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JALLI – an Aesthetic feature of Hindu and Mughal Architecture

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Abstract

The word jail is an Urdu and Sanskrit word used to describe pierced screens to give net like structure. This net like structure is called Jaalidar. This is an ancient art and had shown its development in both Islamic and Rajputana Architecture. This was a feature of architecture embellishment and was used by both Islamic and Hindu artist who has skilled labour to carve such perforated screens. Fine latticework had a considerable status, function and role though somewhat similar and somewhat different in both the architectural styles. This was the reflection of aesthetic taste of Islamic and Hindu dynasties. Jalli , the perforated screens whether made in stone, rocks, limestone, marble or any other material have different representations, inspirations and applications when compared its presence in Islamic and Hindu architectures. The paper presents a comparative descriptive study of jalli structure and its Hindu and Islamic influences. The purpose of the paper is bought out the comparison in designs of jalli as visible in Islamic and Hindu Architecture over years and its development under the influence of each other cultures and reign of their emperors.

Keywords: 1. Jalli structure 2. Islamic architecture 3. Hindu Architecture 4. Motifs and influences

Introduction

Although most of the examples of jall are directing its evolution from Indo Islamic architecture, or from the Sultanate or Mughal reign in India but studies shows that before the Mughal, the jaalis were also used in Hindu Architecture, specifically in Temples. Hindu architecture includes the architecture of various buildings like monasteries, statues, homes, market place gardens and town planning. The buildings were made by specific structural rules or guidelines which were included in Vaastu Shastra, Shilpa Shastra, BrahatSamahita,

and in some puranas and Agamas in their architectural sections. As per the report of Architectural Digest, the carved apparatus (jallis) has existed since 8th century in India. They were found in Pattadkal temple structures of Karanataka and Kerela and also the Kailasa, a temple of Lord Shiva in Ellora Maharashtra. In Hindu architecture the "jall" was created by perforated stones by carving or sculpting the ornamental motifs in the building stones or wood. In the Indo Islamic architecture, the concept of perforated screens creating net like patterns, were made in marble, Lime stone or wood and was usually called as "jalli".

Findings and discussion

Concept and origin of Jall in Indian architecture

Very few examples of Hindu architecture has survived.Some of regional texts are also talking about Jaals like Manasara. Among the other surviving buildings of ancient Hindu period, Temples are the most important examples of Hindu architectural tradition of stone, brick or rock cut architecture of Gupta Empire. As per a Historian James Harley, this absence of secular Hindu architecture was due to the beliefs of Hindus that they always erect the temples with stone and other long-lasting materials, and construct the other secular structures in temporary materials. The most probable reason for this might be the beliefs of Hindus in Atma and Parmatama, as they say that the body belongs to soil and Atma – the soul is a part of Paramatma – The God. As per Hinduism – the soul (foundation) is only permanent thing, remains forever. On the other hand body (upper structure) keeps changing its shape, size, in different births, that is why mostly the foundations and temples (house of God) are made with stone and the other upper parts of secular structures with mud or some other temporary materials. The influence of Persian and Hellenistic Architecture is quite visible in Hindu architecture. Only few examples of secular Hindu Architecture have survived in Modern era. But from the ruminants of temples basic rectangular Jali stone work is seen at the Gupta period. In Gupta and Post Gupta Period basic jail was made with rectangular shapes (Plate 1) was seen in Nachan temples and Pattadakal Temples.

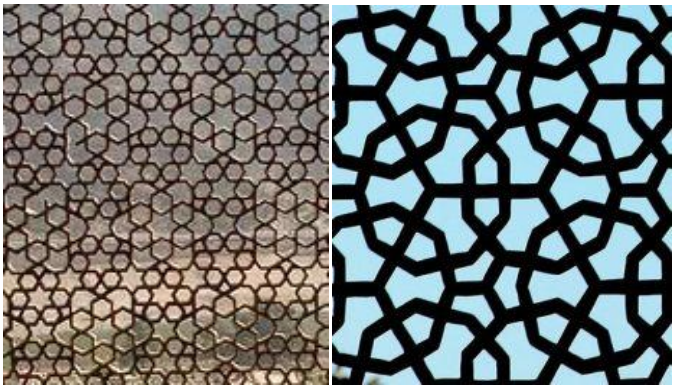
Plate 1

Nachna Parvati-Temple Jali, Gupta period

In Indo Islamic architecture special techniques which were followed in creating Jali structures. It can be a repetition, infinity and symmetrical patterns. The details as described by (Masooma Abbas & Kamath and Daketi, 2016) say its module repetition when geometric patterns are mainly formed. The geometric patterns were consisted of basic shapes squares, circles, triangles and its adaptations like pentagons, hexagons and octagons. On close observation, it can be identified that the bigger complex

patterns are the repetitions of octagons creating a star like pattern in the centre (Plate 2) or octagon combined in the centre with a hexagon (Plate 3). This pattern when repeated gave the illusion of big large complex pattern in which it is difficult to find its stating point and ending point and to give the message that God is infinite. They followed a belief while creating such intricate net designs using geometrical patterns is theta there is no definite place for God.

Plate 2 Plate 3



The experimentations in Hindu Architecture extended into Badami over the course of the next two centuries. This culture of learning encompassed Pattadakal in the 7th century which became a nexus where ideas from northern and southern India fused. It was during this latter period that the Chalukya Empire constructed many of the temples in Aihole-Badami-Pattadakal region.

Pattadakal, became the major cultural centre and innovations in architectural styles along with the nearby Aihole and Badami(ASI Report 2012). This place reached its pinnacle of glory under the Chalukyas from the seventh to the ninth centuries functioning as a royal commemorative site. That was also the period when experimentation in architecture was done by making this place as nexus where ideas from both southern style (Dravida-Vimana) and northern Indian style (Rekha-Nagara-Prasada) can meet and creates a fusion of Nagara and Dravidian styles. The group of about ten temples, surrounded by numerous minor shrines & plinths, represents the climax of early Western Chalukyan Architecture. Four temples were built in the Chalukya Dravida style, four in the Nagara style of Northern India, while the Papanatha temple is a fusion of the two.

King Vikramaditya II (734 - 745 AD) and his art loving queens Lokmahadevi & Trailkyamahadevi, brought sculptors from Kanchipuram to create fantasies in stone in Pattadakal The experimentations in architecture extended into Badami over the course of the next two centuries. In the time period of western Chalukyas, around 12th century inscriptions, contemporaneous texts and the architectural style indicate that, from the 9th to 12th centuries, new Hindu, Jain and Buddhist temples and monasteries continued to be built

in the Pattadakal region. Historian George Michell attributes this to the presence of a substantial population and its burgeoning wealth. Pattadakal was described as harmonious blend of architectural forms of northern and southern India and an illustration of “Eclectric Art” at its height by Unesco.

The most sophisticated temples, with complex friezes and a fusion of Northern and Southern styles, are found in the Papanatha and Virupaksha temples. (Cummings, 2014) The Virupaksha temple is an active house of Hindu worship (ASI, 2011).

Plate 4- Exterior wall segment of Papanatha temple

An exterior wall segment of Papanatha temple (plate 4) built in 1200+ years shows the beautifully connected swastika as a jalli structure of one window and elaborated peacock in another. Both the motifs are important religious motifs of Hinduism. A curved interconnected Jali in the form of horse shoes with wings (kudu) at sculpture of Ardhnarishwara (half Shiva, half Parvati) at Kadasiddheswara temple of pattadakal which is relatively a small temple dated around mid-7thcentury(ASI) or early 8th century (Michell G) gave the idea of skilled hands of artisans in Pattadakal period.

Kũdu (Tamil) is Horse-shoe arch with elongated "head" and side "wings" found throughout "southern" style Indian architecture. Almost identical with the gavãksa but never disintegrates into "split" form. (Michell, 1978)

Plate 5 – Ardhanarishwara At KadaisiddheswaraTemple (7-8th CE)

In Indian architecture, gavaksha or chandrashala (kudu in Tamil, also nāsī) are the terms most often used to describe the motif centred on an ogee, circular or horseshoe arch that decorates many examples of Indian rock-cut architecture and later Indian structural temples and other buildings. In later forms it develops well beyond this type, and becomes a very flexible unit, "the most common motif of Hindu temple architecture" (Harle 1994).

Gavãksha or Gavaksa could be a Sanskrit word which suggests “bulls or Cow’s” Eye. In Hindu sanctuaries, their part is imagined as typically transmitting the light and quality of the central symbol in its sanctum. On the other hand, they are depicted as giving a window for the divinity to look out into the world.

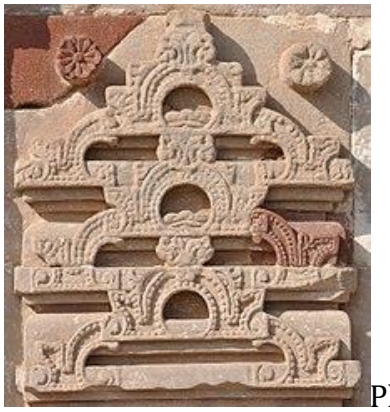


Plate 6 piled up gavakshas at Osian Jodhpur

The famous carved door of Lomas Rishi, one of the Barabar Caves, dated to approximately 250 BCE, displaying the first known Maurya reliefs. The most impressive craftsmanship is seen on the façade of the Lomas rishi which replicates the Horse shoe shaped gable end of a wooden structure with two lunettes with very fine carvings of lattice work and rows of elephants paying homage to Buddhist stupas.

Plate 7 Lomas Rishi, Barabar Caves 250 BCE

Critchlow, (1976) has mentioned the importance and use of circle in Islamic Architecture perforated screens. Circle is representation of Unity and is considered to be symbol of unity in Islamic World. The repetition and expansion of circle gives origin to many more figures of importance. A combination of three circles gives origin to a triangle. In Islamic cosmological analysis a triangle is representation of human consciousness which further relates it to three

major biological functions that is ingestion, digestion and excretion. A circle also has in its vicinity a square which is representation of earth and its important four elements water, air, earth and fire. A square also represents materialistic world. Circle also has in it many other geometric forms like hexagon, pentagon and octagon. In Islamic culture hexagon represents heaven.

Very less geometrical shapes were seen in jall of hindu architecture .although various geometrical shapes and their structure, size, were of great importance to shilpakala. Use of square jalli in Swarg Brahma temple, a temple that is dated to 689 CE in Alampur, Andhra Pradesh, shows that jalli was an elementary part of Hindu sculpture and architecture; the main purpose might be the air and light control in the Temple

Plate 8 Swarg Brahma Temple, Alampur

The jalli structure at Swarg Brahma temple is similar to Sanghmaheshwara temple in Pattadakaal

Plate 9a,b Stone jail in Sangameshwara , the oldest Temple Paddatakal 720 AD

A side wall of Sanghamheshwara temples is showing experimentation with window styles and wall carvings. Combination of geometric patterns or simple stone bars to change the shape of jalli was seen in the jaali structure of window at Galaganatha temple (7^{th} or 8^{th} century) around the shiva carving, indicates the use of jalli or perforation as a form of ornamentation in the Rekha Nagra style of architecture.

Plate 10- Shiva Killing at Galagnatha Temple, Pattadakal

In Islamic architecture the pentagon and octagon plays a very miraculous function while combined and expanded. A pentagon combinations and repetition gives a central five sided star and when vertexes of octagon meets in repetition pattern gives octagon star in the centre. The pentagon star and octagon star are fundamental Islamic patterns. An octagon star has parallel sides giving rise to star rosette leaves. This is also represented as 8 fold rosette (Abdullah and Embi,et al. 2012). Islamic culture has adopted earlier scientific methods and complex geometrical drawings for the development of patterns which relates to ritualistic lslamic tradition (Abdullah and Embi, 2012).

(Henry, 2007) has described the patterns as obtained by the repetition of six regular circles giving rise six triangles at Yzad of Iran. The basic designs are inter weaved with complex geometric patterns. Alai Darwaza has the jalli made in marble having interlacing of two types geometric patterns which is central hexagon star interwoven with triangles and squares. Another pattern shows a centre overlaid square created by interlacing of octagon. The patterns seen at Alai Darwaza don't resemble the concept of jalli at Hindu architecture that is nandyvarta the swastika pattern as mentioned by (Nath, 1976).

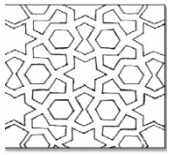


Plate- 11 Alai Darwaza central hexagon star interwoven with triangles and squares

Quwwat-al-islamMsoque and Iltutmish's tomb have interlaced polygon pattern carvings. These were made in 1235. The Islamic concept of gerehsazi which means starp work and is intricate and interlaced geometric work in presentation is a work done earlier to work mentioned in 1300 Silpa (Milwright, 2010, wulff 1966).

The jalli work as present in Hindu architecture and Islamic Architecture which was source of geometric ornamentation were the outcome of Indian craftsman's skill. Some people argue that only simple structure designs were present in Hindu temples and with the influence of Islamic designs in some of architecture built at the parallel ruling time of both Islamic rulers and Hindu Ruler, they become artistic and figurative.

The Mohammad Ghaus Tomb located at Gwalior has intricate lattice work presenting geometric patterns, cervical lines and straight lines creating floral patterns too. The façade of tomb has hexagon joined with straight and incline lines making a delicate pattern all representing arabesque style.

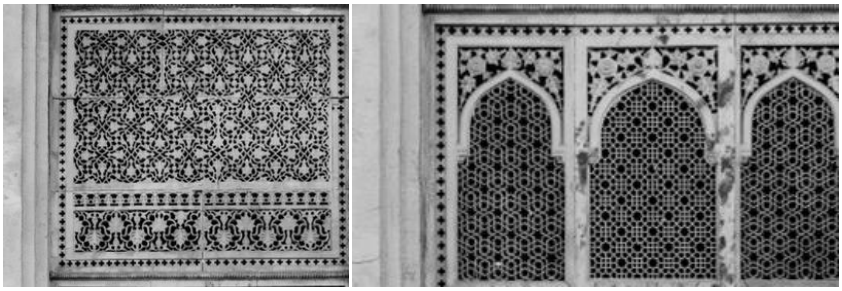


Plate 12 The Mohammad Ghaus Tomb, Gwalior (Source: picfair.com)

Geometric jallis with curved and straight lines both and they have also used arabesque designs and floral designs for carved on the stone walls. In Muhammad Ghaus tomb geometric pattern is mostly used to adorn the facades of tomb and give the proper light effect in the building and the geometric patterns like hexagon, and inclined and straight lines are joined in the form of a delicate pattern. The geometric patterns have taken from the Ammann Beenker tilling a non-periodic tilling. Due to these jalli works the cooling can feel in the tomb and there is always a difference of 5 degree between the of outer and inner temperature. The temperature of inside the tomb is always 5degree less than the temperature of outside the tomb. Similar perforated screens were seen in Galageshwara temple in Galagantha ,Karnataks which exhibits the jail as an important part of Hindu Architecture before the invasions of Mughals .

Plate 13 Perforated window screens at Galageshwara temple in Galagantha ,Karnataks

Welch S. discuss the use of perforated stone windows or Jall in Indian temples of chola dynasty to allow light . Further Pandya (2011) discusses the jalli as small perforations in wall which is effective in both dry as well as hot humid climate zones. It manages to cut down on direct sunlight thereby controls the heat in the compound and it also allows the movement of air for cross ventilation.

Plate 14 - 7 Stone windows at Airavateshvara Temple, Thanjavur,Tamilnadu(Chola Dynasty)

Michell (1978) explained the similar concept of big and small holes as a means of controlling Light and air) in his comparative study of Mundeshwari temple in Ramgarh Bihar, 6 A.D. and Meguti Temple at Aiholekarantaka, 4 A.D.confirms the perforated windows in ancient Hindu Architecture. The windows in Mundeshwari temple were created by several stone screens some of which are divided in to squares and perforated to create the impression of window bars. The decoration is done with the use of foliage's and in upper panels miniature animal masks are found.

The small windows of Meguti temple were much simple in their designs with single panels of square perforations. No carved decoration as in these windows were found.

The holes done in jail were generally of the similar thickness of stone to provide structural strength. Although the Size of holes were quite bigger in the areas of high humidity such as Kerela and Konkan as compared to Rajasthan and Gujrat which are dry climate regions.

In the history of Hindu architecture the Lad Khan Temple has (dated by some to c. 450 but more accurate to (c.620) perforated stone windows and sculptures of river goddesses. The Meguti Jain Temple (c.634) shows progress in structural design. The Durga temple with its northern Indian style tower (8th century) and experiments to adapt a Buddhist Chaitya design to a brahminical one in its stylistic framework is overall a hybrid of north and south Indian styles.

Abbas (2016) reported the work of (Nath, 1988) as per him, the Śilpā of 1300, (mentioned in Nath's supplement 1988 to Volume I and II), explains the six types of jālīs according to their shape and design for temple architecture: the first two are titles for the forms of jālīs, the word gonetrā for semi-circular and triangular pierced screens and hastinetrā for square and rectangular shaped ones. The remaining four types are related to patterns for lattices, respectively called nandyvartaā swastika-based (incorrectly called interlaced by Nath); Rjukriyam or straight line geometrical designs; Puspakarnā, floral designs; and Karnaā, curvilinear patterns (confusingly referred as "geometrical designs made of curved lines, precisely arabesques") (Nath, 1988).

Not only as method of controlling light and air, jalli served as a means of ornamentation. Various ornamented jalli patterns were seen in Virupaksha temple of Pattadakall, with motifs of trees, birds, peacock and various foliage in Jali or the borders or frame of jall.

Plate 15 Windows in Virupaksha Temple 8th Century

The Virupaksha temple of 8th century is the best example of the fruits of creative fusion in terms of the plan, style and integration of arts of both Nagara and Dravid style of architecture. In plate 8 from Virupaksha temple jall showing a story from Mundakopanishad and in plate 16 a wooden jalli from some maratha palace, featuring two birds with tails entwined sitting on a tree are just sample of cultural continuity.

Plate 16

As per a tweet of Wonderful Indian Architecture Official Twitter handles of 'भारतीयवास्तुकला, the ornamented jalli are as old as epics it further reported that the gold flicker work on Jalli was mentioned in Mahabharat.

Stone carving was a major element of elaborated ornamentation of Both Hindu and Jain Temples. Stones were carved shaped, coloured also in various design motifs, in pendant forms. Sculptural figures and other architectural forms were rich elements of Temple architecture. Jall / jalli or the perforated screens or window frames with auspicious motifs and symbols were the big part of stone ornamentation. Michelli G reported that many of their forms evolved from earlier examples in timber which were later realized by artisans working in stone. Heavy stone walls were pierced by using the techniques of carving and drilling to allow light to enter in the interior space through them. This lattice was often close to the central chamber (Garbhagriha) or the surrounding zone of that which is the Pradakshina path

of temple. In Hindu Temples Stones were carved shaped, coloured also in various design motifs, pendant forms.

The relationship that develops between forms and their meanings within the Hindu temple is essential to its function as a link between the gods and man (Michell, 1977, 1988). The square symbolises order, unequivocal form, the celestial sphere and the absolute. The circle on the other hand represents movement, and therefore time. The square and circle, by their very nature, are constant, but the rectangle is not. The square, with its potential to include competing elements, when enclosing a circle represents the dimensions of both space and time.As the cosmos is represented by the circle symbolically, the process of making an architectural model of the cosmos involves the representation of a circle in a square grid in two-dimensional construction and of an ellipsoid (the cosmic egg) in a cubical grid in three dimensional construction. A process of descritization of all curved forms is necessitated by this need to represent them in a square grid, which results in the typical jaggedness of the temple plan (Trivedi, 1993).

A lot of literature has been found discussion the architectural plan of Hindu temple, discussing the square and mandalas, the triangle, all based on Vaastu shastra, and other ancient literature. As per Saussaye, 1891, the symbolism of temple building was sometimes referred as the structure of world and sometimes the religious relationship of men to God.

An Islamic structure, Mosque of Siddi Sayyid, 16th century located at Ahmadabad, represents a great example of studying Jalli in Indo Islamic architecture. .The mosque has twin jaali having the carvings of palm tree and tree of life with fine web of tendrils spread and intricately done. The other features of jalli in the mosque are square panels having geometric combinations of curvilinear giving a look of medallions, simple and complex floral motifs. The medallions at the Mosque can be related to Hindu mythology.

Plate 17 Mosque of Siddi sayyid

It confirms that slowly with the invasion of sultanate the jail patterns made with stone piercing and carving techniques were adapted for use in Sultanate and Mughal architecture and were developed in fine carved jalaka of Mughal kaal.

Jalli of temples from Solanki-period (11th to 12th centuries) of Gujarat and Rajasthan had a particularly strong impact on the styles of the Sultanate period of the same region, bestowing their auspicious designs on later Islamic structures.

Shah V (2020) in her study of Jain temple of Ajinath at Taranga,(11thCentury) Gujarat, reported that ornamented jalaka or lattice work was used in the Shikhar of Ajinath temple. "Ornamental patterns like the jalaka lattice on the shikhar give a texture of light and shade to its surface, it's sole purpose is aesthetic; to challenge human perception and thus alter the state of awareness of the human mind"

Plate18 Jalli Wall, Ajitanth Temple 11th Century. Patan , Gujarat

Resemblece of the Jalli from the back wall of Ajinath temple (11th Century) can easily be notices in the jalli wall of Siddi Sayyid Mosque.

Although Earlier forms of Jaal (square shape) were also seen in rock cut architecture of Dravida style in other areas of India as in Kailasa Temple, Ellora Maharashtra and in manmodi Caves in Junar 2nd Century. Explains the importance of jall and shapes in the hindu architecture showing relationship of Men to GOD.

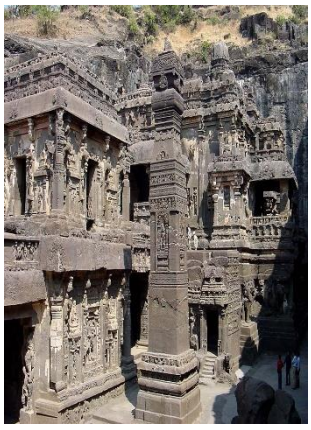


Plate 19 Kailasa Temple Ellora, Maharashtra A rock Cut Architecture of Dravida period

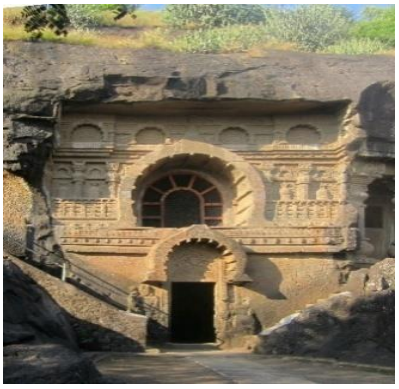


Plate 20 Manmodi caves in Junar 2nd century CE

The classification of temple jali designs and their symbolism has been expounded by Professor MA Dhaky (The Indian Temple Traceries, American Institute of Indian Studies, New Delhi, 2005). A great range of jali designs were identified in temples from very simple spaced vertical bars known as stambhajalaka to more elaborated form including the auspicious religious symbols of Hinduism which includes the Svastika (Meander) or meander with short curved arms (nandyavarta), Hansa (Goose associated with Devi Saraswasti, Goddess of Education, shankha- Related with God Vishnu who takes care of Life , Simha or Sinha the lion, Associated with Durga , the Form of Shakti and the Sudarshana Chakra of Lord Vishnu(medallion), sometimes composed of eight fish (chakra-vyuha).

Geometric forms (bahurandhra) are also known, among them variations of a simple pattern of drilled square holes, sometimes elaborated by a stepped treatment around the edge (turyasra, chaturasraka, sarvatobhadra, sakarnaka, vardhaman) or tipped to form a diamond-like pattern (gonetra, gajendranayana). Architectural features such as miniature columns—sometimes bearing a figural sculpture—or cross straps (rjukriya or stambha) also form a category of jali.

In the naturalistic designs floral designs like open flower head flowing creeper plants or interlocked vine were found most commonly. Lotus flower (Padma) or petals or leaf of lotus plant were other religious symbols used to form jalli or the frames of window. Elephants, deer's, peacock associated with Krishna, and Lions were the most common animals along with the snakes in temples of Shiva.

But of all the figural types, it is just a lone peacock or two that makes its way into Islamic buildings, for example at the shrine of Muhammad Ghaus in Gwalior

The Tomb of Salim Chisti is another fine example of exuberant jalli work. The lattice work relates to gereh sazi designs.

Another Mughal monument, the Tomb of SalimChisti from FatehpurSikri is notable for its exuberant lattice screens enclosing the verandah that have intricate gereh-sāzī designs which is the representation of curvilinear patterned trellises. The fatehpur Sikri has been ornated with gerehsazi styles of lattice patterns at Hawa mahal where small rectangular patterns can be seen, at TimuridislimiKhata where split leaf joined back to back can be seen, and the back was filled with vine movement carvings. The lattice pattern of Islamic representation at

Fatehpur Sikri is more of Timurid curvilinear pattern as mentioned by Welch, 1985, p.191. The polygon interlaced patterns can also be seen.

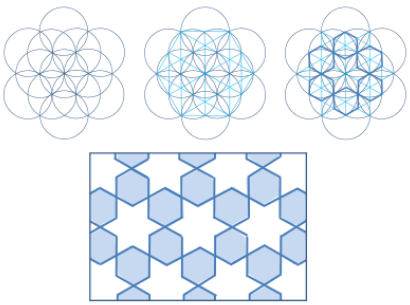


Plate 21,a, - gereh-sāzī designs

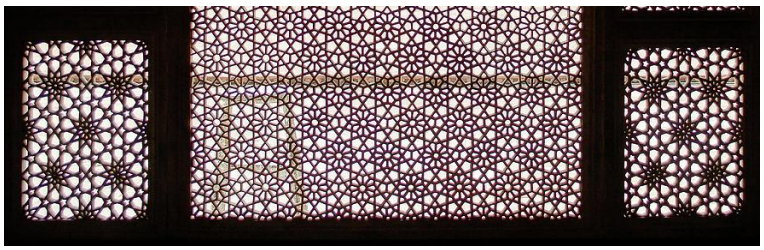


Plate 21,b - Tomb of SalimChisti

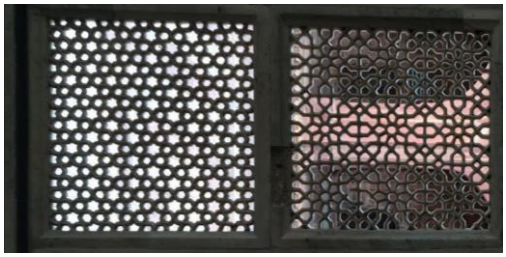


Plate 21,d, - gereh-sāzī designs

Plate 21,c - Tomb of SalimChisti

The influence of Gujarat architectural style can be seen on Salim Chisti Tomb with the presence of semi circular lattices. The tomb of Akbar a Sikandara also shows similar perforated patterns. The gerehsazi patterns can also be seen at Islamic architectures like Tomb of Jahangir, Itimad-ud-Daula made in marble in 17th Century.

Conclusion

Jall is an integral part of Hindu and Indo Islamic architecture. In both the cultures, and architectural styles, Jala was carved with sense of beauty and also establishes the relationship of place and man with God.

All the studies conducted till now, have put some light on the manifestation and implementation of Ideas and concepts in the forms of motifs and different geometrical shapes through the art of sculpture and carving. Whether the Building is a Hindu temple or Tomb of an Islamic saint the concept of jail was developed and presented keeping in mind its symbolism and also the functionality in terms of light and ventilation.

This paper therefore attempts to provide a point of o view for the reader and observer, to understand Jala/ Jall or Jalli , not only as an aesthetic architectural form but also the influence of culture on each other and development of rich Indian Architecture.

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