Light Processing in Iranian Houses; 
Manifestation of Meanings and Concepts

Farah Habib, Fariba Alborzi, Iraj Etessam

ABSTRACT: Light is one of the many wonders in the architecture Iranian houses. It is a major tool for space creation and design. An important consideration in the Iranian architecture, which takes a functional and conceptual approach to the extensive subject of light, has been that light should create a beautiful and spiritual space in addition to being functional. The light used in a house should be pleasing to the eye, and it should not be dazzling or bothersome. Optimal use of light plays a major role in creating mental peace and physical comfort and saving energy. This paper investigates different methods of exploiting natural light in the architecture of Iranian houses. For this purpose, three houses of historical interest in the city of Kashan in Iran (Boroujerdi-ha, Tabatabaei-ha, and Abbasian) were studied for the position and role of natural light in them. A qualitative research method was used within an analytical-interpretative approach. First, the elements and components used to exploit natural light were studied, and then the strategies employed to manifest values, meanings, and concepts were explored within an analytical model.

Keywords: Light, Natural light, Light processing, Iranian architecture, Iranian house, Concepts, Esthetics.

INTRODUCTION
The role of light cannot be ignored in any discussion of architecture. Light has enclosed the environment. Nature, as a whole, is light (Kahn cited in Giurgola, 1975, 2). Light appears to be everywhere, but it is not touchable or catchable. “Light is really the source of all being” (Lobell, 1979, 22). However, one can bring it into an architectural space and give it a material framework through an innovative design. Light is a prerequisite for every kind of visual perception. In absolute darkness, neither space nor form and color are visible. Light is not just a physical necessity. Its psychological value is an important factor in human life in all dimensions (Grutter, 1987, 449). “The human body evolved in the diurnal cycle of light and dark, and is tuned to the spectrum of the sun’s radiation” (Tregenza and Wilson, 2011, 3). The intensity, direction, and color of light are influential elements in an architectural space. These aspects of light and also where it comes from affect space and individuals in different ways, and any change in each of these variables draws different reactions from individuals. Optimal use of light brings about physical comfort and mental peace. “The capacity of light to penetrate matter and temporarily produce an inward glow and intensity of being is a timeless source of human wonder” (Plummer, 2009, 218). Providing appropriate light is considered one of the most important factors in designing architectural spaces (Habib and Alborzi, 2012, 2). Light is the creator of forms, shapes, and images. Light arrangement and processing play the most significant role in changing spaces (Habib and Alborzi, 2012, 3). Shadows can make some changes in form, shape, and space. In the Iranian architecture, attempts are made to use these properties of light in a very beautiful manner. In studying light in Iranian houses, this research revisits the role of light in giving life to spaces. The passage of light rays through openings in the building creates beautiful events on the inside which, in collaboration with other events, redefine identity. “Each building gets its Character from just the patterns which keep on repeating there”(Alexander, 1979, 95). “These patterns of events which create the character of a place are not necessarily human events. The sunshine shining on the windowsill, the wind blowing in the grass are events too” Just like social events, they have influences on human beings (Alexander, 1979, 64). “Every place is given its character by certain patterns of events that keep on happening there” (Alexander, 1979, 55). “The meaning, concept, recognition, and identity of architecture would have remained unknown and unachievable without knowledge of space” (Falakami, 2007, 129).

An Iranian house has particular characteristics, is a space for all seasons, and is in a perfect harmony with culture, values, climate, and the surrounding environment. A balance exists between full and empty surfaces, and it is possible to optimally exploit light in different spaces by creating an appropriate relationship between these surfaces. Many openings are provided in different spaces. An appropriate harmony is created between open and closed spaces. Furthermore, spatial and visual broadness is apparent at different levels. The yard is located in the middle of the house surrounded by house
spaces. Also, there are yards at different levels of the house which make a substantial contribution to space broadness.

MATERIALS AND METHODS

This research aims at investigating methods of exploiting natural light in the architecture of Iranian houses. Three historical houses in the city of Kashan in Iran, i.e. Boroujerdi-ha, Tabatabaei-ha, and Abbasian houses, all dating back to the Qajarid era in the 19th century, were studied. It is possible to visit these houses and to take pictures and films. In addition, their drawings (plans, elevations, sections, and perspectives) and documents are available. The position of light in these buildings was the major focus of this research. A qualitative method was used within the framework of an analytical approach. First, the position and role of each element in the optimal exploitation of natural light in each of these houses were studied, with the results being summarized in tabular format. Then, all the elements involved in the admission and spreading of light were examined within the framework of several conceptual models. Finally, the methods of light processing were explored from functional, conceptual, cultural, and esthetic perspectives using a conceptual and analytical model.

RESULTS AND DISCUSSION

Architectural Elements for Exploitation, Control, and Adjustment of Natural Light

Architecture expresses ideas and values through a system of visual elements (Della volpe cited in Falamaki, 2007, 181). It could be said that light is the most important of these visual elements (Fig. 1). “Variability in space and time is the dominating characteristic of natural light” (Tregenza and Wilson, 2011, 4). The elements and components used to exploit, control, and adjust natural light are studied below.

Entrance and Vestibule

The entrance space controls light and vision. In the Iranian architecture, one cannot enter a building straight away, but rather there are several intermediary spaces which are hierarchically arranged. Elements and components such as forecourt, portal, vestibule, and corridor constitute the entrance to the yard, and this passage is accompanied by a gradual brightening of space. “Light has always played a pivotal role in successions of space” (Plummer, 2009, 54). Vestibule is a reminder of pause and silence and creates a spatial privacy by separating the outer space from the inner space. “Space formation in an Iranian house is based on privacy. As a spatial reflection of respect, privacy adjusts the relationship between the individual and society. The question of privacy concerns many applications, ranging from the most personal spaces to the areas designated for family gatherings. These spaces are arranged hierarchically in the form of intermediate and sequential spaces” (Haeri, 2009, 116). Skillful use of light plays influential key role in defining private spaces. Vestibule is a low-light space which sometimes receives moderate light from the ceiling. As one moves from the vestibule to the yard, the space gets brighter and brighter, with full light being available in the yard. “Immediately after one enters the yard, it is light which shines, differentiates, and is focused” (Habib, 2006). “The roofed, cool, and dark space is connected to an open, unroofed, warm, and light-filled space” (Habib, 2006).

Yard

The yard provides spatial broadness and allows an experience of life in both open and closed spaces. This experience is full of beautiful views. The yard is the receiver of light and air, gives a sense of space and the environment, and creates a sense of spatial belonging (Fig. 2). A private open space is created inside the house to permit connection with the nature, water, sky, and plants. Sky is framed by the walls surrounding the yard. Sky has always been present in the Iranian house and affords the chance to benefit from the sun, moon, night, and stars, wind, rain, and breeze (Alborzi, 2012, 283). In the yard, water reflects light. Also, the trees absorb part of the light and create a pleasant shade, thus displaying light and shadow. “Trees are important to daylight: they enhance a view, they scatter and block sunlight and skylight, and they modify other aspects of the microclimate” (Tregenza and Wilson, 2011, 160). Further, colorful manifestation of plants in different seasons adds to the beauty of space (Table 1).

Fig. 1: Colorful reflection of light, Tabatabaei-ha house in Kashan

Fig. 2: A view of yard, Tabatabaei-ha house in Kashan
Table 1: A conceptual model for the position of the yard in the architecture of an Iranian house

<table>
<thead>
<tr>
<th>Viewpoints</th>
<th>Position of the yard in the architecture of Iranian houses</th>
<th>Picture</th>
</tr>
</thead>
</table>
| **Functional** | Center and heart of the house  
Unroofed space for life  
Connector of spaces  
Exploitation of light and the sun  
Movement of air and breeze  
Nature at the heart of house  
A place for visits and watching  
Holding family gatherings | Fig. 3: A view of yard, Abbasian house in Kashan |
| **Conceptual** | Light  
Reflection  
Brightness  
Relation with the sky and  
A focus on spiritual viewpoint | Fig. 4: A view of yard, Boroujerdi-ha house in Kashan |
| **Cultural** | Creating an open space surrounded by buildings at the heart of the house for the comfort and peace of the family  
Focus on privacy  
Sometimes more importance is attached to privacy through creating courtyard and outer yard.  
Family gatherings and social interactions | Fig. 5: A view of yard, Abbasian house in Kashan |
| **Symbolic** | A small manifestation of the paradise  
Symbolic view of the:  
Sky, light, water,  
Trees and flowers and plants,  
Birds,  
Wind, rain, breeze,  
Sunlight, moonlight,  
Night and stars | Fig. 6: Backyard, Tabatabaei-ha house in Kashan |
| **Esthetics** | Light and shadows, contrast  
Light, color, shade  
Presence of the sky in the Iranian house  
Sunlight, moonlight, night and stars, wind, rain, and breeze  
Presence of water and reflection of images and colors  
Changes of plants during different seasons  
Manifestation of colors during different seasons  
Decorations of the inner sides of the walls of the yard  
Flavor of flowers  
Singing of birds | Fig. 7: A view of yard, Tabatabaei-ha house in Kashan |

**Veranda**

Veranda is a covered space connected with other spaces from three sides and to the yard from one side. It receives light and causes spatial broadness, a wide eye span, and spatial openness. In addition, it makes a desirable environment by providing shade. Shadow complements light. In other words, there is a kind of grading between bright surfaces and shaded surfaces (Meiss, 1986, 125).

**Belvedere**

Belvedere is similar to a veranda, but it has no ceiling. In some cases, is an unroofed yard on upper floors and is used in moonlit summer nights.

**Window**

Window is a frame for light to enter. It is also used to connect the inner and outer spaces, permits seeing out, and provides visual perspectives. One can note the quality of light
which changes from one place to another, but it is impossible to recognize this change before light is manifested through an artificial form. Many architects have designed windows which materialize light and create a sense of locus (Norberg- Schulz, 1984). The following applications are considered for the window:

- Light admission
- Air change
- View and perspective
- Interaction with the outside

**Orosi, Multi-Doors, and Stained Glass**

Orosi are special windows in the Iranian architecture. In most cases, they have Stained glasses which add to the beauty of the house space by creating colored lights. “Just like fire which creates light, light creates color. Colors are children of light” (Seyyed Sadat, 2001, 6). These Stained glasses refract the white light and create beautiful and variable scenes (Fig. 8). “Light, the first phenomenon of the universe, reveals the living essence and nature of the world through colors” (Seyyed Sadat, 2001, 6). “Colors reveal the interior richness of light” (Burckhardt, 1985, 84). Appropriate light processing has a good and influential effect on human health and comfort. Intense light hurts the eyes and results in eye strain; on the other hand, faint light causes tiredness, eye strain, headache, and stress.

**Tabeshband**

Tabeshbands are vertical separators which are placed on the openings in order to allow appropriate light via partial refraction of light. Using Tabeshbands is employed as a technique in the Iranian architecture to adapt to the bright sunlight. The installation of Tabeshbands creates three-door (Seh-dari), five-door (Panj-dari), and seven-door (Haft-dari) openings.

**Roshandan and Horno**

Roshandan and Horno are traditional skylights placed in the ceiling. They allow light into the inner space and provide a view to the sky. They show time by creating a shining area inside the space. Also, they display variable light qualities because light enters at different angles and in different directions at different times of the day.

**Rozan**

Rozan (Aperture) is an opening on the wall, usually on top, which admits light and provides ventilation. It also provides contrast, visual variety, light and shadow, and virtual composition.

**Shabak**

Shabak is a kind of lattice window which allows light into inner spaces. It creates visual manifestations of light and at the same time limits visibility.

**Feriz-o-Khovan**

Feriz-o-Khovan is a kind of latticed brickwork which creates beautiful appearance, admits light, and limits visibility. In some cases, it provides air. Sometimes it is used as a parapet and at other times as part of the façade and portal of a building. It can also be embellished by the addition of ornaments and colors. The particular arrangement of bricks creates fine light and shadows.

**Mirror**

Mirror reflects light, gives representation, creates virtual images, and causes spatial broadness, transparency, radiation, shining, beauty, and brightness.

**Muqarnas, Yazdi-handi, and Rasmi-handi**

These are ornaments in the ceiling which are used for beauty, light admission, spreading, and refraction. They create depth in space through light and shadows and embellishment. “Muqarnas also serve to trap light and diffuse it with the most subtle gradations” (Burckhardt, 1985, 84). Light shines in a different direction and makes materials brightness. “There is no more perfect symbol of the Divine Unity than light. For this reason, the Muslim artist seeks to transform the very stuff he is fashioning into a vibration of light” (Burckhardt, 1985, 84). Light magnifies architectural decorations.

**Light Quality**

Another important factor in the exploitation of natural light is light quality. Light quality differs in different sides of the house. Considering the geographical features of Iran, the warmest and most appropriate light comes from the south. “South light is dynamic and generally more intense as well as having different color-rendering qualities” (Baker, and Steemers, 2002, 72). In this side, the light, brightness, and heat of the sun exists throughout the day, but its quality and intensity differs during the day and in different seasons. In the north side, brightness exists, but there is no direct sunlight. “North Light is typically more constant and cooler, and thus particularly appropriate for spaces that require high daylight levels without the risks of overheating or glare” (Baker and Steemers, 2002, 72). In the east side, the horizontal shining of light is seen at the dawn, but there are shadows and penumbras during the day. In the west side, there is the horizontal shining of light into the house space and severe heat at dusk. On the other hand, the space of the house is divided up into two parts in terms of function: some parts of the house are used in the summer (Tabestan-neshin) and others in the winter (Zemestan-neshin), and this has been a technique to adapt to the climate. Optimal use of light plays a major role in creating mental peace and physical comfort and saving energy.
Table 2: An analytical model for contrastive comparison of houses from the point of view of light exploitation

<table>
<thead>
<tr>
<th>Building</th>
<th>Iranian Houses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boroujerdi-ha House</td>
<td>![Plan of Boroujerdi-ha House](source: Haji-Qassemi, 1996, 36)</td>
</tr>
<tr>
<td>Tabatabaei-ha House</td>
<td>![Plan of Tabatabaei-ha House](source: Haji-Qassemi, 1996, 114)</td>
</tr>
<tr>
<td>Abbasian House</td>
<td>![Plan of Abbasian House](source: Haji-Qassemi, 1996, 125)</td>
</tr>
</tbody>
</table>

Architectural elements for natural light exploitation

<table>
<thead>
<tr>
<th>Yard</th>
<th>Boroujerdi-ha House</th>
<th>Tabatabaei-ha House</th>
<th>Abbasian House</th>
</tr>
</thead>
<tbody>
<tr>
<td>With a light-filled big yard</td>
<td>With numerous yards, a main yard, a small yard, and two backyards, the walls of which create a with round roof plans</td>
<td>With a small yard and tall walls on the ground floor With the wider and broader in top floor, more brightness and light</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vestibule</th>
<th>Boroujerdi-ha House</th>
<th>Tabatabaei-ha House</th>
<th>Abbasian House</th>
</tr>
</thead>
<tbody>
<tr>
<td>With three vestibules, A long entrance to the yard, passing from darkness to light, With mild light entering from the ceiling in some parts of the passage</td>
<td>With two vestibules, A long entrance to the yard, passing from darkness to light. The main entrance in the southeast side, the entrance composed of several sequential spaces</td>
<td>With two vestibules, An entrance vestibule with a long route to reach the yard The southern vestibule leads to an unroofed entrance and then connects the yard through intermediate spaces</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Veranda</th>
<th>Boroujerdi-ha House</th>
<th>Tabatabaei-ha House</th>
<th>Abbasian House</th>
</tr>
</thead>
<tbody>
<tr>
<td>Big veranda in the southern side of the building and in front of a big and beautiful hall A small veranda with pillars in the west side</td>
<td>An veranda with pillars in the middle of the southern side of yard Small verandas with pillars in all sides and backyards</td>
<td>A veranda with a high ceiling in the northwest side Small verandas around Panj-dari rooms Platforms on the first and second floors</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Architectural Element</td>
<td>Description</td>
<td></td>
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<tr>
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<td></td>
</tr>
<tr>
<td>4</td>
<td>Belvedere</td>
<td>In front of the hall in the north side of the building&lt;br&gt;A relatively large belvedere in the north side of the main yard&lt;br&gt;A belvedere in the middle of the west side of the small yard (The hall of the house opens onto two belvederes from two sides, one to a big yard and the other to a small one)&lt;br&gt;A belvedere on the top floor of the east side of the small yard&lt;br&gt;On the second mezzanine in the northeast side of the building</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Window</td>
<td>With several windows&lt;br&gt;With several windows&lt;br&gt;With several windows</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Multi-doors</td>
<td>Seh-dari&lt;br&gt;Panj-dari&lt;br&gt;Seh-dari&lt;br&gt;Panj-dari</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Stained glass</td>
<td>In multi-doors, Orosis, and Rozan&lt;br&gt;In multi-doors, Orosis, and Rozan&lt;br&gt;In multi-doors, Orosis, and Rozan</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Orosi</td>
<td>Space connectors&lt;br&gt;In certain Seh-daries and Panj-daries&lt;br&gt;Connectors of inner spaces&lt;br&gt;Connector of hall and two Seh-dari rooms in the southeast side&lt;br&gt;Connector of the roofed space (Tabestan-neshin) of the east side to the adjacent Seh-dari room</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Tabesh-band</td>
<td>Divider of multi-doors&lt;br&gt;Divider of multi-doors&lt;br&gt;Divider of multi-doors</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Roshandan and Horno</td>
<td>In the ceiling of the hall&lt;br&gt;On the passage from vestibule to yard&lt;br&gt;Openings in the middle of Yazdi-band units across the ceiling (Fig. 18)&lt;br&gt;Pond hall&lt;br&gt;Roofed space (Tabestan-neshin) with light coming through the ceiling&lt;br&gt;Openings in the middle of Yazdi-band units</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Rozan</td>
<td>In the hall&lt;br&gt;In the big room&lt;br&gt;In front of Seh-dari rooms and intermediate spaces (anterchambers)&lt;br&gt;In the hall&lt;br&gt;In the rooms on the second floor&lt;br&gt;In the veranda</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Shabak</td>
<td>Shabak with beautiful stuccos on top of the hall&lt;br&gt;To allow light into the basement</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Feriz-o-khovan (Brick work)</td>
<td>As a fence around the second floor&lt;br&gt;As a fence around the second floor</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Mirror</td>
<td>In decorations&lt;br&gt;Mirror room</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Water</td>
<td>A pond in the middle of the yard&lt;br&gt;Two pond in the big yard&lt;br&gt;A pond in the small yard&lt;br&gt;A pond in each of the two backyard&lt;br&gt;A pond in the middle of the yard&lt;br&gt;A pond in the middle of the pond room in the northwest side of the building</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Muqarnas, Yazdi-band, and Rasmi-band</td>
<td>The main hall has a Yazdi-band domed roof&lt;br&gt;In the entrance portal of the southeast side&lt;br&gt;Cellar and basement&lt;br&gt;The main veranda in the northwest side&lt;br&gt;Roofed space (Tabestan-neshin) decorated with Rasmi-band</td>
<td></td>
</tr>
</tbody>
</table>

After studying the architectural elements used to exploit natural light (Table 2), their position in the architecture of an Iranian house was studied from functional, conceptual, cultural, and esthetic perspectives, and a conceptual model was formulated (Table 3).
Table 3: A conceptual model for the position of light in the architecture of Iranian houses

<table>
<thead>
<tr>
<th>Architectural elements</th>
<th>Functional value</th>
<th>Conceptual value</th>
<th>Cultural value</th>
<th>Esthetics value</th>
</tr>
</thead>
</table>
| **Yard** | Admitting light  
Admitting air  
Perception of the environment  
Connectors of spaces | Introversion  
Privacy  
Sense of belonging | Creating a private open space inside the house to connect with the nature  
Privacy  
Private space  
For family gatherings | Connection with the nature, 
land, sky, water, night, stars, 
flowers, plants, wind, breeze, 
rain, birds, and open air  
Focus on the senses of sight and smell |
| **Vestibule** | Space division  
Showing direction  
Intermediate space for entering main spaces  
Determining privacy  
Separating the inside from the outside | Leading toward light  
Privacy  
Limited visibility  
Halting  
Silence | Privacy  
Delimitation  
Limited visibility | Entering from darkness to light  
Light and shadow  
Contrast | A frame of light at the heart of darkness |
| **Veranda** | Spatial breadth  
Sight breadth  
Spatial perception  
Spatial opening  
Creation of shade | Spatial experience | Sense of spatial belonging | Visual perspective  
Creating light and shadow |
| **Belvedere** | Spatial breadth | Spatial experience | Sense of spatial belonging | Visual perspective |
| **Window** | Admitting Light  
Air change  
Heating  
View and perspective  
Interaction with the outside | Transparency  
Spatial fluidity | Transparency  
Delimitation | A frame to admit light  
Visual perspective  
A view of the outside |
| **Door** | Boundary between the inside and the outside  
Lack of visibility of the inside  
Interaction with the outside | Delimitation | Delimitation | Visual perspective |
| **Multi-doors** | Admitting light  
Air change  
Heating  
View and perspective  
Interaction with the outside | Transparency  
Spatial fluidity | Transparency  
Delimitation | Visual perspective |
| **Stained glass** | Limited visibility  
Space beautification and enthusiasm  
Psychology of colors  
Keeping bugs out | Separating white light into different colors  
Unity to plurality and plurality to unity | Limited visibility  
Psychology of colors | Colorful reflection of light  
Space beautification  
Creating a colorful image  
Creating colorful lights  
Creating a colorful view  
Creating beautiful patterns  
Visual perspective |
| **Orosi** | Admitting light  
Air change  
Heating  
View and perspective  
Interaction with the outside | Transparency  
Spatial fluidity | Privacy  
Limited visibility | Creating a colorful image  
Creating colorful lights  
Creating a colorful view  
Visual perspective  
Geometrical patterns  
Variety of patterns and colors |
| **Tabesh-band** (light preventer) | Light refraction  
Light adjustment  
Dividing the opening into smaller components | Light control  
Light adjustment  
Light modification  
Light manipulation | Light control  
Light adjustment | Creating rhythm in the facade of the building  
Creating recess and projection in the façade  
Creating form variety  
Creating light and shadow in the façade  
Creating depths in the façade |
### Table 3: A conceptual model for the position of light in the architecture of Iranian houses

<table>
<thead>
<tr>
<th>Architectural elements</th>
<th>Functional value</th>
<th>Conceptual value</th>
<th>Cultural value</th>
<th>Esthetics value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Roshandan and Homo</strong></td>
<td>Admitting light into inner spaces</td>
<td>Sky view</td>
<td>Focusing on the sky</td>
<td>Creating a shining area inside the space Showing time</td>
</tr>
<tr>
<td></td>
<td>Allowing light to go in different directions and different intensities</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Rozan</strong></td>
<td>Admitting light</td>
<td>Privacy</td>
<td>Privacy</td>
<td>Creating contrast and visual variety Light and shadow Creating virtual composition</td>
</tr>
<tr>
<td></td>
<td>Ventilation</td>
<td>Limited visibility</td>
<td>Limited visibility</td>
<td></td>
</tr>
<tr>
<td><strong>Shabak</strong></td>
<td>Admitting light into inner spaces</td>
<td>Privacy</td>
<td>Privacy</td>
<td>Visual effects of light Creating virtual composition</td>
</tr>
<tr>
<td></td>
<td>Light refraction</td>
<td>Limited visibility</td>
<td>Limited visibility</td>
<td></td>
</tr>
<tr>
<td><strong>Feriz-o-Khovan</strong></td>
<td>Separator</td>
<td>Transparency</td>
<td>Limited visibility</td>
<td>Creating contrast and visual variety Light and shadow Creating virtual composition</td>
</tr>
<tr>
<td><strong>Mirror</strong></td>
<td>Light reflection</td>
<td>Transparency</td>
<td>Brightness</td>
<td>Reflection of images Light reflection Transparency Luminance Radiation Shining Representation Virtual image</td>
</tr>
<tr>
<td></td>
<td>Contributing toward spatial broadness</td>
<td>Beauty</td>
<td>Cleanliness</td>
<td></td>
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<tr>
<td></td>
<td>Transparency</td>
<td>Honesty</td>
<td>Honesty</td>
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<td></td>
<td>Luminance Radiation</td>
<td>Truthfulness</td>
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<tr>
<td></td>
<td>Shining</td>
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<td>Brilliance</td>
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<td>Reflection</td>
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<td></td>
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</tr>
<tr>
<td><strong>Water</strong></td>
<td>Contributing toward light reflection</td>
<td>Symbol of light and brightness</td>
<td>Brightness</td>
<td>Reflection of images Reflection of light Reflection of sky in water Virtual image</td>
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<td>Freshness of space</td>
<td>Symbol of cleanliness</td>
<td>Cleanliness</td>
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<td></td>
<td>Providing required humidity</td>
<td>Transparency</td>
<td>Holiness</td>
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<td></td>
<td>Contributing toward spatial broadness</td>
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<td>Blessing</td>
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<td>Washing-up</td>
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<td>Prosperity</td>
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<td><strong>Plants and trees</strong></td>
<td>Freshness and greenness of space</td>
<td>Close relationship between humans and nature</td>
<td>Focusing on nature</td>
<td>Beauty Creating light and shadow</td>
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<td>Light admission</td>
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<td>Creating shades</td>
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<td><strong>Muqarnas, and Yazdi-bandī, and Rasmi-bandī</strong></td>
<td>Ornaments</td>
<td>Plurality</td>
<td>Ornaments</td>
<td>Light and shadow Light refraction Light adjustment Light admission Light distribution Creating depth in space through light and shadows Decoration Beatification and of space</td>
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<td>Beautification</td>
<td>Symbolic meaning of unity to plurality</td>
<td>Creating beauty</td>
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<td>Light admission and distribution</td>
<td>Components that make a whole</td>
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<td>Decorating and covering the ceiling and changing a square plan into circular one</td>
<td>Secrecy and mystery</td>
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</table>

**CONCLUSION**

This research was an investigation into the position and function of light in the architecture of Iranian houses and its role in enhancing the quality of house spaces. For this purpose, three historical houses in the city of Kashan in Iran, i.e. Boroujerdi-ha, Tabatabaei-ha, and Abbassian houses, were studied. The elements and components involved in the optimal exploitation of light were the following: Yard, Vestibule, Veranda, Belvedere, Window, Multi-doors, Stained glass,
Orosi, Tabesh-band, Roshandan and Horno, Rozan, Shabak, Feiz-o-khovan, Mirror, Water, Muqarnas, and Yazdi-band, and Rasmi-band. These elements and components were extensively explored in functional, conceptual, cultural, and esthetic terms. The following conclusions can be drawn: 

Variable approaches are taken in the architecture of an Iranian house for the optimal use of light, light admission, light adjustment, light spreading, light refraction, and light control. Light and light-admitting elements give functional, conceptual, cultural, and esthetic values to space. Entering from darkness to light is a common feature in the architecture of Iranian houses.

Light reflection creates beautiful visual effects. Creating light and shadows is a light processing technique in the Iranian architecture.

Light determines spatial privacy. Space gradually becomes brighter from the vestibule to the yard, which is full of light.

The yard causes spatial broadness and light spreading. The yard makes it possible to concurrently experience life in open and closed spaces. This experience is filled with beautiful visual perspectives.

The yard is a recipient of light and air, offers a perception of space and environment, and creates a sense of spatial belonging.

A private open space is created inside the house in order to connect with light, nature, water, sky, and plants. Water reflects light.

Trees absorb part of the light and create a pleasant shade. This brings about light and shadow. Colorful plants and flowers in different seasons of the year add to the beauty of the house space.

Veranda causes brightness, spatial broadness, and sight broadness and creates a pleasant shade in the environment. The window is a frame through which light enters. Additionally, it connects the inside with the outside, makes it possible to see the outside, and is used for air change and visual perspectives. Orosis, multi-doors, and Stained glass focus on transparency and add to the beauty of house spaces by creating a continuum of colorful lights.

Orosis increase transparency, cause spatial broadness, and enable space flexibility by combining spaces. Tabeshband somewhat causes light refraction, thus admitting more moderate light into the architectural space. Tabeshband creates depth, rhythm, and light and shadow in the façade of the building.

Roshandan and Horno admit light into inner spaces and allow sky view. They also show time by creating an illuminated area inside the space and display different qualities of light by allowing light to enter at different directions and in different intensities.

Rozan is used for light admission and ventilation. It also creates contrast, visual variety, light and shadow, and virtual composition.

Shabak admits light into inner spaces and at the same time allows visibility limitation, visual effects, and virtual composition. Feiz-o-khovan allows the passage of light and also moderate and limited view of the other side. Mirror causes light reflection, spatial broadness, transparency, radiation, shining, representation, beauty, and brightness and creates a virtual image.

Ornaments such as Muqarnas, yazdi-band, and Rasm-bandi are used for beautification, light admission, light spreading, and light refraction. They also create depth in the space with light and shadows and space beautification.

The quality of light is another important factor. It differs in different sides of the house.

AKNOWLEDGMENT

This paper is based on the author’s Ph.D. thesis in the Science and Research branch of Islamic Azad University, Tehran, Iran, which was supervised by Dr. Farah Habib and advised by Prof. Iraj Etessam.

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