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Harmonious Relationships: Sounds and Stones in Ottoman Architecture in the Making

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Architectural narratives on building processes are admittedly rare in premodern histories. Accounts of visitors who observed and reacted to architecture in the making are even more exceptional. Moreover early modern audiences' perceptions of music and architecture have been rarely explored in relation to building processes and synesthetic experiences. This article presents a critical reading of Ca'fer Efendi' s *Risāle-i Mi'māriyye* [Book on Architecture] of 1614 by focusing on its chapter about the Sultan Ahmed mosque (1609–17) in Istanbul. Ca'fer associates sounds in the construction site with Sufi musical practices and the science of music. A conversation with a Sufi at the site reveals how twelve types of marbles, four types of strikes, and seven types of foremen were associated with Ottoman music theory. The article also explores how the shared geometrical foundations of architectural tools and musical instruments were linked to harmonious sounds and forms. This union of spatial, visual, and aural experiences of the mosque in the making produced various forms of knowledge for visitors. Architecture's mediating role for sensuous, spiritual, and scientific knowledge further illuminates the relationship between theory and practice in Ottoman architecture.

Introduction

Architectural narratives on building processes are rare in premodern histories. Accounts of visitors who observed and reacted to architecture in the making are even more exceptional. In 1614, when the Sultan Ahmed mosque (1609–17) in Istanbul was under construction, on a site facing the Hippodrome, the Ottoman scholar Caʿfer Efendi (d. after 1633) visited the building to converse with its chief architect, his friend Mehmed Agha (d. ca. 1622), and to seek subject matter for his *Risāle-i Miʿmāriyye* [Book on Architecture] (Caʿfer Efendi 2005: 12–13).[1] The only autograph manuscript of the *Risāle* consists of fifteen chapters, the contents of which are described in the table of contents at the front of the book, along with a list of the title of the poems. Following his visit,

Figure 1: Folios from *Risāle-i Miʿmāriyye*, showing the section on music and architecture in the sixth chapter on Sultan Ahmed Mosque, with the word 'Hū' written in red ink in the top line of the recto page. Caʿfer Efendi, *Risāle-i Miʿmāriyye*, 1614. TSMK, YY. MS 339, fols. 54v–55r. © Photo courtesy of Topkapı Palace Museum Library.

Caʿfer devoted the *Risāle*'s sixth chapter to the mosque. However, he does not describe architectural elements or formal features of the mosque as fixed objects in that chapter. Instead, he was captivated by the sounds arising from the colorful stones being shaped under the tools of the master stonemasons (**Figure 1**). A close critical reading of the chapter, in which Caʿfer conveys his experiences of sounds and stones while observing architectural processes, reveals the production of various forms of knowledge in situ that have not thus far been the subject of an in-depth study.[2] Caʿfer's *Risāle* is a unique primary source on architecture, not only in the Ottoman Empire but also in the Islamic world in general (Kale 2014; Kale 2019).

While scholars have pointed out the link between music and architecture in the *Risāle*'s sixth chapter, most studies have been fragmentary and do not take into consideration Caʿfer's intellectual upbringing, the broader context and content of his text, its intertextual references, and the various sources and traditions he relied on. This article presents a close and critical reading of the book's sections on sounds and stones to demonstrate that visitors to building sites contemplated and speculated on the link between cosmological and musical phenomena through their observations of architecture in the making. This investigation shows the ways in which knowledge was produced on site through lived experiences of architecture, revealing the analogy between seven planets, seven musical tunes, and seven colors, as well as twelve zodiac signs, twelve musical notes, and twelve types of marble. At a time when writings on architectural practice and knowledge were scarce, Caʿfer relied on Sufi musical practices, music theory, and cosmology to expound upon his multisensory experiences and to ground them within a speculative theoretical framework.

The relationship between music and architecture was an important theme in early modern art and architectural history. Rudolf Wittkower (1998) was the leading scholar to have developed the analogy between musical and architectural ratios in Renaissance architecture. Zeynep Nayır-Ahunbay, in her work on the Sultan Ahmed mosque, relies on Wittkower's ideas about the connection between Palladio's buildings and musical proportions and relates the colored columns of arcades in the mosque to Caʿfer's references to musical modes and colors (1975: 95–113). Scholars, such as Deborah Howard and Laura Moretti, study the formal and theoretical aspects of musical proportions and acoustics in design history (Howard and Moretti 2009; 2006; also see Boynton and Reilly 2015). Renewed interest in the multisensory and phenomenological experiences of architecture has led to inquiries about sound and space (Howard and Laura Moretti 2012; Brown 2012). Bissera Pentcheva's writings on the Hagia Sophia reintroduce phenomenological perceptions of historical spaces by focusing on sounds, materials, and rituals (2006; 2011; 2020). This relationship is explored in Islamic art and

architecture. Gülru Necipoğlu closely examines medieval musical writings to shed light on aesthetic perceptions in Islamic art (1995: 185–215; see also Shaw 2019: 57–103), while Nina Ergin expands the studies on soundscapes of buildings in the Islamic world (2008; 2013; 2014; see also Frishkopf and Spinetti 2018). However, how an early modern audience perceived the connection between music and architecture in the Islamic world through lived experience has been inadequately studied, mostly because few written sources directly mention this link. Moreover, the production of knowledge has not been explored through a close and contextual reading of a primary text on Islamic architecture such as Caʿfer's, which includes not only references to building processes and the multisensory experiences of a visitor but also his intellectual speculations. What can Caʿfer's manuscript tell us about the ways in which a visitor experienced a building site aurally, physically, and visually? How did people perceive the soundscape of architecture in the making? How did the sound of tools striking marble become a means of knowing?

I explore these questions through a critical reading of the *Risāle*'s sixth chapter alongside other sections, including the *Risāle*'s prologue to Creation, a music teacher's explanations on music theory in the first chapter, and musical instruments in the fourteenth chapter. Caʿfer's text derives from his embodied experiences, knowledge of well-established sciences, and poetic imagery. When interpreting Caʿfer's writings, then, I rely on theories, scientific perceptions, metaphors, and terms used by the Ottomans themselves in spiritual texts and intellectual sources rather than by applying contemporary theories. First, I demonstrate how Caʿfer associated sounds in the construction site with Sufi musical practices and the science of music. Second, I show how his conversation with a Sufi reveals the ways in which twelve types of marbles, four types of strikes, and seven types of foremen were linked to Ottoman music theory. In so doing, he shows how the union of visual and aural experiences of the building's marble stones enhanced the spiritual knowledge of a visitor. Finally, at the end of his book, Caʿfer's reference to geometrical knowledge embedded in architectural tools and musical instruments reveals how his experiences enabled him to reassess the mathematical source of harmonious sounds and forms, which simultaneously elevated the status of both architecture and music.

An Ottoman Scholar on the Construction Site

Caʿfer visited the construction site of the Sultan Ahmed mosque in 1614, when the structure had already risen to the level of its dome. But what led this scholar to visit a construction site? Caʿfer conveys that he was there not only to visit his friend Mehmed Agha but also to find topics for his *Risāle*, as will be discussed further. His personal

anecdotes throughout the book reveal how Mehmed Agha became his main benefactor after his arrival in Istanbul. Mehmed Agha respected both Caʿfer's literary skills and his learning, as evidenced by their friendship and debates on geometry (Kale 2020). Caʿfer had also long been interested in Sufism. His emphasis on the lineage of his father, Shaykh Behram, from the shaykhs and his father's widely circulated moral stories, along with his periods of seclusion for spiritual purification in a cell (*ḫalvet*), all reveal that he had firsthand experiences of Sufi practices (see Barnes 1992: 33–48). Caʿfer was familiar with various sciences, most of which were studied in the madrasas, such as lexicography, rhetoric, linguistics, and mathematics, as well as religious sciences, including prophetic sayings, exegesis, and Islamic jurisprudence (Shefer-Mossensohn 2015; El-Rouayheb 2015; Kale 2019). His educational background, social entourage, and scholarly duties became influential in his way of experiencing, thinking, and writing about architecture (Kale 2019; Kale 2020). Therefore, his book on architecture is not only the result of an awareness of the elevated status of the architect and architecture but also the culmination of a body of knowledge related to architecture throughout history and a scholar's ability to codify it at a most auspicious moment.

But equally influential for how he understood architecture's spiritual, social, and cultural roles were Caʿfer's lived experiences of architecture. The *Risāle* was the result of Caʿfer's engagement with the practical sphere, which introduced him to the social and ethical dimensions of the built environment. My findings on some key archival records demonstrate that by the time he completed his *Risāle* in 1614, he had already established himself as an eminent official. A seal on a court order from 1598, regarding the distribution of water, shows that Caʿfer ibn Behram (i.e., son of Behram) served for a few months as a *qadi* (judge) in Istanbul (TSMA, E. 7471/4). Another court record from 1605 verifies that, as an expert on religious law, he was appointed to investigate the repairs for a shop that belonged to a pious foundation in Galata (Kuran 2011: 5:286–88). In a 1622 court record, he emerges as a court scribe (Yılmaz 2019: 342–43). Hence, when he visited the construction site to deduce subjects relevant for his book on architecture, Caʿfer was already well equipped with a practical, theoretical, poetic, and ethical knowledge of architecture.

Music Revisited through Stones

When Caʿfer visited the mosque's construction site, the sounds coming from the building enchanted him. Caʿfer's writing on his captivation with music has perplexed scholars because, in the *Risāle*'s first chapter, he narrates how Mehmed Agha had denounced music after his initial musical training at the Topkapı Palace gardens in 1569. But why did Caʿfer reassess the connection between music and architecture in his subsequent

chapters? The narrative of events in the *Risāle*'s sixth chapter sheds light on an early modern scholar's motivation for reevaluating this complex relationship, which derived from recognizing the production of various forms of knowledge during the mosque's construction. Caʿfer speculates on architecture's broader links to diverse phenomena while narrating the unfolding of events on site. This unmediated relationship between body and language allows the exploration of the link between seeing, thinking, and making in architecture within a spatial and temporal context.

While watching the activities of the architect and the laborers, he impatiently waited for an opportunity to converse with Mehmed Agha. In the meantime, an *aziz* — a title often used for members of the Sufi orders and a respected expert in the science of music (*ʿilm-i mūsiki*) came to the construction site to observe the building and sat by Caʿfer (Caʿfer 2005: 70). During his conversation with the *aziz*, Caʿfer mentioned Mehmed Agha's early interest in playing musical instruments as a novice. He said, however, that Mehmed Agha had a dream of cacophonous sounds caused by instrument players, which was interpreted by shaykh Vişne Efendi, who suggested that he seek another art to learn and practice. As a result, Mehmed Agha left musical training and took up the arts of architecture and mother-of-pearl inlay. This story prompted the *aziz* to observe:

> Now he bears witness to the science of music with prayers and devotions. Do you not see how under the pickaxe [*külünk*] the marble [*mermer*] performs *zikr* with the noble sound 'Hū' ... Like the sound made by Sufis and dervishes [*sōfiler ve zākirler*] when attaining a state of rapture and ecstasy with the *semā*, such sounds also come from the marble which is being dressed. And the Aga is here like a shaykh, for he both orders the masters [*üstādlar*] incessantly, saying, 'Work!' and moreover, taking his rosary in his hand, is busy with devotions and prayers. (Caʿfer 1987: 68)[3]

Mehmed Agha was directing the masters with his cubit (*zirā*) in one hand and a rosary in the other (Caʿfer 2005: 69–70). In miniature paintings that show construction sites, royal architects are differentiated from builders by their elaborate coats and cubit rods with metal handles, poses of authority, and central placement in the composition (**Figure 2**) (Necipoğlu 2005: 75–76, 134–35). Visitors to the site — including the patrons who would watch the construction from their temporary kiosk, like the one represented in this painting — could thus easily recognize the chief architect by his distinctive cubit, kaftan, and turban. In Ottoman and European paintings, the cubit was often depicted as an architect's main tool (**Figure 3**) (Renda 1998: 153–78; Necipoğlu 2005: 75–76, 131–35, 157–69). It was the symbol of the architect's competency in geometry and thus his authority on site. Caʿfer's emphasis on both the cubit and the rosary is similar to

the correlation he established between mathematical and religious sciences (Kale 2019). The rosary confirms the piety and saintliness of the chief architect. Caʿfer's likening of the architect to a shaykh also recalls album prefaces that draw parallels between artists and saintly figures by underscoring the links between the quality of one's artwork, piousness, and morality (Roxburgh 2001: 113–15, 133–34, 153).

Figure 2: A royal architect with a cubit wearing an ornate kaftan and a turban during the repair of the fortifications in Kars depicted at the top of the right folio (verso). Gelibolulu Mustafa Âlî, *Nusretnâme*, Istanbul, 1582. British Library, Add. 22011, fols. 198v–199r. © Photo courtesy of the British Library Board.

The religio-political context of the time in which Caʿfer was writing his book also led him to reiterate the *aziz*'s remarks about Mehmed Agha's devotion and skill in the building of this imperial mosque. Sultan Ahmed I (r. 1603–17) was impatient for his mosque to be completed and visited the building site frequently, watching the construction closely from his elevated terrace (Sâfî 2003: 1: 124). In March 1614, his visit was accompanied by a celebration. This special visit also illuminates why Caʿfer narrated the chief architect's efforts in this specific year. The sultan's anxiety was related to ongoing opposition to his building plans from scholars, due to high expenditure,

Figure 3: An Armenian architect with an axe and a measuring rod. "Architecte armenien" from Jean-Baptiste Vanmour, *Recueil de cent estampes representant differentes nations du Levant*, 1714. The Miriam and Ira D. Wallach Division of Art, Prints and Photographs: Art & Architecture Collection, The New York Public Library. New York Public Library Digital Collections. Accessed March 12, 2022. https://digitalcollections.nypl.org/items/510d47d9-69c7-a3d9-e040-e00a18064a99.

although the mosque's construction was legitimized by the shaykh-al-Islam, the person at the top of the religious hierarchy (Necipoğlu 2005: 514–17). This might also explain why Caʿfer's narrative of the mosque, like the rest of his book, foregrounds the chief architect's virtues rather than those of the sultan. The *Risāle* emphasizes that whereas the architect was fortunate to work in a mosque filled with sounds that, as the

aziz states, are like prayers, Sultan Ahmed was also fortunate to have such a devout master architect building his mosque.

The account books of the mosque mention that the first bricks for the dome were purchased in June 1614, coinciding with Caʿfer's visits (Öten 2017: 230). The dome was not completed until 1616, when the keystone was placed and then secured with a marble pin. This step was followed by a dome-closing ceremony in 1617, when the dome was covered with sheets of lead and the final ornamentation was completed (Topçular Kâtibi 2003: 1: 648, 651–52; Rüstem 2016: 253–344). Public attention to ongoing practices and celebrations in an incomplete mosque space underscores that visitors were interested in watching the temporal unfolding of architectural processes, which they associated with ritualistic practices, as much as they were interested in spatial gatherings and ceremonies.

The location of the new mosque close to Istanbul's political, social, and economic centers around the Topkapı Palace and the Atmeydanı (Hippodrome) meant that it could be closely scrutinized by the patron and the court. It could also be easily visited by the curious public during urban wanderings and celebrations, as evidenced by Caʿfer's casual encounter with a bystander (**Figure 4**). Like the *aziz*, members of the public could observe the work of craftsmen and the chief architect and appreciate their efforts, which would otherwise remain unnoticed behind the powerful image of the sultan as the main patron. The *aziz* likened Mehmed Agha to a shaykh because he was directing the craftsmen in the same way that a spiritual master guides disciples during a Sufi ceremony. The construction site thus turned into a performative space where all practitioners participated in the building according to their designated roles. The bodily act of architectural making manifested an invisible order, as the architect's exertions mimicked cosmic harmony on earth, which in turn rendered architecture as a microcosm of the universe.

By referring to both *semā* (devotional rituals) and the physical movements of the builders in the same narrative, Caʿfer indicates that visitors perceived buildings as a mimesis of human ritual and performance, revealing architecture's reliance on the bond between body and place. Visitors recognized the inherent relationship between space, gesture, sound, and motion in the construction work they observed. The striking of pickaxes on marble produced sounds like 'Hū', which symbolized the name and third-person pronoun of God (Caʿfer 2005: 110). Members of the Sufi religious orders chanted God's attributes in rhythm (*zikr*) when they became intoxicated during *semā*, which consisted of whirling movements and music (Feldman 1996: 91; Feldman 1993: 8; Behar 2006: 391–407). Stonemasons and architects with their pickaxes are depicted in Ottoman miniature paintings and European costume albums (Necipoğlu 2005: 158,

Figure 4: William Hogarth, 'Procession through the Hippodrome, Constantinople'. Aubry de La Mottraye, *Travels throughout Europe, Asia and into Part of Africa* ... (London: 1724-, 1: pl. 15). The Metropolitan Museum of Art, Drawings and Prints Digital Collection. Accessed March 22, 2022. https://www.metmuseum.org/art/collection/search/375803

161–62). The pickaxe, listed in the *Risāle*'s trilingual dictionary of artisanal tools, had a sharp end to strike the stone and a flat end to hammer or to drive wedges (Caʿfer 2005: 110; also see 'Miṇḳār', in Bearman et al. 2012). Caʿfer could also be observing the craftsmen, either on the site or in nearby workshops, while trimming slabs of limestone, sandstone, and marble, before placing them in their locations in the building. The miniature painting on the construction of the Ares Castle, showing people and the things they work with, helps us imagine how echoes coming from the tools mixed with the sounds of masons humming in the course of their intense manual labor (**Figure 5**) (on marble workers of the Süleymaniye Mosque, see Sinan and Sai 2006: 125; Necipoğlu 2005: 181). The sound produced by their rhythmic movements and humming would have been similar to that of chanting. The reactions of the spectator to architecture were triggered through the recollection of these shared bodily experiences that became the locus of memory.

Sufis in the Mevlevi order (founded after the teachings of the 13th-century mystic and poet Mawlana Jalal al-Din Rumi, d. 1273) used music, chanting, and whirling to achieve

Figure 5: Construction site of the Ares Castle, showing master masons striking stones with pickaxes. Gelibolulu Mustafa Âlî, *Nusretnâme*, TSMK, H. 1365, fol. 113r. © Photo courtesy of Topkapı Palace Museum Library.

a transcendental state (Tanman 1994: 177–83; Tanman 1998: 181–216; Lifchez 1992; Hammarlund, Olsson, and Özdalga 2005). In Ottoman and European paintings, they were shown whirling in ecstasy under the dome of their lodge (**Figure 6**) (Çağman and Tanındı 2005: 501–27; Elias 2017: 185–209). Any visitor who was familiar with this popular imagery and who saw the workers against the backdrop of the dome being built would have recalled these swirling movements. The illustration of the Ares Castle construction site shows a scaffolding against walls and poles connected by a course of red fabric that indicates the forms to be built. During Caʿfer's visit, the mosque site was

already surrounded by scaffolding (*iskeleler*) and moldings (*karaçavlar*), payments for which were mentioned in account books between 1611 and 1613 (Topçular 2003: 1: 629; Öten 2017: 587, 594, 431). Caʿfer could imagine the hemispherical form of the dome, while viewing the circular opening of the drum surrounded by scaffoldings and workers (**Figure 7**). The movements of the builders under this circular opening must have evoked the ritualistic potential of a domed central space during religious ceremonies. These aural and visual stimuli are likely to have prompted visitors to form an analogy between Sufi rituals and the experience of a workspace. Hence, for visitors, these performative actions on the construction turned it into a space of knowledge production.

Figure 6: Whirling dervishes and musicians playing *ney* and *def* at the Mevlevi dervish lodge. Ignatius Mouradgea d'Ohsson, *Tableau général de l'Empire othoman, divisé en deux parties, dont l'une comprend la législation mahométane; l'autre, l'histoire de l'Empire othoman* [1787] (Paris: [Firmin Didot], 1820), 2: pl. 133. © Library of Congress, Rare Book and Special Collections Division. http://hdl.loc.gov/loc.rbc/Pre1801.07776v2.1

Nevertheless, how did Caʿfer expect people to perceive these invisible, spiritual connections? The *aziz* said that because the chief architect had been infatuated with the science of music, he was able to 'contemplate [*müşahede*] the science of music in its entirety in the building of this noble mosque' (Caʿfer 2005: 70; see also Caʿfer 1987: 68). Sufis used the word *müşahede* to imply that they could comprehend realities

Figure 7: Main arches, pendentives, and drum windows under the dome of the Sultan Ahmed Mosque, 1617, Istanbul. Photograph by the author, February 11, 2013.

beyond appearances through the medium of the heart. For Taşköprüzade (d. 1516), two faculties led to acquiring a higher form of knowledge: the intellect and the unveiling or opening of the heart, called 'contemplation' (Taşköprüzāde 1966: 1:89). Likewise, the *aziz* implied that the rhythmic sounds coming from the building purified his heart to receive spiritual knowledge, just as it would be receptive to the ecstasy caused by a *semā* ritual.

The religious role of music originated from earlier thinkers, such as the philosopher al-Ghazali (d. 1111), who divided music into two groups, based on its impact on people, and noted its potential to reveal a higher form of knowledge (Farmer 1925: 91). People can hear some types of music simply as external sounds, at a physical level. Yet other types of music can, on a spiritual level, reveal hidden meanings though its impact. This popular twofold aspect of music for contemplating a higher truth became one of the main criteria, for Ottomans like the *aziz* and for Caʿfer, by which to assess music's significance. The Ottomans legitimized musical practice by linking sounds to the music of the celestial spheres. Taşköprüzade claimed that whereas there was no air to carry sounds in the superlunary world, love — desiring to unite with pure intellect — was the cause of the movements and sounds of the spheres (Taşköprüzāde 1966: 1:304).

This cosmic music did not have a physical presence, so people could only hear it on a metaphysical level. Rhythmic sounds creating harmony on earth could recall this celestial music and evoke a similar desire in the heart to unite with the world of the intellect. Ankaravi (d. 1631), shaykh of the Galata Mevlevi Dervish Lodge (Mevlevihāne), claimed that rhythmic sounds in a *semā* moved the heart (Ankaravî 2009: 94–155). Horizontal motions of whirling were believed to create a vertical ascent toward the divine, because Sufis believed that approaching God was a circular journey (Ambrosio 2012: 189–90). The analogy between the whirling and chanting of Sufis under the domed ceiling of a lodge and the motions and sounds of celestial entities originated from this popular imagery. The *aziz* used the term 'contemplation' to show that, just like the Sufis who relied on the medium of the heart to acquire a hidden form of knowledge, he could also hear the music of the spheres. Like the *aziz*, Caʿfer recognized the spiritual role of music, a fact made clear in the first chapter of the *Risāle*, where he praises music's deeper impact on the soul. In a couplet written to commemorate Mehmed Agha's first musical experience, he writes:

> Though in appearance just a sound and echo [*sadā*]
> Yet for the heartbroken dervish it is a rare pleasure [*safā*].
> (Caʿfer 2005: 13)[4]

Here Caʿfer likens Mehmed Agha to a heartbroken dervish in search of his beloved. But to show those moving qualities of music, he goes on to relate how his heart was healed after hearing pleasurable sounds, which simultaneously became a bridge for union with the divine (Andrews 2005: 296–99). The Sufi terminology embedded in this couplet reveals the link between music, pleasure, and purification. A simple echo on a surface is contrasted with uplifting sounds, which purify the heart from worldly apprehensions. This comparison relies on a well-known trope that Ottoman poets used to criticize ascetics because they could not apprehend meaning beyond either words or sounds (Andrews, Black, and Kalpaklı 1997: 33). Sufis believed that ephemeral music could evoke the sounds of the heavenly spheres and divine love. The terminology Caʿfer, and the *aziz*, uses demonstrates the influence of popular Sufi ideas on their musical perception. This context is noteworthy because the reception of Sufi rituals and ideas have not been consistent throughout history in Islamic communities. The *aziz* Caʿfer spoke with could have been a member of the Mevlevi order known for its *semā* rituals (Schimmel 2005: 8–17; Feldman 2004: 42–57; Binbaş 2004: 58–71; Feldman 1996: 28–29). Ankaravi defended listening to music, whirling, and playing instruments, such as a frame drum (*def*), in lodges such as the first Mevlevihāne in Konya (Ankaravî 2009: 94–155; Ambrosio 2012: 183–97). Caʿfer probably had friends among this order's

members and would have visited their lodge. The central octagonal space and wooden ceiling of the Mevlevi Dervish Lodge, which was famous for its *semā* rituals in Galata — where Caʿfer acted as a judicial officer circa 1605 — had just been renovated in 1608 (**Figure 8**) (Ayvansarayī 2000: 268–73; Tanman 1996: 317–21; Işın and Tanman 1994: 362–67; Kerametli 1977). Moreover, the ruling elite and scholars increased their support of musical performances in Sufi lodges in the late 16th and early 17th centuries (Feldman 1993: 11). Chanting, singing hymns, and melodic recitation of the Qurʾan in mosques — though performed without instruments — were favorably received in this socio-cultural milieu.

Figure 8: The Semāhāne, with its octagonal dome, at the Galata Mevlevihānesi in Pera, Istanbul. Photograph by the author, May 30, 2019.

Caʿfer's reevaluation of music in his sixth chapter counterbalances his earlier critical assessment of music in his first chapter. This shift within the span of his book shows the temporal and spatial dimensions and narrative-based nature of his writings, influenced by ongoing events and encounters in his life. Caʿfer's experiences of various urban spheres, such as Sufi lodges, embodied memory, and communal imagery contributed to his evaluation of architecture in a state of becoming. He was able to recognize how musical performances enacted in space could produce spiritual knowledge. Hearing the rhythmic sounds generated by architecture in the making while conversing with a Sufi transformed how Caʿfer apprehended music's significance within the context of the space of a mosque. The positive attitude toward music by various groups in this period must have encouraged him to include this section in his chapter on the mosque. Whereas purists' opposition to *zikr* and *semā* rituals were more apparent when Mehmed Agha first encountered music around 1569, chanting and whirling in dervish lodges became more common in the early 17th century (Çavuşoğlu 1990: 187–213; Zilfi 1986: 251–69).

Mahmud Hüdai (d. 1628), one of the leading composers of music in the Halveti Sufi order, saw music as a means for spiritual purification and pleasure, and claimed that chanting evoked the divine (Hüdayi 2003: 131–52; Feldman 1996: 99–102; Behar 2006: 400). Hüdai attended the *mevlūd* ceremony (celebration of Muhammad's birth) in 1610, and another *mevlūd* took place in 1614 while the Sultan Ahmed mosque was still under construction (Sâfî 2003: 104–09; Topçular 2003: 629; Barkan 1972: 2:288). Celebrations in the spring included singing hymns (*ilahi*) and chanting *mevlūd* poems in the mosque (**Figure 9**). Although Caʿfer does not mention these events directly, his light metaphor in his eulogy for Muhammad and allusions to hymns in his 'Spring Poem' suggest that he participated in them. Celebrations and rhythmic chanting in the unfinished mosque space must have triggered his poetic imagination and inspired his rhymes (Caʿfer 2005: 6–7, 77; Kale 2014). The recitation of poems during celebrations and building ceremonies contributed to the production of rhythmic sounds in space. Caʿfer's embodied experiences and memory of various sounds in sacred places influenced how he perceived music's spiritual role. Conversely, these aural experiences had an impact on his understanding of architecture's role in producing a feeling of harmony through sounds. Another Sufi master, Sivasi Efendi, likened the whirling dervishes to angels revolving around the Kaʿba's heavenly prototype (Çavuşoğlu 1990: 198–200, 211–12). He maintained that spiritual light would appear in the Sufi's heart during *semā* and *zikr* rituals. Sivasi was present at the foundation ceremony of the mosque in 1609 and began preaching there on Fridays immediately after its completion in 1617 (Topçular 2003: 1: 562, 654). Assigning these roles at the mosque to people who had favorable opinions of

music strongly suggests that music was considered a positive factor by the time Caʿfer was writing his book and eventually influenced his perception of it.

Figure 9: The *mevlūd* ceremony at the Sultan Ahmed Mosque in the 18th century. Ignatius Mouradgea d'Ohsson, *Tableau général de l'Empire othoman, divisé en deux parties, dont l'une comprend la législation mahométane; l'autre, l'histoire de l'Empire othoman* [1787] (Paris: [Firmin Didot], 1820), 1: pl. 25. © Library of Congress, Rare Book and Special Collections Division. http://hdl.loc.gov/loc.rbc/Pre1801.07776v1.1

Although Caʿfer had been hesitant about the legitimacy of music as an art form due to Mehmed Agha's dream, he rediscovered music's power to elevate the mind toward a higher form of knowledge. Likewise, Mehmed Agha, being closely associated with famous sufi masters in favor of music, such as Hüdai, may also have reassessed his view regarding its legitimacy. The source of their dilemma was whether music could serve as a vehicle for spiritual knowledge mimicking cosmic harmony or whether it was mere entertainment. The architecture of the mosque attained a higher epistemological role by enabling visitors to contemplate cosmic music through sounds coming from it. The fact that the established science of music was embedded in the mosque also elevated architecture's ontological status. Aside from such spiritual concerns, however, Caʿfer also had practical concerns: the soundscape of a mosque was important during

rituals. During preaching, chanting, and singing hymns, echoes emanating from the sound of tools striking marble surfaces could anticipate how people would actually hear sounds in the completed mosque. The marble coverings of the main piers had been completed in 1612, accompanied by celebrations on the construction site (Öten 2017: 108). Experiments and discussions regarding the placement of acoustic vases inside the domes were probably ongoing at the time (Kayılı 1989: 273–86; Kayılı 1988: 1: 545–55; also see Ergin 2008). The *mevlūd* ceremony in 1614 would have been an opportunity to test how sounds resonated on surfaces when they were covered with marble veneer and reverberating tile. These spiritual and ritualistic dimensions of music in architecture motivated Caʿfer to include a lengthy account of the link between rhythmic sounds and performances on site, which became the source of knowledge production for visitors.

Musical Knowledge Embedded in Architecture

Caʿfer considered his conversation with a Sufi musician noteworthy not only in a milieu supportive of its practice but also during a theoretically productive period. The *aziz*'s subsequent comments show that he was aware of contemporary theories on music, which formed an intellectual basis for architecture (Feldman 1996: 28–29; Feldman 2015: 87–138; Doğrusöz 1998: 109–16; Wright 1996: 455–69; Feldman 1993; Feldman 1990). The *aziz* stated,

> When looking at this noble building I have contemplated [*müşahede*] twelve types of marbles. From each marble a different sound [*sadā*] and a different type of melodic mode [*makām*] is produced. In the same manner, I have contemplated twelve modes from the sounds of the twelve marbles. And some of the craftsmen [*üstādlar*] wield their picks very gently. Their pitch is like *yegāh*. And some wield them harder than this. Their pitch is like *dügāh*. And some wield them harder than this. Their pitch is like *segāh*. And some wield their picks very forcefully. Their pitch is like *çārgāh*. And I have observed in this the four derivative modes [*şū'be*]. (Caʿfer 1987: 68–69 (modified); Caʿfer 2005: 70–71)

The *aziz* claimed that he contemplated twelve types of marble, which produced different sounds and melodic modes when the stonemasons struck them (Caʿfer 2005: 70–71). In the *Risāle*'s first chapter, Caʿfer conveys an account on Pythagoras's discovery of the science of music from the rhythmic sounds caused by waves crashing against the shore (Caʿfer 2005: 16). In another story, the poet Rumi mentions that he began dancing in ecstasy after hearing the rhythmic sounds coming from the metals worked by blacksmiths in the market (**Figure 10**) (Aflaki-i ʿArifi 1976). These two accounts

are similar in their underlying message: rhythmic striking of hard surfaces mimicked cosmic music and moved the soul. Just as blacksmiths' hammering produced sounds causing Rumi to start whirling, so too did the striking of marble create cosmic music. Caʿfer's account narrates the reactions of spectators to the rhythmic sounds produced through the materiality of architecture. They discovered the science of music embedded in the physical world through bodily participation as much as through contemplation.

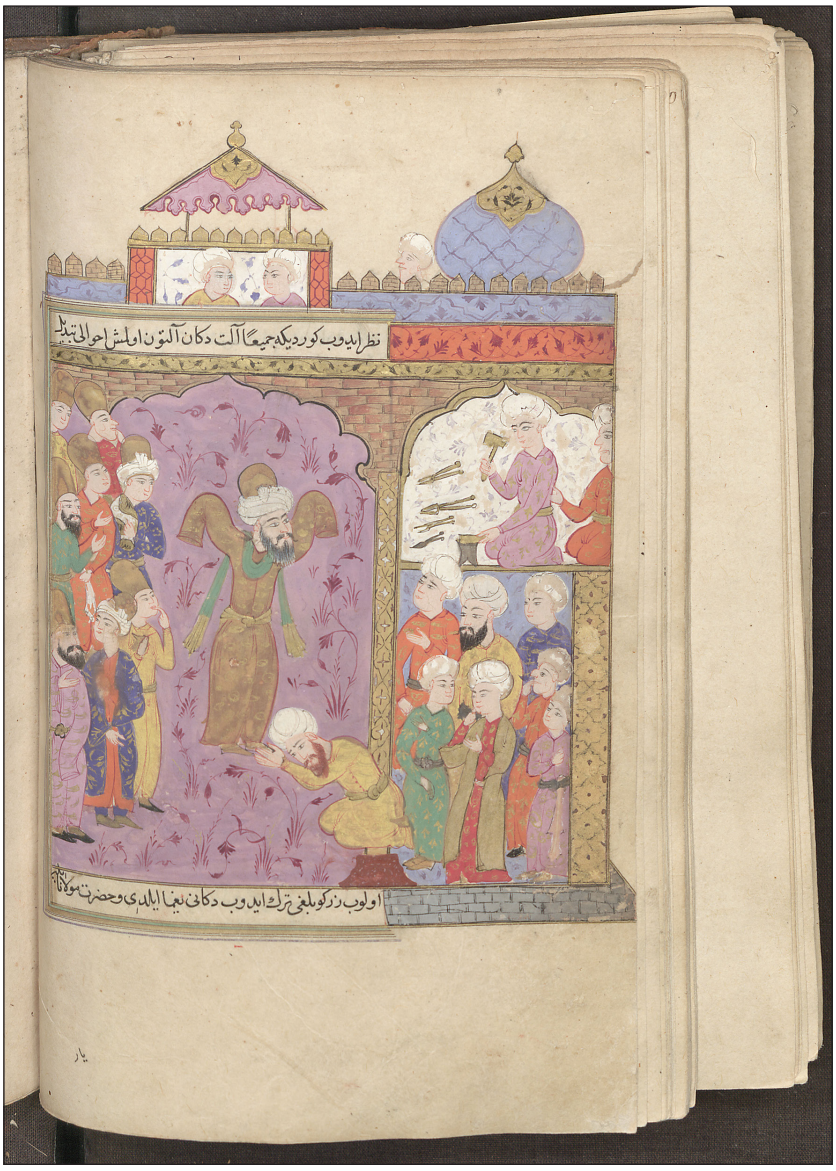

Figure 10: Rumi dancing to the sounds produced by metalworkers. Shams al-din Ahmadi Aflaki-i ʿArifin, *Tercüme-i Sevâkıbü'l-Mevâkıb*, TSMK, Revan Köşkü, nr. 497, fol. 219v. © Photo courtesy of Topkapı Palace Museum Library.

In his first chapter, Caʿfer writes that the four elements, fire, air, water, and earth, correspond to the four derivative modes in music theory (Caʿfer 2005: 15). In al-Kindi's theory of music, which Caʿfer may have been familiar with, the four elements, associated with four humors, are also associated with the four strings of the lute that produced different sounds, ranging from heavy to light (Farmer 1925: 98–105). Such a theory underlay the association of the sounds generated by different degrees of craftsmen's strikes with derivative modes, ranging from *yegāh* (first place) to *çārgāh* (fourth place). Within the context of the *Risāle*, strikes could also relate to the four elements: the 'fourth place', eliciting the strongest strike, was analogous to the firmest element, earth, whereas the 'first place' arose from the gentlest strike, which was likened to fire, the most mobile element. This underlying association implies that a visitor did not ascribe different sounds to the hardness or softness of stones. Rather, stonemasons produced these sounds according to the intensity of their motions while using tools. The application by builders of diverse techniques and strengths recalls the different ways in which musicians played their instruments. Caʿfer does not mention the types of tools they used, yet his remark on diverse shapes of musical instruments and the list of artisanal tools in his dictionary indicates that he could recognize their distinctive formal and functional features that caused various rhythmic modes. The accounts dated 1614 list stonemasons according to the marble elements they fashioned, which ranged from small piers to arches (Öten 2017: 111–14). Caʿfer would have encountered these diverse manners of architectural making, each of which required a special technique resulting in a unique sound.

When masters struck the stones zealously in repetitive movements, by occasionally changing their intensity, they entered an uplifting state. The relationship between body, memory, and motion was well recognized among Ottoman scholars. Katib Çelebi (d. 1657) states that back-and-forth bodily movements of students while memorizing lessons helped them find balance and strengthen their ability to think (Çelebi 2008: 32–33). This rocking motion resembled the Sufis' movements during chanting that reinforced their spiritual powers. While this transcendental state gave mental and physical strength, bodily movements stimulated corporeal memory and cognitive functions. Likewise, while the movements — and accompanying humming — of stonemasons evoked their bodily memory and reinforced their cognitive abilities, the humming and movement also gave them strength to complete the difficult tasks involved in the construction of a monumental building.

These ecstatic motions produced not only rhythmic sounds but also proportional forms derived from the working of the builders in harmony. The *aziz* continued his observations:

> And when contemplating the noble mosque, I encountered seven foremen [*mute'med*]. And they would ceaselessly walk around the building and enjoin the craftsmen, saying, each in a different sort of tone and sound, 'Work you!' And I contemplated in their voices the seven tunes [*āvāze*]. (Caʿfer 1987: 68–69; Caʿfer 2005: 70–71)

Visitors would be able to detect these foremen in the construction site because they sported elaborate coats and superior attitudes, often depicted, in miniature paintings, giving instructions to the masons. But the *aziz* initially claimed that he noticed these seven foremen because each was using a different tone that produced seven tunes (Caʿfer 2005: 70–71). In the *Risāle*'s first chapter, Caʿfer says that Mehmed Agha's music teacher told him that, in music theory, seven tunes corresponded to seven planets (Caʿfer 2005: 15–16). Al-Ladhiqi (d. 1495) related musical modes to planets to numbers, based on well-known Neoplatonic and Pythagorean music theories (Pacholczyk 1996: 145–50). Islamic scholars also associated seven planets with seven kinds of humans due to differing characteristics (Farmer 1925: 113). This popular imagery implies that visitors would perceive an analogy between the different voices (or seven tunes) of foremen and their diverse characters. The link between the types of planets, humors, and musical tunes was familiar to the general public, who knew and most likely had some experience of music therapy to balance disturbed humors in people (Shefer-Mossensohn 2011: 69–77; Shiloah 2017: 69–83). Caʿfer presumably knew that the building complex would include a hospital, a bathhouse, and a hospice (Nayır-Ahunbay 1975: 85–86). In his endowment deed dated 1612, Ahmed I had already defined how physicians should know about humors and be kind-hearted toward patients in addition to being insightful, as well as knowledgeable about preparing prescriptions (Nayır-Ahunbay 1975: 86). Considering such precautions and Mehmed Agha's knowledge of music, it is likely that the use of musical therapy in the hospital to treat patients was also a part of ongoing conversations, which also informed Caʿfer's perception on site.

On a theoretical level, numbers had further implications: seven songs, seven planets, and seven voices related to Pythagorean cosmology and numerology, as expressed in Ikhwān al-Ṣafā's Neoplatonic writings of the 10th century (*Brethren of Purity*) on the fourfold division of the cosmos (2010; see also Wright 2008: 15–18; Necipoğlu 1995: 116–20, 186–89, 209). Numbers established a rhythmic bond between planets and other natural phenomena that revealed the harmony of the cosmos. The *aziz* relied on this number theory for his subsequent speculations:

> And these twelve types of marble must first be identified. Then they must be polished [*perdāh*]. In each of them there is a different sort of tone and sound. And I contemplated the twenty-four compositions [*terkib*] in them. Thus, all the modes that I

> have expressed impart the form [*şekl*] of the science of music. (Caʿfer 1987: 68–69; Caʿfer 2005: 70–71)

According to the *aziz*, when craftsmen sorted and polished these twelve types of marble, they produced different tunes (Caʿfer 2005: 70–71). The link between twelve musical tones and twelve zodiac signs in music theory further suggests that visitors could associate twelve marble types with these zodiac signs (Caʿfer 2005: 15–16). Additionally, they could identify 24 compositions (*terkib*) based on different ways the marble had been polished, which evoked the 24 hours in a day (Caʿfer 2005: 16). A composition meant playing a complete musical mode in a clockwise motion, recalling the passing hours. Safiyuddin (d. 1294) described the cyclical and repetitive features of rhythmic musical modes in his book on music theory (*Kitāb al-adwār*) and associated them with cosmological entities in Zodiac charts (Wright 2004: 366–67; Karamustafa 1992: 71–89). It was through such analogies between various natural phenomena and cosmic imagery that visitors perceived the embodiment (*şekl*) of the science of music in the building.[5]

Yet Caʿfer does not rely on only intellectual speculations; he was aware that architecture was primarily a spatial and temporal art. His writings derive from his embodied knowledge of the ongoing building activities on site. The circular motion of polishing stones must have evoked the playing of musical compositions, whose duration was conceived as full circles. In texts, musical cycles were likened to life cycles because they represented the attainment of perfection by the passage of time, just as a person gained maturity through aging (Ertan 2007: 37–38). Stonemasons polished the marble surfaces by making clockwise motions with their tools until the stones became reflective, like mirrors. The reference to the number 24 within the context of polishing implies that, just as the quality of light changed during the 24 hours of a day, so too did the color of each marble transform over time. Caʿfer must have witnessed closely the making and refining of architectural elements. Polishing was one of the last steps before marble columns, veneers, and other architectural elements were put in place, which brought the building closer to perfection and completion. Large expanses of marble, whether paved with tesserae or covered with larger pieces, could also be polished after being put in place. When Caʿfer visited the mosque, he saw the architect near his prayer rug placed on the marble-carved courtyard near the fountain (*şadırvan*) (Caʿfer 2005: 69). He could have sat down to converse with the *aziz* under the arcades of the mosque's forecourt while observing the polishing of the white marble pavement in the courtyard (**Figure 11**), noting how every hour spent polishing brought the marble closer to perfection.

Figure 11: The white marble pavement and the fountain against the backdrop of arcades in the forecourt of the Sultan Ahmed Mosque, 1617, Istanbul. Photograph by the author, August 22, 2017.

But in Sufi terminology, polishing a surface had a hidden meaning. Taşköprüzade narrates a story to differentiate between the attainment of knowledge by the intellect versus the heart. According to Taşköprüzade, Chinese and Byzantine artists in ancient times got into a dispute about their mastery of painting. A contest was organized and two walls, divided by a curtain, were built. Chinese painters worked zealously to generate the most wondrous and colorful images. Byzantine artists, however, refrained from writing or painting and resolved instead to polish their wall. When the curtain was dropped, the images made by the Chinese painters looked even more enchanting on the facing wall that had been polished by the Byzantine artists (Taşköprüzade 1966: 1:91). Taşköprüzade told this story to demonstrate the connection between knowing through reason and knowing through the heart. The story confirms how wonders of the world appear more awe-inspiring to a polished heart, or surface. It originates from Rumi's frequently illustrated *Mesnevi* (long poem), which mentions the notion of 'polishing by heart' (Andrews, Black, and Kalpaklı 1997: 118–21). Different versions of this story

circulated widely in the medieval and early modern periods (Necipoğlu 2015: 45–53, 60). It also related to the analogy established between polishing the heart and polishing a mirror, a metaphor for creativity and creation that appears in Islamic texts on the arts (Roxburgh 2001: 96, 164–68, 177–89; Soucek 1972: 9–21).

Another Ottoman scholar, Kınalızade (d. 1572), stated that the followers of the heart receive signs from the world of images through the reflection of divine light. He claimed, however, that not everyone could bear beholding these realities, which would annihilate the ignorant. However, Kınalızade warned people against rejecting these mystical experiences and spiritual personas like al-Suhrawardi (d. 1234), even though they could not comprehend them. He gave the example of Greek philosophers, such as Plato, Pythagoras, and Hermes, who contemplated the world of images through divine light, in contrast to Ptolemy, who contemplated stars through vision (Kınalızade 2007: 184–88). Ottoman scholars like Taşköprüzade, Kınalızade, and Caʿfer believed that contemplating the reflection of the world on a purified or polished heart or surface disclosed the realities hidden beneath visual phenomena (on sight and knowledge, see Necipoğlu 2015). Caʿfer's literal and metaphorical references to the act of polishing marbles in relation to knowledge production and perfection in the arts derive from this well-known analogy between purification, perfection, and knowledge.

The polished marble surfaces were in the process of becoming as luminous as mirrors. The link between art and knowledge becomes visible when, in his 'Spring Poem', Caʿfer praises the partially completed building. Whereas Caʿfer evaluated polishing as an ongoing event that produced pleasing sounds, in this poem, he likens the perfectly polished surfaces to mirrors:

> Its marble body is like a polished mirror
> While scrutinizing it, one's image is manifested to man
> (Caʿfer 2005: 78)[6]

Caʿfer envisioned that the building's polished marble surfaces, whose luminosity resembled that of a mirror, reflected the world in the most revealing way. Polished marble columns, pavements, and cladding on piers and walls would enhance a visitor's visual experience (**Figure 12**). Greek and Arabic ekphrases celebrated marble surfaces in buildings like Hagia Sophia by likening them to mirrors (Pentcheva 2015: 241–74). Ottoman poets used the mirror metaphor — implying illumination, purification, or reflection — in relation to the Mirror of Alexander because it was recognized for displaying all good and evil on its luminous surface (Andrews, Black, and Kalpaklı 1997: 45–48). The mirror was also a metaphor for the beloved's face, free of impurities and

reflecting the good (Andrews and Kalpaklı 2005: 344–45). Caʿfer's imagery highlights not only the visual features of polished elements manifesting creative powers embedded in the building but also the mosque's intermediary role for knowing oneself: viewing one's image on a polished surface recalls the mystical experience of attaining self-knowledge during purification, also recalling similar themes in album prefaces (Roxburgh 2001: 179–93). This insight or contemplation was often likened to gnostic knowledge that gave access to the world of images (Necipoğlu 2015: 23–61). The importance attributed to the process of polishing as well as to polished images demonstrates that not only viewing the building's visual qualities but also contemplating their making generated pleasure and knowledge.

Figure 12: Marble-clad piers and walls and marble columns in the entrance arcade of the Sultan Ahmed Mosque, 1617, Istanbul. Photograph by the author, May 30, 2019.

By validating, through narration, the *aziz*'s perceptions about the intersection of sounds coming from the marbles with the music produced by Sufis and music theory, Caʿfer underscores that celestial music and hidden knowledge are embedded in the building. Caʿfer contemplated these connections during his personal visits and conversation with the *aziz*, whose reflections stemmed from experiencing architecture in its state of becoming. A visitor apprehended these links while observing actions and hearing sounds. The visitor was not looking at a finished building per se: the spatial context of experience was a construction site, where the sounds of hewing, trimming, and polishing merged with the voices and movements of workers. These rhythmic sounds and motions materialized in harmonious architectural forms. Conversely, building activities gradually manifested the forms of knowledge implanted in architecture, such as the science of music. During this temporal and spatial unfolding, architecture mediated the aural and visual experience of visitors.

Geometry as the Foundation of Music and Architecture

The link between music, stones, and planets in Caʿfer's cosmology parallels the concepts put forth by other Ottoman scholars. In the 16th century, interest in musical writing shifted from its mathematical basis to cosmological associations, influences on people, and practical applications. Caʿfer, however, unites cosmological with mathematical approaches. He was equally attentive to the geometrical basis of music, which aligned with his interest in architecture's geometrical foundations (Kale 2020). Caʿfer believed that, like geometry, the science of music was also embedded in the building. After writing that Mehmed Agha had destroyed his instruments to denounce music, in chapter 14 Caʿfer reevaluates musical instruments (Caʿfer 2005: 25–26, 115–18). This shift stems from recognizing the geometrical basis of musical instruments, like the artisan tools.

For Caʿfer, the science of geometry was such a beautiful science (*latif ʿilm*) that even the shapes (*heyetler*) of the artisans' (*ehl-i sānayi*) tools (*ālet ve adāvāt*) derived from its forms (Caʿfer 2005: 117). For example, the hoop drum and tambourines are in the shape of a circle. The lute's curves are based on three arcs: the semicircle, shorter than a semicircle, and greater than a semicircle. While the shape of the pan pipe is based on an acute triangle, the shapes of harp and kanun follow other types of triangles. Caʿfer refers to this geometrical basis to morally justify the inclusion of instruments in his book. By mentioning music's basis in geometry, he further validates his lengthy account about the sounds in the building that prompted his writing: the art and science of architecture and music mutually relied on the noble science of geometry.

Caʿfer probably consulted books on music that described the geometric forms of musical instruments. Earlier thinkers such as Avicenna and al-Farabi had formulated the distances between the strings of an instrument according to mathematical proportions (Popescu-Judetz 1996: 67–81). Şükrullah (1388–1488) wrote the first Turkish text that explained the relationship between mathematical proportions, musical modes, and the shapes of the parts of an instrument (2008: 97–117). Although Caʿfer does not elucidate how different forms and proportions of instruments produced diverse modes, his list is similar to the ones in use during the 17th century (Pekin 2009: 1019–41; Feldman 1996: 111–69). He states that each beautiful form (*şekl-i latif*) depicted in the science of geometry had a deep impact on the heart (Caʿfer 2005: 115). This implies that sounds produced by proportionally shaped instruments could move the heart as well.

Against this backdrop, Caʿfer's reference to the geometrical basis of the tools of artisans is not random. He must have perceived a link between the production of rhythmic sounds and forms in the mosque. He knew that architects and artists like Mehmed Agha used tools such as set squares that were triangular in shape (Caʿfer 2005: 111). Due to this shared geometrical basis, not only did the tools generate sounds similar to those of musical instruments, but they also fabricated beautiful forms. Hence, it was not a coincidence that Caʿfer mentions Pythagoras as both the founder of the science of music and as the first compiler of the book on geometry after Hermes (Caʿfer 2005: 20). These relationships allowed Caʿfer to better understand the shared source of his uplifting aural and visual experiences while observing the building under construction.

Despite legitimizing music in this manner, Caʿfer was still concerned about its moral outcomes, such as its seductive power to lead one to worldly concerns (Artan 2006: 455). In chapter 14, Caʿfer states that it was appropriate to conclude his book by mentioning some of the noble qualities of music because the *Risāle* began by referring to the science of music (2005: 115). He therefore suggests that it is possible to glean some important lessons from it. He quotes a hadith about the archangel Israfel blowing the trumpet on the Day of Judgment to resurrect the faithful to account before God (2005: 115–16). Caʿfer tries to justify this instrument's moral role according to religious accounts and concludes his chapter with a poem that depicts musical gatherings as sources of disillusionment about the transitory nature of the world. While his words reveal a common anxiety about the Day of Judgment, they also demonstrate how he tried to justify music based on its spiritual and uplifting value (Fleischer 2000: 42–54). With this, he implies that both he and Mehmed Agha were interested in music's noble qualities, as experienced through architecture.

Conclusion: Material, Imaginary, and Intellectual Connections

The building under construction materialized various types of harmonious relationships ranging from sounds to images. But the source of a visitor's epiphany was the ephemeral process of architectural making: the mosque was in a stage of becoming. Writing a book on architecture while observing the construction of a major imperial building shows that architectural knowledge was not gained merely by examining completed projects or by reading existing canonical sources. Rather, such knowledge emerged from synesthetic perceptions of architecture in its making and in action, understood as the union of all senses, including sight, sound, smell, and even touch, through the tactility of materials. A visitor would not analyze the proportional relations between finished architectural elements, for example, by examining the ratio between the height and the diameter of a finished column and its base. Instead, the visitor contemplated the elements of a building in the making, constantly changing shape, as they were harmoniously being joined together. This process was as wondrous as the finished elements. Once the building was finished, the musical experience and knowledge embedded in stones would be lost. By including an anecdote from his visit to the construction site, Caʿfer assured his readers that cosmic music — the source harmony — was embedded in the building: this legitimate basis distinguished architecture as a noble art. With his sixth chapter, Caʿfer's goal was to reveal these legitimate foundations and the virtuous role of a sultanic mosque under construction to scholars and Sufis, who might otherwise oppose this extravagant project or the musical ceremonies taking place in the mosque. His musical elaboration suggested they visit the mosque and hear this ephemeral music. Against this backdrop, music and architecture complemented one another: architecture imitated music's harmonious and divine basis and impact, while music practiced in a sacred space assumed a divine role. At issue was not which art was superior, but how each could nurture the other.

Caʿfer's writings on architecture and sounds suggest a new form of architectural knowledge different from the architectural theories on orders and proportion in European treatises. Considering the ongoing debate on the theoretical foundations of early modern Islamic art and architecture, this Ottoman scholar's book shows how he conceived of and codified the episteme of architecture, as deduced from his lived experiences and observations. Although Caʿfer struggled to find reliable references in books on architecture to support his claims to these connections, he overcame these difficulties by relying on other forms of knowledge, such as music, cosmology, numerology, and geometry. His attempts to establish a relationship between architecture and other sciences also parallel his efforts to promote architecture to the ranks of other well-established sciences, a first in Ottoman architectural writing. In

this manner, both theory and practice informed how visitors perceived and responded to the relationship between sounds and marble in the architecture of early-17th-century Istanbul.

The *Risāle*'s sections on music and architecture demonstrate that diverse phenomena formed a layered unity in Caʿfer's sensuous and intellectual worlds. They shed light on early-17th-century perceptions of the arts and architecture by various social groups beyond court circles. Ottoman audiences evaluated architecture as a source of knowledge based on their lived experiences during their urban wanderings and gatherings. This experience, however, was not limited to viewing a finished project: rather, these spectators were sensitive to contemplating things in the making. Whereas historical accounts by visitors to the monumental buildings often mention their uplifting experiences, such as that of the famous traveller Evliya Çelebi, Caʿfer's rare narrative demonstrates how audiences reacted to a building that was gradually emerging in front of their very eyes, which they associated with wondrous powers (Evliya Çelebi 2006; also see Fetvacı 2008). Viewing architectural processes while structural elements were being joined together were intriguing and awe-inspiring for most visitors. Learned visitors to architectural sites, however, could rely on intellectual speculation along with empirical observations and imagination to acquire various forms of knowledge, ranging from spiritual and emotional to natural. In this way, architecture in a state of becoming, encompassing both structural and ornamental elements, became a vehicle for mystical experiences, spiritual ascent, and intellectual inquiries. While this agency enabled viewers to perceive the relationship between theory and practice in architecture, a few curious scholars like Caʿfer carefully recorded these lived experiences and oral communications on site to codify them in writing, providing clues as to how early modern audiences reacted to architecture in the making and how spatial thinking processes are informed by material culture.

Notes

[1] The *Risâle-i Miʿmâriyye* (2005) is in romanized Ottoman Turkish. An English translation, by H. Crane, is in Caʿfer (1987). All translations are mine, unless otherwise noted.

[2] For earlier studies, see Çığ (1984) and Nayır-Ahunbay (1975); for more recent assessments, see Necipoğlu (1990) and Fetvacı (2008). For the first sustained and critical reading of the complete *Risāle*, see Kale (2014).

[3] I have slightly modified Crane's translation. For Caʿfer's original text, see Caʿfer (2005: 70).

[4] *Zāhirā gerçi ki bir sıyt ü sadādır ancak*
Dil-i gamhāre veli özge safādır ancak.

[5] Owen Wright (2004) briefly mentioned the link between music and cosmology in Caʿfer's writing yet claimed that there is a lack of symbolic interpretation of architecture, which I disclose in this article.

[6] *Vücūh-ı memmeri āyine-i mücellādır*
İçinde ādeme bakdıkça gösterir didār

Competing Interests

The author has no competing interests to declare.

Authors' Note

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