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Deep Beauty at the Archetypal Level: Analysis of the Barood Khana Haveli

Abstract

In an attempt to learn from the wisdom of the past, this paper analyzes the architectural design of a traditional courtyard house of Lahore, known as the Barood Khana Haveli. For this purpose, the archetypal level of the 'Deep Beauty Framework' is explored to find out the presence of geometry, number and proportion, as well as the inclusion of the four survival characteristics given by Grant Hildebrand (2008): complex order, prospect, refuge, enticement and peril. Among the various design strategies that are found in the haveli, this research discovers the use of root rectangles in the plans and geometric patterns of the six and eight-point stars in the decorative details. Examination of the prospect claiming courtyards, refuge spaces such as the verandahs, and paths that turn and disappear, offer inspirational ways in which designers can create more meaningful and life enhancing architectural experiences.

Keywords: Traditional House, Courtyard, *Haveli* (mansion), Deep Beauty, Archetypal, Geometry, Proportion, Complex Order, Prospect, Refuge, Enticement, Peril

Introduction

'Deep Beauty'[1] encompasses more than just aesthetics; not only restricted to ecological science but expands the thinking of a designer from functionality to regionalism and deeper meanings of architecture. The 'Deep Beauty Framework' presents a holistic approach towards a sustainable and life-enhancing 'architecture of place.'[2] The three interconnected levels of the framework look at the functional, typological and archetypal aspects. The archetypal level in particular explores the deeper and more meaningful layers of architectural design. G. Coates explains this as:

"*The Archetypal Level involves the use of archetypal building elements, patterns and forms that are most typically found in the world's sacred architecture. Buildings at this level speak in the natural language of space, which is rooted in the pre-verbal meanings of embodied experience: up and down, right and left, front and back, inside and outside, near and far, darkness and light, rough and smooth, warm and cool, the horizontal and vertical, the center and*

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periphery. The archetypal and biologically-rooted polarities of prospect and refuge, complexity and simplicity, enticement and peril are structured in ways that deepen and harmonize the apparent psychophysical opposites of lived experience. Often such buildings are shaped to higher levels of formal order by use of the universal tradition of qualitative number and sacred geometry. The archetypal level is the deepest layer of meaning and metaphoric signification in architecture. Buildings that reach this level lead users back through layers of consciousness and time from the outer surface of the waking mind to the depths of what Carl Jung calls the collective unconscious and beyond, to the edge of the luminous ground of being itself."[3]

Men and women in traditional sacred societies see the universe as an emanation from the One and believe that humans and nature have the common characteristic of structure and proportion that can be quantified through mathematics. Every creation of man and nature are forms that can be observed through mathematical laws of geometry, similitude and symmetry. The beauty of a snow crystal depends as greatly on its geometry as on its capacity to reflect a more complex order. All shapes, lines and surfaces are set in accordance with the proportions that are found in nature and exhibit perfect systems of beauty. Based on an impartial foundation, detached from the personal tastes of a person, a beauty is reached that is universal, general, and eternal.[4]

Karsten Harries, argues that to make a genuine dwelling, it is important to use natural symbols. These symbols make a language of space that is derived from the existence of human beings. The human body provides a sense of proximity through a set of coordinates: up and down, left and right, front and back[5]. Harries, gives an example to explain how all of these coordinates have their own significance. He states, *"Up, for example, has a very different significance from down. We cannot simply turn a building upside down or rotate it; but we can design buildings to look as if they could be inverted or rotated rather easily. The curtain wall invites such a look of invertibility... Think of the gabled roof, its presence seems to resist inversion."*[6]

Similarly, vertical and horizontal, inside and outside, dark and light, all have different meanings.[7] The horizontal and vertical can be called natural symbols because they belong to experiences of human beings in nature, like standing up and lying down. A slab, line or plane represents the horizontal, which ties a building and the earth together. The horizontal can symbolize comfort or an unlimited openness but it can also indicate death, sleep and rest. On the other hand, the vertical is assertive and requires effort to stand. It has the ability to accentuate a space and connects the above and below, the earth and the sky. It possesses the power to gather people around a center that forms an axis mundi. Tall vertical structures endorse human pride and can be associated with masculinity.[8]

The natural symbols of light and dark refer to a light that changes according to the time of the day and year, and moves us from light to darkness. The reference here is not made to any artificial light but to the sun. This natural language is absent in modern buildings as artificial lighting has discouraged our

dependency on sunlight.[9] Inside and outside relates to the idea of refuge and prospect. As explained later, the inside is a refuge, which can be perceived as shelter and a prison. The outside is a prospect, which can be threatening but also provides a sense of openness and freedom. Harries also discusses the symbol of a center. Every enclosed space has a center. Squares and monuments can form centers of cities and neighborhoods that serve a communal purpose. Sacred structures represent centers that have symbolic significance.[10]

Assumptions made by science have reduced things to just objects and eliminated their potential to speak. Natural symbols are a way that our body perceives our surroundings. Thinking about this natural language while designing has the potential to produce non-arbitrary architecture that is universal.

Grant Hilderbrand has identified five survival-advantageous characteristics: prospect and refuge, complex order, peril, and enticement. Designing these characteristics into our buildings increases the likelihood of creating deeply rewarding spaces. Humans have a tendency to process sensory information and categorize it into some form of order. We find appeal in sensory materials that are ordered but also complex at the same time. Order alone becomes monotonous and complexity alone results in chaos. Hildebrand combines these two characteristics and calls them 'complex order.'[11]

Humans need shelter for protection from climate and other threats. Jay Appleton has referred to this characteristic as 'refuge.'[12] Simultaneously, we also require vast open spaces called the 'prospect.' Hence, the prospect is spread out and lit, while refuge is narrow and dark. Both cannot exist together, but they must be connected allowing one to examine the prospect from the refuge and flee to the refuge from the prospect. Prospect and refuge spaces can also be created in indoor environments.[13] Interior spaces that are small and dark act as refuge, while large and bright halls behave as prospect. The prospect and refuge cannot be established in a building with constant ceiling heights and same amount of light. Though daylighting is essential for human well-being, dark spaces are also important as our retreat and place for recovery, sleep and meditation.[14]

Stephen Kaplan concluded from his research that humans prefer settings that present mystery.[15] We aspire to discover the unknown but remain in safety. It is important to note that during this process of discovery, we like to move from the dark into the light, where we can assess the dangers of the place before entering, rather than from the light into the dark, where other dangers or creatures in the dark are able to see us first. Hildebrand calls this characteristic 'enticement'. Enticement only uncovers part of the information and leaves the rest to be revealed. Architectural spaces can be designed incorporating enticement or a pattern or sequence of several enticements.[16]

We enjoy settings that let us experience thrill, where we experience fear with pleasure. Hildebrand calls this characteristic 'peril'. In situations of peril, we face real dangers, but we have the capacity to manage the risks. This controlled confrontation gives us pleasure. In architecture, tall buildings, extended balconies and transparent bridges are examples that provide such experiences.[17]

These five characteristics given by Hildebrand have the potential to make buildings meaningful and give us pleasure by offering experiences that are similar to those of a natural setting. The long-term worth of design is impractical without attracting all the senses. If design is unable to inspire, it will be discarded rather than sustained.[18]

Rubric for Analysis

The archetypal level has been operationalized to develop the following rubric for analysis:

1. Orientation in Space
2. Geometry, Proportion and Number
3. Spatial Polarities in Natural Settings

The archetypal analysis of the house requires finding the presence of the world's scared architecture and archetypal elements such as courtyards, towers and basements. The use of mathematics, nature, numbers, geometry, proportions, symbolic dimensions and patterns is assessed. Occurrence of spatial polarities including complex order, prospect and refuge, enticement, and peril in the overall experience are explored. Natural symbols have not been studied for this house.

Case Study: Barood Khana Haveli

Barood Khana Haveli is an example of a traditional courtyard house, situated in the Old Walled City of Lahore. The *haveli* was built in the 18th century when the Sikh ruled this region. The architecture of the house reveals many stories about that era and its people along with enlightening the contemporary designers with the wisdom of the past.

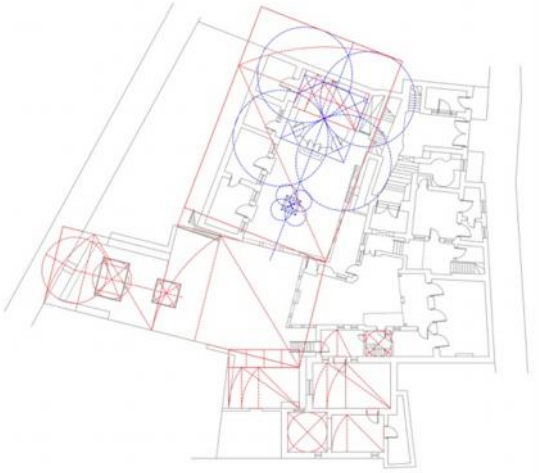

Fig. 1 Geometric Analysis of the Barood Khana Haveli

Orientation in Space

The *haveli* faces the Lahore Fort. From the roof of the *haveli*, the grand Badshahi mosque (c. 1673) is visible. Both of these monuments facilitate orientation inside the *haveli*. The towering minarets and the call for prayer five times a day, give the inhabitants a sense of direction.

Geometry, Proportion and Number

The main courtyard is formed by root 2 rectangles of different sizes. The square in the smaller rectangle defines one side of the courtyard. The middle axis

of this square is also the middle axis for the podium and the pool. The podium has the proportions of a root 2 rectangle and the pool is a square. The opposite corner of the larger root 2 rectangle in the courtyard meets a root 3 rectangle on one side, which forms the entrance area. The inner courtyard has an octagonal pool, which is in line with the octagonal shape that becomes the *sheesh mahal* (lit. palace of mirrors). The sheesh mahal is a half octagon that is attached to a root 3 rectangle. The second inner courtyard has rooms with proportions of a square, root 2 rectangle, root 3 rectangle and the golden rectangle. It is difficult to assess the proportions of the courtyard itself due to the angled lines (Fig. 1).

Fig. 2 Geometric Patterns found in the Interior of the Barood Khana *Haveli* (Hexagonal Grid, Diamond Grid, Arabesque Design)

Geometric patterns and arabesque designs that decorate the *haveli* manifest features of traditional Islamic art. Intricate designs combining the circle, square, hexagon and curve cover the floors, screens, balconies, doors and windows, using different colors and materials including wood, stone and glass. The hexagonal grid has been used multiple times in the screens, terrace railing and the bench in the courtyard. A combination of the six-point star with the hexagon forms the top of the doorways. The floor pattern in the main courtyard is comprised of designs constructed with circles, curves and octagons. The terrace floor has the eight-point star as the main geometric element and the terrace screen is the standard diamond grid (Fig. 2).

Spatial Polarities in Natural Settings

The house is comprised of both outdoor and indoor spaces. For the purpose of this study, the spaces have been divided into two groups. The first is the exterior prospect and exterior refuge and the second is the interior prospect and interior refuge (Fig 3).

The courtyards of the house have trees and balconies under whose shadows exterior refuge spaces are created. Other exterior refuges are the verandahs that provide dark sheltered spaces. All these exterior refuges open into the uncovered, brightly lit courtyard floor, which is the exterior prospect space (Fig 4).

Most rooms contain a refuge and prospect within themselves. The windows create dark and light zones inside the rooms. The octagonal part of the *sheesh mahal* is lit, while the other half is dark and cozy. This distinction is also defined from the arch in the ceiling. From the interior refuge one looks into the interior prospect that further looks into the courtyard, which is the exterior prospect. The passage connecting the rooms on the north side of the building does not have direct light. It is an interior refuge that opens directly into an exterior prospect.

The balconies and some parts of the terraces are covered by screens. These refuge spaces are private and dark zones from where a person is able to view the open courtyard and the open terrace. The trees on the terraces create refuge spaces with their foliage.

Fig. 3 Prospect and Refuge Spaces along with Paths that Turn and Disappear

(Left: Ground Floor Plan; Right: First Floor Plan)

The ground floor plan has a number of enticing trails that disappear around bends, creating the characteristic of enticement possible. In the diagrams (Fig. 3), the black arrows represent these enticing bends in pathways inside the *haveli*. Upon entering into the main courtyard, screens and the location of other courtyards allow the user to partially view the inner courtyards, while creating a sense of mystery. The linkages of the rooms, the passageways and the combinations of prospects and refuges throughout the plan entice the observer into exploring further. The dark and narrow staircases turn and disappear mysteriously (Fig 5).

Fig 4 Main Courtyard and Verandah; Exterior Refuge and Exterior Prospect

The geometric analysis in the earlier pages explain the presence of order and complexities in the plan of the house. The plot is not a distinct uniform shape, but the spaces created inside are based on certain geometric rules. These spaces have complex relationships that cannot be easily understood while visiting the place. It takes time for the user to discover how the areas are connected.

The open courtyards and the roof top offer a perilous thrill to the users (Fig 5). The open to sky court generates a feeling of danger by how it is affected by the weather, the intrusion of birds and the darkness at night. The roof top gives the view of all the terraces, courtyards and the street from a height offering the thrill of elevation.

Conclusions

This in-depth analysis of the Barood Khana Haveli helps us understand how 'Deep Beauty' has been achieved at the archetypal level historically and how contemporary designers can benefit from this wisdom of the past. The archetypal level explores the symbolic importance of architecture which is attained by directing the conscious mind to the depths of unconsciousness and beyond. Buildings at this level possess elements, patterns and forms found in the world's sacred architecture, speak the natural language of space, employ qualitative number and sacred geometry in design and demonstrate the occurrence of biologically-rooted polarities.

Fig. 5 Enticement and Peril
Left: Staircase; Paths that Turn and Disappear
Right: Views from Roof Top

For this research paper, the rubric developed for the assessment of the archetypal level includes three parameters: how the building is oriented in space; how

geometry, proportion and number are employed; and if spatial polarities are present. The proximity of the Barood Khana Haveli to the grand Lahore Fort and the Badshahi Mosque orientates the users. The visibility of the monuments from the roof and the streets, as well as the sound of the *azaan* (call for prayer) from the mosque, provides a sense of reference in space.

Geometry in the layout plan is evident because spaces of the *haveli* are divided in proportions of root 2 rectangle, root 3 rectangle, the golden rectangle, square and octagon. Patterns found in the *haveli* are inspired from Islamic art. The floors, screens, balconies, doors and windows are decorated with geometric patterns made from circles, squares, hexagons, curves, the six-point and the eight-point stars. The wooden *jali* (screen) dividing two of the courtyards has carvings depicting arabesque design.

The spatial polarities include complex order, prospect and refuge, enticement and peril. Due to our primitive instincts, humans need shelter spaces, referred to as 'refuges', in order to feel safe but we also have a fondness for vast open spaces, referred to as 'prospects', where we can easily see resources and threats. Refuges are dark and narrow while prospects are well-lit and spread out. A meaningful space is created when prospect and refuge are both present and one can be seen from the other.[19] In this *haveli*, prospect and refuge spaces can be found in the outdoors as well as in the interior. The prospect claiming courtyards can be seen from refuge spaces, such as the verandahs and the shades of trees and balconies. Spaces close to the windows are well-lit and high ceilings give a feeling of vastness, creating prospects within the interior. Refuges are dark and cozy areas that are found away from the window and have low ceilings.

The characteristic of design that presents a mystery and fulfills our primitive need for discovering is called 'enticement'.[20] Spaces inside the *haveli* are linked in such a way that one space is only partially visible from the other creating mystery for the observer. The courtyards are separated by perforated screens. Staircases are L-shaped, dark and narrow. Humans experience pleasure in thrilling situations where they face dangers that they can overcome. This characteristic is referred to as 'peril'.[21] In the *Barood Khana Haveli*, roof tops create a sense of danger due to their height and views down below. The courtyards offer a perilous thrill because of their openness and vulnerability to the weather, insects, birds, and darkness at nighttime.

The design of the *Barood Khana Haveli* succeeds in meeting the criteria for attaining 'Deep Beauty' at the archetypal level. Inhabitants are able to orient themselves, a formal order is apparent through the use of geometry, proportions and number and, the spatial polarities enrich the lived experience. The design strategies identified in this paper are important guidelines that can direct future architects to learn from our traditions to help create sustainable and more meaningful spaces for the future.

Notes:

1. Figures 1, 2 & 3 were developed by Rabia A. Qureshi as part of her MS Architecture Thesis at the Kansas State University in May 2015 under the supervision of Prof. Gary J. Coates.

2. Figures 4 and 5 are photographs that were provided by the Mr. Yousaf Salahuddin, current owner of the Barood Khana Haveli, in 2014.

References

[1] The term "Deep Beauty Framework" (2014) was coined by Professor Gary J. Coates, Department of Architecture, Kansas State University, Manhattan, KS.

[2] 'Architecture of Place' is a concept that refers to architectural designs that ensure high quality of people's relationships with a place. Further details on this term are summed up in the paper:
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