

The Role of Garden and Courtyard in Organizing the Space of Aristocratic Houses in Tehran during Qajar's Era

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ABSTRACT: Constructing houses in the form of garden-house became popular among Statesmen and the privileged class in Naseri period. Iranian traditional houses which used to be formed around a central courtyard, now were organized around a garden. So the transition from houses with courtyard to garden-houses created a new order of relationships between spaces, resulted in redefining spaces and their forms. The framework structure of the spaces along with their life culture have been investigated in the present research paper since without considering the inhabitants' behavioral and cultural characteristics the framework patterns shaping the space cannot lead to identifying architectural features. So, the qualitative research method was used to study four aristocratic houses in Tehran within an analytical-interpretative approach. The results indicate a change in space organization. There are sustainability concepts in designing spaces in a house which are attained differently in the garden and sometimes redefined because of the changing needs. At the end, the roles of garden and yard are compared with each other in creating diversity and spatial regularity, defining the privacy and territory, perspective, access, entrance and function.

Keywords: Garden-house, Courtyard, Qajar, Life culture

INTRODUCTION

Some changes were made in the status of the aristocratic houses in Tehran in the late Qajar era. Houses with living spaces built around several courtyards were shaped in combination with the garden at this time. House-gardens were located inside and outside the city walls; Villages in the countryside could attract Tehran's residents, both rich and poor, toward themselves because of the inclement weather in Tehran especially on hot days. Thus most people spent the warmer months of the year in Shemiranat- a countryside village around Tehran.

This issue is seen in the life of Qajar kings especially Naser al-Din Shah¹. Therefore, Shah could preserve his tribal character so that he travelled between his countryside gardens on warm days of the year:

"Today, the King went to Saltanat Abad² and I was with him. He entered the Thousand Street. He had lunch at Kolah Farangi³. I told him the daily news. After lunch, he reviewed the requests. He took a nap. He had supper and tea. He rode the horse to the calico factory where the new residents started working with foreign

machines and its second floor also used as an army provisions storehouse. As riding his horse, he went to the Qajar Palace⁴, then to Eshrat Abad⁵ and after that to Lalehzar⁶, finally he entered the city's House at the sunset" (Etemad al-Saltaneh, 2010, 20 -21).

Lambton (1996, 131) believed that the life of Qajar kings always had a base of Turkmen tribes; since even along with the splendor and luxury of Naser al-Din Shah's court and his European voyages, other princes were interested in camping life and hunting. A similar life pattern was popular among the aristocrats of Tehran; so that they had their own gardens in Shemiranat as well as their urban houses and they spent some months there along with their family and crew every year.

The suburban house-gardens have a comparable structure to the urban house-gardens and courtyard- houses mainly in terms of their natural and geographical locations. Many studies relate these significant changes to the influence and modeling after the West without taking the internal shaping factors and architectural context into account. Meanwhile the role of life culture and environment is significant in creating such a space. Finding the pattern used in the design of such spaces based on life style and

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culture can lead to identifying valuable characteristics of the architecture, as well as explaining the house structure. In this way, the study of architecture, landscape, environment and life culture seems essential since they are shaping the natural and artificial elements of the yard and garden.

MATERIALS AND METHODS

The present research was conducted through a qualitative method. The sampling was done in a way to include a range of courtyard houses and house-gardens and the houses inside and outside the city walls for having the possibility to compare them with each other. Resource collection and data organization were conducted using first-hand sources, such as biographies, memoirs, diaries, travelogues and historical images as well as documents and historic photos. Then the data analysis and description were conducted comparatively and adaptively to infer the applied pattern in these houses.

Introducing the Study Samples

To investigate the above-mentioned issues, Nassir al-Dowleh house-yard, two inner-city house-Gardens (Massoudieh and Ghavam al-Saltaneh) and Farmanfarma (Farmaniyeh) house-Garden outside the city walls were selected to be studied. The locations of these houses are specified on the map of Abd al-Ghaffar Najm al-Mulk



Nasiri wall up to 1905 ———
New walls of the city after 1905 ———

Fig.1: positions of the investigated houses in Abd al-Ghaffar Najm al-Mulk's map in 1891, from left to right:
Ghavam al-Saltaneh house, Massoudieh mansion, Nassir al-Dowleh
(Source: United States library of congress, 2013)

(Fig. 1). Farmaniyeh's house-garden can be seen outside the Nasiri walls in Fig. 2.

Nassir al-Dowleh house was built in 1855, based on the pattern of traditional courtyard-houses of earlier period. It is located next to Mirza Mahmoud Vazir alley and was constructed during Mohammad Shah⁷ Qajar's period. Although it is being



Fig.2: The city wall of Tehran with its remarkable gardens in 1890 (Source: Khansari et al., 2004, 111)

demolished, Nassir al-Dowleh house possesses adequate and verifiable documentations for the study.

Masudieh's house-garden is one of the gardens and buildings located in the north of Naseri Palace. In 1878 Nezamieh⁸ was built on the west side of the garden (Zoka & Semsar, 1997, 207). The house-garden was of about forty thousand square meters although only one and a half acres of it has remained up to the present time. Eastern part of the garden which was adjacent Nezamieh and included within the building were separated from the main part after the outer portion was sold by Hamdam al-Saltaneh⁹ to the government and therefore, the rest was divided into smaller properties in 1923 (Ayatollah-zadeh Shirazi, 2011, 9). Ayatollah-zadeh Shirzai (2011, 15) based on Tarikhe-Massoudi and other documents presumes that Masoudieh mansion refers to state building, Biruni¹⁰ and entrance sections and Nezamieh building refers to Andaruni¹¹ section and the private building for Zel al-Soltan¹²'s living.

Farmaniyeh's house-garden in Shemiranat was sued as his large family's summer house. According to Mehrimah Farmanfarman's notes (2008, 147), the only way to go to Shemiranat was through a curved way passed Darvazeh Dolat¹³ Pich Shemiran and continued to Qajar Palace, Zarabkhaneh three-way, Gholhak and Tajrish. Farmanfarma house consists of a main or Biruni building with a springhouse. On the west, the Andaruni building has yards in its north and south sides. There was a wall around the yard which separated Andaruni and Biruni sections. At first the Biruni section seemed to be a small octagonal pavilion with four rooms around it where tea and hubble-bubble were served. Due to its suitability for settlement, it was developed and three southern great halls, a kitchen and a bedroom were added to it. In all three halls there were tinted windows with sash valves which called Orosi. Andaruni building has a main entrance on the south side, but the north entrance shaped in Coronet style and facing the Clerks' office (Afshar Naderi, 2007, 62, 67).

Ghavam al-Saltaneh house consists of two Andaruni and Biruni buildings in extroverted style without a central courtyard and it was built in the early twentieth century in a garden with an area of 7000 square meters. The house-garden was located in part

of the Sani al-Dowleh garden. Currently, the Biruni section is used as the Museum of Glass, and the Andaruni part as Farabi Foundation. Museum of Glass building is 1040 square meters. The overall roof was constructed dome-shape before the establishment of Egypt embassy and after that it turned into a flat roof (Mousavi, 1998, 6).

The bodies of four investigated houses are shown in Fig. 3.

Criteria for Analyzing the Houses

In analyzing and investigating the houses to identify the role of yard and garden, it will be also possible to study and deal with issues such as physical matters, cultural characteristics and life style. Therefore, spatial analysis will be along with examining the culture and life style. The followings are considered for investigation:

The placement of the open and closed spaces (outdoor of the courtyard or garden and indoor of the house) and the evaluation of open and closed spaces forming the house, specifying the value, role and importance of open and closed spaces together with (the amount of life spent at open and closed spaces and the use of each space).

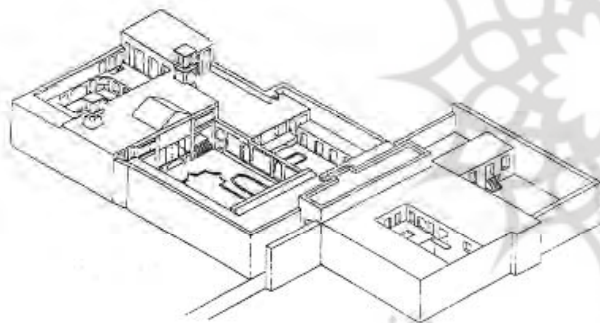
Semi-open spaces will reveal how to connect open spaces of the yard or garden to closed spaces and the possibility of developing these spaces into each other. The role of semi-open spaces in facing the open and closed spaces is in relation with the mode of life in them, enjoying the view and preserving the privacy. So, a change in the body of semi-open spaces can reveal a change in the definition of privacy or landscape.

The height of house spaces around the yard and garden can be investigated because of locating in different environments in the countryside and city. The amount of attention paid to the underground spaces and other floors can be justified according to the climate, life culture and function.

Views and perspectives in courtyard houses and house-gardens will illustrate the privacy and aesthetic taste of the residents.

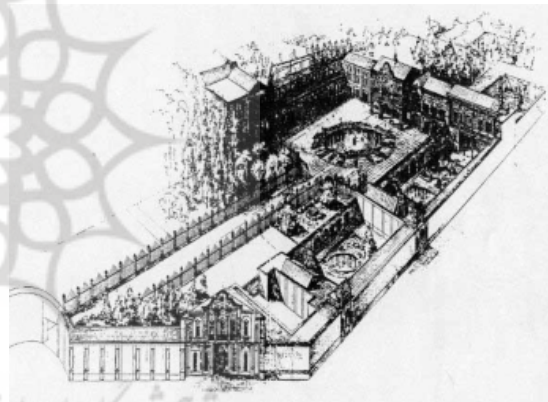
Defining the entrance shows a relationship between outdoor and indoor spaces. The privacy and considering the indoor or outdoor can be redefined through the type of entrance.

Ornamental objects, yard and garden furniture display the taste of the society and in the case of aristocratic houses they represent a kind of aesthetic trend in the society, culture and residents' demands. Garden and yard furniture and objects are



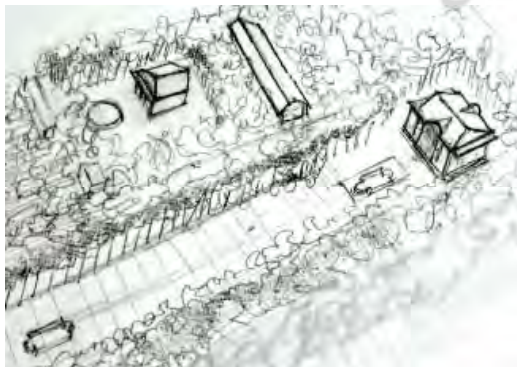
Nassir al-Dowleh house: the entrance, Biruni and Andaruni buildings, service sections are demonstrated in the sketch

(Source: Mousavi, 2003, 24)



Massoudieh mansion: the entrance and various Biruni building are seen in the sketch

(Source: Ayatollah-zadeh Shirazi, 2011)



Farmaniyeh house-garden: entrance, Biruni building, clerk's office, and service sections are seen in the sketch



Ghavam al-Saltaneh house: the entrance of Biruni and Andaruni building are seen in the isometric view

(Source: Archnet, 1988)

Fig.3: Introducing the body of four investigated houses

considered as life tools affected by lifestyle.

Organizing behaviors in the yard and garden can be effective in explaining their structure in connection with the body of the yard and garden.

Garden Features in Travelogues and Biographies

Tehran houses and gardens were described in travelogues and memories of many tourists often in the form of very detailed descriptions. The focus of emphasis in these notes reveal the patterns used in the yard and garden structures. While the body in some of these homes remained unchanged, they are not sufficient to study and identify the design patterns. Identifying the role of life culture which seems to be an important matter in shaping spatial patterns of ancient houses is not possible without studying the writings of those days.

Among the biographies, Abdollah Mostofi has written valuable and interesting notes with detailed descriptions about the life culture and house in the late period of Naser al-Din Shah and after that. Diaries of Ein al-Saltaneh and Naser al-din Shah also contain a more detailed description of houses, palaces and gardens in the late Qajar period.

Among travelogues, Polak's travelogue belonged to the period of Fath Ali Shah, but it can lead to a general understanding of the yard and garden structures. On the other hand, the writings of the early Qajar period by Olivier, Flora and Lambton do not contain remarkable description of Iranian houses.

Of Polak's (1989, 50): "The yard is a rectangle with rooms in the distance of two feet from ground level on three sides" and to reach many areas around the yard, everyone must pass the yard. Multiple yards organize the spaces belonging to different members of the family. At Abdollah Mostofi's house as mentioned in his autobiography, a yard belonged to him and his wife, the other one was owned by his brother's family, and the Biruni yard belonged to both. And in his father's house, a yard was for Andaruni building and another one for Biruni building and his father's two wives and a courtyard dedicated to the carriage house (Mostofi, 2007, 255-259).

Thus, every house has a yard. Besides these gardens, the wealthy people had a large garden in the city, too. Abdollah Mostofi in describing his father's new garden which was apparently located out of the city walls and in North of Cheragh-gaz Street, pointed out the Biruni and Andaruni buildings (Mostofi, 2007, 381). There was usually a building named "Kolah Farangi" located on the main axis and sometimes in the center of the garden and decorated with paintings of hunting and fighting animals in the inside and outside and the owner also received guests and spent the morning and evening hours there (Polak, 1989, 779).

Ein al-Saltaneh (1995, 508) described Amin al-Soltan's house and Garden which was located near the gate of Hassan Abad and the British embassy and probably constructed in 1889 or 1890. as "the garden is really beautiful and extremely spectacular. It has two beautiful lakes with nice fountains. He constructed a beautiful and much better house than most buildings in

Tehran. The rooms have furniture of different types. It has five rooms and a corridor which is called "Hall" in English, some basements, too. The corridor was very broad and excellent. The room where I met Mohandes al-Mamalek, was full of fantastic things and objects. It was in a pure 'foreign style'".

The foreign style was seen not only in the furniture but also in the plants and lawns and flowers of the gardens. In his diaries, Naser al-Din Shah (2005, 71) described Amin al-Soltan's garden as: "in the evening we went to a garden near the embassy, Amin al-Soltan built a new Garden. The house has a stone of water from the aqueduct he built there. The garden is of a perfect size. It has a well-designed lake with good, clear and deep water, two swans, a few ducks and five wild ducks ... Around the lake was two hundred and thirty steps long. A fountain went up in the center. A platform was built at the edge of the lake. A Hindi tent was put up there. I sat there. It had planting, lawns and etc".

According to the above-mentioned notes, the early gardens of Qajar era were constructed in Safavid style so that Negarestan garden in northern trench of Tehran built in Fath Ali Shah's period and Nezamieh garden possessed an axis and symmetry. Negarestan and Nezamieh gardens were considered inter-city gardens because of modifying the city walls during Naseri period and Farmaniyeh, Kamranyeh, Sahebgharanieh gardens were built on the north of Shemiran gate.

According to the study by Behbehani & Sultani (2003) the tradition of constructing garden with an entrance on the main axis and also the garden view and perspectives focusing on the elements within the garden have changed in this period by constructing new gardens of Shemiran; to the extent to which in Eshratyab garden, the view of the Alborz mountains was defined for Palace prospect. There was also no obligation to follow the principle of symmetry in the construction of garden buildings.

Outer bed of the wall was also important and unlike the past, and propylaeum had a relationship from inside to the outside, and it did not express the totality of the garden but was defined in connection with the outer space and moved in relation to the axis of garden (Ibid., 94).

Thus from the middle of Naseri period to the end of the Qajar era, dramatic changes occurred in the structure and decoration of houses. These changes are not only due to the imitation of the West, but also due to a change in the culture or environment. The research results described in the rest of the article will also reveal some of the changes in the culture and livelihood of the aristocratic.

The Placement of Closed and Open Spaces in the Houses Under Study

While in traditional houses, the area of open and closed spaces are close together in size, in the house-gardens, the area of open spaces are several times larger than the area of closed spaces, and by passing the city walls and entering the countryside, their difference in size increases to a great extent.

As seen in Fig. 4, the open and closed spaces of Biruni section

are larger than the Andaruni section spaces which can change upon the size of the family; since the combined-house was not considered finished and complete, the spaces could be extended and modified according to new or changing needs of the house. Various Massoudieh buildings were built with transposition. In the western part of the Biruni complex, there was a single floor building with a basement which was probably destroyed in 1340. Eastern building in the yard was Divankhaneh (Exclusive House of special times) located between Biruni and Andaruni sections, was also destroyed. The Andaruni section has been entirely vanished (Ayatollah-zadeh Shirazi, 2011, 16). On the other hand, the geometry and structure of Ghavam al-Saltaneh house did not have the possibility of change or expansion.

Axes of open and closed spaces are always coincided and creatively organized beside each other; of course, in Ghavam al-Saltaneh house the organization of Andaruni and Biruni spaces was very simple and the Andaruni and Biruni axes are not in the same direction. This can be justified due to the retention of privacy in viewing each space so that the main views of Andaruni and Biruni sections do not meet each other. In Farmaniyeh garden, the main axis of the garden was located in front of the building of Biruni on the east side which represents the change of garden area so that a part of the west side was eliminated or added the East.

Male-Female and private-public areas included both open and closed spaces: Andaruni and Biruni sections contained both open and closed spaces. Considering the Andaruni or Biruni spaces

was based on the culture, lifestyle and family structure (Mahdavi, 2012, 357) and this issue has been seen in all four studied sites. A point to be considered here is the placement of these two spaces which are usually connected via an intermediary in aristocratic houses such as eunuch room. But from the late period of Naseri, the boundaries between men and women gradually became more blurring and they did not need an intermediary to connect the two spaces. Of course, using the Andaruni and Biruni terms for Ghavam al-Saltaneh house does not apply because a building was used only for family life and another one for work so that due to the structure of the house and the impossibility of its development, an extended family could not live in it.

Yard classifications formed a variety of spaces and boundaries: Andaruni courtyards and rooms, Biruni courtyards and rooms, service courtyards and rooms.

In Ghavam al-Saltaneh house, Massoudieh mansion, and Farmaniyeh garden, using the walls plays an important role in isolating spaces from each other. In traditional houses, this happens through the spaces drawn all around the open section. In Massoudieh mansion, some walls separated Divankhaneh from the outside, so that the Biruni courtyards have an independent identity, and have seen each other which seemed effective in the symmetry of space view. The Andaruni building of Farmaniyeh mansion has courtyards on its north and south sides. There was a wall around the yard, which prevented a direct view to the Andaruni courtyard. One-storey building in the northern Andaruni section was the office of secretaries with a main entrance on the north, but also



Fig. 4: The placement of closed (coloured in yellow) and open spaces (coloured in blue) in the houses under study



Fig. 5: The connections of open and closed spaces

it had a door to the Andaruni building and a crescent-shaped wall was facing it to avoid a direct view to the Andaruni courtyard.

The Connection of Open and Closed Spaces in Four Investigated Houses

Open and closed spaces are connected in two ways: communication through physical access (movement) and the other one is having a view from closed to open spaces, which usually happens through a semi-open space, such as a porch (Fig. 5). In a comparison of four studied houses, Ghavam al-Saltaneh house does not have any semi-open space and it used double patio windows instead of a porch. The process of elimination semi-open spaces is seen in Ghavam al-Saltaneh house. This issue is seen as well due to the open-space area of the yard and garden. As in Ghavam al-Saltaneh house, the garden area declined and the open-space area decreased and had the role of defining the territory. Therefore, the necessity of having a porch to see the open space has been faded away. The architecture of Ghavam al-Saltaneh house got influenced by the nineteenth century Europe architecture. However, its closed structure and lack of porch could lead to a redefinition of the privacy. So the presence of a porch was regarded as prevention in protecting

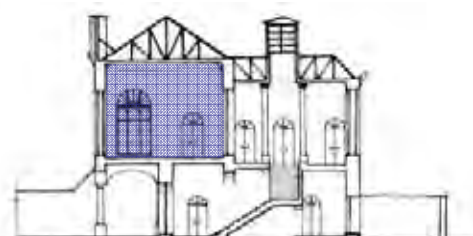
private spaces against the vision of the surrounding space. Closed spaces such as in Massoudieh and Nassir al-Dowleh houses had a variety of ways to open spaces. A porch and Orosi¹⁴ windows played important roles in connecting open and closed spaces. Motion access took place mostly from sides of the closed spaces, and of course in Ghavam al-Saltaneh and Massoudieh houses, it was influenced by the Western neoclassical architecture; also, the entrance was in the center of the closed space.

Investigating the Altitude of House Spaces around the Yard and Garden

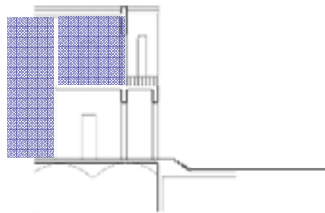
It is somewhat obvious that there is a relationship between the height of the spaces and their spatial value, but it is also influenced by other factors such as the characteristics of the open space nearby as well. For example, in Massoudieh mansion, Shahneshin¹⁵ where the reception of special guests and dependent Lords was carried out is as high as the opposite large open space. The Shahneshin has two floors and faces the Biruni larger yard in Nassir al-Dowleh house. But it was generally shaped on a smaller scale than the Shahneshin of Massoudieh mansion. In Farmaniyeh garden, a broad view of alcove was decorated with large and high porches which represent the importance of the



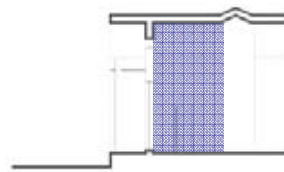
The high Biruni of Nassir al-Dowleh emphasizes its importance and the courtyard axis. It also has a basement to prepare a pleasant micro climate
(Source: Mousavi, 2003, 28)



The high Biruni of Massoudieh facing the vast courtyard



The Biruni of Ghavam al-Saltaneh has the same height of the other nearby spaces. Just the center of the building in which the stairs are located has a two story height



The high Biruni of Farmaniyeh garden without any basement

Fig. 6: The altitude of house spaces around the yard and garden

alcove and an extensive exterior garden was located next to it. But in Ghavam al-Saltaneh house there is essentially no difference between the height of the Shahneshin and other adjacent spaces and the defined open space also occupies a small area (Fig. 6).

In each of the four buildings studied in the research, the Biruni section is higher than the Andaruni part, and maybe the reason for that is the necessity of having a decent Biruni space for the man of house. Abdollah Mostofi refers to a decent Biruni space "... We began to think about the plan to knock out former small barn, outdoor space and middle yard to make a decent exterior building ..." (Mostofi, 1992, 514). On the other hand, his writings show that the decorations of Biruni building were simpler than the Andaruni ones (Ibid, 2007, 266). Another reason could be hiding the Andaruni space which was possible to be seen for having a lower height than the Biruni space.

Most houses whether the old or new used to have a basement and springhouse for making perfect weather conditions. Water channels and air-holes had ways into them (Shahri, 2004, 197-198). So, the existence of such a space in the country house-gardens was not considered necessary. The role of roof space for the night use has been removed in house-gardens because of their sloping roof.

Views and Landscape

As Sackville-west (2007, 85) noted in visiting Farmaniyeh garden in 1926, Persian gardens are of trees and no flowers. Farmaniyeh garden has a view of trees in the Biruni axis. Rows of trees in the courtyard around entrance axis and Biruni building of Farmaniyeh mansion also form a nice main view of the mansion. In Masoudieh, Biruni courtyards are adorned by pools and gardens. Since the four sides of the courtyard have

enclosed spaces, porches, walls and arcs, the pond reflects the surrounding views. Many flower vases and lighting tools are seen in Biruni western yards of Massoudieh. However, the number of trees in these yards is very low.

View control is done through the placement of the walls or spaces. In Ghavam al-Saltaneh house, the difference between exterior and interior axes will lead to protect the private spaces. In Massoudieh mansion and Farmaniyeh garden, walls are important for controlling visibility and landscape of the spaces. In Nassir al-Dowleh house, landscapes are defined by the surrounding spaces and yard elements.

In Farmaniyeh garden, in addition to the views created by the elements of garden, a view of distant mountains is also part of the experience of the garden space.

The axes of the open spaces which shape the closed spaces too, are shown in Fig. 7.

Entrance Definition

The entrance of aristocratic houses like Nassir al-Dowleh has always reached to a dark corridor where the door attendant was located. There are several ways from the corridor to the Biruni or Andaruni courtyards. The access to all spaces is done through the yard, although there is no direct connection between the house entrance and the yard. Locating the place and shape of the entry make it outstanding in the exterior view of the house and thus it will be at the service of the outer space. Meanwhile in Ghavam al-Saltaneh house, the entrance is located on the building's axis and the Biruni garden is placed across from it. So, inter- and outer spaces of the house are connected to each other through the common axis of the yard or garden with the entrance. In Massoudieh mansion and Farmaniyeh house-garden

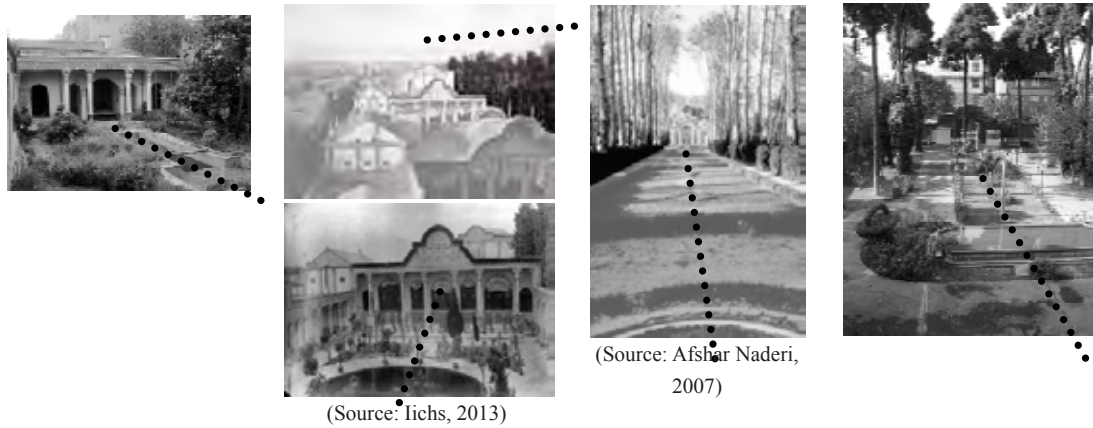


Fig. 7: The axes of courtyard and garden and its improvements with the elements of garden and courtyard in Nassir al-Dowleh house, Massoudieh mansion, Farmaniyeh house garden and Ghavam al-Saltaneh house)

there is no direct entry to the open space of the garden and the axis of the garden is not as the same as the entrance axis. The entrance is defined in relation to the exterior space. However, the carriage-house gate is located exactly at the axis of the garden in Massoudieh house.

The entrance of the Andaruni and Biruni buildings from the yard was through the corners on both sides of the main hall in traditional homes like Nassir al-Dowleh. However, in buildings such as Farmaniyeh and Ghavam al-Saltaneh, the entrances form the main axis and center of the building. Massoudieh mansion is in between these two categories, so that both types of entrance are seen there.

The entrance of three houses which has remained intact, are demonstrated in Fig. 8. In Massoudieh mansion the main entrance wasn't located in the main axe but the entrance of the carriage is as the same as the garden axe.

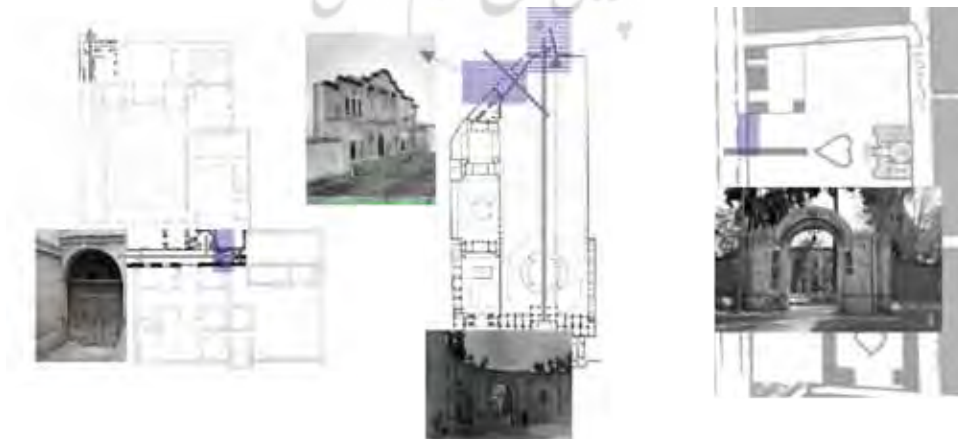
The Decorations and Elements of the Yard and Garden

Spatial elements around the yard and garden are organized on

their axis, so that there were some kinds of symmetry and balance that residents of these two spaces receive. Sometimes decorative arches were used in areas without buildings in order to create a sense of balance but of course, the function of such spaces especially on the walls would lead to privacy and boundary of the spaces.

Pool and gardens are constant elements of the courtyards and gardens: they built a square pool across from the middle room. The distance of the pool from the buildings were carpeted on three sides for setting in the shadow side on the bed in the afternoons, mornings and evenings of the spring and summer. They built a path in the middle of the paved-way down the yard to the pool section and paved-way up the yard and it was carpeted called "Kharand". There were two pieces of land on the sides of the Kharand named Baghcheh¹⁶. Abdollah Mostofi described the gardens in his house as decorated with fruit trees such as green tomatoes, apricots, cherries, pomegranate, apple, and plum (Mostofi, 2007, 263-264).

As mentioned earlier, Persian gardens are the gardens of trees and not of the flowers. Trees and flower pots are worthy elements



(Source: lichs, 2013)

Fig. 8: Entrance definition in Nassir al-Dowleh house, Massoudieh mansion and Ghavam al-Saltaneh house

in the courtyards of Massoudieh mansion and this can be seen in the yards and gardens of Naseri period. The lights are seen in Massoudieh yards but not in Nassir al-Dowleh yard.

While creating and maintaining gardens was one of the very old amusements (Barjesteh, 2007, 450), competition for planting tomato, flowers and lawns is of characteristics of changing Persian Gardens in the late Naseri period.

Organizing Behaviors in the Yard and Garden

The yard is not just an open space submitting lights to the surrounding areas and organizing the closed and semi-open spaces of surroundings, but a space for living which organizes behaviors within and has various functions. The main element of the yard is the pool which has a decorative role in Ghavam al-Saltaneh house, Farmaniyeh garden and Massoudieh mansion and is investigative in terms of aesthetics and creating vibrancy and vividness. However, sometimes the pool has certain functions in interior buildings and service yards: "they washed hands and face in the pool (washed for saying prayers, washed dirty clothes), they took water from it to water the ground and spray water on samovar's legs, washed the kitchen boiler and anyone always worked around it" (Farmanfarmaian, 2008, 183). Other elements of the yard also had certain functions; the platforms around the yard were used for drying seeds of watermelon, melon and ... Pickles or jam containers which were temporarily seen there, suggest the activity of cooking on that day. Room and porches around the backyard were complementing the yard behaviors: Watching the yard from porches and resting in its shade or getting protection in the closed spaces of the rooms indoors on cold days (Ibid., 185).

A certain part of the yard was sometimes the center of activity and dialogue of the family at appropriate times of the year in the shade or sun. Children were playing and the guests were also welcome there. Biruni and Andaruni courtyards of some aristocratic houses were used on special occasions for "Tazieh"¹⁷ and "Rozeh Khani"¹⁸: "the princes, Lords and men who had a large reception area and the ability to pay the premium to the skinner, cameleer, timpanist and state musicians, would hold Tazieh ceremony. Even some of them put up special tents to the size of a large yard and constructed the yard in a way so that during Tazieh days it could be used as a Tekieh"¹⁹ (Mostofi, 2007, 438-439). The garden was a complement for closed space functions as well as the yard. As the everyday life flows in it and sometimes the parties were held there, in her diary notes Mehrimah Farmanfarmaian (2008, 131) refers to Biruni and Andaruni gardens: "The boys were playing and studying in the Biruni garden and the girls had their own plans and activities in the Andaruni gardens". In the description of Nassir al-Dowleh's reception of Hajj Sayyah, we see: "They had sent me a servant and a horse at the sunset, so I rode the horse to his house. He had very polite and trained servants who put some seats in the middle of the garden" (Sayyah, 1967, 70).

In Abdollah Mostofi's description of his courtship rituals and to be seen by the bride's family, he wrote the detailed story in his book, he described a part of the bride's family house and a tent

put up in the garden: "At the garden entrance, little sirs [younger brothers of the bride] welcomed me and took me to a calico tent which was not far from the entrance of the garden and carpeted by excellent Kurdistani and Iraqi carpets. Tent walling were located on the right hand of the tent in interior garden side at every two-meter distance and built a wall of calico and burlap between the interior and exterior buildings. In the middle of the tent but leaning more towards this cloth wall, there were some seats, and two or three tables with some containers of fruits and pastries on them and it was obvious that the "observatory" would be installed behind the tent walling ..." (Mostofi, 1992, 426-427). In Ghavam al-Saltaneh house unlike the other three houses of the research, it seems that the garden functions decreased only to serve as a closed space to provide privacy and perspective.

RESULTS AND DISCUSSION

The four investigated houses indicate a gradual change in the type of closed-space organization as it has shown in Table 1; thus Nassir al-Dowleh house belonged to the early period of Naseri was organized around several courtyards like other traditional houses of Qajar era. Massoudieh mansion is placed on the border of spatial regularity between courtyard-houses and house-gardens; So that the large Biruni courtyard is separated from other spaces such as the garden; however, its physical discipline is very similar to Farmaniyeh house-garden. Farmaniyeh house-garden obeys the principles of spatial organization both in Andaruni and Biruni buildings. Ghavam al-Saltaneh house has changed dramatically compared to the three buildings mentioned earlier; private spaces and territories are blurred in it and spatial variation also has been reduced in this house.

The larger outdoor space has been allocated to the Biruni building in the garden and yard. Developing the house was along with increasing Andaruni building which in the case of courtyard houses, occurred by the addition of an open space and organizing the Andaruni building surrounding it and in the garden by separating a part of the garden using a wall. In this organization, open and closed spaces axes are always aligned with each other, while Ghavam al-Saltaneh house is an exception of this regularity. Modifying space organization of the house around a courtyard or in the garden is defined by reducing the number of open spaces. Thus, a movement is also seen in reducing the number of closed and semi-open spaces. The split and diverse closed spaces are organized around several courtyards in Nassir al-Dowleh house, while there is a more coherent plan in Ghavam al-Saltaneh house and the number of open and closed spaces has been vastly reduced, to the extent that the possibility of changing or adding materials seems impossible.

The role of wall will be highlighted, as in the earlier traditional houses like Nassir al-Dowleh; different spaces were connected or separated from each other through a middle-space but this time, the wall has played the role of space separator. In Massoudieh house-garden the wall can be verified; building in terms of spatial characteristics, is placed at the interface between traditional courtyard house and the house-gardens.

Multiple Biruni yards were separated by a wall and have gotten a

Table 1: Comparison of the four surveyed houses

Evaluated Criteria	Nassir al-Dowleh House	Massoudieh Mansion	Farmaniyeh house-garden	Ghavam al-Saltaneh house	
Open and closed spaces	Spatial variation	Organizing closed spaces besides several open spaces	Organizing closed spaces besides several open spaces	At both Biruni and Andaruni sides, open and closed spaces are less segregated.	Low spatial variability, two open and closed spaces that are separated by a wall.
	Axes	All axes of open and closed spaces are aligned with each other.	All axes of open and closed spaces are aligned with each other.	All axes of open and closed spaces are aligned with each other.	The axes of both open and closed spaces of Andaruni and Biruni buildings are perpendicular.
Relationship between the open and closed spaces	porch	small porches at the entrance on both sides of Shahneshin	Large porches on the south side of the Biruni buildings	Large porches on the south side of Biruni and Andaruni buildings	Just a small terrace above the entrance, Andaruni building without Porch
	Window	Orosi windows of Shahneshin with climbing up will turn Shahneshin space into a porch	Orosi windows on all Biruni Shahneshin	Orosi windows in exterior Shahneshin Smaller windows in interior building	Double Windows (Venice)
Height of spaces surrounding the courtyard / garden	Maximum of two floors plus a basement	Maximum of two floors, some buildings have basements	single floor without a basement	Two floors plus a basement	
Views and perspective	various types of Views	Yard elements, building facades, Sky	Yard elements, building facades, Sky	Garden elements, building facades, the sky, the surrounding mountains	Yard elements, building facades, sky, outdoors spaces
	Control of view	Closed spaces	Walls and closed spaces	Wall	Hanging direction of building axis, wall and the height of the building
Entrance Definition	The entrance as a perpendicular element to the axis of building (indirect connection between inside and outside the building)	carriage way entrance as an element along the building and yard axes and the main entrance is located off-axis	entrance as an element outside the building and garden axes alignment	Entrance as an element along the building and garden axes (direct connection of inside and outside the building)	
Elements, components and decoration of the yard / garden	Pool, garden, tree	Pool, garden, tree, vase, lights	Pool, garden, tree, lights, lawn	Pool, garden, tree, lights, vases, flowers	
Yard / Garden functions	Behavioral functions, aesthetic and defining the realm	Behavioral functions, aesthetic and defining the realm	Behavioral functions, aesthetic and defining the realm	Limited behavioral functions, aesthetic and defining the realm	

unique identity, though they have a view of each other. As semi-open spaces the porch and Orosi windows play an important role in the relationship between open and closed space although they were omitted in Ghavam al-Saltaneh house.

Around the yard, there are a variety of physical accesses to the closed spaces, while in the garden, the access is much reduced. Organizing spaces and access often occurred in the closed spaces in the gardens while in the yards, each space has a separate access to the yard and organizing the access has been carried out into the yard.

The basement was deleted in Massoudieh Mansion and Farmafarma country-gardens. The heights of neighbor closed spaces will vary depending on the area of open space, to the extent to which the height of building in Massoudieh mansion and Farmaniyeh garden is much higher than Nassir al-Dowleh house.

The pool is the most important element of the yard and garden. The plants are mostly limited to trees in the yard; however, the flowers in Ghavam al-Saltaneh house were part of the garden decorations. Lawns were applied in Farmaniyeh garden, too. Using flower pots in the yard was very common in Massoudieh mansion and Nassir al-Dowleh house.

The Style and culture of life play an important role in above mentioned changes. The need for having multiple Andaruni and separated spaces has been reduced mainly for fading male-female borders and shrinking families because of condemning polygamy and independence of children from parents. The courtyard which was the center of behaviors and events and numerous aspects of aesthetics in Nassir al-Dowleh house has had a function of determining the domain and making a limited view in Ghavam al-Saltaneh house. Compared to three other

Table 2: Comparison of the yard and garden spaces in organizing the house

The roles of the yard and garden	Houses with courtyards	House – Garden
Spatial variation	High spatial variation	Limited spatial (combination of open and closed spaces) variation
	Organizing scattered closed spaces	Organizing integrated closed spaces
Spatial order	emphasis on the axis of the courtyard mostly through a symmetrical facades and courtyards elements	Driven more by the prospect of an emphasis on the axis of garden mostly through trees views and other garden elements
	Courtyard as an open space and enclosed in closed spaces	The garden as an open space and enclosed among walls
Privacy and realm definition	Isolation and separation of spaces by open and closed spaces	Separation of spaces by walls
	Emphasize on the role of open space (yard) in defining the realm	Emphasize on the role of the wall in defining the scope
	Privacy Control via lower height of the Andaruni building than the Biruni building	Privacy Control via lower height of the interior building than the exterior building
views definition	All views are limited to inside the house spaces (open and closed spaces)	Some views include outdoors like the surrounding nature outdoors landscape (mountains) and/or the street
	Center-oriented perspective	Axis-oriented perspective
	Limited Vegetation	More diverse vegetation: taller trees + grass
Entrance and access definition	Entrance as an element outside the yard and building axes alignment (indirect connections between inside and outside the building)	Entrance as an element outside the garden and building axes alignment (indirect connections between inside and outside the building)
	A space with spatial hierarchy (propylaeum, hashti ²¹ , corridor)	A brief space between inside and outside the building
	Frequency of physical access (motion) from buildings to the courtyard	Limited physical access (motion) from buildings to the garden
	Organizing an access to closed spaces via the yard	Organizing an access to closed spaces within the building
Function	Behavioral, and aesthetic functions and defining the realm	Behavioral, and aesthetic functions and defining the realm ²⁰

surveyed houses, in Ghavam al-Saltaneh house the open space has fewer behavioral functions.

CONCLUSION

According to investigated criteria, a gradual change is seen in the structure of yard and garden of Nassir al-Dowleh to Massoudieh, Farmaniyeh, and Ghavam al-Saltaneh. The life culture and the environment had an important role in the mentioned change; as changing of family structure from expanded form to a smaller one, caused to lose the need of having various yards and Andaruni. And blurring boundaries between men and women highlighted the wall role instead of overlaying spaces in separating realms. On the other hand, decrease of family's activities in the open space made its structure simple.

The environment had a significant role in defining the structure

of yard and gardens too. Being settled in the walls of the city, caused to shaping yards hidden from neighbour's point of view. Being in countryside made it possible, to have a view to the outside the walls of the house. The elements of gardens changed too; as the Biruni of Framaniyeh garden has a comparable appearance to the Massoudieh garden. Farmaniyeh garden is full of trees while in Massoudieh garden, more than trees, flowerpots exist. The houses inside the walls of the city had basement while the houses outside the walls of the city did not need it any more. In the analysis derived from the study of the four houses, a brief comparison can be done between the houses with courtyards and house-gardens as shown in Table 2.

Some principles are shared between both types of houses, including the presence of an axis which organizes the open and closed spaces. The elements of the gardens and yards are

changing like the architecture of houses from the middle of Naseri period so that the flower pots were become a part of decorative elements in gardens and courtyards; the lawns and flowers were added to it since then.

Thus, some models such as diversity and spatial regularity, defining space and territory, the landscape and its management, defining entrance, furniture and function of the spaces located in the yard and garden have gotten a new definition and sometimes the intervention of cultural-life reasons would cause changes. Privacy and territory protection, which has led to the definition of Andaruni and Biruni spaces, were the concepts of sustainability in house architecture and have realized in a variety of forms in the gardens and houses.

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ENDNOTES

1. The king of Persia from 1848 to 1896, during the Qajar era
2. A garden in north eastern part of Tehran
3. A building with doors and windows all around itself towards a garden which surrounds it
4. One of the most ancient palaces of Qajar in Tehran which was destroyed during Pahlavi era
5. A palace between Qajar palace and Negarestan garden in eastern part of Tehran
6. A garden and mansion built in the walls of the city during Fatah Ali Shah Qajar's period and later developed according to Naser al-Din Shah's order
7. The king of Persia from the Qajar dynasty (1834 to 1848)
8. The name of a garden which was built in 1853
9. Zel al-Soltan's son's wife
10. Exterior section of the Persian traditional houses called 'Biruni' which was the men quarter
11. The interior section of the Persian traditional houses called 'Andaruni' in which the family specially women and children lived
12. The eldest son of Naser al-Din Shah
13. One of the ancient gate of the Tehran in Naseri period
14. A particular form of window made of wood and stained glass which is moved vertically
15. Alcove
16. Little gardens in which flowers grow
17. A religious performance
18. A religious custom in which people gathered to listen to the threnody
19. A place in which Tazieh is demonstrated
20. Behavioral functions in the garden of Ghavam al-Saltaneh reduced because of the less importance of the open spaces.

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