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# A STUDY OF THE ARCHITECTURE AND URBAN PLANNING OF DAHANEH-E GHOLAMAN IN SISTAN, IRAN

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**Abstract:** The Achaemenid architecture is a prominent example of the Achaemenid art. The Achaemenids were very interested in constructing palaces and terraces adorned with columns. The remains of these structures can be seen in Susa and Persepolis. Due to the expanse of the Achaemenid Empire and the extent of their political activities, they established satrapies at every corner of their empire to protect their lands. Dahaneh-e Gholaman (the gateway of slaves) is one of these satrapies, which is believed to have served as a political center in the Achaemenid Empire. Located in Sistan in the east of Iran, Dahaneh-e Gholaman is the only mudbrick city surviving from the Achaemenid Era. Traces of the Achaemenid architecture and urban planning can still be observed in the remaining buildings. This study sought to identify the features of the Achaemenid architecture in Dahaneh-e Gholaman using an interpretive-historical methodology. The findings show that, unlike other Achaemenid structures that are generally made of stone, clay was used to construct the buildings of Dahaneh-e Gholaman due to the availability of certain construction materials and the region's climatic conditions. In addition, unlike other Achaemenid structures which have flat roofs, the buildings constructed in Dahaneh-e Gholaman have domed roofs. This shows that the residents were very knowledgeable about the region's climatic conditions. Other elements of the Achaemenid architecture such as corner towers, apadana, military barracks, and columned halls are also present in Dahaneh-e Gholaman, all of which indicate the influence of the Achaemenid architecture and urban planning on this historic city.
**Keywords**: Achaemenid architecture, Dahaneh-e-Gholaman, Mudbrick City, Sistan.

**چکیده:** معماری دوران هخامنشیان از نمونه‌های بارز هنر دوره هخامنشی است. هخامنشیان علاقه زیادی به بنای کاخ‌ها و ایوان‌های ستوندار داشته‌اند که در شوش و تخت جمشید نمونه‌هایی از آن را می‌توان مشاهده کرد. با توجه به بزرگ بودن امپراطوری و مسائل سیاسی هخامنشیان، آن‌ها ساتراپی‌هایی در اقصی نقاط سرزمین هایشان می‌ساخته‌اند که به نوعی از سرزمین‌هایشان مراقبت کند. یکی از این ساتراپی‌ها که از مراکز سیاسی امپراطوری هخامنشیان بحساب می‌آید، دهانه غلامان در در شرق ایران واقع در سیستان است. دهانه غلامان تنها شهرخشتی باقی‌مانده از دوران هخامنشیان است که با در نظر گرفتن شرایط اقلیمی و بومی منطقه، کما بیش تاثیر معماری و شهرسازی هخامنشیان در بناهایش دیده می‌شود. این مقاله با روش پژوهش تفسیری–تاریخی با معرفی ویژگی‌های معماری هخامنشی و معرفی ساختمان‌ها، در پی یافتن ویژگی‌های معماری هخامنشی در منطقه دهانه غلامان می‌باشد. نتایج تحقیق نشان می‌دهد که بر خلاف دیگر بناهای هخامنشی که عموماً از سنگ ساخته شده‌اند، در بناهای دهانه غلامان با توجه به مصالح موجود و اقلیم منطقه، از خشت در ساختار بناهایشان استفاده کرده‌اند و بر خلاف معماری هخامنشیان که عموماً سقفها بصورت صاف و مسطح بوده در دهانه غلامان سقفها بصورت گنبدی شکل طراحی شده‌اند که خود نشانه آشنایی و علم مردمان آن زمان به اقلیم و محیط بوده است. همچنین عناصر دیگری از معماری هخامنشیان نیز مانند برج‌های گوشه‌ی، آپادانا، وجود پادگان نظامی در شهر، تالارهای ستوندار در معماری و شهرسازی دهانه غلامان به چشم می‌خورد که همه این‌ها نشانه وجود و تاثیر ساختار معماری و شهرسازی هخامنشیان بر شهر دهانه غلامان می‌باشد.

**کلمات کلیدی:** معماری هخامنشیان، دهانه غلامان، شهر خشتی، سیستان.

## I. Introduction

Nowadays, knowledge, science, and research are the most important rails of progress and development in any society. In other words, research can directly produce science. Studying ancient societies, the life of our ancestors, and the process of formation of cities and their place in human history can be very beneficial. Each generation builds its history not on the ruins of its predecessors but on the achievements and developments made in the past. In order to know the social institutions and technologies of historic civilizations, one needs to study history. Knowing the history of a society can help us understand its culture and create an authentic identity for that society. Studying history helps humans better understand their society and avoid getting caught up in the turbulent currents of time. One of the important ways to know the history of our ancestors is to study the historical monuments and relics left by them. Ancient Iran saw the rise and fall of many empires in different periods, including the Achaemenids. The remains of this empire show that a great civilization once lived during the Achaemenid Era. The historical site of Dahaneh-e Gholaman is the only city that remains of that period (Sarhaddi-Dadian *et al.*, 2017). Examining the structure and buildings of this site can shed more light on the history of the Achaemenid Empire (Sarhaddi-Dadian, 2013).

Evidence shows that the formal Achaemenid architecture of Dahaneh-e Gholaman was influenced by the vernacular architecture of the region and the local climatic conditions. Dahaneh-e Gholaman holds great significance in archeological studies as it is a clear example of Achaemenid architecture and urban

planning. The fact that no other city remains of that era adds to the importance of this historic site. While the remains of the palaces in Persepolis, Susa, and Pasargadae also belong to the Achaemenid period, Dahaneh-e Gholaman is the only bona fide city that remains of that age. There is no other historic settlement with comparable expanse and architectural features such as districts, buildings, and applications that can be said to belong to the Achaemenid Era (Mohammadkhani, 2009). The orderly and accurate plan of Dahaneh-e Gholaman, the buildings, the public and religious spaces as well as the private areas of the city are indicative of the advanced urban planning utilized in the eastern half of the Iranian plateau during the Achaemenid Era (Mousavi Haji and Mehrafarin, 2009).

This study aimed to provide a better understanding of the architecture and urban planning of the historical site of Dahaneh-e Gholaman in an attempt to answer the following questions:

- How did the architecture and urban planning of Dahaneh-e Gholaman take shape and develop?
- How did the architectural characteristics of the Achaemenid Era affect the architecture of Dahaneh-e Gholaman?

### I.1. Research background

Dahaneh-e Gholaman was discovered by Italian archaeologists in 1960 and was excavated from 1962 to 1965. These excavations were led by Umberto Scerrato, a member of the former International Association for Mediterranean and Oriental Studies (ISMEO) and a professor of archeology at the University of Naples and the University of Rome (Mohammadkhani, 2009). The second iteration of excavations in Dahaneh-e Gholaman began in 2000 by a group of archaeologists headed by Seyyed Sajjadi under the auspices of the then Cultural Heritage, Handicrafts and Tourism Organization of Iran (Seyyed Sajjadi, 1996b). Many reports and articles have been authored by Seyyed Mansour Seyyed Sajjadi about Dahaneh-e Gholaman. Hassan Ali Arab has also discussed this historic site in his articles and MA thesis published in 2005. A paper titled *The reflection of the natural conditions of the Sistan Plain in the Architecture of Dahaneh-e Gholaman* authored by Mahdi Keykhaei and published in 2015, a book titled *A Study of the historical geography of Sistan: from the Beginning of the 9th Century* AH authored by Mousavi Haji and Mehrafarin and published in 2009 and a book titled *Historical research on ancient Sistan* authored by Italian orientalist and historian Gherardo Gnoli and translated into Persian by Seyyed Mansour Seyyed Sajjadi in 2016 are among the published works that explore Dahaneh-e Gholaman.

## II. Research methodology

The methodology of this study was interpretive-historical with a descriptive-analytical approach. In other words, the history of Sistan and Dahaneh-e Gholaman as well as the characteristics of the Achaemenid architecture were reviewed using the interpretive-historical method, and the architectural findings were expressed in a descriptive-analytical way. The required data were collected by library research and field surveys. The documents used to this end include old and new photographs, geographical maps, initial construction surveys, satellite images, historical texts, written works, etc.

## III. History of Sistan

Sistan spans a large expanse of land in the southeast of Iran and the major portion of this region is in Afghanistan (Sarhaddi-Dadian et al., 2021). The ancestors of the current residents of Sistan, who have descended from the Scythians, were an Aryan tribe who, after a period of turbulent and migratory life in the east of Iran, settled in a land that was later called Sajistan or Sistan as it is known today. The region had an independent culture and civilization. During the time the Silk Road passed through Sistan, important cities, towns, kingdom centers, towers, and fortifications were built along the road. But strong winds have buried most of these structures throughout time. In a book titled *Ancient Iran*, proposes that while the west of Iran was influenced by the Babylonian and Greek cultures, the east of Iran has always been the core of the Iranian culture. Sistan was one of the centers of Zoroastrianism. The three sons of Zoroaster will emerge next to Hamoun in Sistan according to Zoroastrian beliefs (Kalbaali, 1996).

## IV. Achaemenid architecture and urban planning

The Achaemenid architecture incorporates elements from different lands. The Achaemenids harmonized these elements and altered them based on the geographical requirements and local conditions of ancient Iran. They constructed their buildings on large platforms and raised the roofs of their structures on high columns. Platforms, large columns, corner towers, memorial gates, apadana, sculptures, and decorations are among the components of the Achaemenid architecture (Mohammadifar and Mirsafdari, 2014). Achaemenid palaces were initially asymmetrical and rectangular but they gradually became symmetrical and square (Motamedmanesh, 2018). The major characteristics of the Achaemenid architecture are as follows:

**Placement:** Choosing a place higher than the surrounding area with a commanding view was very important. Achaemenid buildings were designed in a way to impress the visitors from the moment of entering them.

A courtyard often lay before the entrance porches and two-sided stairs surrounded the central hall. Wooden or stone columns and side rooms connected to the end of the main hall by semi-dark spaces were a common sight. Using these columns had two advantages: the need for fewer pedestals and more roofed open spaces.

**Decoration:** The place and number of decorative elements in Achaemenid buildings corresponded to the rank and position of the owners. For example, the places that belonged to the king were elaborately decorated (Keikhaei, 2015).

**Colors:** Vivid, bright, and intense colors such as purple, azure, and green were commonly used to show the grandeur and glory of the Achaemenid Empire (Fotouhi Ghiam, 1995).

American orientalist and Iranologist Frye believed that the most important feature of Persian architecture was not the height of the columns or the delicate motifs, but the skillful use of spaces and platforms (Frye, 1998). The barrel arch later developed in Iran, paved the way for the construction of halls with large ceilings. During the Achaemenid Era, trade relations expanded and money-based business became common. Bazaars were established inside city walls for the first time and adopted a new role. A special design was implemented in building cities.

Achaemenid cities were built in strategic places and special attention was paid to environmental issues in their construction. Such considerations were unprecedented before the Achaemenid Era. Green spaces and gardens were incorporated into the body of these cities and buildings were raised based on the social class of the owners. In this period, the city became the place where the government was stationed. The function of the governments could go beyond the sphere of influence of cities and often corresponded to the power of the governments (Arab, 2005). According to Soltanzadeh (1983), garrisons were located inside Achaemenid citadels.

The city where the king dwelled was heavily guarded and well cared for. In addition, garrisons were often constructed inside the forts built in the middle of the city, around the citadel and the royal neighborhoods as well as the residential areas with high fences raised for protection.

## V. Dahaneh-e Gholaman

Dahaneh-e Gholaman is located in the east of Iran, 2 km from Qalehno Village near Zahak City and 45 km from Zabol City (Fig. 1). It rests on a series of natural heights with a length of 1.5 km and a width of 300-800 meters, next to the dried delta of Senaroud. The remains of a few buildings and monuments belonging to the Achaemenid Era can be seen in the area. In the first half of the 1960s, an archeological team led by Italian archaeologist and Iranologist Umberto Scerrato excavated this area for three seasons and discovered grand buildings, including a temple (Gnoli, 2016). The area of the central section of the city is estimated to have been about 88 hectares and the whole city about 100 hectares (Seyyed Sajjadi, 1996b). The remains are scattered over land with a length of 1.5 km and a width of 300-800 meters. Similar to the ancient cities of Persepolis and Pasargadae, Dahaneh-e Gholaman is relatively higher than the surrounding areas (Scerrato, 1962).

The inscriptions of Darius the Great refer to this area as Zaranke. Zaranke was one of the four satrapies of the Achaemenids whose representatives offered gifts such as spears, shields, and cows to the king of Persia during the Nowruz celebration (Herodotus, 1957). The people of Zaranke fought alongside other Iranians in many wars and rushed to the aid of the Achaemenids when needed because of their shared characteristics such as religion, race, and language. Cyrus the Great named these people the Evergetáes (meaning "good") and exempted them from paying tax in appreciation of their help. When Cyrus the Great and his soldiers were starving in a desert, this tribe gave them 3,000 chariots filled with foodstuff (Pirnia, 1983). The Achaemenid inscriptions mention Zaranke as a state but do not mention the name of its cities. Nevertheless, the capital of this state was probably called Zaranke as well. The exact boundaries of Zaranke remain unknown but its neighboring regions were Gedrosia, Arachosia, Mecca, and Ariana. Ctesias, the physician of Ardashir II, mentions Zaria as a city close to the shores of Lake Hamoun, which was built by Darius the Great. During the reign of Darius II, Zaria fell to rebellion, and an independent government was subsequently formed (Mousavi Haji and Mehrafarin, 2009). The history of Sistan holds that when Alexander entered Sistan, he settled in a castle in the north of the region, which had been built by Kay Khosrow. Another castle built in the south of Sistan by Ardeshir I has also been mentioned (Anonymous, 1994).


**Figure 1. The location of Dahaneh-e Gholaman in Sistan (by authors).**

Gnoli (as cited in Azarniousheh, 1990) suggested that Nad Ali is the same pre-Achaemenid Zarin City which continued to exist during the Achaemenid Era but was probably not the capital and that Dahaneh-e Gholaman is the New Zarin City, which was built by the Achaemenids (more specifically Darius the Great) not far from the original Zarin (about 24-25 km) after they conquered the region.

Sistan bore other names during the Achaemenid Era including Zarangeh, Sarangeh, Zarangianeh Darangianeh, Darangis, Darangeh, Dardaneh, and Zarang (Olmstead, 1978). Studies show that Dahaneh-e Gholaman was built based on a specific plan to serve a specific goal during a relatively short lifespan as the city does not have various urban layers. It is perhaps the only city from the Achaemenid Era in which private homes were constructed alongside governmental and religious buildings. In addition, it is probably one of the few ancient sites on the Iranian plateau that contains valuable information about the informal and formal religious rituals and practices in ancient Iran (Mohammadkhani, 2009).

## V.1. The name of Dahaneh-e Gholaman and the religion of its residents

The common religion in Dahaneh-e Gholaman was probably early Zoroastrianism or pre-Zoroastrianism practices. There is no consensus among historians as to what the religion was but the most accepted theory suggests that it was one of the common religions shared by both Iranians and Indians. Considering that Iran and India are geographically close to one another, this does not seem unlikely. During the Achaemenid Era, this city was known as Zarak or Zaranka, to which Greek historians have referred as Zarrineh. But it is not the same as Zaranj of the Islamic Era. There is disagreement among historians about the location of Zarak. The three locations often suggested in this regard are the Sorkh Dagh hills in Nad Ali in the Afghan part of Sistan, Dahaneh-e Gholaman near Chah Nimeh, and the ruins of the old Zahedan. Despite this difference of opinion, there is no fundamental difference between the related theories (Seyyed Sajjadi *et al.*, 2009).

## V.2. Urban planning and architecture in Dahaneh-e Gholaman

The residential area of Dahaneh-e Gholaman is divided into two approximately equal parts connected by a long flat piece of land. The buildings of the western section are along a river while those of the eastern section collectively form a square with a total area of 200 m$^2$. Seven structures are especially prominent among these buildings, which might have had social, religious, or private uses. Regardless of the uses of these buildings, there is a large area in the middle section which is surrounded by porches or houses in some places. These buildings are different in terms of form but their structure is based on the same principles. All the buildings are square, lack a courtyard, and have a main foyer with columns and cubic or circular pillars in the central part. In the eastern section of the residential area, a very detailed plan has been implemented that bespeaks strict and regular governmental and administrative control (Scerrato, 1966a).

Although the cemeteries of ancient cities can be different in terms of the size of the graves, the type of burial, and the objects buried along with the deceased (based on their social class), there is no information available on this subject in Dahaneh-e Gholaman because no cemetery has been discovered in the city. A waterway divides Dahaneh-e Gholaman into a northern section which houses larger buildings used by aristocrats and a southern section which houses smaller buildings used by common people. The southern section, which itself has an eastern section and a western section, is divided into smaller lots with a precise arrangement and this remarkable order was implemented under the supervision of an overseer (Hojabri Nobari *et al.*, 2007).

The buildings of this city have been constructed based on a relatively accurate geometry. Because of the 120-day winds of Sistan blowing from the northwest to the southeast, openings, and entrances were made on the south side of the buildings, opposite to the direction

of the winds. The main walls are made of strong mudbricks and the rooms have right angles and arched roofs, utilizing the aesthetic principles of architecture (Seyyed Sajjadi, 2002). Although roofs were horizontal and flat in the Achaemenid architecture, the local architects of the ancient Sistan used arches to build roofs because of the climatic conditions of the region (Mariani, 1996). Table 1 shows the comparison of the architectural features of Achaemenid buildings with those of the buildings found in Dahaneh-e Gholaman.

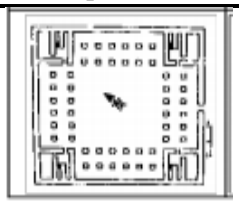
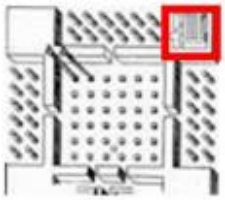
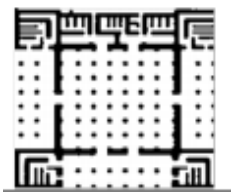
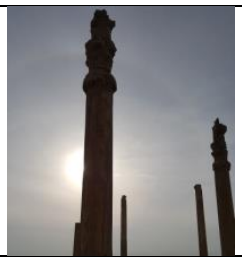
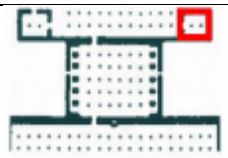
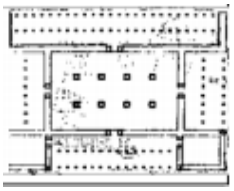
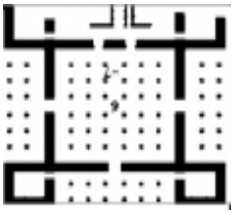
| | Corner towers | Apadana | Columns | Platforms |
|---|---|---|---|---|
| **Dahaneh-e Gholaman** |  |  |  | - |
| **Persepolis** |  |  |  |  |
| **Pasargadae** |  |  |  |  |
| **Susa** |  |  |  |  |

**Table 1. The comparison of the architectural features of Achaemenid buildings with those of the buildings found in Dahaneh-e Gholaman (by authors).**

A total of 27 recognizable structures have been discovered in the excavations and surveys performed in Dahaneh-e Gholaman. These buildings are remarkable in terms of size, plan, room arrangement, and other architectural features (Seyyed Sajjadi, 2003).

The most important buildings in Dahaneh-e Gholaman can be classified into five groups (Fig. 2): (1) offices/government buildings: buildings no. 1 and 2, (2) religious buildings: building no. 3, (3) residential houses: buildings no. 4, 5, 6 and 7 (Dahaneh-e Gholaman is one of the few ancient sites belonging to the Achaemenid Era in which residential houses can also be found in addition to royal, public and religious buildings), (4) industrial workshops: building no. 15, (5) military area (Mohammadkhani, 2009).

The remains are divided into two groups of main buildings and several single buildings (Fig. 3). The 27 buildings are grouped into an eastern part and a western part.

The eastern part itself is divided into two equal sections. The remains stretch as far as the tomb of Zoroaster. Three buildings are located in the eastern part and five buildings are in the western part of the city. These buildings had religious, social, and public uses.

A large building (no. 3), some small and medium-sized buildings, and residential houses are located in the western part of the city. Large buildings, which served as barracks and had military applications, are in the southern section.

These buildings are about two kilometers away from the core section of the city.

The buildings used to have large walls approximately 200 meters long and 3-4 meters wide (Mohammadkhani, 2009).

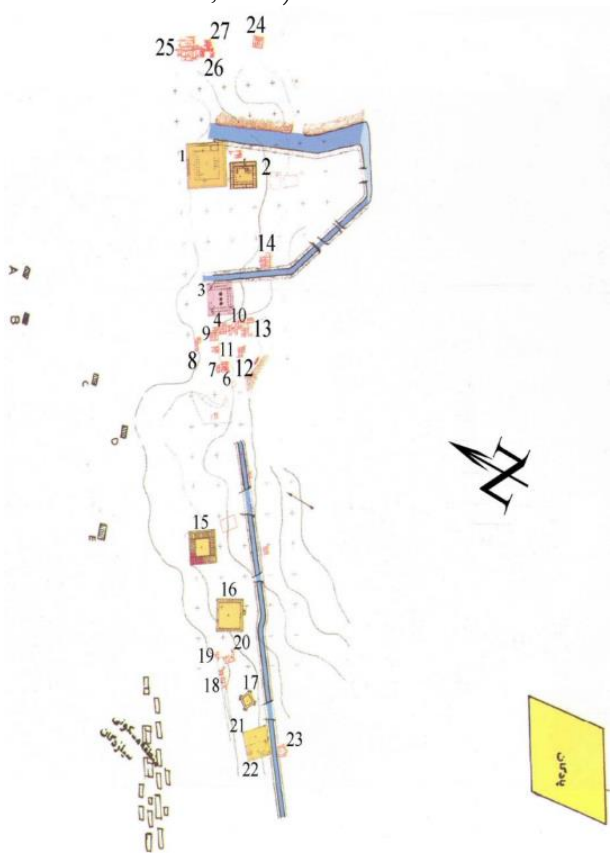



**Figure 2. The dispersion of the buildings of Dahaneh-e Gholaman (Seyyed Sajjadi, 2003).**

**Figure 3. The dispersion of the buildings discovered in Dahaneh-e Gholaman (Mohammadkhani, 2009).**

**Building no. 1:** This building had a general and public use. Similar to buildings no. 2 and 3, it had a large central courtyard with a porch, which was used for holding public and religious ceremonies. Its proximity to buildings no. 2 and 3 further strengthens this theory. The main use of the building has not yet been determined in the excavations (Seyyed Sajjadi, 1996a).

**Building no. 2:** This building (Fig. 4) has a size of 43x53 meters and has 45 main rooms and two annexed rooms (Mariani, 1996). Thick 1.2x1.2-meter square columns can be seen inside the building. It has been covered with a layer of mud. The courtyard can be accessed via a rectangular porch. The entrances are 50, 70, and 100 cm wide with platforms on both sides probably used for sitting (Mariani, 1996). Based on his comparison of the ceramics, Genito (1990) refers to this building as a treasure house. This building had a central courtyard that could be accessed through the entrances of the porch. Although the architectural style with which Genito has made comparisons is similar to the Achaemenid architecture of Dahaneh-e Gholaman, the design principles of the latter are based on the local climatic conditions in the sense that there is a courtyard in the center and a few rooms surround the courtyard with a minimal number of entrances and openings. Scerrato proposes that this building had public uses and compares its design with that of the hallways of Central Asia. He also proposes that the plan of this building is comparable to that of Persepolis (Arab and Khaledian, 2019). Both structures are large and square. Similar buildings with the same application have been found in Georgia (Knauss, 2001). A central courtyard surrounded by some rooms is a feature of the Iranian architecture observed in Susa as well (Velayati, 2010).

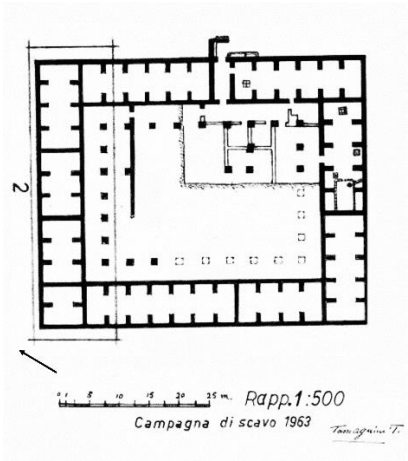


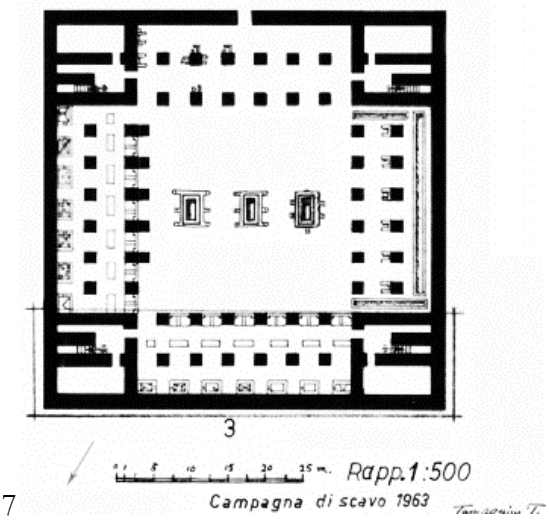

**Figure 4. A photograph and the plan of building no. 2 (Mohammadkhani, 2009).**

**Building no. 3:** This building (Fig. 5) is the most important building in the city. The existence of braziers,

fireplaces, altars, and platforms shows that this building was used for religious purposes (Seyyed Sajjadi, 2003; Scerrato, 1966b). The building is located on the eastern half of the water canal and two waterways separate it from the residential area and buildings no. 1 and 2. There is an entrance to the south and the central courtyard is surrounded by four unconnected porches. The excavations revealed that five columns had been reinforced with supporting piles (Scerrato, 1966b). These piles seem to have served as decoration, however, since no structural weakness has been found in the building (Seyyed Sajjadi, 1996a). The most important feature of this building is the columned porches, which were common in the Achaemenid architecture. This feature was very beneficial in the dry climate of the region. Oval arches have also been used in Dahaneh-e Gholaman. While brick arches have been discovered in the temple of Chogha Znabil and the presence of curved structures in Haft Tappeh hints to the use of this architectural technique back in the second millennium BC, the oval arches in Dahaneh-e Gholaman built in this way to be more compatible with the climatic conditions of the region are considered important because roofs were majorly flat in the Achaemenid architecture (Mohammadkhani, 2009). Another important feature of this building is the use of curved bricks (Mariani, 1996). A few steps can be seen in the corners of this building which were most probably used for accessing the roof because a second floor could not have existed considering the domed top of the building. In general, the residents of arid areas are not inclined toward raising their buildings high. They always build their yards lower than the level of the adjacent passage to protect themselves from the elements (Arab and Khaledian, 2019). Scerrato suggests that the characteristics of building no. 3 hint to a certain stage of an Indo-Aryan religion, which might have been the early stage of Zoroastrianism. Seyyed Sajjadi proposes that the religion practiced in Dahaneh-e Gholaman was probably one of the common Indo-Iranian religions in the region (Arab, 2005).

**Building no. 4:** Two rooms have been discovered in building no. 4 (Fig. 6). There is a column with a diameter of about 90 cm in the middle of one of the rooms which is probably the more important of the two. This building is rectangular and its dimensions are 22.20x15.60 meters (ISMEO, 1975). There is a small altar in the southwest corner. The plan of this building is very similar to that of building No. 6, both of which have much in common with the special Achaemenid structures on the terrace of Persepolis (Scerrato, 1966b). On a smaller scale, the building is similar to the house of a high-ranking person in Persepolis (Genito, 1990).

**Buildings no. 5, 6, and 7:** These buildings can be considered typical examples of private houses in the typology of Achaemenid structures. There are two square columns at the central section of building no. 5. One of the characteristic features of building no. 6 is a central hall surrounded by eight rooms. There is a pyramid-shaped brazier with stairs in the southeast corner of the main central space. Although this building is small, its form is similar to that of other urban structures in the city. Building no. 6 is located near Building no. 3 (a public shrine) and probably belonged to a religious leader. Similar to building no. 13, building no. 7 has circular columns in its central hall. Buildings no. 4, 5, 6, 7, and 13 have columns in the middle of their rooms, which was a common architectural feature of private houses at that time (Arab and Khaledian, 2019) (Fig. 7).




7

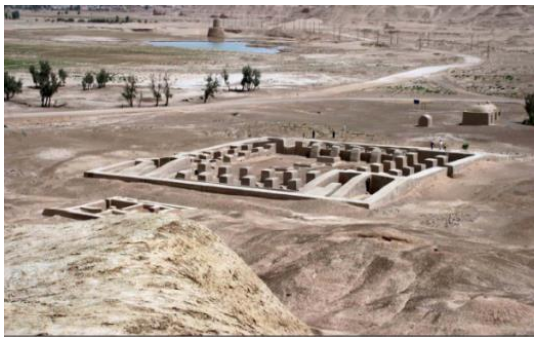


**Figure 5. A photograph and the plan of building no. 3 (Mohammadkhani, 2009).**

**Figure 6. Building no. 4 (Mohammadkhani, 2009).**

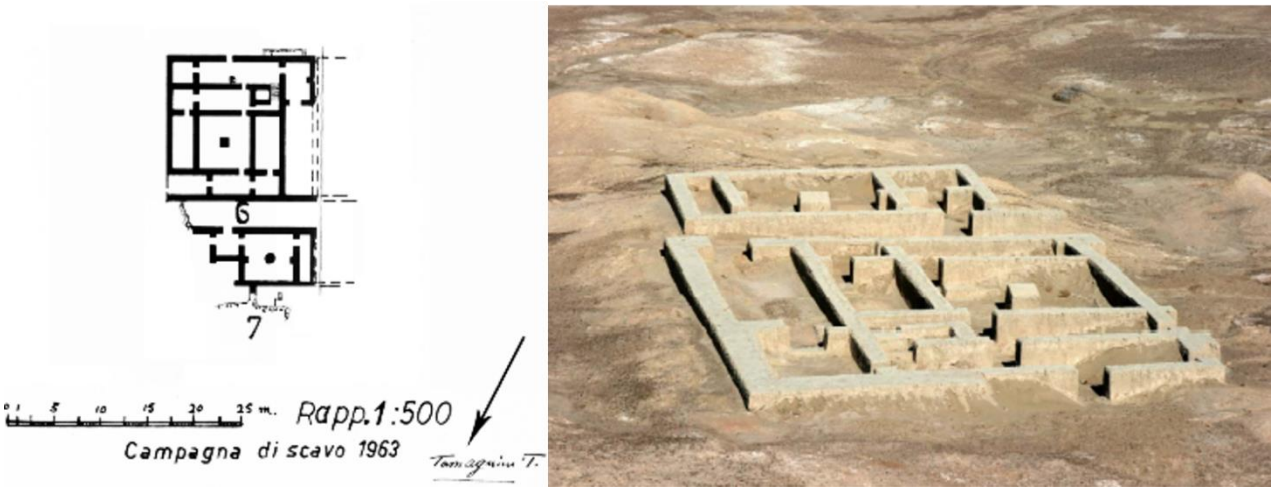



**Figure 7. A photograph and the plan of buildings no. 6 and 7 (Mohammadkhani, 2009).**

**Building no. 15:** This building has 36 rectangular rooms that surround a 50x50-meter central square courtyard. Six types of mudbricks have been used in this building, including a curved type (Seyyed Sajjadi, 2003). No skylight or window has been found in building no. 15. Narrow entrances connect the rooms of this building and to the courtyard (Seyyed Sajjadi, 2003). The roof of the first room of this building is believed to have been curved (Seyyed Sajjadi, 2004). Seyyed Sajjadi proposes that this building and Altyn Tepe 10 archaeological site in Turkmenistan and the sixth and fifth-century buildings in Central Asia that had religious and industrial uses have comparable similarities. The building has been built on a platform with a height of 50 cm on which clay-engaged pillars rise to the ceiling (Fig. 8). There is a small altar similar to the one found in building no. 3, which was used to bless religious objects and workshop products (Seyyed Sajjadi and Saber Moghaddam, 2003). If Scerrato's theory about one of the three altars in building no. 3 being devoted to Anahita is correct, it is very likely that the statue of a woman found next to the altar in room 25 is Anahita (Arab, 2005).

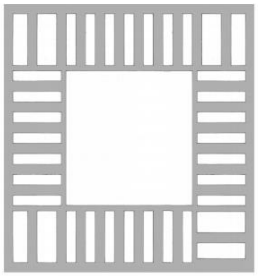


**Figure 8. The plan of building no. 15 (Mohammadkhani, 2009).**

The unique feature of this building is the presence of small clay pillars (Fig. 9). These pillars are hollow and are approximately 20-25 cm in size. The use of this space is not exactly known. However, the gaps between the clay pillars, the possibility of wind flow through the pillars, the low roof and the coolness of the corridors suggest that this building was probably a cold storage.

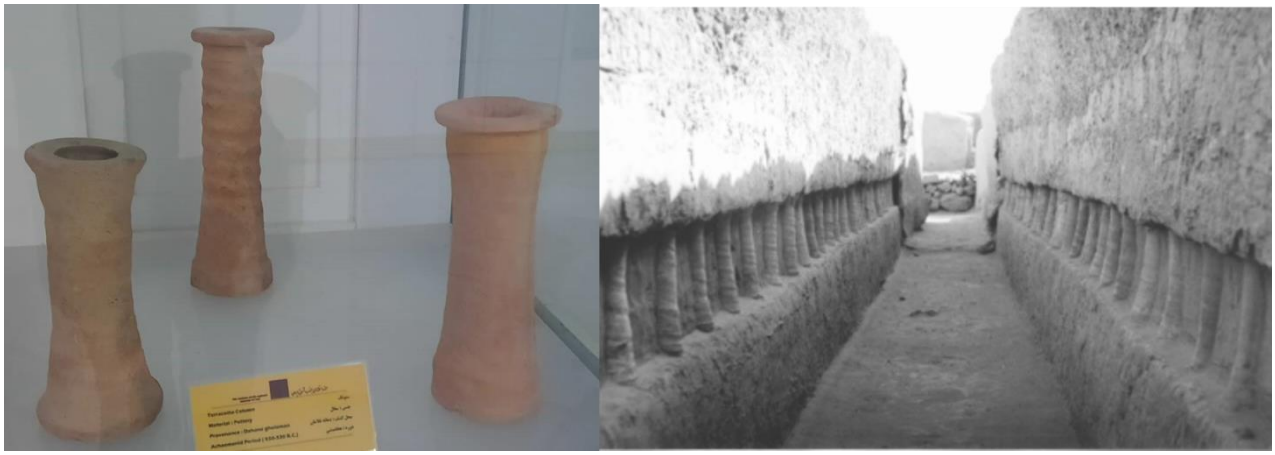


**Figure 9. The small clay pillars in building no. 15 (Sajjadi, 2007).**

**Building no. 16:** Scerrato found a brazier in building no. 16 (Fig. 10). The building is estimated to have been built in the 5th or 6th century BC. It is located near the large buildings of the site and is considered a medium-sized structure that most likely belonged to a special person such as a member of the nobility who was interested in religious matters. The origins of such a hierarchical structure of society can be traced back to the time when Darius expelled the inhabitants of the Elamite city of Susa to build his palace on the acropolis (Boucharlat, 2001).

**Figure 10- Building no. 16 (Mohammadkhani, 2009).**

Seyyed Sajjadi suggests that the explorations made in 1978 and 1979 in the margins and bed of the large pit now covered by the waters of Chah Nimeh revealed the remains of metal and pottery kilns, large bricks, ceramic objects, and pieces of molten metal. It seems that the main industrial area of the city is now buried under the waters of this pit (Seyyed Sajjadi, 2001).

While war and conflagration had no role in the decline and destruction of the city, storms, political decisions and the sudden drying of the river feeding the city were major reasons. Almost no significant object or artifact was found in the excavations of Dahaneh-e Gholaman. This may indicate that the residents had sufficient time to prepare for the evacuation (Mohammadkhani, 2009). This city had a very short life span of 150-200 years in the 5th and 6th centuries BC. Unlike many ancient settlements that gradually grew, developed and evolved from small villages to large cities, the construction of this city was planned beforehand based on specific goals. As such, it is a significant case for studying the Iranian architecture and urban planning during the Achaemenid Era (Seyyed Sajjadi, 2003).

## VI. Conclusion

The Achaemenids built one of the greatest empires of the ancient Iran. Because of the extent of their ruling system and political factors, they established satrapies in all lands under their rule. Dahaneh-e Gholaman was one of these satrapies, which is located in Sistan in the east of Iran. It is the only mudbrick city that remains of the Achaemenid Era. Due to its political status, Dahaneh-e Gholaman is also the only Achaemenid city in which aristocratic, public, and political buildings can be seen next to residential houses. Unlike other Achaemenid establishments which were generally made of stone, the buildings of Dahaneh-e Gholaman are made of various types of mudbricks including curved ones due to the availability of this material. In addition, the roofs of the buildings are barrel arches, which is a unique feature since roofs were flat in the Achaemenid architecture. The dome-shaped roofs of the buildings in Dahaneh-e Gholaman were beneficial for the residents due to the environmental conditions and the arid climate of Sistan. Such architectural choice bespeaks the knowledge of the historic residents of Dahaneh-e Gholaman about the region's climate and shows that they were able to use the environment to achieve more comfort. The other features of the Achaemenid architecture such as corner towers, apadana, barracks within the city, and columned halls are also present in the architecture and urban planning of Dahaneh-e Gholaman, all of which point toward the influence of the Achaemenid architecture and urban planning on the city.

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