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The Tokyo Cami
Ottoman Architecture That Adopted The Latest Japanese Technology

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1. Introduction

The tragic accident of the Ertuğrul in 1890 had a highly significant impact on the relationship between Japan and Turkey in modern history. Due to this tragedy, people in both countries have been able to identify with each other. For example, Mr. Torajiro YAMADA (1866-1957), who found passage to Istanbul with the survivors, has lived there for a long time and converted to Islam. He has played an important role in enhancing the mutual understanding between the two countries. By the 1920s, the number of expatriate Muslims living in Japan had rapidly increased. The primary reason for this was that certain Turkish people (Qazan Tatars) who had once lived near the Volga River were exiled to Japan, taking advantage of the chaos caused by the Russian Revolution to escape persecution[1]. On the other hand, since the 1930s, there was a sudden rise in concern regarding Islam in Japan among the nationalists and the military. Some researchers and experts at government establishments have enthusiastically collected information and participated in the academic activities that were part of "a conciliatory policy" for invading China and Southeast Asia[2]. Simultaneously, in some cities, Muslims displayed a strong tendency to construct their own mosques. Consequently, they built the mosque of Kobe in 1935, the mosque of Nagoya in 1937, and the mosque of Tokyo in 1938.

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[1] Masayuki YAMAUCHI, "God Army, Green Army, Red Army," Chikuma Shobou, 1988 (in Japanese) / Takeo MORIMOTO, "History of Tokyo Mosque," Islamic Center Japan, 1980(in Japanese) / Iwao KAMOZAWA, "Records of Tatars in Japan," Hosei University, 1981-82(in Japanese)

[2] Keiko SAKURAI, "Muslim Community in Japan," Chikuma Shinsho, 2003(in Japanese)

2. The Kobe Mosque and the Former Tokyo Mosque

2-1 Construction of the Kobe Mosque

In the 1920s, a number of Indian Muslims who traded in cotton products lived in Kobe. When the idea of constructing their own mosque emerged in the beginning of the 1930s, a rich Indian merchant named Firozeddin raised a fund for the construction of the mosque, and collected a sum of 120,000 yen from the Muslims living in Kobe. It is believed that of the total of 120,000 yen that were collected, Firozeddin's contribution amounted to 66,000 yen[3]. The Muslims purchased a plot in central Kobe city for their mosque, which they started constructing in 1934. The three-storied reinforced concrete mosque was completed in August 1935. This mosque was designed by Swagger and associates, who designed the Canadian Embassy along with Antonin RAYMOND in 1932[4]. It was constructed by the TAKENAKA Corporation.

The plan of the mosque is rather simple—the entrance is followed by a vestibule and a stairway, and then, a large prayer hall. The axis of the qibla intersects that of the entrance at right angles and a semicircular mihrab is positioned on the right side. A prayer gallery for women is located on the second floor opposite the mihrab. An observation on the façade reveals that the part of the main entrance projects forward a little and the two lower stories support the third storey, whose wall retreats backwards slightly. Each window is framed by a squatting, four-centered arch and casts a series of deep shadows, and the main entrance is extremely wide and is equipped with balcony eaves. The entrance is flanked by twin minarets having a three-layer composition. The first layer of the minarets is rectangular; the second, octagonal; the third, circular. Although this variation in the shape of the minaret is reminiscent of the medieval minarets of Cairo, the emphasis of the central features, the articulation of the arched windows on each storey, the turrets at the four corners of the lower stories, the finial decoration of the dome, and the brackets supporting the balcony, all bring to mind the mausoleums and mosques of the Delhi sultanates. Thus, the mosque appears to have been influenced by medieval Indian designs.

This mosque, which escaped World War II unscathed, was not severely damaged by the Hanshin-Awaji (Kobe) Earthquake in January 1995 either.

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[3] KAMOZAWA, op.cit. / Fujio OMURA, "History of Islam in Japan," 1988 (in Japanese)

[4] Architectural Institute of Japan(AIJ), "Inventory of Japanese Modern Architecture," 1980 (in Japanese)

This indicates that the materials used to build the mosque were of extremely good quality. Since its foundation, the Kobe Mosque has been a stronghold not only for the Muslims in Kobe but also for those residing in other parts of Japan.

2-2 Construction of the Former Tokyo Mosque

In the wake of the construction of the Kobe mosque, another mosque was also due to be constructed in the central area of Tokyo in 1938. A Turkish Tartar named Kurban-Ali played a leading role in the establishment of the mosque. He appealed to the existing political and financial circles for their help in its construction. He managed to procure a contribution of 120,000 yen[5]. Mr. Yoshio YOSHIMOTO, who was left the MITSUBISHI Estate after he had completed the MARUNOUCHI Building in front of the Tokyo Station, took charge of its design. It was constructed by SHIDA-gumi[6].

The former Tokyo Mosque consisted of two parts—the forequarter, including a vestibule and stairways, and the mosque proper, consisting of a large prayer hall. The prayer space for women was constructed on three sides above the main prayer hall. A minaret with a four-layer composition stood on the rooftop in the forequarter, and a dome crowned the central section of the prayer hall. Unlike in the Kobe mosque, the axis of the entrance coincided with that of the qibla. Accordingly, the mosque was characterized by an extremely symmetric composition. Since the external contours of the building were rugged, its elevation also varied. In general, its design is believed to be influenced by the Central Asian style—the original homeland of the Turkish Tartars. However, I believe that the main design of this mosque is related to the architecture of the Mamluk period in Egypt. The surface of the entrance, also slightly salient, was decorated with pointed star patterns in delicate geometrical relief. If this is considered as an exception, I believe that the slender windows framed by an arch at the top, the parapet on the rooftop, the shape of the minaret, and the design of the mihrab in particular, are reminiscent of the connection with the Cairene mosques.

When this mosque was constructed, Japan was already in the midst of the real war against China. Because of the limited resources available during the war, the use of large quantities of ironwork was restricted; consequently, only about 48.5 tons of the ironwork were used in the construction of the

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[5] MORIMOTO, op.cit. / OMURA, op.cit.

[6] Terunobu FUJIMORI, "History of Japanese Modern Architecture," Iwanami Shinsho, 1993 (in Japanese)

mosque[7]. As the use of iron was the bare minimum, wooden frames were used in the construction of most of the structural framework. As a result of these extreme conditions, the former Tokyo Mosque appears to have had structural problems. During the postwar period, the building deteriorated rapidly. Finally, due to concerns that its dome might collapse, the mosque was demolished in 1986.

3. Construction of the Tokyo Cami

3-1 The Issue of the Construction of the New Mosque

After the demolition of the former Tokyo Mosque in 1986, the site remained untouched for almost ten years without any substantial plans being drawn up for the construction of a new mosque. In July 1994, the Turkish government announced a concrete basic plan for a project involving the construction of a new mosque at the same site. In November, the KAJIMA Corporation, one of the major constructors in Japan, decided to accept the tender for the general coordination and execution of the plan as well as the construction of the mosque. Mr. Hilmi ŞENALP, a Turkish architect, was to be responsible for the creation of a basic design for the new mosque. However, the actual construction began in March 1998. In other words, the construction began over three years after the acceptance of the tender. Because of the vast distance between Turkey and Japan, it seemed extremely difficult to lay down the content of the design in a concrete manner. This can be deduced from the length of the time that was required to accomplish this. The officials responsible for the design from both parties exchanged numerous e-mails and also held the design a total of six meetings regarding the design in Tokyo and Istanbul. The most difficult issue raised at the meetings was the question of how the design conceptualized by the Turkish party would be adapted to fit Japan's various regulations and requirements for anti-seismic structures and disaster prevention.

The construction began in March 1998, and was completed after two years and three months in June 2000. The KAJIMA Corporation took charge of the construction for the structural framework and its equipment, and many Turkish artisans executed the finishing of the exterior and interior using the building materials and products sent directly from Turkey. It is believed that the maximum number of such artisans was 70.

[7] AIJ, "Journal of Architecture and Building Science," vol.642, 1938 (in Japanese)

3-2 Description of the Architecture

The Tokyo Cami is located in the central area of Tokyo and is surrounded by high-level residential districts. The site of the mosque has an area of approximately 734 square meters and faces a major arterial street to the north. While the site is relatively rectangular in shape, the building stands diagonally due to the axis of the qibla. The reinforced concrete building has one underground floor and three stories, and the total floor area of the entire building is approximately 1,477 square meters. The ground floor and the underground floor are used as a "Turkish Cultural Center in Japan"; it consists of a multipurpose hall, an exhibition room, a reception room, and an office. The mosque occupies the floors above the second storey. The mosque proper faces a front terrace on the east side, where the entrance portico, topped by seven small domes, is located. The main prayer hall is rectangular, and is covered by a main dome, 10.8 meters in diameter, 23.25 meters in height (from the ground), and four lateral half domes. The projecting section, which comprises a mihrab, is located in front of the center of the main hall. An upper gallery for women, both sides of which are topped by a small dome, is located toward the entrance of the main hall. A cylindrical minaret stands beside the entrance portico and approximately 41.5 meters in height (from the ground) with one balcony.[8]

4. The Traditional Techniques and Latest Technology Used in the Tokyo Cami

4-1 Outstanding Traditional Techniques in the Ottoman Style

A Dome on the Hexagonal Frame and the Spatial Composition in the Prayer Hall: The most significant architectural feature of the Tokyo Cami is a dome based on a hexagon frame, whose original scheme, as stated by Mr. ŞENALP, may have been derived from the Üç Şerefeli in Edirne (1437-48). On glancing upwards in the main prayer hall, we observed a beautiful dome complex, which is composed of a main dome supported by a huge hexagon structural frame and six semi-domes adjoining the main dome. A rectangular space covered by the main dome and two lateral half domes forms a prayer area. Further, one semi-dome provides a space for the most sacred alcove, which includes a mihrab on the qibla wall, while another semi-dome skillfully creates space for a vestibule.

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[8] Information and references from the KAJIMA DESIGN.

It should be noted that previously in 1453, the Üç Şerefeli Cami had displayed large-scale dome construction and had adopted a hexagonal structure. According to D. KUBAN, this hexagonal structure is peculiar to Turkish architecture[9]. Mimar SİNAN, the greatest Ottoman architect, adopted and implemented this structure in some medium-scale Camis[10]. It is believed that the results of his attempt had a bearing on the most important work of Ottoman architecture—the Selimiye Cami (1567-74).[11]

The Lower Part Treated as a Plinth: As mentioned before, sections of the underground floor and the ground floor, which serve as a cultural center, functions as a plinth that supports the mosque proper, a colonnaded portico, and a front terrace. On the side facing the street, the dome complex consists of a main dome, semi-domes, and small domes that are a comparatively large and of considerable volume. A slender minaret also stands on the side facing the street and provides a balance against the volume of the dome complex. The sight of these domes and the minaret stands out against the surrounding townscape. This piece of architecture does not appear heavy and stolid, despite its considerable height and volume. It may be observed that a certain kind of stability is generated by the treatment of the lower section as the plinth of the building. The composition of the façade of the Tokyo Cami is reminiscent of the Laleli Cami (1759-63), an excellent structure belonging to the later Ottoman period, located in downtown Istanbul, facing the main street. This is an excellent urban layout that invests the façade of the mosque with a distinctive character, while the area of the site, which is limited due to its densely urbanized surroundings, is effectively utilized.

Traditional Techniques Used in the Finishing and Decoration: The details of the mosque, such as the muqarnas and calligraphy, were crafted by many skillful Turkish artisans who, as mentioned before, used original materials transported from Turkey. Such traditional techniques still have great potential for use in contemporary architecture. For instance, clay mixed bits of straw on the site were used for the finishing of the main dome. After the

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[9] Doğan Kuban, "Osmanlı Dini Mimarisinde İç Mekan Teşekkülü: Rönesansla bir mukayese", Güven Basım ve Yayınevi, 1958

[10] The others with a hexagonal scheme by Sinan are Sokollu Mehmet Paşa Cami(1571), Atiki Valide Cami(1579), and Cerrahpaşa Cami(1593).

[11] Kimyo YAMASHITA, "Ottoman Domes based on Hexagon: The Prototype of Tokyo Mosque," 12th Annual meeting of the Japan Society for Hellenistic-Islam Archaeological Studies, 2005 (in Japanese)

clay was spread on the surface of the dome, it was roofed with lead plates. This is a sustainable technique that is significant from the point of view of its insulating performance. The sections of the muqarnas that are molded with frames are reinforced by the addition of hemp fibers to the plaster. In addition, the components of the muqarnas are assembled using wire as well as hemp fibers. These traditional techniques are skillfully combined with modern materials and methods. It is interesting to note that such traditional techniques can still be utilized in construction works today.

4-2 The Latest Know-how and Technology

Solution to the Existing Japanese Regulations: Since the Tokyo Cami is a public facility in which an unspecified number of people may be gathered at any given time, it is required to have high safety standards with regard to earthquake and disaster resistance. Particularly in Japan, where strong earthquakes occur frequently public buildings are always required to have a high level of stability and cannot be constructed unless they are proven to be sufficiently strong and flexible. There are also various restrictions concerning the volume of a building. For example, the provisions regarding the area occupied by the building the total floor area, and the height of the building, etc, should be taken into account. It appears that the problems concerning disaster prevention were a major issue during the negotiations with the authorities. The disaster prevention simulation was carried out in collaboration and through cooperation with various specialists and experts in accordance with an existing regulation that applicable to specific buildings such as skyscrapers and dome stadiums[12]. Through these consultations, the safety of the Tokyo Cami was verified on the basis of an overall evaluation and the building was equipped with the latest disaster prevention equipment.

Truss Wall Method Adopted for the Main Dome: Architecture crowned with a dome is extremely unusual in Japan. An industrial method that can construct an RC dome 10 meters or more in diameter was required for the construction of the Tokyo Cami. Subsequently, a method known as the Truss Wall method was adopted. This technique can be used to fabricate not only hemispherical structures but also various other types of structures with complex curved surfaces rather easily. On account of this method, the arrangement of steel bars and the fabrications of molds in reinforced concrete construction could progress simultaneously, the timbering of the

[12] Article 38 in the Building Standard Law (*Kenchiki Kijyun Hoh*)

molds could be reduced, and the assembly process involved in reinforced concrete construction could be efficiently systematized. Most important, the construction work in general could proceed safely.

Construction of Slender and Strong Columns in Using a Concrete-Filled Steel Tube (CFT) Structure: The great domes of the Ottoman architecture required large-scale piers or thick walls; these were sometimes mockingly referred to as the "Foot of the Elephant." The Cami project examined the possibility of constructing a type of column that the architect ŞENALP insisted upon—one that would be as slender as possible and would support the heavy weight of the main dome. As a result, a column composed of CFT was adopted. This method was the latest technique at that time and had just begun to be applied to high-rise buildings in Japan. The structure, which is constructed using a steel tube filled with high-strength concrete, is expected to display synergy effects and to possess the merits of both steel tubes and concrete. This method can reduce the area of the column because of its rigidity, its bearing strength, and its deformation performance, etc. As compared with a steel structure, the CFT structure is more effective in reducing the displacements caused by earthquakes and winds. It also displays an excellent of fireproof performance because it is filled with concrete and the provision of fireproofing protection can be simplified. In fact, the buildings that adopted this structure did not sustain severe damage in the major earthquake that hit Kobe in 1995. This fact attests the excellent earthquake-proof performance of the CFT structure.

Conclusion

The Tokyo Cami was completed in June 2000, and was appraised and commended as a remarkable work by the Architectural Institute of Japan (AIJ) in 2002. The Tokyo Cami is not only the biggest mosque in Japan but also a cultural center that introduces the Turkish culture. A prayer hall covered by a main dome, an open arcaded porch, and a pencil-like minaret are the main elements and the composition common in the classical Ottoman architecture. The details such as the muqarnas and decorations such as the calligraphy are executed by skillful Turkish artisans, using materials transported from Turkey. Therefore, visually, the Tokyo Cami is characterized by distinguishing features, derived from the Ottoman architectural style. On the other hand, since it is located in the midst of modern Tokyo, it must satisfy the Japanese construction requirements for a high level of anti-seismic safeguards. These, however, do not take into account

the construction of structure such as mosques. Thus, the Tokyo Cami adopted the latest architectural technology that was recently utilized in some skyscrapers.

In other words, the Tokyo Cami, which was constructed in Japan at the beginning of the 21st century using the latest construction technology, can be considered to be a revived Ottoman mosque, which is based on the outstanding traditional Turkish style. The construction of the Tokyo Cami involved extensive collaboration and cultural interaction between Turkey and Japan, and its presence in the Ottoman style will have further impacts on both societies in the future.