

Original Research Article

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The letters in the Stone Inscriptions of «Bani Hasanwayh» (330-405 A.H.)*

Abstract

Problem Definition: In 330 A.H., at the same time as the Buyid domination, Amir Hossein Kurd founded the Bani Hasanwayh reign in the west of Iran. The stone inscriptions obtained from this period, besides providing reliable and important historical information, show the inscription style and represent the form of the letters of this writing art of the 4th century A.H. In the current research, focusing on the stone inscriptions of Bani Hasanwayh, an attempt is made to study script in this period, which is a part of the history of the Buyid dynasty. Also, to better understand and recognize the form and clearly identify the changes and transformations of the letter form in the stone inscriptions of Bani Hasanwayh, the letters of these inscriptions will be compared with the letter form of the two wooden tablets of Adud al-Dawla period (363 A.H.). Accordingly, this research attempts to answer the following question: What are the most important features of the written forms of Bani Hasanwayh inscriptions?

Objective: The aim of this research is to identify and introduce the form of letters and decorative elements of Bani Hasanwayh stone inscriptions.

Research Method: The nature of the current research is fundamental, and it was conducted using a descriptive-analytical method based on documentary and visual studies. The sampling method is purposive and five stone inscriptions from Bani Hasanwayh are the focus of this study. These stone inscriptions were made from 374 to 404 A.H.

Results: The script used in the studied stone inscriptions is a decorative Kufic script (Movaragh). Two-lobe forms are the most important decorative elements in combination with the letter form in these inscriptions.

Keywords

Bani Hasanwayh, Buyid Dynasty, Stone Inscriptions, Letter Form, Script

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Introduction

In the 4th century A.H., at the same time with the reign of the Buyid dynasty, there was an efficient government in the western part of present-day Iran named Bani Hasanwayh (330-405 A.H.). It had close relations and interactions with the Buyid dynasty, and in time, the alliance agreement between these two was established. Hasanwayh, the son of Barzikani, ruled over Dinawar and a large part of western, southwestern, and southern Iran, which included the entire current range of Lorestan (Pishkouh and Poshtkouh). Bani Hasanwayh rulers paid a lot of attention to development. Several dated inscriptions from that period have been found that emphasize this importance. These inscriptions, besides providing accurate historical information, represent a part of the history of inscriptions of that time. On the other hand, considering the importance of this period regarding inscription designs in the early centuries of Islam, the study of the script forms used in the inscriptions will clarify part of the path of the script evolution in these centuries. In the current research, focusing on the remained inscriptions from the Bani Hasanwayh period, the study of scripts in the inscriptions of this period will be discussed. In this regard, this study deals with the question of "what are the most important features of the written forms of Bani Hasanwayh inscriptions". Such research studies are references to study the form of letters in different periods. The present research investigates a part of the vast area of inscriptions in Iranian art, aiming at recognizing the letter forms within the extensive scope of Iranian inscription art of 4th century A.H. in the Lorestan region.

Research Method

The present research is conducted using the observational and descriptive-analytical method. First, the general description and analysis of the visual structure of the inscriptions of Bani Hasanwayh is discussed. Then, in order to identify and explore more precisely, the letter forms in the stone inscriptions of Bani Hasanwayh will be compared with those in the two wooden tablets related to the period of Adud al-Dawla in 363 A.H. In total, five stone inscriptions from Bani Hasanwayh are the focus of the present study. These stone inscriptions were made between 374-404 A.H.

Research Background

There is no research that specifically deals with the study of the written forms of the stone inscriptions of Bani Hasanwayh. However, in the research studies that have been done about the history of this period, there have been references to these stone inscriptions, which has created a suitable platform for discovering more about these inscriptions, and it is: One of the most important backgrounds of the current research is the book entitled «The First Inscriptions in Islamic Architecture» by «Blair» (2015), who studied the early inscriptions of Islam, which, besides historical materials, paid attention to the study and rooting of the letter form in these inscriptions. In the meantime, he has discussed the stone inscriptions of Bani Hasanwayh as a part of the inscriptions of the first centuries. Also, among the articles, the following can be mentioned: the paper by «Sotoudeh» (1965) entitled «Two inscriptions from Badr Ibn Hasanwayh» and the article by «Izadpanah» (1966) entitled «Inscription in Kufic script in Lorestan», both of which describe briefly the historical information of two inscriptions; one is the inscription of Kashkan bridge and the other is the inscription of Imamzadeh Zeyd Ibn Ali in Khorramabad city, related to Badr al-Din Hasanwayh. «Dehnavi» (2014) also in the article entitled «Bani Hasanwayh Reign from Rise to Fall (330 to 406 A.H./941 to 1015 A.D.)» has studied the history of the Hasanwayh reign and in the end of the research, he mentioned the historical aspects of the Kashkan River and Kalhor

bridge inscriptions. Also, «Moradi» (2018) in his article entitled «Sarmaj (Dekan): Meeting place of the kings of the world» also investigated the history of Sarmaj castle and, in the end, he mentioned the inscriptions obtained from this castle. In the conducted studies, attention has been paid to the historical aspect and the text analysis of the inscription and the type of them, along with the historical explorations of this period. In none of the cases, the script and form in the inscriptions of Bani Hasanwayh have been investigated. With the historical studies of the Bani Hasanwayh period and the reading of its inscriptions, one can feel the need for investigating the form of letters, which is the visual aspect of written inscriptions. The present research, from the point of view of studying the form of letters in this part of history, is important. Although it is a small step in understanding the evolution of the form of letters in inscriptions.

Bani Hasanwayh

The beginning of the Kurdish Hasanwayh's reign coincided with the rule of «Rokn al-Dawla Deylami». This Buyid ruler had always taken a friendly approach towards Hasanwayh (Ibn Meskawayh Razi, 1997, vol. 6, p. 328). «The rulers of this dynasty ruled a part of the Jabal region at the same time as the golden age of Islamic culture in the fourth century A.H. (See Chart 1). The region under the control of this government was a barrier between Baghdad, the center of the Islamic government, Shiraz and Khorasan, one of the power centers of the Buyids and the Samanids, in the east of the Islamic world. The first ruler of Bani Hasanwayh was Amir Hossein; however, in fact, it was his son, Hasanwayh, who could emerge as the founder of this dynasty by expanding his territory and increasing his authority in front of his rivals» (Dehnavi, 2014, p. 106). Hasanwayh died in 369 A.H. in Sarmaj Castle (Dehnavi, 2014, p. 108). His sons «Abul Alaa», «Abdul Razzaq», «Abul Njam Badr», «Abu Adnan Bakhtiar» and «Abdul Malik» left. Among them, only Badr was appointed. He could come to power with the help and support of «Adud al-Dawla». Badr obeyed him during Adud al-Dawla's lifetime. After the death of Adud al-Dawla and the rise of «Samsam al-Dawlah», Badr strengthened the foundations of his power and reached the peak of his power during the reign of «Baha al-Dawlah». According to «Ibn al-Athir»: the work of Badr bin Hasanwayh gained great dignity and was nicknamed Nasir al-Din and Nasir al-Dawlah from the Caliph's Court (Ibn al-Athir, 1972, pp. 275-15). «Badr, the son of Hasanwayh, reached the peak of his power in 388 A.H. During his rule, he paid special attention to construction and development affairs, and in Lorestan, he built several big bridges over the Keshkouh and Samira rivers, whose ruins remain with inscriptions in Kufic script» (Izadpanah, 1997, pp. 145-146).

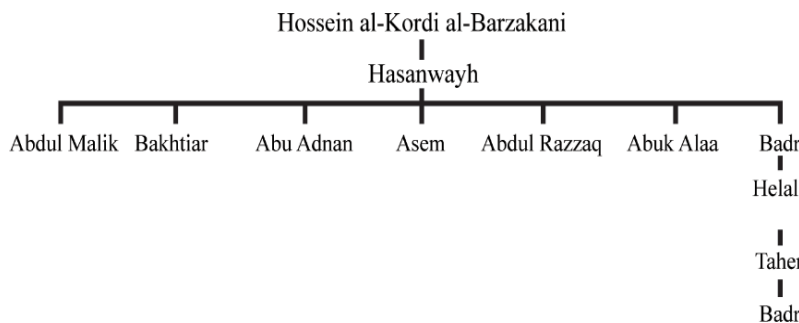


Chart 1. Bani Hasanwayh's genealogy. Source: Zambaver, 1977, p. 321.

Stone Inscriptions of Bani Hasanwayh

In total, five stone inscriptions belonging to the period of Bani Hasanwayh rule are introduced:

1. Stone inscription of Kalhor Bridge¹: The first inscription obtained from this period is the inscription of «Kalhor bridge»² on the Kashkan River, dated to 374 A.H. (See Figure 1). Two similar stone tablets, the eastern one has been destroyed, but the western one is still present and the type of inscription is «Ehdathieh»³ and they are on the rocks on both sides of the Kalhor bridge, on the Kashkan bridge, in the north of the Mamoulan village near Khorramabad (Blair, 2015, p. 81). This building has been recorded in the list of national works of Iran under number 2586. «This tablet is engraved with five lines of Movaragh Kufic script, and this pair of stone tablets is the first remaining inscriptions of Badr bin Hasanwayh, the son and the most famous member of the Hasanwayh dynasty. Badr made Shapurkhashat (present-day Khorramabad) the center of his government and ruled over the entire mountain from «Gundeshapur» (near Dezful) to the eastern Mesopotamia. He could maintain his power for about thirty-five years (from 369 to 405 A.H.) because of his service to Daylamites» (Parviz, 2020).



Figure 1. Stone inscription of «Kalhor» bridge, 374 A.H., handmade by «Hertzfeld»- 1928 A.D. Source: Parviz, 2020.

In the Kufic inscriptions, all the letters and words are placed consecutively and one after the other on the baseline; However, in the inscription of the Kalhor bridge, this principle is not observed. It seems that the scribe did not have enough skills or that he had another goal. At the end of the inscription, the artist faced the problem of lack of space to place the text and put the words on each other. Sometimes, a word from the text of the inscription is missing, and the scribe has placed it between the lines. Writing letters and words together in this way does not exist in other inscriptions, and the sequence of words in this inscription does not follow a specific order and reason; Also, the irregularity of the distance between the lines of the baseline has confused the overall composition of the inscription and made it difficult to read⁴ (See Figure 1). Using multiple baselines in writing words (such as writing complex words in round lines) is one combination that can be seen in some inscriptions of Bani Hasanwayh and also of the Buyids; such as the words «النجم» and «الحسين» in the Kalhor bridge inscription (See Table 1). Letters, (م), (ن) have upward sequences. The tips

of the sequences (د، ج، ن، م) reach a two-lobe form. The letter (م) in بسم has two lobes and (م) and first (س) are decorated with a palmetto.

Table 1. Base line in Kalhor bridge inscription. Source: Authors.

		
<p>Fakhr al-Dawla, 374 A.H., www.zeno.ru</p>	<p>Ghelichkhani, 2013</p>	<p>The words الحسين and النجم</p>

2. Stone inscriptions of Hasanwayh water storage: The second inscription studied in the current research is related to a water storage dated to 375 A.H. in the ruins of «Shapourkhashat» which was found near Khorramabad (See Figure 2). This is a stone tablet with two inscriptions⁵ engraved in Movaragh Kufic⁶ script: a. The band around the frame and b. inside the frame. The type of inscription is Ehdathieh. «This inscription, like the previous one, cannot be understood from the text of the building they built; It is possible that it was a water storage; Because, according to Rouzarvari, Badr bin Hasanwayh, he had spent a lot of money on building water reservoirs» (Blair, 2015, p. 82). This inscription has a peripheral band and intensive plant motifs fill the main frame. They didn't limit themselves to the two-lobe form and placed three-lobe forms on dents of (ب) and (س). «The inscription has a beautiful and elegant writing style. Although it follows Kalhor bridge inscription in terms of content, it is more detailed than that. It has a band around it, and the pattern of two lotus flowers in a raised and dome-like shape fills the main frame» (Parviz, 2020).



Figure 2. Hasanwayh Water Storage Inscription, 375 A.H., photo and execution by Ahmad Parviz. Source: Parviz, 2020.

In the structure of the letters of this inscription, the scribe followed the inscription principles as if his hand was familiar with inscription writing. Having basic similarities with other Bani Hasanwayh inscriptions, the visual structure of the letters in this inscription has features that distinguish the character of the letters and words in this inscription. The height of the letters is almost the same in all the inscriptions, and even letters such as (س), which are short letters, besides stretching in the vertical direction and combining with decorative elements (a two-lobe form), are of the same height as other vertical letters such as (الف). In a way, the artist has tried to fill the entire inscription by stretching the letters vertically and adding decorative forms and combining simple nodes with the letters. With the presence of the two-lobe form, the letters have varied in thickness and have given rhythm to the structure

of the same height as the inscription letters. The artist did not write identical letters in the same way; Like the letter (س) (See Table 4). It is as if the letters borrow their form from the form of the letters before and after them, as well as their position in the inscription. The letters and decorative elements in this inscription have a more consistent order and visual structure compared to other Bani Hasanwayh inscriptions.

3. Kashkan Bridge stone inscriptions: Another inscription belonging to this period is related to Kashkan bridge⁸ near Khorramabad (See Figure 3). «According to the inscription that fortunately remained from the Kashkan bridge and is now kept in the «Falakol Aflak» castle, this bridge is attributed to «Abunjam Badr bin Hasanwayh» and its construction took place during 389 to 399 A.H. in ten years (Sajadi, 2002, p. 241). «Stone inscription with seven lines of Movaragh Kufic⁹ and the type of inscription is Ehdathieh. The inscription is based on the model of the previous two inscriptions of Badr bin Hasanwayh; however, here the stone inscription is bigger and hence the text is more detailed. They have written بسم الله in full and have given the date of issuing the order and the date of completion of the work. An interesting point is that in this inscription there is no mention of Badr bin Hasanwayh's title, Naser al-Dawlah. This title was given to him by the Caliph in 388 A.H. at the request of Bahalduleh Dailami. In the design of this inscription, it can be seen that the style of the script is like the Movaragh Kufic of the two previous inscriptions; With those two-lobe leaves on the capital letters and the palmetto that is on the head of (م). In addition, two (ل) have placed palmetto in الله» (Blair, 2015, p. 106). The letters (الف) and (ل) which are articles in the Arabic language and are repeated several times as Shahadat verse and the word الله, inspired and encouraged artists to find ingenious ways to intertwine them (Schimmel, 2010, p. 37).



Figure 3. Inscription of Kashkan Bridge, 399 A.H., photo and execution by Ahmad Parviz. Source: Parviz, 2020.

The Kashkan bridge inscription is written in a few lines, just like the two Kalhor bridge inscriptions (See Figure 1) and Hasanwayh bridge (See Figure 6). The distance between the lines is such that the stretching of the vertical letters did not interfere with the lines. Identical letters are written similar to each other, but they do not exactly match each other in form. For example, the shape of the dents. With all these descriptions, the overall spirit of the inscription is coherent and the elements have unity in form and shape. The growth and movement of two-lobe forms of letters and lines has caused the entire surface of the inscription to be filled with motifs and words. The combination of motifs and letters in the

negative spaces of the inscription has created a fluid and fluent combination. The weight¹⁰ of letters is not much compared to the inscription of Hasnawayh bridge, which is more similar to this inscription. The lack of writing principles for the form of letters has caused a decrease in readability. Like the variation of the height of the dents, there is no fixed rule for the ratio of the dents to each other and to other letters.

4. Stone inscriptions of Sarmaj Castle: Two pieces of stone decorated with Kufic script were found in the village of «Sarmaj»¹¹ preserved in the Museum of Ancient Iran (No. 3280). Four other similar pieces of stone decorated with Floriated Knotted Kufic script were obtained, two pieces are on top of the «Chehr»¹² bridge and the other two pieces are in the cemetery of Shah Abad «Sofla»¹³ village. In total, there are six pieces of broken rectangular stone in Sarmaj Castle (Chehri, M. & Chehri, R., 2017, p. 182) (See Figures 4 & 5). On each piece, there is a decorative band 50 cm wide, 20 cm of which are inscriptions in Movaragh Kufic, above the inscription is a rosary band, 10 cm wide, and above that is a band with the jag motif, 20 cm wide, and the type of inscriptions are Quranic¹⁴. It seems that all six stones were in one building; Because all of them have similar inscriptions and decorations. One or two words of inscriptions remain on each stone. It appears that the short phrases are from the Qur'an. The text of the inscription on one of the stones¹⁵ is بِسْمِ اللّٰهِ, which was written in a very ornate script. (الف) and (ل) have come together in الله above and an arch has appeared between them. It can be seen from the style that these stones are the work of the early Islamic period. At that time, Sarmaj was the castle of Bani Hasnawayh near their throne, Dinawar. In these Movaragh Kufic inscriptions, like the previous inscriptions, the end of the letter (م) is written with a swan-neck form leading to a two-lobe form. In the inscriptions of Kalhor bridge, (هـ) is written with two holes next to each other and a palmetto is placed on it. Of course, there are more letter decorations and circles next to that palmetto. Between the previous two inscriptions of the bridges, there is a palmetto sitting in the middle of (الله) (Blair, 2015, pp. 109-110). «Around the inscriptions, two rows of decorative geometric motifs as overlapping triangles can be seen with a large circle and a hole in the middle in the shape of an eye. Regarding the triangles and the space between them, the artist has fully observed the dimensionality and giving them depth» (Chehri, M. & Chehri, R., 2017, p. 183). In the inscriptions of Bani Hasnawayh, different styles of calligraphy have been used at the same time. Besides the Qur'anic inscriptions, the intertwining of letters can also be seen in the inscription of the Sarmaj castle and water storage. Sarmaj inscriptions were installed in private property and they did not intend to convey a message, so they made these inscriptions very elaborate and somewhat complicated. Blair believes that the script style partly depends on the content of the text. In fact, historical texts were written in simple and readable scripts, and prayer, religious, and Quranic texts were written in elaborate, complex, and floriated scripts. Inscribed stones of Sarmaj are strange and unusual; So much so that it is not possible to say clearly where they were located (Blair, 2015, pp. 110-112).



Figure 4. Stone inscription discovered in the historic area of Sarmaj. Source: Moradi, 2018, p. 177.



Figure 5. Sarmaj inscriptions. Source: Moradi, 2018, p. 177; Chehri, M. & Chehri, R., 2017, p. 1839.

5. The stone inscription of the Hasnwayh Bridge: The last inscription is related to the stone inscription of the «Hasnwayh bridge»¹⁶ of 404 A.H., a stone tablet with five lines of Kufic script, which is now kept in Imamzadeh Zeyd in the west of the Khorramabad Grand Mosque (See Figure 6). The type of inscription is Ehdathieh. The general style of the inscription is the same as the previous inscriptions of Badr bin Hasnawayh. «In this inscription of Badr, a new title has been found: Mawla Amir al-Mu'minin (مولی امیر المؤمنین). The date of the inscription is one year before Badr's death. The structure of the inscription is more or less disordered compared to the first inscription of the Kalhor bridge, which was very uniform. An example is that (لی) has been lost in مولی, and that is the reason Sotoude called this inscription telegraphic. It cannot be attributed to the building where the inscription is installed. Because the construction date of this building is 950 A.H. Based on the comparison of this inscription with other inscriptions of Badr Hasnawayh, it can be attributed to a bridge or another public building» (Blair, 2015, p. 131).



Figure 6. Inscription of Hasnwayh bridge, 404 A.H., photo and execution by Ahmad Parviz. Source: Parviz, 2020.

The thickness of the written forms of the text of this inscription does not follow a fixed pattern. The form of the letters is thicker compared to the inscription of Kashkan bridge (See Figure 3), which makes the space of the inscription appear darker and denser. The general form of the inscription is like those of this period, and the overall composition of the inscription seems harmonious, but the quality of the writing is not the same throughout the entire surface of the inscription, the connections of the letters in the final parts of the text are delicate and inconsistent with other parts of the inscription. The dissimilarity of the form in identical letters is quite clear, and the basic principles of writing have not been paid

attention to in them; For example, the form of the letter (ن) with an upward extension is in the swan-neck form, but none of the forms of this letter in this inscription are completely similar (Table 2). The letters (و) and (ر) which are combined with a swan-neck form are not written similarly to each other. In Kufic inscriptions, sometimes the artist may have used a letter of several forms to obtain a beautiful composition, but in this inscription, a letter with a specific form is not written the same. The inscription on Hasanwayh bridge is more similar to that of Kashkan bridge compared to other inscriptions.

Table 2. The comparison of letters. Source: Authors.

و	ن	ن	ن	ر	ه	ه	The Space between letters and words

The form of letters in the stone inscriptions of Bani Hasanwayh

Artists of the early centuries designed exquisite types of Kufic script and used them in various works. This script was not separated from the decorations (Khazae, 2002, p. 4). Apart from the decorative aspect and arrangement of the building, the inscriptions have great historical and religious importance and can clarify the unknowns of many characteristics of the related artistic period. In addition, Arabic and Persian scripts have created beautiful works over the centuries because of the quality of their letterforms in various applications, along with plant decorations or connecting to them (Shayestefar, 2019, p. 99-100). In the meantime, knowing the form of letters in different periods can clarify a part of the puzzle and mystery of the evolution of the letterforms. Forms that represent the writing method and style of their time in each period. In the era of the Buyid, inscription has special conditions, in a way, it has found its place in the art of its time and can be seen in almost all inscription works; so that the distinguishing feature of the art of the early centuries of Islam, as well as the Buyid and before Islam, is the use of inscriptions. The inscription works of the Bani Hasanwayh period is not separate from the development and evolution of the formal art of its time, i.e., the Buyid era. As it was said, the interactions and connections between Hasanwayh and the rulers of the Buyid have created a link between the art of these two. In some coins of Hasanwayh rulers, the names of the kings of the Buyid were minted (See Figure 7). In order to better understand the letter forms in the inscriptions of Bani Hasanwayh, besides the separate study of the letters of the inscriptions in this part of history, their comparison with the letter forms in the inscriptions of the wooden tablets of Adud al-Dawla 363 A.H. is discussed (See Figure 8). What is considered recognizing the letters in the inscriptions of Bani Hasnawayh is the shape of the letters. To this aim, it is necessary to pay attention to the knowledge of the features of the shape and form of the letters in the inscriptions and the extent to which the shape of the letters is in line with the reading and follows their original form. The shape characteristics of letters are important for identifying each letter. As it was mentioned, «horizontal, vertical, inclined, circular, combined, etc. movements are distinct in original scripts and have caused a great variety of forms. This issue is more noticeable in Kufic scripts, which do not have fixed and specific writing principles. In Islamic scripts, single letters in combination with each other in a word are generally placed in three positions: either at the beginning of the word, in the middle, or at the end of the word. A change in the location of a letter in a word is generally accompanied by a change in the letter's shape. Therefore, according to the type of letter and

its location, sometimes the letters have many differences with their singular forms in terms of shape, if sometimes, there is no similarity between the singular letter and its function in the word; While all letter forms have identical tone. Like the difference between (س) and (سـ), which are very different in terms of form definition. In the shape's study of the letters, it can be seen that there are similarities between parts of the letters, meaning that some parts of one letter are exactly repeated in other letters and cause the similarity of a part of two or more letters with each other» (Afshar Mohajer, Salehi, & Farid, 2016, p. 46).



Figure 7. The name of Shams al-Dawlah on the coin of the era of Badr bin Hasanwayh, 402 A.H. Source: <https://acsearch.info>.



Figure 8. Adud al-Dawla wooden tablets, 363 A.H. Source: O'Kane, 2006, p272.

Individual study of letters

The letter (الف) is always static and in the same form (Abu Bakr Muhammad Bin Seraj, 2009, p. 10). «The first form of the Islamic alphabet is the letter (الف), which has a static and vertical status in all pre-middle and after-word positions, this point is actually the identifying feature of this letter. الف has a constituent part that sits on the baseline in many scripts. The letter (الف) in connectors deals only with the letters before it, and in this case, it also maintains its shape characteristic» (Afshar Mohajer et al., 2016, p. 46). The letter (الف) in the inscriptions of Bani Hasnawayh has kept its vertical position and has an external appendage similar to the inscription on the wooden tablet of Adud al-Dawla. The end of these letters is a decorative element of two-lobes form, and sometimes, it is combined with a similar shape, i.e. a hand-fan shape (See Table 3).











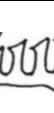





Table 3. The form of letter الف. Source: Authors.

Kalhor bridge	Hasanwayh water storage	Kashkan bridge	Sarmaj castle	Hasanwayh bridge	Adud al-Dawla wooden tablet

The small letter (فـ) is studied on behalf of the letters (فـ فـ فـ). These letters in the Iranian Islamic alphabet follow fixed shape characteristics and their difference is in the location of the dot (Abu Bakr Muhammad Bin Seraj, 2009, p. 10). In the explanation of this letter, it should be said that the horizontal or lying state is the most important indicator for identifying the letter (فـ) as singular and the last letter of the word. In case of small (فـ) which is a part of main (ف), the similarity between small (فـ) and main (ف) is only in the beginning

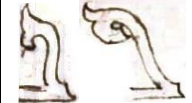




of this letter (Afshar Mohajer et al., 2016, p. 47). Small (ب ن) are not similar to their form in singular. «Letter (س); by tracing the manuscript samples left from the early Islamic centuries until around the fifth and sixth centuries A.H., it can be stated that the only distinguishing feature of the letter (س) is the presence of its three dents. In single letter and after-word positions, there is a round movement in the continuation of this trident, which is not worth reading» (Afshar Mohajer et al., 2016, p. 50). In the inscriptions under study, there is only a small (س) and because of the similarity of the dents of (س), they are placed in the same section with letters (ت ث ف ي). In all inscriptions, the form of the first dent next to a letter, such as (س) or other similar letters to (س), does not follow a specific rule. Based on the need of composition, the scribe makes the first dent sometimes equal and sometimes shorter, and sometimes in a stepwise manner compared to the adjacent dents or a letter like (س). The combination of adjacent dents is very diverse and expressive based on the combination of letters and words next to the height of the dents. The dented letters are like the diagonal cut of the dents in the Adud al-Dawla inscription. The adjunction of the two-lobe form can be seen in the Hasanwayh water storage inscription and the Sarmaj castle in connection with the dents (See Table 4).

Table 4. The form of the letter س, dented letters ب, ن. Source: Authors.

Kalhor bridge	Hasanwayh water storage	Kashkan bridge	Sarmaj castle	Sarmaj castle	Adud al-Dawla wooden tablet	Form of dents	
							
							






The circular and curved movements in the letter (ح), along with the horizontal structure, have created two opposite movements that have reached relative balance and harmony together (Alibeygi & Charei, 2009, p. 15). The horizontal back-and-forth movement in the first part of the letter (ح) is the most important identifying feature of this letter, which is written in the Hasanwayh stone inscriptions in line with the vertical letters and in combination with the swan-neck form. It also represents the letters (خ, ج). Letters that are distinguished by dots, and because of the absence of dots in inscription works, it has become illegible or hard to read. In the text of the previous inscriptions, in the present study, the capital letter (ح) is not used. The general form of the letter (ح) is the same in all the inscriptions in this research and they are drawn in a curved movement in the vertical direction under the adjacent letters. This form is present on the wooden tablets of the Adud al-Dawla and it is very similar to the inscription of Hasanwayh bridge. The letter (ح) in the inscriptions of Kalhor bridge, Hasanwayh water storage and Kashkan bridge is accompanied by a decorative two-lobe form (See Table 5).

Table 5. Letters ح، خ، ج. Source: Authors.

Kalhor bridge	Hasanwayh water storage	Kashkan bridge	Sarmaj castle	Hasanwayh bridge	Adud al-Dawla
			-		

«The general structure of the letter (ح) is usually two parallel lines that are placed on the baseline and are connected from the right side, and in its upper line on the left side, there is an appendage to the right side. In different writings, the change of the length of these letters can be seen on the baseline» (Alibeygi & Charei, 2009, p. 15). «The letter (ح) is very similar to the first parts of the letter (ج) in terms of the stroke of the pen, because it comprises two parts from left to right and right to left, which is written in different scripts with different slopes. In the Kufic script, the difference between this letter and (ج) is in its split angle and open mouth» (Afshar Mohajer et al., 2016, p. 48). The form of the base of the letter (ح) is the same as the form of this letter in the wooden tablet of the Adud al-Dawla; with the difference that in the inscriptions of Bani Hasnwayh, it is combined with exaggerated decorative elements. The sickle-shaped rotation of the upper part of the letter (ح) that ends in the two-lobe form is very interesting, and in the inscriptions of the Kalhor bridge, Hasanwayh water storage, and Kashkan bridge, it is clearly visible. A simpler example of this form can be seen in the inscriptions of the Hasanwayh bridge and the wooden tablets of the Adud al-Dawla (See Table 6).












Table 6. Form of the letter ج. Source: Authors.

Kalhor bridge	Hasanwayh water storage	Kashkan bridge	Sarmaj castle	Hasanwayh bridge	Adud al-Dawla wooden tablet
	 Reconstructed form		-		

The letter (ج) is explained in this section because of its similarity with the letter (ح) in writing. «Some letters in the Islamic alphabet comprise small, round parts. According to each script, the space between these round shapes can be closed or open (in the traditional expression of eyeless and eyelet movements). The first part of the letter (ج) is also composed of these microforms. The letter (ج) can be identified from the oblique movement that tends downwards from the right side of the first piece (round). The space under the first letter is very important because there is no space under the circular shape in Kufic inscriptions. Like the previous two examples of (ح) and (س), the letter (ج) can be connected only after-word position» (Afshar Mohajer et al., 2016, p. 50). The letter (ج) has a neutral structure compared to horizontal and vertical. Also, according to the curved movements corresponding to the circle, it is among the circular letters (Alibeygi & Charei, 2009, p. 15). The simple and undecorated form of the letter (ج) in the Kalhor inscription is like the Adud al-Dawla wooden tablet, with the difference that in the Kalhor inscription, this letter has a slight curve. One of the most important features of these two letters in the inscriptions of Bani Hasanwayh, except for the Kalhor bridge inscription, is their combination with a swan-neck shape and





height with vertical letters, which has caused the letter (و) to be like (ق) and reduced its readability or it has created ambiguity in the identification of these letters. The form of the letter (و) in the inscription of Kashkan bridge has completely deviated from the principles of writing this letter compared to other inscriptions and has changed its form in line with the combination of adjacent forms; it is difficult to identify it individually (See Table 7).

Table 7. Form of letters و، و. Source: Authors.

Kalhor bridge	Hasanwayh water storage	Kashkan bridge	Sarmaj castle	Hasanwayh bridge	Adud al-Dawla wooden tablet
			-		
					

The long stem of the letter (ط) is distinguished from the letter (ص) and has the same height as the letter (الف) (Alibeygi & Charei, 2009, p. 15). The vertical form of the letter (ط) in the Kufic script is used to create different forms compared to the letter (ص). This vertical movement is an essential part of reading this letter. «The long sequences of letters (ك) and (ط), which were obviously extended (extensive) in the early Kufic script, receive long elegant shamareh to the right» (Schimmel, 2010, p. 34). The stem of the letter (ط) in the inscriptions of Bani Hasnwayh has a swan-neck shape, similar to the to the Adud al-Dawla wooden tablets, whose extension ends in the two-lobe form. However, in the inscription of Kalhor, this letter is written with a vertical stem leading to the shape of an arrow (See Table 8).

Table 8. Form of the letter ط. Source: Authors.

Kalhor bridge	Hasanwayh water storage	Kashkan bridge	Sarmaj castle	Hasanwayh bridge	Adud al-Dawla wooden tablet
	-		-		

«The letter (ع) has two different indicators in different places. This means that in single letters and pre-word position, a circular movement with a wide opening towards the right is its identification feature, and in middle-word and post-word position, it has a triangular shape facing downwards, which can have a hole. In single letters and post-word position, the letter (ع) with round movement has a wide opening to the right» (Afshar Mohajer et al., 2016, p. 52). The effective part of its readability is completely above the baseline (Alibeygi & Charei, 2009, p. 15). In most of the Kufic inscriptions, the letter (ع) has the most variety compared to other letters; however, in Hasanwayh stone inscriptions, it has a simpler form than other letters. Only in the inscription of Kashkan bridge and the inscription of Sarmaj castle, it has a decorative aspect, and also this letter is written in the Adud al-Dawla wooden tablets, completely simple and geometrically (See Table 9).

Table 9. Form of letters ع، ع، ع، ع. Source: Authors.

Kalhor bridge	Hasanwayh water storage	Kashkan bridge	Sarmaj castle	Hasanwayh bridge	Adud al-Dawla wooden tablet

The first part of the letter (ع) has a round shape that is common in all its writing modes, and the second movement is taken from the letter (ب) and has no reading value (Afshar Mohajer et al., 2016, p. 53). It should be mentioned that the space and hole inside the first part rarely deviated from the semi-circular form, and often the letter (ع) is written simply and sometimes the second movement of this letter is written without stretching. The form of this letter in the inscriptions of Bani Hasanwayh is like the Adud al-Dawla wooden tablets, simple and devoid of decoration. The letter (ق) is also similar to the letter (ع) in terms of morphological features. When it is written separately, it curves downwards (Abu Bakr Muhammad Bin Seraj, 2009, p. 14). Because of its circular shape, the second part of the letter (ق) is written, in most cases, similar to other circular letters, such as (ل), (ن). The capital letter (ق) is not used in these inscriptions. The variety of the form of this letter can be seen because of the combination with the nail-like form and the extension in its circular form. The nail-like form is associated with the letter (ق) in the inscriptions of Kashkan and Hasanwayh bridges. While in the Adud al-Dawla wooden tablets, the circular form of the first part of this letter has taken on a stretched triangular shape, and in the inscription of the Kalhor bridge, it is written with some sharpness (See Table 10).


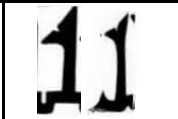
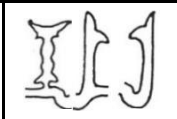


Table 10. Form of letters ف، ف، ف. Source: Authors.

Kalhor bridge	Hasanwayh water storage	Kashkan bridge	Sarmaj castle	Hasanwayh bridge	Adud al-Dawla wooden tablet
	-		-		
	-		-		

The letter (ل) has a longer movement than the letter (الف) and the circle shape of (ن) and has a split shape in many scripts. Of course, the identification index of this letter, especially in the pre-word and middle-word position, is only its first part (Afshar Mohajer et al., 2016, p. 54). «The coordinated movement that results from the combination of horizontal letters with vertical letters in this letter prevents boredom and eye fatigue; Because the combinations of letters in terms of verticality and horizontality and their connection to each other are made according to the scribe's taste. This shows the flexibility of the letters and the calligrapher can make them into any shape he wants» (Alibeygi & Charei, 2009, p. 8-9). The second part of the letter (ل) is the same as the letter (ن) in the Adud al-Dawla wooden tablets, meaning that its circular form is not complete. This form is observed with a slight curvature in the inscription of the Kalhor bridge. In other inscriptions, the two-lobe form is connected to the first and middle form of the letter (ل ل) and the U-shaped connection is used to connect this letter with its adjacent letters, except for the Kalhor bridge inscription.

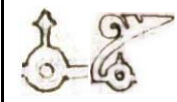


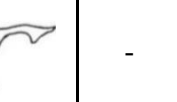

In the Kashkan bridge inscription, this letter is out of its straight and vertical position (See Table 11).

Table 11. Form of letters ج, ل. Source: Authors.

Kalhor bridge	Hasanwayh water storage	Kashkan bridge	Sarmaj castle	Hasanwayh bridge	Adud al-Dawla wooden tablet
			-		

In the letter (ج), there are two constituent parts: the round movement and the movement of (الف) which is connected only in the single letter and after-word position and to the left side of the circle and then it is drawn down. This movement can be rotated from horizontal to vertical, which can be seen from the range of Kufic to Shikasta scripts. The concern of the similarity of this letter to the letter (س) is clearly clear in the description of an old treatise that has survived from the 4th century: the only difference between the final (ج) or single (ج) and the letter (س) is that (ج) is a small circle which is attached to the head of a curved line and the curvature is like its back and waist, but (س) is a small circle which is attached to the head of a curved line and the curvature is like its belly (Abu Bakr Muhammad bin Seraj, 2009, p. 16). «The identification index of the letter (ج) is its first part and its shape can be from circle to square. Most of the time, this part is placed downwards in relation to the horizontal line or the baseline» (Afshar Mohajer et al., 2016, p. 95). The letter (ج) has appeared in various forms in the stone inscriptions of Beni Hasanwayh. Unlike the downward movement of the end of (ج), this letter has been connected to a swan-neck shape with vertical lines. The nail-like form is also seen above the letter (س) and (ج). This can also be seen in the wooden tablets related to the period of Adud al-Dawla 363 A.H. Decorative motifs play a key role in the written forms of this letter in the inscriptions of Bani Hasanwayh. The nail-like shape above the letter (ج) is more decorative and complicated than the wooden tablets of Adud al-Dawla (See Table 12).







Table 12. Form of letters. م، ن، هـ. Source: Authors.

Kalhor bridge	Hasanwayh water storage	Kashkan bridge	Sarmaj castle	Hasanwayh bridge	Adud al-Dawla wooden tablet
			-		

The semi-circle or semi-oval shape facing upwards is the most important identification feature of the letter (ن), which is the starting point of the second movement of many other letters. Of course, the most significant feature of identifying this letter in pre-word and middle-word position is a dent at the beginning of this letter (Afshar Mohajer et al., 2016, p. 55). «The difference between (ن) and (س) at the end of the word is that (س) is reversed and (ن) is bent» (Abu Bakr Muhammad bin Seraj, 2009, p. 16). In these inscriptions, circular letters such as (ح, ل, ن) are placed on the baseline and it plays a constructive role in maintaining the force as the letters above the baseline; However, in the two wooden tablets







of Adud al-Dawla and the Kalhor bridge inscription, the extension of circular letters like (ن، ج) and also letters like (و، و) are extended below the baseline. The form of the letter (ن) in the wooden tablet of Adud al-Dawla is simple and geometric, like the letter (ج، ج). The form of this letter is repeated in the Kalhor bridge inscription with a little more curvature. However, in other inscriptions, by connecting the swan-neck form, it creates a similarity with the forms (و، و) and in the Hasanwayh water storage inscription, it is combined with a heart-shaped knot and a two-lobe form (See Table 13).

Table 13. Form of letters ن، ن. Source: Authors.

Kalhor bridge	Hasanwayh water storage	Kashkan bridge	Sarmaj castle	Hasanwayh bridge	Adud al-Dawla wooden tablet
					

The letter (ا) may be said to be the smallest letter in Islamic letters: a closed circle with an space in between. The beauty of this letter is so much that if an extra element is added to it, it resembles a letter like (م). The difference between (ا) and (م), both of which are originally circular, is that when (ا) is placed at the beginning or middle of the word, it is split in half with a line in the middle. For this reason, it cannot be confused with (م) and when they are placed at the end of the word, the bending of (م) causes the difference between (ا) and (م) (Abu Bakr Muhammad bin Seraj, 2009, p. 16). (ا) and its types are among the letters that have the most diversity in writing in the Kufic script. The common feature of the letter (ا) in the inscriptions of Bani Hasanwayh is the nail-like form that is used along the middle line of (ه), it is present in the wooden tablets of Adud al-Dawla, but in the inscriptions of Bani Hasanwayh, it is connected to a two-lobe form corresponding to the preceding and following letters, and Also, the composition of the inscription has taken on a more decorative aspect (See Table 14). The last form (ا) is connected to the double-lobe form, sometimes with vertical letters of the same height. Floriated and leafy forms were used to fill the middle, bottom, and top spaces of the letters (Schimmel, 2010, p. 36). The letter of middle (ا) is written with two circles next to each other, and it is also written in this way in the wooden inscription of Adud al-Dawla.





Table 14. Form of letters ه، ه. Source: Authors.

Kalhor bridge	Hasanwayh water storage	Kashkan bridge	Sarmaj castle	Hasanwayh bridge	Adud al-Dawla wooden tablet
					

(ح), the back-and-forth movement, which is a moving three-part element, turns into a one-part dent in the middle-word position. Sometimes, in the same single letter, the first part (i.e. moving from right to left) remains fixed, and the second part continues its backward movement, which is called reverse (ح). The identification index of this letter can be its first and second part (back-and-forth movement) in single letters and after-word position. In the

after-word and middle-word position, the identification feature of this letter changes its shape to a dent (the same feature that occurs in the letters (ب) and (ن)). In these cases, the way to identify this letter from others is two dots in the sub-dents (Afshar Mohajer et al., 2016, p. 57). «In the Kufic script, the various forms of this letter are chosen and written according to the special space that the line has. The stretching of these letters on the baseline is the dominance with horizontal movement» (Alibeygi & Charei, 2009, p. 16). The letter (س) was not present in the inscriptions of Hasanwayh water storage and Sarmaj castle. In the inscription of Kalhor bridge, it is written in a simple reverted (س) and in the inscription of Hasanwayh, it is written completely similar to the wooden tablets of Adud al-Dawla, with an upward movement and then a reverse (س) movement. The reverse form of this letter in the inscription of the Kashkan bridge has a semi-circle form (See Table 15).









Table 15. Form of letter س. Source: Authors.

Kalhor bridge	Hasanwayh water storage	Kashkan bridge	Sarmaj castle	Hasanwayh bridge	Adud al-Dawla wooden tablet
	-		-		

The method of connecting letters

Among other issues on the shape of the letters is the way of connecting the letters to each other. The form of connecting the letters influences the shape of the writing. Two types of U-shaped connection and a simple connection can be seen in the stone inscriptions of Bani Hasanwayh. In the Kalhor bridge inscription, only a simple connection is used, and in the stone inscription of the Hasanwayh water storage, the U-shaped form is used as the letter connections. The U-shaped form can be seen in the connections of the individual parts of the letters in this inscription, even between the dents of the letter (س). It seems that the purpose of the scribe was to create a decorative form for this inscription. In the stone inscription of the Kashkan bridge, the U-shaped connection is often used and sometimes, a simple connection is used, and the connection in the stone inscription of Sarmaj castle is like the connection in the stone inscription of the water storage. Connections in the stone inscription of Hasanwayh bridge are in a state of ambiguity because of the lack of thickness and thinness as letters and words, so it is understood that both simple and U-shaped connections have been used in this stone inscription. But in the end, both types of connections have been clearly used in the wooden tablets of Adud al-Dawla (See Table 16).

Table 16. Letter connections. Source: Authors.

Kalhor bridge	Hasanwayh water storage	Kashkan bridge		Sarmaj castle	Hasanwayh bridge	Adud al-Dawla wooden tablet	
							
ثلثمائه	بسم	ثلثمائه	حمن		الله بقا	سبحان	حمن

In sum of the study of letters, it can be stated that in inscription, letters take unique forms in different connections. Although these forms follow the spirit of the time of their writing art, they have an independent and unique personality. In order to compare the overall form of the letters in the examined inscriptions, three words (الله، لا و حسين) which are present in

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almost all the inscriptions are placed together in Table 17 and the forms of the studied letters are presented in Table 18.

Table 17. Comparison of the forms of (الله، لا و حسين). Source: Authors.

Kalhor bridge	Hasanwayh water storage	Kashkan bridge	Sarmaj castle	Hasanwayh bridge	Adud al-Dawla wooden tablet

Table 18. Form of letters in studied inscriptions. Source: Authors.

Letters	Adud al-Dawla wooden tablet, 363 A.H.	Kalhor bridge inscription, 374 A.H.	Hasanwayh bridge inscription, 375 A.H.	Kashkan bridge inscription, 399 A.H.	Sarmaj castle inscription, 370 or 390 A.H.	Hasanwayh bridge, 404 A.H.
الف						
The similarity of the form of the letter (الف) can be seen in all the inscriptions. The hand-fan shape at the end of this letter in the Adud al-Dawla wooden tablet has developed into the two-lobe form in other inscriptions.						
س and dented letters						
The dents of the letter (س) have a diagonal cut, and in the inscriptions of Hasanwayh water storage and Sarmaj castle, they end in a two-lobe form.						
ح، حـ						
In all the inscriptions, the stretching of the upper part of the letter (ح) can be seen vertically, and it is combined with a two-lobe form.						
د، دـ						
The sickle-shaped form in the upper movement of the letter (د) can be seen in all the inscriptions, by combining this form with a two-lobe form, more complex forms have been created.						
ر، رـ						
و، وـ						
The letters (و) and (و) in the Adud al-Dawla wooden tablet are geometric and simple. In the Kalhor bridge inscription, they have a slight curve, and in other inscriptions, the ends of these letters are combined with a swan-neck and a two-lobe form.						

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Letters	Adud al-Dawla wooden tablet, 363 A.H.	Kalhor bridge inscription, 374 A.H.	Hasanwayh bridge inscription 375 A.H.	Kashkan bridge inscription, 399 A.H.	Sarmaj castle inscription, 370 or 390 A.H.	Hasanwayh bridge, 404 A.H.
ط						
The vertical stem of the letter (ط) is combined with a two-lobe form by turning to the right, which is reminiscent of a sickle shape. Only in the inscription of Kalhor bridge, it is written completely vertically.						
ع، ع، ع، ع، ع						
The letter (ع، ع) has the most variety of form in the studied inscriptions and (ع، ع) has created a new form in the inscriptions of Hasanwayh bridge, Sarmaj and Kashkan bridges with a nail-like form.						
ف، ف						
The transformation of the form (ف) is not a fixed process, in the inscription of the Adud al-Dawla wooden tablet, it is drawn vertically, and in the inscription of the Kashkan bridge, it is associated with a nail-like form.						
ل						
In the course of its evolution, the letter (ل) has been slightly curved from a simple geometric form and combined with a two-lobe form in the inscriptions of the Hasanwayh water storage and the Kashkan bridge.						
م، م، م، م						
The letter (م) in combination with the nail-like form is in line with the form of this letter in the inscriptions of Adud al-Dawla , and in the inscriptions of Hasanwayh stone inscriptions, it leads to a swan-neck form in (م).						
ن						
The geometric form of the letter (ن) in the inscription of the Adud al-Dawla wooden tablet has changed to a completely curved form in the inscription of Kalhor bridge, and in other inscriptions, the circular form of this letter is combined with a swan-neck form.						
ه، ه، ه						
The variation of the nail-like form can be seen in the combination with the letter (ه).						
س						
The letter (س) is similar in the Adud al-Dawla wooden tablet and the inscription of Hasanweyh bridge, and in the inscription of Kalhor bridge, it has an inverted form. In the inscription of the Kashkan bridge, it is combined with a swan-neck shape.						

Conclusion

By studying the form of the letters in the Bani Hasanwayh stone inscriptions, traces of the writing forms of the Adud al-Dawla wooden tablet were identified in these inscriptions, which shows that the western part of the Buyid series had more influence on the Bani Hasanwayh artists than the eastern branch (Jabal and Ray branch). According to the historical order of the inscriptions of Bani Hasanwayh, the stone inscription of Kalhor bridge, which was written ten years apart from the Adud al-Dawla wooden tablets, has the most similarity with these tablets, with the difference that the letters are more elongated vertically, the letters are more curved, and two-lobe forms are added to the letters. The form of the letters in the stone inscriptions of Bani Hasanwayh have more curvature than the form of the letters of Adud al-Dawla wooden tablets (with geometric forms and no decoration) and in combination with decorative two-lobe forms, nail-like and swan-neck forms, they have obtained more complex forms. These decorations have influenced the visual features of Bani Hasanwayh stone inscriptions and increased its decorative aspect. One of the most important features of Bani Hasanwayh stone inscriptions is that the letters do not extend below the baseline, and the scribe wrote on the baseline, even the letters that normally extend below the baseline, such as (ن, و, ل, ج). This is not observed only in the Kalhor inscription, like Adud al-Dawla wooden tablets period. In the Kalhor water storage inscription, because of the same height of the letters, it has the least variation of the baseline, and order and harmony can be seen between the letters and in the overall composition of the inscription. Kalhor bridge inscription has the most variety of baselines. This has given the inscription a catchy beat. In addition, the distance between the lines and the length of the lines is not equal. The inscriptions of Bani Hasanwayh bridge and Hasanwayh water storage have density and compression of letters and writing compared to other inscriptions, while almost the artist has tried to make the height of the letters the same. In all the stone inscriptions examined by Bani Hasanwayh government, the entire surface of the inscription is filled with letters. In these inscriptions, each word is not placed in a certain format, so the form of the letters between the previous or the next word is stretched and expanded. Decorative forms have filled the space between the letters like a flowing liquid. This has been done by combining letters with a two-lobe form, a nail-like form, and a swan-neck form. This has been made even at the cost of unusual changes as letters; forms that have caused a decrease in readability. In the inscription of Hasanwayh bridge, the written form does not fit into the principles of the inscription works. One of the most important features of letters in the inscriptions of this period is the change and transformation of the form of letters in favor of composition. Although the stone inscriptions of Bani Hasanwayh and Kashkan bridges follow the tradition of writing letters of their time, the letters were written without paying attention to legibility and the principles of inscription works. The thickness and thinness of the letters in all the letters of these two inscriptions are not the same. On the other hand, although the Kalhor bridge inscription did not follow the principles of inscription writing, it followed the tradition of writing letters. The letters are legible and the scribe has tried to make the writing form the same in all letters.

Acknowledgments

In the end, we are grateful for the guidance of Dr. Mohammad Khazaei, the corresponding author's advisor in the doctoral dissertation on the stylistics of the Buyids inscriptions, due to his valuable and influential comments in the article's process.

Appendix

1. «The historical area of the Kalhord or Kalhort bridge building, which is sometimes called Kalahor» (Parviz, 2020).
2. The text of the inscription: بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ هَذَا مَا اَمَرَ بِنَائِهِ الْاَمِیْرُ الْاَجَلُ ابُو النّٰجْمِ بَدْرُ بْنُ حَسَنُوْیْهِ بْنِ الْحَسَنِیْنَ اَطَالَ اللّٰهُ بِقَائِهِ (Blair, 2015, p. 80; Parviz, 2020).
3. «A large number of inscriptions are devoted to mentioning the history and founder of repairs. Some of these inscriptions are entirely specific to the description of these events, and some contain a religious text, at the end of which the history of the founders of the renovation or construction of the building is mentioned. However, the importance of both types of these inscriptions is because they provide information about physical changes. Usually, in the Ehdathieh inscriptions, after the mention of God and the prayer of the founder, the date of construction or renovation of the building and the names of the supervisors and the architect are mentioned» (Sahragard, 2016, p. 76).
4. «Readability is a general concept that includes both readability and legibility» (Afzal Toosi, 2016, p. 73).
5. The text of the inscription: بِسْمِ اللّٰهِ مَا اَمَرَ بِنَائِهِ اَمِیْرُ الْاَجَلِ ابُو النّٰجْمِ (بَدْرُ) بْنُ حَسَنُوْیْهِ؛ سَنَہٗ خَمْسَ وَ سَبْعِیْنَ وَ ثَلَاثَمِائَہٗ (Blair, 2015, p. 82).
6. Movaragh Kufic is the one where the spaces between the letters are filled by the curvature of the branches and leaves (Fazaeli, 1983, p. 153).
7. Dr. Ahmad Parviz, an archaeologist from Poldakhtar.
8. Kashkan bridge is located on 52 km west of Khorramabad city, on the ancient road from Shapurkhast to Tarhan, Simreh, and Sirvan, in a place called Ban Espi on the Kashkan river (Pirhayati, Pedram, & Anisi, 2019, p. 3). This bridge is on the route of the ancient roads from the north to Sirvan (Shirvan), from the south another branch of it extends towards Khuzestan (Sajadi, 2002, p. 245). The Kashkan bridge with east and west directions in its current state has fourteen pillars and is 235 meters long, connecting the two sides of the valley (Sajadi, 2002, p. 251).
9. The text of the inscription: بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ هَذَا مَا اَمَرَ بِنَائِهِ الْاَمِیْرُ الْاَجَلُ ابُو النّٰجْمِ بَدْرُ بْنُ حَسَنُوْیْهِ بْنِ الْحَسَنِیْنَ اَطَالَ اللّٰهُ بِقَائِهِ (Blair, 2015, p. 106; Parviz, 2020).
10. Weight, one of the characteristics of writing, is equal to the proportion of black surfaces on a white background (Afzal Tousei, 2016, p. 76).
11. Sarmaj is located in the southeast of Bisotun, a Sasanian area that was inhabited in the early Islamic centuries, one kilometer southeast of Bisotun (Blair, 2015, p. 108).
12. The Chehr bridge was built five kilometers west of Sarmaj on the Gamasiab river during the Pahlavi period (Chehri, M. & Chehri, R., 2017, p. 182).
13. The Shah Abad Sofla village is located three kilometers east of the Sarmaj village (Chehri, M. & Chehri, R., 2017, p. 182).
14. Najmabadi (an eminent Iranologist (1922-2016) believe; Based on the date written in Arabic, this stone inscription can be dated 370 or 390 A.H. He determined the age of these stone inscriptions (Moradi, 2018, p. 176).
15. «It seems that this stone has been placed on the right side of an entrance door. Because the inscription reaches a vertical strip with a geometric knot pattern composed of eight and five. It can be assumed that another one of these stones was on the left side of the same door; Because it starts with a vertical strip and the inscription is behind this strip. According to Najmabadi, the text of this inscription is الرَّحْمٰنِ (Blair, 2015, p. 108).
16. Text of the inscription: بِسْمِ اللّٰهِ هَذَا مَا اَمَرَ بِنَائِهِ اَمِیْرُ الْاَجَلِ ابُو نَجْمِ بَدْرِ بْنِ حَسَنُوْیْهِ ابْنِ الْحَسَنِیْنَ مَوْ (لی) اَمِیْرُ الْمَوْدِ اَطَالَ اللّٰهُ بِقَائِهِ وَ فَرَّغَ مِنْهُ فِی سَنَہٗ تِسْعَ وَ تِسْعِیْنَ ثَلَاثًا (لَهُ مِنْ بَعْدِ) عَشْرَ سَنَیْنَ اِثَابَہٗ اللّٰهُ عَلَیْہَا (Blair, 2014, p. 131).

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