

Nadeem Alam*

The Art of *Pietra-dura* during the 17th Century Mughal Era: From Early Patterns by Noorjahan to the Elegance under Shahjahan

Abstract

This research unfolds the origin, style and materials of Pietra-dura, and its evolution in the subcontinent under the Mughals. This decorative artform has been considered as the most astonishing feature of the Mughal architecture of the seventeenth century that was started by talented empress Noor Jahan and attained its zenith under the keen interest of Shahjahan. This paper investigates the earliest patterns of Pietra-Dura, adopted at the Tomb of Itimad al-Daula. It further explores the evolution of this genre at a later period of Shah Jahan when he used it with elegance at the Mausoleum of Jahangir, Taj Mahal, Rang Mahal and Khas Mahal at Red Fort Delhi, Diwan-i Khas at Agra Fort, and Naulakha Pavilion with Shish Mahal at Lahore Fort. The different materials and the intricate designs of Pietra-dura have also been discussed in this paper, which tries to find out indigenized variations of this unique art of ornamentation.

Keywords: Pietra-dura, Inlay-work, Mughal Era, Itimad al-Daulah's Tomb, Jahangir's Tomb, Taj Mahal, Agra Fort, Delhi Fort, Lahore Fort

Introduction

Etymologically speaking, the word *Pietra-dura* has two parts having different meanings. However, the term is coined to convey the literal meaning of *Pietra* (hard) and *Dura* (stone) or 'hard stone' collectively.

The word *Pietra* has its linkage to the ancient Greek language, where a word πέτρα (*pétra*) was used for stone. The Latin word *petrum* evolved in Italian as *petra*; which carries the same meanings of 'the hard' or 'stone'.

The *Dura* can be traced back to *dure*, the Latin word having been used as an adverb and carrying meaning of harshly, sternly, roughly stiffly or awkwardly. Whereas, in English the same word *dure* has been used as verb giving expression to continue, to last, or to endure.

The current term of *Pietra-dura* is of Italian origin, believed to be of the nineteenth century where it has also been used as *Pietre-dure* as plural.

Along with the architecture, its ornamentation has been given equal importance with ever-evolving history of this very genre. Fresco-painting, stucco-work, mirror-work, and inlay-work have been some notable techniques of beautification of inner and outer walls, floors and ceilings of noteworthy structures.

Originally, the art of inlay-work, in its earliest form, can be traced back to the ancient Greek, Roman and Egyptian civilizations for ornamenting different surfaces of wood, stone or metal. However, the Renaissance period in Europe and precisely in Italy could be marked as the best shape of an evolved form of inlay-work, today known as the *Pietra-dura*, covering delicate floral and geometric patterns.

“In this medium, *pietre dure*—that is, hardstones, or semiprecious stones—are meticulously cut and fitted to create sophisticated decorative patterns, narrative paintings in stone, or extravagantly fashioned luxury objects. Reviving and

* Nadeem Alam, Lecturer in Art History, College of Art and Design, University of the Punjab, Lahore

expanding ancient Greek and Roman techniques, artists of the Italian Renaissance developed *pietre dure* into an alluring art form.”

(Giusti vii)

Pietra-dura is the art of inlaying the stone-cut designs, embedded into another stone-surface, usually softer than the inlayed fragments. It is believed that the art of *Pietra-dura* was founded in Europe. The Renaissance period Italy is considered as the center of this art, from where it might have spread around the globe.

It is also a hypothesis that Italian workers brought this art form to the subcontinent during the Mughal period in the 16th century. The inlay-work, in other styles, associated to the Mughals could be traced back to the Humayun’s period. However, the specific art of *Pietra-dura* evolved in the 17th century, especially under Shahjahan.

The signature work of *Pietra-dura*, associated with the Mughals, is marked with colourful, subtle and intricate designs accomplished by inlaying precious and semi-precious stones, gems or even sea-shells; usually on the white marble base compliant with delicate floral, geometrical or arabesque patterns.

The most famous precious or semi-precious inlaying material for *Pietra-dura* consists of coral, pearl, cornelian, jasper, lapis lazuli, onyx and topaz. However, the base is commonly the white marble.

The noteworthy structures of the Mughal period having delicate *Pietra-dura* work include:

Mausoleum of Itimad-ud Daula, Mausoleum of Jahangir, Taj Mahal, Rang Mahal and Khas Mahal at Red Fort Delhi, *Diwan-i Khas* at Agra Fort, *Naulakha* Pavilion and *Shish* Mahal of Lahore Fort with some patterns of this art at many other structures of that royal epoch.

The Art of *Pietra-Dura*, from Italy to the Subcontinent

It has been a popular, yet debatable, belief that the art of *Pietra-dura* reached the Subcontinent with and by the Italian travelers and craftsmen during the seventeenth century. Few western historians believe that they were Italian artisans who, not only taught this art to the Mughal craftsmen, but also worked at the great project of Taj Mahal.

“Some of the artists appear to have tried their fortunes in foreign lands, and it is thought that a part at least of the works in *pietre dure*, executed in the Taj Mahal of Agra, are of Florentine origin.”
(Scientific American 388)

Although, the process of inlay technique is an ancient craft and often associated to the Greek and Roman practices as well. However, the nearest past reference regarding inlay-work in Europe, is usually associated with the inlay process in Italy; that was in vogue for wooden furniture designs at a popular level. These techniques for furniture design-patterns, gave way to apply the same cut and fit technique in architecture, prompting the art of *Opus-sectile* and *Pietra-dura*.

There are contrary views as well that suggest that this genre of art was already in practice at this part of the land, and they link it with the Persian tradition of ornamentation. There is an ideology about the evolution of *Pietra-dura* in the Subcontinent; it states that this artform developed from Mosaic work, which was in fashion at an earlier period of Akbar. The gradual change in style and scale of the motifs suggest that, if not completely, partially the art of *Pietra-dura* developed under the Mughals, and reached to an elegant and advanced level during the regime of Shahjahan.

“Some believed it is developed slowly in India as we can observe the differences found in the inlay work of the buildings of Akbar to Jahangir and then Shah

Jahan. A continuous development in Inlay art can be seen in Jahangiri Mahal to Akbar's Tomb and then in Tomb of Salim Chisti and Itmad-ud- Daulah's tomb." (Sharma et al. 02)

In this context, the Mosaic work at the notable buildings by Akbar and Jahangir could be considered as the derivation of the *Pietra-dura* work developed under the Mughals. At the same time, there is acceptable evidence of Italian samples of this very genre, present at the Mughal court; which the Italian merchants and travelers might have brought as souvenirs to please the emperors and courtiers.

"Pietra dura was certainly practiced in Florence, and as Italian craftsmen certainly worked for Shah Jahan, the truth may be that a technique evolved independently in India was brought to its final perfection by Italians." (Terry 21)

It is also a strong probability that the indigenous artisans, not only studied the local trends and styles of Mosaic or *Opus-sectile* patterns, but also learned the Italian patterns and techniques, to evolve a native style of this art; the Mughal style *Pietra-dura*.

"It is known that Shah Jahan possessed some specimens of Italian work of this kind: some panels from a cabinet were incorporated into a large design behind the throne in the Hall of Public Audience in Delhi in the 1640s." (Tillotson 76)

Pietra-dura under the Mughals

The art of *Pietra-dura* developed in the Subcontinent during the seventeenth century, and its origin is traced in Italy. Supposedly, it reached at these lands by the Italian missionaries, or travelers, of the sixteenth century. The second quarter of the seventeenth century is marked as a crucial period in the Mughal history. At that juncture of time, Shahjahan was on the throne with a peculiar taste for architectural splendours. Moreover, Noorjahan was also taking care of the mausoleums of her father Itmad-ud Daula and husband Jahangir.

During this period of Shahjahan, as there were many architectural projects on the cards, including the unparalleled masterpiece of Taj Mahal, the Italian craftsmen are believed to inspire this technique of the local artisans of the Subcontinent.

The inlay-work has also been a feature of the wooden furniture. The tops, sides or terminals of different furniture articles like chairs, beds, tables etcetera, were adorned with inlay-work. Many western historians have also put this technique under the term *Pietra-dura*; however, technically *Pietra-dura* is confined to colourful precious or semi-precious stones being embedded in marble slab, with delicate patterns.

Empress Noorjahan, is considered responsible for the earliest *Pietra-dura* work at the Mausoleum of his father Itmad al-Daula (1628), and later his husband Jahangir (1637). Noorjahan's love for her father and husband, played a vital role in adorning these mausoleums to a notable level, with exquisite ornamentations, including the *Petra Dura*.

Shahjahan's period (1628-1658), is the most important era in the evolution of the Mughal architecture, in terms of structure, material and ornamentation. The mausoleum of Jahangir (1637), Taj Mahal (1648), *Shish Mahal* (1632), Khas Mahal (1640), and Rang Mahal (1648) in Red Fort Delhi, the *Diwan-i Khas* (1635) of Agra Fort, *Naulakha Pavilion* and *Shish mahal* are attributed to Shahjahan along with the exquisite work of *Pietra-dura* on its walls, arches, niches, and columns.

These buildings could be labelled as the true representation of *Pietra-dura*, during the Mughal period; with the exception to the tomb of Itmad-ud Daula, built by Noorjahan, all other edifices belong to the magnificent architectural taste of Shahjahan.

This technique of *Pietra-dura* flourished under Shahjahan, mostly with the inlaying of the precious coloured-stones and gems on the white marble slabs serving as the base. Along with the floral and geometrical designs, the vases, flowers, fruits and the *Purna-kalasa*¹ motifs were also worked upon in this genre.

This style of work, after attaining popularity in the subcontinent under the Mughals, was introduced to many indigenous possibilities where the inlay-work was already a trait of adorning the monumental architecture. The inlay-work of the Mughal architecture is mainly characterized by the white marble being embedded or inlayed into the cavities of red sandstone slabs.

On the other hand, the art of *Pietra-dura* is precisely confined to small-scale minute floral or geometrical patterns, cut out in precious or semi-precious stones, gems or pearls and embedded into the marble slab, already chiseled to create the mirror-image cavities where the cut-out patterns could be fit in or inlayed.

The Mausoleum of Itimad-ud Daula (1628)

The first and the far most structure of the Mughal era, that can be presented to signify the art of *Pietra-dura*, is the Mausoleum of the Mirza Ghiyas Baig titled as Itimad-ud Daula. He was the father of Empress Noorjahan, the wife of Jahangir, and held the key post in the court of the Emperor.

Itimad-ud Daula was born in Tehran, and migrated to India from his birthplace following the unfavourable circumstance. He was received by Akbar and was appointed to serve as the treasurer of Kabul by the Emperor. After 1611, when Jahangir married her daughter Mehrunisa Begum, who was the wife of a Mughal courtier Ali Quli Khan famously known as Sher Afghan, Itimad-ud Daula was elated to power as the prime minister.

It is believed by many that Jahangir planned a successful murder of Ali Quli Khan in 1607, to marry Mehrunisa in 1611, and gave her the title of Noorjahan (light of the world).

After the death of her father in 1622, Noorjahan commissioned a lavish mausoleum for his late father and the royal courtier. It took six years to complete the tomb, which resulted into a jewel-box like structure, quite different from the other Mughal edifices, but well adorned with notable work of *Pietra-dura*.



Figure 1. Display of *Pietra-dura* on the walls of Itimad al-Daulah's Tomb

¹ *Purna-kalasa* is a prominent motif of the Hindu architecture. It is a combination of two words; *purna* means "full" and *kalasa* stands for "pitcher". It is considered to be a symbol of abundance, fertility and an overflowing life force

This mausoleum has been built of white marble, almost completely enclosed with the inlay-work of *Pietra-dura*. The abundance of the *Pietra Dura* at this tomb is a remarkable feature to mention. In many ways, the tomb of Itimad-ud Daula is worth mentioning, keeping in view the ornamentation of the Mughal architecture. This edifice, not only changed the style but also the material for the structures to be built by Shahjahan during his regime, a major shift from popular red sandstone to the white marble; especially, where the ornamentation of the building was prioritized.

This tomb is considered as the prime inspiration in the art of mausoleum architecture and related ornamentation for all later tombs, including the great Taj Mahal. As a matter of fact, the inlay-work of *Pietra-dura* has also been practiced and successfully carried out, for the first time in this land, with a feeling of profusion and extravagance.



Figure 2 *Pietra-dura* on the Pillar-sides of the tomb of Itimad-ud Daula.

“Itimad-ud-Daulah’s tomb is a highly ornate edifice, which is looked upon as an imminent precursor of the Taj Mahal as far as elaborate carvings and inlay work are concerned. The tomb has exquisite inlaid marble patterns - *Pietra-dura* decoration depicting cypresses, wine glasses, and an amazing variety of geometrical arabesque.” (Kamal et al. 848)

Moreover, the *Pietra-dura* work carried out at the tomb of Itimad-ud Daula has some distinct features in comparison with those attributed to Shahjahan. This work at the Itimad-ud Daula mausoleum, carry more abstract and mosaic based design patterns whereas, the later style of *Pietra-dura*, of Taj Mahal, and other monuments, showcases the grandeur and opulence of the white marble as well; giving it an equally important place in the design and considering the white as part of the great motifs collectively.

<p>7. The decorations— enamelled tiling, mar- ble mosaic outside, fresco-painting inside.</p>	<p>7. The decorations— fresco-painting and marble carvings inside, enamelled tiling and marble mosaic outside, and <i>pietra-dura</i> inlay- ings both outside and inside.</p>	<p>7. The decorations— marble carving inside, and <i>pietra-dura</i> inlay- ing of precious stones in marble both inside and outside.</p>
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Figure 3. Table from The Indian World, Vol. 2, Showing comparison of Decoration; Akbar’s Tomb Column-I, Itimad-ud Daula Tomb Column-II, and Taj Mahal Column-III

As shown in the above table, the *Pietra-dura* work is at both outside and inside the tomb of Itimad -ud Daula and at the Taj Mahal. Showing the equal opulence of both the Mausoleums, nevertheless, Taj Mahal is more popularly considered as the most lavishly decorated tomb. This table also advocates the absence of *Pietra-dura* at the tomb of Akbar in Sikandara, Agra.

In many ways, the style of architecture from Akbar’s tomb to that of Shahjahan, changed, in construction material as well as decorative arts. In between the two mausoleums, Itimad-ud Daula’s tomb could be marked as the diversion point. Later, the other techniques also evolved gradually to an elegant level.

“Red sandstone was replaced by pure white marble; fresco-painting and mosaic in coloured marbles by carvings and exquisite *Pietra-dura* inlaying of precious stones in white marble; the stone screens of the upper cloister by the wonderful marble enclosure of trellis-work, a chef d’ oeuvre of elegance in Indian art.”
(Ray 121)

Mausoleum of Jahangir (1637)

As soon as the project of the tomb of Itimad-ud Daula completed in 1627-28, Noorjahan has to start another one for his beloved husband. Jahangir died in 1627, en route to Lahore from Shimla, Kashmir. The same year Noorjahan commissioned the great quadrangle mausoleum for Jahangir to the north-western outskirts of Lahore; at the right bank of River Ravi, a place now known as Shahdara Bagh.

This mausoleum, after completion in 1637, presented the grandeur that the Mughals are known for. Although, the project was started by Noorjahan, but soon took over by Jahangir’s successor and son Shahjahan, the architect emperor. The building of this tomb chiefly consists of the red sandstone with beautiful white marble inlay-work over it. The cenotaph, and the space around it have been adorned with exquisite *Pietra-dura* work. Here, the quality and the subtleties of this art seem a step ahead from its antecedent structure of the Itimad-ud Daula’s tomb.

The construction of the mausoleum was patronized by Noorjahan herself whereas, Shahjahan took care of the decorative work. The delicate *Pietra-dura* at the cenotaph and the attached platform is attributed to Shahjahan.

“Shah Jahan's contributions to his father's burial site were *Pietra-dura* decorated marble sarcophagus and cenotaph, although he later appropriated the responsibility for the construction of the entire funerary monument once it was completed.”
(Razvi 11)



Figure 4. Tomb of Jahangir: Platform and Cenotaph with *Pietra-dura* while the Epitome is with Inlaid Calligraphy

Shahjahan's peculiar taste for ornamentation of buildings provided space for the lavishness associated with the *Pietra-dura*. During his regime, *Pietra-dura* flourished in the Subcontinent and reached at its climax at the walls of Taj Mahal, and through intricate and minute embellishment at the *Naulaka* Pavilion and *Shish Mahal* of Lahore Fort.

The *Pietra-dura* work at the mausoleum of Jahangir is considered as the first such an experiment under the rule of Shahjahan. Although, this practice has been carried out at the tomb of Itimad-ud Daula, but that was commissioned and completed by Noorjahan. Moreover, the accomplished and mature style of *Pietra-dura*, with white marble base given equal importance in the design, evolved during the Shahjahan's period, could be seen as a successful practice, at the cenotaph and space around it. Furthermore, the *Opus-sectile* technique has also been adopted to adorn the floor of the chamber.

“This form [*Pietra-dura*] reached its climax under the reign of Shah Jahan; the best executed forms could be seen in Taj Mahal, of which the Inlay decoration on the sarcophagus of Jahangir's tomb was a fore runner.” (Khan 60)

The cenotaph of the Jahangir's tomb has been covered with naturalistic floral patterns carried out in *Pietra-dura*. This work is considered as the finest example of this art form inlaid in semi-precious stones like amethyst, carnelian, lapis, lazuli, and turquoise. At Taj Mahal later, the ornamentation of the *Darwaza-i Roza*, is comprised of a good share of *Pietra-dura*.

Taj Mahal (1648)

Taj Mahal is considered as a masterpiece of the Mughal era architecture, as well as the metaphor for Shahjahan's love for his wife Mumtaz Mahal. This is the most extravagant mausoleum ever built for a woman, not in the Subcontinent but perhaps in the world; often described as one of the wonders of the world. It took seventeen years, to complete this marvel of the architectural history of human beings.

Known for its white marble pavilion, the Taj Mahal also carries one of the best works of *Pietra-dura*. This work is different from few of its early precursors, not only in terms of delicacy but also regarding the sensitive appearance of the inlaid gems and semi-precious stones.

Few critics of the Taj Mahal, like Lancaster, have related this *Pietra-dura* work to the Persian miniature painting, in terms of the rendering of thinly scattered foliage. In his words, this quality is stated as:

“One calls to mind the sparse planting seen in gardens pictured in fifteenth-century Iranian miniatures and thereby comes to understand the reason for the loose character of the *Pietra-dura* work on the Taj itself.” (Lancaster 10)

The white marble base used to facilitate the cut and fit process of the *Pietra-dura*, serves as the backdrop of a unibody frame rather than an embedding slab. This quality makes the Taj Mahal as one of the prime examples of evolved style *Pietra-dura*, that has been used enviously on the archways, entrances and the cenotaph. For this marvel in marble, the exclusive and delicate marble stone was imported from Makrana, Rajasthan exclusively. This marble proved as the best suited for carnelian, lapis lazuli, turquoise and malachite to be cut and fitted into it, to exhibit floral designs upon the glistening ivory surface.



Figure 5. Display of *Pietra-dura* and lattice screens in the central hall of the Taj Mahal

The artisans who worked at the Taj Mahal, or the supervising engineer or designer of this mausoleum must have worked meticulously on the decorative strategies. As a matter of fact, contrary to the *Pietra-dura* work at the mausoleum of Itimad-ud Daula where one can observe a clustered, intricate and busy design, the onlooker can feel a relaxed and loosely arranged motifs of a free-flowing composition. This quality must have intentionally attained by composing the inlaid material with the marble base in a complementary manner; that could be marked as an advanced level of craftsmanship.

Lancaster advocates the quality of the background, for the *Pietra-dura* work at the Taj Mahal, as of high quality and translucent owing to the unmatched quality of the embedding marble.

“It must be conceded, however, that the lucent quality of the inlay material at the Taj would call for a more delicate type of design than that of the earlier monuments, especially with a background composed entirely of high-keyed translucent marble. (Lancaster 9)



Figure 6. *Pietra-dura* detail at Taj Mahal

This demonstration of floral *Pietra-dura* is so unique that often it is linked with the traditional Florentine *Pietra-dura*. Many historians even theorize that this work might be carried out by the Florentine artisans, or at least as an inspiration of the Italian practice of this artform. However, few rationale approaches advocate it to be deeply rooted in the Mughal and Pre-Mughal patterns of Islamic architecture where the non-figural design motifs were preferred over the figural, and arabesque over the grotesque, with a distinctive feature of unmatched geometrical and floral harmony.

The concept of paradise, being followed by most of the Mughal emperors in the shape of a quadrangle (*chiharbagh*), in their architectural accomplishments created a magical and ethereal quality as well. This very feature could be found at Taj Mahal generally, and precisely in the motifs and design of the *Pietra-dura* work.

Khas Mahal (1640) and Imtiaz Mahal (Rang Mahal 1648) in Red Fort Delhi

The Red Fort of Delhi is another example of peculiar Mughal taste in architecture. Accompanied by a *Jamia Masjid*, the Red Fort looks quite familiar with its counterpart in Lahore, the *Badshahi Masjid* and the Lahore Fort. The fort is believed to be re-founded by Akbar in 1565, adjacent or on the foundations of the earliest fort built by Islam Shah Suri in 1545. Later, it was modified by Shahjahan from 1628 to 1648.

During this period the Khas Mahal and Rang Mahal were restored, renovated and re-constructed, and are attributed to Shahjahan for their detailed ornamentation. The *Pietra-dura* work is a pivotal feature of these pavilions, executed with semi-precious stone on white marble base.



Figure 7. *Pietra-dura* at Columns of the the Rang Mahal Arcade Red Fort, Delhi



Figure 8. Rang Mahal at Red Fort Delhi, detail of *Pietra-dura* works

The Imtiaz Mahal, or most popularly known as the Rang Mahal, is an important building in the vicinity of the Red Fort. It was closely situated to the Khas Mahal and also served as the royal Harem. Keeping this status and nature in mind, one could find good enough reasons for the extravagant embellishments carried out in various decorating techniques and styles; the *Pietra-dura* work is one of those applied to add colours and ambiance to this unique edifice. It does not have that original ceiling which is believed to have gold-inlay work for decoration. That gold was looted by the Jats and Mahrattas during the unrest and war of 1857.

The largest building in the area and the chief center of communal activity was the Imtiaz or Mumtaz Mahal (Distinguished Palace) or, as it was later called, the Rang Mahal (Colored Palace). The ceiling of this mansion was brightly colored and inlaid with gold.” (Blake 39)

The *Diwan-i Khas* at the imperial enclosure, often referred as the Hall of Private Audience, of the Delhi fort, has some exclusive *Pietra-dura* work at the pillars and on the ceiling.

As a whole design, this building might not attract the viewer with its external appearance; however, the inside adornment is exclusive with *Pietra-dura*.

“The Hall of Private Audience, externally of simple, chaste design, is within thickly covered with an inlay of semi-precious stones on marble...Walls were adorned with panels of *pietra dura*. Arches were richly cusped” (Sharp 330)

Diwan-i Khas (1635) of Agra Fort

This hall is commonly referred as the Hall of the Private Audience, just like its counterpart at the Red Fort Delhi. *Diwan-i Khas*, is an integral part of the Agra Fort, that is situated on the right bank of River Yamuna; the second notable structure around this River after the Taj Mahal.

Shahjahan has an exquisite sensitivity towards architecture and to match it; he demolished all the buildings in the then capital city of Agra, except for the Jahangir Mahal, which was erected by his grandfather Jalal-ud Din Akbar. Palaces, and *diwans* were built with an exceptional emphasis on internal and external ornamentation. Shahjahan also founded the new capital city of Shahjahanabad in 1639, now known as old Delhi.

To mention the notable structures of that period in Agra;

“These buildings are *Diwan-i-Am*, *Diwan-i-Khas*, Sheesh Mahal, Khwabgah, Mussaman Burj, Moti Masjid and a large number of maid servant quarters. All these buildings except Moti Masjid has been constructed with white marble.” (Singh 75)

Since marble was the preferred material for most of the pavilions by Shahjahan, naturally *Pietra-dura* became the first choice to adorn the walls, pillars and arches of these structures.

Diwan-i Khas at Agra Fort served as Shahjahan's royal palace at Agra. Adjacent to the main pavilion, the open terrace provides the serene view of the Yamuna River along with a distant panorama of the Taj Mahal. The pillared pavilion of the *Diwan-i Khas* showcases exquisite *Pietra-dura* details over the arches, on the pillars and even around the fringe of the fountain situated inside the royal hall. (Fig. 9).

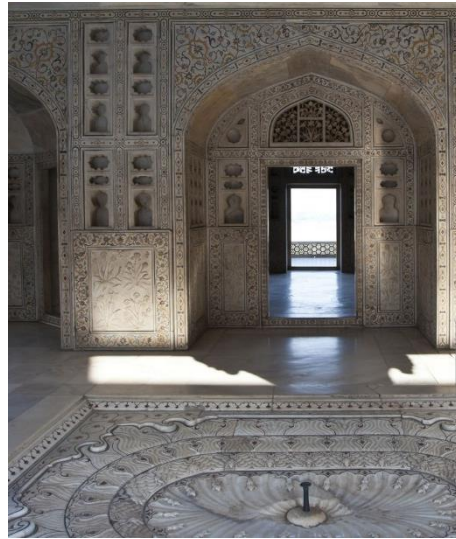


Figure 9. Interior Walls *Diwan-i Khas* with *Pietra-dura*, Agra Fort, India

K. C. Arora describes the *Diwan-i Khas* at Agra Fort in these words.

“The hall built by Shah Jahan in 1637 is an exquisite production of art and its beautiful marble inlaid work with precious stones display artistic decoration of the Persian style.” (Arora 44)

The *Pietra-dura* at the *Diwan-i Khas* carries Persian taste within its design with marble given more space to infuse the serenity of the white colour. Moreover, the colour scheme of this *Pietra-dura* work displays a calculated colour range, consisting of ochre, ochre-green and light-green with white marble as the base colour. The design patterns are floral and intricate, yet flowing and soothing.



Figure 10. Detail of *Pietra-dura* at Khas Mahal of Agra Fort



Figure 11 *Pietra-dura* at the Pillar of Musamman Burj - Agra For.

Shish Mahal and Naulakha Pavilion, Lahore Fort (1631)

The *Pietra-dura* is one of the most challenging arts that demand great deal of patience and perseverance. Especially when it comes to small scale motifs and minute detailing. The *Pietra-dura* work rendered at the *Shish Mahal* of Lahore Fort, is considered as the most delicate and refined specimen of this art. Many critics of this artform contemplate this work as the best example of *Pietra-dura* that has been ever produced in the Subcontinent.

The miniature details and the level of accuracy, applied on these small-scale motifs, is unparalleled even at the Florentine examples of this art. The hand-cut semi-precious stones, fitted in the equally accurate cavities present the precision that can challenge the modern-day techniques like laser-cut motifs.

“Here the extremely minute and delicate work produced in semi-precious stones, such as agate, jade, lapis lazuli, etc. has no parallel.” (Khattak 319)

Dr. A. Rahman in his book, *Islamic Architecture of Pakistan*, has mentioned this unique feature in the following words.

“...an area measuring not more than $2\frac{1}{4} \times 1\frac{3}{4}$ inch (the area forms a miniature niche on the capital of a pillar belonging to this structure Naulakha) the stones were counted and it was found out that as many as 102 pieces had been used to form just one floral pattern.”
(Rahman 36)



Figure 12. A decorated Pillar-top at Lahore Fort; A small-scale and very complicated display of *Pietra-dura*

The *Pietra-dura* work at the Lahore Fort, mainly at the *Shish Mahal* and the *Naulakha Pavilion*, can be titled as the masterpiece of this genre. The journey started from the lavish work at the tomb of Itimad-ud Daula, reached its best with delicacy and subtlety at the walls and pillars of Lahore Fort.

The pedestals, pillars and the pillar-tops, along with spandrels over the archways of the *Shish Mahal* and *Naulakha Pavilion*, carry some of the best works of *Pietra-dura*, especially, the columns of the *Shish Mahal* showcase exquisite floral motifs with minuscule details.



Figure 13. *Pietra-dura* on Floor of an Indoor Marble Fountain, Lahore Fort

Normally, the art of *Pietra-dura* is confined only to the walls or pillars of a royal structure. However, at the Lahore Fort, this artwork could be found at the floor of a fountain as well. Further, it can be analyzed that the floors where footfall is not expected, like the fountain (Fig. 13), can also be adorned with *Pietra-dura*. The other example of this nature can be found at the *Diwan-i Khas* of Agra Fort (Fig. 9).

As a common practice, as adopted at the Mausoleum of Jahangir at Shahdara, the similar art to decorate the floors, titled as *Opus-sectile* would come under the Inlay-work. However, in *Opus-sectile*, on floor-cavities, only the coloured stones are cut and fitted not the semi-precious stones or gems. Moreover, the floor motifs of *Opus-sectile* are larger in scale than the *Pietra-dura*. Hence, to determine any inlay-work as *Pietra-dura*, the nature of the inlayed material and the scale of the work are the considerable features. For this very art, the material should at least be semi-precious and scale should be smaller.

Conclusion

The art of *Pietra-dura*, is undoubtedly an artform that evolved during the Mughal period, especially, after the first quarter of the seventeenth century. On the other hand, this ornamental art for royal architecture, is believed to be of the Italian origin that might have developed on indigenous patterns in the Subcontinent.

However, this technique was not in actual practice unless Noorjahan commissioned the tomb of his father Itimad-ud Daula, which is considered as the forerunner in regard to the art of *Pietra-dura*. Under the unique taste of Shahjahan, the matchless genre of *Pietra-dura* developed presumably with some variations in style and design, evident in many buildings of that era.

The mausoleum of Jahangir, Taj Mahal, Rang Mahal and Khas Mahal at Red Fort Delhi, *Diwan-i Khas* at Agra Fort, *Naulakha* Pavilion and *Shish* Mahal of Lahore Fort are some notable edifices with a prominent share of *Pietra-dura* as an ornamentation art.

From the tomb of Itimad-ud Daula to the minute-scale and intricate rendering at the *Naulakha* Pavilion and *Shish* Mahal, this artform evolved gradually and according to the taste and aesthetical vision of its patron Shahjahan as well as of the practitioners of this genre.

The size and style of the motifs, floral and geometrical nature of the design, selection of precious and semi-precious gems and stones, and above all the compositional flow of the collective pattern, all these aspects contributed to the development of *Pietra-dura*.

Before Shahjahan, the red sandstone was the most popular building material for the Mughal taste. The culmination point of this material is exhibited by Akbar when he built the unique city of Fatehpur Sikri. Shahjahan had a specific taste for the aesthetic value of his buildings. For that ornamental challenges, he adopted white marble to replace the relatively coarse surface of the red sandstone.

The marble was comparatively softer than the red sandstone, hence; it provided more possibilities for minute, intricate and complexed patterns and designs, inlayed or inscribed.

The inlay-work was already in fashion among the Mughal architects where, they would embed the white marble into the red sandstone. Pavilions and diwans at Fatehpur Sikri, Akbar's tomb at Sikandra, and Jahangir Mahal at Agra are few examples of the existing inlay-work. Nevertheless, the evolved, and the best, form of this artform surfaced in the shape of *Pietra-dura*, which demonstrated more artistic, complexed and varied designs and colour schemes.

The Shahjahan's regime of the seventeenth century, could be marked as an era of architectural accomplishments with unique patterns of ornamentation. There were many other decorating artforms like Fresco-painting, Mosaic-work, *Kashikari*, Stucco-work, Inlay-work and others, but unquestionably, the most enduring and aesthetically accomplished of all, is the *Pietra-dura*.

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