Research Article GU J Sci, Part B, 10(2): 219-234 (2022)

Gazi University

Journal of Science

PART B: ART, HUMANITIES, DESIGN AND PLANNING

http://dergipark.gov.tr/gujsb

Moldings on Facades until the End of the Classic Period in Ottoman Architecture

Suzan ESİRGEN[1], Önder AYDIN[2,*]

[1] *0000-0002-8322-1903, Gazi University, Architecture Faculty, Department of Architecture, 06570, Ankara, TURKEY*

[2] *0000-0002-6659-5380, Gazi University, Architecture Faculty, Department of Architecture, 06570, Ankara, TURKEY*

Article Info

Received: 24/06/2022
Accepted: 28/06/2022

Keywords

Ottoman Architecture, Facade Layout, Facade Elements, Moldings

Abstract

The current study focuses on the moldings, which is one of the elements in the building surfaces, and aims to reach the reflections of the unwritten principles of the Ottoman architecture in the process of its classicization. For this purpose, 15 buildings are discussed within the scope of the study, which have the potential to contain the aesthetic values of their respective erection times spanning from the foundational period to the classical period as the Ottoman architecture started to craft its originality and authenticity. These 15 buildings constitute focused examples from the surfaces of the mosques as the platforms where the stylistic transitions can be read most easily. They were built by the Ottoman dynasty in capitals such as Iznik, Bursa, Edirne and Istanbul signifying important threshold points. Furthermore, the moldings on the mosque walls were analyzed with analytical methods. The transformation of moldings into an important means of expression in the classical period and especially in Sinan's buildings, and the process that prepared the powerful role it acquired on the periphery have been pursued from the early period examples. Studies on the sample group have provided inferences about the functions, relationships and behavior patterns of the moldings, and have shown that molding configurations are based on a series of relationships, functional data and principles rather than a number of mere coincidences.

1. INTRODUCTION

"Once an accurate interpretation of Islamic art is evaluated with concepts developed outside of the particular art culture, it is imperative to examine how not only existing but also non-existent phenomena change attitudes" [1].

The article aims to elaborate and reread the formation process of the Ottoman style through moldings. In the study, the changes with respect to the architecture and stylistic transitions were observed based on the moldings which are the subject of the research observed from the foundation period, when Ottoman architecture commenced to realize original applications, until the end of the classical period, when the period of stagnation and Western influences began. The transformation of the moldings, which seem to be an ornamental element on the facades, into an important means of expression in the classical period and particularly in Mimar Sinan's buildings, and the process that prepared the powerful role it acquired on the facades have been investigated since the early examples.

The study covers a 400-year period starting from the construction of Iznik Haci Ozbek Mosque in 1333-34 up to 1748 when the construction of Nuruosmaniye Mosque began which designate the milestones for the history of architecture. In this process, various developments affecting the main design components such as context, program, construction, form, material and image have occurred. The Ottoman Empire, which started to be founded as a *beylik* (principality) in Söğüt, a small settlement area, developed rapidly, extended its territory, spread over a wide geography, met with new cultures, transformed from a principality to an empire, and created new architectural formations that responded to this culture with new lifestyles. The

* Corresponding author, email: oaydin@gazi.edu.tr

article study focused on the changing formations during this journey and the traces of the change in moldings during this change process.

The actual people and their lives who moved to Söğüt, Bursa and İznik during the foundation period of the Ottoman Empire, throughout the Seljuk and *Beyliks* era, brought their lifestyles along with their memories. Programs related to life, culture and living such as inns, baths, madrasahs, soup kitchens, met with the local materials of the conquered lands and the construction traditions of local builders, thus were reshaped with a new interpretation in the new lands [2].

In the founding years of the Ottoman Empire, which was in parallel with the pervasion and development periods of Islam, the mosque architecture, which was moved to new lands, was loaded with symbolic meanings far beyond its physical nature, and despite all its plain appearance, it formed the most effective building group among other building programs with its cubic and magnificent structures [3]. The article study focused on mosques, which is the effective buildings of the process.

The horizontal mass setup, which preceded the portal of the Seljuk period, started to transform in new lands, and the dome became the dominant element of the mosque architecture as the vaulting of the structure since the foundation years of the Ottoman State, and the vertical effect began to become evident with its cubic body, curvilinear dome vaulting and minarets rising to the sky [3, 4, 5]. With this new symbolic appearance, the mosque became the architectural symbol of the newly established state, was built in every newly conquered land, in every newly established neighborhood, took on the task of integrating the Ottoman lands and determining the borders, and became the indicator of dominance in the Islamized lands with this symbolized appearance [6].

The mosque image, which consists of a prismatic body and a single dome with curvilinear lines, which has been used since the early examples of Ottoman architecture, has changed over time, and with the volumetric growth of the mosques, it has transformed from a simple structure with a single dome to a pyramidal structure with domes attached to the main dome [5, 7]. The solid wall surfaces, the sharp finish of the facades with upper cornices, the plain cubic appearance that ends with the pulley bearing the dome and the single dome, reached its classical appearance over time with the pyramidal structure of the main dome and the dome chain that supports it, reaching down to the lower levels [3, 8].

In due course, architecture fed with the entire cultural accumulation and the data of the expanding geography, with the search for structural solutions in buildings reaching large dimensions, the facades were liberated and transformed into lightened surfaces with plenty of light, moldings found an increasingly widespread area of use on the facades and turned it into one of the most powerful means of expression [1, 3, 5].

The aim of the research is to investigate the reflections of the Ottoman style on the thresholds of change and moldings developed on the facades, in a wide period of time, developing geographical conditions and different cultural transformations. In the study, answers were sought to the questions of what is the place of the moldings on the walls, where are the places where the moldings are used, what kind of changes the moldings have demonstrated over time.

In line with these parameters, the research area covers 15 dynasty mosques in Ottoman capitals. Therefore, in the study, in chronological order, İznik Hacı Özbek Mosque (1333), Bursa Orhan Bey Mosque (1339), İznik Yeşil (Green) Mosque (1378), Bursa Hüdavendigar Mosque (1365), Bursa Ulu Mosque (1396), Edirne Eski Mosque (1403), Bursa Yeşil (Green) Mosque (1419), Edirne Üç Şerefeli Mosque (1447), Istanbul Bayezid Mosque (1501), Üsküdar Mihrimah Sultan Mosque (1548), Istanbul Şehzade Mosque (1548), Edirne Selimiye Mosque (1569), Istanbul Sultan Ahmet Mosque (1609), Istanbul Yeni Mosque (1597-1663) were analyzed. Exemplary buildings, each representing a historical moment and reflecting the aesthetic values of its own period, carry clues about molding touches, functions of moldings and principles of formation. The repetitions of molding touches in different buildings point to the search for common style development.

Once reviewed, it is seen that the researches on the subject address 25 mosques belonging to the Sinan period which were analyzed on the basis of facades, the relations between the facade elements and facade arrangements and the whole building were examined in Jale Erzen's [7] study titled "Mimar Sinan Dönemi Cami Cepheleri", and the secondary elements and ornaments that establish the facade were excluded from the scope of the research. Ahmet Ersen [2], in his doctoral thesis titled "Erken Dönem Osmanlı Mimarlığında Cephe Biçim Düzenleri ve Bizans Etkilerinin Niteliği", investigated the Byzantine influences in the lands taken conquered in the formation of early Ottoman architecture and the effects of traditional architectural accumulation in the memories on the facade. In the research, the transformations in the use of materials and the changes in the facade arrangements have been examined, not limited to mosques, by including buildings with different functions and associating them with their historical context. Gülru Necipoğlu [6], in her work titled "Sinan Çağı Osmanlı İmparatorluğunda Mimari Kültür", presents Sinan buildings and the social structure that prepares their existence process, the geographical structure and all the infrastructure related to architectural etiquette in a wide spectrum. Leyla Baydar [9] focused on the aesthetic values of the period in her doctoral thesis named "Batı Tesirine Kadar Osmanlı Mimarisinde Estetik Kriterler". Yıldız Demiriz's [10, 11] "Osmanlı Mimarisinde Süsleme", "Sinan Mimarisinde Bezeme", Yıldıray Özbek's [12] "Erken Osmanlı Mimarisinde Taş Süsleme" included extensive research on ornamentation. Muhittin Binan's [13] "Türk Saçak ve Kornişleri", Afife Batur's [14] "Osmanlı Camilerinde Kemer: Strüktür Biçim İlişkisi Üzerine Bir Deneme (1300-1730)", Ayla Ödekan's [15] "Kütle Biçimlenişi ve Cephe Düzenlemesi", and Semra Ögel's [16] "Şehzade Mehmet Camii'nin Dış Yan Sofaları" are examined in detail as aforementioned thesis and articles shed light on the study. Furthermore, studies on the facade components, which are often considered independently from the whole facade, and the information about the period buildings, walls and components referred in many publications are the source of the study.

2.FINDINGS

In the findings section, the tables were combined in historical order and all the moldings on the walls of the sample building were recorded, and the changes in the process were followed. Periods were investigated in order to determine whether new molding types are added depending on where the moldings are used in the overall facade setup, whether there are molding types of which their use has been abandoned over time, whether there are molding of which their use is systematically continuous in the process or whether they remain singular examples, whether the use of moldings is intensified or diluted. According to the data obtained, it is seen that there are changes in the types of molding, molding densities, molding element relations, molding dimensions, molding formations, molding materials included in the facade setup in the sample building facades.

2.1.Moldings on the Facade in the Process

The analysis results show that the cornice moldings and arch moldings appeared on the facade of the building from the early period examples (Table 1). Niche moldings began to appear on the facade of the building with the addition of niches to the "*mihrabiye*" in Bursa Yeşil Mosque for the first time. The moldings of the "*mukebbire*", which is the small balcony where the "*muezzin*" stands in the semi-enclosed entrance arcade of the mosques, are placed on the entrance facade of Sultan Ahmet and Yeni mosques, both of which are framed with moldings. No moldings were observed on the wooden mukebbires that were added to the Mihrimah Sultan Mosque later. Although the balustrade moldings were used as individual examples in the entrance portico of Iznik Yeşil Mosque and in the oriel balustrades of the Bursa Yeşil Mosque, it was observed that they were repeated in the later examples with the participation of the side sofas in the mosque architecture in the Şehzade Mosque. Although there are balustrades in the Hüdavendigar Mosque, no moldings were observed. Fountain moldings were placed on the facade for the first time in the Süleymaniye Mosque, which is an example of the classical period, with the inclusion of the fountain lines on the facade and were repeated in the following examples. The gargoyle took place on the facade of the building from the early period and shadows were formed around the gargoyle with moldings or grade difference from the early period to the classical period without showing continuity in the process. Arch moldings were located on the facade of the building from the early period to the end of the classical

period, except for Bursa Yeşil Mosque and Mihrimah Sultan Mosque examples, and in some examples, the arch surface was shaded with a difference in level. The buttress moldings started to be used on the facade after the buttresses were made visible on the facade of Üç Şerefeli Mosque and were repeated in later examples. Except for the minarets added later to the early period mosques, the minaret bases have taken their place in the mosque mass and on their own bases since the aforementioned Üç Şerefeli Mosque, and they have been repeated until the last examples, except for the Mihrimah Sultan Mosque, and the moldings have appeared on the minaret bases.

Table 1. *Moldings on the facades from the early period to the end of the classical period*

		İznik Haci Ozbek Mosque	Bursa Orhan Bey Mosque	İznik Yeşil (Green) Mosque	Murat Hüdavendigar Mosque	Bursa Ulu Mosque	Edirne Eski Mosque	Bursa Yeşil (Green) Mosque	Edirne Üç Şerefeli Mosque	İstanbul Bayezid Mosque	İstanbul Mihrimah Sultan Mosque	İstanbul Şehzade Mosque	İstanbul Süleymaniye Mosque	Edirne Selimiye Mosque	İstanbul Sultan Ahmet Mosque	İstanbul Yeni Mosque
ELEMENT MOLDINGS																
Architectural Element Moldings	Door Moldings			X		X	X	X	X	X	X	X	X	X	X	X
	Window Moldings		X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Niche Moldings			-	-	-	-	X	X	X	X	X	X	X	X	
	Mukebbire Moldings							X							X	X
	Balustrade Moldings			X		-	-	X	-	-	-	X	X	X	X	X
	Fountain Moldings			-	-	-	-	-	-	-	-	-	X	X		X
	Gargoyle Moldings		X			X	X						X	X		
Bearer Element Moldings	Arch Moldings	X	X	X	X	X	X	-	X	X		X	X	X	X	X
	Buttress Moldings		-	-	-	-	-	-	X	X	X	X	X	X	X	X
	Minaret Base Moldings		-	-	-	X	X	-	X	X	-	X	X	X	X	X
Ornament Element Moldings	Board Plate Moldings		X		X	X						X	X	X		X
GROUP MOLDINGS																
	Group Moldings									X		X		X	X	X
SURFACE MOLDINGS																
	Floor Moldings				X	X						X	X	X	X	X
	Cornice Moldings	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Ground Moldings		X	-	X	X	X					X	X	X	X	X

2.2. Moldings of Elements and Moldings of Sub-Components

Throughout the process, with new elements added to the whole facade layout, new elements were added to the whole facade layout in the new process, as well as new molding types, are also observed to form moldings belonging to the sub-components of the elements. Sub-components of each element, such as arches, spandrels, epitaph inscriptions, began to be defined by moldings in the process, and moldings were

observed around these sub-components and their sub-components. It has been observed that the molding layers increase from the whole to the part in the multi-surface elements that overflow from the facade, such as the door and the minaret bases. There are moldings that define the outermost surfaces first, and then moldings that define components such as arches and engaged columns inside each surface. It is seen that the types of loops occur, as well as moldings of the sub-components of the elements. Sub-components of each element, such as arches, spandrels, epitaph inscriptions, began to be defined by moldings in the process, and moldings were observed around these sub-components and their sub-components. It has been observed that the molding layers increase from the whole to the part in the multi-surface elements that overflow from the facade, such as the door and the minaret bases. There are moldings that define the outermost surfaces first, and then moldings that define components such as arches and engaged columns inside each surface (Table 2).

Table 2. *Moldings of elements and molding of subcomponents on the facades from the early period to the end of the classical period*

MOLDINGS OF ELEMENTS AND ITS SUB-COMPONENTS				
	ELEMENT MOLDINGS	ELEMENT COMPONENTS MOLDINGS	ELEMENT SUB-COMPONENTS MOLDINGS	SUB-COMPONENT MOLDINGS OF ELEMENT SUB-COMPONENTS
Architectural Element Moldings	Door Moldings	Arches	Spandrels	
			Tympanum	
			Frame	
		Niches	Epitaph inscription	
			Spandrels	
			Stalactite	
		Engaged columns	Frame	
			Geometric transitions	
		Epitaph inscriptions	Exterior frame	
			Interior frame	
		Interior arches		
		Stalactite	Frame	
			Spandrels	
		Shoe rack		
	Window Moldings	Arch		
		Spandrel		
		Tympanum		
	Niche Moldings	Frame		
		Stalactite		
		Epitaph inscriptions		
	Mukebbire Moldings			
	Balustrade Moldings			
	Fountain Moldings			
	Gargoyle Moldings	Frame		
		Bearer		
Bearer Element Moldings	Arch Moldings	Arch circumference		
		Arch impost		
	Buttress Moldings	Frame		
		Elements		
		Geometric transitions		
	Minaret Base Moldings	Surfaces	Engaged columns	Framework
				Geometric transitions
			Arch	Spandrel
				Tympanum
				Frame
			Epitaph inscription	
		Geometric transitions		
Ornament Element Moldings	Board Plate Moldings			

2.3. Group Moldings

Throughout the process, moldings that create groupings which collect elements in an upper frame, as well as moldings descending to the sub-component scale of the elements, were also included in the facade layout. It has been observed that it was frequently applied in Sinan period mosques, where the moldings that connect two windows on the facade of Bayezid Mosque and define the group for the first time are repeated in the next examples.

2.4. Molding Formats

From the early period to the end of the classical period, changes were observed in the formation of the moldings that were included in the facade slayout. The moldings with motifs around the eaves, windows, arches, and ornament elements in the early period examples were replaced by the ovolo moldings in the process. It has been observed that the moldings with motifs are mostly limited between the ovolo moldings located on the cornices of the arcaded courtyard, in the finial motifs, in the side sofa windows of the Süleymaniye mosque and at special points such as the minaret bases of the Selimiye Mosque (Table 3).

In addition to this transformation observed in the 400-year period, applications with a facade setup formed from the derivatives of a single type of molding, in which various molding motifs were applied together in the formation of the element moldings among the samples, were observed. It has been observed that in the early period examples such as Orhan Mosque and Hüdavendigar Mosque, various molding motifs were applied together, and in classical period examples such as Süleymaniye and Selimiye mosques, moldings derived from the uniform molding formation were included in the universal facade composition.

Different molding formats are observed in a single sample building, as well as variations existing in a single molding type belonging to a single building. In the process, as in the example of the Yeşil Mosque in Iznik, three different cornice molding motifs were used in the arcade and sanctuary part and the section coming to the base of the minaret, and there are also examples from the early period. Changes observed in a single molding sample are discussed for each molding under the title of evolution of moldings.

2.5. Moulding Materials

It was observed that there were changes in terms of the molding materials during the process. It has been observed that bricks were used in İznik Hacı Özbek Mosque, Bursa Orhan Mosque, Bursa Murad Hüdavendigar Mosques and stone moldings were used permanently from İznik Yeşil Mosque, Bursa Ulu Mosque and Bursa Yeşil Mosque, which are among the early examples. In addition, tile motifs are frequently observed between the moldings in Bursa Yeşil Mosque (Table 4).

Table 3. *Molding formations on the facades from the early period to the end of the classical period (M: motif moldings; K: ovolo moldings; P: balustrade; T: finial; R: reconstruction door, *: level difference, **: material difference)*

		İznik Haci Ozbek Mosque	Bursa Orhan Bey Mosque	İznik Yeşil (Green) Mosque	Murat Hüdavendigar Mosque	Bursa Ulu Mosque	Edirne Eski Mosque	Bursa Yeşil (Green) Mosque	Edirne Üç Şerefeli Mosque	İstanbul Bayezid Mosque	İstanbul Mihrimah Sultan Mosque	İstanbul Şehzade Mosque	İstanbul Süleymaniye Mosque	Edirne Selimiye Mosque	İstanbul Sultan Ahmet Mosque	İstanbul Yeni Mosque
ELEMENT MOLDİNGS																
Architectural Element Moldings	Door Moldings			M K	K R	M	K M	K M	M K	K M	K	K	K	K T	K M T	K M T
	Window Moldings		M	M K	M	M	K	K M	K M	K	K	K	K M	K	K	K
	Niche Moldings			-	-	-	-	K	K M	K	K	K	K	K	K	
	Mukebbire Moldings							K							M	M
	Balustrade Moldings			M K		-	-	K	-	-	-	K	K M	K	K	K
	Fountain Moldings			-	-	-	-	-	-	-	-	-	K	K		K
	Gargoyle Moldings		M			R							*	K M		
Bearer Element Moldings	Arch Moldings	M		K *	M	*	R	-	*	K		*	K	K *	K	K
	Buttress Moldings		-	-	-	-	-	-	K	K	K	K	K	K	K	K
	Minaret Base Moldings		-	-	-	K	K	-	K M	K M	-	K	K	K M	K	K
Ornament E. M.	Board Plate Moldings		M		M	K						K	K	K	*	K
GROUP MOLDİNGS																
	Group Moldings									K		K		K	K	K
SURFACE MOLDİNGS																
	Floor Moldings				* *	K						K	K	K	K	K
	Cornices	M	M	M K	M	K	K	K	K	K M	K	K M	K M P	K P	K M P	K M
	Ground Moldings		K	-	*	K	K					*	*	K	K	K

Table 4. *Molding materials on the facades from the early to classical period (O: brick; X: stone)*

		İznik Haci Özbek Mosque	Bursa Orhan Bey Mosque	İznik Yeşil (Green Mosque)	Murat Hüdavendigar Camisi	Bursa Ulu Mosque	Edirne Eski Mosque	Bursa Yeşil (Green) Mosque	Edirne Uc Serefeli Mosque	İstanbul Bayezid Mosque	İstanbul Mihrimah Sultan Cami	İstanbul Sehzade Mosque	İstanbul Süleymaniye Cami	Edirne Selimiye Mosque	İstanbul Sultan Ahmet Cami	İstanbul Yeni Mosque
ELEMENT MOLDİNGS																
Architectural Element Moldings	Door moldings			X		X	X	X	X	X	X	X	X	X	X	X
	Window moldings		O	X	O	X	X	X	X	X	X	X	X	X	X	X
	Niche moldings			-	-	-	-	X	X	X	X	X	X	X	X	
	Mukebbire moldings							X							X	X
	Balustrade moldings			X		-	-	X	-	-	-	X	X	X	X	X
	Fountain moldings			-	-	-	-	-	-	-	-	-	X	X		X
	Gargoyle moldings		O			X	X						X	X		
Bearer Element Moldings	Arch moldings	O	O	X	O	X	O	-	X	X		X	X	X	X	X
	Buttress moldings		-	-	-	-	-	-	X	X	X	X	X	X	X	X
	Minaret Base moldings		-	-	-	X	X	-	X	X	-	X	X	X	X	X
Ornament E. M..	Board Plate moldings		O		O	X						X	X	X		X
GROUP MOLDİNGS																
	Group moldings									X		X		X	X	X
SURFACE MOLDİNGS																
	Floor moldings				X	X						X	X	X	X	X
	Cornices	O	O	X	O	X	X	X	X	X	X	X	X	X	X	X
	Ground moldings		X	-	X	X	X					X	X	X	X	X

3. EVOLUTION OF MOLDINGS

In the study, 15 mosques, which were highly regarded as important thresholds from the foundation of Ottoman architecture to the end of the classical period, were investigated with respect to the moldings, the moldings used in the sample buildings were determined, listed and examined in the findings section. The data obtained reveal that, together with the historical transformation of the use of molding in buildings, each molding group undergoes a change within itself in the course of time. In this section, the stages of change within each molding group and the transformation journey over time are investigated.

3.1. Conversion Thresholds of Element Moldings

Architectural element moldings

Door Moldings

Whereas the moldings in the Iznik Yeşil (Green) Mosque, which is one of the early examples, are framed only by the arch section, the engaged columns in the inner corners are also framed with moldings outside this frame, while the door moldings in the Edirne Eski Mosque, which is a later example of the early period, include the arch section and the pier, but the moldings framed arches and piers in two parts. In Edirne, which is considered to be the last example of the early period, the moldings combined all the door components in a single frame from the outside, and after this example, the inclusive application of the moldings to all the door components was continued in the next examples.

Window moldings

Since the lower row windows of Bursa Hüdavendigar Mosque are closer to eye level, while it is expected that the workmanship appearances will increase, flat arch were used, the moldings on the upper row windows were applied as a contour on the arch without making surface difference and gradation. In the Iznik Yeşil Mosque, moldings were formed on the inner edge of the window arches, and the surface was drawn inward with the molding layers, and the tympanum was made clear. When it comes to the example of Bursa Yeşil Mosque, the surface is drawn in with moldings, the arch, inscription, corners are framed with moldings to cover all window components as a whole and adorned with elaborate stonework. With the addition of courtyards to the mosque structure in Edirne Üç Şerefeli Mosque appeared courtyard window typology in Ottoman architecture. In large lower-row windows, moldings frame the window and pull it in from the surface to cover all window components. The use of color and alternate walling in the window arches has contributed to the forming of the window and increased the legibility of the arches. In the arch, the surface has been retracted, and there has been a level difference around the tympanum, and the tympanum has become evident. The molding layers on the window doretrees continued to deepen inward. The upper row windows were arranged smaller, covered with honeycomb infill, and the recession remained in the arch area. The windows continued to be adorned with different motifs depending on their location, but at the same time, variations were disciplined with moldings. The moldings on the windows of the Bayezid Mosque reached the appearance of the classical period, the change in the modulation of the building with the effects of the Istanbul experience was also reflected on the windows, moving away from variations, and the single window ornament program was reproduced in the building with minor changes. The variation is concentrated in the motifs on the tympanum. By the time that the Sultan Ahmet Mosque period was reached, the window moldings remained only around the window doretrees, and the relationship between the elements and the place established by the moldings weakened. The moldings, which gather the window sub-components in a single frame and emphasize the integrity with their shadows, have turned into elements that adorn the window frames in the Sultan Ahmet Mosque. The moldings, which become thinner and thicker depending on the location of the window, benefit from the negative and positive impact of the shadows, and obtain different effects with the numerous articulations of the combination of circular and angular sections, treated all components equally in Sultan Ahmet Mosque windows without entering into a dialectic with other facade components. The variations are reduced to minor details with regards to the size difference between the lower row and the upper row window. Classical molding practices observed in areas with priority in perception order, closer to eye level, were applied on the upper floor windows above the arcade vaulting of the courtyard facades, which are located in the second plan, and the hierarchy formed according to the ground in formation was avoided.

Niche moldings

Mihrabiye niches were placed for the first time in the facades of Bursa Yeşil Mosque, the niche was surrounded by a wide band of moldings, and its stalactites (muqarnas) side was ornamented with stonework. From the intrados with muqarnas to the inner surface of the three-sided niche was crossed with a chamfer, and the embroidered facades were framed. However, except for the outer molding frame, the inner movements have not yet turned into molding sections. In the following periods, the front of the niche and the bases of the muqarnas will end at the same level. In the example of the Yeşil Mosque, the front of the colonnade, perhaps in a sense, descended below the separation level with the function of the column head.

The window and the niche were constructed together on the facade of the Üç Şerefeli Mosque under the arcade, and a niche was formed on the window with its muqarnas casing, and all the components from the outside were framed with moldings. The outer frame turned inward from the bases continued under the window doretrees, creating a volumetric frame. The muqarnas face is clearly separated by the level difference on the surface, which is drawn inward from the outside with the moldings, and the muqarnas face and the bases of the intrados end at the same level. Inward movement was continued with the tapering moldings on the marble doretree, pointed arch spandrels and the window top on the inner surface was framed with a colored border. The windowed niche application was repeated in Edirne Selimiye Mosque. The moldings in the niches of the Bayezid Mosque have largely gained their classical appearance, and the moldings have drawn the outer frame. The muqarnas facade was projected outward with a step difference, and the volumetric frame was completed from the muqarnas bases with thin moldings. In the Şehzade Mosque, the principles of the niche moldings applied in the Bayezid Mosque were repeated, and the front of the niche was framed with thin molding layers. On the outer side sofa facades, which were added to the mosque construction program for the first time, superficial "mihrabiye" niches with a niche motif with moldings were added. The moldings draw the outer frame, and a niche motif is created with the surface difference inside. With these examples, Sinan made a breakthrough in terms of the use of molding and made use of moldings for the order he constructed. The niche-door-niche trilogy was created in Edirne Selimiye Mosque with mihrabiye niches at the gateway. A higher effect was achieved by placing inscriptions on the niches near the door, which were formed with moldings. In Sultan Ahmet Mosque, with a different approach, a material difference was made in the mihrabiye niche and the niche was separated from the facade material. However, this distinction provided the formation of integrity with the windows, with the difference in material instead of the bond between the elements established by moldings until that day. The epitaph on the niche and the moldings on the windows demonstrated similarities and turned into a new network of relations. In the Yeni Mosque, on the other hand, tiling was not used on the surface mihrabiye niches covered with tiles, and a different approach was carried out by including tile frames.

Mukebbire moldings

Throughout the process, the use of mukebbire remained limited, and the repetition and diversity that would allow the transformation of mukebbire moldings could not be reached. Mihrimah Sultan Mosque's wooden mukebbire is a recent addition. Mukebbire is present in the examples of Sultan Ahmet and Yeni mosques dating to the end of the classical period, a shadow effect is created in the Sultan Ahmet Mosque with angled use, and the support side is framed with patterned moldings in the aforementioned Yeni Mosque.

Balustrade moldings

Marble grids diversified with different geometric motifs on the arcade balustrades of Iznik Yesil Mosque are framed by moldings with thin sections and narrow band gaps. The addition of outer side sofas to the mosque architecture in the Şehzade Mosque initiated the widespread use of balustrades. Rectangular strips were formed with moldings on the horizontal massive low marble balustrades, and the horizontal lines on the facade were continued with moldings. Marble networks were added on the massive balustrades at the Şehzade entrances, and there were moldings on the marble frames of the networks. In the lower floor arcade moldings of the Süleymaniye Mosque, the principles of the Şehzade Mosque were continued. In the upper floor arcade balustrades, the columns stepping on the balustrade, the balustrades and the moldings on them undulate following circular movements. Molding cross sections and band gap widened. In Selimiye Mosque, the molding principles on the balustrades were maintained, but the molding sections and band gap widened, and the inward recession deepened. In the Sultan Ahmed Mosque, on the other hand, the arcades added to the courtyard walls and the balustrades in the mosque mass dominated all the side facades, and the moldings repeated the example of Süleymaniye. In the Yeni Mosque, massive balustrades and horizontally effective moldings continued to be used in the side arcades and passages, and the upper floor arcades and the balustrades formed with motifs at the Şehzade Mosque entrance were framed with moldings. The principle of continuous inward retraction was not applied to the massive balustrades of the Yeni Mosque, unlike the chamfered surface in the inner part framed by the moldings.

Fountain moldings

With the inclusion of the courtyard with the arcade in the mosque program, the fountains were also included in the courtyard with the arcade. For the first time, the series of fountains in the Süleymaniye Mosque went

out of the courtyard and became a part of the mosque facades. In the Suleymaniye Mosque, boards were formed with moldings in the series of fountains located under the arcade railings, and different molding sections were applied for empty and fountain boards. In the Selimiye Mosque, the sequence of fountains are located under the arcades and the ground molding, as in the Süleymaniye Mosque. A board with moldings is defined for each fountain. Molding sections and depth and shadows have increased. In the Sultan Ahmed Mosque, there are fountain lines under the arcade, but no board definition is made for each user the incidental to the moldings, and the weakening observed in the network of relations provided by the moldings throughout the building has disappeared in the fountain sequences. In the sequence of fountains located under the strong ground molding in the Yeni Mosque, the sections where the fountains are located are framed and defined with the specified moldings.

Gargoyle moldings

The gargoyle in Bursa Orhan Bey Mosque, which is one of the early examples, is a specific example with its dimensions and the radial brick frame surrounding it. In Bursa Ulu Mosque, the gargoyles are supported by cornices with sections compatible with the cornices. The surface difference created by pulling inward is observed in the arch located around the gutter in the Şehzade Mosque. In the Süleymaniye Mosque, the gargoyles turned into strong elements on the facade as the hollow elements of the whole composition and gradation was applied around them with the surface difference. Gargoyles continued to be the strong element of the composition in Selimiye Mosque. The gargoyles on the side facades are enriched with ovolo moldings and muqarnas on their cornices. The only gargoyle located in the center of the qibla facade has turned into a special element of the qibla facade composition with specially shaped moldings as an indicator of the emphasis placed on water in Sinan buildings.

Conversion thresholds for bearing element moldings

Arch Moldings

In the Iznik Haci Ozbek Mosque, the first exemplary building of which epitaph has survived to the present day, two rows of bricks framed the tympanum and turned inward at the joist hanger level. In Bursa Orhan Bey Mosque, brick-stone alternating masonry was continued, the arches were framed with a patterned brickwork between a single row or between two rows of bricks, variations were continued on the face and forehead of tympanum, and moldings and inward gradation were made on the arch located on the entrance axis. In the arches with twin belts applied on the side faces of the arcade, the tympanum is pulled in. At the entrance portico of Iznik Yesil Mosque, the arch pattern is repeated with protruding moldings. The moldings were not used on the entrance axis and on the side faces of the portico. In the Hüdavendigar Mosque, on the other hand, the arch backs of alternating bricks are ornamented with a row of bricks. The arches on the entrance axis are differentiated by the motif frames created around the arch on the upper floor and the moldings and inward movement created on the tympanum on the lower floor. In the upper floor arches, the tympanum is drawn inward from the facade surface, and twin arches are placed on this surface, which is ornamented with geometric motifs. In the Üç Şerefeli Mosque, with the addition of the arcades to the mosque mass, the arches became one of the dominant elements of the building mass, the use of alternating colors in the arches began to appear and they became the predecessor of the alternating braided arcade image. Following this example, in some applications, the belt accent was replaced by the use of alternating colors and the belt accent created with moldings, and the shadow obtained by the step difference created by drawing inward instead of molding in alternating braided belts was satisfied. In the courtyard of the Bayezid Mosque, the arches have attained the characteristics of the classical period with their alternating braided appearance and the moldings on the back of the arch. In the courtyard with the arcade of the Süleymaniye Mosque, the arches are framed with double sequences of moldings, and a shade is obtained without the use of moldings in the outer side arcade arches. In the Selimiye Mosque, the reverse of the practice in the Süleymaniye Mosque was tried, and shade was obtained in the inner courtyard without using moldings, and in the side arcade arches, the arches were framed with moldings. In the Sultan Ahmet Mosque and Yeni Mosque, the moldings on the cloistered courtyard and outer side arcade arches framed the arches.

Buttress moldings

For the first time in the Edirne Üç Şerefeli Mosque, the buttresses protrude from the building mass and the geometric transition zones are emphasized with moldings. In the Bayezid Mosque, the overhanging

buttresses rose up to the cornices level, preserving their prismatic structure, and ended at the same level as the cornice moldings, and the cornices overflowed at the same level as the buttress moldings, only in the plan plane. In Mihrimah Sultan Mosque, on the other hand, the buttresses stood out from the facade surface, the moldings were arranged in double layers for the first time, while the molding group on the upper layer was connected with the other elements of the vaulting system in the plan plane, the molding group on the lower layer moved vertically to form a frame. The buttresses rising up to the cornices level in the Şehzade Mosque exceeded the cornices level in the center, connected at an angle with the wall surface at the cornices level and adorned with muqarnas. Angled layers in angled connections and moldings caused a wavy appearance at the cornices level, buttress bases were adorned with moldings by giving niche motifs, this practice was repeated in later mosques. In the Süleymaniye Mosque, the angled connection at the cornices level, the wavy appearance, the double-layered moldings, as well as the buttresses are framed by the second molding belt at the cornices level. It is framed horizontally again at the level of the floor molding. Niches with muqarnas hoods are placed on the bases and are lightened with windows. In the Selimiye Mosque, on the other hand, the buttresses were finished with double-layer moldings, and the buttress face was lightened with niches and windows with muqarnas imposts. The elements on the buttress face are narrowed upwards to obtain a higher view, the frames of the moldings around the elements are tapered upwards and the perspective effect is strengthened with the help of moldings. At the top is the upward rising motif obtained with a colored border. The elements and moldings on the buttress surface are designed to ensure the integrity of the buttress. Although the buttresses on the mihrab facade remained within the mihrab protrusion, niches were created at the junction points and connected with muqarnas. In the Yeni Mosque, the moldings could not be constructed to define the integrity of the elements, the arcade cornices and the ground moldings were in front of the buttresses and the holistic display of the buttresses was prevented. The frame formed by moldings on the buttress face has risen to the bottom of the cornices, and the finish has been emphasized with a rosette, which is a finishing motif. The moldings define the buttress only for a part of the buttress, and the element identification function of the moldings is disrupted. Angled connection to the facade with stalactites on the mihrab facade and other principles of buttresses at the upper levels were maintained.

Minaret base moldings

After the doors, the minaret bases stand out as the facade elements where moldings are used most frequently. In minarets that stand out from the mass like doors, the minaret sections and the geometric parts of each section are defined by moldings. On the minaret bases closest to the eye level, each surface is defined by engaged columns that soften the corners and moldings on the pedestal components on the surface.

Minarets were added to the early period mosques, so there were irregularities in the cornices moldings. However, it is possible to observe the reflections of the fact that the Iznik Yeşil Mosque minaret was built in the same period as the building, in the details of the cornices moldings, which are specialized in the minaret section. Bursa Ulu Mosque has two tower minarets in the northeast and northwest corners, which were built at different times. In both of them, the ground level and the transition section with triangles are separated by strong moldings, and a gradual recession is applied on each surface. The tower minaret of Edirne Eski Mosque is located in the northwest corner. Between the minaret base and the triangular transition zone, there are flat and inward chamfered moldings, and a band with an inward motif under the moldings. Retracted boards with moldings were created on each surface, and gradual inward drawing was continued with different motifs on each board. The columns in the corners are framed with moldings. Each of the Edirne Üç Şerefeli Mosque minaret bases was arranged differently and the molding layers increased depending on their location. The moldings ending the pedestal section, the moldings on the ground, the moldings at the separation of each surface, and the moldings around the engaged columns in the corners were repeated depending on the location. As the sub-components of the minaret bases such as the west facade minarets located in the main approach direction, the motifs on each side, the arch corners, the molding layers on the minaret doors, the moldings around them increased as well. The tower minarets of the Bayezid Mosque are among the tower minarets with dense moldings due to the moldings around all the sub-components and the enlargement of the belt zone and the framing of each board with moldings. In addition, the cornices with motifs on the base of the minaret move vertically, ensuring continuity and separating the tower from the main outer walls. While the moldings on the minaret bases of the Şehzade

Mosque continue to exist on all surfaces, all geometric transitions and all the minaret base sub-components, they also move together with the side arcades and buttresses on the facade. Like the double-layer moldings on the cornices moldings, the moldings ending the minaret base are located on two separate levels on two separate layers, and the width of the molding band range has been expanded with the addition of the moldings with motifs. On the minaret bases of the Süleymaniye Mosque, although all the rubbing and shaping principles are repeated, the depths are reduced, the coloring and motifs are cleared, and the simplification process is observed. Selimiye Mosque minaret bases displayed a different attitude after the simplification process in Süleymaniye Mosque. The minarets, which Mimar Sinan praised, moved away from the plain line in other parts of the mosque and became special with their deeply shaded consoles and muqarnas. Instead of defining the minaret faces of the minarets of the Sultan Ahmet Mosque with molding frames, the surface is drawn inward without moldings, and a vertically effective texture is created within the board with surface movements. Boards created with moldings in Yeni Mosque did not define surfaces or elements, vertical boards were created on the surface with moldings.

Transformation thresholds for ornament element moldings

Board, plate and disc moldings

In Orhan Bey and Hüdavendigar mosques, which are examples of the early period, there are moldings around the boards and discs formed by bricks in different sequences to delimit the board and to define it by separating it from the facade surface. In the next period, except for the boards formed with moldings on the entrance facade of Bursa Ulu (Grand) Mosque, the board application, which is not an element component, but a purely ornamental element, has not been continued. (This application is also likely to belong to the next renewal applications period)

3.2. Conversion Thresholds for Group Moldings

Group moldings that organize the facade elements started to be seen in the whole facade setup limited to the double window groupings in the Istanbul Bayezid Mosque, and in the Selimiye Mosque, which is considered one of the masterpieces of the classical period, the groupings created on all the facades of the building were applied with rich variations. Double-quartet groupings representing each dome unit on the courtyard facades, five-window groupings in the semi-enclosed entrance arcade, triple-window groupings on the side facades, arch groupings, niche-window groupings on the buttress faces were formed by moldings.

3.3. Conversion thresholds for surface moldings

Floor moldings

The high facade of the Hüdavendigar Mosque, which has a different significance in Ottoman architecture with its two-storey arcades, is emphasized with a different color and protruding floor molding. In Bursa Yeşil Mosque, on the other hand, the two-storey facade is expressed with triple motifs emphasizing the floor separation. In the Şehzade Mosque, the moldings were given a different function, and the window motifs, which were given the second row appearance with the moldings, were created with the moldings. By adding small third row windows in the openings close to the door, all architectural tools were used with moldings in order to obtain a high-looking facade. In the Süleymaniye Mosque, a group of vertical moldings descending from the cornices molding progressed along the facade, the side facades of which ascended and descended at the floor level. In the Selimiye Mosque, the floor molding is clearly visible between the buttresses, separate from the group moldings above and below, separating the floors on the facade. In Sultan Ahmet and Yeni Mosques, as in Selimiye Mosque, the floor moldings are supported by moldings with motifs underneath.

Cornice moldings

Although the İznik Hacı Özbek Mosque was badly damaged due to the roadworks carried out in the 1950s, this earliest Ottoman artifact carries valuable traces of the evolution of moldings. The double row patterned brickwork and cornices moldings on the tile-covered dome bases surround the high pulley, providing deep shadows and a sharp finish to the building. The traces of the end of the body facades have faded. Despite

the abundance of arguments that Bursa Orhan Bey Mosque is a renovation building, the idea that the original situation was followed in the renovation gained weight. On the brick-stone-alternating masonry facade, the body facades were terminated with multi-layered patterned brick moldings, and the moldings were cut without continuity at the elevation differences at the cornices level. All cornices moldings moved horizontally around the building. Iznik Yeşil Mosque, which is one of the pioneers of the transition to a new era with its stone facade cladding, is on the verge of a new transformation with its stone cornice moldings in harmony with the facade. As in other Bursa Mosques, the two sections of the arcade and the sanctuary were created with a difference in elevation, and they were finished with different moldings and belts with different motifs under the molding. A special transition motif has been applied to the minaret section, which is located at the junction of the arcade and the sanctuary. Bursa Hüdavendigar Mosque has a different place in the process with its different program, two-storey arcade as well as cornice moldings. Arches of different sizes framed the body facades with different layers and at different levels in the horizontal plane. A new phase was started in Edirne Üç Şerefeli Mosque, and the cornice moldings, which had finished the structure in the horizontal plane until that day, started to move in the vertical plane as well, leading the Sinan mosques in particular with its double-sided movement. The cornice moldings, which carry and intake the water coming from the vaulting system away from the facade and are the transition element to the vaulting system, therefore, shaped horizontally, have turned into a new form of expression, an element that finishes and frames the walls, in addition to its structural function, with its horizontal and vertical uninterrupted movement from the main facades to the arcade level and from the end of the arcade to the ground. . The importance given to the cloistered courtyard and the richness of life in the courtyard in the Istanbul Bayezid Mosque is also reflected in the cornice moldings, and the cloistered courtyard cornice moldings have taken a role in space definition tools with multi-layered, motif moldings. In Istanbul Mihrimah Sultan Mosque, the double-sided movement of the cornice moldings and the principle of continuity were strongly applied, while the upper group of the double-layer moldings drew horizontal frames with other vaulting system elements in the horizontal direction, while the molding group in the lower layer moved vertically and framed the facades. Along with the size of the buildings that grew in the process and moved away from human dimensions, the band gap in the fringe moldings was also expanded according to the perception level, and semi-permeable void finishes were obtained by adding motif moldings on top of the massive moldings. After the cornice moldings with motifs in the Şehzade Mosque, the railings, which are higher and hollower elements, were added to the cornice moldings in the Süleymaniye Mosque, resulting in a semi-permeable appearance at the upper levels. Finishing elements proportional to the size of the building became pioneers for subsequent applications, and the application was repeated in Selimiye and Sultan Ahmet mosques, and the principle of double-layered continuity was maintained.

Ground moldings

Like the cornice moldings, ground moldings have been located on the bases of the building since the early period to remove water from the building. The ground molding, which is partially visible in the Orhan Bey Mosque, shows itself in the Hüdavendigar Mosque with its structure and different materials that overflow from the facade throughout the entire arcade. The arcade cornices have been raised for a higher, more effective facade view at the entrance, the floor molding has been highlighted to underline the original facade setup with its two-storey arcade, and the ground molding has been placed on the ground uninterruptedly to emphasize the horizontal lines and all floors. In Bursa Ulu Mosque, Edirne Eski Mosque and Edirne Üç Şerefeli Mosque, ground molding can be seen along the entire facade or partially, especially on the entrance facades, and the level differences are supported by steps. Starting from the Selimiye Mosque, the ground moldings have expanded in cross-sections, increased in depth, have strong shadows, and added to the composition with the arcade balustrades above them, creating horizontal lines with wider band gaps. The vertically effective fountain boards in the series of fountains under them provided a different texture under the ground level.

4. CONCLUSION

The changes that Ottoman architecture went through during the transition period from beylik to empire were traced on the buildings with the aesthetic values of the period. In the Ottoman state, which was established as a principality (beylik) in Söğüt and spread over a wide geography with the conquered lands,

meeting with different cultural structures, the change of architecture was observed in the capital mosques, where the buildings embodying the aesthetic values of the period were concentrated.

Mosques, which were built in every newly established neighborhood in the conquered lands, integrating the Ottoman lands, determining the borders, and showing the dominance in the Islamized lands, contain strong and accurate data for the period for research with the symbolic values they carry. In order to trace the strong role of moldings on the facade in the classical period and especially in Sinan buildings, the article also covers the early period buildings. The research started with the analysis of the Hacı Özbek Mosque, known as the oldest mosque with an inscription in Iznik. Despite all the recent renovation problems, the building contains traces of the period's material, technique, formation concerns and aesthetic concerns. The facades of Bursa Orhan Mosque, Murad Hüdavendigar Mosque, Yeşil Mosque, İznik Yeşil Mosque, Edirne Eski Mosque, Üç Şerefeli Mosque, Selimiye Mosque, İstanbul Bayezid, Mihrimah Sultan, Şehzade, Süleymaniye, Sultan Ahmet and Yeni mosques were examined in historical order. Data on architectural formation principles of Ottoman architecture were followed. In particular, Mimar Sinan's search for structural solutions in buildings that reached large dimensions, nourished by all the architectural knowledge that reached his period and the data of the expanding geography, freeing the walls, obtaining lightened, lightened facades. It has been observed in the exemplary structures of the Sinan buildings, where the facade was treated as a design object and turned the moldings into one of the most powerful means of expression.

The relationship of the moldings with the ground has been observed in every example from the early period. In Sinan buildings, moldings have turned into an important element that connects all facade elements and strengthens the relations with the ground, but in the examples after Sinan, the relations with the ground and the use of moldings that provide these relations have weakened. In the facade arrangements designed according to the order of approach to the building, order of perception, arrest points, transition points, the moldings were shaped, concentrated or thinned depending on all these variables, and the band gaps were widened or narrowed. In line with these parameters, the side facades, which are the first contact facades in Ottoman mosque architecture, gained more importance than the entrance facade, which was between the arcade arches, and the moldings intensified. Instead of duplicating the facade layout on all facades or duplicating the facade elements on the facade, it was preferred to be shaped according to the importance of each point and the characteristics of each facade element, and moldings were used to reach the desired goal.

The components that form the facade of the building, in parallel with the aesthetic values of the period, have created new effects with new arrangements in a 400-year period. It has been seen that the formation of the moldings, which are one of the elements that form the building facade, is not due to their purely functional duties or purely form duplications, and that the aesthetic values of the period played an active role in their formation. Studies on the samples have shown that the molding formations are based on a series of relations and principles far from randomness, and the formation decisions of moldings bear strong traces of the existence of the unwritten rules of Ottoman architecture.

REFERENCES

[1] Kuban, D. (2004). *Mimarbaşı Koca Sinan: Yaşadığı Çağ ve Eserleri*. İstanbul: Vakıflar Genel Müdürlüğü.

[2] Ersen, A. (1986). *Erken Osmanlı Mimarisinde Cephe Biçim Düzenleri ve Bizans Etkilerinin Niteliği*.. İstanbul: İTÜ Yayınları.

[3] Kuban, D. (2016). *Osmanlı Mimarisi*. İstanbul: Yapı-Endüstri Merkezi Yayınları.

[4] Aslanapa, O. (1986). *Osmanlı Devri Mimarisi*. İstanbul: İnkılap Kitabevi.

[5] Baydar, L. (1999). Klasik Dönem Osmanlı Kamu Yapılarında Estetik Ölçütler. In G. Eren (Ed.), *Osmanlı: Cilt 10 Kültür ve Sanat.* Ankara: Yeni Türkiye Yayınları, 57-64.

[6] Necipoğlu, G. (2013). *Sinan Çağı Osmanlı İmparatorluğunda Mimari Kültür*. İstanbul: İstanbul Bilgi Üniversitesi Yayınları.

[7] Erzen, J. (1981). *Mimar Sinan Dönemi Cami Cepheleri*. Ankara: ODTÜ Mimarlık Fakültesi Basım İşliği.

[8] Yetkin, S.K. (1965). *İslam Mimarisi*. Ankara: Ankara Üniversitesi Basımevi.

[9] Baydar, L. (1986). *Batı Tesirine Kadar Osmanlı Mimarisinde Estetik Kriterler*. Doctoral Thesis. Ankara: Gazi Üniversitesi Fen Bilimleri Enstitüsü.

[10] Demiriz, Y. (1979). *Osmanlı Mimarisinde Süsleme 1, Erken Devir (1300-1453).* İstanbul: Kültür Bakanlığı.

[11] Demiriz, Y. (1988). Sinan Mimarisinde Bezeme. In *Mimarbaşı Koca Sinan Yaşadığı Çağ ve Eserleri*. İstanbul: Vakıflar Genel Müdürlüğü, 466-474.

[12] Özbek, Y. (1999). *Erken Osmanlı Mimarisinde Taş Süsleme*. Doctoral Thesis. Ankara: Hacettepe Üniversitesi Sosyal Bilimler Enstitüsü.

[13] Binan, M. (1952). *Türk Saçak ve Kornişleri*. İstanbul: İTÜ Mimarlık Fakültesi.

[14] Batur, A. (1974). *Osmanlı Camilerinde Kemer: Strüktür Biçim İlişkisi Üzerine Bir Deneme (1300-1730).* İstanbul: İTÜ Mimarlık Fakültesi.

[15] Ödekan, A. (1988). Kütle Biçimlenişi Ve Cephe Düzenlenmesi. In *Mimarbaşı Koca Sinan Yaşadığı Çağ ve Eserleri*. İstanbul: Vakıflar Genel Müdürlüğü, 513-520.

[16] Ögel, S. (1990). Şehzade Mehmet Camii'nin Dış Yan Sofaları. *Vakıflar Dergisi,* (21), 151-164.