

**COMPARATIVE STUDY OF ELEMENTS AND PROPRIETIES IN ORSIES OF
ZAND AND QAJAR PERIODS**

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ABSTRACT

In spite of every historical era, the Orosies (sash windows) in architecture have made some unique similarities and differences which have sensible influences on architectural ornaments. Diversity of spaces form has caused differences between Orosis in form, for example widespread use of Beam Ceilling in Qajar period has increased use of rectangular format in original frame in these windows. Gereh Sazi (making knot) was basis of formation Orosis in Iran. On the strength of present technology points in accessible historical samples, improvement and employment of skilled implements and modern stuffs have caused to emersion some styles such as Qavare Bori in Zand, and Parcheh Bori in Qajar period, which consequently have enhanced quantity of mass and types of decoration in sash windows in Qajar era. The result of this research is subjects related to its history, technology, proportions of forms and colors, cognition of evolution and development of figure and other aesthetic proprieties. Recognition and introduction of decorative elements, structural and colored proportions between Orosis of these two periods are the main purposes of this research, which can find a way for reviving and dynamism of this art in contemporary architecture.

KEYWORDS: Gereh Chini, Golden proportion, Orosi (wooden muntins), Zand and Qajar periods.

INTRODUCTION

Of the first glassy pore Versions, we can refer to some cases in the Choghazanbil temple that Girshman found many glassy pipes at this place. The glasses are made of black and white opaque glass rings and it seems that they were used in window. Of the other later cases we can refer to Galla placidia tomb in the city of Ravenna at Italy belonged to the three and fourth, A.D (Reyntiens. 1990). That the windows of this building are covered with stones of yellow mica. Usually before that, the meshy stone windows without glass were used in the buildings (Kianmehr, *et al.*, 2006). The oldest obtained kinds of lead muntins (Rose windows) at churches go to the seven century A.D. that is related to Cent pitter church near Vaticano. There are hundreds of painted colorful glasses at these churches It needs to be mentioned that in addition to the mentioned cases, one of the most common and outstanding decoration used in the Gothic period churches was drawing on the colorful pieces of glasses, so that the years of 1200 till 1250 A.D. are called golden period of lead painted Rose windows in Gothic and of its main kinds we can refer to the Notherdom church windows in Paris. Of course in churches (Moshtaagh .,2008), usually the painted glasses have stated religious aspect and refer to the life of Christ and Holy Maryam and his apostals that this religious aspect at art of sash windowsi in Iran is considered abstract. The abstract paintings used in these windows regarding the creation conditions of drawing, make special classification and proportions and as a result of the intelligence of the artists and balance and conformity with the general form of the building and other Constituents, these windows are made, so one example of these classifications we can even refer to the balance and conformity of the color of glasses and usage of colorful proportions. At church windows, because of certain conditions of painting and using figural representations, these divisions detach too much from the geometrical from so this issue itself affects color classification of the glasses and consequently the glasses have a non-geometrical form. Of course it should be mentioned that the lead painting Rose windows that is done at churches until now has been channeled to abstract from and even to a style like cubism, during the two recent centuries (Moshtaagh , 2008). In these Rose windows we see Some thick colors of golden and shinning blue and dark green and also dark red that show that artist at this period did not look for showing natural facts and mostly looked for showing the supernatural world. Gradually the propensity for using this decoration at Iran architecture became prevalent, but the necessary documents for knowing and identifying its background have not been presented now.

In some buildings of Safavid period some examples of this decoration are seen but considering the joining in some periods after that we cannot surely consider this period as the beginning of making the sash windows in Iran. Lack of background researches in wooden decoration depend on Iran architecture is visible and this research is gang to re find some typical samples of sash windows related to two periods of Zandid and Qajarid and their special characteristics by

comparative investigations of aesthetic proportions. To this end, from Zand period, The wide open window of central hall (called shahneshin (king accommodation)) at west side of Karim khan fort and from Qajar period the wide open window of central hall (called shahneshin) of Tehran religious leaders house will be studied.

BACKGROUND OF THE STUDY

Some researchers have studied the sash windows such as Mehdi Amraei (2004) at the Orosi book, the windows in front of light has referred to forms, joining method and also introducing some prominent masters of this art. It should be mentioned that in a collective article done by kiyanmehr and khazayen (2006) named concepts and numerical statement in putting a collection of geometrical form together at Safavidd period there is a refer of connection of this art with Iranian Gnosticism. Also in” the art of gereh sazi (Geometric wooden muntins) in architecture and carpentry” written by Shafaei (2001) and the book putting a collection of geometrical forms together in Islamic architecture and traditional arts by Zomorshidi (1986) also it is mentioned to the name paintings and method of Geometric pattern (gereh sazi), also it is necessary to say that in the book “sacred art” written by Bourkhardt (2010) it is referred to the intellectual aspects of the paintings in the Rose windows. Also in the book Rose window written by kaun (2005) he writes about history of craft and introducing lead muntins (Rose windows) from the beginning and in detailed about Gothic period , but at this article with a new perspective it studied craft , structural and decorative proportions in the sash windows (Orosi) and considering too much decorations at Zand an QAJAR periods on these cases also changing the general form of Orosi (wooden sash window) at this period the investigated types are chosen from these two periods. This article with a new look and the descriptive analytical method with direct observation of the writers attendance at both mentioned buildings (karim khan zand fort in shiraz and the religious leaders house in Tehran) and usage of library studies about making and history of wooden appendices depended to architecture , conformity and analyzing the mentioned Rose windows in 2 periods of Zand an. QAJAR are studied.

THE HISTORY OF SASH WINDOWS (ORSI)

By sash windows (Orosi)we mean the windows that due to stained glass by sash windows (Orsi)we mean the windows that due to stained glass and having organic and geometrical paintings have made a regular classification at the central hall (called shahneshin)of the house (Yavari ., 2008). , these kinds of windows because of stainedl glass have both decorative and functional aspects , making a veil between inside and outside space that in addition to entrance of light to the inside space is an insulation for preventing losing temperature and insects entrance to the inside (Amrayi., 2003).Besides , chipping the forms makes creating broken colorful spaces in the area that this problem itself can cause not seeing the inside space and is an emphasis to our internal architecture of our land (Pirnia ., 2011). One of the reasons of using plain glass at high parts and using stained glass at lower parts also can be this fact that the part that family members are doing daily affairs will not be seen from yard. Before extension of political and commercial relations between Iran and Urope at Safavid period we are not faced with examples of glassy pores. It is said that before entering glassy cups instead of glass, waxy colorful papers were used that were greased with oil , this caused the paper to be transparent and light could enter more. Some evidences are seen in Alighapu palace to prove this. During Safavid period with cultural transactions between Iran and Europe and the Venice expensive glass that came to king Abbas court too much stained glass imported to Iran´ s market so we can observe the prevalence of these glasses from the late periods of Safavid and Zand in Iran.

Most examples of usage of mesh geometrical classifications in carpentry craft are remained from Safavidd period that we can refer to examples Such as the wooden window of Ardebili sheikh safiodin grave, hasht Behesht, chehel sotun and Alighapu and the buildings in Jolfa Esfahan. The later examples of this art were used at Ilkhani and Teimori periods in making meshy windows (panjereh Moshabbak). (Zomarshidi. 1986). In addition to that of later examples of this art we can refer to the bold knot at mosque Jame Naein that belongs to seven century (Kianmehr ., 2008). OF course we observe the geometrical classifications from the earlier periods in some arts such as book decoration and acrography and brickworks but its prevalence in wooden making loop at Safavid period in building gigantic gates and Orosis (wooden muntin) of 3 doors and following 5 doors will explain to us the instrument improvement.

THE CONCEPTION OF PATTERNS IN SASH WINDOW

Wooden muntins include two main categories: rotating and angular patterns. These two patterns are technically classified to three series for example usually angular patterns are constructed by girih chini and rotating patterns are made by “parche bori” and “ghavare bori”. Here are explanations of mentioned technics.

Girih chini (junctions)

Wooden girih chini is a combination of geometrical shapes that are placed in a harmonious manner. Creation of a geometrical plane by wooden sections called "alat" is called girih chini. Alats (wood pieces) are interconnecting by tongue and groove joints (Reyntiens. 1990). According to the pattern, these sections (alat) create special motifs and symbols in the composition called "shamseh" (star) and mostly 8pointed star is used in Safavid era.

Laleh Bakhtiari has claimed number eight is an emphasis on eighth stage of suluk and Miss Mir Ahmadi suggests that in Safavid period eighth stage of suluk was more considered, maybe the artist invites all residents to holiness.

Perhaps the reason why constructors of sash windows, have chosen girih chini for theosophical conceptions is that geometrical patterns are the most abstract shapes and are beyond the nature. On the other hand they are stable because of angles and straight lines. We surely know geometrical shapes begin by a point and continue to countless sides. So they could be drawn and constructed unlimitedly. It must be claimed that lots of castes in Islamic period and specially in Safavid era were formed influenced by Sufi Chivalry way which have Islamic rules. Since apprentices must have learnt these rules and accept one of those castes to be able to learn any profession, we can easily observe the penetration of religion and beliefs in the art works specially sash windows.

Islimi bori or Ghavare bori

Along with the improvement of equipment, girih in girih sazi turned to rotating motifs and therefore girih were constructed in islimi patterns. These samples are titled "islami bori", which were applied in wooden architectural constructions appearing in late Safavid dynasty and were popular in Zandid and Ghajar era (Nikrooh. 2011). These motifs are in the centroid of frames of sash windows in the shapes of star and lilies.

Parche bori

The creation of this art has been in Safavid and Zandid era and they are mostly used as ornament in architecture in Ghajar era because of facilities improvement. This art such as other ones is impressed by naturalism in Ghajar dynasty and is more realistic. They were constructed by vegetal motifs sometimes arabesque (islami). Here is the technique: the pattern is copied on a rectangular piece of wood with 6 millimeter height, 5 centimeter width and 15 centimeter length, the pattern will become latticed, then the wood is cut to two sides, blank spaces are filled by stained glass and wood pieces are glued to both sides of stained glass again (Nikrooh., 2011).

STUDYING THE SASH WINDOWS AT ZAND PERIOD (the case study is karim khan fort)

Studying form of sash window at central hall (called shahneshin) of western side of karim khan fort)

The window of Central hall (called shahneshin) at west Side of karim khan fort is an example of a wooden window being and the orifice of hall with an arched roof. Using this kind of roof refers to the ideology and the culture of this land because from strutting point of view, building the hall with beam roof was UN accessible for the architectures. The Iran architecture history shows that about 2500 A.D (Amrayi.2003). at Takht Jamshid some huge and extensive halls with beam roof were made but we can say that popularity of ceiling after Islam was because of the Covered meaning at this kind of roof. Refer to the world creature at the highest point of these kinds of roofs is a refer to the world beyond material and spiritual and a refer to the origin of this world. Islamic architecture has tried to in vision the true and lasted nature and we can observe at the process of this finding and attempt the track of religious manifestation in all kinds of Islamic art including music , painting , Volume the attachments dependent on the building and finally the architecture itself .

Following the Safavid period architecture , using the arched roofs at Zand period was popular , using this kind of curve made the distance between two lateral walls at the side of weight tolerance of roof decrease and the Volume instrument increase and this problem itself made the pillars of two sides increase. The arched roofs in addition to pillars transformed their Strength to the earring roomii and this force transformation to the adjacent houses went on and using archway (called Sabaatii) in lanes was important for this reason (Pirnia, 2011). If archway (called Sabaat) was removed from lanes, the houses of that area would surely have been driven and this issue perhaps is one of the reasons of this quotation by deceased doctor Bagher Ayatollah Zadeh Shirazi :

"If a house ruins at the old texture then the whole texture will be lost". As the dependent Structures to the architecture are built in conformity with space we witness the 3 doors windows because of creating ting hall following the using of

roof that usually at QAJAR period due to the popularity of hall (shahneshin) with beam ceiling and consequently Creating larger space we observe 7 doors windows and 9 doors windows.

Usually presence of sash window sin the form of window on the beginning of the orifice of these halls has an effect on making a beautiful setting and colorful and spiritual space at the central halls.

Studying the dimensional proportions and Visual features related to the effect dimensions.

The original framework of the mentioned window is exactly a perfect special curve (called 'panjohaft'iv) with the proportion length to width 1/618, This framework has created a Golden ratio (Ayatollahi., 2011) . When we divide the original framework to the smaller frame works, in each sub collections we will face with the Same proportion. In both the original framework and in the framework related to each of the doors. The Centre of the rectangles diameters are in conformity with the important points , in the large rectangle we achieve a point at the Centre of main sun(star) and at the above framework we achieve a point that is the collided point of vertical and horizontal instrument of the brick shaped for, and this problem creates balance at the whole framework and it shows symmetry at the horizontal and vertical and Vertical side of door and also the Vertical axis of the whole and of these points shows the perfect and artistic sight of creator (Fig.1).

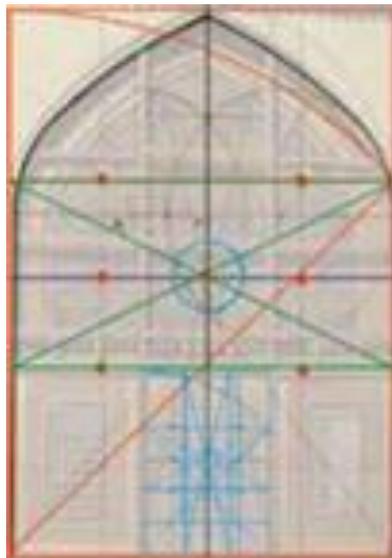


Figure 1 – Golden proportions of central hall (called shahneshin) window of zand karim khan fort and the point of colliding the golden points with the center of suns at this putting loop.

If we divide the main framework into three parts we will have radical two Golden ratio in each frame work so that the below Golden ratio includes 3 **small doors opening upwards** and each of these doors is a radical two Golden ratio itself. The form of the text and used margins at each of the doors is also in proportion and balance with radical two rectangle and this issue shows the Conformity, proportion, balance, and unity at the whole work. Each of the above doors is main margin with the geometrical painting of the knot ten and four and at the width and height of frame work has been replicated 6 times and 9 times respectively. Usually at the used divisions in the same work we face with the odd numbers and this window is an exception in this aspect. The **small doors opening upwards** 'Torreh'v is covered with the wave shaped painting and is replicated at the length for 10 times and at width for 6 times, also we face an exception in dividing the paintings (Fig. 2).

The painting of wave is in **Islimi bori** or **Ghavare bori** form which itself shows the improvement of instrument at Zand period because for doing eslimi cutting we need to the more elegant cutting instrument and the popularity of Islimi bori or Ghavare bori at this period proves this fact. The doors background is filled with brick shaped form and have plain and colorless glasses.



Figure 2: using putting knot with Islimi bori or Ghavare bori in decorating windows door of karim khan fort , (reference , the writer).

The used Colors at doors margin include yellow, orange and azure. At this margin the proportion of the Gute complement colors that blue the two orange is 1 to 2 has been reversed (Ethan.,1999). Which shows that the artist emphasized to the yellowish orange color and wanted to make a balance between the sun concept and its nature in addition to showing the spiritual space. At this talk we can also refer to the immaterial nature of color that God (Baghareh, 138) says at Holy Koran this is the color of God and whose color is better than Gods. One other reason for using this color more is more entrance of light through this color and making more lightening at inside space. The small doors opening upwards 'Torreh' with stained glass is red and green which we also observe Contrast of the Complementary colors , but this time exactly in accordance with Goteh color table , green and red are used one to one. Now if we consider 2 above Golden ratios as a perfect framework for the zigzag part of the window we gain a square framework that has placed the making loop painting above window.

The background of this framework is covered with girih star of 16 and 8 points. And in this regard like above doors the proportion of red to green is one to one and the proportion of complement color of blue (margin of 16 points star) to orange (16 points star) is like above doors and this case makes us face with an atmosphere full of light and the yellowish orange color extended in the air makes sunlight more strong in some bright space. The zigzag curve margin is covered by 10 and 4 points star girihs and considering combination of color is in conformity with the above margin. At Series ('selselle'vi) of zigzag curve we have half wave paintings that are done with Islimi bori or Ghavare bori technique and in this case like wave at doors margin the balance between red and green is equally done (Ethan .,1999). The wave pointing which is taken from loze has plenty of meanings in Iranian Gnosticism and by Visual studying of this form we can achieve 2 vertical and by horizontal (concept substance) sides, so this additional combination refer to the corporal and spiritual entity of human being in Iranian Gnosticism and caused to many usage from this motive at Iranian art (Kianmehr., 2008).

STUDYING THE SASH WINDOWS QAJAR PERIOD (The case study is the historical house of Tehran religious leader).

Analyzing the form of window in Tehran religious leaders house:

Emam khomeini square, Naser khosro Avenue, Emam jome Alley has embraced and old and precious house that the region in habitants called there as emam Jome house. This remained building has been built from QAJAR period during the years of 1280 – 1300 A.H. Emam jome house at first belonged to Mirzagha khan Nouri, The king Naserodins chancellor then seyed Abolghasem , seyed Zidodin, Tehran Emam jomes elder son and Maerol mamlek's granddaughter bought that house then after his father's death , he took the responsibility of leadering and custodianship of the king's mosque. (Nikrooh. 2011).

The middle window of central hall (called shahneshin) in Tehran Emam Jome house is one example of placing a wooden window on the hall's orifice with beam roof (Fig. 3). At QAJAR period one of the changing manifestation at architecture space setting was the popularity of using the beam roofs (Najafi *et al.*, 2009). The reasons for using this kind of roof were features like, building more extensive hall, Using more space, becoming more thin pillars, becoming more light roof all cause to create the bigger space than the 'tagh and tuize' architecture, as a result light could pass through the main hall too much.



Figure 3 – The Golden ratio form of the middle window in the central hall (called shahneshin)of Tehran Emam jome house (Reference , the writer).

Removing the roofs burden on 3 large and heavy pillars around hall causes in some of the QAJAR houses at the end of central hall (called shahneshin), the window be placed instead of the wall between this hall and the back forth hall, but because of the lack of light behind this window, decoration with cut mirrors and the sticky gold glasses^{vii} were used to reflex the light into the main hall and show the light of glasses. Because if the stained glass don't reflect the incoming light they shown as dark colors and their tincture would not be visible, so for the glasses that didn't reflect light on behind, the sticking gold sheet technique was used to reflect the front light supply so that color separation would be signified. The main framework of the middle window at this house is consisted of 2 complete squares, in the other words we can observe a parts and each part has 9 doors, it should be mentioned that all rectangle frame works either the doors or decoration with cut mirrors are complete Golden ratio, except the down doors that have alter painting in all of the other cases, the place of colliding the frame works diameters with the center of star or the center of design's background are conforming. In the mentioned window we can hardly find a point that lacks decorations. Even the beams that made the doors apart have half beams that are decorated with cut mirrors, and their capitals are decorated with wooden mogharnas. The strip is covered with decoration of cut mirrors and on these decorations has been plastered with large paintings of decoration with 'chodanikari'^{viii} (Fig. 4). The horizontal beams of the door are painted with botanical paintings with colors of green, red, blue, and oil yellow. (Fig. 5).



Figure 4: part of decoration with color and oil on the door's beam (Reference, writer).



Figure 5: part of decoration with color and oil on the door`s beam (Reference, writer).

At these horizontal door`s beams we can observe making loop with the 6 pointed star painting , this star is decorated with colors of green , blue , and orange , but at this example the one to one balance between green and red is somehow out of balance and the proportion of red to green is 2 to one. The artist has used from the entire arrangement between yellow and blue, that shows the emphasis on yellow and he probably by using yellow for sun decoration wanted to make a relation cases that putting knot together has been used in this window is this painting that is used at the door`s margins in the other parts of window observe large Islimi bori or Ghavare bori, covered by geometrical and organic cut textiles. At door`s rim we see Islimi bori or Ghavare bori with organic paintings that are decorated with cut mirrors and behind sticky gold glasses. Also the above Islimi bori or Ghavare bori triangle of altars in these doors are decorated with cut textile of botanical paintings (Figure 6).



Figure 6 – the doors decorations including putting knots together and cutting

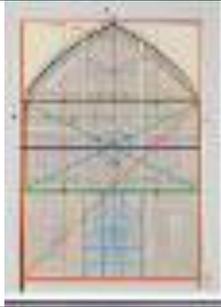
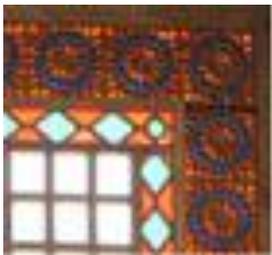
Textile in altar triangle and the doors series. (Reference, The writer).

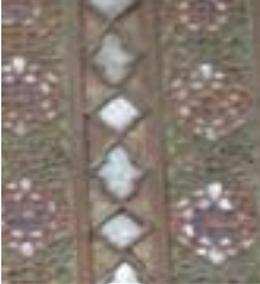
At doors we are faced with 5 different paintings of Islimi bori or Ghavare bori so that 4 of these paintings are replicated on the 2 sides of the fifth painting. Each of these doors have the Islimi bori or Ghavare bori painting and their instruments are decorated with cut mirrors and the inside spaces of the textiles are decorated with some Islimi bori or Ghavare bori of organic and geometrical paintings.

ANALAYZING AND COMPARING

The analysis and comparison done in this section, based on the structure and decorative elements are categorized into 3 main groups that are form and proportions, painting and color and each of the mentioned titles are analyzed and compared at Table 1.

Table 1. Similarity and difference in the main framework of window related to Zand and QAJAR period (Reference, The writer).

QAJAR Figure	Explanations	zand figure	Explanations	
	<ul style="list-style-type: none"> -Rectangle -9 doors -Below the strip with similar design -above the strip 5 different designs 		<ul style="list-style-type: none"> The zigzag curve (in conformity with building architecture) 3 doors with similar design 	1) Window from and the number of doors
	<ul style="list-style-type: none"> -Length to width 2 (complete Golden ratio) 		<ul style="list-style-type: none"> Length to width 1/4 (radical 2 golden proportion) 	2)Used proportions in the main frame work
	<ul style="list-style-type: none"> -Organic and geometrical paintings -altar form in doors -Islimi bori or Ghavare bori and plot technique 		<ul style="list-style-type: none"> -To dominate the geometrical painting -The brick shaped from on the doors -Putting knots together Technique 	3)Decorative and Structured element in the window
	<ul style="list-style-type: none"> -Plot having organic and geometrical Islimi bori or Ghavare bori on the text and margin -The 'Torreh' painted by organ paintings -The series decorated by mirrors 		<ul style="list-style-type: none"> -The plot 'Torreh' and doors painted by wave painting with plot cutting technique -Without series 	
	<ul style="list-style-type: none"> -The middle strip has decorations of mirrors and cast iron 		<ul style="list-style-type: none"> -the middle strip lacks decorations 	3)-Daval (The middle strip)

	<p>-The horizontal beams of door are painted with botanical paintings with botanical color -The beam between doors have wooden half beam and wooden mogharnas capital</p>		<p>-the horizontal beam of door lack decorations. -the pillar between doors lack decorations</p>	<p>4)beam of doors</p>
	<p>-The beams plot is decorated with the asleep and rise wave painting with decoration by cut mirror</p>		<p>-The carrier beams plot lack decoration and inner façade</p>	<p>5) plot beams</p>
	<p>- has colorful sticky gold glasses -using too much decoration with cut mirrors - complement colors of red and green -combination of blue and yellow and emphasis on yellow</p>		<p>-has colorful glasses -lack decoration with cut mirror -complement color of green and red with proportion one to one -combination of blue and yellow with emphasis on yellow</p>	<p>6)-the decorative element of color in window</p>

Source: by writer

CONCLUSION

In fact by researches we can say that transformation and evolution of window like many other arts, is affected by the dominant culture, commercial and economic relations with other countries and technology development and instrument at different periods. The mentioned items have had many effects on the changes in architecture form, transforming the zigzag curve into beamed and flat roof and consequently has changed the window form according to the roof form and changed it to rectangle. Using too much of the decoration with cut mirror and sticky gold glasses in the windows of Ghajar period shows the popularity of production and import of this production at the country and shows increasing level of being luxurious. One of the reasons of using too much of these glass and mirrors besides making surrounding more beautiful is having a brighter central hall (called shahneshin) that cause reflecting of the incoming light into the central hall. As mentioned before, different arts as well as sash windows were popular at QAJAR period, arts like decoration with cut mirrors, decoration with cast iron and drawing on the wood and in addition of showing the shift in people's interest, it also shows influence of foreign art and from other point view, using easy and fast methods for creating decorative and beautiful elements and achieving an decorated surrounding. For this reason it causes to create windows and halls full of different decorative elements at QAJAR period. Studying the evolutions and transformation done on the mentioned windows and changing the decorative elements of these windows from geometrical forms and putting knots together into organic and turning forms in qavare bori and also more delicate vegetall designs in Islimi bori or Ghavare bori shows the improvement and elegance of wood cutting instrument. Using vegetal paintings with oil and color painting also shows the popularity of western painting techniques clearly at QAJAR period. The researches

done show how much the artists and creators of these wooden crafts have used golden and geometrical proportions in form and details that this issue itself could have balanced emotion and peace inspiring to the viewers. Of the reasons of creating this kind of appropriate combinations in the craft's details we can refer to the dominant nature on the eslimi and geometrical paintings, proportions and the classification in these paintings as well as being affected by surrounding framework, Considering the transforming structural form of the windows from the zigzag curve to a rectangle form, it also caused creation of golden classification in the whole craft.

REFERENCES

- Azar K. (1971).** Persian Proper Names. Sekkeh printer, Tehran, Iran.
- Amrayi M. (2003).** Sash, Windows to the Light. Samt, Tehran, Iran.
- Ayatollahi H. (2011)** Theoretical Principles of Visual Arts. Samt, Tehran, Iran.
- Bakhtiari fard H. (2009).** Color and Communications. Fakhrakia, Tehran, Iran.
- Burckhard T. Translated by Jalal Satari (2010).** Sacred Art (Principles and Methods). Soroush, Tehran, Iran.
- Cowen P. (2005).** The Roze Window. Thames and Hadson, England.
- Ethan J. (1999).** Color Elements. Translated by Zhaleh dust, Behrouz. Efaf, Tehran, Iran.
- FereshtehNejad M. (1977).** Girih saazi And Girih chini In Persian Architecture. National Heritage Board, Tehran, Iran.
- Lucie-smith E. (2001).** The Thames and Hudson Dictionary Of Art Terms. Translated by Farhad Goshayesh. Efaf, Tehran, Iran.
- Hosseini rad. A. (2007).** Principles of Visual Arts. Tehran: general printing and textbooks distribution office, nashre kotobe darsi, Tehran, Iran.
- Kianmehr Q. and Khazayen M. (2006).** Numerical Expression and Conceptions in Safavidd Girih chini. Mahe Honar Book, Tehran, Iran. 91(92): 39-26.
- Kianmehr Q. (2008).** The Crafts Workshop (2). textbook distribution, Tehran, Iran.
- Najafi A. and Amiri A. (2009).** The Theoretical Courses (architecture). Pub Sepahan, Isfahan, Iran.
- Nasri A. (2008).** The Wisdom of Christian Icons. Cheshmeh, Tehran, Iran.
- Nikrooh. A. (nov-8-2011).** The Story of a Different House. Shargh Daily, Tehran, Iran. number 1364, page 11.
- Moshtaagh K. (2008).** The Art and Literature of The World And Iran. Negine sabz, Tehran, Iran.
- Moshtagh KH. (2009).** Culture, art and literature of the world. Neginsabz, Tehran, Iran.
- Pirnia M. (2011).** The Introduction of Islamic Architecture. Soroush, Tehran, Iran.
- Rahnavard Z. (1999).** The Wisdom of Islamic Art. Samt, Tehran, Iran.
- Reyntiens P. (1990).** The Beauty Of Stained Glass. Bulfinch, Britain.
- Sadr S. (2007).** The Crafts Encyclopedia. Simaye danesh, Tehran, Iran.
- Shafayi J. (2001).** Girih sazi In Architect and Carpentry. Cultural Figures Community, Tehran, Iran.
- Shakeri Raad M. (2001).** Man, Nature, Design (1) (art). Payame Noor University, Tehran, Iran.
- Sharif Zade. A. (2002).** Wall painting In Iran. Cooperation Fund Institution, Tehran, Iran.
- Tajvidi Z and Shakeri Raad M. (2007).** The Introduction of Persian Traditional Arts. Payame Noor University, Tehran, Iran.
- Wulff H. (2006).** The Crafts of Persia. Translated by Sirous Ibrahim zade. Elmi va farhangi, Tehran, Iran.
- Yavari H. (2008).** The Manifestation of Light In Traditional Iranian Art. Sure mehr, Tehran, Iran.
- Zomarshidi M . (1986).** Ghereh chini in traditional Islamic architecture and art. Markaze nashr ketabe daneshgahi Tehran, Iran.

Foot notes

i These doors are called Geutin in Europe. Piriniya consider the Orsi word as a Persian word that means wide and open. Orsi is a kind of wooden window and has drawers that are opened and closed by moving toward above and low

ii Earring room : Rooms at 2 sides of alcove hall and at the second flat of the building and usually have small windows in front of alcove hall
iii Sabaat a corridor between two houses from there you can pass one house to the other and it covers the alley's roof between two houses
iv one kind of arched curve , for more information and the playing method refer to book familiarity with Islamic architecture wroeten by Mohamad karim pimiya
v) 'Torreh' : The smaller margin around the main margin , for more information refer to the book "khataei flowers" , written by Parviz Eskandarpour
vi Is a margin around 'Torreh', for more information refers to the book " khataei flowers " written by parviz Eskadarpour.

vii The pieces of glass that have no light supply behind them and to be seen colorful, they use gold sheet in the back of these glasses in order to make a colorful mirror and reflect the light supply.
viii Decoration with chodanikari and putting layers of plaster together is a kind of plaster artistry that put the layers of plaster together in order to change the design from flat to extensive