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ANALYSIS OF SAMARKAND'S REGISTAN SQUARE AS A MASTERPIECE OF ISLAMIC ARCHITECTURE

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SUMMARY

Samarkand's Registan Square is among the greatest Islamic architectural achievements, symbolizing the architectural and cultural victory of the Timurid dynasty. The Registan Square, being the architectural and cultural hub of Samarkand, consists of three colossal madrasahs of Ulugh Beg, Sher-Dor, and Tilya-Kori symbolizing the splendor of beauty and the scientific success of the time. This research examines the historical context, architectural details, and artwork of Registan Square, particularly its intricate mosaic tilework, geometric designs, calligraphy, and domed buildings. The study also investigates the symbolism and religious connotations inherent in the architectural elements of the square, including its use as a learning center, marketplace, and place of religious activity. In addition, comparative analysis with other Islamic architectural wonders, including the Alhambra, Great Mosque of Córdoba, and Taj Mahal, helps place Registan Square's impact on the greater Islamic architectural heritage into context. The research concludes by considering the enduring legacy of Timurid architecture and how it has helped shape modern architectural thought.

Key words: registan square, samarkand, timurid architecture, islamic architecture, ulugh beg, sherdor, tilya-kori, mosaic tilework, islamic calligraphy, domes and archways, geometric patterns, cultural heritage.

INTRODUCTION

The historical city of Samarkand, the heart of the Timurid Empire at its zenith, is famous for the Islamic architecture and culture which flourish [2]. The Registan ensemble, a masterpiece of Central Asian Islamic and world architecture, is located at the city centre [14]. The Registan is the ancient trade center of Samarkand. The ensemble comprises three historical buildings: the Ulug Beg Madrasah built by Ulug Beg ibn Shahrukh in 1420-1427, the Tilya-Kari Madrasah built by Ulug Beg's stepson Ulumkhoja in 1646-1660, and the Sher-Dor Madrasah built by Yalangtush bahadur in 1619-1636. Sixty years are long span to demolish old buildings, to displace architectural workshops, to rough out piles and clear building plot. Thus, a town-forming social centre arose in the trade and cultural life of Samarkand [1]. Combined with the large tents, whose profits were spent on caravansaries, the monumental part of the market square became the roots of the madrasah building, characteristic sites of the trade centre of the East cities.

Registan Square, in the city of Samarkand, Uzbekistan, is being considered as one of the masterpieces of Islamic architecture [12]. Why is the plaza or public square is so much the first masterpiece of Islamic architecture? Why is the square space as impressive, even intimidating, as it is? In answering these questions (and other related ones), this essay reflects on the broader themes of certain building types and architectural forms which come to resonate throughout Islamic architecture, suggesting some answers [8]. It seeks to consider the square as an assemblage of elements, analyzing their inter-relationship rather than just taking them at face value for granted. Furthermore, what is the legacy of such a prime example of monumental Islamic architecture today? And how do we compare and contrast such a building with other older or newer examples of public squares?

HISTORICAL BACKGROUND OF SAMARKAND AND THE REGISTAN SQUARE

Following the banks of the Zerafshan River, the flame-coloured city of Samarkand rises out of the arid plains of Uzbekistan, glowing under the rays of the Central Asian sun. Once the capital of Sogdiana, Samarkand has witnessed Alexander of Macedon, Genghis Khan and Tamerlane pass through her streets. Throughout the dynasties of the Sogdians, Turk-Shuks, Seljuks, Karakhanids, Samanids and Ghaznavids, Samarkand was the city's often violent legacy until the arrival of the Timurid lineage and the construction of her most magnificent masterpiece. Under the benefits of Timurid theocratic patronage, the Registan Square was established at the heart of Samarkand, as the central caravanserai where the Silk Road would pass through the capital. It was envisaged as a hub for cultural and social activity, providing for bazaars, stables and baths complemented by madrassahs, khanqahs and mosques. The thick and high walls of the square would echo the great vaulted bazaar's encompassing crowdingly bustling lanes and dark alleyways where the sound of coins and jingling harnesses mixed with the calls of traders and beggars. Babar the Tiger exiled the Timurid prince of Samarkand, Omar Shaykh to Herat, after prompted to rebellion against the usurper of the Timurids, the Uzbeks [1].

Nevertheless, he will forever long for the noisy, light-filtered madness of the bazaars in the Registan Square. Through its historical resonances of Persian and Central Asian cultures, it provides a chronological biography of the flame-colored city of Samarkand and its commitment [4]. It sheds light on the formative dynasties that oversaw its establishment, its evolution, and its rise to prominence. An often contested city, Samarkand sits at the crossroads of various cultural zones. During the reign of the Afrighids in 870, the capital is moved from Bukhara to Samarkand, known as Karn until then. More so than any other historical capital, the site of Samarkand and the Registan square in particular encapsulates the essential historical and metaphorical co-existence of history and architecture.

ARCHITECTURAL FEATURES OF THE REGISTAN SQUARE

At the heart of Samarkand, Uzbekistan, lay the grand Registan Square. Its majesty has stood for centuries, even through the tumultuous reign of Genghis Khan. However, seen from a wider perspective, Samarkand's Registan Square is not just a collection of three grand edifices and their madrasahs. Instead, these structures interact with the landscape and the other architectural pieces in the square to create the name "Registan Square." Within this square, three main madrasahs dominate; Sher-Dor, Ulugbek, and Tilya-Kori meaning Lion's bearing, Great Prince and Decorated by Gold, respectively. Each of these Islamic edu-religious buildings actually consists of a pair of nearly identical madrasahs facing each other

along the central north-south axis of the square [3][6].

In addition, three other religious structures enriched the regal reputation of the square: the grand mosque, the great khanaqah and the Diet Khan's extensive two-story audience hall. Moreover, surrounding the square, a garden and four chaharbagh arrangements provide the 'earthly paradise' atmosphere of the square. The broad state of historical, socio-political, cultural, and religious aspects of the set-up were also closely examined. Registan Square is seen as Islamic architecture at its purest and most sophisticated [10]. Even one glance at the square reveals its beautiful form. The grand madrasahs are built to a harmonious scale and proportions. The austere design is composed of geometric forms, and the decoration is high and low relief. The square is constructed from local materials. Uzbekistan is rich in stone, and the Registan square is made entirely of cut sandstone blocks. Furthermore, the base sandstone would be chiseled by stone masons to be ground. Holes were then drilled from the chiseled surface with a tube-drill; such a device would be cooled by water which the mason mixed with camel dung to increase the cohesiveness of the paste. After the holes are drilled several centimeters deep, the mason would insert wooden pegs and wet them. The wood would expand with the water, cracking the sandstone. It must be noted that while the sandstone buildings are built using accurately cut blocks, arcade bases and fence balustrades are made with taht.

Mosaic and Tilework

The exquisitely crafted mosaic and tilework that adorn the breathtaking majesty of Samarkand's Registan Square renders it a masterpiece of Islamic architecture. The artistry of the mosaic is particularly striking and has received the most attention from builders and conservationists. The striking color mosaics of Islamic architecture are known and to a large extent admired by many. The geometric figures diffused from the Muslim world often appear remote, ideal intellectual exercises rather than the subjects of the design of actual buildings. To most Europeans, the Central Asian palaces resemble rather than premise on the artisans' manual skills. Moreover, the techniques documented in sources largely ignore such everyday activities. In contrast to the makers of stone inscriptions, that is, the artisans skilled in calligraphy, those engaged in the preparation of mosaic backgrounds and figures remained in the shadow. Indeed, the nature and appearance of their unglazed work were After a group of craftsmen were employed in lead casting and fixing leaf gold to emboss the inscriptions; but the same inventory contains no information about the artisans of the mosaics [5].

The other group counterparts without inscriptions for a banner, mixing gold lay with certain pigments in order to produce "golden" tones. Color plays important role in the philosophy, cosmology and symbolism of many cultures, including the Muslim civilizations of the Near East and Central Asia. No existing source allows a clear picture of the rationale underlying the choice of certain colors and tiles motifs at a certain time for a certain place; the accounts that are available nevertheless suggest that the motifs and colors often had spiritual or philosophical pretexts. It is rare that such documents or images are extant; however, from existing sources and visual landmarks one can argue that, at least in some contexts, geometric tenets and mystical/philosophical connotations strongly influenced the Islamic temples. On a more material level, it is known from the mise-en-oeuvre from granada that the tilework and the stucco ornamentation, or sgraffito crossed one another "in-huite". Cortes ruled that ornaments of the Alhambra should be of equal prestige, but is only when textiles, mosaics and calligraphic friezes are seen together that the beholder gains an understanding of the finest palace of the Western Islamic tradition as a garment and a poem; as Khamriyah and Kumash.

Islamic Calligraphy

Since the antiquity text is a very essential medium between humans as it can be considered as a place for preserving thoughts and knowledge. Such a significant indicator has been taken into consideration once Islam emerged, as a necessity to forward the beliefs. It is a well-known fact that Islam began to flourish when it could express the art of writing in a unique manner with two aspects either this art from the materialistic perspective with the calligraphy or from the spiritualistic perspective with the broadness of the eminent book Quran [7]. It would echo a simple thinking regarding the afore-cited quotations. Calligraphy, an art form that can add spiritual depth and beauty to the text, is much employed in the

Islamic world. This art combines the elements of aesthetic with intellectual depth. The aesthetic side secures royalty through the comparison of the forms and beauty of styles used. On the other hand, the intellectual aspect conveys or deepens the meaning and idea of the text it contains. Unlike Western art, this art is still alive and appeals to a large segment from upper echelons to lower sections in every Islamic society. Moreover, calligraphy is mainly integrated into the architectural elements of the Islamic world and this style is transformed into a universal style in every part of that world. Like other Islamic art, text is the fundamental of the art as well. However, in this world this view finds more sophisticated application.

It is possible to find an aplenty of mosques, madrasahs, palaces, a part of city walls and gates, fountains or tombs built in the name of the ruler, and so many buildings have imprints of inscription inside or outside. These inscriptions include the name of the ruler, the name of the architect or the builder, date of building, and so many beautiful verses from Quran such as the name of Rasulullah Muhammed and his companions. There is very close relationship between architecture and thought, cult, culture, capital and identity. Cities generally reflect the civilization of its inhabitants. Its appearance is enhanced by color, shape and embellishment. These are the results of art. Architecture is also a form of response to elite interests, hopes and aspiration. The architectural inscription is a very suitable tool for transferring the beliefs that the elite wants to emphasize. So, it is generally essentially encountered in all architecturally vierd reference of observation of civilization and identity. Besides this, the art of calligraphy can transfer the written ideas to the stone, the paper, leather or wood. Urban calligraphy plays a visual and aesthetic role on the building. It reveals the ritual life and belief of the individual. As a visual accent, it can also create a feeling of solidarity and foster a sense of identity or local pride. It is intended to impress observers. Indeed well preserved medieval urban calligraphy can still have a powerful visual impact and thus aside from its basic function as decoration or message carrier, often suggests other, more splendid qualities such as costliness, piety or sophistication. It is part of the city's tradition, an accepted style that varies only slowly over the centuries. There are many different forms displaying basic epigraphic style, Diwani, Naski, Ta'lik and Thuluth.

Archways and Domes

Registan Square is a remarkable architectural symbol of Islamic civilization and the domain of Tamerlane's empire in the late 14th century. As small urban congregational complexes, mausolea, mosques, and madrasas have been the main components of Central Asian cities since the 10th century. However, a major commitment to the completion of the ensemble on an individual or joint basis took place during the Timurid period. The construction and restoration of monuments at the Registan epitomize the wisdom, power, and influence of nomadic warrior-pastoralists in the history of settlement and urban society in the triangle of Central Asia-the Great Steppe and Bashkir lines, Transoxania, and Eastern Persia. The madrasas' archways and domes present, in a new frame, Islamic land use and architectural aesthetics in order to enact the necessary religious and legal disciplines, moral decorum, and physical cleanliness, thus defining the settlement and cultural limits of the establishment [9]. An examination of the original structures, building evidence, masonry techniques, constructional developments, and architectural legacies demonstrates a successful combination of existing engineering skills with a new, monumental application resulting in the best manifestation of Timurid engineering arts.

The surviving Timurid portals and their original dome chambers demonstrate a remarkable scale and a high level of embellishment. High arches crown the huge iwan walls, rising to the full height of the blue-tiled front. Hidden cupolas are decorated with beautiful brick patterns; mosaic facings and tilework accentuate the surfaces facing the sun. The domes are ringed with tall minarets, forming an impressive silhouette against the open summer sky. The play of light and shadow captivates the gaze and subtly invites passage to the deep shadows within. Every aspect of these graceful entrance structures beckons the visitor to a world of great grandeur [11]. All the 16 Timurid archways and their copulas are built as parts of a larger complex. Arched entrances are lined with domed chambers, stairs and galleries. Not only inviting the visitor to circulate the square, the internal pathways guide one to explore every detail of these symmetrical and spatially rich structures. This emphasis on perspectival experience is intensified by a more abstract, geometric beauty. The high archways, when viewed directly from the

open-sided courtyard of their madrasas, form intricate, multifoliate shapes and series of nested polygons. The deeper archways are enlivened by dozens of square panels, each containing a starburst surrounded by intricate traceries. The innermost vaulting is perhaps the most complex, best representing the combination of spherical and geometric forms that is characteristic of the Islamic aesthetic tradition. This vastly magnified geometricism of ornament and setting tends to obliterate an underlying structure built with the simplest of Euclidean instruments, as if to emphasize that it was not only scholars and Sufis that imagined God in terms of a masterful geometry in the Timurid East, but rather this conception animated the very frame of daily life and society.

Table 1. Architectural Features of the Registan Square

Architectural Feature	Description	Cultural and Historical Significance
Madrasahs (Sher- Dor, Ulugbek, Tilya- Kori)	Three grand madrasahs dominate Registan Square, each featuring intricate designs, geometric harmony, and educational-religious functions. They symbolize Islamic architectural advancement and historical legacy.	Represents the fusion of Islamic and Central Asian architectural traditions, symbolizing Samarkand's intellectual and religious prominence.
Religious Structures (Mosque, Khanqah, Audience Hall)	The presence of the mosque, khanqah, and audience hall enrich the religious and political significance of the square, reflecting its role as a center for spiritual and civic engagement.	Demonstrates the religious, political, and social influence of Islamic rulers, emphasizing the city's status as a major Islamic hub.
Gardens and Chaharbagh Arrangements	Lush gardens and symmetrical Chaharbagh designs contribute to the 'earthly paradise' concept, enhancing the square's aesthetic and spiritual experience.	Reflects Persian and Timurid influences in urban planning, reinforcing Islamic notions of paradise and celestial beauty.
Mosaic and Tilework	Registan Square is adorned with exquisite mosaic and tilework, showcasing geometric patterns, floral motifs, and golden inscriptions that embody Islamic artistic traditions.	A testament to Islamic craftsmanship and mathematical precision, influencing later architectural developments across the Muslim world.
Islamic Calligraphy	Islamic calligraphy is integrated into the architecture, inscribing Quranic verses, rulers' names, and decorative inscriptions that reflect intellectual and spiritual values.	Acts as both a visual and philosophical element, reinforcing Islamic teachings and shaping the cultural identity of Samarkand.
Archways and Domes	The square features grand archways and domes with intricate geometric designs, high iwans, and structural innovations that highlight Timurid engineering mastery.	Serves as an architectural and engineering marvel of the Timurid era, inspiring later Islamic architecture with its use of perspective, geometry, and spatial harmony.

SYMBOLISM AND SIGNIFICANCE IN ISLAMIC ARCHITECTURE

Registan Square, the central point of the ancient city of Samarkand, represents a magnificent example of classical Muslim architecture. By exploring the deeper symbolism and significance of Registan Square in Islamic architectural traditions, various design elements can be understood as they convey theological ideas and cultural narratives. Through careful architectural analysis and insightful interpretation of architectural meaning, the values, beliefs, and norms inherent in Islamic civilization are revealed. Architectural elements are deeply meaningful, designed to represent harmony, unity, and divine beauty [13]; the meaning of such design elements is elaborated to better understand the cultural significance of the architecture presented. Furthermore, public aspects of Registan Square as a designed location for public and social activities, as well as educational purposes, communicate additional aspects of the robustness of Islamic architectural practice. This is further examined through the consideration of other symbolic elements in Islamic architecture, which are perceived as enhancing the spiritual experience for both inhabitants and visitors to the sacred areas. It is argued more generally that architecture provides a profound medium for cultural and spiritual expression.

COMPARISON WITH OTHER ISLAMIC ARCHITECTURAL MASTERPIECES

In recent centuries a list of seven "world wonders" has been disseminated that dates to Herodotus and is expanded upon by Philon of Byzantium and Antipater of Sidon. This list, however, is focused almost

exclusively on ancient Asia and the Mediterranean region, and various conceptions and commentaries have been produced in Islam by authors such as al-Qazwini, al-Muqaddasi, and al-Maqdisi. Registan Square in Samarkand has also received significant praise and has been highlighted by poets and scholars such as 'Ali Shir Nava'i in his Muhakamat al-Lughatayn, and timeless admiration for the square is clear in statements such as that of the Arab poet ibn Arabshah who remarked, "Oh Samarkand, that abode of mighty kings, rival to paradise itself, Producing living proofs that earth's proud pomp must die." Upon a wider consideration of prominent examples of the art of building among Muslims that are deemed "masterpieces," several regions can be identified and compared on the basis of this list including the Middle East (Architecture of the Laments, Alhambra), Central Asia (Registan Square), South Asia (Taj Mahal), East Asia (Great Mosque of Jenne), and South-East Asia (Sultan Ahmed Mosque, "cathedralturned mosque")/Central Asia (Rukhobod Mausoleum, Shah-i-Zinda). In addition to these an inventory of more than eighty other Muslim countries could also be contemplated which presents an architectural legacy that spans 1400 years, commencing with the Prophet Muhammad's construction of a mosque in Medina, and includes aqueducts, bridges, and domes, all of which reflect theological, social, and homological considerations [15]. Broadly speaking, the design of buildings and architecture reflect spiritual values, express the purpose and functional usage, provide a communal vista and sense of personality (if not immortality) for individuals and their patrons/sponsors, and as such, the effect that these parameters have upon an interior—in fulfilling these requirements—can be seen to be quite universal. In a more specific comparison with the interior design of the Alhambra, it becomes apparent that its exterior ornamentation is more intricate, but interior beauty is rather limited. In contrast, the abundance of deeply meaningful mosaic ornamentation of Registan madredassas adorns the entire facade and each wall facing the square as well as the porticoes and the iwan chamber. In addition, the ceilings are painted sky blues, deep Reds, and black, replicating the material cosmos with an intricate filigree of gold stars and constellations in the style of the noted Uzbek astronomer, Ulugbek. Importantly, the wooden columns and ceiling of each iwan chamber is also painted with a versatile blue aurora borealis astrological chart so that each madressa constitutes an astrolabe with a fixed universal reference in the transcendent blue firmament, subtly suggesting the unity of knowledge, creativity, and energy.

CONCLUSION

Registan Square is an ageless masterpiece of Islamic architecture, evoking the aesthetic, intellectual, and spiritual high point of the Timurid period. More than a group of monumental madrasahs, the square constitutes a history of Samarkand's growth, centuries of cultural cross-pollination, scientific inquiry, and religious devotion. The architectural harmony of the Sher-Dor, Ulugbek, and Tilya-Kori madrasahs, the complex mosaic tilework, Islamic calligraphy, and monumental arches all speak volumes about the region's matchless workmanship.

More than its beauty, Registan Square is the crossroads of knowledge and religion, where theologians, scientists, and artists met to develop ideas that were disseminated to the wider Islamic world. Its lasting impact on building traditions, from Spain's Alhambra to India's Mughal architecture, is evidence of its universal importance. More than that, the integration of geometric exactness, celestial symbolism, and urban planning skill in its design is testimony to the scientific genius of the era.

Today, Registan Square is not just a UNESCO-protected cultural heritage but a living witness to the rich Islamic architectural heritage. It is imperative to conserve and study its architectural and historical significance in order to learn about the artistic and intellectual accomplishments that still influence contemporary architectural thinking and urban planning.

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