Sassanid numismatic revolution. R. Gobl is the next person who provides the most important and complete classification of Sassanid coins (Gobl, 1971: 41-55). In fact, Gobl's research is considered the main reference regarding the numismatics of the Sassanid era. After Gobl, there are also two reliable works by M. I. Mochiri"Numismatical Studies of Sassanid Iran" (Mochiri, 1972: 2-3), and "The Numismatical Studies of Sassanid and Arab-Sasanian Iran"(Mochiri, 1977: 3-23), which put the last touches on the numismatics of the Sassanid period. However, in general, no significant specific research has been published on the coins of Hormizd IV, and only the insufficient book "Hormizd IV: 12 years of reign, 13 years of coins" (Amini, 2004) can be found. Regarding the Sassanid coins minted in Sakastan, we can also refer to two articles "Reconstruction of the political history of Sakastan at the end of the Sassanid Empire based on the new coins from the era of Ardeshir III" (Mortazaei and Zabanavar, 2016) and "Elemental analysis of Sassanid silver Dirhams (Khosrow I, Hormizd IV, and Khosrow II) minted in Sakastan (Sakastan /SK) by PIXE method" (Jozi and Saadat-Mehr, 2021).

IV. An overview of the political situation in Iran during the Hormizd IV reign

Hormizd was uncompromising in foreign relations. He broke the peace treaty with Byzantium and demanded a tribute from the Romans, which they could not pay (Menander Protector, 1985:9-24). The Romans also angered Hormizd IV by accepting an invalid as the son of Khosrow I. After that, a devastating war broke out that lasted throughout the reign of Hormizd IV (John of Ephesus, 1862: 6, 29; Mossig-Walburg, 2000: 71-72). Menander states that "Iranians and Romans would have established peace if Khosrow had not died and his son, Hormizd IV, a scoundrel in every sense, had not taken his place" (Menander Protector, 1985: 207-209). When Hormizd IV ascended to the throne, Emperor Tiberius II proposed a peace treaty in which the Byzantine Empire turned a blind eye to the entirety of Armenia, returned the city of Dara to Iran, and instead retained the city of Arzenir, which was the Roman military base. Hormizd refused this offer, and Tiberius II ordered the eastern commander, Maurice, to prepare for war with Iran. (Menander Protector, 1985: 209-215; TheophylactSimocatta, 1986: 1-3, 17; John of Ephesus, 1862: 6, 22). After the peace negotiations stopped, Roman general Maurice crossed the border and invaded Kurdistan. He even planned to occupy southern Mesopotamia the next year, but Monzar, king of Ghassan, who had betrayed the Romans, informed Hormizd of the Romans' plan. As a result of this incident, Maurice was forced to retreat back to the borders of Rome. During this retreat, the Iranian general Azarmahan chased him, but in the end, Maurice successfully escaped by crossing the border (Whitby, 2001: 102). A year later, in AD 582, the Persian general Tahm-khosrow crossed the Iran-Roman border and besieged the city of Constantine, but Maurice successfully defeated him and finally killed him. However, the illness of Tiberius II forced him to retreat quickly to Constantinople. At the same time, Maurice's successor on the Iranian-Roman border,

John Mystacon, faced the Sassanids at Nymphaeum but was defeated by the Persian army. Philippicus succeeded him after this defeat, but his army was defeated too. Philippicus spent the years 584-585 in Iran and occupied parts of it. In response, the Persians retaliated by attacking Monocartium and Martyropolis. A year later, Philippicus withdrew from Iran in AD 586. In the Solachon battle, he defeated the Persians and besieged the Jelo-Maroon fort but failed to enter the city. After this event, he retreated to the city of Amida, and in AD 587, Heraclius substituted him (*Ibid.*). In 588, the Iranians again attacked Constantine in Roman territory, but the city's defenders held it firmly. In response, the Romans besieged Arzanene in Iran, which was also unsuccessful in combat. In retaliation, the Iranians besieged Martyropolis again. This time the victory was with the Romans. However, then again, in 589, the Persians successfully entered Martyropolis and defeated Philippicus twice. The government of Constantinople recalled Philippicus and replaced him with Comentiolus, whose army successfully defeated the Sassanids at the Battle of Sisauranon. Then he besieged Martyropolis, and it was at this time that the Gok-Turks attacked the eastern borders of Iran (*Ibid.*). In the year AD 588, Iran entered into a serious crisis. Coincident with the war against the Romans, the Khazars attacked Azerbaijan and massacred the people of the region. Several cities on the western borders were also looted by the Arabs, but Balkh was occupied by the Gok-Turks. Ferdowsi says that Nastoh introduced his father, Mehran Stad to Hormizd, and Mehran Stad advised the Shah, to send Bahram Chobin to fight in the eastern borders (Pourshariati, 2008: 124). As he was told, Hormuod sent Bahram with an army of thirteen thousand horsemen to the Gok-Turk Khagan war (Shahbazi, 1988: 414-522) in April AD 588. He achieved a decisive victory in the battle against the joint army of Heptalians and Gok-Turks and conquered Balkh in AD 589. Bahram then passed through the Amu Darya and, in the same year, defeated the Gok-Turk army in a battle and even killed their Khagan personally by throwing an arrow, according to the Shahnameh. After this victory, Bahram VI advanced to Bukhara and minted coins in the name of Hormizd there. Bermuda, Khaqan's son, attacked Bahram's army in this city, and the Sassanid general defeated him decisively and even captured the Prince of Gok-Turks himself and sent him to Ctesiphon. It is said that Hormizd kept him as a prisoner in his palace for forty days and then released him and sent him back home (Rezakhani, 2017: 178; Jaques, 2007: 463; Litvinskyand Dani, 1996: 368-369). After Bahram's victories in the east, Hormizd sent him to Azerbaijan to push back the Khazar invaders. Bahram VI also won this battle, and then he was commissioned by the Sassanid Emperor to fight against the Romans. In the first battle, he defeated the Roman legions in Georgia, but in the aftermath of the battle, he suffered a surprise attack. Hormizd, who was jealous of Bahram after his successive victories, took advantage of this failure, deposed him from his position, and humiliated him (Shahbazi, 1988: 414-522; Martindale *et al.*, 1992: 167).

According to the other narrative, it was Izad Gheshnsep that made Hormizd suspicious of Bahram. He told Hormizd that Bahram VI kept the best part of the booty for himself and did not send them to the capital. In any case, Hormizd did not reflect Bahram's popularity and fame and detached from his position as the general commander of the army. It is said that to further humiliate Bahram VI, he sent him an iron chain to remind him that after all these victories was still the servant of the Emperor (Tafazzoli, 1988: 260). Finally, this incident caused Bahram to revolt against the throne. The rebellion of this commander resulted in the fall of Hormizd IV from the position of the Sassanid Emperor.

V. The political status of the Sakastan province during the Sassanid period

In the course of the Parthian era and during the time of Ardavan II, a part of the Scythian tribes settling in the northeast of Parthia invaded the borders of the Parthians, occupied the southeast of their territory, and formed the kingdom of Sakastan. During the reign of Parthian Mehrdad II, the kingdom of Sakastan entirely became a subordinate of the Parthian Empire (Colledge, 2001: 27). In the middle of the Parthian period, the Soren dynasty, which had the privilege of giving crowns to the Parthian kings, have ruled in this region (Pigulevskaya, 2008: 250; Mortezaei and Zabanavar, 2016: 168).

Sakastan was a very important place in Persian mythology and was probably one of the centers of the Zoroastrian religion (Dezfulian, 2008: 856). Further, according to Zoroastrian sources, the most important historical events, such as the preservation of the seed of Sushant, the story of Fereydoun, the war between his children, and the acceptance and spread of Zoroastrian religion by Vishtasb have taken place in Sakastan (Daryaee, 1996: 536). The Sassanid Sakastan province includes Derangia and Achaemenid Arachosia (Brunner, 1983: 774). Considering the current modern political borders, in addition to Sistan in Iran, present-day Rajasthan, Gujarat, central Punjab, northwestern provinces of India, and present-day Haryana are also part of this ancient territory (Khadmini-NdushanandNahidi Azar, 2004: 23). In some historical texts, this ancient region, due to its location in the south of Khorasan, was called Nimruz, and this name has been mentioned many times in Shahnameh (Dezfulian, 2008: 856). The first reference

to Sakastan in the Sassanid period is related to the inscription carved on the stones of the Kaaba (Cube) of Zoroaster ordered by the Sassanid Emperor Shapur the Great. The inscription mentions Sakastan when introducing his territory. Also, in this inscription, Narseh is mentioned as the King of India and Sakastan and Touristan to the coastline" (Sprengling, 1953: 16-17). During the reign of Bahram II in this part of the country, a Sassanid prince named Hormizd rebelled but soon was suppressed and replaced by Bahram III, who appointed viceroy to the Sakastan province after Bahram II's re-conquest of it sometime in the 280s. Bahram III ascended to the throne vacated by his father following his death in 293 (Mousavi Haji, 2010: 101-122; Frye, 1973: 128).

Based on the historical evidence, it seems that in the early days of the Sassanid Empire, a prince who held the title of Sakanshah or, more fully, the title of the King of India, Sakastan, and Touristanto the coastline had a special privilege to succeed the Sassanid emperor. In the Shapur Sakanshah inscription, which was created in the first years of Shapur II's reign in Persepolis, Shapur Sakanshah introduces the region under his control as India, Sakastan, and Touristan to the coastline (Daryaee, 2001: 110). The last time the title of Sakanshah appears in the Sassanid inscriptions is related to the Soluk Davar inscription placed on the wall of Dariush's palace in Persepolis, where the inscription of Shapur Sakanshah is mentioned in the same place. According to Lukonin, this inscription dates back to around AD 326-327 (Lukonin, 1971: 209). It was made in the first years of the reign of Shapur II and before his extensive conquests (Mortezaei and Zabanavar, 2016: 170). Simultaneously with the progressing conquests of Shapur II and the conquest of the Kushanian territory, the title of Sakanshah was marginalized, and the title "Kushanshah" became the most prominent title used in the eastern regions of Iran. During the time of Kavad I, only a few parts of Sakastan remained under Sassanid rule. However, as a result of the successful campaign established by Khosrow I, this region returned to the territories under the command of the Sassanid Empire. However, after Peroz I was killed in AD 484, Heptalians seized most of the territory of Sakastan, and during the Kavad reign, the Sassanids ruled only parts of Sakastan. However, as a result of the successful campaign of Khosrow I, this region returned back to the grasp of the Sassanids. (Kolesnikov, 2010: 192). After Khosrow I's military reforms dividing the Sassanid territory into four regions, Sakastan is located in the southeast of Iran-Shahr, according to some sources, bordered by the Nimruz region, like the other cities of Iran-Shahr (Daryaee, 2008: 40), while according to some other sources, such as Thaalabi's reports, it is located in the Khorasan region (Thaalabi, 1989: 393).

At the end of the Sassanid era, Sakastan once again became the key state in this period. After the death of Khosrow II and during the all-around crises that occurred throughout the Sassanid territory, Sakastan was always an inseparable part of Iran-Shahr despite the scattered small rebellions. In the years AD 658-663, and during the reign of Yazdegird III's son Peroz, it was one of the last headquarters of the Sassanid empire as the principal area to support Iran against the Arabs (Daryaee, 2009: 37).

VI.Coinage in Sakastan during the Sassanid period

The Sakastan mint with the abbreviation "SK" can be seen on the coins of the Sassanian period (Gobl, 1973: 259. Mitchiner, 1978: 525. Malek, 1993: 89). For the first time, the name of Sakastan was imprinted on the coins of Bahram I (Fig. 1) and Shapur II, and the full name of Sakastan is engraved on the coin (Mochiri, 1977: 337; Unvala, 1957: 1-3). The evidence provided by Alram regarding the minting design of coins by the Crown Prince during the time of Ardeshir I (Alram, 2007: 231) indicates that the commencement of the minting in Sakastan coincides with the beginning of the reign of Ardashir I (Mortazaei and Zabanavar, 2016: 171).

Figure 1. Bahram I dirham minted in Sakastan.
(https://www.zeno.ru/showphoto.php?photo=208062)

The coins minted in Sakastan with the mark "SK" appear during the reign of Khosrow I (Malek, 1993: 89), and the noteworthy point is that these coins were minted in the 27th year of the reign of Khosrow I (Moshiri, 2010: 180). By stating that the minting place in Sakastan imprints can be attributed to several cities and probably the biggest city of the state, Moshiri presents the theory that while the minting place of Sakastan and Zarang coins is the same (ZR, ZRN, ZRNG), the gap between the coins minted in Sakastan by Shapur II and Khosrow I is filled by the coins minted in Zarang. It proves with acceptable reasons that coins with the mark "SK" was minted only during the period when the Sakastan governorate was

completely under the control of the Sassanid empire, and in the interval from the defeat of Peroz to the victory of Khosrow I over the Heptalians when the Sassanid emperors only had control over Zarang, their coins also imprinted with the Zarang mint mark (Fig. 2) (*Ibid.,* 181-180).

Figure 2. Kavad I dirham minted in Zarang (Rastegar, 2015: 657).

There are scattered coins related to the 27th to the 46th year of Khosrow I and also from the 3rd to the 12th year of Hormizd IV with the mark "SK" (Fig. 3), which shows the continuous manufacture during this ancient mint. The Sakastan mint was also very active during the time of Khosrow II, and many samples were available from this mint during that period (Gaube, 1973: 103). At the end of the Sassanid period, coins from Ardeshir III, Boran, and Yazdegerd III were designed in this mint (Mortazaei and Zabanavar, 2016: 173).

Figure 3. Sakastan Mint Mark (SK) (Authors).

The last Sassanid Emperor who minted coins in Sakastan was Yazdegird III. Discovered coins of the 3rd to the 20th year related to the Yazdegerd dynasty were seen with the Sakastan mint mark. (Amini, 2008: 348. Mochiri, 1977: 389-397). There are some reasons proving the fact that in the last years, and especially the 20th year of Yazdegerd's rule, these coins were minted by his sons, Pirouz and Bahram.During this period, Yazdegerd was murdered (Daryaee, 2006: 21-29). After the conquest of Sakastan by the Arabs, the mint of this state was also active. Even during the Umayyad and Abbasid eras, coins with the names, Zaranj, Madinah Zaranj, and Sajistan, have been introduced until now (Moshiri, 2010: 178).

VII. Introducing Hormizd IV coins minted in Sakastan

In the past, coins were minted mainly of gold, silver, and copper. The Sassanid Empire, like other contemporary and earlier governments, maintained the usage of these three metals. However, golden coins did not have much of an exchange aspect among ordinary people. During the reign of Hormizd IV, the minting of the golden Dinars was stopped, and the copper coins called Pashiz were minted in small numbers, but the minting of the silver dirhams continued according to the needs of the society. The dirhams of the Hormizd IV period have a weight of about 4.10 to 4.15 grams (Gobl, 2003: 109-115).

The design of the dirhams of this period was also adapted from the dirhams of other Sassanid kings after the reign of Peroz I (AD 459-484) (Kianzadegan et *al.*, 2018: 184). Details of the design of the Hormizd IV dirham minted by the 3rd year of Hormizd in Sakastan (Fig. 4):

Obverse design: (1) Pahlavi word 'p̄zwt' (Abzūd). (2) Royal crown. (3) Crescent moon and stars. (4) Chain circle on the coin. (5) Crescent moon and star at the 3, 6, and 9 o'clock positions. (6) Profile of the Sassanid king. (7) Hormizd's name is Hormazd in Pahlavi (spelling 'whrmzd').

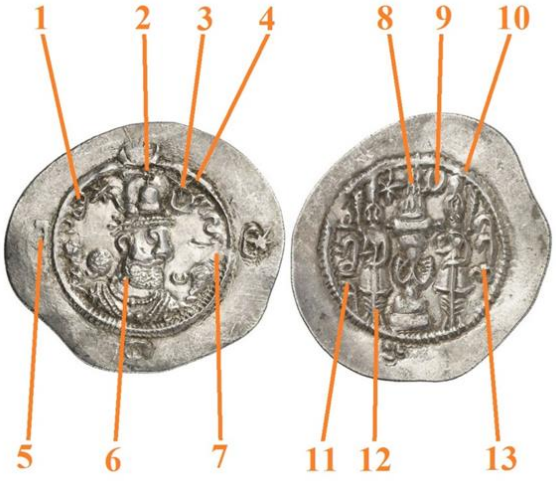

Figure 4. A sample of Hormizd IV dirhams, minted in Sakastan, the 3rd year of Hormizd's rule (Authors).

Reverse design: 8) Zoroastrian holy hearth. 9) Crescent moon and star. 10) Chain circle on the back of the coin. 11) Minting date.12) Two guardians standing on the sides of the sacred Zoroastrian hearth.

13) The minting place marked in Pahlavi "SK" (Sakastan).

The basis of the calendar in the Sassanid period was the new king's accession to the throne. In this way, the reigning year begins with the inauguration of each king and ends with his removal or death. The date imprint on the Sassanid coins occurred first during Peroz's time, and it was not usual to record the date on the coins before him. The first time, date minted on Sassanid coins was the year "two", indicating the second year of Peroz's reign (Fig. 5), and this path continued until the year "seven" (except the year five of his reign) (Jozi *et al.*, 2021).

Figure 6. The date on Hormizd IV coins (Authors).

Figure 5. The first dated Sassanid coin, Peroz I, in the second year of his reign (Amini, 2008: 31).

After the seventh year of Peroz I's reign, inscribing the date was stopped due to the reasons that have been mentioned earlier, the occurrence of the drought and considering it as bad luck.

Finally, for the second time in the time of Jamasp (AD 496-499) and then in the eleventh year of Kavad I's reign, which is equal to the first year of the second series of his reign, it became customary to put the year on the coins (Mochiri, 1972: 123). The year of minting is written on the left side of the back of the coin and next to the holy fire guard, which is engraved in the form of letters from top to bottom (Fig. 6). The date imprint on the coins of Hormizd IV also occurs from the first year of his reign and continues until the thirteenth year of his reign (Table 1). This thirteenth year coincides with the removal and assassination of Hormizd, then his son, Khosrow II takes his position as the emperor. (Amini, 2004: 92).

As mentioned in the research method, according to the numismatic sources, a list of Hormizd IV coins minted in Sakastan was prepared, and in addition, two reliable numismatic sites were also used to search for coins as well as find the unintroduced samples.

These coins were minted in a similar type and on four different dates, the 3rd, 5th, 10th, and 12th years of the Hormizd kingdom. The result of this examination is shown in Table 2:

Table 1: Dates on the back of Hormizd IV coins (Amini, 2004: 94).

عدد	خط پهلوی	عدد	خط پهلوی
۱		۸	
۲		۹	
۳		۱۰	
۴		۱۱	
۵		۱۲	
۶		۱۳	
۷			

Table 2: List of Hormizd IV coins minted in Sakastan (Authors).

Dirham, silver, SK mintage, year 5, 4.12 grams, 29 mm (https://www.zeno.ru/showphoto.php?photo=180617).

Dirham, silver, SK mintage, year 3, 4.08 grams, 28 mm (Seyyed Ali Seyyed Mousavi Collection, 2021).

Dirham, silver, SK mintage, year 12, 4.11 grams, 29 mm (https://www.sixbid-coin-archive.com#/de/single/134039564).

Dirham,silver, SK mintage, year 10, 4.13 grams, 29 mm (https://www.zeno.ru/showphoto.php?photo=268500).

VIII. Conclusion:

The reign of Hormizd IV should be considered a tense period because he had conflicts with the Byzantine Empire from the west, the Arabs from the southwest, and the Caspian tribes from the northwest. Hormizd IV was mostly vigilant in the western regions of Iran. On the other hand, Sakastan, although a vast and important state located in the eastern part, was not much of the considerationby the empire during this period. There are many silver coins and few copper coins left from Hormizd IV, among which the share of silver coins in Sakastan province is limited to a small amount. Looking at the coins minted in the western mints, we see that during the 13 years of Hormizd IV's reign, each city minted coins for almost 8 to 10 years or eventhroughout the total period. However, in Sistan province, only in 4 years, mainly during the years 3, 5, 10, and 12, few coins were minted. By this comparison, we can conclude that the problems of the east of the country, saving on court fees, lack of prior attention, distance, etc., and limited coins with limited dates have been minted in this state.

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ANCIENT PICTOGRAPHS IN BAKHTEGAN COUNTY OF FARS PROVINCE, IRAN

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Abstract: One of the oldest traditional arts in the world, which has lasted for thousands of years, is rock art. The rocky face of the mountains seems to be the first painting canvas on which our antediluvian ancestors tried to record their artful works. Although other methods of recording the works of art were available to primate humans, they became obsolete over time due to the deficiency of the dialyzed materials used. There are different opinions attributing a thorough chronology to these types of ancient paintings. Although in many areas, these motifs are dated to the Paleolithic period, in different parts of Iran, similarities in terms of subject and style can be perceived between these motifs and motifs presented on the pottery samples each one relating to the different cultural periods. Perhaps we can deal with the chronology of the patterns by the comparative approach. The study of these ancient motifs has been given special attention in the world for several decades, but in Iran, the comprehensive studies have not been done yet and generally, the majority of the presentations only include the descriptive collections of the motifs. The preceding researches demonstrate that the art of pictographs can be seen in most parts of Iran, especially on the Zagros and the Central Plateau. In the Fars province, due to its geographical location in the South Zagros, rock art has been identified and introduced from different regions, including petroglyphs and pictographs. In the present research, studying the Bakhtegan county of Fars province, we identified some of the pictographic instances, and in this article, we try to introduce their patterns. The present study prepared by the field and library study methods to document, classify, and attribute a relative chronology of the patterns based on the comparative approach. The studied motifs are of the color-painting type embracing the human, animal, plant, and symbolic motifs.
Keywords: Rock art, pictograph, Rock shelter, Bakhtegan, Fars.

چکیده: از سنت‌های هنری بسیار قدیمی در دنیا که طی هزاران سال تداوم داشته، نقوش صخره‌ای است. به نظر می‌رسد بستر صخره‌ای کوه اولین بستری بود که انسان برای ثبت آثار هنری خود انتخاب کرده است. گرچه روش‌های دیگری برای ثبت آثار هنری در اختیار بشر قرار داشته، اما به دلیل خاصیت تجزیه‌پذیری مواد مورد استفاده با گذشت زمان از بین رفته‌اند. در مورد تاریخگذاری نقوش فوق نظرات مختلفی وجود دارد، هر چند بر بسیاری مناطق، این نقوش به دوره پارینه سنگی تاریخگذاری شده اما در نواحی مختلف ایران شباهت‌هایی از نظر موضوع و سبک بین این نقوش با نقوش روی سفال‌های ادوار مختلف فرهنگی دیده می‌شود که شاید بتوان با این مقایسه به گاهنگاری نقوش پرداخت. هر چند چندین دهه است که در جهان مطالعه این نقوش مورد توجه ویژه قرار گرفته اما در ایران هنوز مطالعات جامعی صورت نگرفته و عموماً شامل توصیف مجموعه‌های نقوش است. پژوهش‌های صورت گرفته نشان می‌دهد که هنر صخره‌نگاری در بیشتر نقاط ایران، به ویژه زاگرس و فلات مرکزی دیده می‌شود. در استان فارس نیز با توجه به موقعیت جغرافیایی و قرار داشتن آن در زاگرس جنوبی تا کنون از مناطق مختلفی هنر صخره‌ای شامل کنده‌نگاره و رنگ‌نگاره شناسایی و معرفی شده است. نگارندگان نیز در شهرستان بختگان استان فارس نمونه‌هایی از رنگ نگاره را شناسایی نموده و در این مقاله سعی بر آن است تا به معرفی نقوش پرداخته شود. پژوهش حاضر با روش‌های مطالعه میدانی و کتابخانه‌ای به مستندنگاری، طبقه‌بندی، گاهنگاری نسبی نقوش بر اساس مطالعات تطبیقی و معرفی نقوش مذکور پرداخته است. نقوش مورد بررسی از نوع رنگ نگاره بوده که شامل نقوش انسانی، حیوانی، گیاهی و نمادین است.
واژگان کلیدی: نقاشی صخره‌ای، رنگ‌نگاره، پناهگاه صخره‌ای، بختگان، فارس.

I. Introduction:

Rock carvings and paintings are the most prominent works of art in various fields of study, including archeology, art history, social sciences, etc. Petroglyphs function as a branch of rock art in many societies, cultures, and civilizations used as a means of expressing the thoughts and beliefs of the cults and the ancient rituals of a culture (Gillette *et al.*, 2014: 1) (Sheikh Akbarizadeh *et al.*, 2013). Generally, the subjects represented on the petroglyphs are influenced by the geographical, cultural, and environmental conditions prominent in each region, and historically, rock art motifs continue from the Paleolithic period to the present day. However, defining the absolute chronology for such motifs is a difficult task for a variety of reasons. In general, petroglyphs are visible in a wide geographical area and in many countries in Central Asia, Europe, and Africa. These motifs can represent a specific historical event, a story, or a myth. They might define a specific territory or be related to the performance of the specific ritual. Although some of these motifs seemingly indicate the occurrence of real events, some of them absolutely exhibit abstract individual art (Vahdati, 2010: 15). These samples were discovered by chance in Bakhtegan County by the authors. Due to the location and characteristics of this area, there might be more rock motifs. Bakhtegan County should be studied archeologically by the scientific methodology. This will help to illuminate the dark corners of this art as well as the different parts of the life of the ancient people who

were the creators of this art. The present study identifies and classifies the rock motifs of Chehel Dokhtaroon and Chashme Roni and according to the archaeological studies focusing on this field, we can propose a relative chronology for the mentioned motifs.

II. The research background:

The first scientific study on rock carvings in Iran began when Italian geologists in the Balochistan region were working to discover and extract minerals in 1958. They discovered a number of rock carvings in the Gezo region (Dessau 1960). In 1969, Hamid Izadpanah came across the red and black paintings for the first time in the caves and rock shelters of the Kuhdasht region (Izadpanah, 1997: 308-307). In the same area, in Do-shah Cave, on the flat walls of this cave, he discovered one hundred and ten paintings all painted in black (Izadpanah, 1997: 173). Charles McBurney studied the rock carvings of Do-Shah and Mir-malas in 1969 (Burney 2005: 16-14). In 1987, Sarraf and Bashash identified the petroglyphs of Tuyserkan in Hamedan province (Sarraf &Bashash 1987: 6, Sarraf 1997: 304-310). In 1992, the petroglyphs of Lakh Mazar in Birjand were studied (Labafkhaniki&Bashash, 1994: 4). In 1993, Bigleri and Jamshidi studied the paintings of Cheshmeh Sohrab Cave in Kermanshah (Bigleri *et al*., 2007: 50-55). The Hanjiran motifs have been introduced in the Mahabad civilization book (Pedram, 1994: 82-80). In 1994, Rasoul Ashtoudan, in his dissertation paper entitled "Overview of Karaftoo Cave", explained the paintings inside the cave in one chapter (Ashtoudan, 1994: 98-92). In 1997, the listed articles to mention; Mahnaz Fooladvand wrote her master's thesis on the Homian, Mir-malas, and Do-shah (Fooladvand, 1978). In 1997, Lakhmzar Birjand paints by Mohammad Reza Badi (Badi, 1997), paintings of Divin Alvand Valley of Hamedan by Mohammad Rahim Sarraf (Sarraf, 1997), rock carvings of Sirjan by Babak Farhadi (Farhadi 1997), and the petroglyphs of Arnan mountains in Yazd (Shahrzadi, 1997: 133-142). In the following year, the collection of rock paintings of the Teymareh region was published as a comprehensive book containing many pictures and patterns (Farhadi, 1998). Newer research has also been done by Mohammad Naseri-Fard in Teymareh (Naseri-Fard 2009). During the years 1998 and 1999, the archeological evidence of pictographs in Mashhad County, and a collection of rock motifs in Toos Plain were identified and studied (Bakhtiari-Shahri 2009: 21-24). For the first time, Jamal Lahafian began to study and research the rock motifs of Kurdistan province (Lahafian, 2001-2002). In 2001, the pictographs of Ashkaft-i Ahoo in Bastak county in Hormozgan province were examined (Bahador, 2001, Sadeghi, 2002), and the study of recently discovered paintings began at the same time (Garajian *et al*., 2001). In 2003, the pictographpaint of Balochistan pictograph (Heidari, 2003). In 2004, a joint group from the Liege University in Belgium, led by Marcel August, in collaboration with Jalal Adeli a member of the Lorestan Cultural Heritage Organization, studied lately discovered petroglyphs in the same region (Ott *et al*., 2003: 8-12). During the archeological revisions of the Bardsir County samples, a number of patterns were studied. In 2005, Jalaluddin Rafiefar published a book entitled Arasbaran petroglyphs (Rafiefar, 2005). In the same Iran-Belgium joint group, a number of new paints were identified in the Kuhdasht region (Remacle *et al*., 2006). Taher Qasimi, in his dissertation entitled "Study on the rock motifs in Kurdistan Province," examined these motifs (Qasimi 2006, 2007: 71-81, Ghasimi 2007, 106-89). In 2006, Sirvan Mohammadi introduced the rock carvings of Qala-e-Bazi mount in Isfahan (Mohammadi-Qasrian, 2006, 62-65) and a number of rock carvings of Qom County as a preliminary task (Mohammadi-Qasrian, 2007) and with Naderi's cooperation, he examined the pictograph paint in Khore Hanjiran of Mahabad (Mohammadi-Qasrian&Naderi, 2007: 64-61). In 2007, the pictographs of the southern mountains of Buin Zahra County in Qazvin province were identified and documented within the framework of a research project (Mulla-Salehi *et al*., 2007-2006). In the framework of a research project, a collection of rock motifs in the Gotvand region of Khuzestan was studied (Azizi, Khoranaghi *et al*., 2011). During the archeological study of Gabrik Dam in Hormozgan, a collection of rock motifs was identified (Darabi, 2007). Mohammad Naseri-Fard published the results of his research in the field of rock art in Iran in 2009 and published his latest studies in this field (Naseri-Fard, 2009). In 2008, during the archeological study of Bazaft Chaharmahal and Bakhtiari region under the supervision of Rasoul Borujeni, several sets of rock motifs were identified (Seyedin-Boroujeni, 2008). A number of pictographs were identified in the Hulk Caves Complex in Fars Province (Vahdati *et al*., 2008: 91-96). In 2009, during the archeological survey of Boyer-Ahmad County, a collection of pictographs was identified (Alamdari, 2009). One of the newest books published on rock art is "Stone Canvas" about rock art in North Khorasan Province (Vahdati, 2010). Yaghoub Mohammadifar and Ismail Hemmati in 2012 introduced paints in Malayer that include a collection of about 700 different patterns (Mohammadifar& Hemmati, 2014: 223-252). In 2015, Ghorbani and his colleagues studied the petroglyphs of the historical region of South Khorasan Province (Ghorbani *et al*., 2015: 82-57). A number of pictographs were identified in the Saravan County, Negaran Valley, and Marzbanik Valley in Baluchestan (Sarhadi Dadian *et al*. 2015; 2021; Moradi *et al*. 2013). In Fars province, petroglyph motifs from Naqshe Rustam (Khanipour *et al*., 2015), Passargad (Azizi Kharanaghi & Salimi, 2016),

Bavanat (Khanipour *et al*., 2018), Eghlid (Barani *et al*., 2019), a pictograph of Abduzo Rock Shelter, Firoozabad (Qasimi *et al*., 2010: 27-17), and the Tonge Teyho (Fazel&Alibagi 2012).

III. Geographical location and history of Bakhtegan county:

There are comments about Abadeh-Teshk region in many books, especially those ones mention Fars County, called Fars-nameh locally. Especially around Teshk Lake and Bakhtegan Lake, which are among good locations accommodating human settlements since prehistory. The area around the Lakes is one of the most important centers of ancient Iranian civilization. The Achaemenid and Sassanid buildings in this region, the principal of which was the Istakhr county located next to Bakhteganeh or Neyriz Lake, and around them, there were extensive villages and towns (Mashkoor, 1992: 556). In the fifth century AH, Ibn Balkhi says in his book Farsnameh: "Abadeh is a town with a strong fort and has a temperate climate", (Ibn Balkhi 2006: 133). In the eighth century AH, Hamdollah Mostofi called Abadeh a town with a strong fortress and a temperate climate and said; "the water is from the grace of the river kour, bringing on a lot of grain and grapes feeding the countless huts and villages" (Mostofi 1983: 129). It is stated in Naseri Farsnameh:" Abadeh Tashk is bounded on the east by the Neyriz and Bavanat blocks, on the north by the Sarchahan [Sarchahan] and Qonqari blocks, on the west by the Karbal block, and on the south by the Bakhtegan Lake. The climate of this block near the Bakhtegan Salt Lake tends to be temperate. Water is from canals and springs, cultivation of chickpeas, wheat, barley, cotton, sesame and castor. Its orchards are adorned with almonds, pomegranates, and grapes. It is better in flavor and sweetness than most Persian pomegranates. Its trade wealth is almonds and pomegranate paste. This block is 12 farsakhs from Hosseinabad to Tashk village. It is two and a half farsakhs from Bakhtegan Lake to Bijehkan and Khajeh Jamali. The name of the town is Abadeh. Tashk is the name of a village under the Abadeh subdivision authority 23 miles east of Shiraz. Its houses are made of raw clay, mud, and wood. Their number is close to 250 doors. This block consists of 8 rich villages" (Fasaei 2008: 1242). Abadeh Tashk district became a county in 2009 after its separation from Neyriz County.

IV. Chel-Dokhtaroon petroglyphs:

At a distance of 10 km northwest of the county of Abadeh Tashk, in the foothills known as Kow-khom, is a village called Tashk (Fig. 1). At about 1 km northeast of this village and in a part of the mountain known as Chel-Dokhtaroon, there are several rock shelters. In one of these shelters (UTM, 751923-3303469) a collection of pictographs on the body of the rock facing west is visible (Fig. 2). This collection is either an individual or a group work consisting of animal, plant, and symbolic motifs all painted red.

There are three animal figures in one of the Chel-Dokhtaroon rock shelters. The first painting depicts a goat with a long, curved neck and a slender waist. Conversely, the horn motifs of the historically prominent goats, which are seen on pottery as a large crescent from the head to the tail of the animal, the horn of this animal is oblique and have large appendages to the middle of the body. The body of the animal engraved with the connected triangles and patterned with crossed lines. In front of this goat a plant was painted (Fig. 4: 1 and Fig. 3). Below the painted triangular goat, a completely different animal is depicted. The body of this animal painted asymmetrical oval and the inside decorated with diagonal lines. The head and neck of this animal are smaller than the body and its horn is much larger and more complex. The horn is extended diagonally with a slight arc in the direction of the body and irregular horizontal lines are engraved on it. The painting is probably of a deer (Fig 4: 2 and Fig 3). The third animal in the collection of the forty-two rock carvings is a strange painting, and considering its appearance, it can even be said that the painted animal is imaginary. The whole body and head of this animal are drawn in a unified manner without dividing lines and the body of the animal and from the head to the end as a band with a small width. Each leg of this animal is drawn by a smooth and simple line. Its neck is completely turned backward and continues from the point of curvature to the end of the body. Inside the narrow strip that forms the body is decorated with a wavy line and a dot, parts of which have now been removed, and on its neck a wavy line as a mane, and on the animal's head two small crown-like appendages. There are two small appendages along the neck that resemble the beak. This animal has a short tail that is drawn and turned 90 degrees toward the animal's body (Fig 4: 6 and Fig 3).

The largest number of motifs of this rock are simple plant motifs that are engraved using vertical and horizontal lines and oblique lines. The trunk and the plant are drawn with a vertical line and their branches with diagonal lines with a sharp angle or horizontal lines with a 90-degree angle. Some of the floral motifs are drawn more elaborately, the branches are fractured at the end and bent down at a sharp angle, with a small dot between each branch. Some of the other motifs drawn on the rock are the painted plants with downward branches. The stem of the plant was drawn in a straight and vertical line with branches at right angles to the stem. The end of the branch, which has a small appendage, is engraved downwards (Fig. 6 and 4: 3 and Fig. 3).

One of the symbolic paintings is a square whose three sides are marked with a straight line and all three sides are decorated with interconnected triangles from both sides. The fourth side is not lined. A zigzag line and a painted circle are drawn below it without connection to the main body of the figure. The inside of the square is divided into four parts by two lines, like the main sides, decorated with triangle motifs, and there is a dot inside each triangle. In the three triangular parts of the square a relatively large dot and at the top of the upper side of the square there is a plant pattern with four branches (Fig. 4: 5 and Fig. 3). Other symbolic motifs include dots, painted circles, vertical, horizontal, and oblique lines. These motifs are drawn separately or collectively or next to other motifs (Fig. 4: 7 and Fig. 3).

V. Cheshme Roni pictographs:

On the northern slope of Wool Mountain, at the mouth of the crossroads, on the right side of Sarchahan-Abadeh road at the distance of 23 km north of Abadeh Tashk county, there is a spring known as Cheshme Roni (Fig. 1).

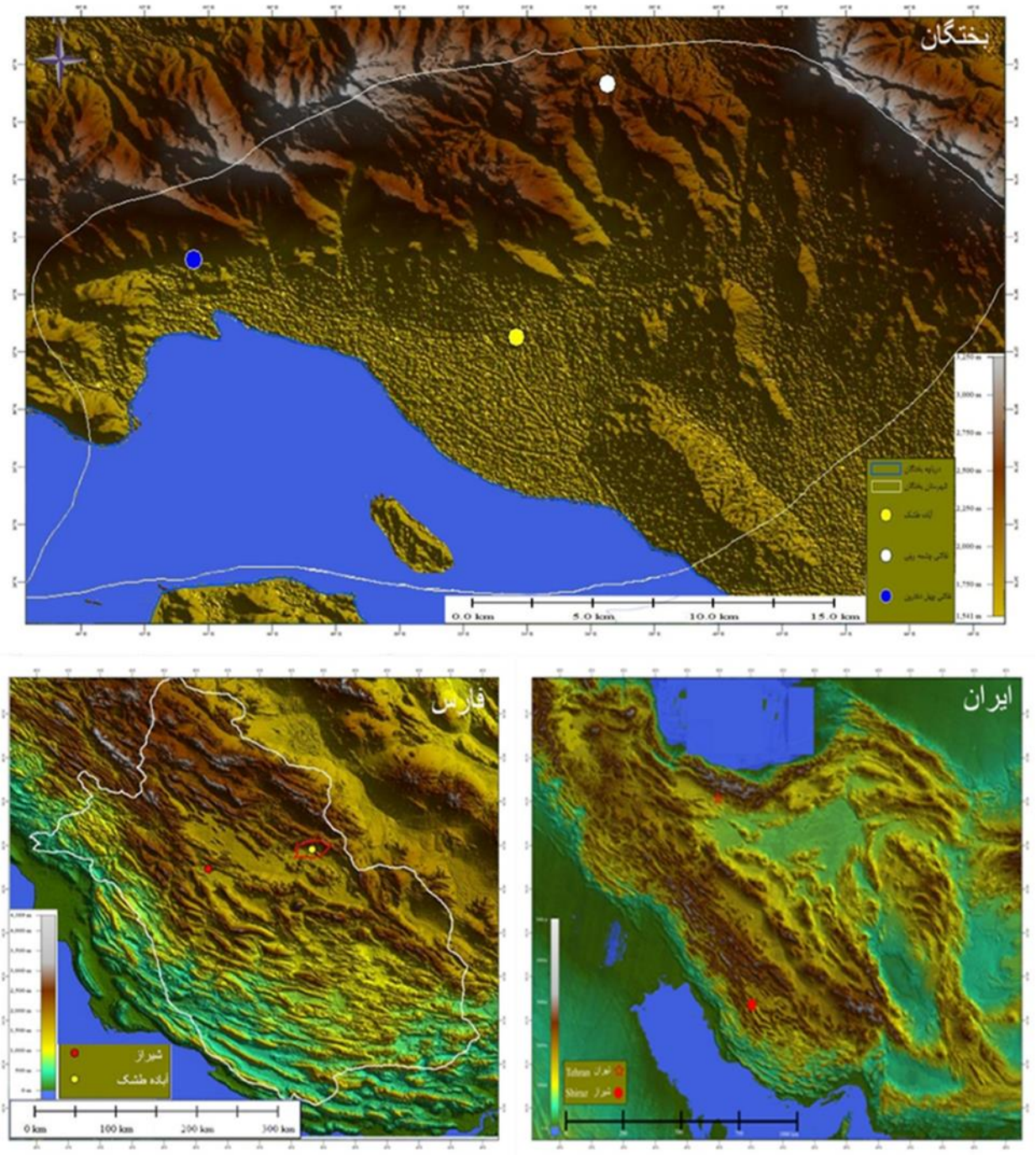

Figure 1. Location of Chel-Dokhtaroon and Cheshme Roni (by Authors).

About 100 meters south of the spring, a small cave is located in the geographical position (UTM) 766691-33310312 (Fig. 5), where paintings of humans are visible on the eastern body of the entrance of the cave. On the eastern wall of the entrance of the cave with a width of 150 cm, a length of about 10 m, and a height varying from 60 cm to 3 m, the image of three people is engraved (Fig. 6 and Fig. 4).

It can be seen inside a depression in the cave wall. In this painting, three humans can be seen, two with a larger body at the top and one with a smaller body in front of the others. All three human beings move outwards with their hands separated from their bodies and their legs drawn moving forwards.

Figure 2. The location of the pictograph of Chel-Dokhtaroon (by Authors).

Figure 3. Chel-Dokhrtaroon pictographs (by Authors).

VI. Chronology

One of the most important problems in studying rock patterns is their chronology and dating. This can be achieved by sampling and executing laboratory operations and interdisciplinary studies. Unfortunately, in Iran, due to the impossibility of laboratory studies, the exact dating of these designs cannot be realized, but by doing comparative studies, their relative dating can be achieved (Mohammadiafar & Hemmati, 2014). Most of the studies done in the field of Iranian rock art have paid less attention to the chronological issues.

The chronologies presented so far are often based on the semiotics of mental recognition of the elements and items displayed, stylistic and comparative studies, and the iconography of patterns and similar items (Mohammadi Ghasrian, 2007).

The use of such methods has become the only reason for obtaining a relative chronology and cannot indicate the exact time of rock formation (Mohammadi, 2006). By relative dating, several things can be considered, and based on them, the approximate time frame of the patterns can be estimated.

VII. Conclusion

The lack of coherent archaeological studies on Bakhtegan County made the historical monuments of this region remain unknown until now. The authors' current study of the rock motifs of this county is one of the few archaeological studies about the region. A comprehensive study of this county, in addition to recognizing the cultural developments of the region during various periods, can also help us to determine the chronology of the identified patterns. Examining and analyzing these petroglyphs and other well-known collections can help us to study the stylistic features and their evolution over time from prehistoric times to the present. The motifs identified in Chel-Dokhtaroon and Tong Roni is all pictographic.

The Chel-Dokhtaroon motifs include 3 animal motifs, 8 plant motifs, 1 symbolic motif, and two sets of dot motifs. The motif of 3 humans can be seen in Cheshme Roni. Some of the Chel-Dokhtaroon drawings and their meanings are unknown to us, and probably the purpose of this painting was to symbolically express the natural environment around or to display some religious meanings. Ethnological studies can provide us with clues because even today in most parts of Fars province, the life of nomadic tribes is still similar to their ancestral lifestyle in ancient times. Careful study of their communities from different perspectives can help us to better interpret the concepts of rock art. Some of the Chel-Dokhtaroon paintings and Cheshmeh Rooney are unique in terms of style, method, and type, and the production, content, and theme are not comparable to the paintings that have been obtained so far from other parts of Iran. By a relative comparison, these motifs can be attributed to prehistory. It should be noted that laboratory studies must be performed to ensure the dating process.

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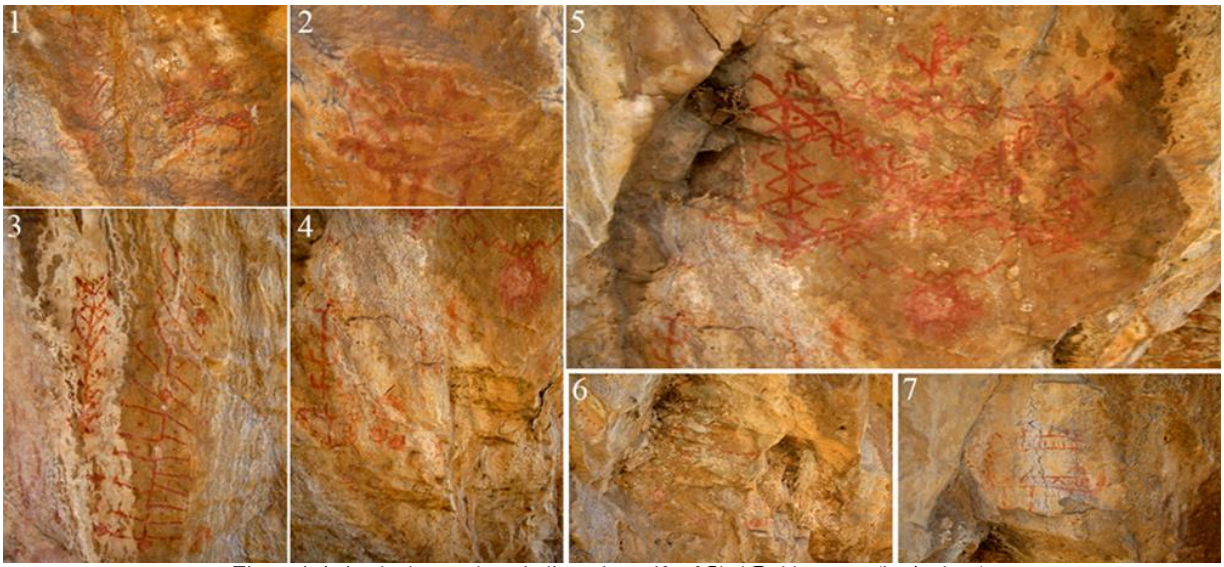

Figure 4. Animal, plant and symbolic rock motifs of Chel-Dokhrtaroon (by Authors).

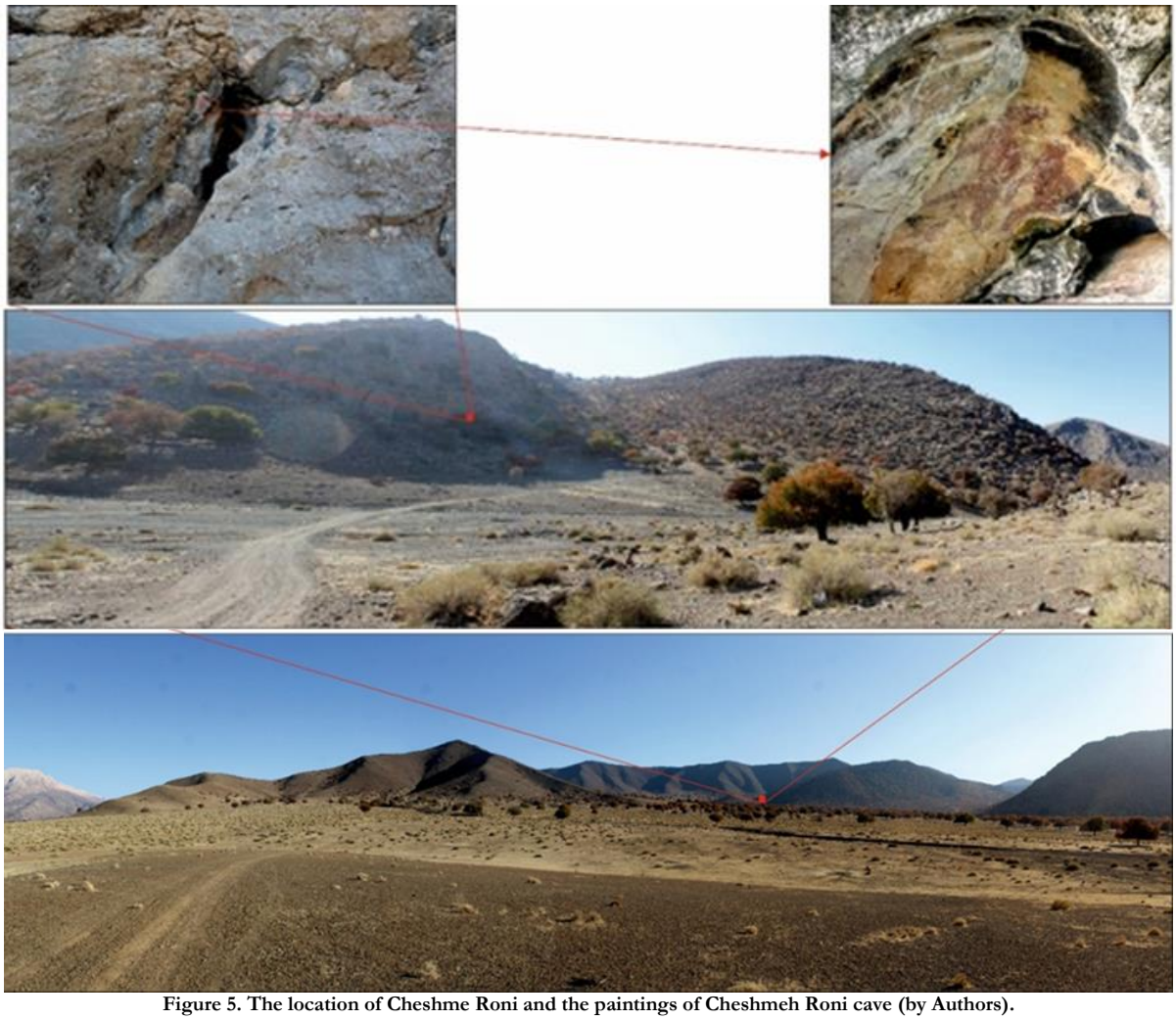

Figure 5. The location of Cheshme Roni and the paintings of Cheshmeh Roni cave (by Authors).

Figure 6. Pictograph of Cheshme Roni (by Authors).

Figure 7. Pictograph of Cheshme Roni (by Authors).