

THE BIRTH OF AN AESTHETIC DISCOURSE IN OTTOMAN ARCHITECTURE ¹

Gülsüm NALBANTOĞLU

Received : 15.9.1988;

Keywords : Ottoman Architecture, Architectural Profession, Architectural Orders, Westernization

1. This article has been adapted from the Ph.D. dissertation (1988) titled *The Professionalization of the Ottoman Turkish Architects* submitted to the University of California, Berkeley.

2. For the state of the architectural profession in the west see the works of Briggs (1974, 1927); Etlinger (1977, 96-123); Wilkinson (1977, 124-160).

3. By all this, I do not at all mean to undermine the aesthetic quality of classical Ottoman architecture. As some contemporary works indicate, one can actually derive certain proportional rules and orders analyzing the plans and sections of Ottoman monuments (Haider, Yazar, 1986; Arpat, 1986; Söylemezoglu, 1986). Yet there is no evidence that such proportions had actually been theorized and codified on an aesthetic basis. The reasons for geometric regularities should be sought in the formal heritages of the Roman, Byzantine and Islamic architectural traditions, structural and constructional requirements and even the grid-based representation technique used in the royal office. For a recent study of Ottoman architectural representation techniques see the work of Neepoglu-Kafadar (1986).

The sixteenth century was a time of impressive architectural careers both in the Ottoman Empire and in the Western world. In the West, the Renaissance culminated in the works of masters like Michelangelo and Palladio. In the Ottoman Empire, Sinan, the most widely known Ottoman architect, built the royal monuments of a prosperous age.

It is obviously misleading to talk about the Renaissance as a homogenous entity since there were significant differences in the ways various cultures experienced the new artistic spirit. Italy set the standards. Beyond that, each culture offered a distinct articulation of Italian ideas with its own historical heritage. So far as the definition of the profession of architecture was concerned, however, Western Europe had reached a relative unity by the end of the century. The architect was established as an artist who conceptualized his field in terms of the Vitruvian trinity, *firmitas* (firmness), *utilitas* (commodity), and *venustas* (delight)². The patrons of architecture varied. In Italy they were wealthy merchant families and the papacy; in England, the court and the gentry; in France and Germany, the state. In all cases, these patrons recognized architecture as an art form and were ready to acknowledge the capabilities of the architect as a relatively autonomous artist.

In the Ottoman Empire, on the other hand, the architect was first and foremost a servant to the state. His functions ranged from surveying and administering the construction site to regulating building practice in urban centers. Visually, the firmness and grandeur of the built product was of primary importance for the courtly patrons of architecture. There was no distinction between the terms of art and craft in Ottoman terminology (Cezar, 1971, 431). Abstract aesthetic codes, which formed the basis of Western architectural thought since the Renaissance, were absent from the vocabulary of Ottoman architects³.

Within this context, the professional histories of the Ottoman and Western architects followed two distinct trajectories until the end of the eighteenth century. Until then, the Ottoman architect had no reason to accommodate the spirit of the Renaissance since a self-confident political patronage claimed superiority over the Western world in all respects. Throughout the nineteenth century, however, the Ottoman architect witnessed radical changes in the very definition of his profession. This was the period when Westernization was adopted as an administrative, economic and cultural policy by the ruling elite in the

4. This process has been a favorite topic of analysis for Ottoman historians. For classical studies see the works of Berkes (1964), Lewis (1961), Shaw and Shaw (1961), Gibb and Bowen (1950).

Empire⁴. The field of architecture could obviously not remain untouched. Within a century, the major streets of Istanbul were lined up with the architectural orders of the West. Detailed stylistic analyses of nineteenth century buildings have been made by Turkish architectural historians (Çelik, 1986, 126-155; Batur, 1985; Tuğlacı, 1981). Our concern here is less with style than with the conceptualization of architectural forms by a new generation of professionals. During the last decades of the nineteenth century, members of Ottoman artistic circles engaged in a conscious attempt to codify the aesthetics of Ottoman architecture along Western lines. This gave rise to the education of a new type of architect who identified himself first and foremost as an artist, internalizing an aesthetic discourse which his Western colleagues had long adopted as the basis of their profession.

ARCHITECTURAL KNOWLEDGE IN THE OTTOMAN EMPIRE DURING THE CLASSICAL PERIOD

There was no educational program specifically designed for the training of architects in the traditional structure of Ottoman society. No equivalent of the art academies of Europe existed nor were there any treatises codifying aesthetic principles for use as guides to professional practice. One's professional skills were recognized either through employment in the Office of Royal Architects (*Hassa Mimamları Ocağı*) or by a licence granted by the office. As a matter of fact, the organization itself worked as a school for practicing architects in many respects. But special skills, which I want to discuss below, had to be gained before entering the office.

One could enter the Office of Royal Architects either through military training or through the Palace School (*Enderun-u Hümayun*). Traditionally, non-muslim recruits, 8-20 years old, who were trained in a special School for Novices (*Acemi Oğlanları Ocağı*) participated in construction and shipbuilding as part of their training. Hence, by the time they became army members (*Yeniçeri*) they were equipped with the necessary skills to build military structures like bridges or fortifications. Sinan's (1490-1588) career was representative of this process. Before being recruited, Sinan had worked as a mason in Kayseri, a central Anatolian town. With that background he was obviously engaged in some building and repair work during his initial military training. As an army member he travelled to Rhodes, Belgrade, Mohacs, Germany, Corfu, Puglia and Moldavia. Sinan's extraordinary capacities as a builder in wartime came to the attention of Sultan Süleyman I, who appointed him as the Royal Chief Architect in 1538. It is worth noting here that many Western architects of the sixteenth century also owed their social status to their association with the noble art of warfare. The phenomenon was typical of the period when military conquest was symbolic of political power and architecture was not divorced from engineering.

A second way to become a royal architect within the Ottoman bureaucratic framework, was through the Palace School (*Enderun-u Hümayun*). The school commonly trained the recruits for administrative careers and palace services in a variety of subjects ranging from theology and astronomy to clockmaking and masonry (Terzioğlu, 1984). The background of Mehmet Tahir Ağa, one of Sinan's students, provides a good example of this course. As a recruited non-muslim, Mehmet Tahir Ağa was placed in the palace service (*Enderun*) as a page boy in 1569. His biographer tells us that he was first interested in music and received the appropriate training in the field (Gökyay, 1976, 123). His career plans changed, however, when he became interested in geometry and decided to learn "the crafts of mother-of-pearl inlaying and architecture" (Gökyay, 1976, 131). The chief of the atelier of mother-of-pearl workers had to test Mehmet Tahir Ağa's skills before accepting him as an apprentice. The test consisted of hitting a plank on a marked spot with an adze. Tahir Ağa was successful and was given training in the arts that he desired to master. He learned the initial principles of architecture from Sinan, who would occasionally visit

the atelier. The training took twenty years, during which he had the chance to work on different building sites. Tahir Ağa was appointed to work in a variety of administrative positions before he was offered the rank of chief architect in 1606.

As the lives of Sinan and Mehmet Tahir Ağa demonstrate, both military and administrative training provided the kind of knowledge that was required to practice architecture. Most of this training was practical, especially in the former case. Geometry seems to have been the only theoretical knowledge that was associated with architecture as well as with other crafts like mother-of-pearl inlaying. It is interesting to see that Mehmet Tahir Ağa was accepted for training in both architecture and mother-of-pearl inlaying once he showed interest in geometry. The roots of a geometrical education were well grounded in Ottoman society. Euclid's books were translated and read in palace circles from the fourteenth century on. The traditional schools (*medrese*) also included geometry in their educational programs. Architects, however, were not educated in these schools which were primarily dedicated to studies of a higher theoretical level like theology, law, and medicine. Practice on the construction site was imperative to become an architect. A contemporary Ottoman poem is indicative of the status given to geometrical knowledge (Ergin, 1977, 148-149):

Don't value geometry too much
 Don't fall into that circle of doubt
 Calling out the forms you see:
 Here is a spiral, here is a square, here is a pentagon

 Contrivance it is, who would object,
 But let the architect beware of it

Both to the students of the palace school and to the military, architectural training was secondary. It was necessary mainly because of the wide range of talent needed for the erection of royal buildings, which were proliferating in an age when Ottoman power was at its peak. Manual work and crafts skills were all that was required of the military or palace students. Only a small minority would later have the privilege to enter the Office of Royal Architects. This usually required a demonstration of outstanding manual skills to the Chief Architect or an administrative authority. Mehmet Tahir Ağa, for example, got his first promotion upon presenting a mother-of-pearl-inlaid lectern to the Sultan.

A student architect would commonly be appointed to a variety of jobs before attaining the rank of the royal architect. This was the case with Mehmet Tahir Ağa, Davud Ağa, and Dalgıç Ahmet Paşa, all royal architects of the late sixteenth century. Mehmet Tahir Ağa had worked as a doorkeeper (*kapucu*), chief of judges (*muhzirbaşı*), administrative officer (*müsellim*) and the superintendent of water conduits (*su nazırı*). Davud Ağa and Dalgıç Ahmet Paşa, too, had occupied the latter post before serving as royal architects. The process could even work in reverse order as in the case of Kasım Ağa who worked as the steward of the Sultan's mother (*valide kethüdası*) after having served as a royal architect (Eyice, 1979, 782-88).

Just as architecture was only one branch of knowledge among others to be taught in the palace school and during military training, the position of royal architect was one among a variety of possible occupations that a former student could be offered. The lack of any codified aesthetics, limited the breadth of architectural training to the construction site and an abstract knowledge of geometry. There was no specific theoretical discourse on architecture itself that could form the basis of a professional education. This is precisely the point that separates the Ottoman architect of the sixteenth century from his Italian, French or English contemporaries. A discourse based on the classical orders had been a direct product of the style-conscious and history-conscious architect of the West (Figure 1). The vocabulary of the Ottoman architect was not based on style but on the soundness of the built product. A late sixteenth century Ottoman description of architecture is telling (Meriç, 1965):

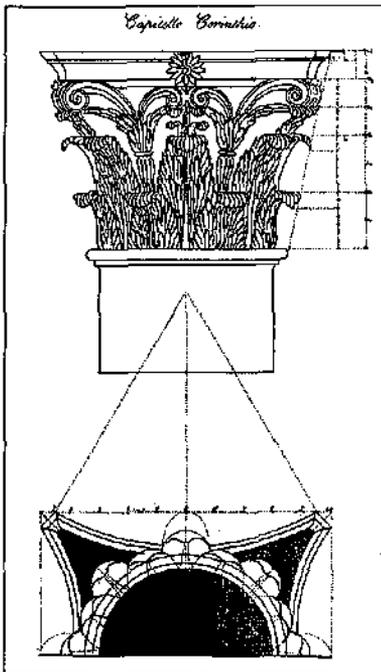


Figure 1. An example from Alberti's *Ten Books on Architecture* for a typical representation of the Corinthian order in the western tradition of architectural treatises (Alberti, 1485, plate XXVIII).

In the presence of no harder craft than architecture, whoever bears this difficult task is first to be good and devout; he should not start the foundations when the ground of the building is not firm and must pay thorough attention not to let anything interfere with the proper course of construction; he should let the building be firm and should build the dome and the semi-domes according to the quantity of the pillars, columns, and arches and tie the arches properly without showing negligence; he should not display haste in important matters and be patient - as goes the saying, successful is the one who remains patient - so that upon finishing the building he may find the spiritual guidance for eternal salvation.

It is clear that the Ottoman architect was not expected to be the *uomo universale* of the West. Not the design of the building but the construction process and the firmness of the built structure was of primary importance to him.

The Ottoman architects' identity did not undergo any significant changes from the mid-fifteenth to the late-eighteenth centuries. The first transformations in education came in the late eighteenth century, as part of the military reform movements. Cultural contacts of the Ottoman intelligentsia with France resulted in the adoption of the French educational system by Ottoman military schools. The first of these, the Royal School of Military Engineering (*Mühendishane-i Berri-i Hümayun*) which was founded in 1795, incorporated some structural courses to train military engineers in the building of roads and bridges⁵. After 1801, royal architects too were ordered to attend the classes offered to engineering students.

Hence, the rather arbitrary practice of the previous centuries, when no strict rule governed the training of the royal architects, was replaced by a rational process. In reality, none of the courses that the school offered were directly related to architectural practice. The institutionalization of architectural knowledge remained in the engineering realm until the end of the nineteenth century when the two professions began to be separated by distinct changes introduced to the very definition of the architectural field.

ARCHITECTURE AS ART

On April 2, 1873, a British newspaper published in Istanbul announced the opening of a picture gallery in the Ottoman capital, remarking that "the gradual but perceptible development of intellectual culture and artistic taste seems to be at last forcing the barriers raised by fanatical ignorance against the arts of printing and sculpture in Turkey" (*The Levant Herald*, April 2, 1873, 109). The exhibition in question was one of the first of its kind and marked an important beginning in the cultural history of Istanbul. At the time, there were very few Ottoman artists and sculptors. In the absence of any school for art education, talented students of the military school drawing classes were sent to Parisian academies to be trained as artists⁶. The first programs of art education in Istanbul were conducted in the private ateliers of foreign artists. These were advertised in foreign newspapers and were mostly located in Pera, the most Europeanized district of Istanbul⁷. They must have predominantly served the foreign and non-Muslim population.

It did not take long for the Ottoman administration to patronize the newly developing field of art. On September 29, 1877 the Council of State issued a report describing the backward state of artistic and architectural education in the Empire and announcing the foundation of an art school as a response⁸. The director and art instructor would be the renowned court artist Guillement. His assistant and an architecture instructor named Chinkiria would form the rest of the teaching staff⁹. The School's opening was announced in the Ottoman newspaper *Vakit* on October 23 of the same year. The notice stated that no discrimination would be made among the applicants on the basis of sex or religion. This was an invitation both to the Muslim population, the majority of whom were unacquainted with professional art, and to the non-Muslim groups

5. For extensive information on the history and program of the school see the works of Mehmed Esad (1896, 1312), Uluçay and Kartekin (1958).

6. For biographical notes on the first Ottoman artists see Halil Edhem (1970, 1924, 73-82).

7. In 19 August 1874, the following notice appeared in *Le Levant Herald*: "Atelier de sculpture - Grand Rue du Tchikour, Maison de M. Canzuck - Monsieur J. Cozzida, qui vient d'ouvrir un atelier de sculpture, de dessin et de decorations en tous genres, se recommande a tous les architectes."

8. The report is published by Cezar (1971, 493).

9. In the report which is translated from Ottoman script, the names are spelt as *Mösyö Giyme* and *Mösyö Ciegirya*. The spellings that I have used here come from Halil Edhem (1977, 1923, 37). The first names were not mentioned in any of these sources.

10. Montani, whose first name is unknown, was an architect of Italian origin who built the Aksaray Valide Mosque in Istanbul (Cezar, 1971, 130). No information was available to me about the other authors.

11. The ideas elaborated in the *Principles of Ottoman Architecture* were curiously paralleled by a simultaneous interpretation of Islamic architecture by the French orientalist circles. A recent research reveals the attempts of Viollet-le-Duc to adopt an intellectual approach in the study of Islamic architecture. (Çelik, 1986).

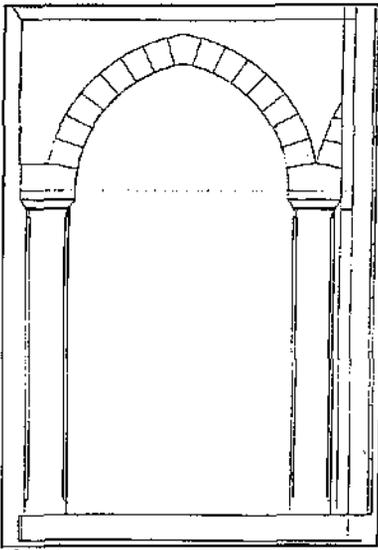


Figure 2. The conical order (*tarz-i mimari-i mahruzî*) (Ibrahim Edhem, 1873, plate II).

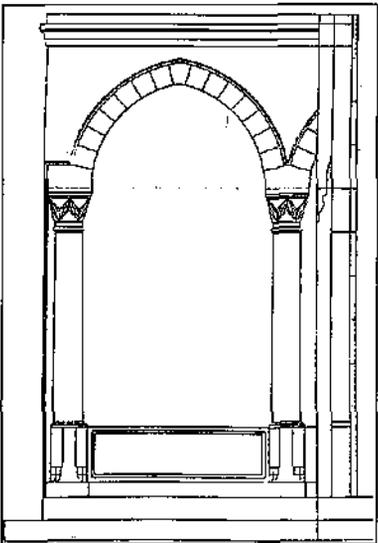


Figure 3. The diamond-form order (*tarz-i mimari-i müsteavi*) (Ibrahim Edhem, 1873, plate IV).

who were traditionally educated in their own semi-autonomous schools. No further documentation of the project exists. The school was either not opened at all or had a very short life span until the Russian War of 1877-78 (Cezar, 1971, 443). Even so, the program marked a significant turning point in the history of Ottoman architectural education. A common bond was established between art and architecture; at its basis lay the idea of aesthetic production. Curiously, however, architectural aesthetics was developed to a far more sophisticated level outside of the educational institutions. The major breakthrough came with the publication of a book for the 1873 World Exhibition held in Vienna.

The Principles of Ottoman Architecture (Usul-ü Mimari-i Osmani) is the title of the impressive volume consisting of 145 pages of text and 189 plates (Edhem, 1873). The book was the product of a collective effort including French and German versions of the Ottoman text. The editor was the Minister of Education, Ibrahim Edhem, Marie de Launay, Montani, Bogos Sasiyan and Maillard were the other contributors¹⁰. The opening paragraph stated the thesis: the surviving monuments of Ottoman architecture proved the existence of specific architectural principles that were peculiar to Ottoman culture. This marked a very important attempt to found a theoretical basis for architectural knowledge¹¹. For the first time, Ottoman architecture was to be codified along aesthetic principles. As Westerners had done, theory would be derived from history. Since there was no written history of Ottoman architecture as yet, the book had to undertake that task as well.

The first chapter of *The Principles of Ottoman Architecture* was a historical account from the foundation of the Empire to date. The names of principal monuments associated with each successive sultan and a few architects' names were given in chronological order. More important however, was the underlying theme of the rise and fall of an Ottoman identity inherent in architecture. The reader was not told what the components of this identity were, but received clues about what it was not. The architecture of the early fourteenth century, for example, was regarded as "structurally sound and monumental" but degraded in not being "based on any architectural principle" (Edhem, 1873, 10). The author was clearly looking for a quality that went beyond constructional perfection. Occasionally, he mentioned the Seljukid, Byzantine or Arabic characteristic of an early Ottoman building. The native identity was supposed to have reached its peak during the sixteenth century, when "a skillful architect under the name of Sinan appeared on the scene and achieved universal fame" (Edhem, 1873, 11). A period of decline followed this glorious era that lasted until the reign of Sultan Ahmed II (1691-1695), when French and Armenian architects, ignorant of the existence of an Ottoman character, produced eclectic buildings that were absolutely unacceptable. Only recently, according to the author, Ottoman architects began studying Western treatises to reestablish the principles of architecture. This last statement summarized the new architectural ideology of the Istanbul elite, which was perfectly in accord with the whole notion of modernization. The West would provide the correct and absolute principles upon which a native architectural culture would be built.

The following chapter, given the same title as the book itself, formed the core of the work. The author, Montani Efendi, began by summarizing the characteristics of the architecture of various nations as reflections of their cultural formations.

Similar to the lines of Hegelian art philosophy, Montani Efendi was trying to locate the *geist* of each culture in its architecture. Egyptian architecture, for example, revealed the theocratic idea; Indian monuments represented eternal illusions; Greek architecture demonstrated a fondness for principles; Roman buildings displayed magnificence and grandeur. A noble severity, on the other hand, constituted the principal characteristic of Ottoman architecture. The implied superiority to other cultures was remarkable here. Not only was the author trying to establish a legitimate existence for Ottoman architecture, but he was also attempting to attribute a superior quality to it. In the second part

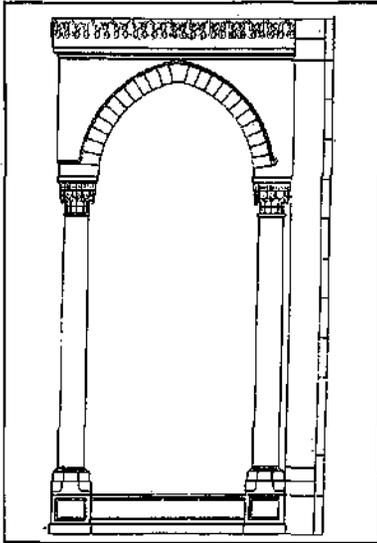


Figure 4. The crystalline order (*tarz-i mimari-i mücevheri*) (İbrahim Edhem, 1873, plate VI).

12. For most informative accounts of the foundation and the program of the school see the works of Cezar (1971 and 1983), Mimar Sedat (1922, 1338) and *Sanayi-i Nefise Mektebi Talimatname ve Ders Programları* (1911, 1327).

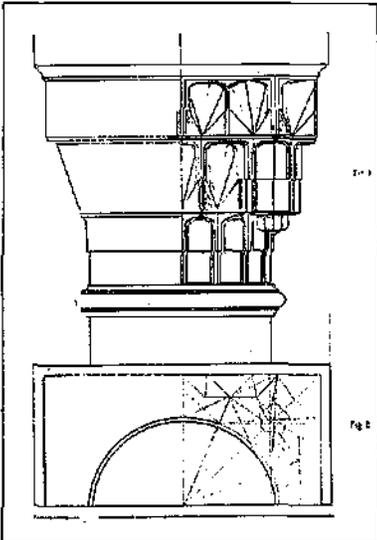


Figure 5. The analysis of the crystalline order (*tarz-i mimari-i mücevheri*) (İbrahim Edhem, 1873, plate III).

of the chapter he introduced the notion of architectural order, which he defined as the skillful arrangement of the parts of a building to form a geometrically comprehensible totality. The identity of that order could be established by reference to the column capitals.

Here we finally have the basic principles governing contemporary Western architectural theory: national character and architectural order. Based on these, Montani Efendi set out to reevaluate the Ottoman past. He traced a gradual progress towards the establishment of an Ottoman order and perfection of proportions which was supposed to culminate in the work of the renowned architect Sinan. There were, according to the author, three orders in Ottoman architecture: conical (*tarz-i mimari-i mahruti*), diamond-form (*tarz-i mimari-i müstevi*) and crystalline (*tarz-i mimari-i mücevheri*), identified by their capitals (Figures 2,3,4.). Montani Efendi made a careful analysis of the proportional relationships between the parts of the columns and their appropriate use within the building. His representation techniques were clearly based on the Western prototypes (Figures 1,5). He also elaborated on the use of arches and decorative elements, concluding that the principles of Ottoman architecture held a distinguished place among the architectures of all nations.

The rest of the book was devoted to monographs on selected Ottoman buildings, such as the Green Mosque in Bursa and the Süleymaniye Mosque in İstanbul, and a chapter on Ottoman ornamental details. The final part consisted of a long list of Sinan's works classified according to building type. The importance of *The Principles of Ottoman Architecture* was threefold. First, it marked the rise of a historical awareness of Ottoman as well as Western architectural aesthetics. Second, it attempted to codify the former to provide a universally recognizable identity for Ottoman architecture. Third, it announced the beginning of a nationalistic ideology that was to dominate architecture in the coming decades. In sum, the voluminous work of İbrahim Edhem and his co-authors, signalled the beginnings of an intellectual concern with architecture outside of the military schools and the traditional bureaucratic practice.

It is important to remember that only a small group of Westernized elite in İstanbul was leading this transformation. To give an example, a news item that appeared in a 1875 issue of *The Levant Herald* (December 22, 1875, 442) read:

A lecture on "Ottoman Architecture" was delivered at the town residence of Edhem Paşa on Friday last by Montani Efendi. A number of Turkish and Christian functionaries were present

Edhem Paşa and Montani Efendi apparently extended their interest in architectural theory beyond the book they prepared for the international exhibition. It was left to the son of the former, Osman Hamdi Bey, to integrate the new approach to architecture into an educational program through the foundation of the Royal School of Fine Arts (*Sanayi-i Nefise-i Şahane Mektebi*), in 1883¹².

The last three decades of the nineteenth century marked a total break from the traditional definition of architecture in the Ottoman Empire. Yet it would be too simplistic to characterize this break as pure 'Westernization'. From the beginning, tensions between Westernist and nationalist frameworks stirred the minds of Ottoman intellectuals. The awkward attempt of Montani Efendi to codify three orders of Ottoman architecture signalled only the beginning of a long search to establish a new yet native tradition in architecture. It also signalled the beginning of an ongoing attempt of a professional elite to monopolize architectural taste through the aesthetic codification of forms.

OSMANLI MİMARLIĞINDA ESTETİK SÖYLEMİN DOĞUŞU

ÖZET

15.9. 1988'de alındı;
Anahtar Sözcükler : Osmanlı Mimarisi, Mimarlık
Mesleği, Mimari Düzenler, Batılılaşma.

Batı dünyasında mimarın mesleki kimliğinin boyutları Rönesans döneminde belirlendi. Vitruvius'un *firmitas, utilitas, venustas* üçlüsünden hareketle, estetik alanda yetkinin iddiası meslek ideolojisinin önemli bir boyutunu oluşturdu. Onbeşinci yüzyıldan ondokuzuncu yüzyılın sonlarına kadar oluşan mimarlık yazınının hemen tümünde en az bir bölüm Dorik, İyonik, Korintiyen düzenlerin ve diğer mimari öğelerin geometrik orantılarının çözümlenmesine ayrıldı. Batılı mimarın sanatçı kimliği, akademilerin çoğaldığı, sanatsever işverenlerin eksik olmadığı bir dünyada görece bir özerklik, hatta otorite kazandı.

Osmanlı mimarının kimliği ise, onaltıncı yüzyıldan ondokuzuncu yüzyılın başlarına kadar devlet bürokrasisi içinde, Hassa Mimarları Ocağı'nın merkezi yapısında belirlendi. Gerek mimarlar, gerekse padişah ve devlet kademelerinin ileri gelenlerinden oluşan işverenler açısından, tasarlanan yapının sağlamlığı ve anıtsallığı öncelik taşıdı. Osmanlı mimarlık bilgisinde ondokuzuncu yüzyılın sonuna kadar estetik alanın özerkliği söz konusu olmadı. Mimarlık söylemi malzeme, boyut, teknik ve sağlamlık kavramları çerçevesinde kuruldu.

Bu gelenek, Osmanlı-Batı ilişkilerindeki denge değişiminin Batı dünyası lehine dönüştüğü yüzyıllarda bozulmaya başladı. Onsekizinci yüzyıldan sonra mimarlık ürünlerinde görülen biçimsel değişimler mimarlık tarihçilerimizce incelenip araştırılıyor. Bunların yanısıra bir de mimarlık mesleğinin, mimarın tanımının ve mesleğin hizmet alanının değişimleri sözkonusu. Estetik boyutun mimarlık söylemine girmesi de bu döneme rastlıyor. 1873 Viyana sergisi için Maarif Nazırı İbrahim Edhem Paşa'nın hazırlattığı *Usul-ü Mimari-i Osmani* adlı yapıt bu açıdan özellikle önemli. İlk kez Osmanlı mimarlığı tarihini konu eden kitap, klasik dönem anıtsal yapılarındaki biçimsel öğeleri de inceleme konusu yapıyor. Hatta Osmanlı sütun başlıklarını sınıflayarak Batı'nın mimarlık kuramına benzer bir temel oluşturmaya çalışıyor.

1883 yılında kurulan Sanayi-i Nefise Mektebi'nde kurumsallaşacak olan bu yeni yaklaşım birkaç açıdan önemli: bir tarih bilincinin oluşması, mimarlıkta ulusalcı bir bilincin ortaya çıkması, Osmanlı mimarlığının biçimsel çözümlemesi yoluyla ona Batı kültürü içinde bir yer açma çabası bunların başlıcaları. Mesleğin tarihinde bu temaları günümüze kadar izlemek mümkün. Ondokuzuncu yüzyılın sonundaki gelişmeler, özerk bir estetik alanın mimarın kimliğinde belirleyici olduğu yeni bir dönemin başlangıcını oluşturması açısından özgün bir önem taşıyor.

REFERENCES

- ALBERTI, L.B. (1485) *Ten Books on Architecture*, ed. J.Rykwert (1966), Transatlantic Arts, New York.
- ARPAT, A. (1986) Numerischer Symbolismus in der Sakralen Architektur der Osmanen, *Proceedings of the Second International Congress on the History of Turkish and Islamic Science and Technology* (2) 67-80, İTÜ, İstanbul.
- BATUR, A. (1985) Batılılaşma Döneminde Osmanlı Mimarlığı, *Tanzimattan Cumhuriyete Türkiye Ansiklopedisi*.
- BERKES, N. (1964) *Development of Secularism in Turkey*, McGill University Press, Montreal.
- BRIGGS, M.S. (1974, 1927) *The Architect in History*, Da Capo Press, New York.
- CEZAR, M. (1971) *Sanatta Batıya Açılış ve Osman Hamdi*, İş Bankası Yayınları, İstanbul.

- CEZAR, M. (1983) *G.S.A'den 100. Yılda Mimar Sinan Üniversitesine*, Mimar Sinan Üniversitesi Yayınları, İstanbul.
- ÇELİK, Z. (1986) *The Remaking of Istanbul*, University of Washington Press, Seattle.
- ÇELİK, Z. (1988) *Viollet-le-Duc and Oriental Architecture*, unpublished paper presented at the annual meeting of the Society of Architectural Historians, Chicago, April 13-17.
- EDHEM, İ. ed. (1873) *Usul-ü Mimari-i Osmani*, İstanbul.
- EDHEM, H. (1970) *Elvah-ı Naksiye Koleksiyonu*, Milliyet Yayınları, İstanbul.
- ERGİN, O.N. (1977,1943) *Türkiye Maarif Tarihi*, trans. H.Ünal Nalbantoğlu, Eser Yayınları, İstanbul.
- ESAD, M. (1896) *Mirat-ı Mühendishane*, Karabet Matbaası, İstanbul.
- ETTLINGER, L.D. (1977) The Emergence of the Italian Architect During the Fifteenth Century, *The Architect*, ed. S.Kostof, Oxford University Press, New York, 96-123.
- EYİCE, S. (1979) Mimar Kasım Hakkında, *Belleterin* (43) 782-788.
- GIBB, H., BOWEN, H. (1950) *Islamic Society and the West: A Study of the Impact of Western Civilization on Moslem Culture in the Near East*, Oxford University Press, London.
- GÖKYAY, O.Ş. (1976) Risale-i Mimariyye, Mimar Mehmet Ağa, Eserleri, *Ord. Prof.İsmail Hakkı Uzunçarşılı'ya Armağan*, Türk Tarih Kurumu, Ankara, 113-214.
- HAIDER, G., YAZAR, H. (1986) Implicit Intentions and Explicit Order in Sinan's Work, *Proceedings of the Second International Congress on the History of Turkish and Islamic Science and Technology* (2) 29-42, İTÜ, İstanbul.
- Le Levant Herald* (1874), August 19.
- LEWIS, B. (1961) *The Emergence of Modern Turkey*, Oxford University Press, New York.
- MERİÇ, R.M. trans. (1965) *Mimar Sinan, Hayatı ve Eserleri*, Mimar Sinan, Tuhfet-ül Mimariyye, Türk Tarih Kurumu, Ankara.
- MİMAR SEDAD (1922) Sanayi-i Nefise Mektebi, *İkdam*, June 5.
- NECİPOĞLU- KAFADAR, G. (1986) Plans and Models in Fifteenth and Sixteenth Century Ottoman Architectural Practice, *Journal of the Society of Architectural Historians* (45:3) 224-243.
- Sanayi-i Nefise Mektebi Talimatname ve Ders Notları* (1911, 1327) İstanbul.
- SHAW, S., SHAW, E.K. (1961) *History of the Ottoman Empire, Modern Turkey*, Cambridge University Press, Cambridge.
- SÖYLEMEZOĞLU, K. (1986) İstanbul Rüstem Paşa Camii, *Proceedings of the Second International Congress on the History of Turkish and Islamic Science and Technology* (2) 105-114, İTÜ, İstanbul.
- TERZİOĞLU, A. (1984) Saray-ı Hümayunda Teknik Eğitim, *Tarih ve Toplum* (35) 266-271.
- The Levant Herald* (1873), April 2.
- The Levant Herald* (1875), December 22.
- TUĞLACI, P. (1981) *Osmanlı Mimarlığında Batılılaşma Dönemi ve Balyan Ailesi*, İnkılap ve Aka, İstanbul.
- ULUÇAY, Ç., KARTEKİN, E. (1958) *Yüksek Mühendis Okulu*, İ.T.Ü. Yayınları, İstanbul.
- WILKINSON, C. (1977) The New Professionalism in the Renaissance, *The Architect*, ed. S.Kostof, Oxford University Press, New York, 124-160.