

Hungarian and Ottoman-Turkish Architectural Relations Ottoman Memorial Architecture in the Territory of Hungary

Thesis Book of PhD Dissertation

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Figure 1 on the cover: The orthogonal view of the cross section carried out in the axis of the TLS scanner model of the canopy spaced shrine (türbe) in Ilok, Croatia. The survey was conducted by Gergő Máté Kovács, 2019.

Figure 2 on the cover: The orthogonal view of the cross section carried out in the axis of the TLS scanner model of the shrine (türbe) of Gül Baba in Buda. The survey was conducted by Gergő Máté Kovács, 2019.

Figure 3 on the cover: The orthogonal view of the cross section carried out in the axis of the TLS scanner model of the shrine (türbe) of Idris Baba in Pécs. The survey was conducted by Krisztina Fehér and Gergő Máté Kovács, 2018.

Figure 4 on the cover: The orthogonal view of the cross section carried out in the axis of the TLS scanner model of the shrine (türbe) of Damat Ali Pasha in Belgrade, Serbia. The survey was conducted by Gergő Máté Kovács, 2019.

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I. The aim and subject of the research, the thematics of the dissertation

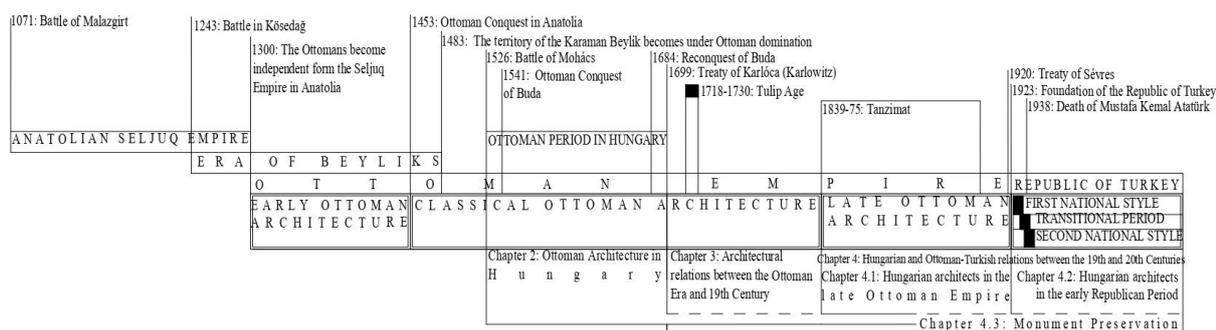


Figure 1: the periodisation of the Hungarian and Ottoman-Turkish architectural relations, the concept of the dissertation. (Gergő Máté Kovács, 2019.)

The research examines the architectural tendencies of three main periods of Hungarian and Ottoman Turkish architecture. (**Figure 1**) First, Ottoman construction activity in the territory of Hungary is examined; primarily, the example of memorial buildings. Possible answers are sought to the question, as to whether there is a connection between the function of the buildings created by the Ottomans in Hungary, the identification of the builder, and the type of construction activity. The principles of the spatial and structural formation of the memorial buildings are also examined together with any common features that can be used as a contribution in the evaluation, identification and heritage protection of the buildings.

The second part of the dissertation examines the period after the Ottoman domination in the territory of Hungary. Initially, it reviews Hungarian and Ottoman-Turkish architectural relationships between the period of conquest and the 19th century; the subsequent life of Ottoman buildings created during the occupation, as well as Hungarian-related buildings in the Ottoman Empire. It then describes the architectural relations following the turn of the 19th and 20th centuries, the late Ottoman Empire and the early decades of the Republic of Turkey, referring to newly constructed buildings and the protection of the existing heritage. This chapter publishes the less researched, Hungarian-related chapters and architectural parallels in Turkey during the aforementioned period.

The research is based on archival sources, data from Turkish and Hungarian journals of the era, as well as Turkish, Hungarian and English literature.¹ In the case of the adjectives related to the architecture of the Republic of Turkey, contemporary Turkish spelling has been used; the transcription of the preceding period is according to Hungarian pronunciation, and in the case of the Arabic geographical names, the transcription method is derived from the Encyclopaedia of Islam.²

¹ Researched archives: Database of Balassa Bálint Museum in Esztergom, Archives of Budapest University of Technology and Economics, The Drawing and Plan Archives of Budapest University of Technology and Economics – Department of Architectural History and Monument Preservation, Plan Archives of Gyula Forster National Heritage and Asset Management Centre, Hungarian Academy of Arts Hungarian Museum of Architecture and Monument Documentation Centre, Hungarian National Archives, Republic of Turkey Prime Ministry Ottoman Archives (T.C. Başbakanlık Osmanlı Arşivi), Republic of Turkey Ministry of Culture and Tourism – Presidency of Cultural Asset and Museums – Office of Monument Preservation in Edirne (T. C. Kültür ve Turizm Bakanlığı, Kültür Varlıkları ve Müzeler Genel Müdürlüğü, Kurullar Dairesi Başkanlığı, Edirne Koruma Kurulu), Archives of Topkapi Palace Museum (Topkapı Sarayı Müzesi Arşivi). Researched journals: Arkitekt; Tarih Dergisi [Historical Journal]; Ankara Araştırmaları Dergisi [Journal of Ankara Studies]; Akademi 10 Mimarlık ve Sanat [Academy 10 Architecture and Art]; İstanbul Araştırmaları Yıllığı – Annual of Istanbul Studies.; Türk Sanat Tarihi Araştırma ve İncelemeleri [Researches and Analysis of Turkish Art History], Az Est, Magyar Építőművészet, Vasárnapi Ujság.

² **BEARMAN et al., 2006.**

II. The new scientific results of the research

Thesis 1: The Hungarian and Ottoman-Turkish architectural relations and architectural tendencies has been framed in three periods: 1.) the Ottoman period of Hungary during the 16–17th centuries; 2.) the transitional period between the Ottoman domination of Hungary and the 19th century; 3.) the intensive period from the turn of the 19th and 20th centuries with the different interactions related to the previous ages.

(Related publications: [1], [2], [10], [11], [12], [13], [16], [17], [18], [20])

The summary examines cross-period phenomena and draws parallels between the different ages, reflecting also on newly discovered architectural case studies and data. The tendencies of the individual periods can be grouped in territorial terms, by the nature of the construction activity, and through significant relationships and parallels. (**Table 1**)

Table 1: Periodical overview of the Hungarian and Ottoman-Turkish architectural relations and architectural tendencies												
The age of the Ottoman domination in Hungary (16-17 th centuries)			The period between the Ottoman domination and the 19 th century (17-19 th centuries)				From the turn of the 19–20 th centuries up to the present day					
The territory of the Ottoman Empire	Ottoman construction activity in the territory of Hungary	buildings constructed by the Ottomans	Hungarian territories of the Habsburg Empire	Subsequent life of Ottoman Buildings	conversion related to the change of function	partially conversion	Hungarian territories of the Austro Hungarian Monarchy, Hungary	research and restoration of the Ottoman buildings in Hungary	from the Turkish part			
		buildings converted by the Ottomans			reconstruction related to the change of function	total conversion			from the Hungarian part			
		vanished buildings			vanished buildings							
				Territory of the Ottoman Empire	Hungarian related buildings erected	buildings used by the members of the Hungarian immigration	Territory of the Ottoman Empire and the Republic of Turkey		Researches, monument preservation works on existing buildings			
						Diplomatic buildings					Newly erected buildings, plans	plans of Hungarian architects
												Activity of Hungarian engineers, constructors
									Buildings with Hungarian connections			

Sub-thesis 1.1: There is a connection between the functional groups of the Ottoman buildings in Hungary, the groups of newly constructed or converted buildings, and the identification of the founder, and their impact on the architectural design.

(Related publications: [1], [11], [17])

Apart from the necessary military troops, from an Ottoman perspective, a relatively small number of inhabitants moved to the significant, although small but distant, frontier area.³ The number of buildings constructed by the Ottomans is relatively low - met mainly with newly emerging sacral and social needs. Among them, there are a few that have remained to the present day with an unchanged function; the majority have been destroyed, or partly or completely rebuilt after the occupation, especially in the 18th century.⁴

Apart from functional grouping, Ottoman construction activity can be divided into groups of newly built or Ottoman-transformed buildings. The construction activity was not realised entirely at the behest of the Sultan, but also private building by the imperial elite, with significant state control. Buildings that were constructed according to imperial command were mainly existing buildings, which could be quickly transformed after the occupation. These buildings mainly use architectural features from the centre of the empire, with there being a direct architectural export between the imperial centre and the periphery.

There is a connection between some functional groups of occupied Ottoman buildings, groups of newly built or converted buildings and the person of the builder, who had an impact on the architectural design. This can also be demonstrated in the case of memorial architecture. (Table 2)

Table 2: Correspondence between construction technology: spatial formation, construction material and function in the Ottoman buildings of Hungary.

Construct. technology		Function					Spatial formation		
Charact. use of material	Construct. method	Profane architecture			Profane buildings with sacral importance	Sacral architecture			
		Fortifications	Residential buildings	Commercial buildings					
soil, timber	newly built	Palanka – parkan					Framing an interior space		
	rebuilt or suppl.	kale	palace, residence			praying buildings – djamis and mosques			
brick or stone	newly built			bedesten	baths (hamam, ılıca, kaplıca)		Transiti-onal space		
					education (mektep, medrese)	cloister (tekke)			
					social (imarethane)	memorial buildings		shrines and mausolea (türbe)	closed-spaced shrine
								opened-placed, canopy shrines (türbe)	
				fountains (sebil) and wells (çeşme)		tombstone (mezartaşı)	Not framing interior space		

³ HEGYI, 1976.

⁴ SUDÁR, 2018. 312–406.

Sub-thesis 1.2. The use of oriental motifs around the turn of 19th and 20th centuries, in the period of the late Ottoman Empire is independent of the buildings constructed on the territory of Hungary during the Ottoman era and are not the effect of the aforementioned construction. Rather, it is related to a general European fashion, and a specific Hungarian research on origin, that of Turanism, with mainly North African originated forms.

(Related publications: [6], [12], [13], [14])

At the turn of the 19th and 20th centuries, elements of handicrafts, miniature painting, applied arts or architecture (including photos) captured from Ottoman territories were mainly donated, stolen, researched or exported into different cultural environments, where local art was inspired either by the techniques, stylistic elements and motifs. The effect occurred not only in a western direction, but also towards the east: for example, the appearance of Turkish elements in Arabic miniature painting, the individual Turkish image of the Arabs, or the effects of Turkish art in India.

In the case of Hungary, this tendency is independent of the Ottoman buildings constructed in the territory of Hungary and cannot be attributed to the effects of those built under Ottoman occupation – the tendency is the result of a general European fashion, orientalism, or a specific Hungarian ideology known as Turanism. These trends appear in parallel, but their nature and the main ideas are different. Neither Ödön Lechner, Miklós and Vilmos Zsolnay nor Ignác Alpár were impressed by the Ottoman buildings in Hungary – which would have been obvious - but the motifs and techniques were broadcast by European exhibitions, journals and the previously mentioned artefacts and photographs from the Ottoman Empire during the turn of the 19th and 20th centuries. The common feature of all these examples is that the artefacts, created in a chronologically and locationally heterogeneous cultural environment, influenced the local culture. The result is an "oriental" character that has only one common denominating feature: the inspirational elements are transferred through the Ottoman Empire, and the sources are mostly from the periphery or outside Ottoman territories: they came from the North African, Maghreb areas.

All this can be seen on the competition plan of the Historical Hall prepared by Ignác Alpár. Thus, the source of the Historical Hall's general form and motifs, which was conceived by Ignác Alpár, is a photograph depicting the shrine of Emir Sūdun in Cairo. The phases of the formal reception can be traced on its margin. (**Figure 2**)



Figure 2: The shrine of Emir Sūdun, drawings on the margin of the photo, and the plan of the Historical Hall. The connection phases between the photo and plan. BUTE Department of History of Architecture and Monument Preservation. Catalogue No. 80021 (the first three figures); **BLOCH-FIDRICH, 1932, 59.** (fourth figure)

A similar phenomenon can be observed in the Lágymányos area, at the bay enclosed by the regulation of the Danube in 1896, where the building complex designed by Károly Gerster was constructed. The light structural buildings with a scenic atmosphere (see the facade drawing of the main entrance to the Danube: **Figure 3**), were intended to summon the character of Constantinople. However, the motifs and forms are not related to Constantinople, nor Anatolian or the Balkan territories, but to more distant, North African (maghreb) architecture, outside the Ottoman Empire (see the gate structure of the Moroccan brick necropolis of Shalla, Morocco: **Figure 4**), or the architectural features of the Iberian, Moorish territories.

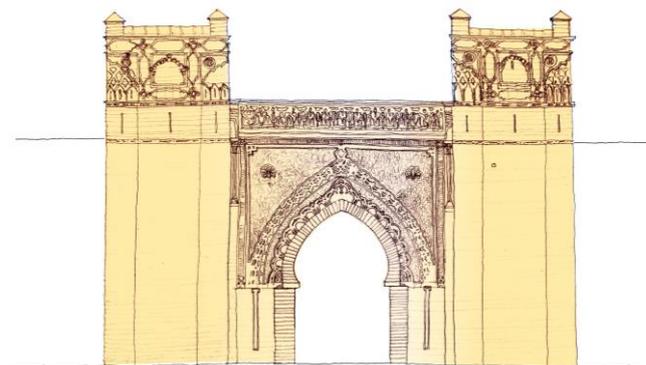
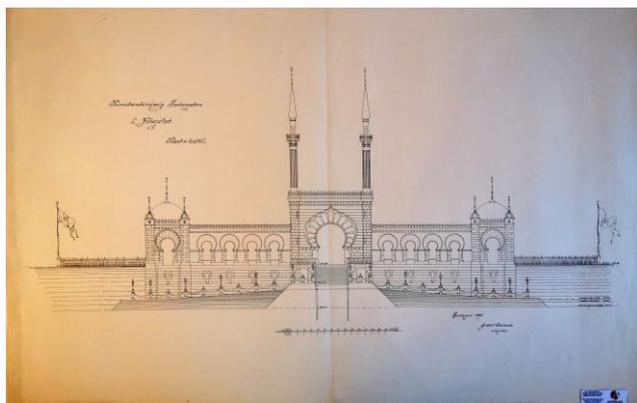


Figure 3 (left): Facade drawing of the Constantinople building complex's main entrance building in Lágymányos, Budapest. Designed by Kálmán Gerster. The plans were dated January 24, 1896. Source: **MNL OL T 08.02.38**;

Figure 4 (right): The brick structure of the royal necropolis in Shalla near the city of Rabat; the gate building is dated in the 13th - 15th centuries (Marinide Dynasty). Drawing by Máté Gergő Kovács, 2018.

It illustrates how the 'Oriental' image of the era had limited connections with historical Ottoman architecture, but rather a general European fashion.

Sub-thesis 1.3: In the early Republic of Turkey, besides the known construction workers arriving from Hungary, at each period of the era (First and Second National Architectural Movement and the Transition Period between them), plans by Hungarian architects can be detected typically, during the final, transitional phase of the official style created for the given ideological purpose by the state.

(Related publications: [3], [4], [5], [6], [15], [21])

The primary endeavour of the early Turkish Republic was to reconstruct the country both physically and ideologically. The era is divided into two large national architectural movements by Turkish architectural literature, with a transitional period.⁵ The first National Architecture Movement (from the 1920s to the 1930s - the architects: Kemalettin and Vedat Tek) used the 'pre-Ottoman', Seljuq style, instead of the Ottoman forms; the aim being a search for origin and the creation of an ideology counter to the previous Ottoman character. During the period, several European engineers representing modernist European architecture and the Bauhaus school travelled to Turkey (Bruno Taut, Ernst Egli, Hermann Jansen, Clemens Holzmeister), and also took part in the education of a completely new

⁵ ASLANOĞLU, 2010.; BOZDOĞAN, 2012.; SÖZEN, 1984.

generation of architects. They are the members of the Second National Architectural Movement (from the 1930s to the 1950s), the generation searching for a synthesis between modernism and local architecture (architects: Seyfi Arkan, Sedat Hakkı Eldem). At that time, traditional Anatolian architectural features based on European technology (ferroconcrete as a material, a clear and well-grounded space structure, economic construction) had become a rational architectural culture that adhered to Anatolian traditions. The creators of the age used the elements of Anatolian architecture not only as a formative quotation, but searching the reasons for their creation, the spatial and constructional principles, they aimed to involve the main Anatolian vernacular architectural features into their contemporary buildings. In this case, in contrast to the turn of the 19th and 20th centuries, it was not the direct export of forms and motifs, but the analysis of the spatial and structural principles for their contemporary application. Neither was it just a stylistic question; this kind of change in attitude had economic reasons. In the late Ottoman era, and the first phase of the Republican era, the use of construction methods, materials, and proportions had become uneconomic, which led to the emergence of contemporary European editing and material use.

During this period, in all phases, Hungarian architects were also arriving in Turkey. Although the plans of these Hungarian architects were not realised, their impact can still be felt during this architectural chapter, not only in Turkey but also in Hungary (see István Janáky's plan). In addition to their presence for period, project-specific or design contests (see Alfred Bardon's plan), the most important intellectual and educational workshops in the early Republic of Turkey, the Academy of Fine Arts in Istanbul employed architects from Hungary, notably, Ferenc Hillinger.

Sub-thesis 1.4: Following the turn of the 19th and 20th centuries, the protection of the common Hungarian and Ottoman-Turkish architectural heritage can be divided into three periods: the initial period of the turn of the 19th and 20th centuries and the early 20th century, the paradigm change of the 1960s with the beginning of research specifically dedicated to Ottoman heritage, and the trends of today. The period beginning in the 1960s, also affects the current day with a more comprehensive international character.

(Related publications [2], [7], [10], [11], [18])

Since the turn of the 19th and 20th centuries, certain tendencies have been observed in the relationships between Hungarian and Ottoman-Turkish monument and heritage protection. (**Table 3**) On the one hand, it is clear that not only the Ottoman memories of Hungary but also the Hungarian-related memories of the Ottoman Empire and the Republic of Turkey were the purpose of the research and protection activities. In many cases, the individual investments were followed by the result of symbolic diplomatic acts. The research into Ottoman monuments and monument preservation activity began relatively early, in the middle of the 19th century, with the buildings attracting the attention of both Hungarian and Turkish experts. Initially, the interventions to the monuments were isolated, and the Ottoman phenomena were secondary; the significance was attributed to the general historical character of the building. However, a change of paradigm has been observed since the 1960s, which provided the basis for targeted, systematic, interdisciplinary and international building research and restoration work. From that point on, the Ottoman character can be regarded as the primary value; the researchers specialised in Ottoman architecture, and several monographs, catalogues and comprehensive restoration works were created. The proposals of the aforementioned period has effect of the present architectural relations, with more intensive international cooperation.

Table 3: The researchers of the Ottoman architectural remains and the chronology of the aspects of researches.

	Researchers, architects, historians, philologists, archaeologists of Hungary	Researchers, architects, historians, philologists, archaeologists of Turkey	Most important examples	The aspects of research
The beginnings of the 20th century	Ernő Foerk, István Genthon, Géza Fehérvári, Lajos Grill, István Möller Imre Henszlmann, Arnold Ipolyi, Péter Gerecze, Gyula Gosztonyi	Mimar Kemalettin	Monument preservation interventions on several, individual buildings, e.g. the shrine (türbe) of Gül Baba in Buda, the djami of Gazi Khasim in Pécs	Instead of the Ottoman origin, the historical character of the building is important, but some of the Ottoman features are also preserved. Also, the ideological approach is significant (turanism and orientalism), and from a diplomatic point of view, the projects are framed by positive Hungarian-Ottoman relations.
1950- 1960- 1970' s years	Győző Gerő; József Molnár, Valéria Kováts, (İslam mimarisinin genel araştırması: Erzsébet Tompos), Károly Ferenczy, Mária Sándor	Ekrem H. Ayverdi, İ. Aydın Yüksel	Research and restoration works for almost all of the Ottoman buildings of the era. Summary works, monographs, typologies.	The birth of specified "Ottoman-Turkish archaeological research". Systematic research on architectural history, interdisciplinary approach. Attention to the Ottoman memories of Hungary from both the Turkish and Hungarian sides.
From the 1990' s until the present days	Géza Dávid, Pál Fodor, Judit G. Lászay, László Gere, Ibolya Gerelyes, Erika Hancz, Klára Hegyi, István Horváth, Tamás K. Pintér, Gyöngyi Kovács, Dániel Mányi, István Mányi, Tamás Mezős, Norbert Pap, János Hóvári, Adrienn Papp, Péter Rabb, Balázs Sudár, Ákos Zsembery, Judit Botos, Gyula Cséfalvay	Burcu Özgüven, Mehmet Emin Yılmaz, Gökçe Günel, Doğan Kuban, Emre Saral, Erdal Çoban İsmail Tosun Saral	Protecting the heritage of some Ottoman memories with the involvement of an international expert base (Shrine Gül Baba, Buda; Minaret of the Djami of Kethüda in Eger). Systematic research on the specific function: Ottoman baths in Buda; mosques and djamis. Research groups: Mohács as a historical landscape, Sultan Suleiman's memorial shrine (Szigetvár, Turbék). Regional, thematic collaborations.	At national level: International research groups have emerged around current, internationally important, fundamental and interdisciplinary research topics. Government Decree on the protection of Ottoman memories. Regional, thematic cooperation. At international level: International (Turkish-Hungarian) research and restoration projects with Turkish and Hungarian state support, which specifically take into account the Ottoman memories of Hungary as a special type of building. Joint sharing of the knowledge base in Hungary and Turkey. Diplomatic bodies, two-way international agreements.

Thesis 2: a database containing the key buildings of Ottoman and Seljuq shrine architecture, including the shrines (türbe) in the territory of Hungary, has been created. The database provides data to place the Ottoman memorial buildings in Hungary on the scale of Ottoman architecture from a spatial and structural point of view.

(Related publications: [8], [9], [11], [17])

Ottoman memorial architecture, formed from the Central Asian and Iranian based Seljuk traditions, was partly influenced by Byzantine architecture and appeared in the semi-peripheral Balkan and peripheral Hungarian areas.

As a basis of the research, database reviews the building type of closed and transitional spaced memorial buildings, that is, the closed and open-space mausolea (türbe and kümbet). The collection covers the Carpathian Basin, the Balkan Peninsula and the Anatolian Peninsula in order to distinguish the examples in the Balkans as the immediate neighbourhood of the occupied Hungarian territories, which are the subject of the dissertation, and in the central region of the Empire in the classic period of the Ottoman Empire. The reason for this distinction, is that Balkan architecture serves as a direct example of Ottoman architecture in Hungary with local characteristics.

The table examines the buildings according to the region, settlement or town; the identification of the builder and architect; time of construction; plan, type of construction covering the space doors and windows on the façade; mihrab. The database of the examined memorial buildings, handling the buildings as the primary source, based on manual surveys with TLS scanners and surveys available in the following Turkish-language scientific literature (AYVERDI, 1966; AYVERDI, 1978; AYVERDI, 1981; KILCI, 2007; ÖNKAL, 1996A; ÖNKAL, 1996B.) The following table summarises the typology of the key examples of Seljuq and Ottoman memorial architecture. It is based on the layout of the plan, the number of levels and the spatial features indicating the position of the grave and the symbolic grave (*sanduka*), distinguishing typical key buildings, and further examples. The background of the fields in the table shows whether the arrangement is typical of Seljuq, Beyliks, Ottoman architecture or, specifically, Ottoman architecture in the territory of Hungary. (Figure 5) The database provides an opportunity for further analysis and research. The research could also be expanded from the central areas of the Ottoman Empire to other areas relevant to the study of the building type (the so-called Maghreb areas, Egypt, the areas in the Middle East that were periodically part of Ottoman territories). Similarly, the territories that were not part of Ottoman architecture but having correspondence (Iran and Central Asia).

Almost all spatial types had been developed during Seljuk architecture, with the Ottomans using some of them (typically single level, polygonal forms and the more limited variants) in the Hungarian areas. In terms of their size, most of the early shrines are approximately 10 m in height, so they do not reach the twenty-meter high Seljuq kümbets or the Iranian tower shrines. Although Ottoman shrines are typically monospaced, following the türbe of Murad II (1421-1451), there is a gentle spatial differentiation of the interior. In the case of the features of Ottoman buildings, several reductions have been applied: there are no two-storey buildings, and the circular plan type was not used between the 13th and 18th centuries. All the Ottoman shrines in the territory of Hungary are central, polygonal, with both closed and open-space buildings.

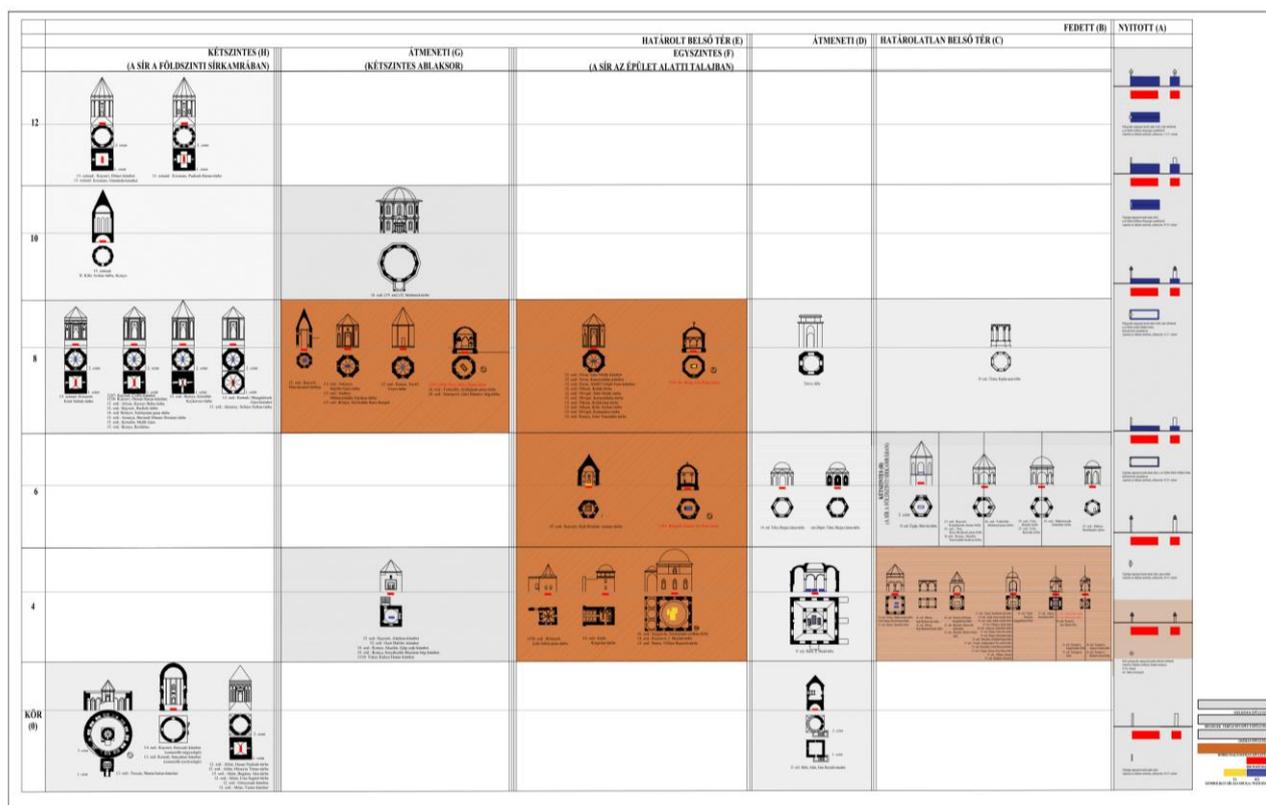


Figure 5: Space typology of Seljuq and Ottoman memorial buildings between the 10th and 17th centuries with the characteristic key examples. Created by: Máté Gergő Kovács. The full-sized chart is part of the dissertation.

Thesis 3: in the case of the Ottoman shrines in the territory of Hungary, the measure (architectural cubit / architectural arşın / architectural zira’) applied in 15–16th century Ottoman architectural practise has determined the exact structural and spatial dimensions.

(Related publications: [8], [17], [19])

In the case of some types of Ottoman buildings, it can be stated that in the composition, redactional correspondence exists. The most typical example is the case of minarets, since here, there is a correlation between the horizontal and vertical dimensions of each structural element. This provides the option to generate the mass of the building algorithmically from the plan.⁶ In the course of the research, TLS scanner and manual survey drawings have been prepared, which are included in the appendix of the dissertation. Based on the true to form surveys, the typical spatial and structural dimensions of buildings are summarised in the table above. (**Table 4**)

It can be concluded that the characteristic dimensions of Ottoman shrines that are still visible in Hungary, are also proportional as well as the shrines in the neighbouring territory of present Hungary (Ilok, Croatia and Belgrade, Serbia). Similarly, both the horizontal and vertical dimensions of their interior spaces and their structural dimensions can be expressed as an integral multiple of the general architectural measure of the 16th century (*bennâ’ arşını / mimarî arşın*). (**Table 5**)

⁶ EL KORDY, 1997.; HORVÁTH-ZSEMBERY, 2008.

Table 4: The characteristic sizes and structural materials of Ottoman shrines in the Carpathian Basin

feature		examined building				
spatial type		closed space				opened space
polygon of the plan		octagonal		hexagonal	square	
	measure	Shrine (Türbe) of Gül Baba, Buda	Shrine (Türbe) of Idris Baba, Pécs	Shrine (Türbe) of Damat Ali Pasha, Belgrade ⁷	Shrine (Türbe) of Sultan Suleiman in Szigetvár	Shrine (Türbe) of Ilok
size of the interior space ⁸	cm	604 - 607	610 - 615	542–547	509–608 x 612–622	238–240
	arşın	8 x 8	8 x 8	7	8 x 8	3 x 3

Table 5: the types, denomination and division of arşın.⁹

	type of measure			
	architecture		other /e.g. textiles/	
Turkish	1	bennā' arşını (mimarî arşın)	1	'ämme arşını
Arabic		bennā' zīrā'ı		'ämme zīrā'ı
Persian				
Hungarian translation		könyök		rőf
Turkish	24	barmağ	100	barmağ
Arabic		isba'		isba'
Persian		angush		angush
Hungarian translation		ujj / hüvelyk		ujj / hüvelyk
SI	75.774 cm		68.597 cm	

The TLS scanner survey confirms that in the case of the Ottoman shrines in Hungary, the system of units used in Ottoman architectural practice of the 15–16th centuries determined the exact structural and spatial dimensions.

Sub-thesis 3.1: In the case of the shrines built by Ottomans in the territory of Hungary, regularity can be detected between the spatial and constructional dimensions of the applied wall structure, which is determined by the architectural arşın unit.

(Related publications: [17], [19])

The dimensions of the interior space of the octagonal Ottoman shrines in Hungary, measured in a horizontal plane, are the same: 8x8 *arşın*s. Vertical dimensions include 1 arşın difference: while the Shrine

⁷ Diameter of the circle drawn within the building.

⁸ Measured on the horizontal section drawn at the level of the first row of windows (h_1).

⁹ **TKSM YY. 339. fol. 1r–87v, CRANE, 1987, 76–77.**

of Gül Baba in Buda has an internal size of 10 arşın (the horizontal and vertical dimensions are the same), Idris Baba’s interior is 11, although the latter has two horizontal rows of windows. The structural and spatial dimensions of buildings can be expressed as a multiple of the arşın, but although their measurements may vary depending on the construction material used, the dimensions remain within the scale given by the unit of measurement. (Table 6)

Comparing the dimensions of the buildings’ interior space, similarities in size can be determined. The measurement of the wall structure is either 1 arşın or 1 ¼ arşın, so the arsin is proportionally increased. The latter case occurs when the material of the wall structure is not limestone rubble masonry, but a mixed masonry and/or the height of the building is greater - the height and width values are not 1: 1. Consequently, the increase in the dimensions of the wall is related to the height or the applied structural material on a scale determined by arşın units.

Table 6: Comparison of the typical dimensions and the material properties of the masonry in the existing shrines in the Carpathian Basin and the building under archaeological research							
spatial type		closed space					opened
polygon of the plan		octagonal		hexagonal	square		
measure		Shrine of Gül Baba, Buda	Shrine of Idris Baba, Pécs	Shrine of Damat Ali Pasha in Belgrade	Shrine (Türbe) of Sultan Suleiman in Szigetvár		Shrine of Ilok
the height of the interior ¹⁰	cm	665 - 669	756 - 759	679–681	unknown		530–532
	arşın	8 ¾ (1 arşın 18 parmaks) / floor construction in the interior: ¼ arşın or 6 parmaks/	10	9	unknown		7
Characteristic thickness of the wall construction	cm	75.6 - 77	86 - 89	75.4–75.7	the separating walls of the forebuilding 70-80	constructional walls of the shrine 95-100	76–76.3
	arşın	1	1 ¼ (1 arşın 6 parmaks)	1	1	1 1/4 (1 arşın 6 parmaks)	1
the size of the dome in the interior	arşın	4	4	4	unknown		2
material of the wall structure		limestone rubble masonry walls, the interior is plastered, the exterior is covered with a thinner rubble masonry wall	heterogeneous material in irregular arrangement and surface – at several heights, regular horizontal rows are noticeable	limestone rubble masonry walls, the interior is plastered, the exterior is covered with a thinner rubble masonry wall	brick and marl wall construction with wooden beams		limestone rubble masonry wall with double brick rows

¹⁰ Measured on the vertical axis of the building (h₂).

Thesis 4: the Ottoman shrines (*türbe*) built in the territory of Hungary were designed with a similar methodology, which is visible on a plan that remained from the era of classical Ottoman architecture and was recorded in written or drawn form.

(Related publications: [8], [10], [17], [19])

While thousands of significant Ottoman buildings were erected in the sixteenth century, there are only a few drawn documents and no models available for research today. Thus, regarding the architectural historiography, the written sources such as accounts and letters are particularly relevant for current research, shedding light on the construction and drawing practices for decision-making, cost estimation, as well as on the details of buildings in the Ottoman Empire.

In the architectural practices of the Ottoman Empire, architectural drawings and the art of calligraphy (*khatt*) were often executed by the same artists. Consequently, the interrelationship between the two methods of drawing is perceptible. The phenomenon outlined above was observable among the artists of the imperial workshop. Indeed, the *mıstâr tahtası*, traditionally used for calligraphy, was also the tool of architectural drawn documents and the design process. This modular grid system was used as a base for both the design calligraphy²¹ and constructional details, especially for *muqarnas* (**Figure 6**) and the complete construction. Consequently, it can be stated that in the Ottoman architectural practice of the 16–17th centuries, the calligraphy, architectural design and architectural representation were carried out using the same tools; therefore, there was a direct relationship between fine art and architectural design. A complete construction designed on a modular grid system, the plan versions of a shrine from the first half of the sixteenth century, preserved at the Topkapı Palace Museum, is particularly relevant here¹¹ (**Figure 7**). The plan was presumably a draft prepared for decision (karname), representing the three provisional variants of the design of the bektashi türbe of Abdal ‘Ağa, Emir Seyyid, Receb, and Burçan (Bermekan) Dede in Çorum. The base of the building is a modular grid system based on the arşın as a unit: the dimension of the interior is 10x10 arşın, and the wall thickness is 1 arşın.

According to the surveys listed above, and the written and drawn sources from the 15–16th centuries, it can be assumed that the shrines in the territory of Hungary were constructed according to written commands using the previously referred to drawings. In the 16th century, a provincial architect¹² was working in Buda and consulted the imperial chief architect with the mediation of the *kadi*. At the same time, there is a written trace of a draft (*resxm*) for the commemoration of the beğlerbeyi of Buda to prepare a *resm* for the castle of Szigetvár to be sent to the court for approval.¹³

¹¹ Source: TKSM E.9495/11., published: ÜNSAL, 1963, 189-190.; ORGUN, 1938, 336., NECİPOĞLU, 2005, 169-171.; DÜNDAR, 2008.

¹² The work of the Buda Provincial Architect (Budun Mimari) reveals the document that was created in 1572, which is a draft of the conversion of the Virgin Mary Church into djami. NECİPOĞLU, 2005. 160.; BOA-KK 67 (5 M 980, 5.).

¹³ Source: Mühimme Defterleri, No: 23, 30., 58. Date: Year 981. Cemâziyelevvel 25. BOA, MD. 23, #58, (25. Ca. 981

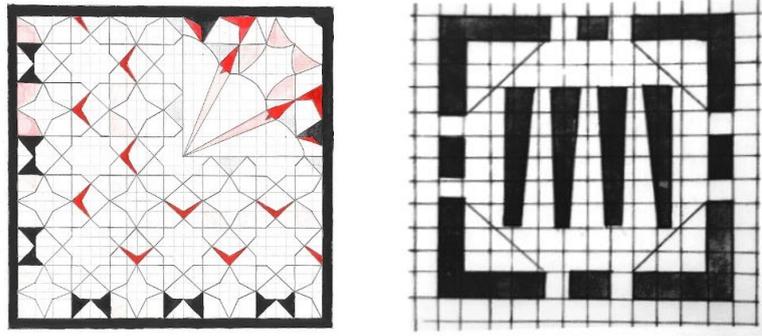


Figure 6 (left side): Repeat unit for a stellate *muqarnas* quarter vault, based on a composite orthogonal and radial grid system with patterns limited to 45, 90, and 135 degrees (Redrawn by Gergő Máté Kovács after (NECIPOĞLU, 1995, 272, 333.),

Figure 7 (right side): One drawing of the three plan versions of the türbe of Abdal ‘Aṭa, Emir Seyyid, Receb, and Burqan (Bermekan) Dede with the modular grid system. Source: TKSM E.9495/11., közli: (NECIPOĞLU, 1995, 6.).

Since the *arşın* unit was recorded in Ottoman written sources in the territory of Hungary (see Mustafa Pasha's *vakıfname*) and was visible in drawn documents (see Çorum, a drawing of the bektashi shrine for Abdal Ata, Emir Seyyid, Receb and Bermekan Dede, with the *arşın* module grid system), with Ottoman drawn documents also occasionally produced in the area of Hungary (see the command related to the Castle of Szigetvár), it can be assumed that the shrines were built according to central written or drawn commands, in which the characteristic dimensions (structure, interior space) were recorded; these would also have provided guidance for local masters. Thus, the use of *arşın* units in structural and spatial dimensions, which can be observed in the true to form surveys, can be correlated with written commands, drawing documents and architectural units used in the area of Ottoman-dominated Hungary. (Figure 8)

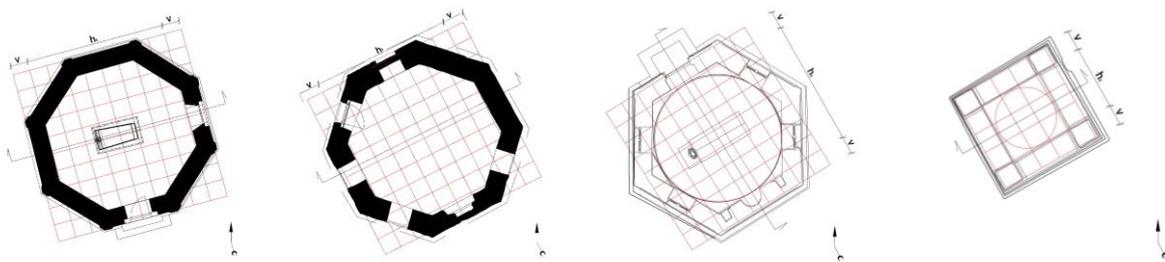


Figure 8. Proportions of the plan of Gül Baba’s shrine in Buda, Idris Baba’s shrine in Pécs, Damat Ali pasha’s shrine in Belgrade and the canopy shrine in Ilok, shown here in relation to the *arşın* modular system. The scales are: in the case of Gül Baba and Idris Baba’s shrine: 10x10; Damat Ali pasha’s shrine: 9x9; canopy shrine of Ilok: 5x5. The buildings face north. The surveys were prepared by Gergő Máté Kovács and Krisztina Fehér. Drawings: Gergő Máté Kovács, 2019.

Thesis 5: The aforementioned methodology, which establishes correspondence between the dimensions of the Ottoman memorial buildings, a 15–16th century method of documentation and a unit of measurement, can serve as an architectural contribution to identifying the remains of unexcavated shrines.

(Related publications: [10], [11], [17], [19])

Two of the 17¹⁴-18-22¹⁵ buildings built in the 16th and 17th centuries are still open to the public today (Gül Baba's Shrine in Buda and Idris Baba's Shrine in Pécs), and one is under excavation (the *makam* shrine of Sultan Suleiman in Turbék-Szólóhegy). However, the actual number of the former shrines has been an open question, together with several monuments awaiting identification and archaeological excavation. The shrines that can be currently visited also have some questions attached as, after the Ottoman occupation, major alterations occurred to each of them. Consequently, the identification, research and restoration of the shrines (*türbe*) in Hungary remains an important area in the history of architecture, archaeology and art history.

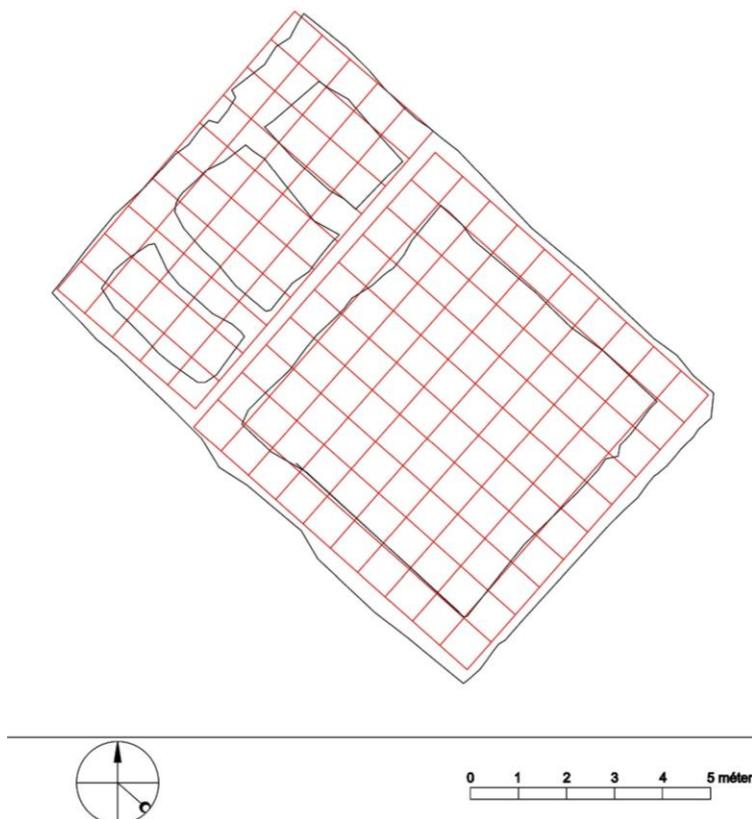


Figure 9: The contour of the base of the walls of the türbe (shrine) of Sultan Suleiman in Szigetvár-Turbék-Szólóhegy, with the red coloured module grid of arşın units. The drawing was made according to the excavation documentation of Erika Hancz and Béla Simon with the title of “Plan of the excavated building in Szigetvár-Turbék-Alsóhegy”. Source: **HANCZ, 2017. page 95., figure 4.**

¹⁴ AYVERDÍ, 2000, 84.

¹⁵ SUDÁR, 2013, 39., 70-91.

The methodology outlined in the previous theses, which establishes correspondence between the dimensions of the buildings, the documentation method of 15th–16th centuries, and unit of measurement, can be tested on the shrine of Suleyman Sultan. In recent years, the exact location of the shrine and its building complex (mosque, cloister-tekke and palisade-palanka) have been identified by an international and interdisciplinary research team,¹⁶ and at the same time, its basal walls have been excavated.¹⁷ The building, built on the former area of the sultan's tent and over the buried organs of the Emperor, was a square planned structure covered by a dome with a three-part porch roof (*son cemaat yer*). Its basic structural walls are brick and stone, with wooden beam lines. The contour drawn on the survey documentation of the excavated shrine is also coherent with the modular grid system of arşın units; therefore, the determining structural and spatial dimensions of the shrine can be expressed as multiple units of the historical measurement. (Figure 9)

Consequently, if this dimensional regularity can be detected on an excavated section of wall structure, it will serve as a contribution to determine its Ottoman origin. Dimensional correlations can be a contribution to the theoretical restitution for building reconstructions.

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¹⁶ PAP-FODOR, 2017

¹⁷ HANCZ, 2017.

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