

Aleppo's Mosques as Examples of How Solid and Void Interact in Islamic Architecture

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Abstract: *This study examines the interaction between solid and void elements in the historical Aleppo, Syria, mosques' architectural form. The study's goal is to look into how this interaction has been incorporated into mosque architecture and how that has affected the buildings' appeal on the social, cultural, and aesthetic levels. The study employs a qualitative and quantitative research methodology and includes a review of the literature and site visits to particular Aleppo mosques. The paper examines the historical context of mosque architecture in Aleppo and analyzes the design principles that govern the relationship between solid and void elements. The research shows that the mosques' architectural design exhibits a harmony between solid and void components, resulting in a play of light and shadow that improves worshippers' spiritual experiences. The study also highlights the shifting in the relationship between open and closed spaces in mosques of Aleppo during the Ottoman era, resulting in reduced access to proper ventilation and natural light. The study also demonstrates how, during the modern era, Aleppo's understanding of Solid and Void evolved, reflecting changes in architectural style and urban planning that require a review of the best ways to utilize mosques' exterior squares and reap their social and environmental benefits.*

Keywords: Mosques, Aleppo, Solid, Void, Courtyard

1. Introduction

Aleppo is home to several historic mosques that date back to the 7th century (Alafandi & Abdul Rahim, 2014). The most famous of these is the Umayyad Mosque, which was built in the 8th century and is considered one of the oldest and largest mosques in the world (Kuban, 1974). It features a stunning courtyard with marble columns and intricate mosaics (al - Jamīlah, 1999). Another notable mosque in Aleppo is the Al - Halawiyya Mosque, which was built in the 12th century and features a beautiful courtyard with fountains and gardens (Guidetti, 2016; Neglia, 2020), and the Al - Adiliyah Mosque, which was built in the 13th century and features intricate stonework and beautiful tile work (Bonner & Bonner, 2017). Aleppo also has many historical mosques from the Mamluk and Ottoman eras, as well as some modern mosques notable for their architecture and decorations (Al - razik & Mohamed, 2020). Unfortunately, many of these historic mosques have been damaged or destroyed during Syria's ongoing civil war. However, efforts are being made to restore them to their former glory so that future generations can appreciate their beauty and significance (Ibold, 2020; Noaime, 2023).

The plurality of historical mosques and the diversity of their forms confirms that Aleppo has a rich history of Islamic architecture (El - Hakim, 2021), particularly in the form of mosques. These structures of mosques not only serve as places of worship but also as cultural and historical landmarks (Noaime et al., 2020). Therefore, studying the architectural form of historical mosques in Aleppo is crucial for several reasons. Firstly, it provides insight into the development and evolution of Islamic architecture over time. The mosques in Aleppo showcase various styles and techniques that were used during different periods, such as the Umayyad, Mamlouk, and Ottoman eras (Gokalp & Uguz, 2018). By studying these structures, architects, and historians can understand how Islamic architecture has

evolved over time and how it has been influenced by different cultures (Noaime et al., 2020).

Secondly, studying the architectural form of historical mosques in Aleppo can help preserve these structures for future generations (Militello, 2018). Many of these mosques have been damaged or destroyed due to conflict and natural disasters. By documenting their architectural features and design elements, architects can recreate them accurately if they need to be rebuilt. Lastly, understanding the architectural form of historical mosques in Aleppo can help inform contemporary mosque design (Petruccioli & Pirani, 2013). Architects can draw inspiration from traditional designs while incorporating modern materials and techniques to create functional yet aesthetically pleasing structures that reflect their cultural heritage.

Furthermore, Aleppo's historic mosques are characterized by their intricate designs, which often incorporate the interplay of solid and void spaces (Miroğlu, 2005; Noaime, 2016). This interaction refers to the way in which architects use empty spaces within a building to create a sense of balance and harmony with the solid elements. In the case of Aleppo's historic mosques, this case is particularly important as it plays a crucial role in defining their aesthetic appeal. Despite their importance, there has been limited research on the role of solid and void spaces in the design and construction of Aleppo's historic mosques. This research problem seeks to address this gap in knowledge by exploring how the interaction of solid and void spaces has been used in the design and construction of these mosques. The research problem also seeks to examine the impact that this interplay has had on the social, cultural, and aesthetic appeal of these mosques. By understanding how these spaces have been used in the past, we can gain insights into how they can be used in contemporary mosque design.

This research problem is significant because it sheds light on an important aspect of Aleppo's cultural heritage that has

been overlooked. It also provides valuable insights into how mosque design can be improved by incorporating traditional design elements. And it can provide valuable insights into how architecture can shape social interactions. Ultimately, this research will contribute to a better understanding of Aleppo's architectural heritage and help preserve it for future generations.

2. Materials and Research methodology

The research methodology for this study involves a combination of qualitative and quantitative research methods. The qualitative research method involves the analysis of historical documents, literature reviews, and case studies of historical mosques in Aleppo. The quantitative research method involves the use of computer - aided design (CAD) software to create 2D models of the mosques and analyze their architectural forms. The materials used for this study include historical documents, a literature review, photographs, and drawings of historical mosques in Aleppo. The CAD software used for creating 2D models includes AutoCAD and Photoshop. Other materials used include books on Islamic architecture, articles on mosque architecture, and academic journals on architecture.

Data Collection:

The data collection process involves the following steps:

- 1) Literature Review: A comprehensive literature review was conducted to gather information on the architectural form of historical mosques in Aleppo.

- 2) Case Studies: Case studies were conducted on selected historical mosques in Aleppo to analyze their architectural form.
- 3) Data Collection: Data was collected from various sources such as photographs, drawings, and historical documents.
- 4) Analysis: The models were analyzed to identify the interaction between solid and void in the architectural form of the mosques.
- 5) Conclusion: Based on the analysis, conclusions were drawn regarding the architectural form of historical mosques in Aleppo and their interaction between solid and void.

Overall, this research methodology and materials will provide a comprehensive understanding of the architectural form of historical mosques in Aleppo and their interaction between solid and void.

3. Historical background of Aleppo

Aleppo is the largest city in Syria with 190 km² and one of the oldest continuously inhabited cities in the world (Mohamed et al., 2020; TOPAL) . Aleppo is important because it is located in northwestern Syria on a plateau 680 meters above sea level, approximately fifty kilometers from the Turkish border. Aleppo is an important city because of its size, history, and its location. Aleppo is also an important city because of its architecture. Aleppo's architecture is a combination of ancient Eastern architecture and modern Western - style buildings.

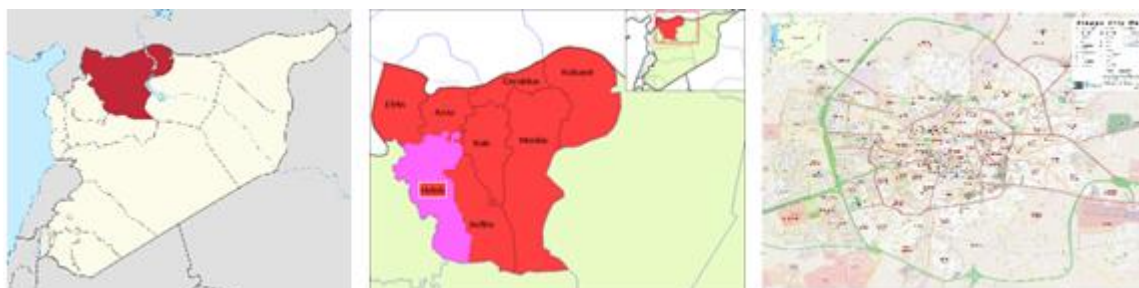


Figure 1: Aleppo region location and administrative boundaries Source: Aleppo municipality.

Aleppo's strategic location has made it a crossroads of many civilizations over the centuries (Asslan et al., 2022; TOPAL) . It is situated at the northern end of the Fertile Crescent and has been an important trading center since Roman times. Aleppo was conquered by the Arabs in the seventh century, and by the Seljuk Turks in the 11th century. It later came under Crusader control (Khalil, 2014) , before being captured by the Mamluks in 1260. The city was then ruled by the Ottoman Empire from 1516 until 1918, when it was occupied by British and French troops during World War I. Following the war, Aleppo became part of Syria, which gained independence from France in 1946 (Spagnolo, 1969) . The city has been besieged on several occasions since the start of Syria's civil war in 2011 and has been extensively damaged during the conflict. Despite this, Aleppo remains one of Syria's busiest cities and is home to a number of important historical monuments.

The city was founded in the 3rd millennium BCE, and its earliest surviving structures date back to the 1st century CE

(Matthiae & Lamberg - Karlovsky, 2003) . These include the imposing Citadel of Aleppo, a fortified palace that was built on the site of an earlier Assyrian fort. Other notable examples of early Aleppo architecture include the Great Mosque of Aleppo, built in the 8th century CE, and the Souq al - Madina, a covered market that dates back to the 13th century. In the centuries since then, Aleppo has been repeatedly occupied and sacked by invading armies, but its architectural heritage has survived, nonetheless. Today, the old city of Aleppo is a UNESCO World Heritage Site, and its ancient buildings remain an enduring reminder of this rich history (Al Azm, 2015; Vincent, 2004) .

Aleppo's climate is characterized by hot, dry summers and cool, wet winters. The average temperature in July is about 26°C (79°F), while the January average temperature is around 6°C (43°F). Rainfall occurs from October through May, with an annual average of 600 mm (23 inches) (Paine & Lieutier, 2016) . Aleppo is located in a semi - arid region, which means that it receives very little rainfall. However,

the city is situated on the edge of an oasis, which provides a source of water for crops and gardens. Despite the lack of rainfall, the climate in Aleppo is relatively mild and temperate. The city experiences moderate humidity levels and little extreme weather.

4. Solid and void in Islamic architecture: literature review.

The interplay between solid and void spaces is a fundamental aspect of Islamic architectural form, and it plays a crucial role in defining the aesthetic and functional qualities of Islamic buildings (Alami, 2013; Shahlaei & Mohajeri, 2015). In Islamic architecture, solid spaces are typically associated with privacy, protection, and enclosure. These spaces are often used for private functions such as prayer, meditation, or relaxation (Lehrman, 1980). They are also used to create a sense of security and protection from the outside world. Solid spaces are typically characterized by their thick walls, small windows, and limited openings (Bollnow, 1961).

On the other hand, void spaces in Islamic architecture are associated with openness, lightness, and transparency (Nejad et al., 2016). These spaces are often used for public functions such as social gatherings or communal prayer (Albarazy, 2022). They are also used to create a sense of connection with the natural environment. Void spaces are typically characterized by their large windows, open courtyards, and expansive views. The interplay between solid and void spaces in Islamic architecture creates a dynamic tension that is both functional and aesthetic (Shahlaei & Mohajeri, 2015). The use of solid walls provides privacy and protection while also creating a sense of mystery and intrigue. The use of void spaces creates openness and transparency while also providing a sense of connection with the natural environment (Tovey, 2007).

One example of this interplay between solid and void spaces can be seen in the design of mosques. Mosques are typically designed to provide both private prayer areas for individuals as well as communal prayer areas for larger groups (Amin, 2019; Ismail, 2008). The private prayer areas are often located in enclosed rooms or alcoves that provide privacy and protection from distractions (Hamilton & Shepley, 2010). The communal prayer areas are typically located in large open halls that allow for maximum visibility and connectivity (Gobe, 2010). Another example can be seen in the design of palaces or residential buildings. In these buildings, solid walls are used to create private living spaces while void spaces are used to create public gathering areas. The use of courtyards, gardens, and open terraces creates a sense of openness and connection with the natural environment while also providing a space for social interaction.

The use of solid and void spaces in Islamic architecture is not only functional but also symbolic (Baharudin & Ismail, 2014). The solid walls represent the strength and stability of Islamic culture while the void spaces represent the openness and transparency of Islamic values. The interplay between these two elements creates a dynamic tension that reflects the complexity and richness of Islamic culture. In

conclusion, the use of solid and void spaces is a fundamental aspect of Islamic architectural form (Baharudin & Ismail, 2014). It plays a crucial role in defining the aesthetic and functional qualities of Islamic buildings. The interplay between solid walls and void spaces creates a dynamic tension that is both functional and symbolic (Shahlaei & Mohajeri, 2015). This interplay reflects the complexity and richness of Islamic culture, creating buildings that are not only beautiful but also meaningful (Bell, 2019).

5. Results and Discussion

5.1 Case studies: Examples of historical mosques in Aleppo

In terms of analysis, we chose five mosque models that reflect various ruling periods in Aleppo's history. Starting with the Great Umayyad Mosque from the Umayyad era, the Halawiyya Mosque from the Azniki and Ayyubid periods, the Utrush Mosque from the Mamluk period, the Al - Adiliyya Mosque from the Ottoman era, and finally the Tawheed Mosque representing modern Syrian architecture were chosen. Our study will look at the connection between open and closed (solid and void) spaces in mosques throughout history. We expect to obtain a better understanding of the significance and interpretation of this relationship by tracing its changes and transformations over time.

- a) *Great Umayyad Mosque*: The Great Umayyad Mosque in Aleppo, also known as the Umayyad Mosque of Aleppo, is one of the oldest and most significant mosques in Syria (HALABI). It was built during the 8th century by the Umayyad Caliphate and has undergone several renovations and expansions over the centuries. The mosque is located in the heart of Aleppo's Old City and covers an area of around 12,000 square meters (ABDULHADI, 2020). The mosque also features a beautiful courtyard with a central fountain and several smaller fountains around it. The courtyard is surrounded by arcades with intricate decorations and inscriptions. One of the most notable features of the Great Umayyad Mosque is its minaret, which stands at a height of 45 meters (Fangi, 2019). It was originally built during the 11th century. Throughout its history, the Great Umayyad Mosque has served as a center for Islamic learning and worship. It has also been a witness to many important events in Syrian history (Cytryn - Silverman, 2009), including battles and sieges. Unfortunately, like many other historical sites in Syria, the Great Umayyad Mosque has suffered significant damage during the ongoing civil war. However, efforts are being made to restore it to its former glory once again. See figure (1).
- b) *Al - Halawiyya Mosque*: It is a historic mosque. It was built in the 12th century during the reign of the Zengid dynasty and is considered one of the most important examples of Islamic architecture in Syria. The mosque features a large courtyard with a central fountain and several prayer halls (Allen, 1986; Gaube & Wirth, 1984; Knost, 2010; Van Berchem et al., 1903). The main prayer hall is covered by a large dome supported by four pillars, while smaller domes cover the other prayer halls. The mosque has undergone several renovations over the centuries, including major restorations in the 16th and

18th centuries. However, it suffered significant damage during the Syrian Civil War, particularly in 2013 when it was hit by mortar shells. Efforts are currently underway to restore and preserve this important cultural heritage site. See figure (1).

- c) *Al - Utrush Mosque*: It built in two stages. In 1399 AD, Aleppo's Mamluk ruler Aqbugha al - Utrush began building the mosque's western facade, minaret, and mausoleum. The donor died and was buried there in 1404 AD (Al - Ghazzi, 1926; Knost, 2010; Van Berchem et al., 1903) , during his second term. The mosque was finished in 1409 AD under Damurdash al - Muhammadi's rule. . The mosque is known for its unique architectural style, which combines elements of Mamluk architecture. The mosque is rectangular in shape, consisting of a courtyard, three arcades, and a prayer hall with arched openings on the south side (Gaube & Wirth, 1984) . A domed mausoleum is located on the northwest corner, with two windows on each of the outside facades. The west - facing facade is the most ornate, with a portal niche, six rectangular windows, and small arched windows above. Over the centuries, the Al - Utrush Mosque has undergone several renovations and restorations. However, it has suffered significant damage during the ongoing Syrian Civil War, including damage to its dome and minaret. Despite this, efforts are underway to restore the mosque to its former glory. See figure (1).
- d) *Al - Adilliyya Mosque*: Mohammed Pasha Dukakinzade, who ruled Aleppo from 1551 to 1553, is the mosque's benefactor. The mosque's local name, on the other hand, stems from its proximity to the governor palace known as

the House of Justice (Dar al - 'Adl) at the time of building (Al - Ghazzi, 1926; Gaube & Wirth, 1984) . A hemispherical dome covers the square prayer area, which is preceded by a double portico. The cupola is supported by engaged pilasters and flying buttresses and is made of lead. The prayer hall's façade is symmetrical, with the portal in the center flanked by windows and a pair of mihrabs with elevated prayer platforms (Van Berchem et al., 1903) . The portal combines Ottoman architecture and local building customs in a rich blend that makes it one of Aleppo's most beautiful examples. The doorway, like the other Ottoman portals, is set within a deep niche topped by a muqarnas hood and flanked by two tiny side niches and engaged colonnettes. See figure (1).

- e) *Al - Tawheed Mosque*: It is a modern architectural wonder located in the city of Aleppo. Its unique location on the right side of the Queiq River, in the Baghdad Station neighborhood, sets it apart from other mosques in the area. Interestingly, this neighborhood has a Christian majority, and the mosque is situated between two churches - the Chaldean Church and the Church of the Holy Cross. The mosque was inaugurated in 1981 AD and boasts a stunning blend of modern architectural styles. The prayer hall is adorned with a central dome surrounded by four smaller domes and four circular minarets. A small garden next to the mosque adds to its charm. It's worth noting that there is a Chaldean church located in front of the mosque, making this area an excellent example of religious coexistence and tolerance. Al - Tawhid Mosque stands as a testament to modern architecture while promoting peace and harmony among different religious communities. See figure (1).

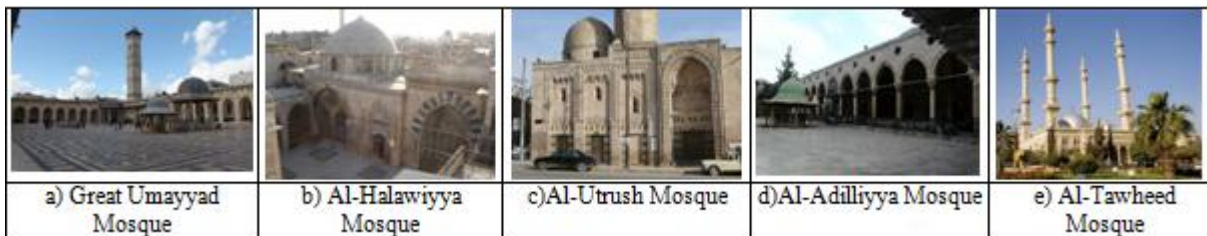


Figure 1: Pictures of the study cases of the five mosques, the source: (a, e) author, (b, c, d) Aleppo Heritage project.

5.2 Solid/void: Significance and impact

To achieve the desired outcomes of our research, we conducted a thorough analysis of the architectural plans for five different models, using the concept of solid and void. This approach enabled us to gain valuable insights into how

the location of the courtyard shifted in relation to the building, as well as how the use of mosque spaces evolved over time. By carefully examining these factors, we were able to draw meaningful conclusions about the development and evolution of mosque architecture. See figure (2).

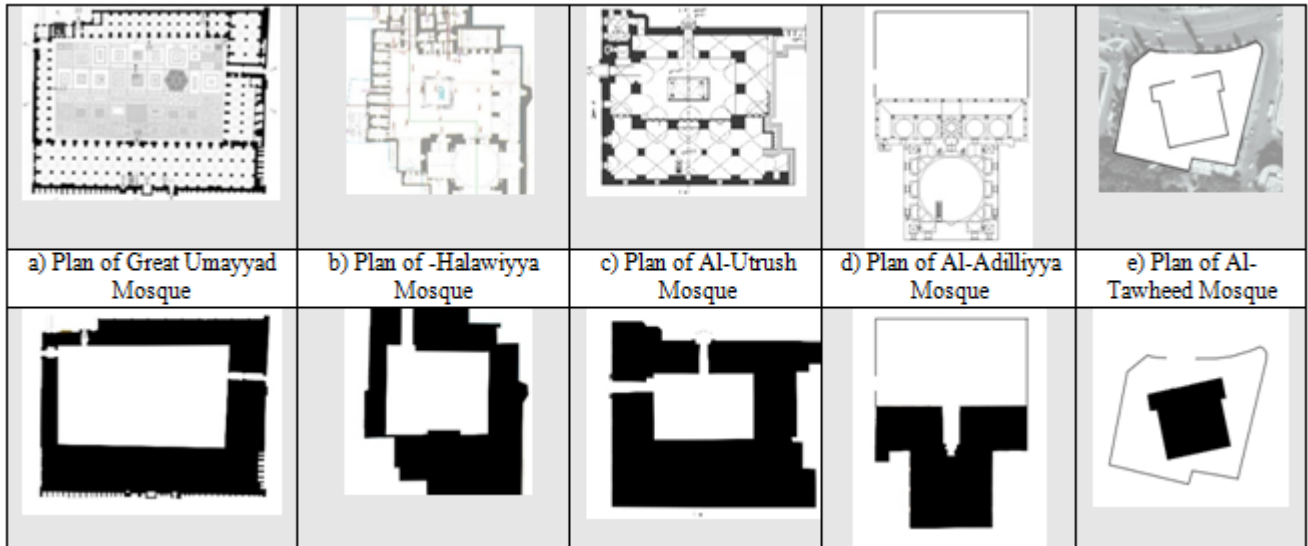


Figure 2: Analyses of Solid and Void in the five study cases - the source: (a, b, c, d) Aleppo Heritage project, (e) author.

After conducting our analysis, it became evident that the relationship between open and closed spaces remained consistent in previous eras, including the Mamluk era where courtyards were internal and prayer hall surrounded them. However, a shift in this relationship occurred during the Ottoman era when courtyard was placed outside of halls. This change had negative effects on the social and spiritual dimensions of inner courtyards, as well as reduced access to proper ventilation and natural light.

To comprehend the shift that occurred during the Ottoman era, it is essential to delve into the morphogenetics of architecture. The Ottomans, who originated from Anatolia and Istanbul, were influenced by Byzantine history. Their approach to places of worship was heavily influenced by the Church of Hagia Sophia, which featured superimposed domes. Furthermore, Byzantine churches lacked the concept of a courtyard and instead emphasized outer courtyards to highlight the building's significance. These outdoor spaces allowed for a better appreciation of the building's aesthetics from outside.

Arab and Islamic architecture places great emphasis on the courtyard of a building, with a particular focus on internal facades. This is in contrast to the external facades, which are typically solid. However, we believe that the relationship between open and closed spaces began to shift during the Ottoman period in the mosques of Aleppo. It is important to note, however, that this change occurred without adequate consideration for the unique philosophy and significance of courtyards within mosques.

The concept of the relationship between Solid and void underwent a significant transformation during the modern era in Aleppo. The open areas surrounding buildings began to envelop them from all directions, marking a departure from the traditional approach. This shift can be traced back to the Ottoman era, where modern mosques lost much of their social, spiritual, and environmental dimensions that were once provided by the courtyards in historical mosques. As a result, this change represents a continuation of an ongoing evolution in architectural design and urban planning. See figure (3) which illustrate Solid and Void relationships in the mosques of Aleppo city during different eras.

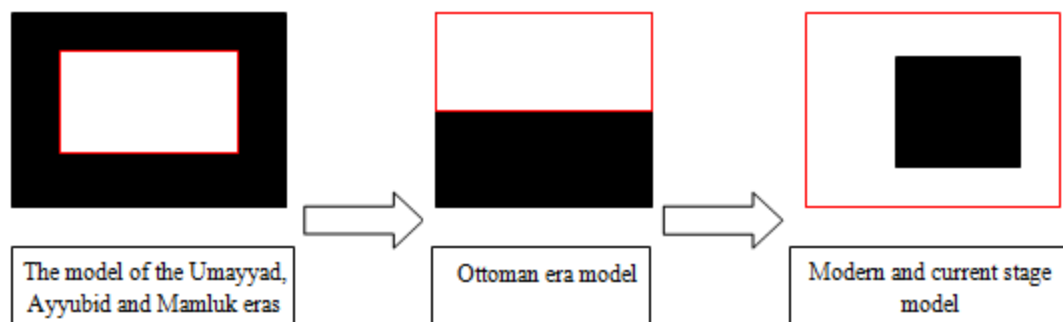


Figure 3: Illustrate Solid and Void relationships in the mosques of Aleppo city during different eras. - source: the author

We believe that further architectural studies can provide a more comprehensive understanding of how to recreate the social life of the outer spaces surrounding existing mosques. Additionally, exploring the mechanisms for environmentally re - employing these spaces could help compensate for the deficiencies caused by borrowed models that have weakened the social and environmental aspects of current mosques.

6. Conclusion

Studying historical mosques is crucial in understanding the evolution of Islamic architecture. Islamic architecture is known for its intricate use of solid and void. These spaces create a dynamic tension between privacy and protection, openness and transparency, and connection with the natural

environment. The interplay between solid and void creates a sense of protection while also connecting the building to its surroundings. This balance between solid and void spaces is a hallmark of Islamic architecture, creating beautiful and functional buildings that are both practical and aesthetically pleasing. The relationship between solid and void in the mosques of Aleppo underwent a significant change during the Ottoman era. This shift resulted in reduced access to proper ventilation and natural light, which impacted the overall atmosphere of these sacred spaces. In modern Aleppo, solid - void relationships changed. The traditional method changed when open spaces surrounded buildings from all sides. Modern mosques lost much of their social, spiritual, and environmental aspects. Further architectural studies may help recreate the social life of mosques' outer areas. Explore ways to environmentally re - use these places to make up for borrowed models that have weakened mosques' social and environmental aspects.

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