
Investigation and Analysis in the Boroujerd's Petroglyphs, Lorestan Province

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Abstract

The rock motifs are special importance in the field of art history, archaeology and anthropological studies, and they are one of the most obvious documents in showing the concepts of social Archaeology. Such motifs are among the oldest surviving historical and artistic works, which numerous examples of them are scattered in different places. During the archaeological exploration in the Boroujerd City in the spring and summer the year of 2016, several collections of petroglyphs (Petroglyphs and Cupules) at different distances with radius of less than 20 km from the Boroujerd City were identified. These petroglyphs are located mainly in the foothills and mountains. The petroglyphs have many motifs and themes, including human motifs (archer, rider and on foot, etc.) animal motifs (ibex, deer, dogs, etc.), geometric, symbolic motifs, inscriptions and cupules motifs. All of the studied motifs are created on separate rocks in the open air and in different sizes, individually and thematically. The research method in this paper has been the field survey as well as library studies and the use of reports, books and articles which published in this field. In this article also tries to answer the questions such as; what was the style of creating the petroglyphs? When were the Boroujerd's Petroglyphs created? The Boroujerd's rock motifs are comparable to which areas? The studies have shown that, most of the identified motifs in the Boroujerd City were created on the surface of the stones by methods of percussive, carving or scratching. The motifs of this collection seems to be related to different periods: due to the amount of weathering and the type of creation. Unfortunately, due to the lack of laboratory studies in the Iran, it is not possible to consider specific

date for them. According to the studies, it can be said that, the motifs of this collection quantitatively and qualitatively are comparable with the rock motifs of different regions of Iran, especially the west of Iran, (Azandaryan Malayer, Argas Malayer, Divin Valley and Dostali Valley of Hamadan and also the center of Iran (petroglyphs of Timareh and Khomein) and even outside the current borders of Iran. In this article, the authors at the first are going to introduce the petroglyphs of the study area and then analyze of them.

Keywords: Lorestan Province, Boroujerd, Petroglyphs, Cupules, Human Motifs, Symbolic.

Introduction

The petroglyphs are the creation of man on rocky and stony canvas, which the creation of them can have numerous of material and spiritual goals, and as an art, a common language and a repetitive pattern in different parts of Iran and other parts of the world, their appearance are expressed in the form of thematic motifs of human, animal, symbolic motifs or the inscriptions with different qualities and quantities (Mohamadifar and Hemati Azandryani, 2017).

In general, the subjects of the motifs of these petroglyphs are influenced by the geographical, cultural and environmental conditions of each region, and historically, rock motifs covered the time range from the Paleolithic Period to the present day, however, the absolute dating of such motifs is difficult for a variety of reasons. In general, petroglyphs can be seen over wide geographical area; in many of the Central Asian Countries, Europe, Africa, and so on. These motifs are often engraved on the rocks in the open air and can represent specific historical events, stories and myths, identify a specific territory, or relate to specific religious rites. Although some of these motifs seems to indicate the occurrence of real events, but a number of others are completely abstract. (Vahdati, 2010: 15).

One of the most important cultural and historical evidences of the Lorestan Province is the petroglyphs, that the rock carvings identified in this area are generally colors type. They have been reported from different places such as the Dusheh Caves, Mirmalas, Houmyan Motifs, etc. (Izadpanah, 1969; Remacle et al, 2007). Obviously, the subject of rock art in the Lorestan Province, apart from the petroglyphs mentioned above, is almost unknown, and this is while in recent years, methodical studies have been conducted both in the inside and outside the borders of Iran. But, this topic has been ignored in the Lorestan Province for reasons such as lack of purposeful studies, lack of comparative history, and so on. So far,

no coherent activities related to the study of rock carvings in the Lorestan Province have been carried out, and it is necessary that, the comprehensive field research with this purpose carried out on a large scale. However, in recent years, several sites have been identified and studied by the researchers (Sabzi & Hemati Azandaryani, 2017; Sabzi et al, 2018; Bahrami & Sabzi, 2019; Sabzi et al., 2015).

The Boroujerd's rock carvings due to lack of accurate archeological research are still unknown in the region, accordingly, they have not been registered in the list of cultural heritage monuments. In the following, the authors will introduce study and analyze these petroglyphs in this region.

It should be noted that, the research method in this research was performed using field research (survey, identification, documentation and sketching) as well as library studies and in a descriptive-analytical manner will try to introduce, describe, design and in the final, compared the newly discovered petroglyphs of the Boroujerd City. As mentioned earlier, the present study seeks to answer the following questions: 1. What was the style of creating the petroglyphs? 2. When were the dates of creating the Boroujerd's petroglyphs? 3. The Boroujerd's petroglyphs are comparable with which area?

Research Method: The present study is kind of descriptive-analytical research and the methods of collecting information were in the field and in the library too. The field activities include identifying, study and documentaries of the petroglyphs, (photography, sketching and classification) and library studies have included the use of published reports, books and articles about this field.

Research Background

So far, many petroglyphs have been identified and studied throughout the Iran and the beginning of this research in the Iran was first done by the Italian team, which in the year of 1958 discovered a number of rock carvings in the Gazou Area (The village of Gazou is located about 40 km the northeast of the Khash City) (Dessau, 1960). Other activities and researches on rock carvings in the Iran carried out which include rock carvings in the historical site of the Timareh (Farhadi, 1998: 65-66), Arasbaran's Petroglyphs (Rafifar, 2005). The petroglyphs of the Lakh Mazar of Birjand (Labaf Khaniki and Bashash, 1994: 4), rock carvings of the Sirjan and Babak City (Farhadi, 1997: 12-19), motifs of the Divin Alvand Valley (Sarraf, 1997: 310- 304), Prehistoric petroglyphs of the Kurdistan (Lahafian, 2000: 14-20), rock carvings of the Hourand Kaleibar (Rafifar, 2004: 111-122), rock carvings of the Miouleh (Shidrang, 2007: 55-61),

rock carvings of the Rashm Dokhtar Mountain (Roustai, 2007: 95-90), study of rock motifs in the Kurdistan Province (Qassimi, 2006; Qassimi, 2007: 71-81; Qassimi, 2007: 89-106), rock carvings of the Qaleh Bozi Mountain in the Isfahan (Mohammadi Qasrian, 2006: 65-62), petroglyphs of the B collection of the Sofla Argas (Beyk Mohammadi et al., 2012: 140-121), petroglyphs of the Doustali Valley (Hemati Azandaryani et al, 2014: 13-18), the petroglyphs of Azandaryan Malayer (Mohamadifar and Hemati Azandaryani, 2014; Hemati Azandaryani et al, 2015: 202-206)..

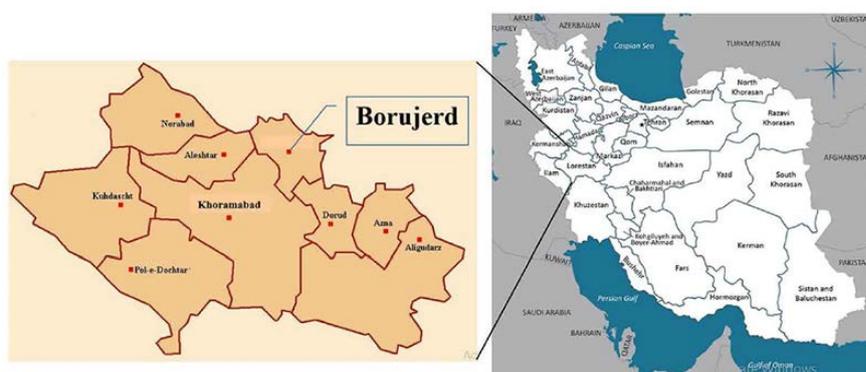
Regarding the research background of rock carvings in the Lorestan Province, it should be said that, Mc Burney, after study the rock carvings of the Dusheh and Mirmalas Caves in the year of 1969, in his preliminary report, considers his work to be the first preliminary report on the Iranian rock carvings (Burney, 1969: 14-16). The rock carvings of the Houmyan, Mirmalas and Dusheh Caves were re-visited and studied in the year of 1969 by the Hamid Izadpanah (Izadpanah, 1997: 173-176 and 307-321). Other important researches related to rock motifs in the Lorestan Province include the study of the Houmyan's Motifs, which are located 2.5 km the northwest of Houmyan rock shelter (Garajian et al., 2001: 101-84). Also, a team led by the Marcel Otte from the University of Liege, Belgium by collaboration with Jallal Adeli, went to the Houmyan Region in the year of 2004, the results of this research were published in the year of 2003 (Otte et al, 2003: 8-12).

A common Iranian and Belgian research team in the Kouhdasht Region identified a number of new works in the year of 2005 (Remacle et al, 2006). Also, this team in the third season of their study, the rock paintings of Houmyan were studied by them in the year of 2008 which is the latest work done on the Houmyan Rock paintings, but unfortunately the result of this study has not been published yet. Some sites have been identified and studied in the recent years, by the researchers (Bahrami & Sabzi, 2019- Sabzi et al., 2015). Due to the numerous studies which mentioned above, especially in the west of Iran and the Lorestan Province, unfortunately, no any mentioned or research has been done on the Boroujerd's Petroglyphs.

Geographical Location

The Boroujerd City is located in the north of Lorestan Province in the location of 48 degrees and 45 minutes' east longitude and 33 degrees and 53 minutes' north latitude in the western Iran. This city from the north is limited to the Malayer and Nahavand Cities in the Hamadan Province, from the east is limited to the Arak City in the Markazi

Province, from the south is limited to the Doroud and Khoramabad Cities and from the west is limited to the Khoramabad and Selseleh Cities in the Lorestan Province. The city has an area of 46, 1701 square kilometers and has two district which named markazi and Aoshtorinan (Ashtrinan) Districts and sevens rural districts (Hemmat Abad, Valanjerd, Darreh Seyadi, Goudarzi, Shirvan, Bardeh Sareh and Aoshtorinan), which about one third of the city level is the heights and hills and two thirds of it are small and large plains. The Boroujerd City with a height of 1540 meters above sea level has cold mountainous weather. The highest point of the Boroujerd City is the Valash Peak with height of 3623 meters above sea level in the Gareen Mountain in the west of Boroujerd City and the lowest point is in the Silakhor Plain with an approximate height of 1500 meters above sea level. The Rock motifs which are studied in this research, they are located in the Darreh Seyadi (Dodangeh and Qapanvari Villages) and Valanjard (Dehkord and Bichoun Villages) of the rural district in the Markazi District and some of them are located in the Kamareh Village from the Aoshtorinan Rural District of the Boroujerd City. All of the rock motifs are located in the mountainous and foothill areas and also in the vicinity of the green valleys with running water sources (taken from the Boroujerd Governor's Website; <http://boroujerd-gov.ir/>) (Maps 1 and 2; Figure 1).



◀ Map 1. Map of Iran and location of the Lorestan Province (Authors, 2019).

Boroujerd Petroglyphs

None of the petroglyphs were mentioned in the archaeological explorations projects which already carried out in the Boroujerd City. According to report of the local's people and the initial visits of the area by the Valollah Teymouri from the (forces Protection Unit of Cultural Heritage Office), caused the authors to survey the area carefully and systematically which lead to identify 5 areas of petroglyphs with various motifs which in the following; we are going to explain them (Some of the motifs and designs of these 5

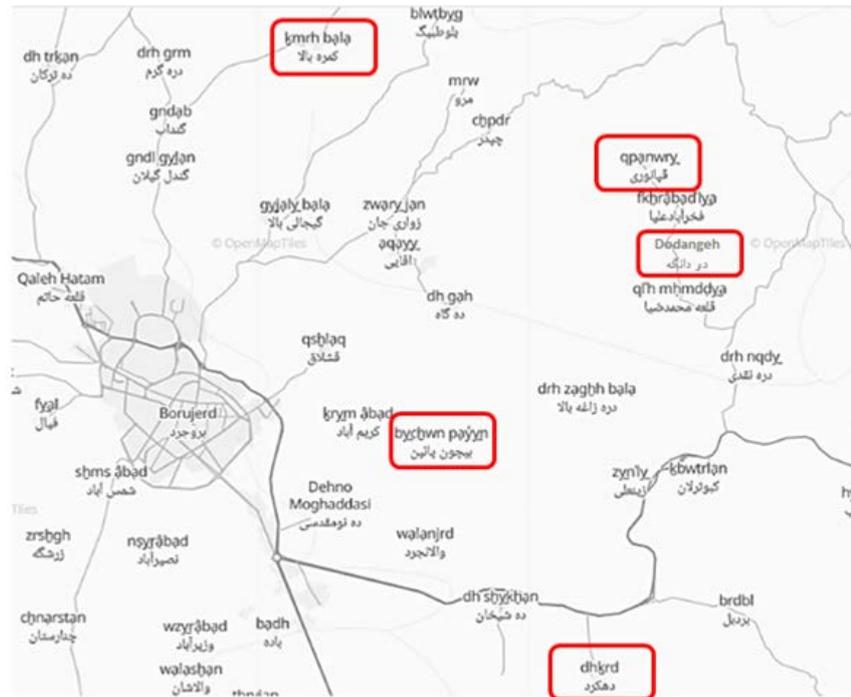
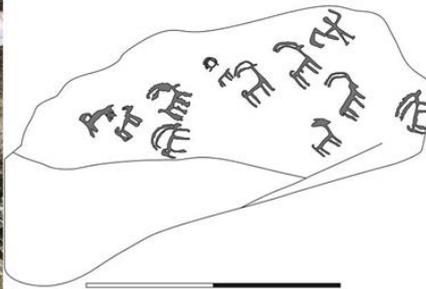


Fig. 1. The Boroujerd City and the location of the petroglyphs (Authors, 2019). ▶

area have been presented; due to the special nature of the designs and importance of the motif, etc.).

Bichoun Bala (Above)

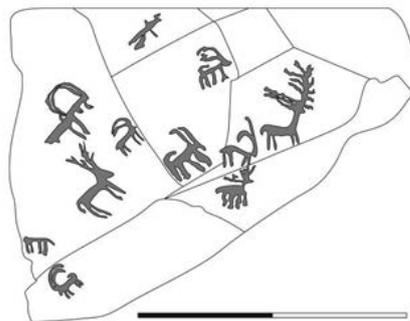
The Bichoun's Petroglyphs are located in the village of the same name and in mountainous areas in a cohesive complex on the separate boulders adjacent to the village and in the geographical coordinates N:33°53'23" – E:48°50'22" around 1723 meters above sea level in the Boroujerd City, central district, Valanjard Village. The petroglyphs consist of two complexes, one of them is located about 800 meters the northeast of the village (within an area of 400×300 meters) and the other complex is located about 600 meters the southeast of Bichoun Village, which includes a collection of animal, human, symbolic motifs and inscription, that engraved on the 86 rocks (49 on the Northeast and 37 on the South East). Both complexes are engraved on scattered and separate boulders which are scattered in the uncultivated land. The source water for both complexes is several springs, one of the spring, which is located in the southeast of the village and the northeastern of complex and running towards the south and it passes the center of the southeastern complex. Unfortunately, due to the lack of identification and study of these petroglyphs, this collection is being severely damaged, so that many of the boulders have been overturned and destroyed (Figures 2, 3 and 4).



◀ Fig. 2. The ibex motif with exaggerated long horns, Bichoun Bala (above) (Authors, 2016).



◀ Fig. 3. The human motifs in the vicinity of symbolic and ibex motifs, Bichoun Bala (above) (Authors, 2016).



◀ Fig. 4. The motif of deer in the vicinity of ibex and human motifs, Bichoun Bala (above) (Authors, 2016).

Dodangeh (Qaleh Ajori)

The Dodangeh Petroglyphs (Brick Castle) are located in the geographical coordinates of N:33° 55'31" and E:48°57'15" and 2201 meters above sea level in the Boroujerd City, central district, Darreh Seyidi Rural District. This complex is located in the one kilometer the east of Dodangeh Village (about seventeen kilometers the northeast of Boroujerd City in the straight line). The mentioned petroglyphs were carved on the more than 50 scattered and separate boulders in the areas about 150×230 meters. Their subjects include human motifs (archer, horseman and standing), animal motifs (goat, deer and dog, etc.), geometric, symbolic motifs, cupules motifs and inscriptions. The source water for this complex of petroglyphs is the numerous of springs which are located in the east and west of these petroglyphs. It should be noted that, this complex is also located in the pastureland area which is not cultivable, but it's suitable for

livestock, and evidence of recent watering place can also be seen in the east of this complex (Figures 5 and 6).

Fig 5. A horseman motif next to the motif of ibex, Dodangeh (Authors, 2016). ►

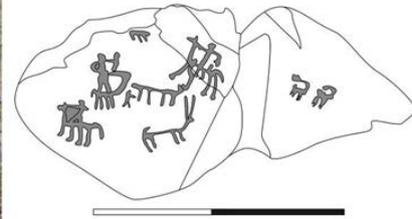
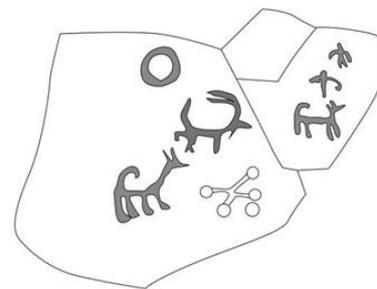


Fig. 6. The cupules next to the animal motifs, Dodangeh (Authors, 2016). ►

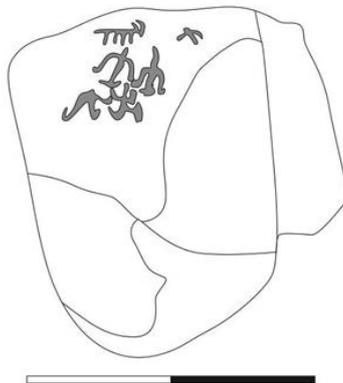


Kamarah

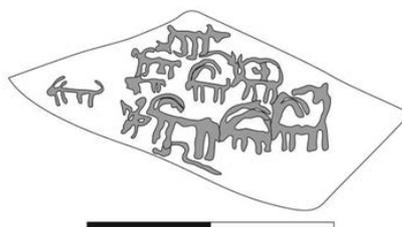
The Kamarah Petroglyphs are located in the northeast of Boroujerd City and in the village of the same name with geographical coordinates of N:33°59'49" and E:48°47'56" and 2008 meters above sea level in the Boroujerd City, the Aoshitorinan Rural District and in the Kamarah Village. The Kamarah Petroglyphs are in two sections, the upper and lower sections. The upper petroglyphs are depicted in an area of about 90×140 meters on about 30 single limestone boulders, and the lower complex is depicted on five boulders. Their themes include human, animal, symbolic motifs and cupules and also inscriptions. The petroglyphs are located in an almost small valley in the southern and southeastern part of the village of Kamarah Bala (above Kamarah) and in the pastureland and non-cultivated area which is suitable for livestock and hunting (Figures 7, 8, 9 and 10).

Qapanvari

The Qapanvari Petroglyphs are two collections and they are located in the village of the same name with geographical coordinates N: 33°50'57"- E:48°54'19" and the altitude of 2170 meters above sea level in the Lorestan Province, Boroujerd City, central district, Darreh Seyadi Village. The petroglyphs consist of two separate and distant



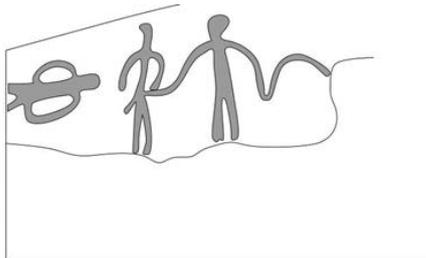
◀ Fig. 7. The Symbolic motifs next to animal motifs, Kamarah (Authors, 2016).



◀ Fig. 8. The animal motifs from the Kamarah collection (Authors, 2016).



◀ Fig 9. The main group of human, animal and symbolic motifs in the Kamarah (Authors, 2016).



◀ Fig 10. The human motifs with interconnected hands (possibly a kind of ritual dance) in the Kamarah (Authors, 2016).

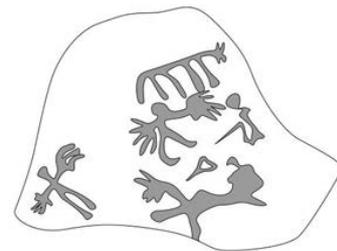
collections, one is about 750 meters the south of the village (in an area of about 80×100 meters, which they are carved on more than 20 boulders. Most of the motifs in this collection are on a boulder, which is also the largest boulder in the area. Another complex is located about 300 meters the northwest of the village (in an area of about 40×30 meters on 6 almost large boulders), which includes a collection of animal, human, symbolic motifs and inscription (Figures 11 and 12).



Fig 11. The main group of Qapanvari's Petroglyphs with symbolic, human and animal motifs (Authors, 2016). ►

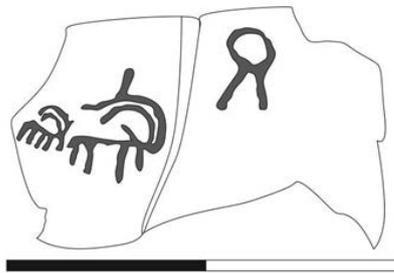


Fig. 12. The human motifs with exaggerated long hands in vicinity of the ibex motifs in the Qapanvari (Authors, 2016). ►



5.5. Choqa Kaferan

This complex is located in the Dehkord Village and geographical coordinates of N: 33°50'20" and E: 48°54'08" and 1850 meters above sea level in the Boroujerd City, central district, Valandjerd Rural District. The motifs of this complex are located on the single limestone rocks; on more than 50 boulders which are scattered and separate in an area of about 150× 230 meters, about 900 meters the west of Dehkord Village(Figure 13).



◀ Fig. 13. The symbolic motifs in the vicinity of the ibex motif, Choqa Kaferan (Authors, 2016).

The General Method and Style of Creating the Petroglyphs

The creation of petroglyphs in the Iran has long history and these motifs are scattered in most parts of the country. In general, there are many factors that are important in choosing the places to create petroglyphs (such as the existence of pastures, hunting grounds, water place, etc.). In general, there is little known about how to create motifs and how to carve on rocks; but what is certain about the creation of the petroglyphs is that, the motifs were made in different places based on the existing conditions, and certainly the tools or objects (metal or stone) had a little higher degree of difficulty of stones and rocks, that's why was able to carve on them. For creating the rock carvings of the Boroujerd City mainly used the scratching, digging, rubbing and cutting methods, which have led to the creation of various motifs on the rocks; however, the quality and methods of creating motifs in different rocks and places are different. It is worth to mentioning that, most of the examples of rock art in the Iran and even in the world have been created by carving method. (Mohamadifar and Hemati Azandaryani, 2014: 12) and this is the most common method of creating petroglyphs.

Regarding the style of creating our study motifs in this research, it should be said that, the style used is mostly abstract, based on simplifying the motifs and their components, like other regions of Iran, most of the motifs are completely stylized and symbolic. The rocks which the motifs are carved on them are kinds schist and phelate and the color of them can be divided into gray to dark brown. These rocks are in various sizes, large, medium and small size, which irregularly are scattered on the slopes of the mountains and on both sides of the rivers, which on some of them, petroglyphs with different themes and different methods have been drawn. The weathering, erosive factors and the passage of time have caused the motifs to be fade and the rocks got cracks and in this way parts of the motifs have been destroyed or are being destroyed.

It should be noted that, due to the different weathering level, it is

possible that, the motifs on rock are not usually related to the specific period and in different periods repeatedly have been carved on a single rock, which indicates the tradition of carving in the study areas.

Study Motifs

The petroglyphs studied in the Boroujerd City can be divided into two categories: Single and collective. In the terms of content, they can be divided into different groups, including animal, human, geometric, symbolic motifs, cupules and inscriptions. What is certain is that, the first human artists usually just paint the animals which they dealt with in their daily lives (Leroi-Gourhan, Bitá). By observing and study the studied petroglyphs in this research, this issue becomes tangible; because all the engraved motifs are exactly the same as those directly related to humans (animals related to nomadic life such as (goat, sheep, horse, dog, etc.) or somehow have been related to the topic of hunting such as (deer) and their daily lives. Among all the available motifs (except the motif of deer that do not exist in the today's environment), almost all other species of motifs still survive in the study area. The interesting point in the petroglyphs of Boroujerd is that, there is no trace of the motifs of trees, plants and birds among all the studied motifs.

Animal Motifs

The animal motifs have long been important in the Iranian art, and what can be seen in the petroglyphs of Boroujerd is that, the style of drawing of the animal motifs of the Boroujerd City is generally abstract and simple like other regions of Iran, and there is no proportion between their organs, and all of these types of motifs are depicted as profile, which are shown in different modes (moving and unmoved), and there are no traces of 3D motifs. These motifs include animal's motifs such as ibex, dogs, horses, deer, etc. (Table 1) and the abundance of motifs in this area, like other areas, is mainly related to the drawing of goats and ibex in different modes with large and elongated horns without fit with the body in different styles. Researchers have considered the abundance of the motifs of ibexes in rock art, due to the symbolic and ritual role of ibexes in the mythical culture of Iran (Rafifar, 2005: 118-124).

The ibex motifs of this area is similar to the ibex motifs, which has been identified on a large scale in different parts of the Iranian and Central Asian Plateaus. It should be noted that, this motif has long existed on the petroglyphs, pottery, metal utensils, rugs, etc.

According to the beliefs and rituals of the past people, it's as symbol of rain, fertility and abundance and it has been passed down from generation to generation in the ancient art (Afzal Tousi, 2011: 1-4). In general, the motif of ibex has long history in the art of Lorestan and has been used on identified rock motifs (in different areas such as the Kuhdasht City), on bronze objects, various sculptures and on the pottery too. Also, in the myths of ancient Iran, among the gods who have been become in the form of beast, we can mention Varzaghneh (Bahram), the god of warfare and victory, who is an abstract creature and one of his incarnations has been male war goat (Hinnells, 1995: 71). There are also scenes of the ibex hunting; the ibex hunting is one of the most common themes in the central and western Asian rock art, which has been considered in almost all areas; since the Neolithic Period (Biglari et al 2007: 52).

| Motif of deer in the Bichoun | Mazre Haj Mad in Hamadan (Rashidi Nejad & Zamaniyan 2009: 95) | Dostali Valley (Hemati Azandaryani et al, 2014) |
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◀ Table 1. The deer motifs in the Boroujerd Region and similar examples (Authors, 2019) .

Human Motifs

The other important and numerous petroglyphs of the Boroujerd Petroglyphs include human motifs, which are in different cases, single (individual) or collective with different themes and scenes (single motifs, hunting, riding and etc) can be seen on the rocks, that their bodies are shown in profile and full-face modes and these group of motifs are created in the form of negative, filled and linear motifs, that are drawn in different sizes and usually in single form (except for a few cases) and the style used for human motifs is the same as for animal motifs. The human motifs are mostly in the form of profiles. In general, it is not possible to identify the sex of these petroglyphs, this group of petroglyphs with other human petroglyphs found in different parts of Iran, such as petroglyphs of the Sofla Argas (Beyk mohammadi et al., 2012), Azandaryan (Mohamadifar and Hemati Azandaryani, 2014), Divin Valley of Hamadan (Rashidi Nejad et al, 2012) and Doustali Valley of Hamadan (Hemati Azandaryani et al, 2014), petroglyphs of Nazoieh Shahr-e-Babak (Farhadi, 1997: 19-12) and Ernan Yazd (Shahrzadi, 1997) are comparable. But due to the lack of feminine signs, it seems that, the motifs are mostly masculine. The general subject of human petroglyphs in the study area are scenes such as: the hunting man with a bow and arrow,

riding in different modes such as archer, spearman, simple, etc., individually on a foot, hand on waist and so on.

Symbolic and Geometric Motifs

The use of symbols to express the beliefs to others is like language, and the differences in them are derived from the experiences of each group (Moshiri, 2001: 5). The symbolic petroglyphs are displayed in most of the petroglyphs collections in the various shapes and designs. Perhaps these symbolic petroglyphs can play decisive role in the chronology of petroglyphs. In fact, symbolic petroglyphs are signs and symbols, which can be a symbol or special sign of a culture; or have a content and specific philosophy in separate or common geographical cultural area, which by studying and comparing these symbols or their comparative study, many cultural, historical and artistic commonalities can be realized. The main problem in dealing with these types of petroglyphs is the discussion of their interpretation. In this regard, researchers should be sufficiently familiar with the topics of prototype, ancient pattern, interpretations, and anthropology.

The most of these petroglyphs have ancient roots in the civilizations and cultures of different regions, which are created in the specific spatial and temporal context and have conceptual commonalities, therefore, in order to study them, it is necessary to be aware of different environmental, climatic, cultural and social conditions. The most important symbolic petroglyphs in the Iran are the symbols of the sun, moon, star, broken cross, concentric circles, etc., that all of them are rooted in the ancient culture of the prehistorical and historical background of Iran and its manifestations can be seen well on the pottery, relief carving, stucco, tiling, brickwork and etc.

It should be noted that, in the vicinity of symbolic petroglyphs, some motifs are observed, that do not correspond to the symbolic petroglyphs and ancient patterns above, and it cannot be considered exactly the same as a particular symbolic motif, but in many areas various of them have been repeated with similarity motifs (Mohamadifar and Hemati Azandaryani, 2017: 35). Among the symbolic petroglyphs of this region, we can mention the symbolic petroglyph of the circle with three parallel lines connected to it, which has been observed in the Azandryan of Malayer (Hemati Azandaryani et al 2014) Arzanfoud of Hamadan (Hemati Azandaryani et al 2016) Sofla Argas of Malayer (Beyk Mohammadi et al., 2012) in the historical site of Timareh in the Tang Gharghab, Shahnshin Ashnakhor and Mor Siyah Farnam collections (Farhadi, 1997) and

also in the Javad Yakh and Sar Kobeh Mountains of the Khomein City (Naseri Fard, 2009) (Table 2). The motifs in the study area include circles with connected vertical lines (between two and four), crosses and broken crosses, square motifs with dots in the middle, hollow or filled circles, heart-shaped motifs, shapes such as 8 number and U shape motifs, combined geometric motifs and so on.

| Bichoun | Qopuzsuzi | Choqa Kaferan | Arpa (Bafq Mahdavarzani et al., 2012) | Azandaryan (Hemati Azandaryani et al 2014) | Azandaryan (Hemati Azandaryani et al 2014) |
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◀ Table 2. The symbolic petroglyphs in the Boroujerd Region and similar examples (Authors, 2019).

The Inscriptions

The inscriptions are another group of petroglyphs in the Boroujerd Region, which include the names of people (men and women) in the Persian, due to the low weathering and sediment cover on them may be they are related to later periods. These inscriptions are sometimes engraved individually or in the vicinity of other petroglyphs.

Cupules

The another group of identified petroglyphs are cupules. The holes created on the flat surfaces of the rocks by the ancient man are called cupule (Naseri Fard, 2009: 148). The cupules are a type of the Paleolithic art and the oldest rock art (Bednarik, 2001), which are mostly created on the vertical and sloping surface of the rock and have cultural function, and in different parts of the Iran and other parts of the world have been observed in different dimensions and sizes (Lahafian, 2010-09: 2). They can have variety of functions, including ritual, chronological, directional, constellation, and so on. Of course, in some cases, they can be related to the livelihoods of people, which used them for the store liquids, chop the stems of plants, grains, legumes, etc. (Mohamadifar and Hemati Azandaryani, 2017: 18).

In the Boroujerd's petroglyphs, the cupules are created in the vicinity of the petroglyphs and seems to be related to each other in terms of time. These cupules are in variety of sizes and dimensions and they are made on five stone slabs (two stone slabs in the Bichoun, two in the Dodangeh and one in the Choqa Kaferan), some of the stone slabs seems to appear are not in their original location because of unknown reasons. On the one of stone board in the Bichoun, on the smooth surface of the stone board 17 cupules with different dimensions were made, and on the second stone board, 22 cupules



▲ Fig 14. The main group of the Bichoun Cupule (Authors, 2016).



▲ Fig. 15. The stone slab with 22 cupules of the Bichoun (Authors, 2016).

are created with 2 to 4 cm diameter and 0.5 to 1 cm depth on flat stone board with approximate 40×60 cm dimensions. The cupules on this stone board are created linearly and started from one side and in the other side became three-lines, it appears that, none of these stone boards are in their original location. Also, in the Choqa Kaferan on a stone slab 16 cupules have been created with 2 to 4 cm diameters, which have been created in the two separate rows of 8. In the Doudangeh, there are also two stone boards (one for 14 cupules in two separate rows, one group consisting of three rows of three-rows of cupules and the other containing five cupules, and the other 7 cupules without specific shape and separate) they are created with different diameters (Figures 14 and 15). These cupules are comparable to the specimens found in the Kurdistan (Lahafian, 2010; Lahafian, 2012) and Doust Ali Valley of Hamadan (Hemati Azandaryani et al, 2014) (Table 3).

Table 3. The Boroujerd Cupules and similar examples (Authors, 2019). ▶

| Bichoun | Qapanvari | Choqa Kaferan | Argas (Beyk Mohammadi et al., 2012) | Azandaryan (Hemati Azandaryani et al 2014) | Arzanfoud (Hemati Azandaryani et al 2016) |
|--|--|--|---|--|--|
|  |  |  |  |  |  |

The Chronology of Petroglyphs

The dating of the petroglyphs of Boroujerd City is not as simple as other similar motifs in other parts of Iran and the world, and the issue of their dating is ambiguous; this is because of the similar motifs which continued from the Paleolithic Period to the present day, and researchers have not yet been able to determine definite conclusions about chronology and the exact date of the rock carvings. In general, to obtain a coherent chronology, all aspects of the motifs must be used, such as the type of technique used to create the motifs, the depth of the motifs, attention to the type of the stone which the motifs are engraved on that and the erosion process in the different climates and other data such as consonant, coherent and related to each other (Mohammadi Qasrian and Naderi, 2007: 63). Most researchers attribute the rock art, especially petroglyphs to the prehistoric peoples; while newer studies show that, many of these motifs belong to the historical periods and even newer periods (Bednarik, 2003). In general, it seems that, among the new types of laboratory methods proposed to determine the age of such petroglyphs, still the safest method is the traditional comparative approach (Viallo, 1998). In the comparative dating method, can used the narrative (thematic)

| N | | 1 | 2 | 3 | 4 | 5 |
|-----------------------------|----------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Site | | Bichoun | Qapanvar ₁ | Choqa Kaferan | Dodangeh | Kamarah |
| Location | | N 33 53 23 E 48 50 22 | N 33 57 50 E 48 54 19 | N 33 50 20 E 48 54 08 | N 33 55 31 E 48 57 15 | N 33 59 49 E 48 47 56 |
| Elevation | | 1723 | 2170 | 1850 | 2201 | 2008 |
| Human Motif | riding | * | - | - | * | * |
| | standing | * | * | * | * | * |
| | hunting | * | * | - | * | - |
| Animal Motif | ibex | * | * | * | * | * |
| | deer | * | - | - | - | - |
| | dog? | * | * | * | * | * |
| | hours | * | * | - | * | * |
| | Bird | - | - | - | - | - |
| nomadic and geometric motif | | * | * | * | * | * |
| Creating method | Beating | * | * | * | * | * |
| | Linear | - | - | - | ** | - |
| | Abrasion | * | * | * | * | - |
| Objects and tools | spear | - | - | - | * | - |
| | Bow | * | - | - | * | - |
| | stick | - | - | - | * | - |
| hunt motif | | * | - | - | * | - |
| hours riding | | * | * | - | * | * |
| Cupules | | * | - | - | * | * |

◀ Table 4. The general characteristics of the petroglyphs of Boroujerd City (Authors, 2019) .

scenes, in fact, get help from the motifs themselves, in this method, the correlation of these motifs can determined a time interval for the motifs. As mentioned earlier, the largest number of petroglyphs is related to the motifs of goats and ibexes, which is an animal that

is domesticated at about 8000 BC, and another animal whose motif is depicted in the study area is the motif of dogs, this animal also domesticated at about 10, 000 BC (Diamond, 1999: 167). Frank Hole believes that, the oldest known motif of the dog in Iran, dates back to the middle of the sixth Millennium BC, that engraved on the pottery from the Green Mound and Choqamish Mound (Vahdati, 2010). Also, the existence of the motif of horse and the presence of man riding horse is related to after the domestication of the horse, which this animal was domesticated at approximately 4000 BC (Diamond, 1999: 167) and it is an animal that is very efficient for chasing the hunt and hunting, and this animal was known in the Middle East, Egypt and India, after the attacks of the Aryan tribes from the northern steppes, in the second millennium BC (Hall, 2011: 24).

In the some of petroglyphs, the motif of arrows and arches can be seen, which indicates the emphasis of the creators of the petroglyphs on the subject of hunting, which according to researchers such as Childe, the use of arrows and arches has become common since the Mesolithic Ages (Childe, 1978: 77). A completely new topic in the relative chronology of the motifs is related to the lichens, on some of motifs, the lichens of different colors (green, black, orange, and white) can be seen, which by considering the longevity of the lichens, can understand the precedence and delay of creating motifs in the relation to each other; so that, the green lichens are newer than orange and orange lichens are newer than white lichens, of course, takes into account the longevity of the lichens and the timing of the changing its color; it can be effective (Mohamadifar and Hemati Azandaryni, 2017: 23). In the Boroujerd's petroglyphs, similar climatic conditions exist in these 5 areas, but by paying attention to the difference between weathering and sediments formed on the petroglyphs, they can be considered as different dates and period. (given that in some of the stone slabs, the motifs were created on top of each other over the several periods (Figures 2, 4, 5, and 11). However, expert researchers in this field; believe that without laboratory studies, the motifs cannot be accurately dated¹. Therefore, due to the lack of laboratory studies in the Iran, it is not possible to provide an absolute dating about the Boroujerd's Petroglyphs. But by using the method of relative typology for the Boroujerd's Petroglyphs; can offer a long period of time from the Paleolithic to the contemporary period. (For example, cupules which is type of the Paleolithic art and it's the oldest rock art) (Bednarik 2001) and (the contemporary period in which the writings with contemporary date) can be seen on the rocks.

Conclusion

Despite a number of archaeological surveys have been done in the Boroujerd City; but the rock carvings of this area remain unknown, and since these petroglyphs are located outdoors, they have been affected by climate and environmental change, erosion, and other human factors, that's why many of them are being destroyed. The Boroujerd's Petroglyphs are mostly displayed in the form of lattice motifs. Also, the motifs in these collections are created in the Two-dimensional and is not traces of 3D display and realism. The motifs of this collection include groups of animal (goats, dogs, deer, etc.), human, symbolic, geometric motifs, cupules and inscriptions and the variety of motifs in this collection shows the cultural, historical and artistic richness of the petroglyphs of this region. The Boroujerd's Petroglyphs in terms of method of creation, type of motif and content mostly are similar to the petroglyphs of the western Iran, especially the petroglyphs of the Sofla Argas and Azandaryan of Malayer.

The Boroujerd's Petroglyphs are mainly located in mountainous and foothill areas, in fact, they are suitable areas for livestock. The Boroujerd's Petroglyphs all are located near the various water sources such as (natural water sources, seasonal rivers, springs, etc.) and also up-country areas. According to the location of these petroglyphs, perhaps it can be said, by caution that, the creators of these motifs were various groups such as nomads, shepherds, hunters or similar groups that were present in these areas. They have created motifs without considering artistic techniques (naturalism, 3D, etc.). The purpose of the creators of these motifs still is vague and unknown to us. Regarding the dating of these motifs, it should be noted that, due to the lack of laboratory equipment, no absolute dating has been done so far, but relative dating can be provided for them, which can have dated them from the Neolithic to the contemporary periods.

Endnote

1. To dating of paintings on rock by sampling pigments that contain pigments with organic particles, the method (AMS-C14), is a reliable method for the absolute dating among the fields of archaeology, geologist, geomorphology. (Bewley, 1984), and there is another way to dating the motifs without paint or pigments, that are engraved. In this method, they are used the accumulation sediments which have covered the engraved part over the time and also are used the coatings that have caused to the brown and black colors (Mohammadi Qasrian, 2007: 16).

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